

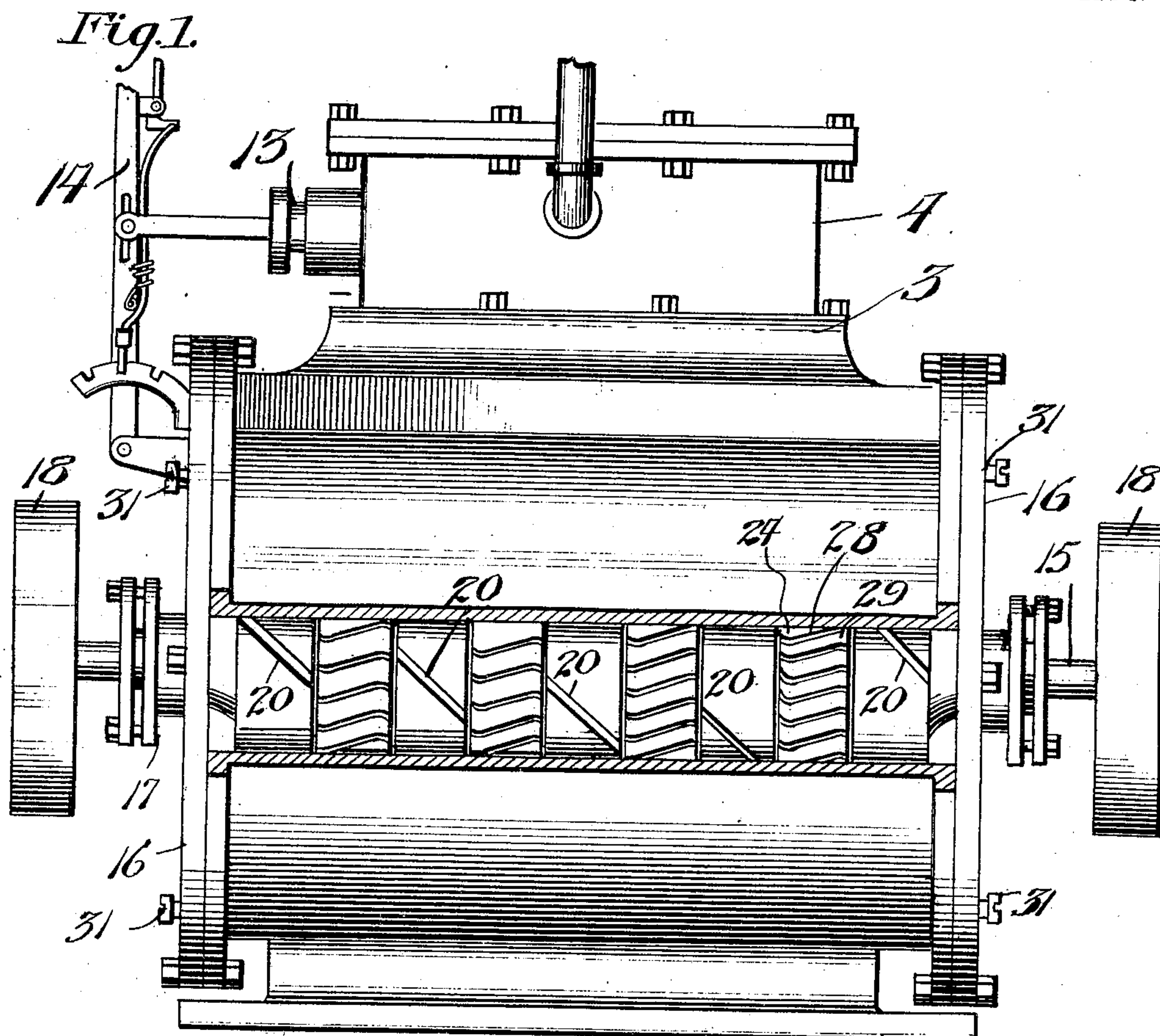
No. 828,443.

PATENTED AUG. 14, 1906.

