

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.

#### DODGE COLLIERY.

This colliery is located in Lackawanna township, about  $\frac{1}{2}$  of a mile north-west of the Lackawanna river. The shaft opening is 211 feet to the Rock, and 301 feet deep to the 14 feet vein; it is 10 feet by 24 feet. It is operated by the Delaware, Lackawanna and Western railroad company. Lewis Roberts is mining boss and Edward E. Thomas is outside foreman.

*Description.*—There is a double breaker connected with these mines; it is located on the Lackawanna and Bloomsburg railroad, 1,100 feet east of shaft; they mine and prepare 630 tons of coal per day; they employ 67 miners, 66 laborers, 32 drivers, 8 door-boys and 12 company men in the mines; 76 slate pickers, 11 head and plate men, 7 drivers, 16 company men, 8 mechanics and 2 bosses outside; in all 305 men and boys; they are working a plane in the mines from the Rock to the 14-foot vein; it is 325 feet long and driven on an angle of 18 degrees; they are working the G and F veins; average thickness of the G vein 12 and F vein 7 feet; they work headings 12, air-ways 15 and chambers 30 feet wide; they leave pillars from 18 to 24 feet wide to sustain the roof; they leave cross-entrances about 60 feet apart for the purpose of ventilation; the roof in the G is slate and in the F vein rock; the mines are in a good working condition.

*Ventilation* is produced by means of a double furnace, located 1,000 feet from main opening; the in-take is located in main shaft and in second opening; it contains an area of 138 feet; the up-cast is located in furnace air-shaft; it contains an area of 120 feet; there is noxious, poisonous and inflammable gas evolved in this mine; the mines are examined every morning before men are allowed to go to work, and every evening to see that the main doors are all closed; the main doors on headings and air-ways are hung so that they 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 4 splits; the amount of ventilation has been measured and reported; ventilation is good.

*Machinery.*—They use 1 pair of hoisting engines of 90-horse power, 1 pumping engine of 95-horse power—all in engine room at the shaft—and 1 breaker engine of 60-horse power in the breaker engine house; they have 2 metal speaking-tubes 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 attached to the sides of their hoisting drums; they use standard wire ropes with clevis and cone attachments; the boilers have been cleaned and examined and reported in good condition; they have a steam gauge to indicate the pressure of steam; the breaker machinery is boxed and fenced off so that operatives are safe.

*Remarks.*—They have furnished a map of the mines; they are connected with Bellevue slope which can be used as a second opening; they have no house for men to wash or change their clothes in; there is some standing water in the mine; the mining boss seems to be an experienced, competent and practical man; he has a fire-boss to assist him; there are no boys working in the mines under 12 years of age; the engineers seem to be experienced, competent and sober men; they do not allow any person to ride on loaded carriages in the shaft or on loaded cars in the slope; they do not allow more than 10 men to ride on the safety carriage 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.

*Note.*—Thomas Sayer, Esq., has charge of the boilers and machinery for the Delaware, Lackawanna and Western railroad company. He is a gentleman of practical experience and he keeps the boilers cleaned and examined and the machinery in good condition, so as to comply with the requirements of law.

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.

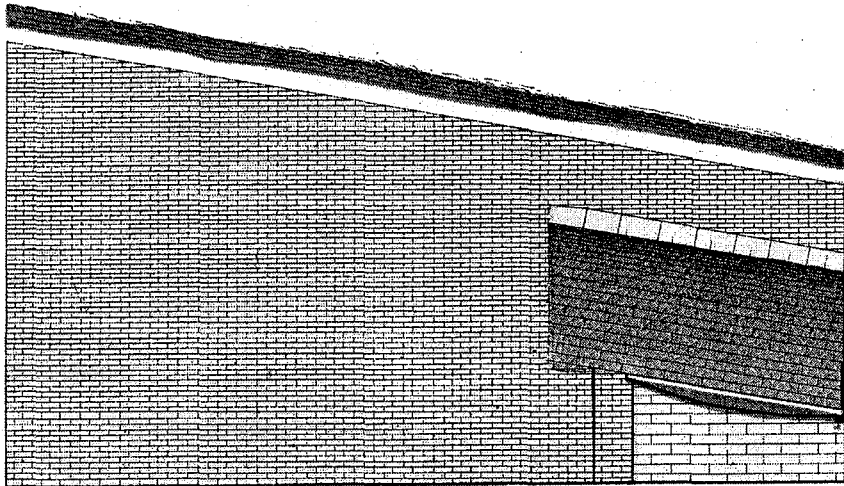
The **Dodge** shaft is also ventilated at present by the fan at the Scranton Coal Company's slope adjoining, which has been lying idle for years. This also is a change from the furnace heretofore used, and has undoubtedly been affected, because it is so much cheaper to run a fan than to keep up a fire 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-

