

fires, owing to a bad system of mining and ventilating established by the company who first opened the mine. The underground manager has had his hands full combatting the sulphuretted hydrogen gas issuing out of the old works. Considering the amount of coal that has been taken out of the mine, the gob fires they have had to contend with and at the same time keep up a good system of ventilation, the mine has been well managed. The escapement shaft is fitted with ladders from bottom to top. The coal is hoisted by twin engines on the first motion, the engines being 16x30 with an 8 foot drum, rope  $1\frac{1}{8}$  inch in diameter. The engines were built by the Litchfield machine works from designs by H. H. Beach, superintendent of the works. The Litchfield engines are the best coal hoisting engines in the 4th district. They are designed for both strength and speed. The steam pipes enter the steam chest from below, and the exhaust passes from cylinders below to the outside of the engine house, leaving it cool and comfortable for the hoisting engineer. The engines are fitted up with a powerful foot brake and a relief valve, which is a valuable invention to hoisting engines. It gives the engineer more control of his engines, relieving the back pressure from behind the piston, and in lowering miners on the cage or heavy weights into the mine, the engineer has full control of his engines. The steam is raised by two-flue boilers 42" 20'. An independent engine and boiler is used to run the fan, which is operated by belt gearing 3 to 1. Lufketter's eccentric safety catches are used on the cages, which have never been known to fail in case of the breaking of a rope.

Manager, J. D. Crabb. Underground Manager, Wm. M. Morris.

#### ELLSWORTH COAL AND MINING COMPANY'S MINE No. 6.

This mine is also situated within the corporate limits of the village of Staunton, on the Wabash, St. Louis and Pacific Railroad. The shaft is 322 feet deep, the coal has an average thickness of 7 feet. The works are all opened on the double-entry plan, and ventilated by a 6 foot Murphy fan. The air is split for each set of entries, which secures good ventilation and the successful working of the coal. The hoisting engines are double, 16x32 on first motion. The hoisting drum is 8 feet in diameter, steel rope 1 inch. The engines are the Litchfield engines with all the latest appliances. One ton of coal is hoisted at a time. On July 30, 1883, the output of one day of 10 working hours was 1,481 tons. The escapement shaft is 6x8 with ladders from bottom to top. Lufketter's safety catches are applied to the cages. Steam is raised by 3 boilers each 42" 28' two-flue boilers. This mine has been very successfully managed.

Manager, J. D. Crabb. Underground Manager, Joseph Hebenstrat.

#### ELLSWORTH COAL AND MINING COMPANY, MINE No. 7.

This mine is located one mile east of Staunton, on the line of the Wabash, St. Louis and Pacific Railroad. The shaft is 360 feet deep; the coal has an average of 7 feet, 6 inches in thickness. The works are located on the double-entry plan, and ventilated by

a 10-foot Brazil fan. The escapement shaft is 6x9 feet, with ladders from bottom to top; the coal is hoisted by double engines 12x24, first motion; drum 6 feet in diameter with a  $1\frac{1}{8}$  inch rope. This is a machine shaft. A Norwalk compressor is used, working nine Harrison coal cutting machines. There is an average of 75 miners.

Manager, J. D. Crabb; Underground Manager, Geo. Judd.

#### ANCHORVILLE COAL COMPANY.

This mine is situated two miles northeast of Staunton, on the Wabash, St. Louis and Pacific Railroad. The shaft is 382 feet deep. The coal will average seven feet in thickness; the coal is hoisted by a pair of double engines 10x20, second motion; geared, 3 to 1; drum six feet, rope  $1\frac{1}{8}$  inches. This company is just finishing an escapement shaft: when finished a ventilating fan will be set up. The coal for the year has been all mined by machinery. A Yock compressor is used and five Yock coal cutting machines. At present the mining is done by hand. There are three boilers 42" 28', two-flue boilers. There has been an average of 50 miners employed during the year. Track scales are used. Screen  $\frac{7}{8}$  x 12'.

Manager, Wm. Giles.

#### ELLSWORTH COAL AND MINING COMPANY, MINE No. 8.

This mine is located one mile south of Mount Olive, on the Wabash, St. Louis and Pacific railroad. The shaft is 402 feet deep; the coal will average eight feet. The works, under the old company, were opened up on the single-entry system. Since it came into possession of the Ellsworth Coal Company, they are opening up the mine with double-entry work. There is no escapement shaft as yet. As they are allowed two years, under the law, in which to sink, it was thought best to let them hole into No. 9. They are at present driving from both No. 8 and No. 9 for connection. They will meet this winter, which will give escapement shaft for No. 8. A pair of Litchfield engines will be put in this fall. The mine is ventilated by cage pressure at present. They employed on an average last year 60 miners.

Frank R. Fisher, Supt.; James Morris, Underground Manager.

#### ELLSWORTH COAL COMPANY, MINES No. 9 AND 10.

These mines are situated within the corporate limits of the village of Mount Olive and on the line of the Wabash, St. Louis and Pacific Railroad. The shafts are 416 feet deep; the average thickness of the coal is eight feet. These mines have been the property of the old Mount Olive company and were worked on the single-entry system. The Ellsworth company will now put them on the double-entry plan. Shafts No. 9 and 10 are each holed into one another and will answer for escapements. The mines are ventilated by a furnace six feet in width of grate bar; No. 9 uses a single engine for hoisting; No. 10, double engines. The two mines employ on an average 175 miners. The screens are  $\frac{3}{4}$  inch by 8 feet.

Frank R. Fisher, Supt.; Underground Manager, Wm. Golding.