

The accumulator is of Professor Rateau's patent water type in two compartments. It is surmounted by a steam-receiver, which has for its object the separation of any oil and water that may be present in the steam, and the obvia-

inlet is never more than 12 lbs absolute, and the vacuum at present obtained at the outlet of the turbine is 27.9" with the barometer at 30".

A series of observations of pressure, vacuum, and con-

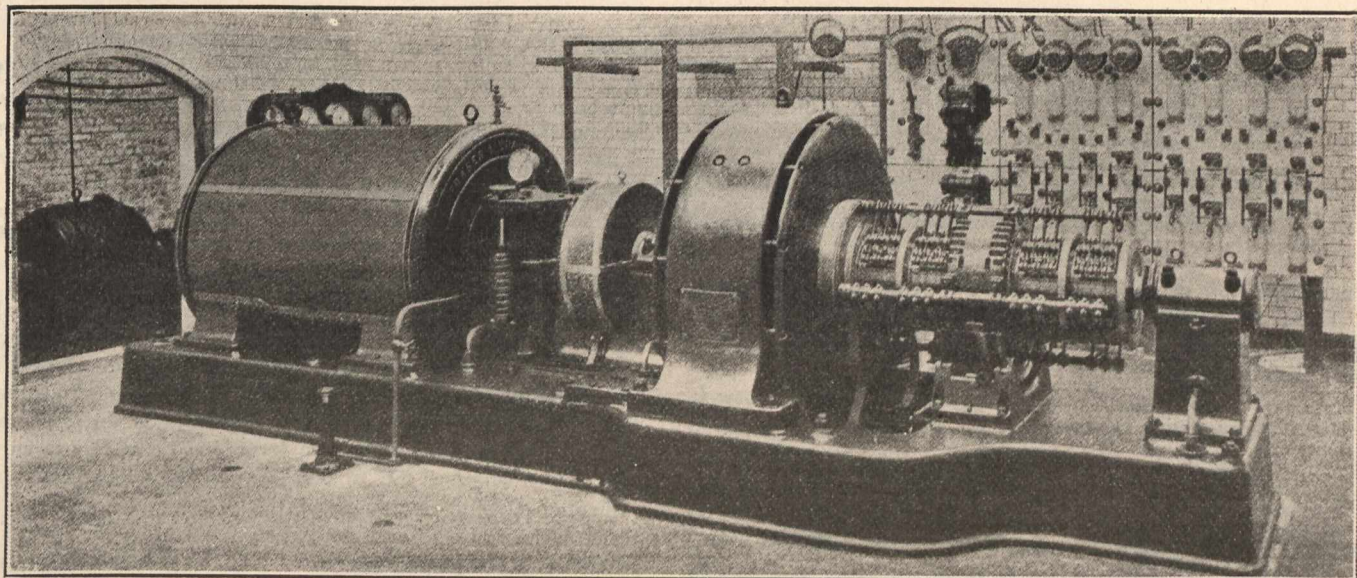


Fig. 5.

tion of the sudden shock which would otherwise be caused by the sudden admission of steam to the water. The steam passes from the receiver to two ranges of branch pipes, and then enters special circulating tubes passing along the whole length of the vessel. The accumulator proper is 11'-6" in diameter by 34'-0" in length, and is firmly fixed on a solid concrete foundation. The accumulator was designed to deal with main-engine stops of 45 seconds when two turbines, working at full load, were being supplied. It has been proved by the tests that a main-engine stop of six minutes can be successfully dealt with when one turbine only is running at full load. Diagrams showing the variation of pressure in the accumulator are shown in Figs. 7, 8 and 9. On the receiver are provided two automatic

sumptions are given in the annexed table. A curve showing the thermo-dynamic efficiency at varying loads, and also consumptions, is given in Fig. 11.

The turbo-generator is coupled to a special Siemens direct-current 230-volt generator by means of a Rateau flexible coupling, and special attention is drawn to the very long commutator. This was necessitated by the fact that carbon brushes were specified, and it is believed that this is the first machine of this size and output designed for such a low voltage, collecting over 2,000 amperes at 1,500 revolutions per minute, in which carbon brushes alone have been used. Ninety-six brushes in all are fitted, and "Morganite" has now been adopted as proving more satisfactory in practice than ordinary carbon.

