

tower is 70 feet high; the cages are self-dumping, of the Bond patent, made by the Ellison Machinery & Foundry Co., St. Louis, Mo., with shaker screens. The sheave wheels are 6 feet in diameter. The sinking of the air shaft has been started; it is 11½ by 7½ feet. The company has not as yet shipped any coal from this mine, but is waiting for the building of a switch from the Iron Mountain railroad. The capacity of this shaft will be from 1,500 to 2,000 tons per day.

The National Mining Co. has put down a new shaft two miles east of Eldorado, Saline county. The shaft is 13 by 9 feet and the depth is 337 feet. A 6-foot vein of coal was reached, which is known as seam No. 5. A pair of hoisting engines have been installed, 20 by 36 inches, they are the Keck Gonnerman make. The drum is 6 feet in diameter with a double brake. The boilers are the Atlas make, Dayton, Ohio, and are 6 by 16 feet, with 6-inch tubes, 300 horse power. The hoisting rope is 1¼ inches in diameter. The wooden head tower is 70 feet high. The cages are self-dumping with shaker screen, Parker make, and an Ottumwa box car loader. The air shaft is down, 10 by 10 feet. The fan is Keck Gonnerman make, 16 feet in diameter. This mine is located on the Louisville & Nashville railroad. The first coal was shipped June 17, 1905.

The Big Muddy Coal & Iron Co.'s shaft No. 9 is just completed. It is located in township 8, Jackson county. The hoisting shaft is 9 feet 1 inch by 18 feet 5 inches inside of timbers, with two cageways, each 6 feet 10 inches by 9 feet 1 inch, also a stair and pipe way 3 feet 6 inches by 9 feet 1 inch in the north end of shaft. The air shaft is 8¾ feet by 18 2-3 feet inside of timbers, with stair and manway in the south end of shaft 4½ feet by 8¾ feet. The air way is 8¾ feet by 14 feet 2 inches, with a division of 8 by 10 inch buntons running through the center of air way. The depth to the coal is 107½ feet. The coal is 6½ feet in both shafts. Both shafts are timbered with 8 by 8 inch timbers through the surface and with 3 by 10 inch long leaf yellow pine through the slate, treated with a wood preservative. Friedstadt interlocking channel irons 16 feet long were used in going through a 14-foot strata of quicksand in the hoisting shaft, and United States interlocking steel piling 14 feet long was used in going through a 12-foot strata of quicksand in the air shaft.

The tippie is built of long leaf yellow pine, and is equipped with self-dumping cages, and four tracks. Each track has a 78-foot United States track scale under the tippie so that the empty and loaded cars are weighed standing. A box car loader will be installed as soon as it is needed.

The shaking screens are of steel, 8 feet wide, perforated sheets extending over 4 tracks, over which 7 grades of coal can be made in the different combinations of the screen.

The engine house of brick, 22 by 32 feet, at the north end of the shaft, and contains a pair of 18 by 36 inch first motion, Danville hoisting engines, equipped with both foot and steam brakes, also an automatic device to prevent overwinding.

The boiler house is 44 by 92 feet, north of engine house, with balloon frame, covered and sided with galvanized iron. It contains four boilers 72 inches by 18 feet, with 70 4-inch flues. Two boilers are set to each battery, and there is room for four more boilers of same size, when needed. The boilers are supplied with coal by a conveyor running from the tippie to the boiler house.

The power house is 44 by 54 feet, balloon frame, covered and sided with galvanized iron, and contains one 20 by 42 inch Allis-Chalmers 300 H. P. Corliss engine at 92 R. P. M., with a 15-foot fly wheel, grooved for 18 1-inch ropes, and drives a 225 K. W. Crocker-Wheeler generator, 250 volts, direct current.

The switch-board has two pannels equipped with buss bar and Weston voltmeter and 1,000 ampere ammeter, one main circuit breaker and three smaller circuit breakers with fuses on each line. There are four circuits running from the switch-board to the bottom of the shaft, two for mining machines, one for lights and one for haulage, so connected up that a short circuit on one line does not affect any other. The cables are lead covered

and well insulated; lightning arrestors are placed on each line outside of the power house, and all cables are carried under cover from the power house to the shaft. There is sufficient room in the power house for a duplicate plant.

The fan is 10-foot Robinson pattern, guaranteed to produce 100,000 cubic feet per minute, and a 2-inch water guage at 350 R. P. M. These are enclosed in a cast-iron housing and connected to the air shaft by a concrete conduit, driven by a 10 by 20 inch plain slide valve engine, with a rope drive.

The main bottom entry of the shaft runs nearly east and west, 14 feet wide and 7½ feet high and 400 feet long, on each side of the shaft. There are two tracks, 3½ feet gauge, laid with 30-pound steel rails, cross bars 12 by 12 inches long leaf yellow pine, set 4 feet from center to center, lagging 3 by 12 inches. The coal is caged from the west side of the shaft, and empty cars are run to the east side by gravity. There is a parallel entry 9 feet wide and arched, on each side of the main bottom entry, making a three entry system on the bottom, with a 30-foot pillar between the main bottom entry and the parallel entries. The bottom is so arranged that the motor can bring the loads to the loaded side of shaft without making a running switch; 200 feet is the greatest distance necessary for the motor to travel without a load.

The pannel system will be adopted in mining, and three entry systems on all entries except the pannel, where the two entry system will be used. There will be two air courses and three traveling ways leading to the air shaft from the main entries.

Two Sullivan electric chain machines are at work at the present time, making an undercut 6½ deep by 5¾ feet high. More machines will be installed as soon as needed. The general plans and construction, both above and below ground, for safe, efficient and economical operation of the property are considered to be second to none in the State.

#### ABANDONED MINES.

Three local mines have been abandoned during the year: The Rice & Crain mine, the Thomas Parritt mine and the mine of the Carterville Diamond M. Co., all located at Carterville.

The Carterville Coal Co. shaft "B" has not been operated during the year. The company failed to give any reason for not working this mine.

#### PROSPECTIVE MINES.

The Chicago & Carterville Coal Co. is still engaged in sinking its shaft "B," which is located two miles northeast of Herrin, Williamson county. The company has had some trouble in sinking through sand and water, which has delayed the work. However, the shaft is now about down to the coal and preparations are being made to begin the sinking of the escapement shaft.

#### IMPROVEMENTS.

The Chicago & Carterville Coal Co. of Herrin, Williamson county, has put in the Sullivan air punching mining machines, also a Sullivan air compressor, which has a capacity of 25 machines. The company is running from 20 to 23 machines per day and is doing good work.

The Carterville Mining Co., of Carterville, Williamson county, has put the main and tail rope system into the old Fredonia mine. This is the oldest mine in Williamson county. The company has purchased some new coal land, and, in order to cut down expenses of hauling, have put in the rope system, which is giving good satisfaction.

The O'Gara Coal Co., at Harrisburg, has changed its No. 2, 3 and 4 mines from hand to machine mines, and has introduced the Morgan-Gardner electric machines. The electric plant is located at the No. 3 shaft. The cable is on top of the ground to numbers 2 and 4 shafts, so that the one electric plant does the work for the three shafts. Two Erie automatic