

Remarks.—They have furnished a map of the mines; they have a second opening for each vein located about 1,000 feet from main opening; they have a house for men to wash and change their clothes in; they have an opening to the surface where men and mules can travel in and out at all times; there are no boys working in the mines under twelve years of age; the engineers seem to be experienced, competent and sober men; the mining boss seems to be an experienced and competent man; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates.

CONTINENTAL COLLIERY.

This colliery is located in Lackawanna township, and lying one and one-fourth miles north-west of the Lackawanna river, in Keiser valley. The shaft is 112 feet to the Diamond or E, 242 feet to the F or Rock, and 293 feet deep to the Clark vein; the opening is 10 feet by 21 feet. It is operated by the Delaware, Lackawanna and Western railroad company. William Dorne is mining boss, and James F. Green is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they mine and prepare 470 tons of coal per day; they employ 67 miners, 67 laborers, 23 drivers, 11 door-boys and 20 company men in the mine; 46 slate pickers, 8 head and plate men, 2 drivers, 20 company men, 10 mechanics and 2 bosses outside; in all 276 men and boys; they have opened from the Clark to the G vein by a rock tunnel 850 feet long; they are working the Clark vein of coal; average thickness 7 feet; they are just opening in the G vein; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 5 to 7 yards wide to sustain the roof; they leave cross entrances about 20 yards apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—The ventilation is produced by means of a fan, which is located north of main shaft; the intake is located at the mouth of shaft; it contains an area of 100 feet; the upcast is at fan air-shaft, area 100 feet; the amount of pure, fresh air is 31,740 cubic feet per minute; there is no noxious or poisonous gas evolved in these mines; the main doors are hung so as they will close of their own accord; they have attendants at main doors; they have double doors on the main traveled roads, and an extra door in case that any of the others should get broken; the air is circulated to the face of the workings in two splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use one pair of hoisting engines of 120-horse power, one pumping engine of 95-horse power and one breaker engine of 40-horse power, all in shaft engine room; one steam pump foot of shaft of 80-horse power, and one fan engine in the fan engine house of 60-horse power; they have a metal speaking tube in the mine; they have two safety carriages with all the modern improvements; they have flanges of sufficient strength and dimensions for safety, and an adequate brake on their hoisting drum; they use stranded wire ropes with clevis and cone attachment; the boilers have been cleaned and examined and reported in good condition; they use a safety-valve to indicate the pressure of steam.

Remarks.—They have furnished a map of mine; they have an opening to daylight where men and mules travel in and out; they have no house for men to wash and change their clothes in; the mining boss seems to be a practical and competent man; there are no boys working in the mine under twelve years of age; the engineers seem to be experienced, competent and sober men; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety-gates; the breaker machinery is fenced and boxed off so that operatives are safe.

HAMPTON COLLIERY.

This colliery is located in Lackawanna township, and lying one mile north-west of the Lackawanna river; it is 125 feet deep to the Diamond vein; it is 16 feet by 9 feet; it is operated by the Delaware, Lackawanna and Western railroad company. Thomas Carson is mining boss, and Jas. F. Green is outside foreman.

Description.—They have a double breaker attached to the shaft tower; they mine and prepare 550 tons of coal per day; they employ 68 miners, 64 laborers, 33 drivers, 10 door-boys and 18 company men in the mine; 55 slate pickers, 12 head and plate men, 4 drivers, 27 company men, 9 mechanics and 2 bosses outside; in all 302 men and boys; they are working 2 slopes in the mine, which are worked by machinery; one is 420 feet long, and the other 575 feet long, each driven on an angle of 7°; they are working the Diamond vein, average thickness 5½ feet; they work headings 12, air-ways 12 and chambers 30 feet wide; they leave pillars from 5 to 6 yards wide to sustain the roof; they leave cross-entrances 20 yards apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—The ventilation is produced by means of a furnace located about 1,000 feet from main opening; the intake is located in Central and Sloan shafts; it contains an area of 100 feet; the upcast is located at furnace shaft; it contains an area of 80 feet; the amount of fresh air is 25,225 cubic feet per minute; there is very little noxious or poisonous gas evolved in the mine; the main doors on headings and air-ways are hung so that they will close of their own accord; they have attendants at main doors; they have double doors on main travelled roads, and an extra one in case an accident should happen to any of the others; the air is circulated to the face of the workings in 2 splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 1 pair of hoisting engines, 120-horse power, and 1 pumping, 100-horse power, in hoisting engines' rooms; 1 breaker engine, — horse power; 2 hoisting engines inside. — horse power each; 4 steam pumps inside. — horse power; they have a metal speaking tube in the shaft; they have 2 safety carriages, with all the modern improvements; they have an adequate brake, and flanges of sufficient strength and dimensions for safety attached to the side of the hoisting drum; they use standard wire ropes, with clevis and cone attachment; 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 mine; they are connected with Continental, Sloan and Central shafts, which can be used as second openings; they have no house for men to wash or change their clothes in; they have no standing gas, but some water in their mine; the mining boss is a practical and competent man; there are no boys working in the mine under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any persons to ride on loaded carriages in the shaft or on loaded cars in the slope; they do not allow more than 10 persons to ride on safety carriage; in the shaft at one time; the parties having charge know their duty in case of death or serious accident; the shaft landings are protected by safety gates; the breaker machinery is fenced and boxed off so that operatives are safe.