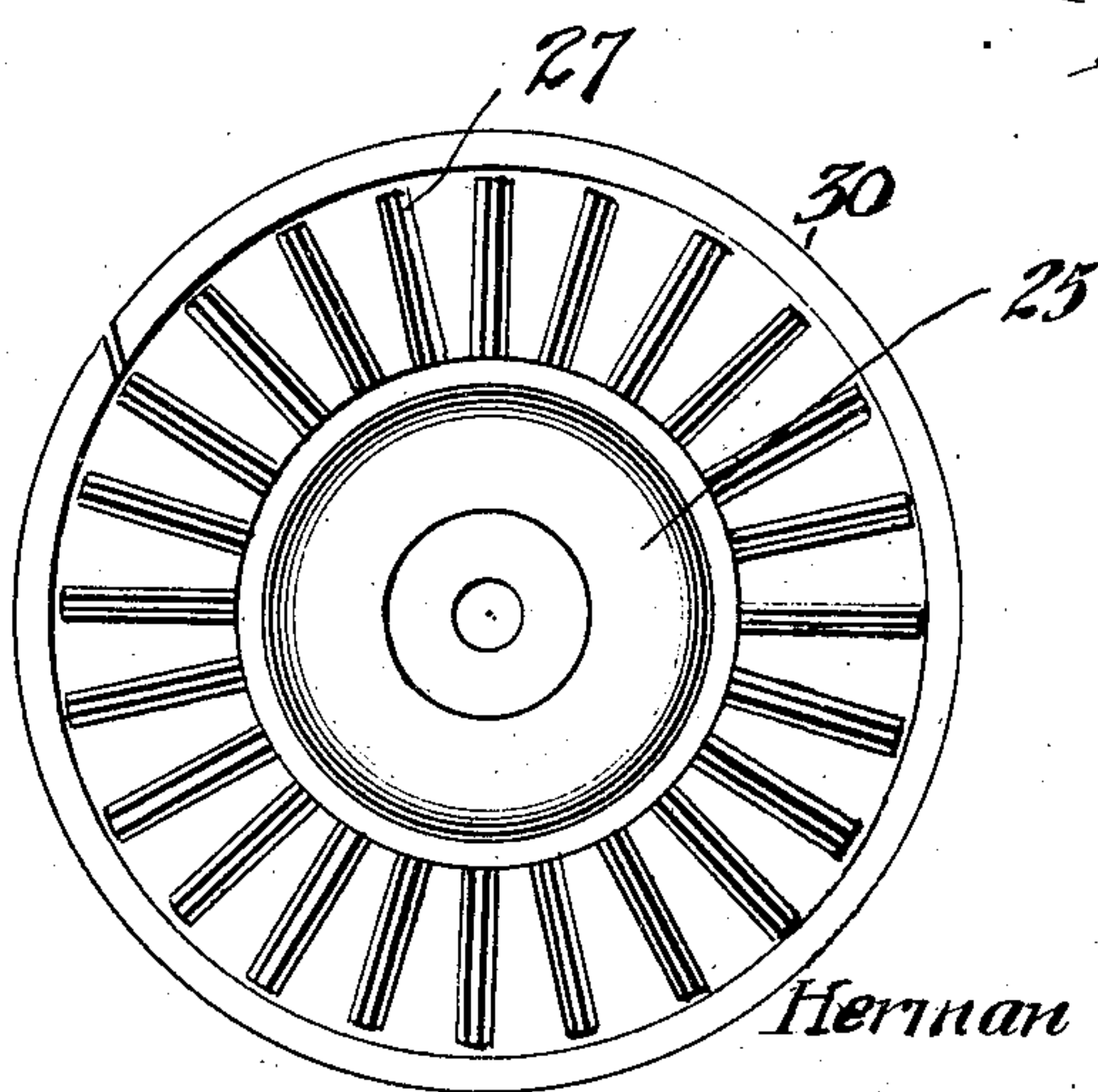
H. J. UHLENKOTT.  
STEAM TURBINE.

APPLICATION FILED AUG. 29, 1905.

