4½ to 5 feet in diameter and from 4 to 5 feet deep below the outlet. Practically all of the cities use some sort of trap over the outlet, the object of which is apparently more to keep sticks and other floating matters out of the sewer than to prevent the entrance of sewer gas; although the latter is considered, and in some cases special provision made for it. The Coleman trap was used in Pawtucket some years ago, but Mr. Carpenter finds that the inlet is small and so constructed that small sticks, leaves and other floating matter readily enter and often produce a complete stoppage; and when frozen slush enters a basin in winter, this form of trap is easily clogged and difficult to relieve. These objectionable features were partially overcome by the addition of a galvanized iron hood over the opening to the trap. Finally, the trap was removed and the hood alone used in the later manholes, the hood being made of cast-iron. Some basins have been constructed and have been in use for years without giving trouble, in which a regular "S" trap is placed just outside the basin, the inlet being protected with a cast-iron hood.

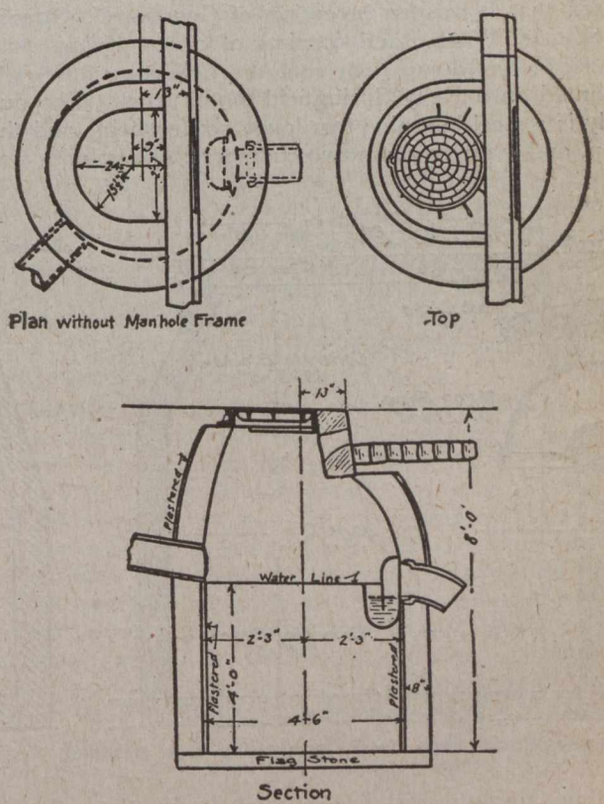
Still another device used in Pawtucket was building the lower part of the basin of two concentric rings of brick, with a 2-inch space between them, and the inner ring built of soft, porous bricks. A pipe leading to the sewer was carried through the bottom of the outer ring, thus draining the space between the rings, and causing a partial drying of the dirt in the basin, the moisture from which passes through the inner ring of brick.

Concerning the top of the basin, Mr. Carpenter believed that great improvement has been made by substituting cast-iron for the heavy stone tops used a few years ago. The heavy granite head was very expensive, and occupied a considerable space in the sidewalk, whereas, with the cast-iron head now adopted in Providence and a number of the other cities, nothing but a light iron cover about two feet in diameter shows on the surface of the sidewalk. Another improvement is in the location of the basin. Instead of placing these at the intersection of the curb lines, the basin is located above the cross walk on one street, and an additional inlet or chute is located on the other street above the other cross walk and connected with the basin. Where corner basins already exist, the old entrance to the basin can be closed and two plain inlets be constructed, one on each street, connected to the old basin.

"When planning catch basin openings and connections, the speaker has often felt the lack of sufficient data relative to the approximate amount of storm water that will pass a given opening in the curb, and also the maximum quantity that will pass the form or trap and connection used. Inlets through the curb, of the form illustrated, generally measure about 4 inches by 24 inches, 4 inches by 30 inches, or 4 inches by 36 inches, as the location seems to demand. Eight-inch, 10-inch or 12-inch pipes are used for connections between the basin and the sewer, as the engineer's judgment dictates. The speaker raises the question, Would it not be well to have more definite data than we at present possess respecting the relative capacity of various inlet openings, traps and sewer connections? Investigations along this line might be made with profit?"

Mr. Carpenter does not use or like the gutter inlet, but prefers the curb opening. He finds among other things that the gutter inlet is very apt to become clogged with leaves, stones and other matter from the streets. Most of the New England cities referred to in the discussion, however, seem to make more or less extensive use of the gutter inlet.

In Cambridge the "D" frame and grate are used, with the straight side of the "D" against the curb. The Cambridge frame and grate weigh about 65 pounds and cost about 12.50 per set. They find that these are liable to clog in time of storm, for which reason a slot or throat is cut in the face of the curb, back of the grate. The trap used is a cast-iron hood which can be lifted up for cleaning out the pipe, the entire trap costing about $5, and including a metal valve that opens outward toward the sewer to shut out sewer gas in case the water falls below the hood. One unusual feature of the Cambridge basin is the size of the outlet pipes, which were built some years ago of 10-inch pipe, then of 8-inch, and 6-inch pipe is now being used, and City



Details of Catch Basins as used in Providence, R.I.

Engineer Hastings states that he has never heard of one of these being stopped up on account of its small size. As stated above, although there are 2,260 basins in the city, the number of cleanings last year was only 1,128, and these averaged 2.1 cubic yards per cleaning, which is about the capacity of the catch basin. The cost of cleaning was $6.48 per basin, or $3 per cubic yard. This cost has increased during the past ten years from $2.58 per basin, or $1.44 per cubic yard, while the number of cleanings has decreased from 2,340 to 1,128.

Boston, although claiming to have invented the "D" grate, has abandoned it for square grates, principally for the reason that they are much easier to pave against. Boston last year cleaned 9,907 basins, removing from each basin about 3¾ cubic yards. The cleaning is done by contract at cost of $3.01 per basin. As the basins are five feet in diameter and four feet six inches from the bottom to the level of the outlet, it is seen that in this case also the basin is in every case nearly full of dirt when it is cleaned. In fact, it is doubtful whether