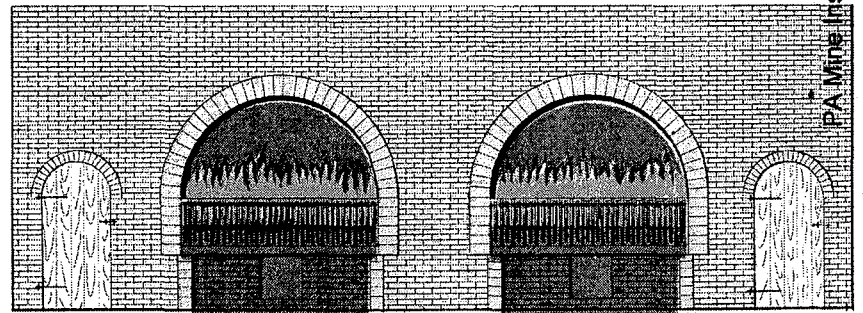
PLAN N<sup>o</sup>6.

PLAN OF THE DODGE SHAFT FURNACE, D. L. & W. R. R. CO. BELLEVUE PA.

PRODUCING OVER 140,000 CUBIC FEET OF AIR PER MINUTE.



SECTION



FRONT VIEW

Scale  $\frac{1}{8}$  inch = 1 foot.

PA Mine Inspection 1879

There are also 75 fans and 14 furnaces for the purpose of ventilation. There are four mines where they are drawing back pillars, that are not ventilated mechanically.

Respectfully submitted.

PATRICK BLEWITT,  
*Inspector of Mines.*

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### COLLIERY IMPROVEMENTS FOR YEAR 1892.

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#### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY.

*Hyde Park Shaft.*—Sunk an air shaft from Big vein to New County vein 6' × 10' = 60' and 28' deep; also sunk an air shaft from New County to Clark vein 6' × 10' = 60' and 78' deep, and drove a tunnel from Big to New County vein 7' × 11' and 146' in length.

*Tripp Shaft.*—Extended slope towards the river 700' in length.

*Dodge.*—Opened from New County from Big vein.

*Brisbin Shaft.*—Drove new plane up the west mountain in Clark vein 700' long.

*Storrs No. 1 Shaft.*—Driving a slope south; also opened a drift in the Richmond vein and put up a new fan, but they will not get much coal as it is too near the outcrop; also sunk No. 3 Storr's, formerly called Cayuga No. 2, from G or Big 155' deep to the Clark vein, and they are opening in the Clark and Diamond veins.

*Pyne Shaft.*—Opened a new plane in the New County vein 530' long.

#### DELAWARE AND HUDSON CANAL COMPANY.

*Leggett's Creek Shaft.*—Are now working coal in Clark vein.

*Olyphant No. 2 Shaft.*—Finished a new lowering plane in 14' vein.

*Jermyn No. 1 Shaft.*—Drove a new second opening from daylight and connected inside with both veins.

#### PENNSYLVANIA COAL COMPANY, DUNMORE, PA., 1891.

Mr. PATRICK BLEWITT,

*Mine Inspector of Second Anthracite District:*

We have during the year started a slope on a grade of 7°, to open up what is known as the Sawyer vein. Mouth of slope situated N. 74 E. and 235' from east corner of No. 1 breaker boiler house and 450' north of Old Smith tunnel. Course of slope N. 79° W. We have driven on above grade and course 175'. Uncovered the coal at a distance of 137' from mouth of slope. When finished it will be from 900' to 1,200' long.

The following were recommended to receive mine foreman's certificates:

David Jenkins, Scranton.  
William W. Baird, Dunmore.  
John M. Dobbie, Pittston.  
Evan H. Evans, Scranton.  
Thomas McWilliam, Moosic.  
Thomas F. Cook, Pittston.  
M. I. Garvey, Pittston.  
John T. Brown, Avoca.  
William Watkins, Scranton.  
I. A. Garvey, Pittston.  
Dd. F. Davies, Scranton.

