R. A. McKEE.

TURBINE PACKING.

APPLICATION FILED MAY 3, 1909.

965,399. Patented July 26, 1910.

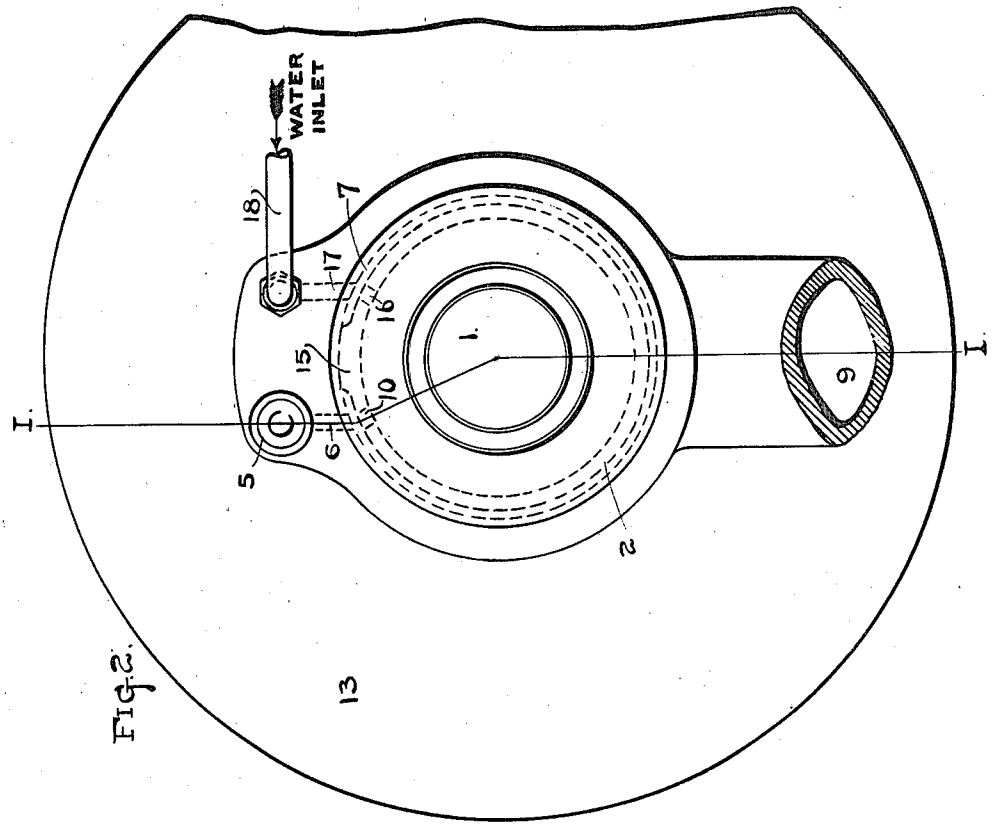

FIG. 2.

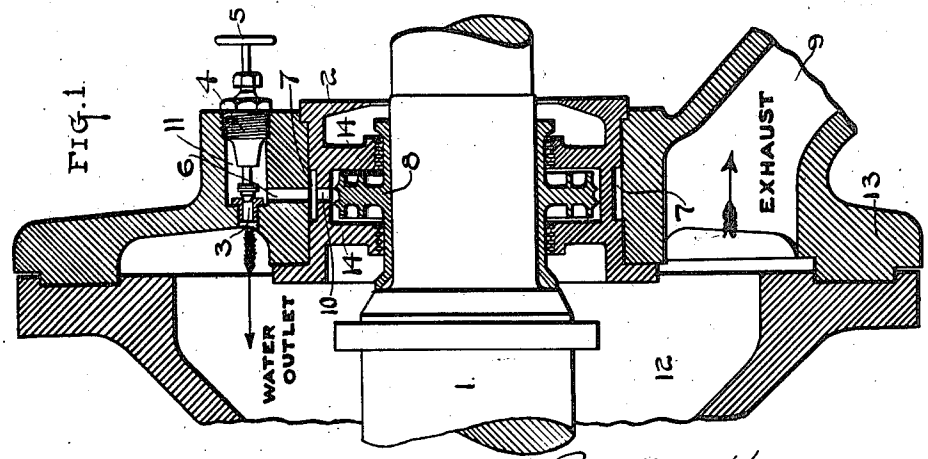

FIG. 1.