HYDE PARK COLLIERY.

This colliery is located in the city of Scranton, lying about 1½ miles north-west of the Lackawanna river. It is 148 feet deep to the Diamond, 183½ feet deep to the Rock and 265 feet deep to the G or Big vein; the shaft-opening is 18 feet by 11 feet. It is operated by the Delaware, Lackawanna and Western railroad company. D. W. Moser is mining boss and Robert E. Ruthven is outside foreman.

Description.—There is a double breaker attached to the shaft tower; they have 2 patent safety-carriages with all the modern improvements; they mine and prepare about 450 tons of coal per day; they employ 61 miners, 61 laborers, 23 drivers, 9 door-boys and 14 company men in the mine; 80 slate pickers, 9 head and plate men, 3 drivers, 20 company men, 8 mechanics and 2 bosses outside; in all 290 men and boys; they are working the G or Big vein, average thickness 12 feet; they work headings 12, air-ways 18 and chambers 30 feet wide; they leave pillars from 6 to 7 yards wide to sustain the roof; they leave cross-entrances 60 feet apart for the purpose of ventilation; the roof is good slate; the mine is in a good working condition.

Ventilation.—Ventilation is produced by means of a fan located in Central shaft; the intake is located in air-shaft about 1,000 feet from main shaft; it contains an area of 120 feet; the up-cast is located in Central shaft, it contains an area of 110 feet; the average supply of fresh air per minute is 30,880 cubic feet;

angle of inclination is $9^{\circ} 35'$. The slope was driven part of the way through coal, at a cost of \$364, but there were $28\frac{1}{2}$ yards of rock to cut, from nought up to eight feet, which cost \$283 33, and 77 yards driven through sandstone, which cost \$3,080. The whole cost for sinking the slope was only \$3,952 33. They have a pair of engines, 13-inch cylinder and 18-inch stroke; estimated horse power, 50; the size of their drum is six feet diameter, which has an approved brake attached to it. There is no second opening to the slope, but they are driving for one toward No. 1 drift, and expect to make a connection soon.

OTHER NEW OPENINGS AND CONNECTIONS.

The Delaware, Lackawanna and Western railroad company have made connections between the **Hampton** shaft and the Oxford shaft, at Hyde Park, and between Tripp's slope and the Brisbin shaft, in the Third ward, Scranton. They have also sunk an air shaft, at Hyde Park, into the workings of the Oxford shaft, and connects also with the Hampton shaft workings. A fan is to be placed at this air shaft which will assist in ventilating both collieries named.

The Pennsylvania coal company have completed a new slope at No. 1 tunnel, in Pittston township, which is intended for hoisting coal. They have also made a second opening for No. 4 slope, in Jenkins township, which is to be used also for ventilation; and the workings of old No. 10 shaft in the 14-foot seam, have been connected with the new No. 10 shaft, in Pittston. No. 2 shaft, Dunmore, was sunk to the lower seam.

The Delaware and Hudson canal company have made a connection, in the 14-foot seam, between Marvine and Leggetts Creek shafts, Providence; and at No. 1 shaft, Carbondale, an air shaft has been sunk, and two more air shafts at No. 3 shaft, and still another at the Coal Brook colliery. These air shafts are only poor-make shafts, unless mechanical means are used to produce ventilation. There are too many of them in Carbondale. What is needed there is a system of air courses inside of the collieries.

At the Filer colliery, Winton, a drift has been driven from a ravine into the workings, for a traveling way for the men to go to and from their work. A new drift has been opened at the Greenwood colliery for mining coal, and the same company have made an additional opening for coal at the Sibly colliery, in Old Forge township. An opening has been made at the Green Ridge slope for ventilation. The above are all the openings and connections made in the district during the year, so far as I am informed.