The following were recommended to receive assistant foreman's certificates:

Thomas Parry, Scranton.  
William McDowell, Scranton.  
James Tibbs, Rendham.  
Ed. R. Hughes, Scranton.  
John R. James, Scranton.  
Samuel C. Evans, Taylor.  
Benjamin J. Rees, Rendham.  
John W. Jenkins, Scranton.

#### Mine Improvements During 1896.

The improvements made in this district during the past year, such as new openings, shafts, planes, tunnels, slopes, boilers, etc., are the following:

The Delaware, Lackawanna and Western Railroad Company.

**Bellevue Shaft.** A tunnel 7 x 12 feet was driven from the Clark vein to the New County vein, a distance of 911 feet, on a grade of two and one-half inches on ten feet.

**Continental Shaft.** A plane was driven on a grade of 11 degrees. Sectional area, 9 x 16 feet; length, 328 feet.

**Dodge Shaft.** A tunnel was driven and completed; sectional area, 72 square feet; length, 300 feet.

**Diamond Mine.** A tunnel was driven from the "seven foot" seam to "Church vein," 300 feet long and 84 feet sectional area. A new drift was also driven on a level having 60 feet sectional area; length, 900 feet.

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 second opening rock tunnel was driven from the New County vein to the Big vein, size 7 feet x 12 feet, length 200 feet, pitch 18 degrees. Installed one 200 K. W. electric rotary converter for mine haulage purposes. Installed and working two 6½ ton motors without reels, and five 6½ ton motors with reels. Installed new water fire lines for protection outside to breaker and out-buildings. Installed 2½ batteries or 10 boilers of the Babcock and Wilcox water tube type, 1515 horse power. Brick building, boilers brick lined, iron trusses for roof, and equipped with Parson's steam blower. Cylinder boilers and old boiler house removed. Hoisting engines were remodeled and removed further away from breaker onto a new foundation and in a new brick building.

Archbald Colliery.—Installed two batteries or 8 boilers of the Babcock and Wilcox water tube type, 1212 horse power. Brick buildings, boilers brick lined, iron trusses for roof, and equipped with Parson's steam blower. Old cylinder boilers removed and old boiler house torn down and removed. Installed fire lines and plugs on the outside for fire protection. Rock tunnel driven from Rock to Diamond vein, size 7 feet x 12 feet, and 75 feet long. Rock plane tunnel from New County vein to Big vein, size 7 feet x 14 feet, length 220 feet.

Continental Colliery.—Second opening rock tunnel driven from Dunmore No. 2 vein to Clark vein, size 7 feet x 12 feet, length 125 feet.

Sloan and Central Collieries.—Second opening rock tunnel driven from Clark vein to New County vein, 7 feet x 12 feet, length 150 feet. Also to do away with hoisting coal at the Central main shaft to the surface, and hauling over with steam locomotive to Sloan breaker; the coal is now transported by electric motor from Central to Sloan under ground, in the Clark vein. Six additional reel motors were installed at this mine during the year.

Dodge Colliery.—A new brick hoisting engine house, size 36x36; and a new pair of direct acting engines, size 22 inches x 36 inches. A new washery annex, size 24 feet x 60 feet for small sizes, capacity 400 tons per day.

Taylor Colliery.—Installed 4 new tubular boilers, 150 horse power each, also brick boiler house for the same, size 53 feet x 41 feet. Installed pair of breaker engines 12x30 inches in a new brick building 36 feet away from breaker. Rock tunnel driven from New County vein to Clark vein, size 7x14x184 feet, also new air shaft for ventilation from New County vein to Clark vein to ventilate above tunnel, size 8x10x23 feet.

#### LEHIGH VALLEY COAL COMPANY

William A. Colliery.—A new boiler plant consisting of seven batteries, with 2100 horse power was completed. A steam line was extended from this plant to the Lawrence and Bablyon mines, and the steam for the three collieries is now furnished from this plant. New cribbing was placed in the main shaft. One pair of 12x22 inch hoisting engines was placed in the Clark vein to replace the old pair which was too small for the work. One 1000 and one 600 gallon pump was placed in the Red Ash vein for silting.

Lawrence Colliery.—A William's crusher was installed to dispose of refuse from breaker, which is run in the mine.

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.

