

J. C. BRITCHER.

TURBINE.

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990,523.

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Fig. 1.

Fig. 2.

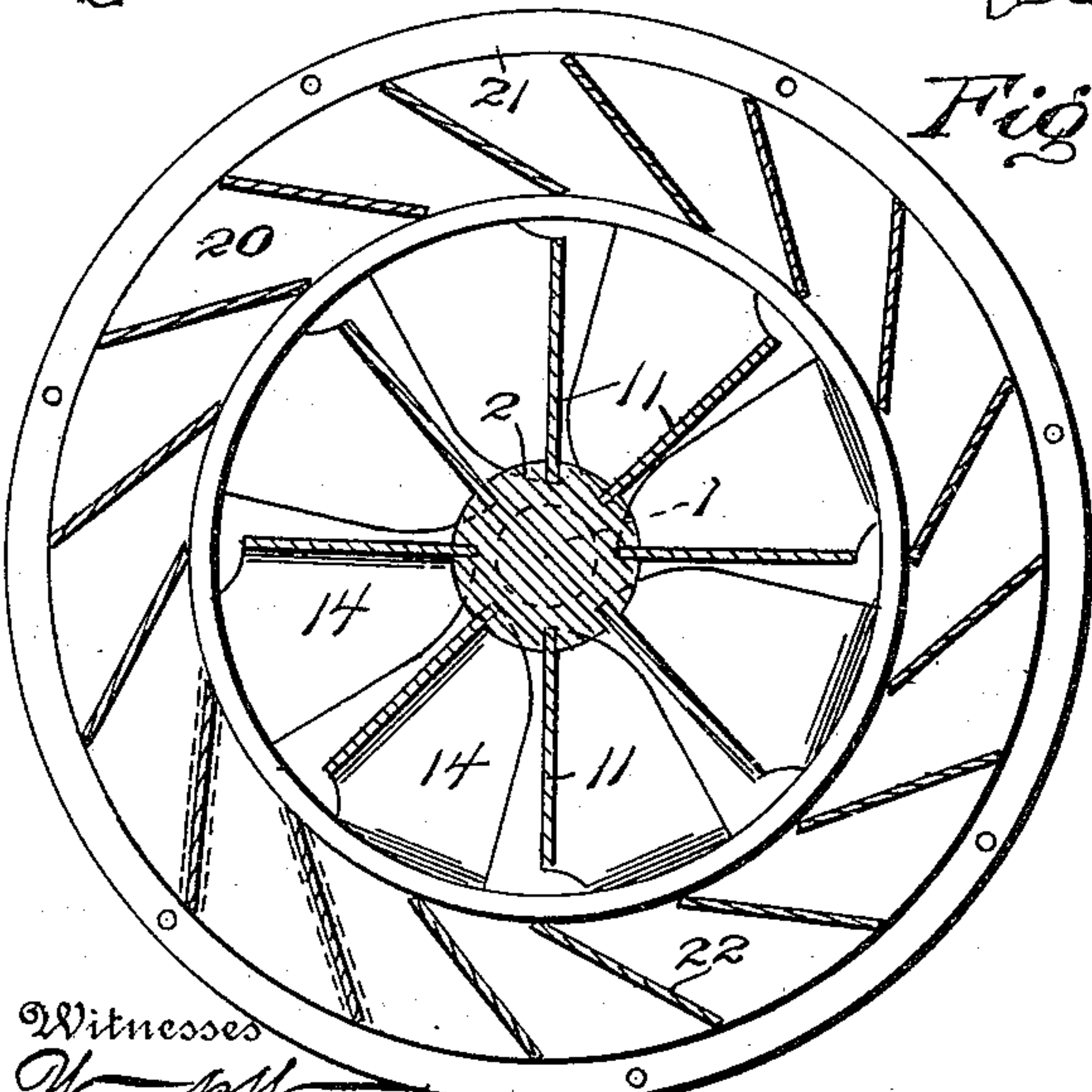
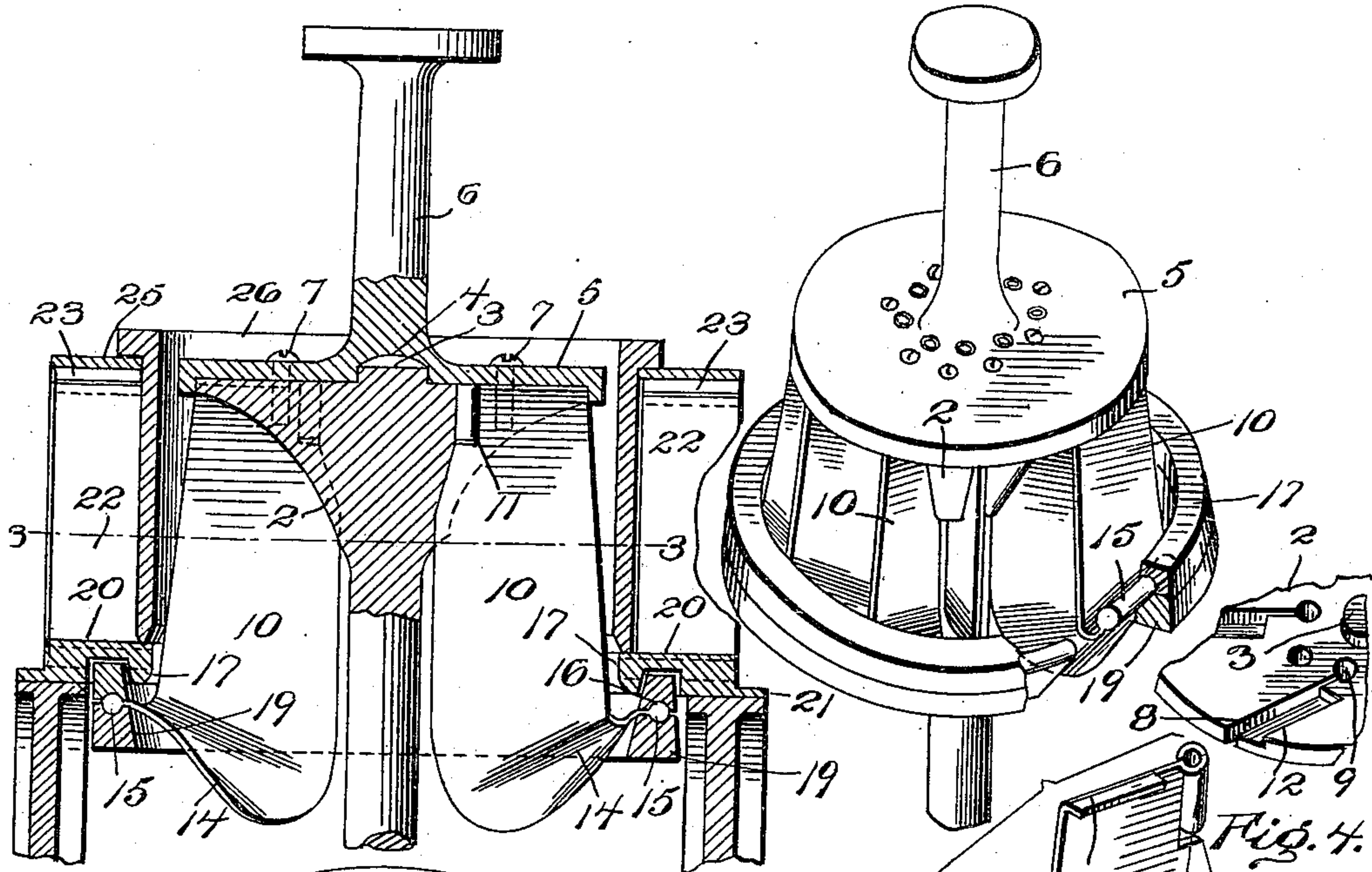


