

from boilers of hoisting engine,) of 25-horse power; they have a metal speaking-tube in the slope; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the 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 mine; they have a second opening located 560 feet from main opening; they have a house for men to wash and change in; there is very little gas and water in the mine; the mining boss seems to be a practical and competent man; he has a fire boss to assist him; the mine is examined every morning before men go to work, and every evening to see that the main doors are all closed; 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 cars in the mine; 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.

No. 2 SHAFT, DUNMORE.

This shaft is located in Dunmore borough and lies 1 mile south-east of the Lackawanna river. It is 53 feet to first vein, which is abandoned, and No. 2 vein is worked by a rock tunnel 600 feet from the bottom of shaft; size of shaft 12 by 15 feet. It is operated by the Pennsylvania coal company. William Bryden is general mine superintendent, Jas. M. Miller is mining boss and J. W. Marchell is outside foreman.

Description.—There is no breaker connected with this mine but there are large schutes where they load large railroad cars and run them to the screens in Dunmore, where the coal is cleaned and prepared; they mine and prepare about 240 tons of coal per day; they employ 40 miners, 40 laborers, 7 drivers, 2 door-boys and 6 company men in the mine; 14 head and plate men and 1 boss outside; in all 110 men and boys; they are working the lowest vein of coal, average thickness 4 feet; they work headings 10, air-ways 15 and chambers 30 feet wide; they leave pillars from 15 to 21 feet wide to sustain the roof; they leave cross-entrances from 25 to 40 feet apart for the purpose of ventilation; the roof is bony coal and slate; the mine is in a good working condition.

Ventilation is produced by means of a furnace located 2,000 feet from main opening; the in-take is located in old No. 1 shaft and in main shaft, area from 145 to 150 feet; the up-cast is located in furnace air-shaft, area 60 feet; the amount of fresh air is 13,500 cubic feet per minute; 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 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 2 splits; the amount of ventilation has been measured and reported according to law; ventilation is good.

Machinery.—They use 1 hoisting engine with pumping gear attached, 40-horse power; they have a metal speaking-tube in the shaft; they have an adequate brake and flanges of sufficient strength and dimensions for safety attached to the sides of the hoisting drum; the ropes, links, chains and connections are in good condition; 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 mine; they have a slope to surface and they are connected with old No. 1 shaft workings, which can be used as a second 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 12 years of age; the engineers seem to be experienced, competent and sober men; they use 2 patent safety-carriages in the shaft; they do not allow more than 10 persons to ride on a safety-carriage at one time; they have been working both veins in the beginning of the year 1872; the shaft-landings are protected by safety-gates.

Buffalo Mines.—Built a three-foot gauge track railroad from mines to Jefferson branch of N. Y., L. E. & W. R. R., a distance of two and one-third miles. Coal is hauled by a small locomotive. A new hoisting engine, new main and pony rolls and screens were also put in, and the breaker and machinery given a thorough overhauling.

Belmont Mines.—A new water-level tunnel; was opened to coal headways, and airways were driven to cut off the distance in haulage.

Edgerton No. 2 was opened by a water-level tunnel. It is located about two miles northeast of breaker. Coal is hauled by a small locomotive on a three-foot gauge track.

Eaton Tunnel.—Drove a heading to surface for manway and ventilation; size of opening, 6'x9'=54 feet.

Eaton Shaft.—Sunk a shaft from surface to the present working or "Archbald" vein 162 feet deep; size of opening, 10'x20'=120 feet area.

Jermyn No. 3.—Sinking slope; it is down 700 feet; opening 14'x7'=98 feet area; driven on a grade of one in three feet; in place, six new boilers, one pair of hoisting engines, 10'x10', one fan engine, 12'x12", and one pump, and are also building new breaker.

Mount Pleasant Mines.—Sinking a second opening from G, or Big vein, to Clark.

Filer's Slope, now Mount Jessup.—Have driven slope in coal about 1,000 feet in length.