IDLE AND ABANDONED COLLIERIES.

The Archbald shaft, Lackawanna township, and Oxford shaft, Hyde Park, owned by the Delaware, Lackawanna and Western railroad company, were idle all through the year; the last work done at the Hyde Park shaft was done in February, and the Scranton coal company's drifts at Bellevue were idle. Bellevue slope and shaft worked only $22\frac{1}{2}$ days.

No. 1 shaft, Pittston township, owned by Pennsylvania coal company, was idle; No. 2 and No. 3 shafts were abandoned as hoisting shafts, and are now used as pumping shafts.

The Marvine shaft, Providence; Powderly slope, Carbondale township, and Breaker, Forrest and Jefferson tunnels, Carbondale City, all owned by the Delaware and Hudson canal company, were idle.

The following collieries have also been idle: Rolling Mill colliery, Scranton, consisting of a slope, tunnel and drift; the Ontario colliery, Pleasant Valley, and the Heidelberg colliery, Pleasant Valley. Spring Brook No. 1

whole number at present in the district is forty-nine. One old fan was replaced with a new one, and two have been removed from one mine to another. Several air-shafts have been sunk, and a large amount of work has been done inside of the mines, for the purpose of utilizing a greater proportion of the air entering them.

The Delaware, Lackawanna and Western Railroad Company still carry the palm for having the best ventilated mines—all of their collieries having excellent ventilation, with the single exception of Tripp's slope. This slope needs attending to, and it is expected that long before the close of the current year, there will be no cause of complaint even here. A new fan, twelve feet in diameter, and three feet six inches face, was erected at the air-shaft connected with the **Hampton** shaft in place of a furnace, which has increased the ventilation from forty-four thousand six hundred to sixty-two thousand six hundred cubic feet per minute. This fan commenced running on the 27th of October.

The Dodge shaft is also ventilated at present by the fan at the Scranton Coal Company's slope adjoining, which has been lying idle for years. This also is a change from the furnace heretofore used, and has undoubtedly been affected, because it is so much cheaper to run a fan than to keep up a fire in a large furnace. The furnace in this instance produced more air for the Dodge shaft than the fan does, but the fan furnishes ventilation for the Scranton mines in addition to the Dodge. The furnace at the Dodge has produced as high as one hundred and forty-two thousand cubic feet per minute, exerting a horse power of 26.66 to move the air, and I doubt very much that another furnace is to be found in any colliery in the country, that will give so favorable a result. It is a double furnace, having an aggregate grate surface of one hundred and twelve square feet, the depth of the upcast being three hundred and thirty feet, and the sectional area, one hundred and thirty-two square feet. As an example of a first class furnace, I here insert a plan of it. There are two other furnaces—one at the Hyde Park shaft, and the other at the No. 2 Diamond slope—both of them sisters to the one at the Dodge, but neither of them has ever produced the quantity of air that this one has, and the difference is accounted for by the comparative shallowness of the upcasts which makes a great difference in the height of the motive column. A new fan has been put in to replace an old one at the Sloan shaft, the old one being so much worn as to require the change.

A number of the collieries of this company are quite fiery, especially the Taylor shaft, Bellevue shaft, Bellevue slope, Dodge Shaft, Sloan shaft, Central shaft, and **Hampton** shaft, while there is considerable gas generated in nearly all of the others. But the ventilation is so sweeping, that no explosion can occur unless it be through want of proper distribution, or through some inexcusable blunder. I find the general mine superintendents, Messrs. B. Hughes and T. D. Davies, always careful, and prompt to inaugurate improvements whenever such are needed, and they always manifest a cheer-

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work the Rock seam out that was left in the Oxford shaft. The rock seems to be of better quality east of the shaft than on the west.

Central Shaft.

This shaft has been re-timbered, as to new buntons and guides, from bottom to top, and also a new fan put in to re-place the old one.

Oxford Shaft.

Put in new cribbing on top of shaft, and are now in process of sinking from Rock to big and Clark seams of coal about one hundred and sixty feet deeper.

Oxford Air-Shaft.

Has connected with G or big seam workings in Central mines. Put in two new hoisting engines, also a fan engine; also a new fan, twelve feet diameter by three and a half feet face. The intention is to lower the coal from the Diamond and Rock seams to the Big and hoist it up the Central main shaft. The distance to be lowered is one hundred feet. Also put in new cribbing on top of shaft.