Fig. 3.

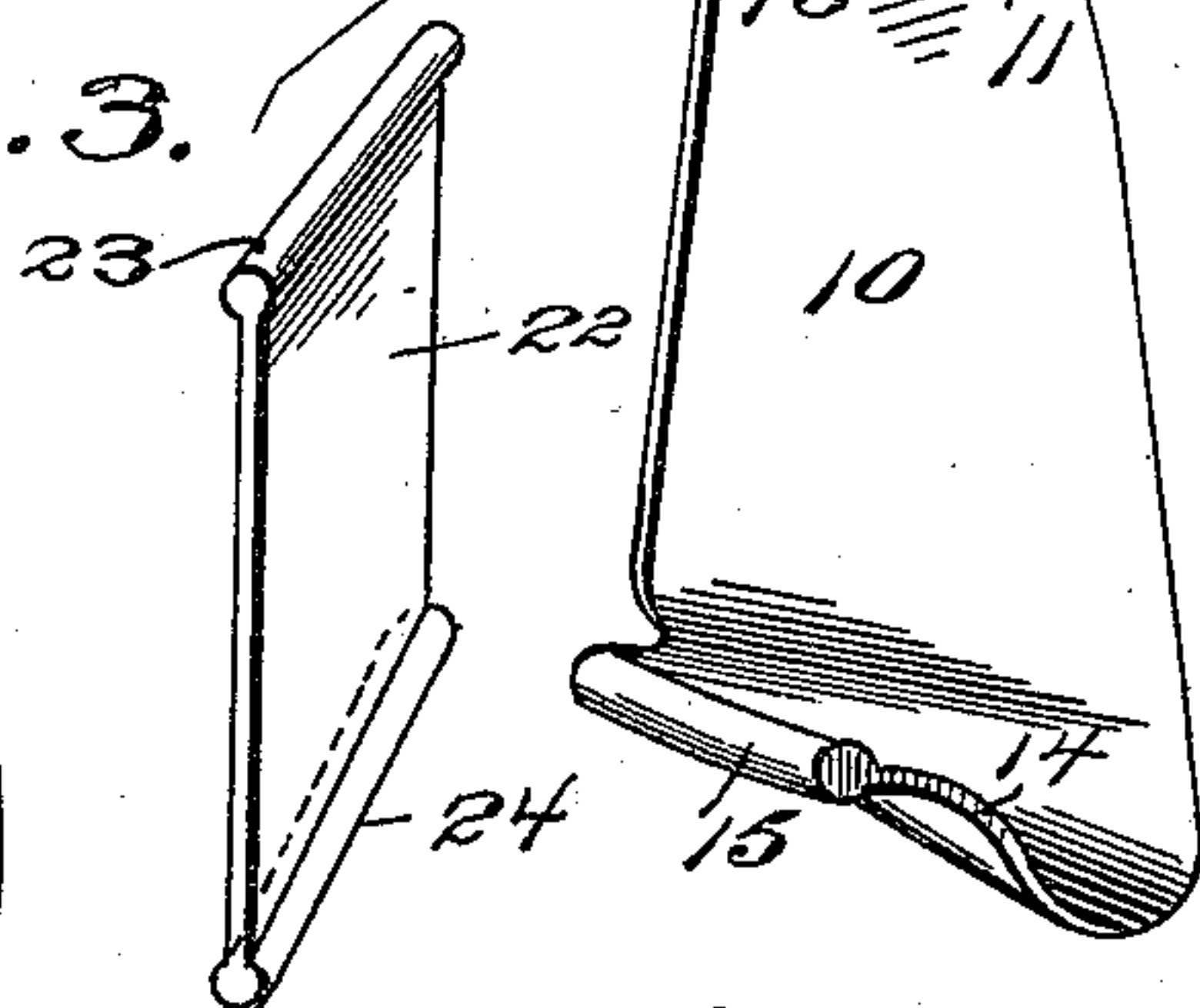


Fig. 4.

