O. JUNGGREN.

VALVE OPERATING MECHANISM.

APPLICATION FILED JULY 16, 1914.

Patented Mar. 30, 1915.

1,133,288.

Fig. 1.

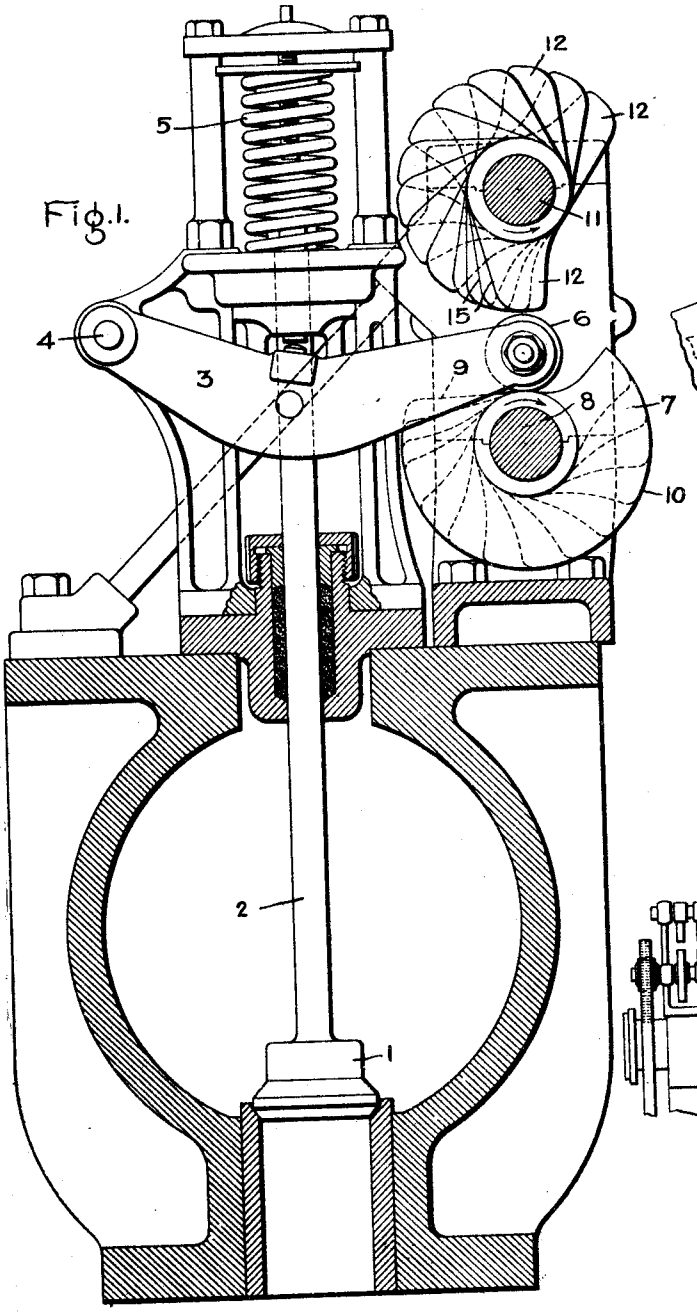


Fig. 2.

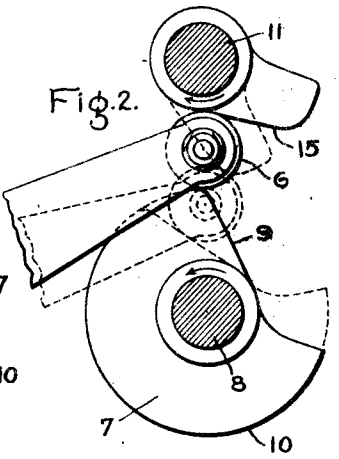
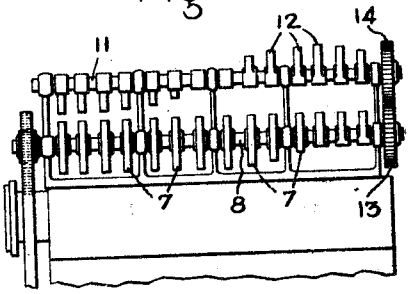


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

OSCAR JUNGGREN, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

VALVE-OPERATING MECHANISM.

1,133,288. Specification of Letters Patent. Patented Mar. 30, 1915.

Application filed July 16, 1914. Serial No. 851,302.

To all whom it may concern:

Be it known that I, OSCAR JUNGGREN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Valve-Operating Mechanism, of which the following is a specification.

