

No. 876,218.

PATENTED JAN. 7, 1908.

H. M. MURPHY.
REVERSIBLE TURBINE.
APPLICATION FILED JAN. 16, 1907.

FIG. 1.

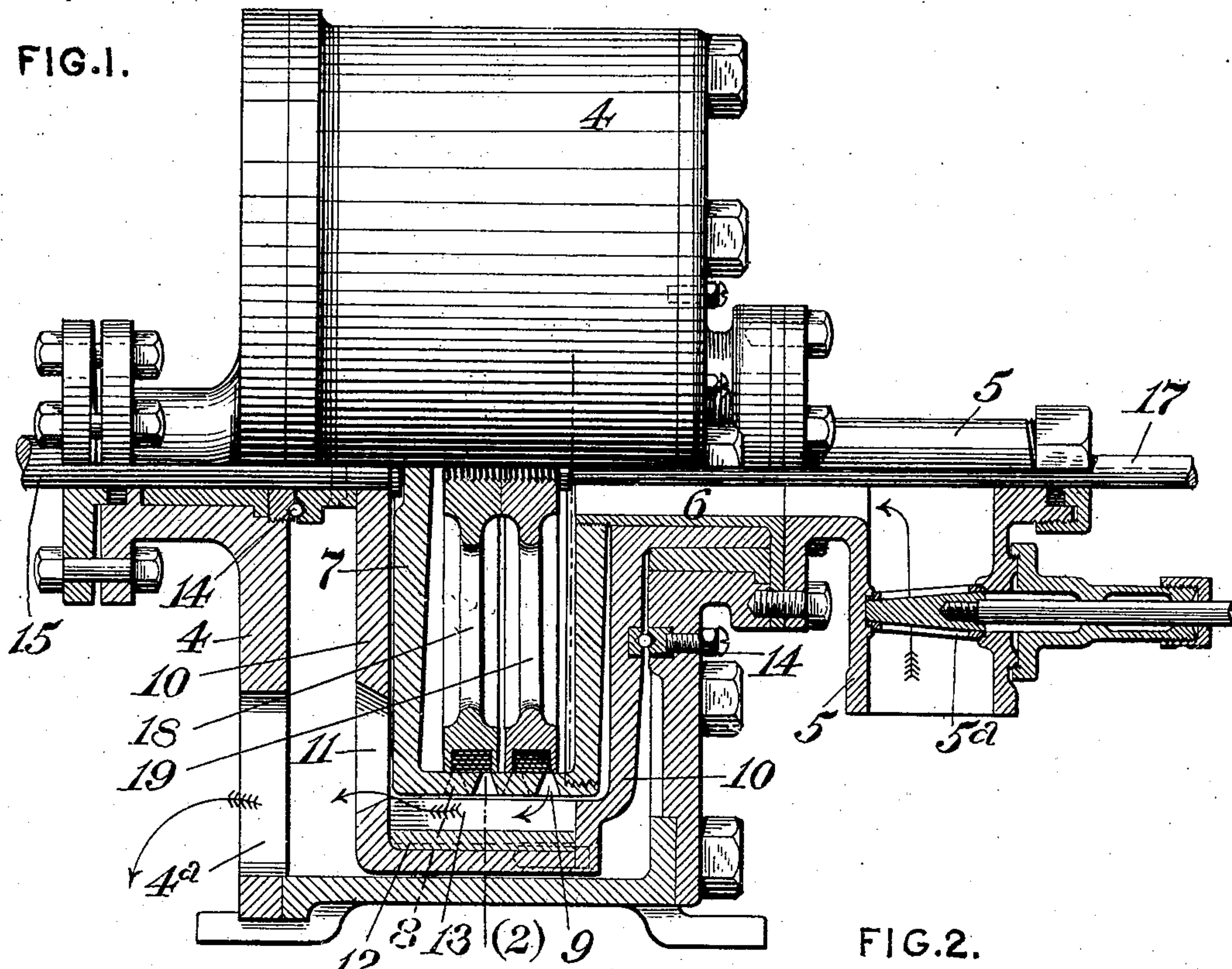


FIG. 2.

