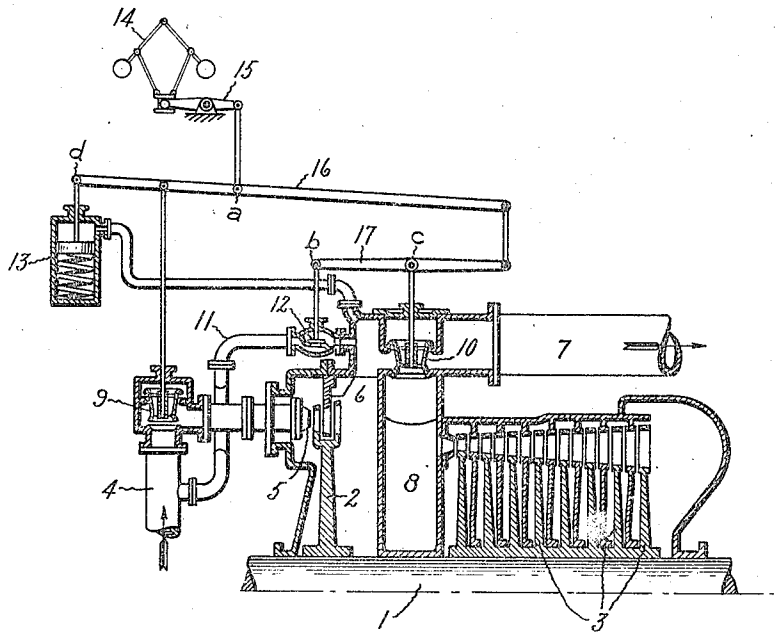
W. KIESER.

TAPPED TURBINE.

APPLICATION FILED OCT. 22, 1914.

1.153,316. Patented Sept. 14, 1915.



Witnesses:

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Inventor

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Att'y.

UNITED STATES PATENT OFFICE.

WALTER KIESER, OF CHARLOTTENBURG, GERMANY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TAPPED TURBINE.

1,153,316. Specification of Letters Patent. Patented Sept. 14, 1915.

Application filed October 22, 1914. Serial No. 868.089.

To all whom it may concern:

Be it known that I, WALTER KIESER, a citizen of the Republic of Switzerland, residing at Charlottenburg, Germany, have invented certain new and useful Improvements in Tapped Turbines, of which the following is a specification.

This invention relates to steam turbines which are tapped at a point of intermediate pressure to supply steam to industrial consumption devices, such as cooking or heating systems.

The object of the invention is to keep the steam pressure constant in the consumption system irrespective of variation in the demand of said system or in the load on the turbine.

The invention consists in a certain combination of controlling valves and regulators arranged and operating in a certain manner, as hereinafter set forth and particularly pointed out in the claims.

The accompanying drawing illustrates diagrammatically one embodiment of my invention.

The turbine shown is a horizontal one, having a shaft 1 carrying one or more high pressure bucket wheels 2 and low pressure bucket wheels 3. High pressure steam is supplied through a main 4 to nozzles 5 directing the fluid upon the buckets of the wheel 2, from which it exhausts at a lower pressure into the chamber 6. A pipe 7 leads from this chamber to the industrial consumption system. Any excess of low pressure steam passes from the chamber 6 to a chamber 8 from which it is supplied to the low pressure wheels 3. A valve 9 controls the admission of high pressure steam to the wheel 2, and an overflow valve 10 controls the admission of low pressure steam from the chamber 6 to the chamber 8. A bypass 11 controlled by a valve 12 conducts high pressure steam from the main 4 direct to the chamber 6. A pressure regulator 13 also is connected with the chamber 6, while a speed governor 14 is driven by the turbine. These two controlling devices are connected with the valves by a system of levers preferably as follows: A short lever 15 pivoted at one end to the speed governor is connected at its other end to a floating lever 16, one end of which is pivoted to the rod of the pressure regulator. Between this end and the point of attachment of the lever 15, the stem of the supply valve 9 is attached. The other end of the floating lever is pivotally connected to one end of an auxiliary floating lever 17 whose opposite end is pivoted to the stem of the valve 12. Midway of the lever 17 the stem of the overflow valve 10 is attached.

The operation is as follows: If the industrial consumption system demands a larger quantity of steam, the pressure in the chamber 6 becomes reduced and the pressure regulator 13 moves the floating lever 16 which fulcrums at the point *a* and lifts the valve 9 to admit more high pressure steam. At the same time, the right hand end of the lever 17 is depressed, fulcruming at *b*, and closes the overflow valve 10 to reduce the escape of low pressure steam to the wheel 3. If this movement of the levers continues after the valve 10 closes, the lever 17 will fulcrum at *c* and open the bypass valve 12 to admit high pressure steam to the consumption devices. The valves 9 and 10 thus move in opposite directions when the pressure regulator operates them. But if the speed of the turbine changes owing to change in its load or in the demand for low pressure steam by the consumption devices, the speed governor will oscillate the floating lever 16 on the point *d* as a fulcrum, and the auxiliary lever 17 on the point *b*, thereby lifting or lowering both of the valves 9 and 10 to regulate the flow of both high and low pressure steam to the bucket wheels. If the load on the turbine should decrease to quite an extent then the valve 10 will be closed by the speed governor, and the auxiliary lever 17, tilting on the fulcrum *c*, will open the bypass valve 12 and admit enough high pressure steam to the chamber 6 to keep up the proper pressure in the consumption system. It thus appears that for all conditions of pressure and load, the pressure in the consumption system will be maintained at or near a given value.

While I have described the operation of the speed governor and the pressure responsive device independently, it will, of course, be understood that in actual operation both will be acting at the same time, each in a way modifying the action of the other on the respective controlling valves.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together

with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. The combination with a turbine having a consumption system connected to a point of intermediate pressure, of a high pressure admission valve, an overflow valve between the high pressure and low pressure sides of the machine, a bypass valve admitting high pressure steam directly to the consumption system, a pressure regulator connected with said system, and means whereby the pressure regulator can actuate the high pressure admission valve and the overflow valve in opposite directions, and will open the bypass valve only after the overflow valve has been closed.

2. The combination with a turbine having a consumption system connected to a point of intermediate pressure, of a high pressure admission valve, an overflow valve between the high pressure and low pressure sides of the machine, a bypass valve admitting high pressure steam directly to the consumption system, a pressure regulator connected with said system, means whereby the pressure regulator can actuate the high pressure admission valve and the overflow valve in opposite directions, and will open the bypass valve only after the overflow valve has been closed, a speed governor, and means whereby it can actuate the admission and overflow valves in the same direction and open and close the bypass valve.

3. The combination with a steam turbine having a high pressure bucket wheel 2, low pressure bucket wheels 3, and a chamber 6 of intermediate pressure, of a consumption pipe 7 connected with said chamber, an admission valve 9, an overflow valve 10, a bypass valve 12 admitting high pressure steam to the chamber 6, a pressure regulator 13 connected to the chamber 6, a speed governor 14, a floating lever 16 connected to the pressure regualtor, the speed governor and the valve 9, and an auxiliary floating lever 17, connected to the valves 10 and 12 and to the lever 16.

In witness whereof, I have hereunto set my hand this 26th day of September, 1914.

WALTER KIESER.

Witnesses:
ERNST KELLER,
WILLY NEUMANN.