Lackawanna Shatt.—Have placed an endless wire rope about 2,000 feet long in main gangway for haulage; it works satisfactorily; it is cheaper and better than horses or mules.

Pancoast Shaft.—Have put in a new set of boilers; have put in Zeigler's patent slate pickers; have graded slope to a uniform grade for about 1,000 feet; they are using the electric arc light at this colliery and it gives general satisfaction.

Rushbrook Shatt.—Have erected a new blacksmith shop, 20'x20', a new powder house, 10'x10', a new barn, 14'x20'; have placed in mine a No. 10 Knowles pump, sunk a second opening to top vein, and have driven headings in top vein going east 350 feet, and in the same vein going west 300 feet; the east heading in bottom vein has been driven 400 feet, and in the same vein going west 125 feet.

Spencer Shaft.—Are driving slope in coal northwest of shaft; in middle vein they are down about 800 feet.

Hon. Thomas Waddell is at present opening up a new mine in Winton borough.

Note.—The Peakville Coal Company's colliery was idle during the year and did not ship any coal.

The Rushbrook colliery did not ship any coal during 1888.

Bridge colliery was sold and abandoned August 16, 1888.

Shaft No. 2, Penn. Coal Company, located in Dunmore, was abandoned September 1, 1888.

Eddy Creek.—Erection of new Guibal fan 28x8 feet with new brick engine room. The shaft is being enlarged from 10x23 feet in section to 12x33 feet 4 inches. At "Birds Eye" a Guibal fan 8x3 feet has been erected, driven by electricity at a speed of 200 revolutions per minute.

Olyphant No. 2.—The 4-foot vein has been cut by two rock planes.

PENNSYLVANIA COAL COMPANY

Gipsy Grove, Outside.—New pair of 15x24 inch geared hoisting engines for shaft. Stable inside with capacity of 20 mules in second Dunmore vein. In third Dunmore vein a stable of same capacity was made.

No. 1 Colliery.—Work is progressing on installation of additional horse power Babcock and Wilcox boilers, which will increase the capacity to 1,200 horse power. A new 10-foot forced draft fan is being erected for the same; also, new Cochrane feed water heater and 12x8x12 inch duplex Scranton pump. A new water tank is being built with a capacity of 50,000 gallons. One alternating current generator 2,300 volts 7 5-10 amperes, speed 1,200 revolutions, belted to a 10x10 inch, 62 horse power McEwen engine. This furnishes power to run the drills and a 20 horse power induction motor, with 220 volts 50 amperes. The 20 horse power induction motor is located at the river end of the tunnel, about 7,500 feet from the generator and is used to run a 57 inch exhaust fan which supplies air to the tunnel. It is connected by belt to a 5 horse power dynamo which gives the direct current to the motors which run the drills. Also one Rand air compressor to furnish power to run air drills at No. 1 end of tunnel. New car and blacksmith shop 30x112 feet with 16x20 feet ell. New supply house 34x50 feet.

Water tunnel from Lackawanna river to No. 1 shaft has been driven in 1,200 feet during the year, and on the No. 1 end of the tunnel 500 feet. In the third Dunmore vein a new gravity plane has been made, section 6x15 feet and 800 feet in length. A new stable has been made in same vein with capacity of 30 mules; also new air bridge sectional area 60 feet and new 16x8½x14 inch Scranton pump.

No. 2 Shaft.—New locomotive boiler, outside. Work is progressing on new engine plant. When completed will be about 5,000 feet in length and will be operated by a pair of 15x24 inch geared hoisting engines, which are now on the foundation. New air course and traveling way have been made at No. 1 tunnel.

STERRICK CREEK COAL COMPANY

Sterrick Creek.—The new shaft 12x30 feet in section which was commenced to sink in 1903 has been completed. This shaft is sunk

IMPROVEMENTS

SCRANTON COAL COMPANY

Johnson.—No improvements reported.

Ontario.—The portion of the breaker blown down by the tornado last fall, has been rebuilt and is expected to resume operations about March 12. The Raymond washery was torn down and moved to this colliery and is now being rebuilt. This will necessitate an increase in the power plant, and it is intended to add two boilers to the present plant for this purpose.

