

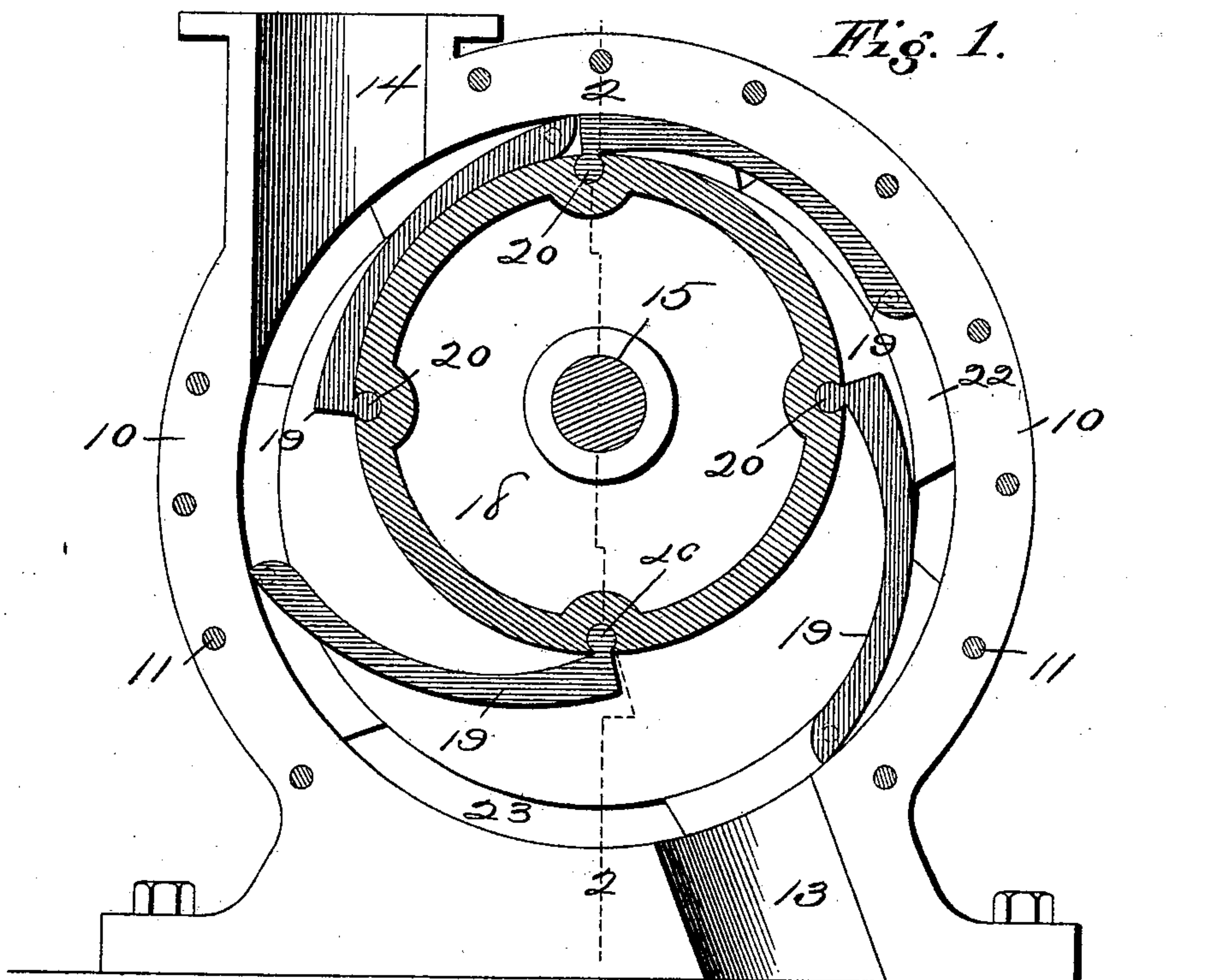
No. 621,752.

Patented Mar. 21, 1899.