3 SHEETS—SHEET 1.



*Fig. 5*



Witnesses

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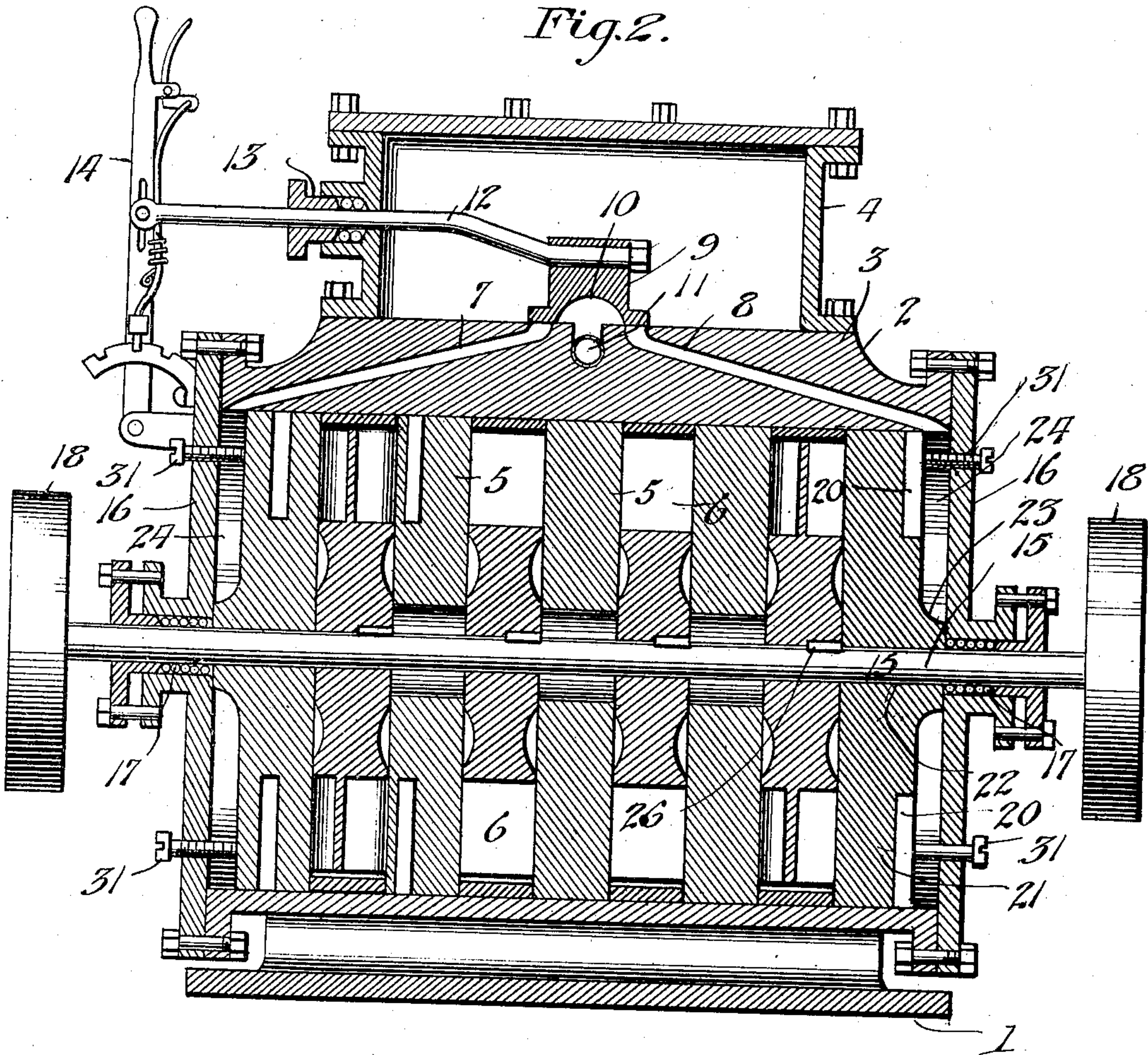
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