

No. 742,423.

PATENTED OCT. 27, 1903.

P. J. HEDLUND.
STEAM TURBINE.

APPLICATION FILED MAR. 30, 1903.

NO MODEL.

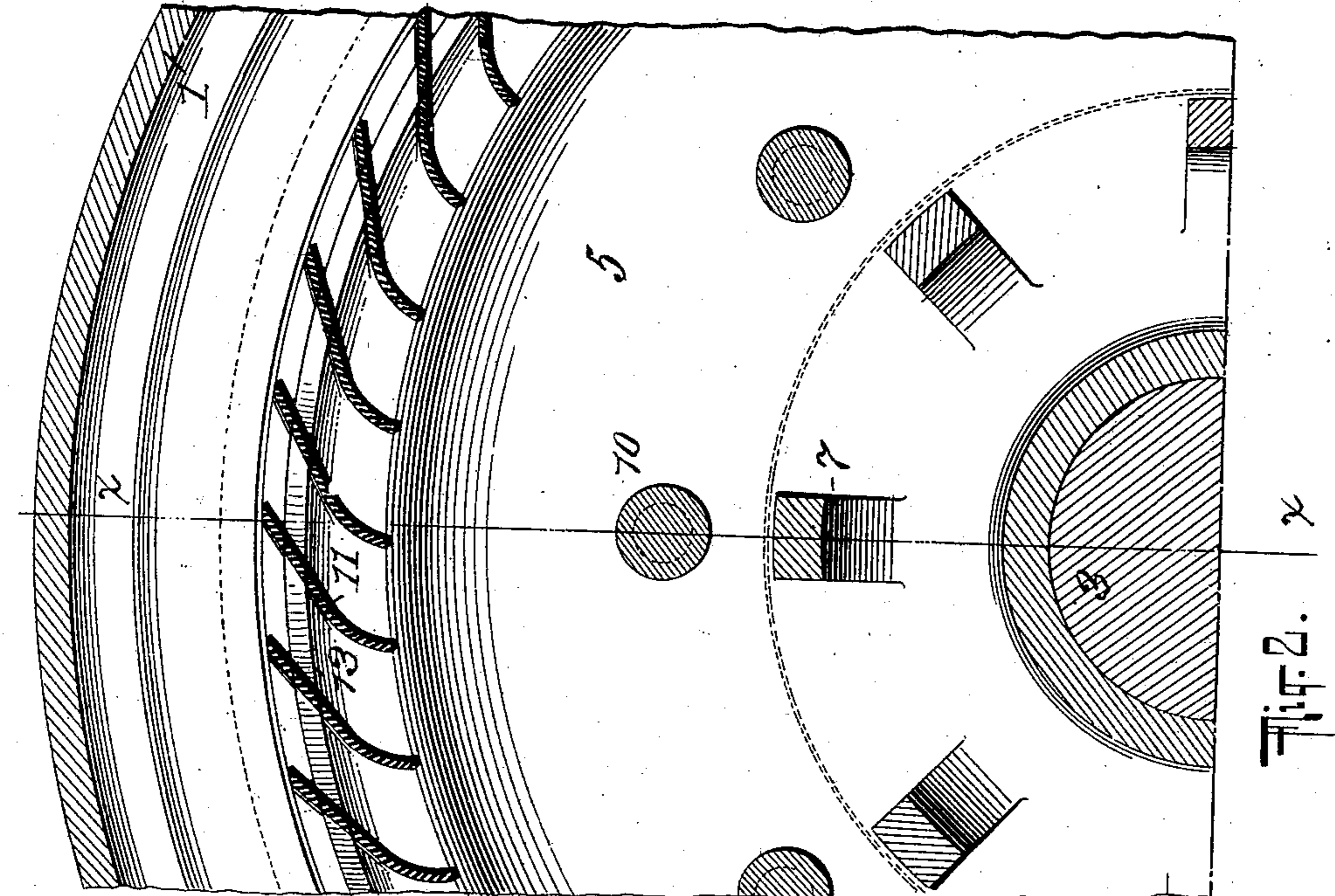


Fig. 2.

