

necessary, to entirely close two or more of the nozzles of each unit.

All bearings, not only those of the main shaft, but also those of the transmission gear and regulation shafts, are fitted with removable babbitted bearing bushes. The shafts are provided with continuous ring oil lubrication, except that the governing shaft, the movement of which

any one of the four units without having to stop any of the other machines. There are two pumps, of which one always is kept in reserve. Both are of the Escher Wyss & Co. type, and each is driven by gear from a separate impulse wheel of about 30 horse-power. In the basement, immediately beneath the pumps, two oil reservoirs with a capacity of about 1,750 gallons have been provided. The two reservoirs are so connected one to the other that it is possible for any pump to take oil from either of the reservoirs. Each pump is also fitted with an air-chamber; the air for the latter is furnished by the sniffing cock, which is mounted on the air-chamber so that the oil may not be mixed with the air.

In order to be able to undertake repairs in the turbine pits also without having to shut down the whole plant, arrangements have been made so as to separate the various chambers by water-tight partitions. For emptying these chambers, each has been fitted with an injector with which it is possible to drain about 2,200 gallons of water per hour. The necessary pressure water for this purpose is tapped from the pressure pipe line, and in such a way that should one or the other pressure pipe line not be working, any of the chambers can still be emptied.

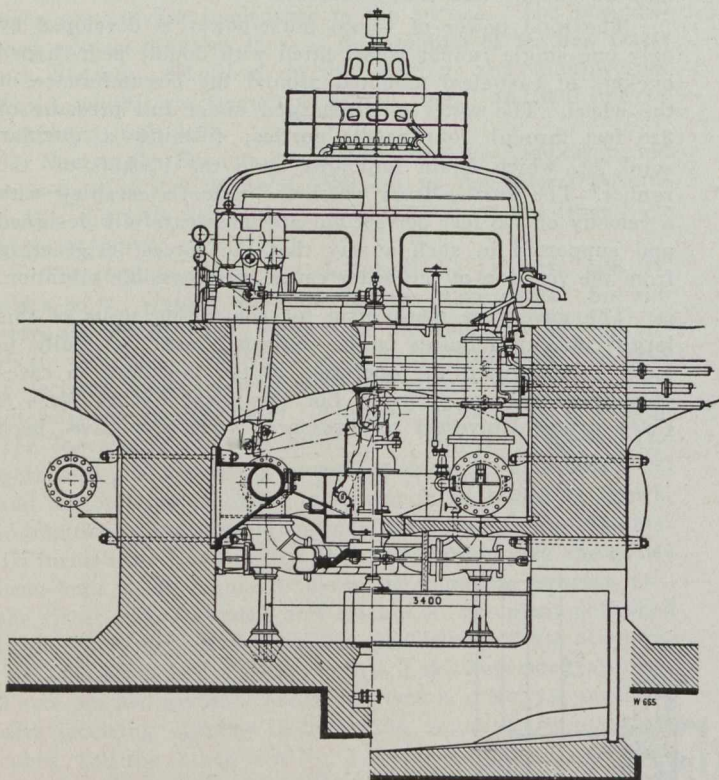


Fig. 2.

is limited, is lubricated by grease. The oil-pressure thrust bearing, which carries the total weight of the rotary parts (about 100,000 lbs.) is placed on the generator frame. On top of this the exciter stator is mounted.

An oil-pressure plant has been installed for the special purpose of balancing and lubricating the thrust bearing.

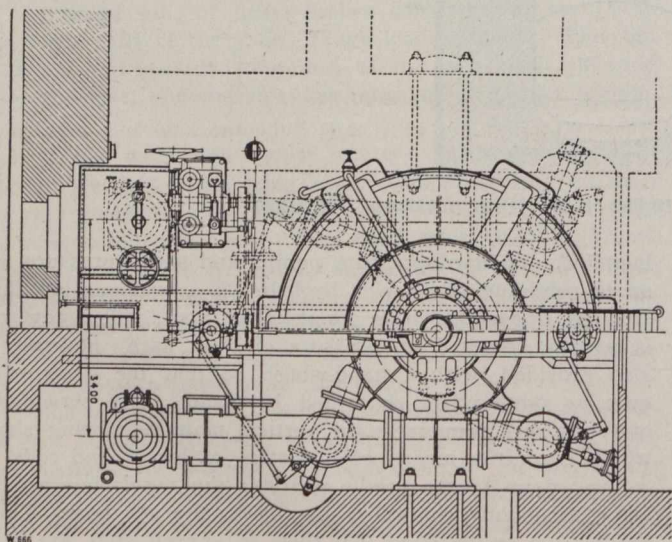


Fig. 3.

As the maintenance of continuous service depends chiefly upon the proper working of this bearing, the oil plant has been most carefully studied and designed accordingly. The oil-pressure piping is arranged in accordance with the so-called "ring system," whereby it is possible to disconnect

## A RARE OCCASION.

By James Hedley.

Detroit River has been, within the past few days, the scene of an event celebrated in an unusual way. This event is the completion of the Livingstone Channel, excavated to a depth of 23 feet and a width of 400 to 600 feet for thirteen miles into the head of Lake Erie, six miles of this distance being through solid limestone, known as the Limekiln Crossing of Detroit River. This work is one of the wonders of science and enterprise, undertaken by government at a cost of \$10,000,000, and all of it paid by "Uncle Sam" except a few hundred thousand contributed by the Canadian Government.

So greatly is this boon to navigation prized by the Lake Carriers' Association and by the marine and commercial men of the inland States and Canada, that its practical completion is signalized by a procession of steamers upon a great scale. Yachts, ferries, passenger boats, revenue cutters, motor boats and great, modern freighters, from 400 to 600 feet in length, passed through this enormous cut, first downward with the current, then back to Detroit, 22 miles, to the accompaniment of flags, bands, siren whistles and the shouts of thousands of spectators, assembled from the lake cities. One steamer, the "Britannia," carried 1,700 guests. The great steel steamer, "William Livingstone," appropriately named, as the channel is, after the president of the association—an indomitable pioneer in the modern improvement of the Great Lakes waterways, headed the procession.

Work was begun on this important achievement in the spring of 1908, when the contractors began the huge cofferdam, which enclosed what is known as the dry-work section, about a mile of the river bed near the upper end of the rock cut. Actual channel digging was begun in the fall of the same year, after powerful steam pumps had drained that part of the river bed enclosed by the dyke. Of the four contracts let, Nos. 1 and 2 were to Chicago parties. Section 3, about 18,250 feet in length, was completed by McNaughton & O. E. Dunbar, of Buffalo, and Section 4, in Lake Erie, 29,000 feet, by G. H. Breyman & Bro., of Toledo.