Scranton Coal Company's Slope.

This mine has been cleaned and new rails re-laid preparatory to commence to work the Clark seam of coal, are now ready to operate. This slope has been idle for years.

No. 2 Diamond Shaft E or Diamond seam.

Are sinking a new slope from the Diamond to the Rock or F seam. The opening is seven by eleven feet in the clear. More than half the distance is already sunk.

Tripp Slope

Made an extra opening in the West mountain, by driving up the pitch about 40° for ninety feet, then sunk a shaft fifty-seven feet deep. It gives an intake for air in the extreme end of the mine workings, and an opportunity for the men to come out that way, if they feel so disposed. This shaft is one and three fourths miles from the mouth of the slope.

Brisbin Shaft.

A heading has been driven to the outcrop on the West mountain from the level gangway, and they are now grading three gravity planes to let the coal down the steep grades from the West mountain side.

Cayuga Shaft.

This shaft has been overhauled, and new cribbing put in to a depth of about sixty feet from the surface.

Storr's Shaft.

This is a new shaft, located in Dickson City borough. It is about two thousand feet northwest from the Lackawanna river. The sinking is pro-

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twenty-inch cylinder, two hundred horse power, one fan engine, eighteen by thirty inch cylinder, eighty horse power to run a twenty-foot fan. There is also a brick engine-house here, with six boilers in place, for burning culm. They are building two breakers at this colliery, with a capacity of one thousand tons per day each. There are a number of men engaged here sinking the shafts and building the breakers. When this colliery is completed it will be one of the best equipped and most substantial in this mining district.

The Lackawanna Coal Company's New Shaft.

This is a new shaft which they are sinking. At present the shaft opening is ten by thirty-four feet, and is down fifty feet from the surface. It is located in Blakely borough on the north-west side of the Lackawanna river, on property leased by the company from Stevens, Hull, and others.

They are working a large force of men sinking the shaft and building all the necessary appendages for a first class colliery.

Jones, Simpson & Co.'s New Shaft.

This shaft is located in Archibald borough, on a tract of land leased by the company, of C. B. Hackley, Esquire. It is about one and one half miles west from the Lackawanna river. It will be connected with their present breaker by railroad track eleven thousand two hundred feet long, the coal to be hauled by locomotive power to the breaker from the shaft. The shaft opening is ten by thirty-four feet. It is sunk about seventy-five feet. The probable depth of the shaft to Archibald seam of coal is one hundred and twenty-five feet.

Belmont Colliery.

This is a new colliery, and consists of three drifts, in Carbondale. Bottom seam of coal, and a new breaker, with a capacity of preparing about four hundred tons of coal per day. It is located in the upper end of Carbondale city, and about fifteen hundred feet east of the Lackawanna river. It is owned and operated by the Butler Coal Company.

The Pennsylvania Coal Company.

This company have made considerable improvements during the year, but their officers have made no detailed statements of the same.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY.

Pyne Shaft.

The company have graded a new gravity plane in this colliery to let the coal down on the West mountain side of shaft.

Continental Shaft.

Re-sunk from G or big seam to the Clark, now operating both seams of coal.

Hampton Shaft.

Sinking a new slope from Diamond seam to F or Rock seam so as to

Lackawanna and Western Railroad Company, introduced the first heaters into mine ambulances.

Other Fatalities.

In addition to the fatalities resulting from accidents which have been regularly tabulated, as required by law, the following list which is attributed to other causes is to be noticed:

On June 5, 1901, David R. Thomas, nineteen years of age, employed as driver in the Archbald mine, received injuries while at work, from which he died. The coroner's jury rendered the following verdict: "Thomas came to his death as a result of a blow received on the head by some blunt instrument in the hands of Tomasafski." Tomasafski has been on trial in the Lackawanna court on the charge.

On September 6, 1901, John Worthington, a laborer, sixty-two years of age, employed in Old Forge No. 2 shaft, died from apoplexy.

On November 29, 1901, George Doyle, a laborer, seventy years of age, employed in the William A. mine, died from natural causes while he was on his way out of the mine.

Mine Foremen's Examination.

The regular annual examination of candidates for foremen's certificates was held in the City Hall, Scranton, Pa., August 19th and 20th, 1901. The following persons were recommended to the Secretary of Internal Affairs, Harrisburg, Pa., to receive mine foremen's certificates: Julian Cooper, Job Whitehouse, Tallie F. Jones, John A. Morgan, Evan C. Davies, C. Grosspictoch and James Regan.

