

No. 849,455.

PATENTED APR. 9, 1907.

J. BEISHLAG.
STEAM TURBINE.
APPLICATION FILED NOV. 22, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

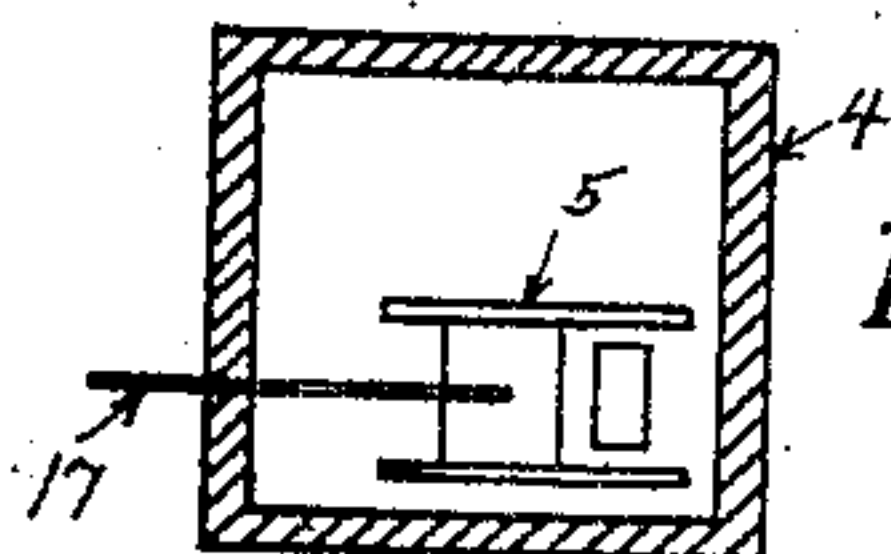
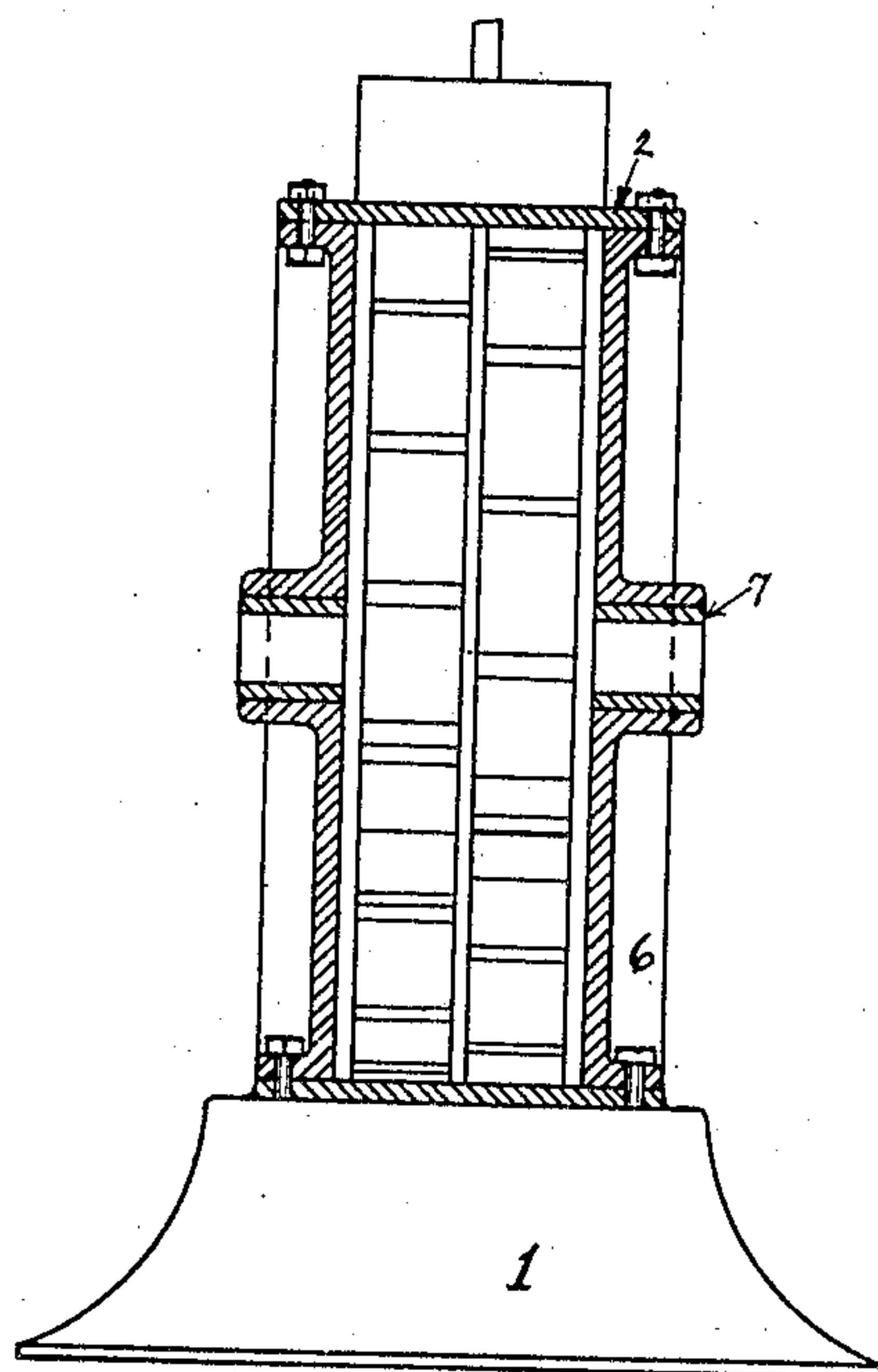


