A NEW TRENCH EXCAVATING MACHINE.

Among the recent developments in excavating machines, a new type of excavating machine has been developed for trenching, the excavation of which by hand often requires the removal of much material than is actually needed for the trench, owing to the necessity of having the trench wide enough for the men to handle their tools. In deep trenches, the work by hand labor is often increased by the necessity of working in stages, the material being hauled two or three times before it reaches the surface. The accompanying cutaway views represent a new trench excavating machine which does the work cheaper and quicker than by hand, and which has already been used on contract work with success in different kinds of soil.

The machine consists of a frame built up mainly of steel I-beams and mounted on four broad-tired wheels. Over the front axle is a shaft to which is pivoted a frame about 20 ft. long, lowering the free end of the cutter frame. The cutters travel up along the working beam, loosening material which is carried up by the blades or scrapers. At the head of the machine the material is dumped into two horizontal belt conveyors, at right angles to the trench, which discharge the excavated material either into wagons for removal or upon the ground alongside the trench ready for the backfilling. The machine has itself about 30 ft. by 12 ft., has a maximum height of 10 ft., and is anchored about 300 ft. ahead. This cable is wound upon a drum which has at one end a rack driving wheel. From this latter shaft a link-belt drives the shaft at the head of the cutter frame, while vertical link-belts drive the teeth gears from which the conveyors are operated. Two men are required: one to operate the traction engine, and the other to operate the excavator, stopping and starting the cutting mechanism and regulating the speed as required. Other men attend to the hauling cable, the trench sheeting and the backfilling.

Fig. 1 is a general view, showing the machine at work on a sewer contract at Glencoe, Ill. The machine itself is behind the Case traction engine. On the sides of the engine pulley will be seen the link-belt transmitting power to the main shaft of the excavator. On this shaft are the large sprocket wheels for driving the chain or belt and also three smaller sprocket wheels. The small wheel at the end of the shaft carries the horizontal chain which drives the shaft at the head of the cutter frame by the large sprocket wheel shown above the conveyor. The other two wheels carry the chains for driving the conveyors. Near the end of the frame will be seen one of the inclined bars of the crowding device already described. Fig. 2 is a view of the trench, with the machine at work in front and the pipe laid ready for the backfilling.

The machines have been used at Chicago, Posen, Harvey and Glencoe, Ill. At the latter place about 6,000 ft. of trench have been excavated, the width being 2 ft. and the depth from 9 to 15 ft. The material there was very hard stiff clay, which stands well, as may be seen in Fig. 2, requiring sheeting boards only at intervals of about 18 in. The sheeting is supported by iron screw-jack trench braces. The 2-ft. trench would be too narrow for excavation by hand, but just allows room for the pipelayers to work, the pipe being kept up to within about 15 ft. of the machine. Behind the pipelaying the backfilling is done by a horse and drag scraper, with two men; the scraper working across the trench and scraping the excavated material from the ridges into the trench. In this hard material the excavator advanced about 50 ft. an hour, but in good earth, free from boulders, the progress may be as much as 100 ft. an hour. At Glencoe, 500 ft. of trench 15 to 15 ft. deep were excavated in a working day of ten hours.

Small boulders can be handled, the cutters loosening the material around them until they fall cut and are carried up by the blades. For large boulders, the cutter frame can be raised and the stone removed by picks. The machine will work in any place where there are not too many rocks and large stones which the machine cannot handle. It will cut trenches 2 to 4 ft. wide and as deep as 20 ft.

These trench excavating machines were designed by the P. C. Austin Mfg. Co. of Harvey, Ill., and are built by that company for the Municipal Engineering & Contracting Co. of Harvey, Ill., which has acquired the sole right for their use. The latter company, therefore, makes a specialty of taking sub-contracts for the trench excavation on sewer or water-works contracts and similar work.