Forty persons were recommended to receive certificates as assistant foremen.

Improvements.

Only a part of the improvements made in the mines of the district have been reported this year.

The Connell Coal Company has remodeled the Lawrence breaker, and constructed an addition, which is equipped with jigs. This plant is to be used for preparing coal from the Babylon colliery of the Temple Iron Company, and also from the Lawrence workings of the Connell Coal Company.

A rock plane was driven at William A. colliery from the Clark to the Marcy vein, a total distance of 140 feet. This is used for letting the Marcy vein coal down to the Clark vein.

The Delaware, Lackawanna and Western Railroad Company reports the following:

The new **Hampton** boiler plant, installed and practically completed in 1901; consists of thirty boilers or units of 313 H. P. each—4,695 H.

P. at 150 pounds pressure, divided into seven and one-half batteries Babcock & Wilcox vertical headed water tube boilers. They are fitted up with McClave & Brooks Automatic Stokers and self-feeding arrangement for fuel from storage pockets, and also have attached the Green Economizers, divided as follows: One for eight batteries and one for seven and one-half batteries, with induced fan draft in connection with forced fan draft. This plant is all under one roof. The steam pipe connections are as follows: To Sloan shaft 1,420 feet of 8 inch pipe. To Central shaft 1,400 feet of 8 inch pipe. To Hyde Part shaft, 3,140 feet of 8 inch pipe. To **Hampton** Shaft, 1,400 feet of 12 inch pipe. To Continental shaft 1,500 feet of 8 inch pipe. The above plant takes the place of ninety-five boilers, cylinders and locomotives. A new reservoir 100 feet in diameter has also been located near the plant which will hold 500,000 gallons of water.

At Pyne shaft a tail rope system of haulage is being installed. Length of main rope 4,000 feet; size of engines 15 feet x 30 feet geared.

Sloan Mine.—A new air shaft has been sunk to the surface vein and a connection driven from the bottom to the upcast compartment of main shaft. A new ventilating fan will soon be erected over this shaft. The fan which is now ventilating the mine and is located at the breaker over the main shaft will be removed, thus reducing the risk from fire, and at the same time doing away with the possibility of the air—which is being exhausted, entering the downcast again.

New Water Shaft.—A new shaft is being sunk at a point between the Central and Sloan shafts. This shaft is 8'x33' in the clear, and will be 500 feet deep. It is to be used to drain the mine workings of the company's Keyser Valley collieries. When the work is finished it is proposed to raise 7,000,000 gallons of water every twenty-four hours, by the use of buckets.

An electric motor system of haulage has been installed in the Dodge mine, and a new steam generating plant erected, at a point between the Dodge and Bellevue breakers. This plant will supply steam to the two mines and breakers.

A new ventilating shaft has been sunk at the Taylor mine from the surface to the Clark vein.

In the Manville shaft of the Delaware and Hudson Company and the Delaware, Lackawanna and Western Railroad Company, and the Delaware, Lackawanna and Western Company's Holden shaft, the old cribbing has been removed and replaced by expanding metal. The work was successfully accomplished in each case, and the result is highly satisfactory.

The improvements made in the several mines in the district are of the usual kind, and as important as the condition of the mine required and the increased output demanded.

Pyne colliery.—A new belt-driven ventilating fan 5x4½ feet by 16 inches was erected at the Pyne. The fans erected in 1903, together with this one, were attached to the breaker, which was a source of danger from fire.

One Rock Plane tunnel located about 1,700 feet north-east of shaft from the Clark to the Big vein; 7x14 feet, length 663 feet, pitch 12 degrees.

Six 6½ ton electric locomotives have been installed, four of which are equipped with reels to work in chambers. Sub-station erected outside for 200 K. W. rotary converter which supplies 250 volts power for the six (6) electric motors inside.

Power is supplied from the central power station near **Hampton** colliery.

The new 1,500 horse power B. & W. water tube boilers and brick house are now nearly completed. Located about 250 feet north-east of breaker.

Sloan Colliery.—One Rock plane tunnel located about 2,000 feet north-east of shaft from Clark to N. C. vein, 7x14 feet length 275 feet, pitch 10 degrees.

Central Colliery.—One rock tunnel plane, located about 800 feet north-west of shaft, 7x14 feet length 375 feet, from Clark to New County vein, pitch 10 degrees.

Hampton Colliery.—One rock plane tunnel, located about 2,600 feet south of shaft, from Rock to Diamond vein, 7x14 feet, length 200 feet, grade 5 per cent.