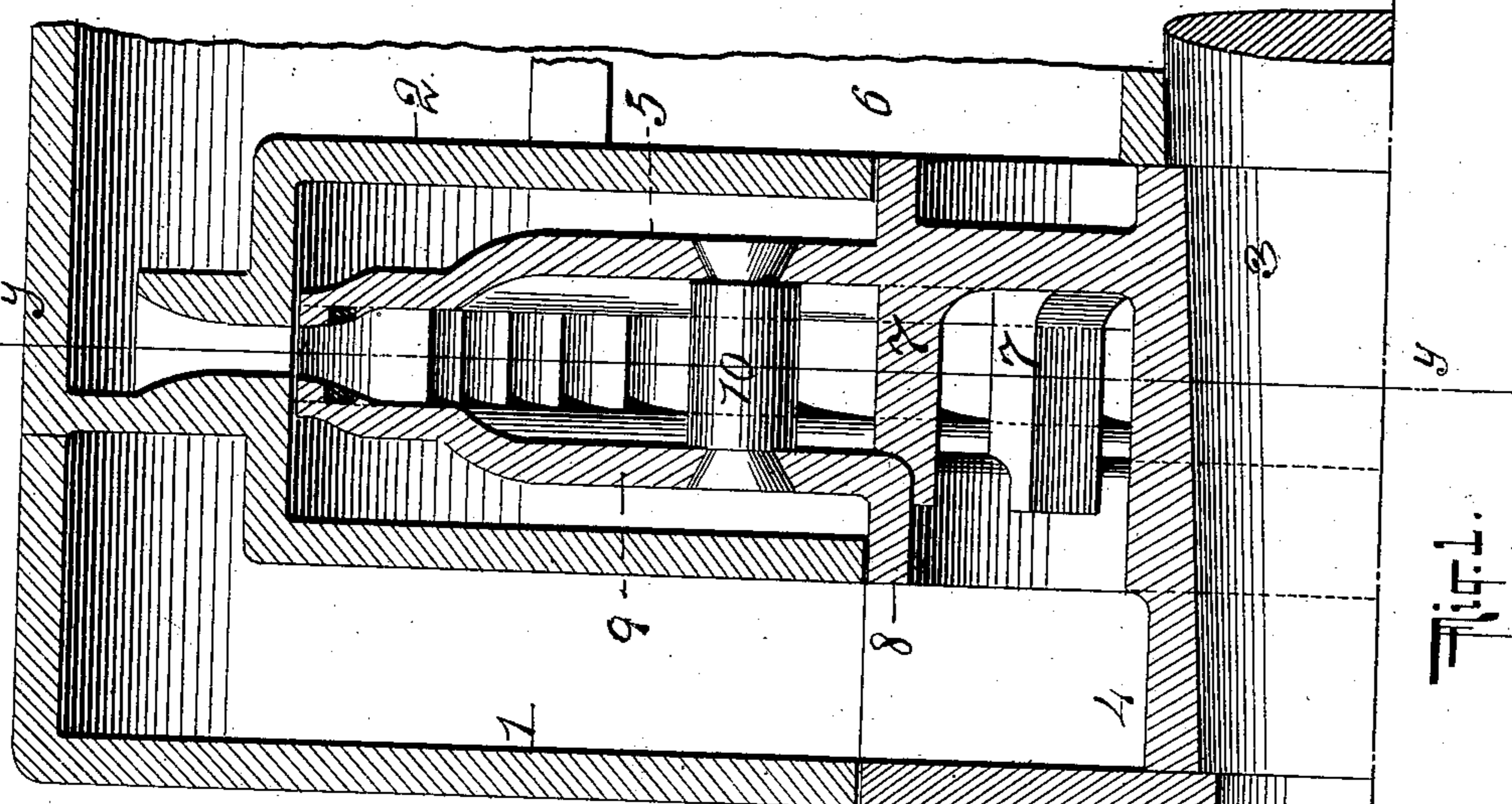


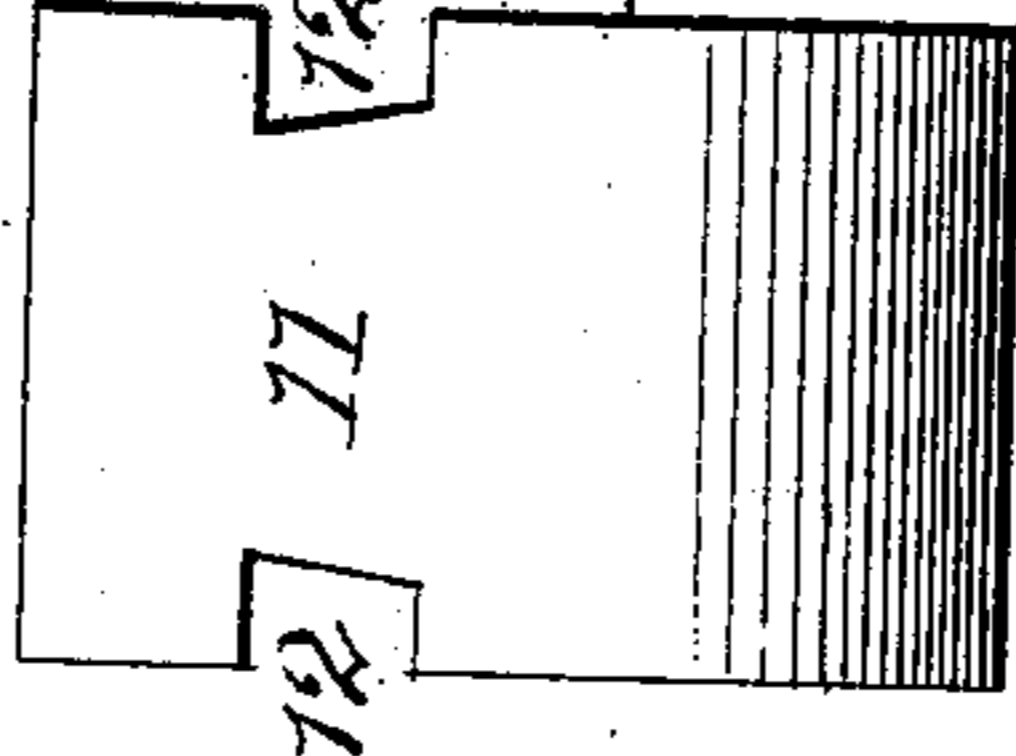
Fig. 1.