Richmond No. 3.—An additional 200 H. P. Maxim boiler has been added to the present plant. The new shaft has been named in honor of General Manager John R. Bryden, and is now known as Bryden Shaft.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs.—Seven hundred feet of the Clark Vein Slope at No. 3 shaft have been graded; average thickness 5 feet. This was done in order to enable them to run the cars to the bottom lift of the slope.

The floors of the boiler house have been concreted; also concrete fronts at their No. 3 shaft. Four new Emery Pickers were installed in the breaker. A scraper line was constructed to convey the culm from the breaker to the washery in order to do away with the handling of cars.

DELAWARE AND HUDSON COMPANY

Eddy Creek.—Grassy Island No. 2 shaft sinking completed to the No. 4 Dunmore vein, a distance of 117 feet. The sinking of No. 4 shaft has been started and is down a distance of 50 feet. This shaft is to be used as a second opening to the No. 2 shaft.

One 78 inch locomotive boiler has been installed at the Grassy Island Washery, also a 10 inch x 14 inch engine and a 600 foot scraper line for feeding bank to washery.

Miles slope extended in rock from the Rock Vein towards the No. 4 Dunmore Vein, a distance of 750 feet. This slope is to be used as a second opening to the Eddy Creek.

A 28 foot Guibal fan has been installed at the Eddy Creek. The shaft has been widened from 10 feet x 24 feet to 12 feet x 33.4 feet from surface to the 14 foot vein.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery.—In 1904 work was commenced on a new brick building 16x36 to contain three rooms; office for the outside foreman, shifting shanty for the fireman and a shifting shanty for the breaker men. This work has been completed.

No. 2 Shaft, Outside.—The following buildings have been erected during the year: a new concrete building 14 feet x 40 feet with three rooms; office for the inside foreman, shifting shanty for the fireman and a shanty for the miners. Two additional locomotive boilers have been installed and a new corrugated iron boiler house 40 feet x 60 feet has been built.

No. 2 Shaft, Inside—A new air bridge has been built in the second Dunmore vein, sectional area 120 square feet. A new engine plane 3,000 feet long has been built in the third Dunmore vein, and a new pair of hoisting engines 15 inches x 36 inches installed to operate the plane.

No. 1 Shaft Inside.—The water tunnel from the Lackawanna River to the No. 1 Shaft was completed August 30. The total length of the tunnel is 6,800 feet.

LACKAWANNA COAL COMPANY, LIMITED

Lackawanna.—At the new shaft on the Lillibridge tract gangways have been driven in the Dunmore vein 500 feet east and west, and a sump driven on the south dip a distance of 275 feet. No chambers have been turned within 200 feet of the shaft.

A 100 K. W. G. E. generator, direct connected to a 16 inch x 15 inch McEwen engine, has been installed at the breaker and carried overland 2,400 feet to the new shaft and down the same to the Dunmore vein, where it operates one seven ton locomotive with reel attachment for chamber work. This locomotive is handling transportation in the Dunmore vein. They have also two percussion drills in operation for drilling rock in this vein, which give good satisfaction. A conveyor line with 10 inches x 48 inches flights 258 foot centres, with an automatic feed and car tip, has been erected to convey the new shaft coal to the breaker. This conveyor is built on a five and a quarter inch pitch and is operated by a 12 inch x 18 inch single engine with rope drive.

The three 250 H. P. boilers and 8 inch steam line which were commenced last year have been completed.

On account of the increase in this plant, it became necessary to install a larger blast fan and to increase the area of the air duct accordingly, and also to install a 2,000 H. P. Cochrane water heater in place of the old one which was only 1,200 H. P. 12x12x7 duplex feed pump was installed to work in connection with the old one.

A 14 inch exhaust steam pipe 200 feet long was erected between the breaker and the new heater and all the exhaust of the pumps and engines, except the shaft hoist, are coupled to the same.