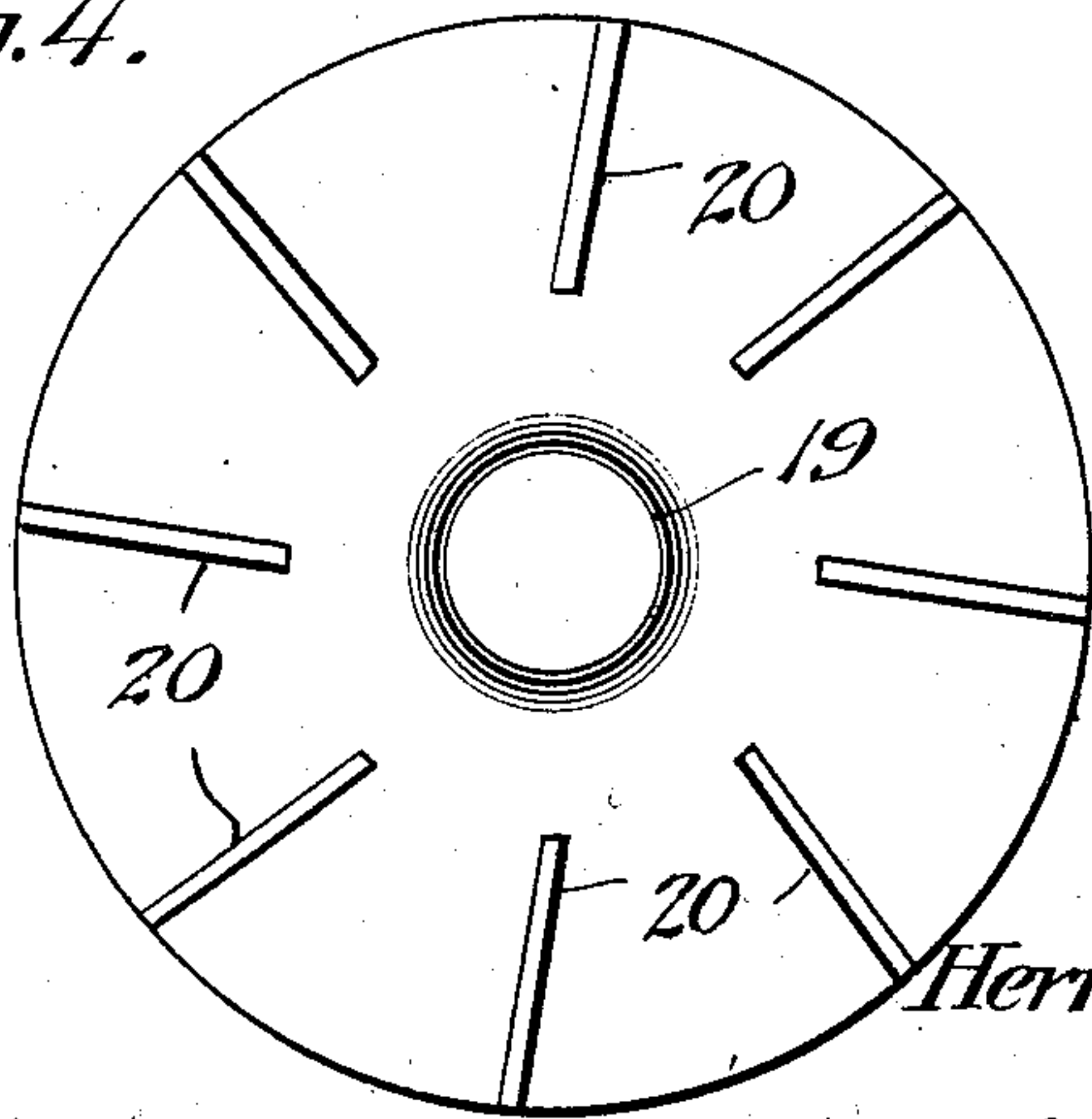
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3 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 4.*