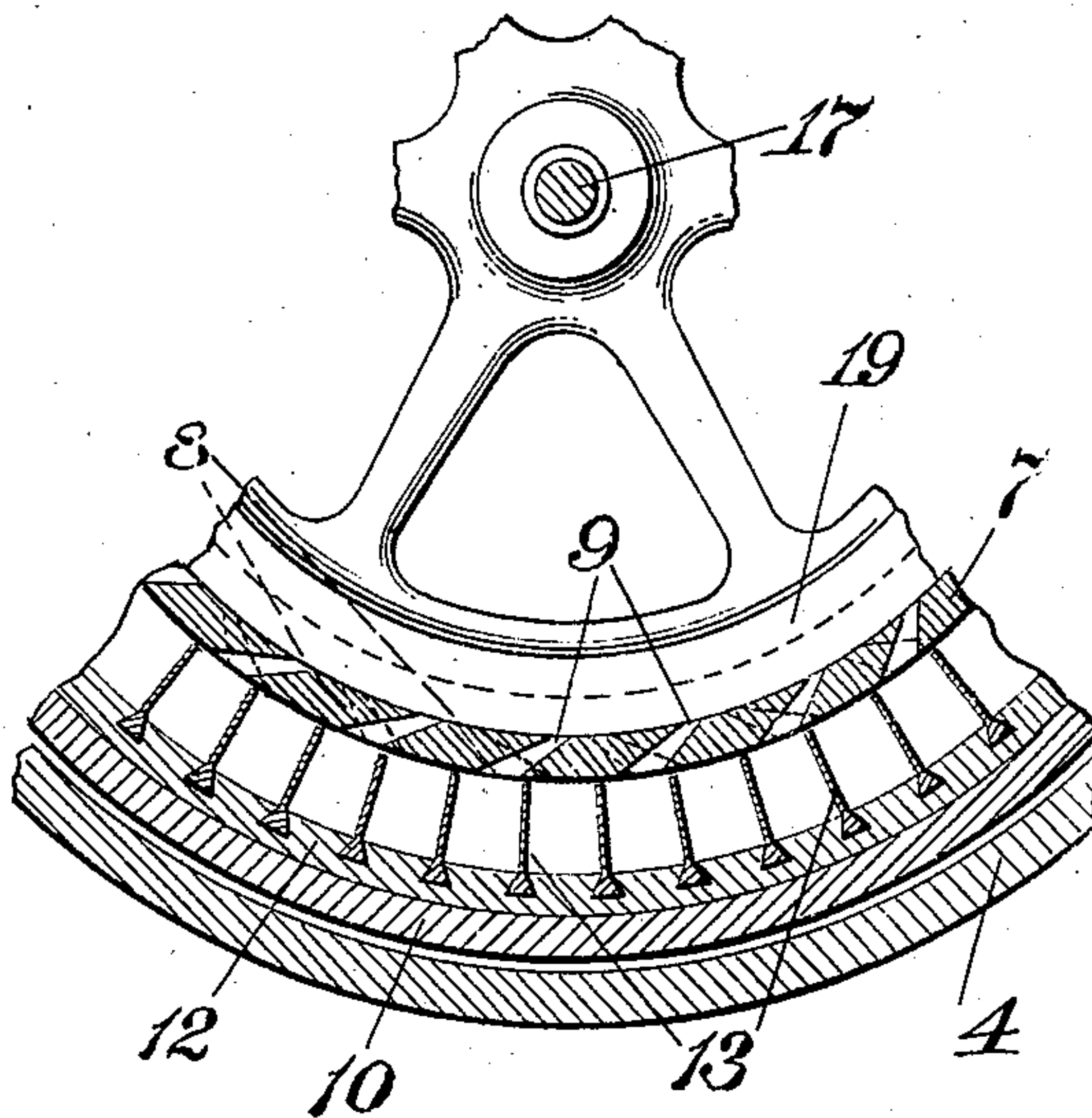