The four stacks on the Cahall boilers were lengthened 32 feet to give better draught for these boilers.

A conveyor was installed to carry fuel from the present fire room conveyor to the bins in front of the Maxim boilers.

The annex breaker engine foundation has been replaced by concrete foundations built of wood, and a substantial frame building has been erected over the same.

The cribbing under the breaker shaft tower was replaced to a depth of 80 feet. Concrete foundations were made outside of this cribbing on which new sills were placed to carry the tower. This tower was also reinforced to the car dump, from the ground.

Three single-decked shaking screens were installed on head of the breaker to handle the run of mine coal and are giving very good results.

IMPROVEMENTS

DELAWARE AND HUDSON COMPANY

Clinton.—New tail rope installed 1,000 feet in length, with a pair of double engines 14x20 inch in River Side Slope to pull coal north and south. A new hospital "First Aid," and wash house has been erected outside for employes of the Dunmore vein. Two new ventilating fans erected, each 20 feet in diameter.

No. 1. Carbondale.—Tail rope has been extended 1,000 feet, delivering cars to main line.

Powderly.—New car shop, supply house and blacksmith shop erected.

Jermyn.—Rock tunnel completed from the Archbald vein to the Dunmore vein, distance 125 feet. New electric motor $4\frac{1}{2}$ tons with 12x18 inch reel on top for lowering loaded and hoisting empty cars in chambers.

White Oak.—New car shop has been erected. New plane in Dunmore vein finished.

PRICE-PANCOAST COAL COMPANY

A rock slope has been sunk in the Diamond vein over the "Anticlinal." A pair of double engines has been put in same vein to hoist the coal from this slope; size of engines 24x36 inch. In No. 3 vein a slope has been sunk 600 feet in length to the river line, and a pair of engines put in to hoist the coal, 12x12 inch in size. No. 2 Gravity Plane that was abandoned six years ago has been opened. In the Clark vein a new plane has been built, 600 feet in length. Dunmore No. 2 vein, the west slope, 900 feet in length, has been graded, and a pair of engines 12x12 inch in size erected outside to hoist the coal. One 250 horse power boiler was installed.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery, Outside—In 1904, work was commenced on the installation of 300 additional horse power "Babcock and Wilcox" boilers, and new 10 foot forced draft fan; also new "Cochrane" feed water heater and 12x8x12 inch "Duplex Scranton Pump" and new 50,000 gallon water tank. This work has all been completed during the year. The following buildings have been erected during the year. A new stone powder house 12x14 feet; a new stone oil house 12x12 feet 7 inch; also new brick wash house for miners 16x24 feet. Work is progressing on new brick building 16x36 feet to contain three rooms; office for outside foreman, shifting shanty for firemen, and shifting place for breaker men.

No. 2 Shaft, Outside.—The fan and head house, which was burned during the year, has been replaced by concrete buildings. A 12 inch concrete wall has been built between the down-cast and up-cast from foot of shaft to fan.

No. 1 Shaft, Inside.—Water tunnel from Lackawanna river to No. 1 Shaft. No. 1 Colliery has been driven in 1,600 feet during the year, and on the No. 1 end, 1,900 feet. Total distance driven since the tunnel was commenced, 5,200 feet. Distance yet to be driven, 1,600 feet. Another tunnel has been driven 675 feet from the third Dunmore vein to the second Dunmore vein, to carry the water to main tunnel, sectional area 6x9 inch.

No. 2 Shaft, Inside.—The new engine plane that was commenced in 1904, has been completed and is now in operation. A new air-bridge has been built on engine plane, sectional area, 120 square feet.

STERRICK CREEK COAL COMPANY

Sterrick Creek.—The Dunmore fan, which was located above the Clark vein water level, about 4,000 feet east of breaker, was removed to the Clark vein air shaft, a distance of 3,000 feet south westerly. The new location is 400 feet from the Dunmore haulage engines and the fan receives its steam from the pipe line which supplies these engines. The friction is reduced by this change, three thousand feet, and the efficiency of the fan increased.