Sloan.—One 100 H. P. electric hoist on Dunmore vein slope, induction motor. Three 6½ ton electric locomotives installed to operate in the Surface and New County veins.

One 200 K. W. rotary converter at water shaft to supply power to Sloan New County vein. One 4x14 feet dust fan, in progress of erection, to take the dust from the breaker.

Bellevue.—One 450 gallon capacity electric pump installed in Clark vein. Electric pumps installed in Nos. 1 and 2 slopes and No. 3 tunnel. Electric chain hoist installed at foot of main shaft. Four electric locomotives to operate in the Clark and Dunmore veins, and one rotary converter. A new concrete wash house with lockers erected. New fire pump and fire line.

Dodge.—One 30 H. P. motor for endless rope, three electric locomotives inside, one rotary converter sub-station installed.

Taylor.—Lighting breaker and buildings with electricity, one 300 K. W. rotary converter and sub-station building.

Holden.—Four electric locomotives installed in Clark vein and one electric pump in Clark vein.

National.—One electric hoist in Clark vein, three electric locomotives, and a new water reservoir outside.

#### DELAWARE AND HUDSON COMPANY

Greenwood.—Checker vein plane at No. 1 new shaft extended 600 feet. No. 1 slope in No. 2 shaft driven 125 feet and completed. No. 1 plane in No. 2 shaft driven 900 feet.

The general condition of almost all the collieries in the district, as to ventilation, drainage and general safety, is good.

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.

Sloan Colliery.—The new air-shaft was sunk a distance of 336 feet during the year.

Bellevue Colliery.—New annex to breaker under construction. Two Triplex Plunger pumps installed. Two low vein coal-cutting machines installed. New concrete mule barn inside.

Dodge Colliery.—New locomotive house. (Outside.) One additional electric locomotive installed. One new 750 gallon fire-pump installed. New concrete mule barn inside. New wash-house.

Holden Colliery.—One additional electric locomotive installed. One additional boiler installed. New wash-house. New concrete barn inside.

National Colliery.—Rock tunnel, No. 2 to No. 1 Dunmore vein. New wash-house. New concrete barn inside.

This Company is to be commended for its efforts in 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.

The company is promoting this educative work through the local branch of the Young Men's Christian Association.

#### SCRANTON COAL COMPANY

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

#### PEOPLES COAL COMPANY

Oxford Colliery.—New mule barn inside constructed of incombustible material.

New breaker was erected south of the site of the old breaker with a capacity of 1,500 tons daily, equipped with the most modern machinery of every kind.

#### CARLETON COAL COMPANY

National Colliery.—New breaker erected, capacity 100 tons daily. Began operations December 12.

### MINE FOREMEN'S EXAMINATIONS

The annual examination of applicants for certificates of qualification as mine foremen and assistant mine foremen was held in the City Hall, Scranton, April 15 and 16. The Board of Examiners was composed of the following persons: H. O. Prytherch, Mine Inspector, Scranton; John P. Corcoran, Superintendent, Rendham; William J. Jenkins, Miner, Scranton; James W. Reese, Miner, Scranton.

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

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, Archbald, Sloan, Hyde Park, Dodge, National, Continental and Holden Collieries.—Ventilation, drainage and condition as to safety good.

### HUDSON COAL COMPANY

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

### SCRANTON COAL COMPANY

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

### PEOPLES COAL COMPANY

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

### CARLETON COAL COMPANY

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

### MINOOKA COAL COMPANY

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

## IMPROVEMENTS

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Installed one rock pulverizer to be used to crush the rock from the breaker and have it flushed into the mines, and one new Corliss breaker engine to replace old engine.

Completed one rock tunnel from No. 2 to No. 1 Dunmore to develop No. 1 Dunmore vein, and new air shaft and engine house. Are installing fan and engine to replace old fan and engine.

Installing a fire escape on breaker. There will be several exits in case of fire.

National Colliery.—Installed an endless rope haulage system at foot of shaft for the purpose of conveying the coal, and a fan at the old Stafford workings. Completed the track and electric equipment, and tunnel from No. 2 to No. 1 Dunmore vein near Meadow Brook shaft to develop No. 1 Dunmore vein. Made a tunnel from Clark to New County vein to develop a section of the New County vein.

Made second opening tunnel from No. 1 Dunmore vein to Clark vein and second opening from Clark vein to New County vein for ventilating purposes.