Fig. 3.

WITNESSES:

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Fig. 4.



INVENTOR

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PER JOHAN HEDLUND, OF STOCKHOLM, SWEDEN.

STEAM-TURBINE.

SPECIFICATION forming part of Letters Patent No. 742,423, dated October 27, 1903.

Application filed March 30, 1903. Serial No. 150,252. (No model.)

To all whom it may concern:

Be it known that I, PER JOHAN HEDLUND, of Stockholm, Sweden, have invented a new and useful Improvement in Steam-Turbines, of which the following is a specification.

The invention relates to an elastic-fluid turbine-wheel, and more particularly to the wheel of the outward-flow type.

The invention consists in the construction of the wheel and also in the mode of attaching the buckets thereto.

In the accompanying drawings, Figure 1 is a partial section of a steam-turbine wheel embodying my invention on the line *xx* of Fig. 2. Fig. 2 is a section on the line *yy* of Fig. 1. Fig. 3 is a detail view showing the mode of securing the buckets. Fig. 4 represents one of the buckets separately.

Similar numbers of reference indicate like parts.

1 is a part of the wheel-casing.

2 is the wheel-chamber.

3 is the wheel-shaft, here shown as having tapered portions, upon which tapered portions is driven the wheel-hub 4. Integrally formed with said hub is one side or head 5 of the wheel, which is provided with a flange 6, which forms a joint with the wall of the wheel-chamber 2. On the opposite side of head 5 are formed a number of bracket-arms 7, which at their ends are shouldered to receive the lower flanged edge 8 of the opposite wheel-head 9. The wheel-head 9 is therefore supported by said bracket-arms 7, and it may also be attached to the wheel-head 5 by means of riveted stud-bolts 10. One of the wheel-buckets is shown separately at 11, Fig. 4. It is preferably rectangular in form and with a notch 12 on each side. The object of this notch is to receive a ring 13, which lies in an annular groove formed in each head 5 and 9 near the circumferential edge thereof. Also in each head 9 and 5 are formed inclined recesses, into which recesses the longitudinal edges 14 of the bucket are inserted.

In placing the buckets in position the ring in one head is first inserted in place, and then when the edge 14 of the bucket is placed in

the recess of that head, so that the notch 12 receives the ring, the other ring 13 is then inserted in the opposite notch 12, and finally the opposite head 9 of the wheel is applied, so that the edge 14 of the bucket enters the recess in that head 9. It will therefore be evident that the ring 13 serves as a lock to prevent the bucket from moving longitudinally, while the recesses in the opposite heads, which receive the edges 14 of the bucket, determine its position between the wheels.

I claim—

1. In an elastic-fluid turbine, two wheel-heads each having on its inner side an elongated recess extending to the circumference, a bucket disposed between said heads and having its edges in said recesses and provided with notches in said edges, and locking-rings received in annular grooves in the inner faces of said heads and in said bucket-notches.

2. In an elastic-fluid turbine, two wheel-heads having their circumferential edges inwardly inclined to form a contracted escape-opening and each having on its inner side an elongated recess extending to the circumference, a bucket disposed between said heads and having parallel straight edges fitting in said recesses and provided with notches in said edges and locking-rings received in annular grooves in the inner faces of said heads and in said bucket-notches.

3. In an elastic-fluid turbine having an annular central inlet in one head, brackets supported on the opposite head and extending therefrom to the outer periphery of said inlet.

4. In an elastic-fluid turbine having an annular central inlet in one head brackets integral with the opposite head and extending therefrom to the outer periphery of said inlet.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PER JOHAN HEDLUND.

Witnesses:

I. A. VAN WART,
WM. H. SIEGMAN.