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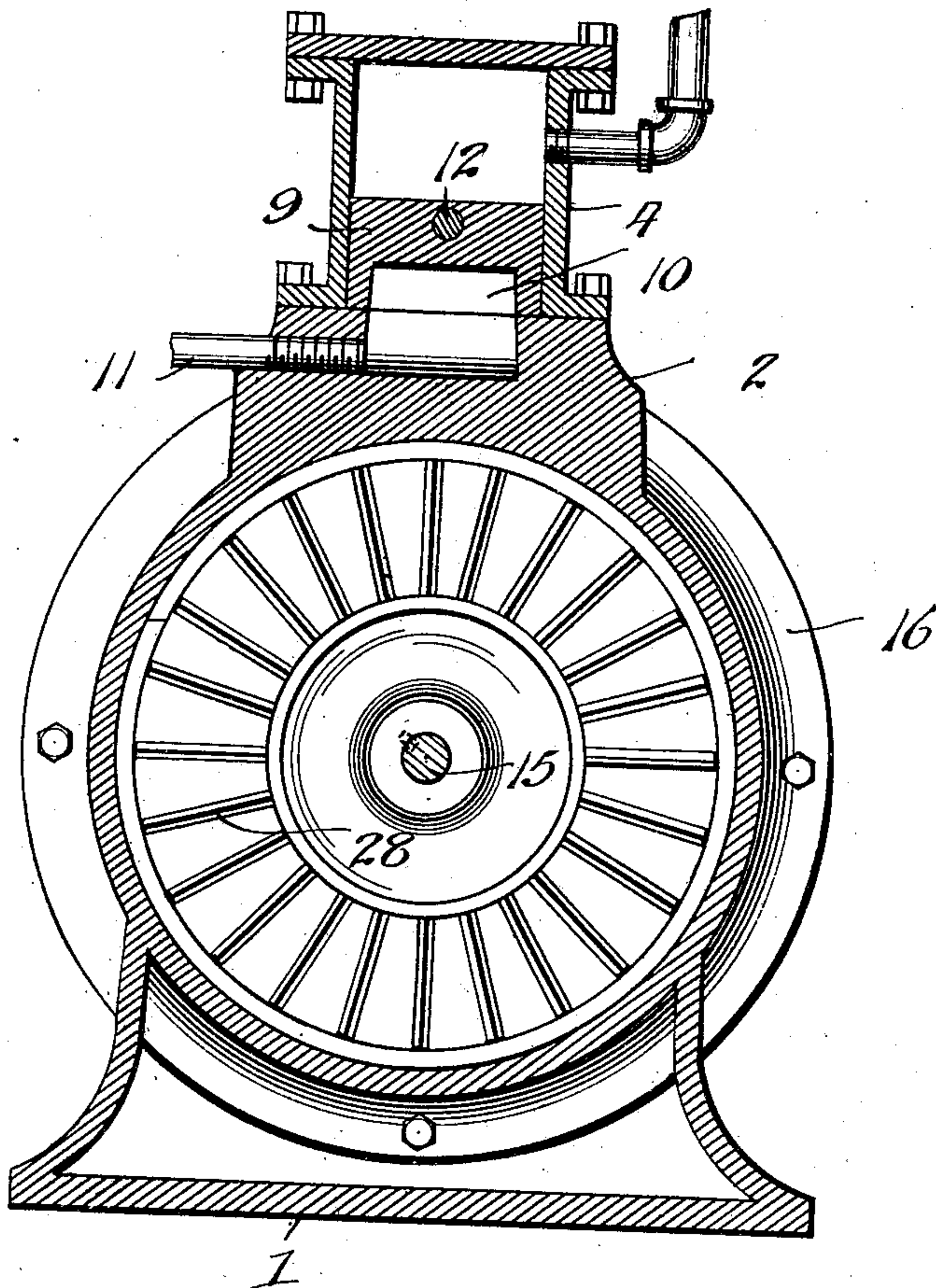
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3 SHEETS—SHEET 3.

*Fig 3.*



Witnesses

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# UNITED STATES PATENT OFFICE.

