Two leather belts, 11″, 2-ply, 15′ 3″ between shafts of motors and pumps.

Two concrete beds for pumps, 1 to 12 mixture, 7′ 9″ x 8′ 10″ x 4′.

Three concrete beds for motors, 1 to 12 mixture, 4′x6′x3′.

Four timbers to keep spacing between motors and pumps. These timbers are at ground level and between the beds; size, 8″ x 8″ x 16′.

One building, 24′ x 30′, in panels to make moving easy.

Wiring and 6″ piping for air line.

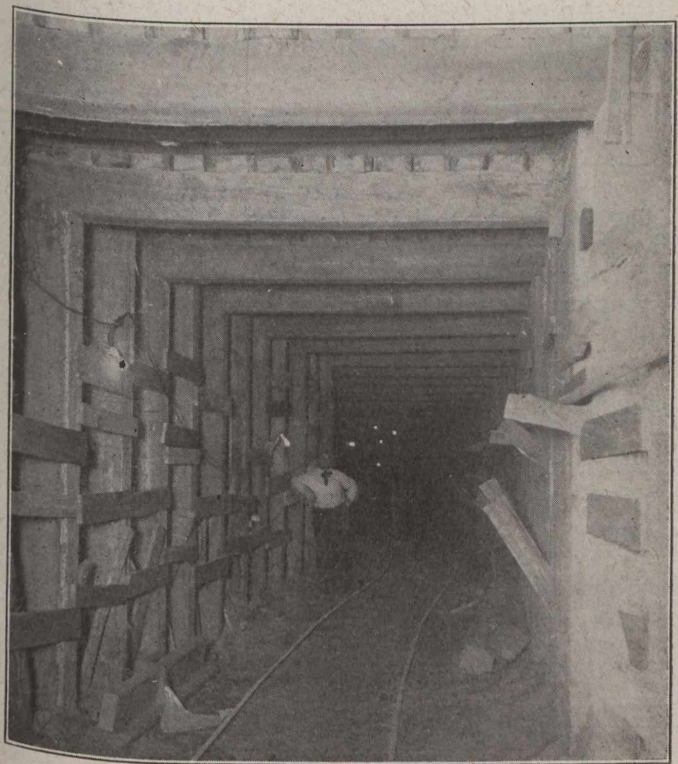

Fig. 8.—Cap and Leg Tunnel.

Cost of Plant.

2 compressors	$5,000.00
2 motors	1,300.00
2 belts	295.00
4 concrete beds	145.00
4 timbers	10.50
Building	225.00

The cost of installing the above plant, including piping and wiring, $330.

Gates	$ 400.00
Valves	100.00

Cost of installing gates and valves, including locks, $112.

Maintenance.

Power	$22.00 per day
Oil and waste	.90 " "
Repairs	.60 " "
Labor	11.00 " "

An average of 24 ft. is constructed here per day of 4′x6′, 3-ring, egg-shaped sewer. The cost for compressed air is, therefore, $1.45 per foot, not including interest on investment or depreciation.

When the work has progressed several hundred feet, it is generally advisable to move the locks nearer to the heading. When this is done a smaller volume of air is required and there is a smaller area for possible escape. Sometimes, if air is escaping rapidly, it has been found profitable to discontinue work for a day and pump in grout through the brickwork to seal the space between the brickwork and the sheeting over the arch. This will prevent the air from escaping from the heading back over the finished sewer to the shaft and thence to the surface. This is another reason why the shaft is lined with concrete above the future sewer.

The methods used for supporting the sheeting in compressed air are in many cases the same as those used in ordinary tunnel work with the exception that less and lighter timbering is required. These methods include the needle-beam method, the cap and leg method, the crutch method, the Christmas-tree method and other methods used when only very light sheeting is required.

The Needle-beam Method (Fig. 7).—To use this system the tunnel must be large and dry, or nearly so. (For a detailed description of this method see article in *The Canadian Engineer* for December 9th, 1915, on "The Keele Street Storm Overflow Sewer.")

Cap and Leg Method (Figs. 1 and 8).—This method is used in compressed air when the sewer is small (6 or 7 ft.) and when the sand is fine and has not enough clay mixed with it to give it the necessary consistency. The sand will cave in on the top or sides before sheeting can be placed to prevent it from doing so. The timber cannot be removed from the work and as the sewer increases in size the size of the timber also increases, thus increasing the cost of the work. The sheeting is driven just ahead of the excavation, the cap and legs being placed when the sheeting has been driven ahead of the previous set about 4 ft. The cap in this new set is placed low, and the next sheeting driven over it, the rear end of the sheeting being under the preceding cap, thus giving it always an upward

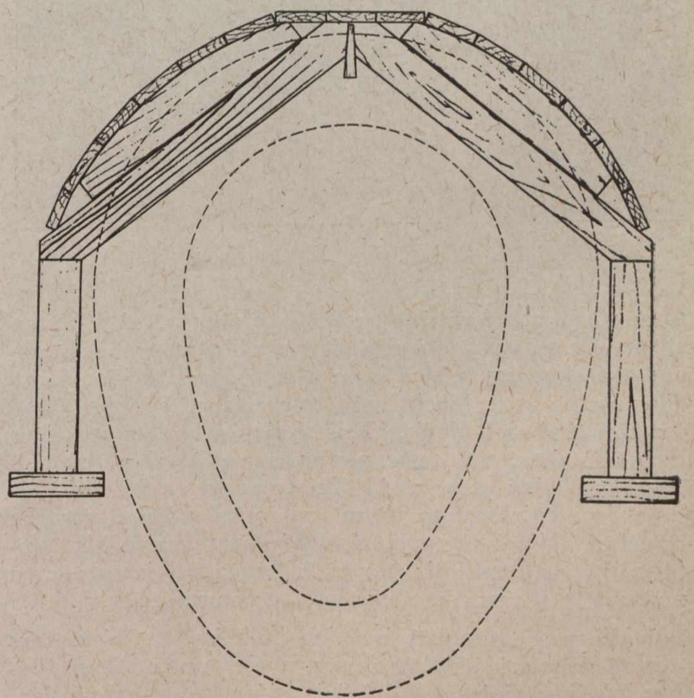

Fig. 9.—Crutch Method of Supporting Sheeting.

angle. When this set of sheeting is driven ahead its full length, a filler is placed between the sets over the cap, as shown in Fig. 1. The legs are cut on the slant, so that the cap always slants upward and the top sheeting, which is given an upward angle, rests evenly upon it.

The Crutch Method (Figs. 9 and 10).—This method is used when the ground is quite dry and only requires