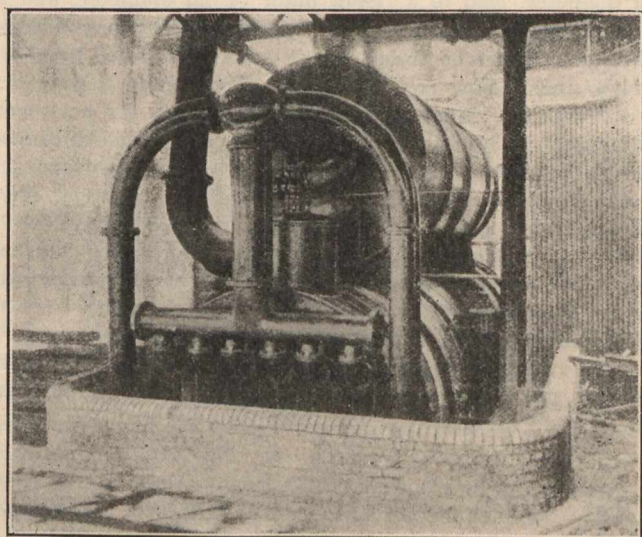


Fig. 6.

relief-valves, which have for their object the prevention of any back pressure accumulating against the primary engines when the turbines, which are driven by the low-pressure steam, are working at less than full load. A 21" pipe from the steam-dome of the accumulator leads the steam to the stop-valve of the low-pressure turbines.

This turbine is of 700 brake Horse Power, and is of Professor Rateau's patent type, having eleven wheels, approximately 40" in diameter. The rotating part of this turbine, together with one of the fixed diaphragms and with the guide-blades, is shown in Fig. 10. The turbine develops full power at a speed of 1,500 revolutions per minute. When working on an overload of 10 per cent., the pressure at the

Tests on Steel Company of Scotland's Low Pressure Turbine, January, 1906.

Refer. Number.	Amperes	Kilowatts	Vacuum at Turbine Exhaust	Absolute Pressure		Steam Consumptions	
				On entering Turbine	Exhaust	Total per hour	Per Kilowatt
1 ...	300	69	28.7	2.9	0.5830	4,590	66.4
2 ...	700	161	28.4	4.49	0.7394	7,170	44.5
3 ...	865	196.5	28.4	5.35	0.7394	8,290	42.1
4 ...	925	212.5	28.4	5.65	0.7394	8,750	41.1
5 ...	1,050	241	28.4	6.11	0.7394	9,480	39.3
6 ...	1,160	267	28.4	6.54	0.7394	9,920	37.1
7 ...	1,120	278	28.6	6.68	0.6399	10,250	36.8
8 ...	1,300	299	28.6	7.25	0.6399	11,130	37.2
9 ...	1,400	322	28.6	7.82	0.6399	12,080	37.5
10 ...	1,500	345	28.5	8.25	0.6825	12,790	37
11 ...	1,600	368	28.4	8.25	0.7394	12,800	34.8
12 ...	1,700	391	28.3	8.82	0.7821	13,600	34.8
13 ...	1,800	414	28.2	9.53	0.8247	14,500	35.1
14 ...	1,800	414	28.0	10.1	0.9243	15,400	37.2
15 ...	1,900	437	27.9	10.7	0.9811	16,300	37.3
16 ...	1,690	389	27.9	9.53	0.9811	14,500	37.4
17 ...	1,825	420	27.9	9.95	0.9811	15,300	36.4
18 ...	1,950	450	27.9	11.4	0.9811	16,480	36.6

The commutator is in two lengths, and the bars have special ventilation ducts through them at the centre. Fan-blades are supplied on each bar, and flexible connections on the tips of the vanes to conduct the current from one part of the commutator to the other. A very powerful draught is induced by this fan through the commutator bars, and after 120 hours' full-load run the temperature rise of the commutator was only 50 deg. Fahr.

The test applied to this set was extremely severe, as it had to run for two consecutive weeks, day and night, without a stop, except for the Sunday, at absolutely full