HERMAN J. UHLENKOTT, OF KEUTERVILLE, IDAHO.

## STEAM-TURBINE.

No. 828,443.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed August 29, 1905. Serial No. 276,263.

*To all whom it may concern:*

Be it known that I, HERMAN J. UHLENKOTT, a citizen of the United States, residing at Keuterville, in the county of Idaho and State of Idaho, have invented new and useful Improvements in Steam-Turbines, of which the following is a specification.

The invention relates to an improvement in rotary engines of the turbine type, wherein in a fluid motive force is transformed into a mechanical power.

The main object of the present invention is the provision of means for readily reversing an engine of this type, the construction being such that the motive force is successively directed against turbine-wheels of peculiar construction, whereby a revolving movement is imparted to said wheels.

The invention in its preferred form will be described in the following specification, reference being had particularly to the accompanying drawings, wherein—

Figure 1 is a view in elevation of an engine constructed in accordance with my invention, a portion of the cylinder being broken out to show the interior construction. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a transverse section taken just forward of one of the turbine-wheels. Fig. 4 is a view in side elevation of one of the abutments.

Referring to the drawings, wherein like numerals of reference designate like parts throughout the several views, my improved engine is mounted upon a suitable bed 1 and comprises the usual cylinder-casing 2, preferably thickened at its upper wall, as at 3, to receive and support the valve-chest 4.

Within the cylinder are mounted what I term the "abutments" 5 and the turbine-wheels or pistons 6, each having a particular construction, to be later described. Steam is admitted to the opposite end of the cylinder from the steam-chest through ports 7 and 8, respectively, controlled through the medium of the usual slide-valve 9, mounted within the valve-chest and overlying said ports, the valve being provided with the usual recess 10 for establishing communication between one of said ports and a suitable exhaust 11, all of which are common in engine structures. The slide-valve is operated through the medium of a rod 12, extending through a stuffing-box in one head of the valve-chest and terminally connected to a lever 14, by which the position of the valve may be regulated.

15 represents the main shaft extending longitudinally of the cylinder 2 and terminally projecting beyond the cylinder-head 16, preferably through stuffing-boxes 17 therein, and being provided with the usual band or power wheels 8.

So far as described my engine structure, it will be noted, includes elements common in the art, and though I prefer the precise arrangement of details illustrated it is to be understood that I contemplate the substitution of any other well-known form of structure for the parts described.

The particular novelty of the invention resides in the construction and arrangement of the turbine-wheels with relation to the fixed abutments. The abutments 5 (illustrated in Fig. 4) are cylindrical in face view and of a size to fit snugly within the cylinder 2. The abutments are centrally formed with an opening 19 of greater diameter than that of the main shaft 15, so that when said abutments are in place concentric with said shaft they are out of contact therewith. The abutments are formed with a series of radially-projected slots 20, arranged in regular order about the periphery of said abutments and extending from said periphery inward toward the center, though terminating some distance therefrom. These slots 20, which are comparatively narrow in width, are arranged at an angle to the axes of the abutments—that is, viewed in plan they incline from a line directly transverse the abutment. The end abutments 21 are exactly similar to the abutments 5, with the exception that the central opening 22 therein is of a size to provide a bearing for the main shaft 15. The end abutments are also provided with central extensions 23, with which the inner faces of the heads 16 of the cylinder contact, whereby to provide steam-spaces 24 between said end abutments and the cylinder heads, with which steam-spaces the respective ports 7 and 8 communicate, as clearly illustrated in Fig. 2. It will be noted that ways 20 in the abutments are inclined in the same direction, so that the steam passing therethrough will be jetted or directed in one continuous direction.

