

EXTRAORDINARY TRENCH DIGGING.

BY GEORGE J. JONES.

A notable piece of excavating machinery is to be seen working at present just outside of Moorestown, N. J., where a sewer system is being laid. The machine referred to is a trench digger, which, operated by five men, cuts a swath through the earth with marvelous rapidity and neatness. The operation of this machine represents a saving as compared with hand work in many different ways. In the first place, in order to lay the smaller sizes of pipe, it is necessary to dig a hole very much larger than is required for the pipe in order to accommodate the bodies of the men who must work in the trench. Then again, where the pipe is to be planted at some considerable depth, the men are compelled to work in stages, and the soil removed must be handled many times before it is finally passed out of the trench. When this trench-digging machine is used, the hole is made just large enough to accommodate the pipe, and this represents a great economy in the amount of material handled. This machine is built by the F. C. Austin Manufacturing Company, of Harvey, Ill., to whom we are indebted for much of the information found herewith, but the photographs were specially made for this article. The machine at work at Moorestown is the largest and most powerful ever built by the company.

The digging machine is built of a framework of I-beams mounted on four broad-tire wheels, and in front of it as it cuts its way along through the earth is a 25 horse power traction engine which supplies the power, the connection being made through a chain belt.

At the other end of the machine there is a twenty-foot shaft of light iron work, the free end of which has a vertical movement. A pair of sprocket wheels at each end carry an endless link belt built up of steel drop-forged links and connected by cross-bars and flat blades or scrapers. Fastened to each cross bar are two plow-shaped cutters, the latter being staggered, so that the whole series of cutters will cover the whole width of the excavation. Alternate bars are fitted with side cutters for trimming the sides of the ditch. The dirt is carried to the top and deposited on a rubber belt, which carries it to either side as may be desired.

The buckets, immediately behind the cutters, are themselves of peculiar design, as they open automatically when they reach the end of the shaft nearest the hopper, and thus prevent any of the excavated soil from remaining in them.

The chain with

its buckets and cutters passes over the main shaft of the machine, and the other end is lowered into the ground and does the cutting. Its position is capable of constant and instant adjustment, so that a ditch of six inches can be dug as readily as one of twelve feet. This hoisting or lowering to the required depth is accomplished by means of a steam gear, which

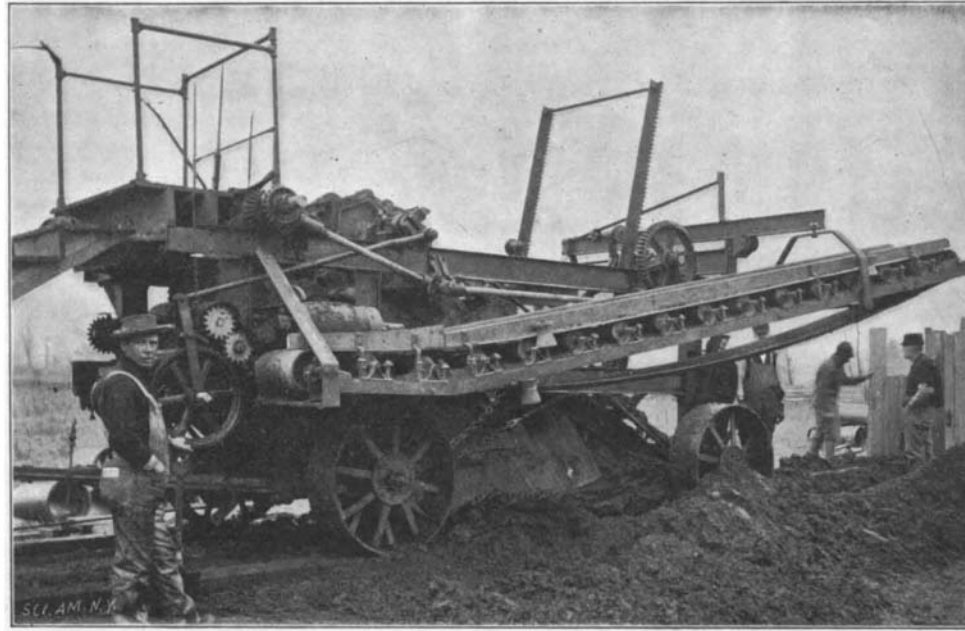
crowds the rack at the rear of the machine either down or up as the case may require. It will be seen that the weight of the machine is thus applied to the crowding device, is removed entirely from the banks of the ditch, and instead assists in the cutting, as the pressure is applied to the breast of the cut.

An iron stake is anchored some eight or nine hundred feet in advance of the machine, to which a cable is attached, this being spooled on a drum in the front part of the machine. At every revolution of the gear wheel a certain amount of this cable is wound up by means of a ratchet device, and gives a steady advance which is automatic. This is capable of regulation, and the speed with which the digger passes along through the earth may be adjusted to the varying conditions of the soil encountered.

