turbines of this series much more than in the previously described series.

A direct comparison can be made between the Turbines V., VI., VIII., and IX.; their efficiency curves have very similar general forms. From the dimension-data given on Table III., it can be recognized that the values of the efficiencies decrease as the ratio of breadth to diameter decreases. This comparison shows clearly the influence of the greater resistance of the channels of smaller flow-surface. Still, the diagrams show here also that in this style of turbine efficiencies of 85 per cent. and more are attainable.

sure central station, in which the oil can be brought to a pressure of between 20 and 25 atmospheres. Alongside the diagrams of Table V. are placed those leading dimensions which are necessary for a criticism of the general effectiveness of the regulation, as, for example, the fly-wheel mass, the size and length of the supply-pipe, &c. It must further be pointed out that the Servo-motor of the automatic pressure-regulator of Turbine VII. is fitted with a governing gear, which is brought into action under the influence of a rise of pressure in the supply-pipe, caused by a sudden decrease of load; while in Turbine IX. a similar governing mechanism is

TABLE V.—Results of Tests of Governing of Turbines VII. and IX.

The governing of both turbines is by oil-pressure Servo-motor (relay motor).

The diagrams show the maximum change of speed with sudden charge or discharge. Observations to the left of each vertical line represent charge in kilowatts; those to the right, discharge in kilowatts.

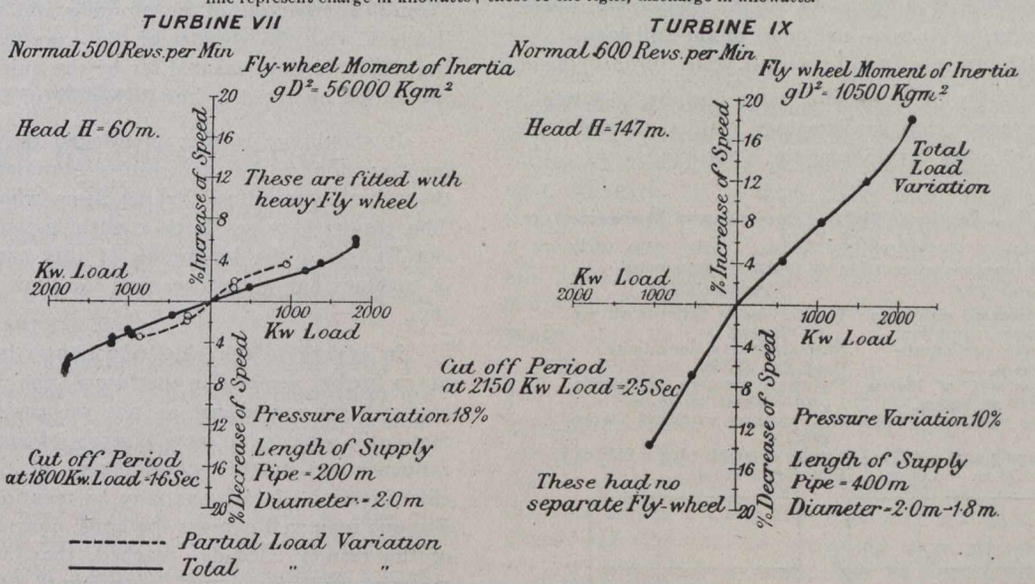
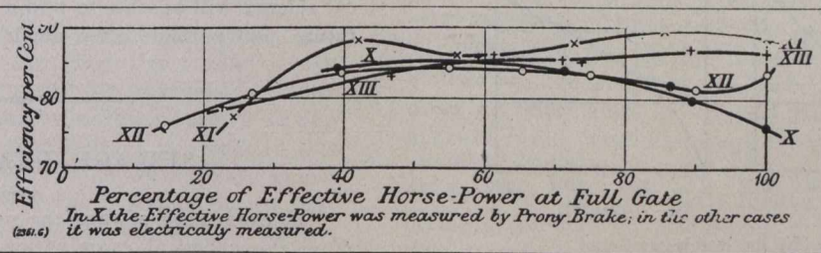


TABLE VI.—Efficiency of Pelton Wheels.



No.	Number of Nozzles.	Fall in Metres.	Revolutions per Minute.	Efficient Horse-Power at Full Gate.	a = per Cent. of Full Load. b = per Cent. Efficiency of the Turbine.											
					a	b	a	b	a	b	a	b	a	b	a	b
X.	2	90	355	326	100.0	76.0	89.3	79.7	86.5	81.6	71.4	83.6	39.6	84.2		
XI.	1	100	180	300	100.0	88.9	85.4	89.3	72.7	87.8	56.0	86.0	42.0	87.8	24.0	77.0
XII.	2	550	376	6050	100.0	83.5	89.9	81.0	75.8	82.8	55.1	83.8	27.1	80.5	14.2	75.9
XIII.	1	850	630	3710	100.0	86.2	89.4	86.9	59.2	85.2	71.2	85.1	46.7	82.9	22.3	78.5

The form of the efficiency-curve of Turbine VII. differs greatly from those of the other turbines of this series; it is however, similar to that of Turbine III. in the previous Series I. to IV. It is to be noted that the correctness of the curve is confirmed by the tests of the governing of the different units of the installation to which Turbine VII. belongs. The apparent difference is probably caused by the form of the blades; but as drawings of these blade-forms are not presented, it is not possible to form a definite judgment upon this point.

In Table V. (below) are given the results of the tests of the governing of Turbines VII. and IX. Here it is to be noted that, in the Servo-motors of the automatic-speed and pressure-regulator, oil is used as the Servo-motor fluid, and each of the two governing plants is worked from an oil-pressure central station, in which the oil can be brought to a pressure of between 20 and 25 atmospheres. Alongside the diagrams of Table V. are placed those leading dimensions which are necessary for a criticism of the general effectiveness of the regulation, as, for example, the fly-wheel mass, the size and length of the supply-pipe, &c. It must further be pointed out that the Servo-motor of the automatic pressure-regulator of Turbine VII. is fitted with a governing gear, which is brought into action under the influence of a rise of pressure in the supply-pipe, caused by a sudden decrease of load; while in Turbine IX. a similar governing mechanism is brought into action by a part of the Servo-motor moved by the automatic speed-regulator, and is again put out of action under the influence of a cataract. The very much less speed variation in Turbine VII. is apparent. The fly-wheel moment of inertia is, however, materially greater than that of Turbine IX. This circumstance, in conjunction with the quicker action of the Servo-motor on Turbine VII., which is indicated by its cut-off period, is the cause of the smaller variation in Turbine VII. In both cases the re-establishment of steady normal condition is reached in the time necessary for safe working under maximum-load variation following maximum-speed variation.

—Tests of High-Pressure Turbines.

Pelton Wheels.—On Table VI. (above) are set out in tabular and graphic form the results of tests of four high-pressure