A ten inch bore hole was driven from the surface to the Clark vein, depth 265 feet, and 2,000 feet of 6 inch wooden pipe laid to carry the culm from the breaker to the Clark vein workings. Eight new shaking screens were installed in the breaker with decks ranging from 18 to 24 feet in length, to take the place of eight 12 foot shakers, which were inadequate with the increased output.

Three balance planes above the water level in the Dunmore vein were changed to one plane, and a pair of 12x12 inch engines installed to operate the same.

DOLPH COAL COMPANY

Air shaft completed from the surface to the Clark vein. A new ventilating fan, 20 feet in diameter, erected at head of air shaft. Extensive improvements were made outside. Previous to 1905, no box cars could be run under the breakers, owing to their height. With the improvements made, this condition is changed. The new chain hoist at head of breaker works very satisfactorily, and with the electric motor which conveys the mine cars to and from the "chain hoist," a great many mules are dispensed with, and all trouble in this line eliminated.

MT. JESSUP COAL COMPANY

A new ventilating fan has been erected at the head of the "North pitch" air shaft to ventilate the Clark vein workings. The diameter of fan is 14 feet.

HILLSIDE COAL AND IRON COMPANY

Erie.—One new 900 H. P. Sterling type water tube boiler plant with Sturdevant cold air blast and exhaust steam boiler feed heater.

Two 12x6x12 inch duplex plunger pumps for boiler feed and fire protection in boiler plant. One new washery; capacity 800 tons per day. New steam plane 7x12 inch in area and 4,200 feet in length. The same is equipped with a pair of engines 16x20 inch cylinder.

Blue Ridge Tunnel.—Condition as to safety good, drainage and ventilation fair. They are robbing pillars.

Richmond No. 3 Colliery.—Condition as to safety good, drainage fair, ventilation good.

DELAWARE AND HUDSON COMPANY

Olyphant Colliery No. 2 Shaft.—Condition as to safety and drainage good, ventilation generally good.

Grassy Island Slope.—Condition as to safety and drainage good, ventilation good with the exception of the Four Foot vein. This vein is very difficult to ventilate as it is thin and the roof is continually falling in the air courses.

Grassy Island Shaft.—Condition as to safety and drainage good, ventilation fair. There is room for improvement.

Eddy Creek Colliery, Birds Eye Mines.—Condition as to safety, drainage and ventilation good.

No. 4 Drift.—Condition as to safety good, drainage and ventilation fair.

DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Storrs Colliery No. 1 Shaft.—Condition as to safety, drainage and ventilation good.

No. 2 Shaft.—Condition as to safety and drainage good, ventilation fair. There is room for improvement.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery No. 1 Shaft.—Condition as to safety and drainage good, ventilation fair.

No. 2 Shaft.—Condition as to safety and drainage good, ventilation fair.

Gipsy Grove Colliery.—Condition as to safety, drainage and ventilation good. This mine has been very much improved.

STERRICK CREEK COAL COMPANY

Sterrick Creek Colliery.—Condition as to safety, drainage and ventilation good. Six air bridges were built during the year, which improved the ventilation.

LACKAWANNA COAL COMPANY

Lackawanna Colliery.—Condition as to safety, drainage and ventilation good.

DOLPH COAL COMPANY

Dolph Colliery, Hackley Slope.—Condition as to safety, drainage and ventilation good.

Hannah Bell.—Condition as to safety good, drainage and ventilation fair.

MOUNT JESSUP COAL COMPANY

Mount Jessup Colliery, Peck's Shaft.—Condition as to safety good, drainage fair, ventilation good.

No. 1 Shaft, Inside.—One 10-inch bore hole from surface to third Dunmore vein for steam line; this will do away with steam line in the shaft. Also one 3-inch bore hole to second Dunmore vein, both of which are to be used for rope haulage on slopes. New slope in second Dunmore vein 6 feet x 12 feet has been extended 450 feet.

No. 2 Shaft, Inside.—Engine plane in second Dunmore vein extended 400 feet.