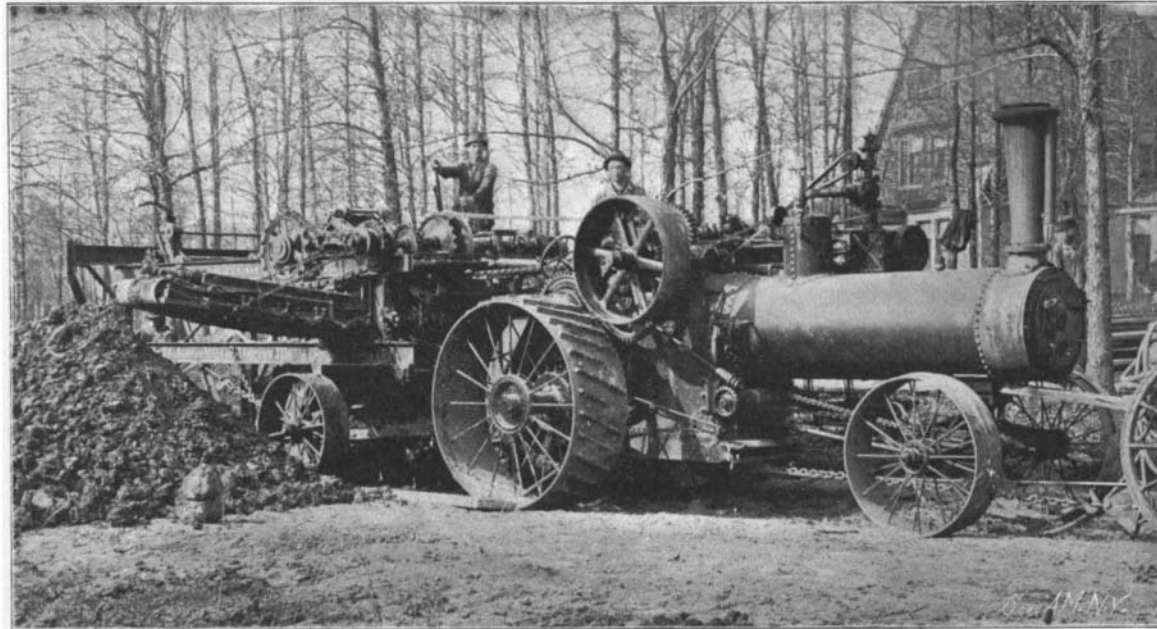
The work at Moorestown was hampered to a very large degree by the presence of quicksands, which were not anticipated. The buckets used are not adapted to raising this character of material, but small rocks and frozen ground are easily handled by the machine. This machine with its crew of five men does work which would be a credit to a very large force of laborers. Under favorable circumstances a ditch four feet deep can be dug at the rate of sixty feet an hour.

For the purpose of preventing street accidents during fogs, which are frequent in London, at certain periods of the year, the Westminster County Council has devised a convenient portable apparatus of great illuminating power. The apparatus consists of a round tank 24 inches high by 18 inches in diameter, charged with 25 gallons of petroleum. By means of compressed air the oil vapor is forced from the tank into a standpipe, attached to which is a burner. By means of a little naphtha, benzoline or paraffin, with which the burner is saturated, the means of igniting the vapor are obtained, and a powerful torch is produced with a flare ranging from 18 inches to 2 feet and a power equal to upward of 1,000 candles. A number of these "fog lights" are maintained ready for use night and day at various depots, and the attendants, who are trained in the management of the apparatus, wheel it to any desired point when the necessity arises.

The German government has purchased the patent rights covering all Europe except Great Britain, Ireland, and France, for an automatic switchboard manufactured in Chicago. The electrical appliance will displace a telephone system of 40,000 instruments.



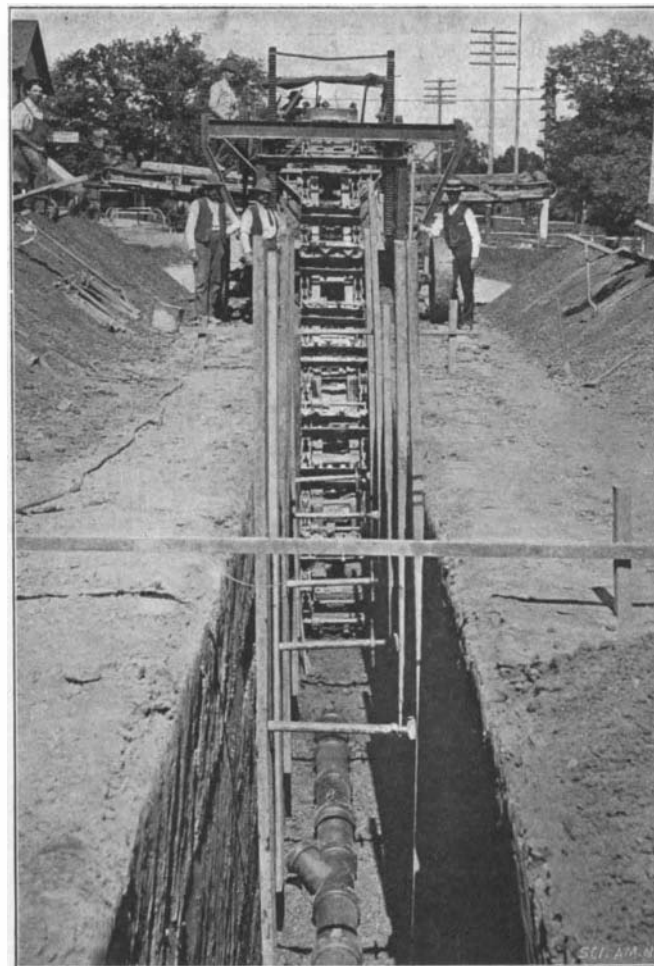
TRENCH DIGGER, SHOWING CONVEYER FOR DELIVERING THE SOIL AT THE SIDE OF THE DITCH.



THE TRENCH DIGGER AND ITS ENGINE.



A VIEW SHOWING ENDLESS CHAIN WITH BUCKETS.



A DEEP TRENCH DUG BY THE MACHINE.