This invention relates to elastic fluid turbines, and its object is to provide an improved valve operating mechanism which will meet some of the defects in operation that have developed in connection with existing installations.

When a steam turbine is operated continuously for a long time, as is frequently the case, the nozzle valves, and the emergency stop valve and their stems are liable to become coated with mud and other impurities which tend to prevent prompt and complete seating of said valves in case of necessity. This is a dangerous condition of things, because with a condensing turbine it requires only a small amount of steam to cause the machine to run away when the load is removed, as for instance by the opening of the circuit breakers in the main leads. At such times it is absolutely essential that the valves shall close quickly and tightly, so that not a pound of steam can reach the turbine.

My invention aims to insure this result even when the turbine has been running for a long time without any occasion to close the emergency valve or even to shut all of the nozzle valves. The means which I employ is not subjected to the action of the steam so that it is free from the deteriorating effects thereof. Moreover, it is of such a nature that it is positive in its action and powerful enough to overcome any amount of sediment or scale which may collect on the valve stem to such an extent that the ordinary closing spring can not start the valve.

My invention comprises, in the case of the nozzle valves of the turbine, a countershaft located above the cam shaft and carrying fingers or wipers which come down upon the lifting levers and force them to follow the cams as the latter recede to closing position.

In the accompanying drawings, Figure 1 is a sectional elevation of turbine valve mechanism embodying my invention. Fig. 2 is a detail view showing the operation of a single cam and wiper, and Fig. 3 is a front elevation, on a smaller scale, of the cam shaft and countershaft.

The nozzle valve 1, attached to a stem 2, is lifted by a lever 3, fulcrumed at 4, and is closed by a spring 5, said stem passing through a stuffing box. The free end of the lever has an anti-friction roller 6 resting upon a cam 7 mounted on a cam shaft 8 and having an active face 9 to lift the lever and open the valve, and a holding face 10 concentric with the cam shaft to maintain the valve in its open position during further angular movement of the shaft. A plurality of cams is mounted on said shaft, one for each nozzle valve; their active faces being angularly displaced around the shaft, which is oscillated by mechanism controlled by the governor to open and close the valves in accordance with variations in load and steam pressure. All this is the customary construction of turbine valve mechanism.

My invention comprises a countershaft 11 parallel with and preferably above the cam shaft, and carrying a plurality of fingers or wipers 12, each in line with its respective lever 3. The several wipers are angularly displaced around the countershaft, corresponding to the displacement of the active faces of the cams. The countershaft is rotated synchronously with the cam shaft by any suitable mechanism, such for example as the two spur gears 13, 14 of the same size keyed respectively to the cam shaft and the countershaft. Each wiper is so related to its cam that when the roller 6 arrives at the point where it leaves the holding face of the cam in readiness to pass down the active face thereof to the position in which the valve will be closed, the active face 15 of the wiper begins to act upon the roller to positively force it down (Fig. 2). By the time the roller has been pushed down to its lowest position, the end of the wiper can pass over and away from it, as shown in Fig. 1, so as to offer no obstruction to the operation of succeeding wipers. This device insures a positive closure of the valves irrespective of the springs, and in a manner which obviates all difficulties due to mud or other impurities collecting on the valve stems.

In accordance with the provisions of the patent statutes, I have described the prin-

ciple 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 the valve mechanism of an elastic fluid turbine comprising lifting levers and cams, of means independent of said cams for positively closing the valves when the lifting levers are released by the cams.

2. The combination with the valves of an elastic fluid turbine, of levers for lifting them, cams for actuating said levers, and independent mechanical devices operating in synchronism with said cams for depressing said levers when released by said cams.

3. The combination with the valves of an elastic fluid turbine, of a lever for lifting each valve, a cam for lifting each lever, and a wiper separate from said cam for depressing said lever.

4. The combination with the valves of an elastic fluid turbine, of levers for lifting them, a shaft carrying cams adapted to actuate said levers, and a countershaft carrying wipers for depressing said levers.

5. The combination with the valves of an elastic fluid turbine, of levers for lifting them, a shaft provided with a plurality of cams for actuating said levers, a countershaft parallel with the cam shaft and provided with a plurality of wipers each acting to depress its respective lever when released by its cam, and gearing connecting said shafts to cause them to rotate in synchronism.

In witness whereof, I have hereunto set my hand this 15th day of July, 1914.

OSCAR JUNGGREN

Witnesses:
E. D. WILLIAMS,
HELEN ORFORD.