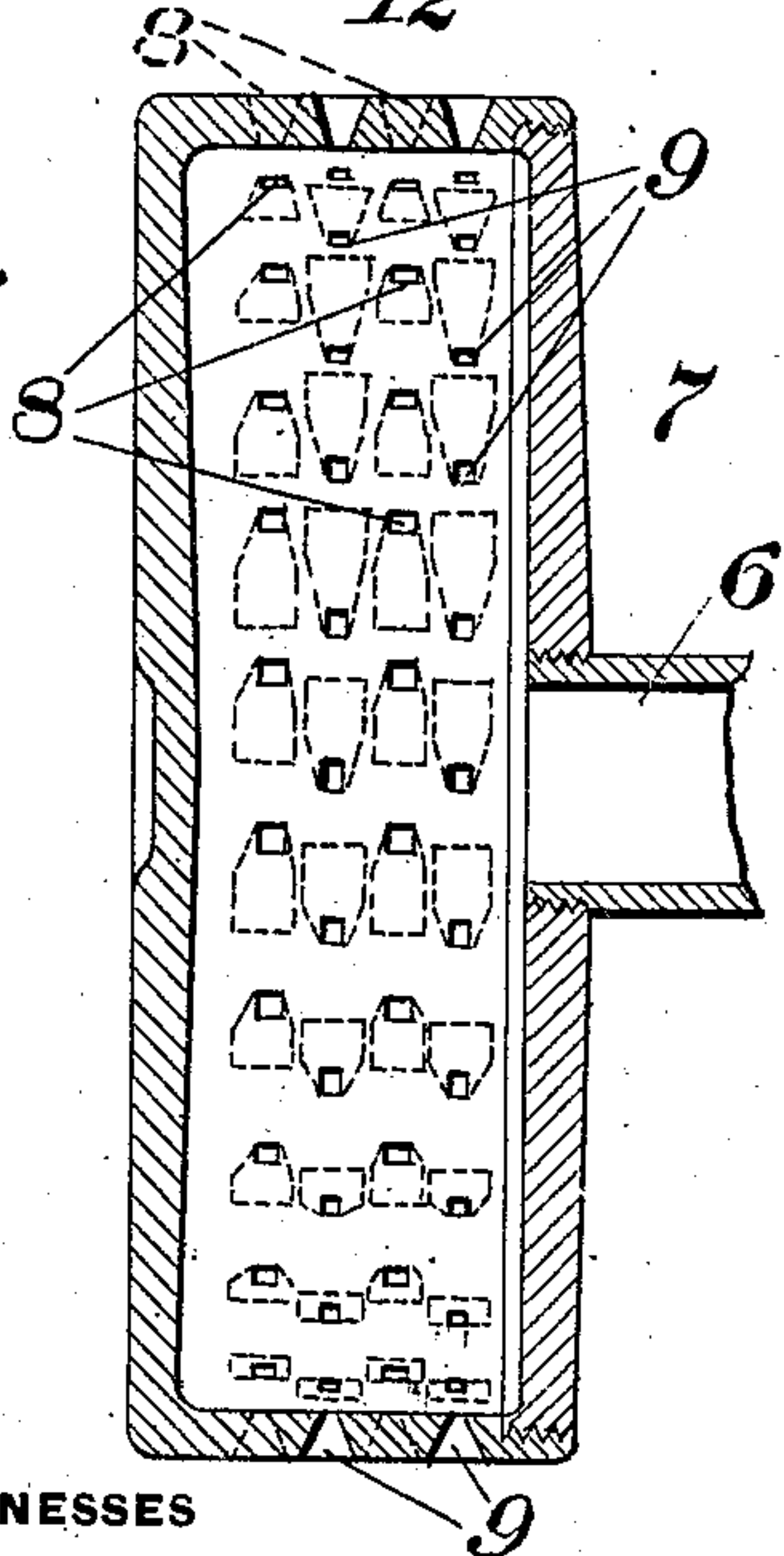


