

ART. 149.—THE "TURGO" IMPULSE TURBINE.

This turbine, which has been developed during the past few years, consists essentially of an axial flow Girard runner, used in conjunction with one or more nozzles of the Pelton wheel type. It thus combines the ease of governing of the Pelton wheel with the higher speed of rotation of the Girard turbine. The diameter of the runner is appreciably less than that of a Pelton wheel using the same jet; the peripheral speed is somewhat higher; and the specific speed about twice as great. It has the further advantage

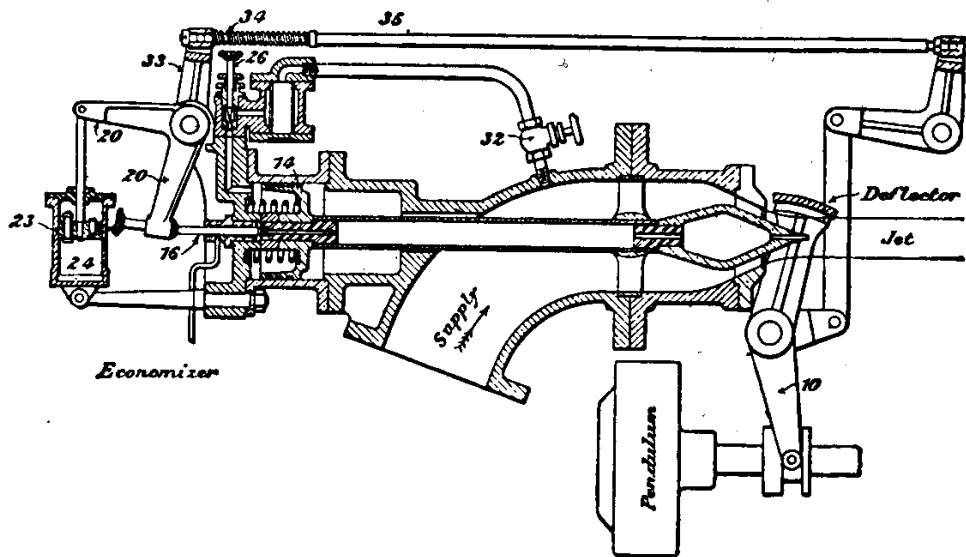


FIG. 209.—Governing mechanism of "Turgo" Turbine.

that the windage resistance of the runner is much less than that of a Pelton wheel. On the other hand, a thrust bearing becomes necessary to deal with the unbalanced end force on the shaft.

Figs. 207 and 208 show such a turbine designed for 150 H.P. at 700 r.p.m. under a head of 250 feet,¹ and Fig. 209 shows the arrangement of the governing mechanism.

Here pressure water is admitted through valve 32 behind the spring load and plunger 14. The spear rod is hollow, and if valve 16 is off its seat this water is vented through the spear rod and a small orifice in the tip of the spear. If valve 16 is on its seat, however, the pressure on the two sides of plunger 14 is equalised, and the spear is forced towards its seat under the action of its spring, closing the nozzle.

The deflector is connected by a linkage to the bell crank lever 20, one end of which presses against valve 16. If the load is thrown off, the deflector is forced into the jet; the valve is pushed hard up against the end of the spear rod; and the nozzle is slowly closed. As the area of the jet is reduced the

¹ "Proc. Inst. C. E.," vol. 213, 1921-1922, part I., p. 396.