is reduced to paste of a creamy consistency before being delivered to the dilution tanks beneath. This pasting tank, 3 ft. in diameter and 4 ft. high, is provided with a stirring device carrying two rather heavy rollers which are located horizontally at its lower end.

The rollers clear the bottom of the concrete tank only by a fraction of an inch, thus insuring the mashing and disintegration of all of the small lumps that are invariably present in commercial calcium hypochlorite. Owing to the fact that the action of the reagent on bronze is to form on the surface of it a fairly insoluble and protective coating of metallic carbonate and oxychloride, that metal appears to be the most available for use on all bearing and stirring or disintegrating devices that come in contact with the solution. Leading from the concrete pasting tank are pipes so arranged that the contents of the tank may be discharged into either of the large dilution tanks on the floor beneath. The outlet of the pasting tank is placed at a considerable distance from its bottom so as to avoid the possibility of drawing off with the paste any fragments of considerable size. The pipes carrying the paste are so arranged as to be readily cleaned in a few minutes in the event that they become clogged. Ultimately they are sure to become clogged if they are not occasionally cleared because of the formation in them of carbonate from carbon dioxide absorbed from the air.

The dilution tanks are hexagonal in form, 9 ft. in maximum diameter and 7 ft. high. Their walls are 6 in. thick. Although the difficulty experienced in properly disposing the reniforcing iron in the construction of a hexagonal tank is much greater than is the case in the building of a round one, the hexagonal tank is to be preferred on account of the fact that in a round tank a rotary stirrer does not produce nearly such thorough agitation and mixing of the solution of hypochlorite as the same stirrer can do in the hexagonal tank. The paste is mixed with water in the dilution tanks until a uniform solution of a strength of 2 per cent. occurs. The use of the two tanks makes it possible to adjust accurately the strength of the solution in one dilution tank while the contents of the other is being utilized. The dilution tanks are placed on supports high enough to permit the use of a gravity feed to the orifice box, which is placed on the floor of the room housing the big tanks.

Bronze pipes, 1½ in. in size, so arranged as to be readily cleaned in the event of stoppage, connect the dilution tanks with a gauging tank 4 ft. in diameter. This gauging tank contains a float, scale and pointer so arranged that the man in charge can accurately check the speed of outflow of solution from his orifice box into the big water main carrying the entire city water supply from the settling basins to the pumps. The solution passes through the gauging tank to the orifice box. Each division on the gauge represents 1 gal. of the hypochlorite solution.

The orifice box is oblong in shape and carries a float of about 250 cu. in. displacement. The float operates a valve which, by either opening slightly or closing, maintains the hypochlorite solution in the orifice box to a constant level. One end of the orifice box is of plate glass to enable the operator to see at a glance that the solution is filling the box to the proper height. Attached to the plate glass and covering a hole in it, is a hard rubber disc having near its periphery several slits, the adjustment of which represents the size of a stream of the per cent. hypochlorite solution that will be the proper amount to treat the quantity of water passing through the main. All movements of the hypochlorite solution after its preparation, are by gravity. Ample opportunity for the hypochlorite to react with any putrescible organic matter and germs in the water is afforded during the time in which the water passes through the centrifugal pumps, the flow line and a small storage basin at Turkey Creek before it is pumped to the domestic water users.

All of the stirring devices are run by an electric motor belted to a line shaft carrying clutches so placed as to make possible the running of any one of the stirrers whether or not any of the others are running.

The principle involved in the construction of practically all hypochlorite installations for the purification of water by the oxidation of germs and putrescible organic matter in municipal water supplies, is substantially the same as that in Kansas City. Concrete, usually reinforced, is universally used in the construction of all permanent apparatus for the preparation and solution of the hypochlorite for mixing with the water to be purified.

OIL-SHALE INDUSTRY.

Canadian capital interests of late have taken considerable notice of the industrial possibilities of the extraction of oil from the shale deposits of Eastern Canada. A short time back the Dominion Government conducted a number of experiments on these shales with a view of obtaining a report that would be of value in the industrial future of the properties covered by these bituminous materials. Fifty tons of the material were transported to Scotland and passed through the plant of the Pumpherston Oil Company's works, MidCalder, Edinburgh county, and from the resulting report we extract the following:

The testing of the New Brunswick oil-shales was conducted on a large scale, and with complete success, at the Pumpherston Oil Company's works, MidCalder, Edinburgh county, Scotland. The various operations were performed under the direct supervision of Dr. R. W. Ells—representing the Mines Branch of the Department of Mines, Canada—and of Mr. W. A. Hamor, assistant to Dr. Charles Baskerville, of the Science Faculty of the College of the City of New York—acting for the Albertite, Oilite and Cannel Coal Company, of that city.

In 1868 Prof. Henry Howe published a mineralogy of Nova Scotia, and concerning the oil-shales, reports in Hants county a 15 foot seam that will yield at least 20 gallons per ton. The non-productive coal-measures of Hants county afford large quantities of shale, which have led to the expectation of finding coal, but the amount of oil that they yield has not yet (1868) been ascertained. The deposits of shale in Antigonish county may be of the same age.

The centre of the Antigonish basin is occupied by highly bituminous limestone overlying the oil-coal and oil-shale beds and from this fact it is thought that the whole group is upper Devonian or lower Carboniferous rocks, which are not known in this country to contain coal beds of any value. On this point Prof. Howe mentions that in a depth of about 180 feet in the neighborhood of Windsor only one small seam of coal, some 6 inches thick, was found in 1864, and that in a shaft sunk at Hantsport in similar rocks, to a considerable depth, no coal was obtained.

The bituminous beds appear to be divided into two groups, the lower of which appears to be about 70 to 80 feet in thickness, 20 feet of which may be regarded as good oil-shale, including 5 feet of curly cannel rich in oil. The upper band, which lies in immediate contact with the limestone, cannot be much short of 150 feet in vertical thickness of strata, containing a large percentage of oil. Of this