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TURBINE-PACKING.

965,399. Specification of Letters Patent. Patented July 26, 1910.

Application filed May 3, 1909. Serial No. 493,631.

To all whom it may concern:

Be it known that I, ROBERT A. McKEE, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Turbine-Packing, of which the following is a specification.

This invention relates to an improved method of cooling the bearing glands of fluid pressure turbines.

The object of the invention is to provide a simple means of controlling the amount of cooling water circulated through the glands for all conditions of operation of the turbine. It has been found that controlling means for cooling water which work well while the engine is running condensing, do not necessarily work well while the engine is running non-condensing, and it is the aim of this invention to obviate this difficulty. During the time a turbine is operating condensing, there is hardly any need of furnishing a special control for the flow of the gland cooling water, since the difference in pressures between the interior and exterior of the turbine will cause enough leakage into the exhaust chamber to prevent overheating of the glands. It is therefore proposed to furnish a special circulation control to be used only while the turbine is exhausting at or above atmosphere, said control to be inoperative at other times.

A clear conception of the invention can be obtained by referring to the accompanying drawings in which like reference characters denote the same part in different views.

Figure 1 is a fragmental section of the bearing at the exhaust end of a steam turbine, taken along the line I, I, Fig. 2. Fig. 2 is an elevation of the device shown in Fig. 1.

The turbine shaft 1 to which the gland runner 8 is attached, passes through the projecting ribs 14 of the gland casing 2. These ribs 14 form an annular space around the shaft 1 in which the runner 8 is located. The gland casing 2 is supported by the turbine head 13 through whose lower part passes the exhaust passage 9 from the turbine chamber 12.

The upper part of the head 13 is provided with a boss through which the water inlet and outlet passages are formed. The inlet pipe 18, see Fig. 2, enters the head 13 and connects with the vertical passage 17. This passage 17 extends down to an incompletely annular space 7, which in turn extends around the gland casing 2 and is cut off by a wall 15 at the top. At a point just below the opening 17, an opening 16 leads from the space 7 into the annular runner space. Another opening 10 forms a similar connection on the opposite side of the wall 15.

Above the opening 10 there is another vertical passage 6 leading to a chamber 11 in the head 13. A valve 4 controlled from the outside of the turbine by a handle 5, can be adjusted to regulate the size of the opening through the bushing 3, which opening forms a connection between the chamber 11 and the turbine chamber 12.

During the operation of the turbine as a condensing engine, the valve 4 is closed so that no direct connection is established between the chamber 11 and the turbine chamber 12. The cooling water is then admitted through the pipe 18 and passes into the annular space 7 and the gland casing 2 through opening 17, 16. Since the pressure within the turbine is less than atmospheric, enough water leaks through the joint between the ribs 14 and runner sleeve to prevent overheating of the water in the gland.

If the turbine is to be run non-condensing, the valve 4 is opened. The cooling water then passes around the space 7 and also around the runner 8 in the direction of rotation. Upon reaching the openings 10, 6, at the other side of the wall 15, the heated water passes upward into the chamber 11 and from thence through the bushing 3 into the main turbine chamber 12, from whence it is carried off in the exhaust.

It should be understood that it is not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. In a turbine, the combination of a shaft, a chamber around the shaft, an inlet to said chamber, and a discharge connecting said chamber to the exhaust of the turbine, said discharge having a controlling means therein.

2. In a turbine, the combination of a shaft, a chamber around the shaft, an inlet to said chamber, an outlet from said chamber

directly connecting with the turbine exhaust, and a valve controlling said outlet.

3. In a turbine, the combination of a shaft, a chamber around the shaft, an inlet to and an outlet from said chamber, and a valve controlling said outlet, said valve being formed in the wall of said chamber.

4. In a turbine, the combination of a shaft extending through the turbine wall, a chamber formed in the wall to extend around the shaft, an inlet to said chamber, an outlet therefrom formed in said wall and leading to the turbine exhaust, and a valve controlling said outlet and manually operable from without.

In testimony whereof, I affix my signature in the presence of two witnesses.

ROBERT A. McKEE.

Witnesses:
G. F. De Wein,
H. C. Case.