FIG. 3.



WITNESSES

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REVERSIBLE TURBINE.

No. 876,218.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed January 16, 1907. Serial No. 352,575.

To all whom it may concern:

Be it known that I, HALLET M. MURPHY, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented certain new and useful Improvements in Reversible Turbines, of which the following is a specification.

My invention relates to turbines especially adapted to use elastic fluids, such as steam, and particularly means for readily reversing the turbine and controlling it. The principal objects of the invention are, to provide a turbine with a revolving driving member which may be readily reversed in direction of movement by valves; to provide a convenient fixed escape port for the steam, and convenient slide valves for controlling said ports; to provide an improved form of driving vanes for the turbine, and to improve the design of the driving and escape ports. These objects and other advantages which will hereinafter appear I attain by means of the construction illustrated in a simple preferred form in the accompanying drawing, wherein—

Figure 1 is a partial side elevation and partial central longitudinal section through the turbine and the casing therefor;

Figure 2 is a partial elevation of the controlling valve, and a section taken along the line (2) in Figure 1 through the casing and the driving member;

Figure 3 is a longitudinal central section through the fixed escape port box for the steam, showing the form of the escape ports.

In the form shown in the accompanying drawing, simplified to illustrate the principles of the turbine only, I have provided a casing 4 which has attached to it a steam box 5 controlled preferably by a slide valve 5^a and admitting steam through the box and through a hollow tube 6 which forms the shank of a fixed steam box 7. This box has two sets of which one set 8 point in one direction, slanting outwardly towards the periphery, and another set 9 of similar form but pointing in the opposite direction towards the periphery, as will appear more clearly from Figure 2. It will be understood of course that the steam box 7 and the hollow shaft 6 are stationary, being bolted to the casing 4 as shown in Figure 1. A partially closed cylindrical casing 10 surrounds and fits neatly the contour of the steam port box

7, and is formed with two hubs and mounted to revolve in the casing 4 between it and the steam box 7. It is provided with ball-bearings 14 and at one side its hub is attached fixedly to the shaft 15 which is used to transmit the power from the turbine.

As will appear more clearly from Figure 2 the revoluble driving member 10, containing the vanes is formed after the fashion of the pelton wheel with vanes 13 which are mounted radially in the ring 12 carried in the bottom of the member 10. At convenient points on the side of the casing 10 are outlet ports 11 and the exhaust is sidewise through these ports and through the ports 4^a in casing 4, Figure 1. The vanes 13 stand at the same angle to both sets of escape ports 8 and 9 and it will be seen that when the escape ports 9 are being used and the ports 8 closed, the driving member 10 will revolve in one direction, and it will revolve in the other direction when the ports 9 are closed and the ports 8 open. For the purpose of manipulating these ports valves 18, 19, are provided in the center of the box 4. A shaft 17 which has threaded upon its end these valves 18, 19, is mounted in casing 5, and the valves are made in the form of rings mounted upon spokes and having packing grooves in the face and fitting closely the inner face of the stationary steam box 7. It will be seen that in the position as shown in Figure 1 both of the valves have covered the respective sets of escape ports and so the engine is at rest; but a slight motion to the left in said figure will uncover the ports 9 and drive the revolving member 10 in one direction, whereas a movement towards the right will close the ports 9 and uncover the ports 8 and drive the member 10 in the opposite direction. From this construction it will be seen that the revolving portion of the turbine, 10, moves between two stationary casings of which one has the inlet ports and to the other the escape ports for the steam, and that by merely sliding the valves 18 and 19 the direction of motion of this part may be changed readily. The moving portion of the engine has no frictional contact with any other part except on its ball-bearings 14 and the vanes for impact of the escaping fluid remain the same for motion in both directions. Other advantages of this construction will readily occur to those familiar with the art.

Having thus described my invention and

illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. In combination, a fixed cylindrical steam box having ports through its periphery, a rotatable cylindrical casing surrounding the steam box and provided on its periphery with a series of inwardly projecting vanes, and a valve controlling the ports.
2. In combination, a fixed cylindrical steam box having two sets of oppositely directed ports through its periphery, a rotatable cylindrical casing concentrically mounted with respect to the steam box and provided on the inner face of the cylindrical portion with a series of radially directed vanes, and a valve for controlling the ports.
3. In combination, a fixed cylindrical steam box having two sets of oppositely directed ports through its periphery, a rotatable cylindrical casing concentrically mounted with respect to the steam box and provided on the inner face of the cylindrical portion with a series of radially directed vanes and a reciprocable piston valve fitting the inside of the steam box.
4. In combination, a fixed cylindrical steam box having two sets of oppositely directed ports through its periphery, a rotatable cylindrical casing concentrically mounted with respect to the steam box and provided on the inner face of the cylindrical portion

with a series of radially directed vanes, and a reciprocable piston valve having a recessed periphery provided with packing and fitting the inside of the steam box.

5. In combination, a fixed cylindrical steam box having two sets of oppositely directed ports through its periphery, a rotatable cylindrical casing concentrically mounted with respect to the steam box and provided on the inner face of the cylindrical portion with a series of radially directed vanes, and a reciprocable piston valve for the inside of the steam box in two sections, each of which is recessed on its periphery and provided with packing.

6. In combination, a fixed cylindrical casing, a fixed steam box provided with ports through its periphery and inclosed in the cylindrical casing, a cylindrical drive member rotatively mounted on the casing between the steam box and casing and provided with an exhaust opening and a plurality of inwardly extending radial vanes, and a valve for the ports.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

HALLET MORTON MURPHY.

Witnesses:

PAUL CARPENTER,
ALBERT G. MILLER.