Fig. 4.

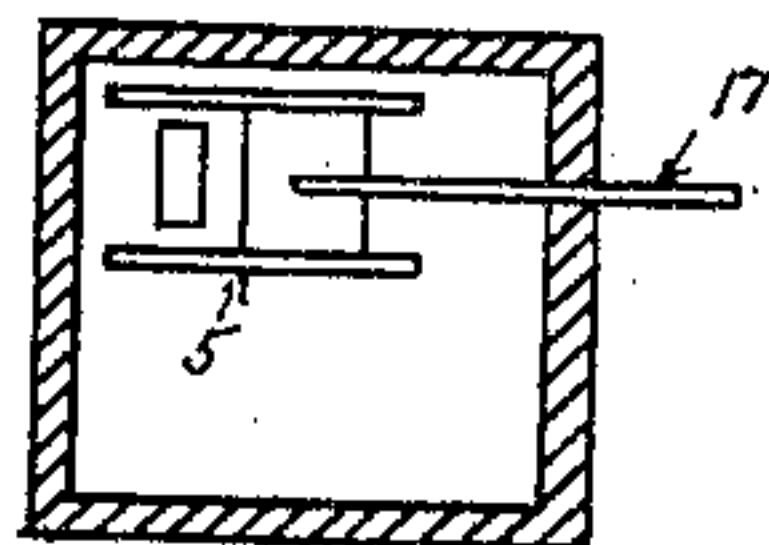
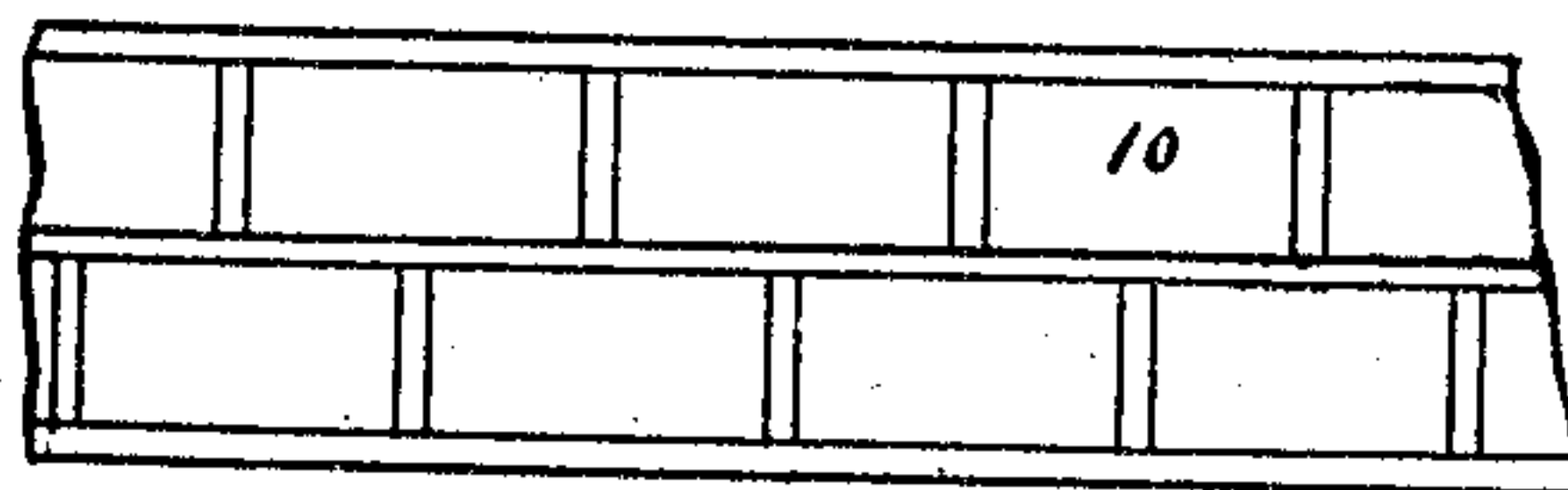