Holden Colliery.—Air shaft from the Big vein to New County vein, size 6x8x36 feet deep, for ventilation.

LEHIGH VALLEY COAL COMPANY

William A. Colliery.—A rock tunnel was driven from the middle to the upper-split of Red Ash vein, at a point near foot of long slope, just west of the Lackawanna river. It was put at this point in order that the coal in this vein between the river and shaft could be mined separately from the same vein east of the river, the coal under the river being kept as a barrier or safety pillar. Since the Hallstead mine was flooded a system of silting has been in operation at this mine. All of the finer refuse from breaker, together with the dirt from culm banks on surface, has been silted into the old workings.

The workings along the Hallstead mines have been thoroughly filled from barrier pillar to main gangway. The work is being continued in the old workings along the Pennsylvania Coal Company's line. A slope has been driven from the shaft level to the lowest point in the Flag and Drake tracts. This was for the purpose of saving in haulage, the foot of Long or Main slope being a considerably higher elevation.

Hampton Colliery.—Idle since October 20 for extensive repairs on breaker. When completed the breaker will be almost entirely equipped with new machinery which includes 12 of the latest improved 5 foot tandem slate pickers. The wood cribbing in the shaft was taken out and replaced with concrete and expanded metal. A new fire proof mine Hospital and Foreman's office were also completed inside.

Sloan Colliery.—One rock tunnel was driven from the New County vein to the Big vein for return air.

Central Mines.—A new 8x6x24 foot diameter fan with steel casing on concrete foundation has been installed at this mine to replace the old 14 foot diameter belt-driven ventilating fan. Also a fire proof brick building for engine room. Class and size of engine: Corless Tandem, high pressure cylinder 14x36 inches; low pressure cylinder 22x36 inches, 84 horse-power. The engine is connected direct to the fan. The fan was connected to the mine May 26.

Central Boiler Plant.—Installed a modern 6,000 horse-power open Cochrane water heater and a new fire proof brick building for water feed pumps, store room and Foreman's office.

Electrical Machinery Installed

Pyne Colliery.—One 10 ton electric motor on west gangway Clark vein. One 1,000 gallon electric centrifugal pump at foot of slope in Clark vein; induction motor, alternating current 400 volts. One 450 gallon electric centrifugal pump in west side dip; induction motor; alternating current 400 volts. Power is taken to these pumps from the surface through bore holes.

Archbald Colliery.—One 6½ ton electric motor in the Big vein.

Continental Colliery.—One 100 horse-power electric motor hoist on Dunmore slope; induction motor; alternating current 400 volts.

Hyde Park Colliery.—One 100 horse-power electric hoist on Dunmore slope; induction motor; alternating current 400 volts.

Sloan Colliery.—One 5½ ton electric motor in surface vein.

Central Water Shaft.—Installed during the year at the foot of the shaft in the Clark vein, an 800 horse-power six-stage electric centrifugal pump. Capacity 5,000 gallons per minute; alternating current; 3 phase; 2,100 volts. Column pipe 16 inch diameter. Lift 480 feet. This pump was put in operation the latter part of December, and to date is apparently working satisfactory. This pump is used in connection with the automatic bucket water hoist that was installed and commenced operation in August 1905.

Bellevue Colliery.—Grading and cutting rock at foot of Main shaft No. 2 Dunmore vein to improve the foot. Installed electric hoist in No. 2 Dunmore vein to operate No. 2 slope. Installed electric motor on V gangway Clark vein. Installed electric motor in New County vein. Rock cut in New County vein to take Big vein coal to New County vein. Tore down old boiler house. Installed new middle rolls in breaker. New water line reservoir to pump house. Erected new brick office for foremen, also new brick pump room. Erected a new brick oil house.

Dodge Colliery.—Installed 3 electric motors, one in Diamond vein, and two in New County vein. Tore down old boiler house.

CONDITION OF COLLIERIES AND IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Archbald.—A new washery annex was completed and put into service on September 13, capacity 600 tons per day.

Hyde Park.—One rock tunnel 6 x 12, length 125 feet, from Rock vein to Diamond vein, to be used as a second opening.

One 10 x 18 shaft, east of the breaker, sunk to the Surface vein a depth of 80 feet, to be used as a second opening and air shaft. This shaft has been completed, but the ventilating fan has not yet been installed.

One 12 x 12 air shaft, to be sunk to the Dunmore veins, has been sunk to a depth of 35 feet, and is now in progress of sinking. This shaft will be equipped with an 8 x 24 Guibal fan with a steel casing.