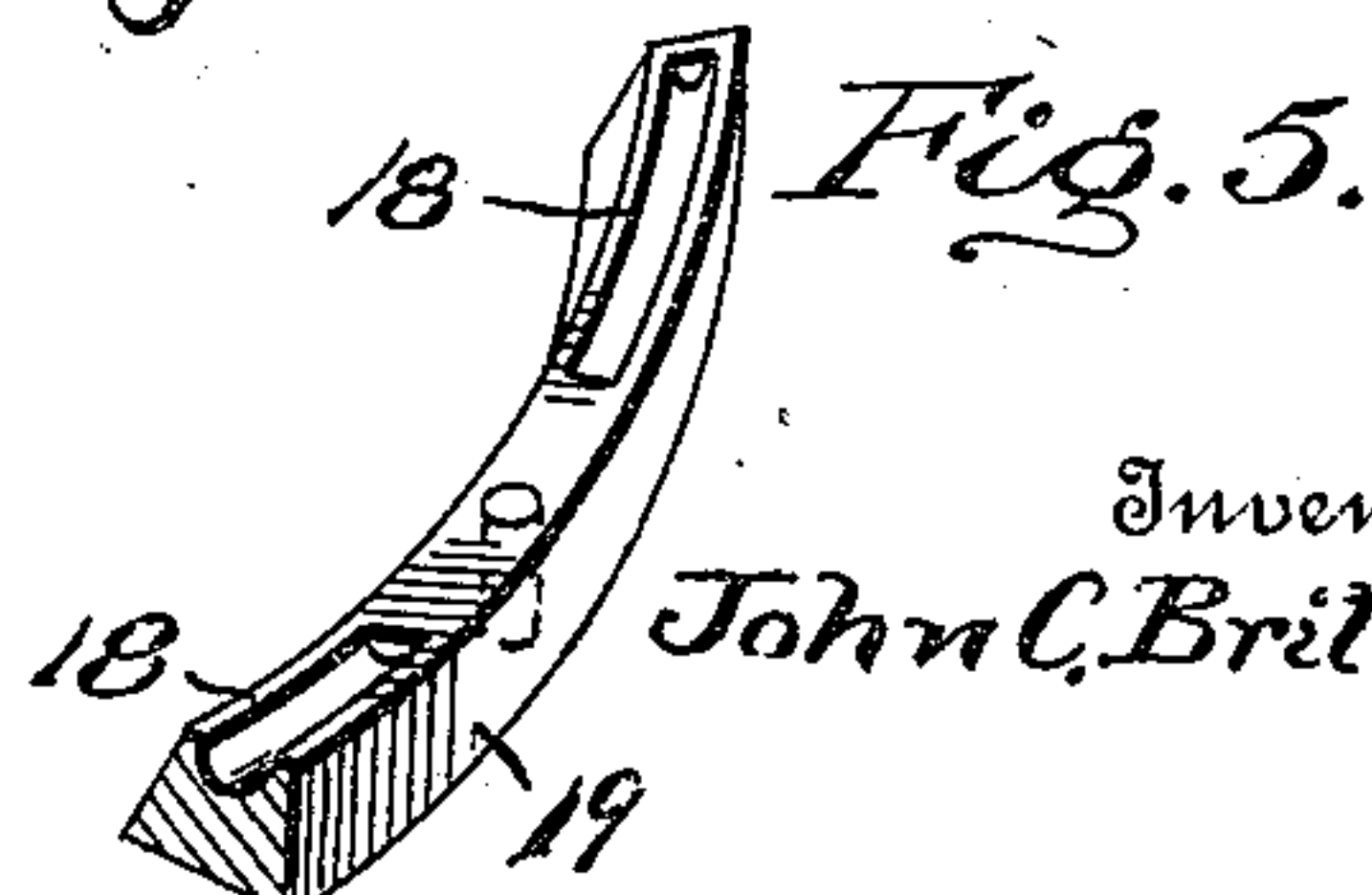


Fig. 5.

Witnesses

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TURBINE.

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To all whom it may concern:

Be it known that I, JOHN C. BRITCHER, citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Turbines, of which the following is a specification.

This invention comprehends certain new and useful improvements in turbines, and it has for its primary object an improved construction of rotor, whereby the blades or buckets may be easily and quickly removed and replaced should any of them become defective by reason of fracture or bending, so as to fail to utilize the motive fluid to the best possible advantage.

The invention also has for its object an improved construction of turbine with an improved water joint between the rotor and the stationary encircling casing of the turbine on the inside, between a band carried by the rotor at the lower end thereof and the stationary vanes with which the casing of the turbine is provided.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical transverse sectional view of a turbine constructed in accordance with my invention, some of the parts being shown in elevation; Fig. 2 is a perspective view of the rotor, partly broken away and partly in section; Fig. 3 is a horizontal sectional view, the section being taken approximately on the line 3—3 of Fig. 1; Fig. 4 is a perspective view of some of the parts detached; and, Fig. 5 is a fragmental perspective view of a portion of one of the rings forming part of the rotor.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The rotor of my improved turbine embodies a preferably vertically disposed shaft 1 which may be journaled at its lower end in any desired way, as in a step bearing, not shown. The upper end of the shaft is upwardly flared, as indicated at 2, so as to

direct the water to the best advantage and effectiveness against the blades as it enters through the vanes of the casing, and the extreme upper end of the shaft is formed with a centrally disposed nib 3 seated in a downwardly facing socket 4 formed in the lower face of a cap-plate 5, said plate being formed with an upwardly projecting spindle 6. The plate 5 is secured, as by screw bolts 7, to the upper end of the shaft 1, and the upper face of the gradually enlarged end 2 of the shaft 1 is formed with any desired number of radial slots 8 terminating at their inner ends in preferably round vertically disposed and elongated sockets 9.