**Dodge** Colliery.—The main shaft has been made wider in order to use a larger car and an endless rope installed from the shaft to the breaker to handle the mine cars.

## CONDITION OF COLLIERIES

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Holden, National, Archbald, Continental, Hyde Park and Sloan Collieries.—Ventilation, drainage and condition as to safety, good.

### DELAWARE AND HUDSON COMPANY

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

### PEOPLES COAL COMPANY

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

### SCRANTON COAL COMPANY

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

### MINOOKA COAL COMPANY

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

### CARLETON COAL COMPANY

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

### SCRANTON ANTHRACITE COAL COMPANY

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

### SPRUKS COAL COMPANY

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

## IMPROVEMENTS

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Reopening water courses through silt, Clark vein, for drainage purposes.

Dodge Colliery.—Completed sump in No. 2 Dunmore vein, to take care of the surplus water. Also completed new foot and tunnel from Rock vein to bottom split, Diamond vein, for haulage purposes.

Outside:—Erected a brick and concrete blacksmith and carpenter shop. Built a new mule barn in order to avoid crossing railroad tracks with the mules, which had to be done in the case of the use of the old barn.

Holden Colliery.—Completed rock tunnel from New County vein to Big vein, for haulage purposes. Installed a new steam pump to take care of the surplus water.

Outside:—Renewed casing on ventilating fan.

## CONDITION OF COLLIERIES

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Sloan, Archbald, Continental, Holden and National Collieries.—Ventilation, drainage and condition as to safety, good.

### DELAWARE AND HUDSON COMPANY

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

### SCRANTON ANTHRACITE COAL COMPANY

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

### SPRUKS COAL COMPANY

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

### JOHN GIBBONS AND COMPANY

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

### MINOOKA COAL COMPANY

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

## IMPROVEMENTS

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Completed a rock tunnel, on a 45-degree pitch, connecting Nos. 1 and 2 Dunmore veins, length 75 feet, and one tunnel 7 by 12 feet from the New County vein to the Big vein, length 50 feet. Installed one 7-ton locomotive and reel, etc., in the Diamond vein "T" gangway.

Outside:—Installed a new Jeffrey ventilating fan, 6 feet wide, 16 feet in diameter, and built a new fan house for the same.

**Dodge** Colliery.—Completed a tunnel and bottom cut, 350 feet long from Rock to Bottom Diamond vein, and foot branch installed with connections with above landings. Tunnel, bottom and roof cut for a distance of 198 feet from Bottom Diamond to Rock vein. Roof cut from L and M gangway, Bottom Diamond vein, for a distance of 400 feet, and roof cut on No. 2 South gangway for a distance of 270 feet. Installed one 10-ton locomotive on main haulage-road. Made new shaft landing in Rock vein; also new sub-station and new mule barn.



## CONDITION OF COLLIERIES

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue, Dodge, Continental, Archbald, National and Sloan Collieries.—Ventilation, drainage and condition as to safety, good.

### DELAWARE AND HUDSON COMPANY

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

### SCRANTON ANTHRACITE COAL COMPANY

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

### CARLETON COAL COMPANY

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

### SPRUKS COAL COMPANY

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

## IMPROVEMENTS

### DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Bellevue Colliery.—Installed 5 7-ton electric locomotives, wing reel device, etc.

**Dodge** Colliery.—Completed roof cut from New County to Big vein. Installed 3 7-ton electric locomotives, and 3 200 KW transformers, cable, bore hole, etc.

National Colliery.—Installed 2 7-ton electric locomotives.

Sloan Colliery.—Completed second opening from Diamond gangway, No. 2 Dunmore vein, into the No. 2 Dunmore vein, at Bellevue Colliery.

### DELAWARE AND HUDSON COMPANY

Greenwood Colliery.—Completed a plane in Dunmore No. 3 bed, from old No. 1 shaft and New No. 1 shaft, to lower coal to New No. 1 shaft, thereby doing away with old No. 1 shaft.

Stripping of New County bed started.

Installed two 1200-gallon pumps at foot of New No. 1 shaft, one centrifugal and one plunger. Direct motion engines installed at No. 2 shaft, and 18 Lehigh Valley jigs in the breaker.

A great deal of interest is manifested in this district in the workings of the Greenwood Colliery Safety Institute which gives splendid promise of producing results.