Fig. 3.



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2 SHEETS—SHEET 2.

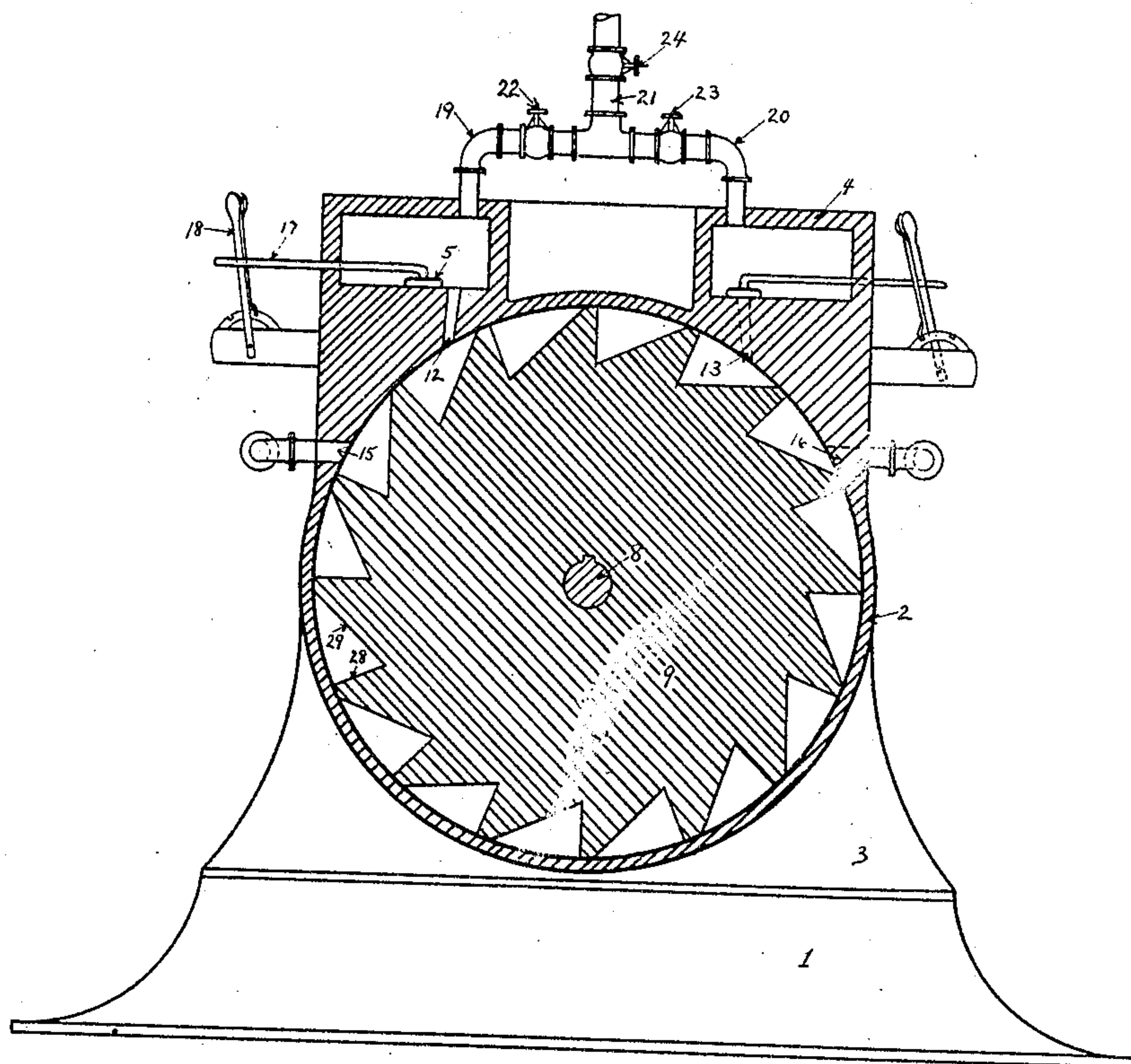


FIG. 2

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UNITED STATES PATENT OFFICE.

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STEAM-TURBINE.

No. 849,455.

Specification of Letters Patent.

Patented April 9, 1907.

Application filed November 22, 1906. Serial No. 344,562.

To all whom it may concern:

Be it known that I, JOHN BEISHLAG, a citizen of the United States, residing at the National Soldiers Home, in the county of Washington and State of Tennessee, have invented certain new and useful Improvements in Steam-Turbine Engines, of which the following is a specification.

This invention has relation to turbine-engines designed and adapted to be operated by steam, and has for its object the provision of a turbine-engine consisting of but few parts, of simple and compact form, in which the utilization of steam is greatly augmented and the waste of the same reduced to a minimum.

My invention consists in the provision of a steam-turbine engine in which the wheel and the buckets on its periphery are formed, preferably, by casting, of a single piece of metal.

My invention further consists in the provision of a steam-turbine engine having a single wheel formed with buckets on its periphery in duplicate, each series of buckets being so constructed that admission of steam to one set will revolve the wheel in an opposite direction from that produced by the admission of steam to the other series of buckets on the same wheel.

My invention still further consists in the provision of a steam-turbine engine having two series of buckets oppositely situated upon the periphery of its wheel and means for controlling the admission of steam to either of the series of buckets, as desired, and thereby operating the engine in either direction.

My invention still further consists in the provision of a steam-turbine wheel with exhausts so constructed that the steam will be readily exhausted after performing its designed work without any tendency to retard the movement of the wheel.

My invention still further consists in the construction, combination, and arrangement of parts more fully described hereinafter and specifically claimed.

In the accompanying drawings, which form a part of this specification, Figure 1 is a central vertical section view of my improved engine, taken longitudinally of the shaft. Fig. 2 is a vertical sectional view of the same. Fig. 3 is an end view of the bucket-wheel. Fig. 4 is a detached view of the slide-valves.

