

the water supply as well as for police protection, street cleaning, etc. The gravitation scheme, even if adopted, cannot possibly be in operation for several years, and the water is required now. A new pipe has been laid, but not yet completed, to bring the lake water into the well at the pumping house. The present pipe, which for over 4000 feet is only three feet in diameter, cannot let as much water into the well as the present engines

leakage then would be from the pipe into the bay. The water would be more easily lifted by the present pumps, and they would work more satisfactorily and pump a larger quantity. The *quality* of the supply would then be of undoubted purity, and by running the centrifugal pump on the island at a higher speed the *quantity* could be indefinitely increased as the public demand became greater. After the gravitation scheme has been settled,

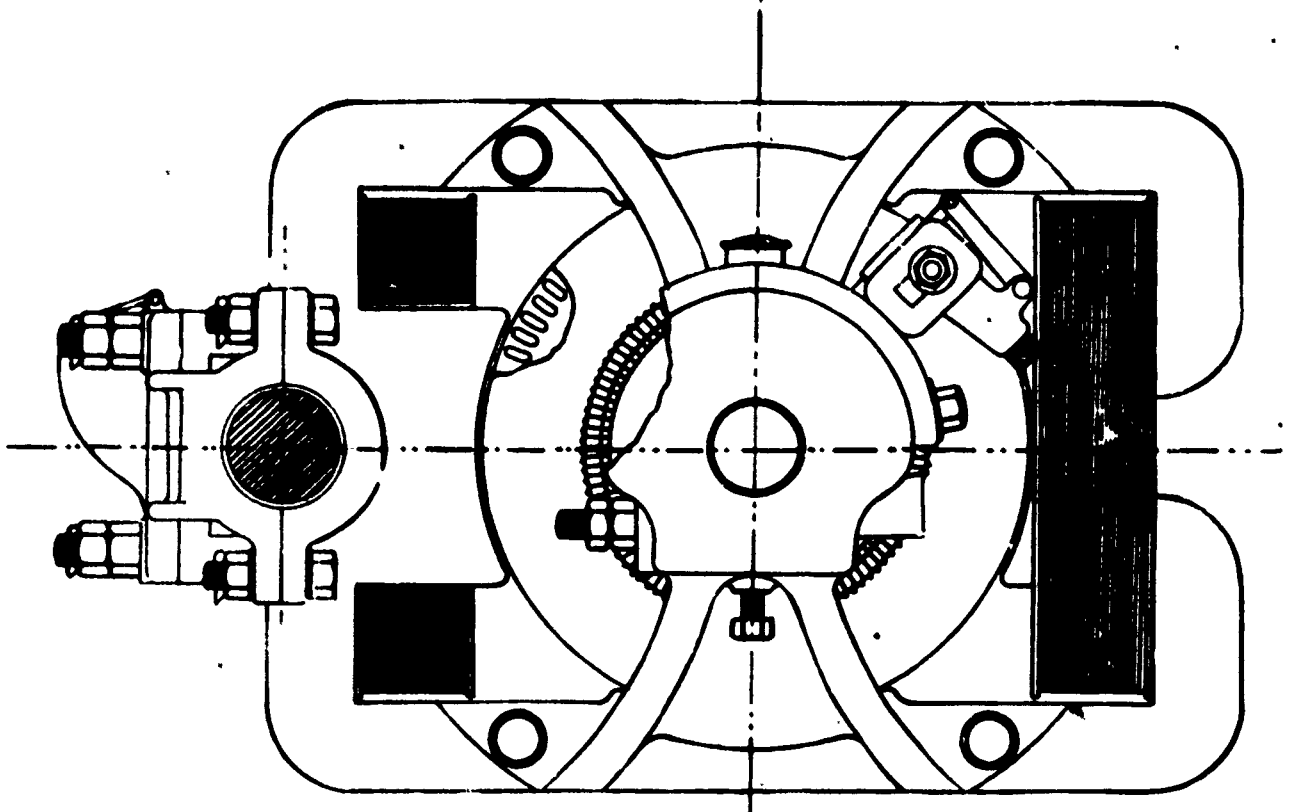


FIG. 5.—SECTIONAL VIEW OF WENSTROM SLOW SPEED STATIONARY MOTOR, GEARING DIRECT TO SHAFT.
[See description on pages 46 and 47.]

can pump out of it. The present pipe has often leaked so badly at some point that bay water has got in. To many it seems a mystery how a pipe under water, but full of water, can draw water into it out of the bay. The reason is that the present pipe supplying the well is so small that before enough water can be got to flow through it to supply the pumps running at their ordinary speed, the water level in the well is about 13 feet below the level of the water in the lake. Hence the water pressure inside the pipe is less than that outside of it, and any joint not abso-

as in all likelihood it will be, to be doubtful as to quality and too expensive as to quantity, then the question of additional pumping stations will be sure to be raised. From one point of view it is a wise and economical plan to have the machinery all at one point and under one management. From another point of view it is most unwise and positively dangerous.

What would Toronto do for water should a boiler explosion occur at the main pumping station as disastrous as that in Quebec last month? One boiler exploding might do in a moment damage enough to destroy the buildings and to disable the machinery to such an extent that no pumping could be done for two or three weeks. Where would we get water? In some towns water is sold on the streets as milk is here. Imagine bay water carted through the streets and sold at so much per pint! There should be at least two complete and inde-

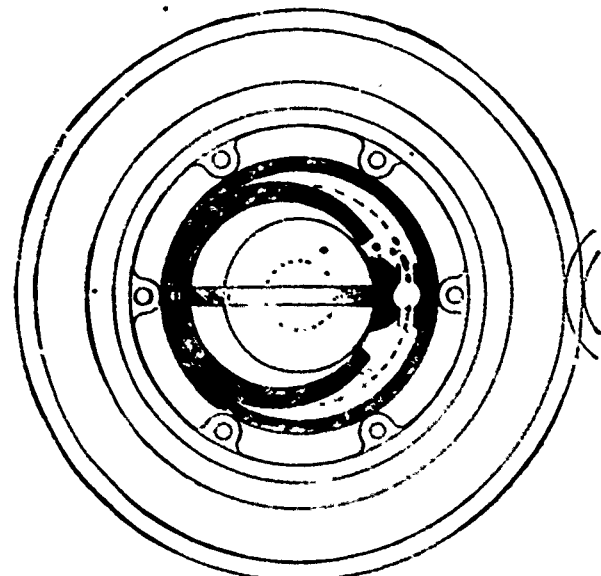


FIG. 6.—SECTION OF HYDRAULIC GEAR.
[See description on page 47.]

lutely tight will permit bay water to enter. The new pipe is considerably larger than the present one, and when it is in use the water level in the well will be much higher, and the danger of leakage will be greatly reduced. Even if the new pipe should be found not absolutely tight, a very simple remedy could be found. By means of a centrifugal pump or a spiral pump, the water could be raised over on the island, and the well at the pumping house kept at a level a little above that of the bay. Any

dependent pumping stations, each large enough to supply the city, and so far separate that an accident or fire at the one would not injure the other. Each station should then be kept running at half its pumping power, and should one become entirely disabled, the other would be in order to go on in full power at once. The gravitation scheme advocate says: "Get our plan and there will be no boilers to burst and no engines to break down!" That may be, but the bursting of pipes and the breaking of water channels have led to as serious results and as long stoppage of supply as ever occurred by the break-down of a pump or the explosion of a boiler.



FIG. 7.—HYDRAULIC GEAR WITH INTERCHANGEABLE RUN AND WOODEN COGS.
[See description on page 47.]