The pistons or turbine-wheels 6 comprise ring bodies 25, practically equal in thickness to the thickness of the abutments, though of materially less diameter than said abutments. The turbine-wheels are keyed upon the main shaft through the medium of keys



26. The body 25 of each turbine is provided with a series of radially-projected wings 27, arranged close together peripherally of the body, each of which wings is of approximately S shape in plan—that is, comprises a straight inclined central portion 28 and reversely-curved ends 29—these described configurations of the wings extending transverse the turbine-wheels—that is, lengthwise the cylinder. It will be noted that the central inclined portion 28 of the wings extends in a reverse inclination to that of the ways 20 in the abutments. The free ends of the wings 27, terminating a short distance from the inner surface of the cylinder 2 and guard-rings 30, are arranged to inclose the free ends of said wings of the turbine-wheel, said rings forming a closed chamber of two adjacent wings, and, furthermore, protecting the wings from injury by contact with the interior surface of the cylinder.

In operation steam is admitted through the port 8 into the steam-spaces 24, finding its way through the slot 20 in the first abutment 21 and through the incline of said slot being directed upward with relation to the longitudinal center of the cylinder. The steam escaping from the delivery end of the slots in the end abutment contacts with the wings 27 of the adjacent turbine-wheel, operating to revolve said wheel in one direction, the progress of the steam continuing through the successive abutments and turbine-wheels to the steam-space 24 at the opposite end of the cylinder and to the exhaust-port 11 through the port 7. In assembling the parts the abutments and turbine-wheels are mounted alternately on the main shaft with the end elements comprising the end abutments described. The shaft, with the abutments and turbine-wheels, thereon is inserted longitudinally of the cylinder and the heads 16 secured in place. The abutments are fixed with relation to the cylinder by any suitable means, and adjusting-screws 81, having threaded engagement with the heads 16, are operated to properly adjust the parts, it being understood that all steam connections and surface-joints are to be suitably packed to prevent leakage. The valve 9, being operated to admit the steam through the port 7, will cause said motive fluid to be delivered against the wings of the turbine-wheels in a downward direction, due to passing in a reverse direction through the ways of slots 20, and this downward jetting of the steam impacting against the reversely-inclined wings 27 of the turbines will operate to drive said turbines in a reversed direction to that precisely described.

It will be noted that the engine described is of simple economical construction, and that the steam passing therethrough is practically utilized without diminishing power to drive successive turbines, all of which are

keyed to the power-shaft, and that the direction of said steam may be readily changed to reverse the engine. The effective mechanical power of the engine will be limited solely by the number of turbine-wheels employed, as each additional turbine-wheel adds materially to the mechanical force resulting from a given fluid motive force, as will be obvious.

Though I have shown and described the invention in its preferred details of construction, it is obvious that various changes can be made in the details of construction of my steam-turbine without departing from the spirit and scope of the invention.

All cut-off valves that are usually used in common engines to lead steam from one end to the other and exhausting outward can be used in this invention or reverse-valves.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A rotary engine comprising a casing, means for admitting steam to opposite ends of the casing, abutments within the casing, and turbine-wheels arranged alternately with said abutments, said abutments being formed to direct the steam into contact with the turbine-wheels, and means for adjusting the abutments and wheels as a whole longitudinally of the casing.

2. A rotary engine comprising a casing, means for admitting a fluid motive force to opposite ends of the casing, non-rotated abutments within the casing formed with inclined ways, and turbine-wheels arranged intermediate the abutments, said wheels having wings reversely inclined with relation to the abutment-ways, the end abutments being formed with central offset portions to receive the cylinder-heads, and adjusting-screws passing through said heads and bearing on the end abutments.

3. A rotary engine comprising a casing, a valve-chest, ports leading from said chest to opposite ends of the casing, means for controlling the admission of the fluid motive force to either of said ports, fixed abutments within the casing, each of said abutments being formed with inclined ways extending transversely therethrough, and turbine-wheels arranged intermediate the abutments, each of said wheels being formed with a plurality of radially-extending wings inclined with relation to the ways in the abutments, the ends of said wings inclining approximately identical with the inclination of the adjacent abutment-way, the intermediate portion of the wings inclining at an angle to both of the adjacent ways.

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

HERMAN J. UHLENKOTT.

Witnesses:

WILLIAM R. DIXON,  
GEO. W. COURTS.