The engine-frame consists of the base-plate

1, which, as shown, is made of a single casting, the upper casing 2, and its base 3, which is likewise a single casting, formed to receive the wheel 9 and also so constructed at its top as to permit of the attachment of the frame 4 of the slide-valve 5. The sections 1 and 3 are firmly bolted together, suitable packing being placed between their abutting surfaces to prevent the escape of steam. Circular end plates 6 6 are bolted and suitably packed at the opposite ends of the wheel-opening in the frame 2. The head-plates 6 6 are provided with openings and packing-boxes 7 for the passage of the shaft 8, which may be supported by the packing-boxes or journaled in separate pillow-blocks attached to the base-plate. The wheel 9, which is suitably keyed to and revolves with the shaft 8, consists of a single casting provided with two parallel series of buckets 10 and 11 on its periphery. The buckets 10 and 11 are alike in shape, being triangular, with a radial bottom 28 and the inclined top 29, the bottom of the wheel forming one of their sides and the circular end plate the other side. These series of parallel buckets are oppositely arranged with reference to the shaft and frame of the engine, as shown in Fig. 3, and are staggered with reference to each series.

Inlet-ports 12 and 13 pass through the upper part of the casing, and exhaust-ports 15 and 16 are formed on opposite sides of the casing above its center. A slide-valve 17 is attached to the upper part of the casing, covering the inlet ports 12 and 13, the operation of the slide-valve being controlled by a handle 17, passing through the side of the valve-frame in a proper packing-box, its outer end being attached to a pivoted locking-lever 18. Connection is made to the steam-boilers and the upper part of the slide-valve boxes by means of pipes 19 20 21, provided with throttle-valves 22 23 24. The exhaust-ports 15 16 may be provided with suitable connections to lead the exhaust-steam to the open air or a condensing-chamber or, if desired, to a low-pressure engine, back pressure being prevented by suitable valves.

The inside of the wheel-chamber, including its ends and the edges of the bucket, are ground so as to make a perfect fit and prevent the escape of steam from the buckets except through the exhaust-ports.

The operation of the engine is as follows: Steam being admitted through the port 12

will pass into one of the buckets 10 and, pressing against its bottom, will cause the wheel to revolve toward the left. As the wheel revolves another bucket of the same series will be brought under the inlet-port 12 and receive the impact of the steam in the same manner and aid in the revolution of the wheel. The bucket first filled will now be opposite the exhaust-port 15, and the steam within it will exhaust through the port. Each bucket will successively receive and exhaust its steam, causing the wheel and its shaft to revolve and conveying the rotary motion through the shaft 8 to any connected machinery.

15 In the case of marine engines one or more wheels can be used to rotate the propeller-shaft, which can be keyed directly to the wheel in each engine. When it is desired to reverse the motion of the engine, steam is cut off from the series of buckets 10 and allowed to pass through the port 13 into the series of buckets 11, exhausting through the port 16, and as the series of buckets 11 are arranged in a different direction from that of series 10 the wheel and the shaft will rotate in the opposite direction, or to the right. The slide-valve is intended to regulate the amount of steam admitted into the casing of the engine, so as to control the speed of the engine.

Having thus described my invention, what I claim as new, and desire to patent, is—

In an elastic-fluid turbine, the combination of a casing having the internal facings of its end walls finished smooth, a wheel mounted therein and mounted so as to have a working fit within the end walls, a plurality of sets of peripheral buckets arranged with their fluid-impinging faces in opposite directions, a peripheral partition between adjacent sets of buckets, the buckets of adjacent sets being disposed in staggered relation, a steam-chest for each set of buckets having their fluid-impinging surfaces extending in the same direction, a nozzle for each set of buckets communicating with each chest, a slide-valve in each chest for controlling the flow of motive fluid through the nozzle thereof, lever and latch mechanisms for actuating the valves independently, a branched supply-pipe connected with the steam-chests, and throttle-valves in the pipes for controlling the supply of fluid to the chest independently.

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

JOHN BEISHLAG.

Witnesses:

FRANCIS FOX,
JAMES W. BEDELL.