10 designates the blades or buckets of the rotor. Each of the blades 10 is adapted to be slipped by an inwardly radial movement at its upper end through one of the slots 8 and is intended to have a cylindrical boss 11, (which is formed on its inner edge at the upper end thereof) fit within one of the sockets 9, whereby to detachably hold the upper end of the blade, so that the latter may be easily slipped into place and as readily removed whenever desired. Preferably, each blade is formed at its upper end with an angularly disposed flange 13 adapted to be received in a recess 12 formed in the upper face of the shaft 1 and defining one side of the slot 8. (See Fig. 4).

Each blade 10 is reversely curved at its lower end, as indicated at 14, so as to obtain the best reaction against the fluid medium which engages it, and each blade is formed at such deflected or upwardly turned lower end with a substantially horizontally disposed circumferentially elongated lug 15. These lugs 15 are adapted to fit in sockets that are formed by recesses 16 in a ring 17 and in corresponding recesses 18 that are formed in the opposing face of a supplemental ring 19, the rings being secured together in any desired way and forming a band for the lower end of the rotor. This rim or band formed by the co-acting rings 17 and 18 is adapted to fit within a recess which is formed in the lower face of a band 20, as best illustrated in Fig. 1, the band 20 being stationary and provided with a rim or flange 21 by which it may be supported on any suitable foundation.

The vanes 22 of the turbine are arranged obliquely and substantially tangentially to the series of blades or buckets 10 and are provided at upper and lower ends with pref-

erably rounded and notched edges 23 and 24 adapted to slip into corresponding grooves formed in the band 20 and an upper band 25. It will thus be seen that the water joint is on the inside between the ring 17 and the series of vanes 22.

26 designates a cylindrical gate which is vertically movable by any desired means, (the same not being shown herein, as it forms no part of the present invention) whereby communication between the vanes and the blades may be controlled, so as to cause the operation or the stopping of the rotor.

From the foregoing description in connection with the accompanying drawings, the operation of my improved turbine will be apparent, the water entering between the vanes 22 and moving downwardly so as to act against the blades 10, being finally discharged through a draft tube, (not shown).

Having thus described the invention, what is claimed as new is:

1. A turbine, embodying a rotor comprising a shaft, said shaft being formed at one end with a series of side edge opening slots terminating at their inner ends in longitudinally elongated sockets, blades adapted to be slipped edgewise into said slots, the blades being formed at their inner edges with bosses adapted for reception in said sockets, the boss being formed at one end of the blade, and means for connecting together the opposite ends of the blades.

2. A turbine, embodying a rotor comprising a shaft formed with side opening slots terminating at their inner ends in longitudinally elongated sockets, blades provided at one end with angularly disposed flanges and at their inner edges of said ends with longitudinally elongated bosses, said ends of the blades being adapted to be slipped edgewise into said slots and the bosses received in said sockets, the shaft being formed with

recesses defining one side of the respective slots, the recesses being adapted to accommodate the flanges of the blades, and means for connecting together the opposite ends of the blades.

3. A turbine, embodying a rotor comprising a shaft formed with side opening slots terminating at their inner ends in longitudinally elongated sockets, blades provided at one end with angularly disposed flanges and at their inner edges of said ends with longitudinally elongated bosses, said ends of the blades being adapted to be slipped edgewise into said slots and the bosses received in said sockets, the shaft being formed with recesses defining one side of the respective slots, the recesses being adapted to accommodate the flanges of the blades, means for detachably connecting together the opposite ends of the blades, and a cap-plate adapted to be secured to the slotted end of the shaft to close the recesses and one end of the sockets.

4. A turbine, comprising a casing including a series of vanes, a band adjoining one end of said vanes, the band being formed on its face away from the vanes with a circular recess, a rotor embodying a shaft, and a series of blades connected at one end to said shaft and mounted within the casing, the blades being formed with returned opposite ends, each of which is formed with a circumferentially elongated lug, and complementary rings formed with recesses accommodating said lugs, whereby to connect together the ends of the blades, said rings being mounted for a revoluble movement in the recess of the band.

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

JOHN C. BRITCHER. [L. s.]

Witnesses:

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