Hampton.—One rock tunnel 7 x 12, length 159 feet, from Rock to Diamond vein, to redeem bottom coal in Diamond.

Sloan.—One rock tunnel 7x12 feet and 90 feet in length, from surface to Surface vein, to be used as a second opening.

One rock slope from the Clark vein to the No. 3 Dunmore vein, 7x12, and 475 feet in length, pitch 15 degrees.

One shaft 12x32 and 185 feet in depth, from the Clark vein to the No. 4 Dunmore vein, located about 700 feet east of Central main shaft. This shaft was completed during the year, and operations commenced in the Dunmore vein.

Central Boiler Plant.—The work of installing six new Maxim boilers, with a total of 3,500 horse power, is now in progress and nearly completed.

Dodge.—Main shaft sunk from Big vein to Dunmore vein and also general improvements made in breaker.

Electrical Machinery Installed

Pyne.—One 300 K. W. rotary converter, and an addition to the sub-station building to house the same, one 6½ ton electric locomotive in Clark vein, one 6½ ton electric locomotive in Big vein.

Archbald.—Two 6½ ton electric locomotives to operate on Rist and Rossars gangways in Big vein.

Continental.—One 300 K. W. rotary converter located on top of the Dunmore vein slope, one 6½ ton electric locomotive to operate in the Dunmore vein.

Hyde Park.—One 300 K. W. rotary converter with addition to sub-station to house the same. One 300 K. W. rotary converter taken away from this colliery and installed at the Central Water shaft for Sloan New County vein.

Three 6½ ton electric locomotives to operate in the New County and Dunmore veins. One Jeffrey rock crusher and foundation, to crush all rock and bone coming from the breaker in order to flush the same into the mines.

Hampton.—Three 6½ ton electric locomotives in the Diamond and Rock veins.

One rock slope from the No. 2 to the No. 3 Dunmore vein, 7 x 12, to a depth of 193 feet.

One 4 x 4 x 14 ventilating fan on the surface vein, driven by a 10 H. P. electric motor, was installed; one 50 H. P. electric motor to drive the ventilating fan at the Central Air Shaft to replace the steam engine, and one 35 H. P. electric hoist to replace the steam hoist to operate the Central Air Shaft.

Hampton Colliery, Outside.—Installed one 750 gallon steam pump for fire protection.

Sloan Colliery.—Installed one 150 H. P. electric hoist on the rock slope sunk from the Clark vein to No. 2 Dunmore vein.

Continental Colliery.—One rock tunnel, 7 x 12, in length 218 feet, from the Clark to the New County vein on the pitch, for the purpose of shortening the haulage.

The main shaft and the air shaft were concreted, replacing the old wood cribbing.

Bellevue Colliery.—New concrete barn in slope. Rock tunnel from New County to Big vein, and a second opening to the same tunnel. Rock tunnel from No. 2 to No. 1 Dunmore vein, and a second opening to the same tunnel.

Built new concrete blacksmith and carpenter shop, outside.

Dodge Colliery.—Concrete partition in main shaft.

Holden Colliery.—Installed electric hoist on plane to Surface vein.

National Colliery.—Installed dust fan in breaker. New brick blacksmith and carpenter shop, concrete barn built, inside. New fire pump and fire line installed. Outside.

DELAWARE AND HUDSON COMPANY

Greenwood Colliery.—Drift opened from outside to Checker vein. Haulage road built from breaker to head of plane, outside, distance 1,000 feet. A plane 400 feet in length, equipped with 10 x 12 engines, was built to hoist coal from mouth of drift to the Surface railroad.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

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

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

Hyde Park.—Ventilation, drainage and condition as to safety, good.

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

Sloan.—Ventilation in Sloan Surface vein is only fair. A new air-shaft is being sunk to improve this condition. Otherwise, the ventilation, drainage and condition as to safety are good.

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

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

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

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

HUDSON COAL COMPANY

Greenwood.—The ventilation where fans are in use is good. In the openings where natural causes are depended upon the quantity is a variable one, but sufficient to maintain a healthy condition. Drainage fair; condition as to safety, good.

SCRANTON COAL COMPANY

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

PEOPLES COAL COMPANY

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

MINOOKA COAL COMPANY

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

CARLETON COAL COMPANY

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

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Archbald Colliery.—All the inside buildings reconstructed of incombustible material.

Continental Colliery.—The 12'x4'x4' ventilating fan was replaced by a new 24'x8'x6' fan, which was put into operation March 20. All the inside buildings reconstructed of incombustible material.