Gipsy Grove, Inside.—One 10-inch bore hole from surface to third Dunmore vein, one 3-inch bore hole from surface to third Dunmore vein. One Dunmore pump 102 plunger, 30-inch stroke, to be used for the purpose of pumping water to supply No. 1 washery.

STERRICK CREEK COAL COMPANY

Sterrick Creek Colliery.—A steam boiler plant, consisting of four 250 horse power Maxim boilers, was erected to replace the two small plants, which consisted of one high and low pressure plant. The foundations of the new boiler house are of concrete and the building is constructed of gray brick, with iron roof trusses and corrugated iron roof. The boiler foundations are constructed of building stone, and the boiler settings of red brick.

MINE FOREMEN'S EXAMINATIONS

The following persons having passed a satisfactory examination were granted certificates of qualification:

Mine Foremen

Frank Good, Scranton; William Lewis, Scranton; Thomas J. Moyle, Simpson; James Horan, Carbondale; George T. Williams, Peckville; Joseph J. Munley, Dickson City; Herbert Spencer, Carpenter, Scranton.

Assistant Mine Foremen

David D. Morgan, Peckville; Isaac Morgan, Scranton; Andrew H. Smith, Jr. Scranton; Edwin S. Jones, Scranton; Joseph A. McCabe, Blakely; Thomas D. Llewellyn, Peckville; James Stephens, Taylor; James H. James, Olyphant; George W. Morgan, Olyphant; Charles J. Latcham, Scranton; Edward R. Edwards, Olyphant; John Brooks, Olyphant.

Grassy Island No. 4 Shaft.—Completed sinking shaft to No. 4 Dunmore vein to a depth of 740 feet, connecting with workings from Grassy Island No. 2 shaft for a second opening. Shaft was concreted from surface 56 feet down the shaft, including concrete buntons.

No. 10 Slope.—Placed an electric pump at foot of slope; installed an electric hoist to hoist coal up inside slope and lower down plane. Installed a 24 inch x 48 foot engine for hoisting on main slope, 2,600 feet long.

Eddy Creek Colliery: Eddy Creek.—Sunk shaft from Fourteen Foot vein to Dunmore No. 4, a depth of 414 feet; gangways opened on North side 120 feet and on South side 70 feet in No. 4 Dunmore.

Birds Eye.—Drilled a 6½ inch electric cable hole 120 feet from surface to Clark vein, and a 12 inch water hole the same depth a few feet from it.

No. 11 Slope.—Was driven to No. 2 vein a distance of 120 feet on grade of 20 per cent. An engine house was erected containing 3 engines; one 10 x 12 inches to operate No. 11 slope; one 10 x 12 inches to operate plane to rock dump, and one 12¼ x 15 inches to operate No. 18 plane in Diamond vein.

PENNSYLVANIA COAL COMPANY

No. 1 Colliery.—Outside. Built a 45 x 29 foot concrete building with steel truss roof, containing one pair of 15 x 36 inch engines which will operate two slopes, one to the Clark vein and the other to the New County vein.

No. 2 Shaft.—Outside. Built a concrete building 42 x 15 feet to be used as an emergency hospital, tool room and blacksmith shop.

MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in City Hall, Scranton, June 15 and 16. The Board of Examiners was composed of L. M. Evans, Inspector, Scranton; F. G. Wolfe, Engineer, Scranton; W. F. Malloy, Carbondale, and David Evans, Olyphant, Miners.

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

Mine Foremen

John Conway, Old Forge; Harry E. Heckman, Jessup; Leo P. Gibbons, Carbondale; William Love, Scranton; Thomas J. Gillen, Carbondale; James F. Feeney, Olyphant; Charles O'Boyle, Olyphant; Howell R. Morgan, Throop; John J. Haggerty, Scranton; Sylvester J. Kane, Forest City; George Watson, Scranton; Thomas W. Lewis, Olyphant; Benjamin Anthony, Carbondale; Edward Newton, Scranton; James Elias, Scranton; John T. Loftus, Jessup; Charles E.