Hyde Park Colliery.—A 7'x12' tunnel, 220 feet long, was driven from the Rock to the Diamond vein. All the inside buildings reconstructed of incombustible material.

Hampton Colliery.—All the buildings reconstructed of incombustible material.

Hyde Park Colliery.—A 7 by 12 foot tunnel, 220 feet long was driven from the Rock to the Diamond vein. All the inside buildings reconstructed of incombustible material. An automatic overwinding device was attached to the hoisting engines.

National Colliery.—An air shaft was sunk from the surface to the Clark vein, a depth of 75 feet. This shaft is 10 by 16 feet in the clear. A rock tunnel was driven on a 45 degree pitch from M. gangway, Clark vein to B. gangway, Clark vein, 7 feet by 12 feet, a distance of 60 feet for ventilating purposes. Installed railings around all dangerous parts of machinery and openings in the breaker and around all engines and machinery outside. Installed a Welch automatic overwind device or engine stop on hoisting engines. Completed new concrete wash-house, which is properly ventilated, and there is a person in charge to see that it is kept clean.

Dodge Colliery.—New locomotive house outside. Installed additional electric locomotive, 750-gallon fire-pump, and a Welch automatic overwind device or engine stop on hoisting engine. New concrete mule barn inside. New concrete wash-house completed; it is properly ventilated and there is a person in charge to see that it is kept clean. Started work on a new haulage system on the outside to safely convey the cars from the drift to the head of the breaker, which is now being done by an engine. This will be completed in a short time. Installed railings around all dangerous parts of machinery and openings in and around the breaker.

Holden Colliery.—Installed railings around all dangerous parts of machinery in and around the breaker. A Welch automatic overwind device or engine stop was installed on hoisting engines. Completed new concrete wash-house, which is properly ventilated, and there is a person in charge to see that it is kept clean.

Continental Colliery.—A second opening and return air course was driven from No. 1 Dunmore to Clark vein, a distance of 73 feet. An air shaft and second opening was also sunk near outcrop to Diamond vein, depth 30 feet. An automatic overwinding device was attached to hoisting engine.

Hampton Washery.—All the buildings were reconstructed of incombustible material.

This Company is educating its non-English speaking employes. Colonel R. A. Phillips, the General Manager, conceived the idea of having pictures taken in the mines showing how accidents occur and how they are prevented. Two hundred of these pictures appear in book form with simple statements. The book was prepared under the direction of Colonel Phillips and Mr. C. E. Tobey, Superintendent of the Coal Mining Department, and ten thousand copies have been printed and will be distributed to groups known as extension schools in the various mining communities.

This Company is promoting this educative work through the local branch of the Young Men's Christian Association, and it deserves much greater patronage than it is getting at present, as it instructs not only in theory, but also in practice.

SCRANTON COAL COMPANY

Capouse Colliery.—All inside buildings reconstructed of incombustible material.

CONDITION OF COLLIERIES

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Archbald, Continental, Sloan and National Collieries.—Ventilation, drainage and condition as to safety, good, except in a few places where conditions should be improved.

HUDSON COAL COMPANY

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

SCRANTON ANTHRACITE COAL COMPANY

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

CARLETON COAL COMPANY

Carleton Colliery.—Ventilation and drainage, good. Safety conditions, fair.

SPRUKS COAL COMPANY

Spruks Colliery.—Ventilation and drainage, good. Safety conditions, fair.

JOHN GIBBONS COAL COMPANY

Gibbons Colliery.—Ventilation and safety conditions, fair. Drainage, good.

IMPROVEMENTS

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Completed two rock tunnels from New County vein to Big vein, each 200 feet long, on a grade of 5 per cent. Erected a new engine and rotary house, of brick, with concrete roof.

Archbald Colliery.—Completed a rock plane from New County vein to Big vein.

Continental Colliery.—Completed a rock tunnel from Rock vein to Diamond vein.

Sloan Colliery.—Completed a rock tunnel from No. 2 Dunmore vein to No. 1 Dunmore vein, 500 feet in length.

Hampton Washery.—Installed two Simplex jigs.

HUDSON COAL COMPANY

Greenwood Colliery.—Installed a car pull at the coal tipple; a lump coal shaker in the breaker; also stationary hoist at No. 2 shaft to eliminate mule haul. A new addition was built to the office building. Completed a connection from No. 1 shaft to No. 2 shaft for water, which eliminates the danger of No. 2 shaft being flooded in case of high water.