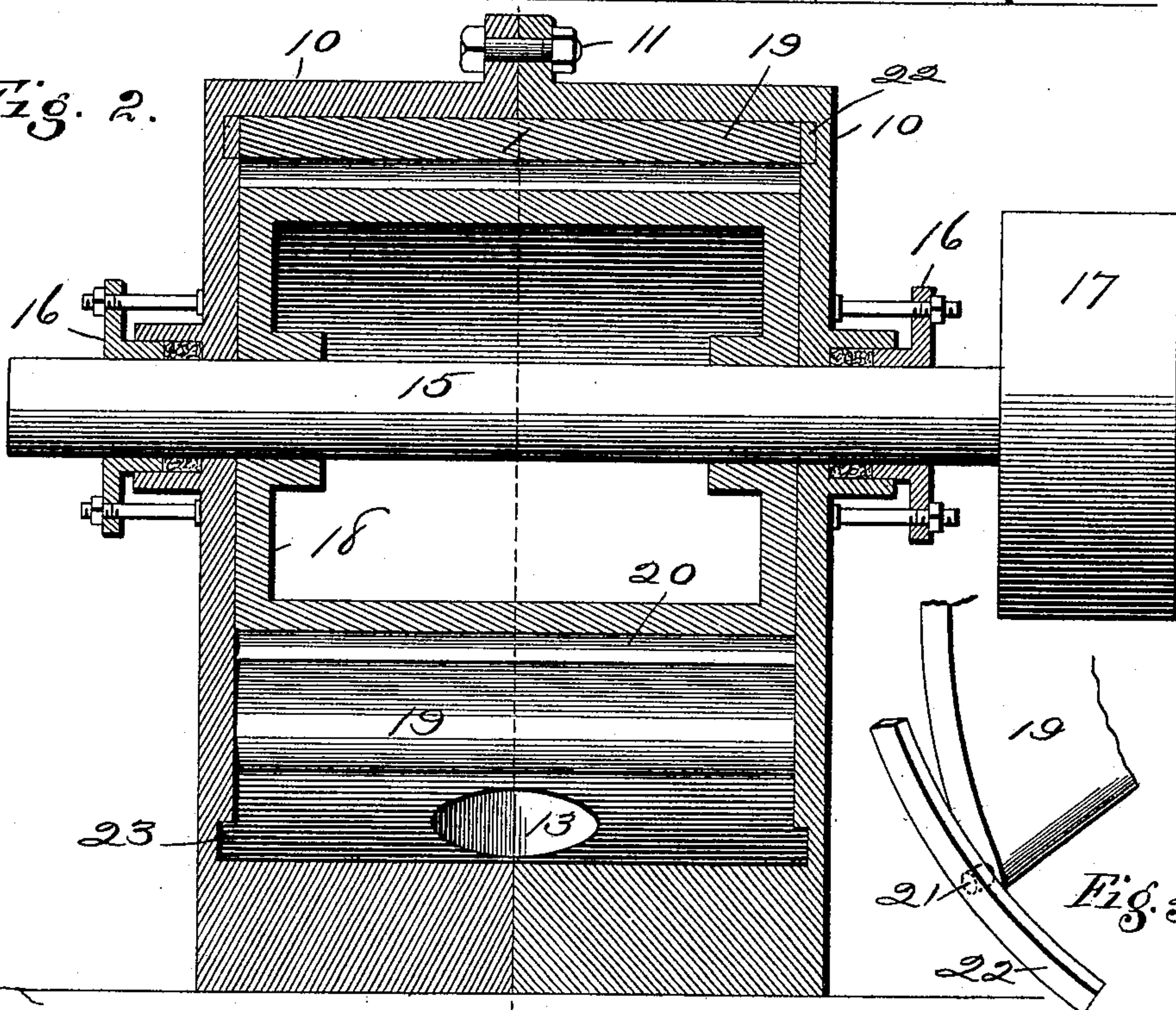
R. F. FLEAK.  
ROTARY PUMP.

(Application filed Feb. 14, 1898.)

(No Model.)



*Fig. 2.*



*Fig. 3.*

Witnesses: *W. J. Sankey* } Inventor: *Robert F. Fleak,*  
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# UNITED STATES PATENT OFFICE.

ROBERT F. FLEAK, OF STUART, IOWA.

## ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 621,752, dated March 21, 1899.

Application filed February 14, 1898. Serial No. 670,321. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT F. FLEAK, a citizen of the United States, residing at Stuart, in the county of Guthrie and State of Iowa, have invented a new and useful Rotary Pump, of which the following is a specification.

My invention relates to that class of rotary pumps in which the valves are pivoted to an eccentric hub and their outer ends engage a smooth-surfaced cylinder, whereby a regular and uniform motion of the valves is effected and pounding prevented.

My object in this invention is to provide a pump of this class in which leakage of the water past the valves is prevented and in which the friction is reduced to a minimum to thereby produce a pump of high efficiency and great durability.

My invention consists in certain details of construction, arrangement, and combination of parts more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical transverse sectional view through the line 1 1 of Fig. 2. Fig. 2 shows a vertical section on line 2 2 of Fig. 1. Fig. 3 shows a detail perspective view illustrating the connection between the valves and the guiding-segments thereof.

Referring to the accompanying drawings, the reference-numeral 10 is used to indicate a cylinder having its interior in the form of a true circle and preferably made of two parts secured together by means of the bolts 11. In its bottom is an inlet-port 13, and near its top is an exhaust-opening 14.

The reference-numeral 15 is used to indicate a shaft passed through the cylinder 10 a slight distance above its center and mounted for rotation in the bearing-boxes 16, fixed to the cylinder. On this shaft 15 is a belt-wheel 17, by which power may be applied to rotate same, and on the central portion of the shaft within the cylinder a hub 18 is fixed, which is cylindrical in shape and so arranged that its upper edge closely approaches the top of the cylinder, while its lower edge is a considerable distance from the bottom of the cylinder.

The reference-numeral 19 is used to indicate the valve.

On one end of each valve is provided an

integral inwardly-projecting journal 20, which is mounted in a corresponding groove which is extended longitudinally of the hub, thus providing for the connection of the valve with the hub and also providing means whereby the valve may be hinged to the hub. One of the essential peculiarities of the valves 19 is that the inner face of the valve is segmental in shape, the curve of the segment being the same as that of the exterior of the hub, while the outer surface of the valve is formed on a segment the curve of which corresponds to that of the interior of the cylinder, and these valves are arranged upon the hub at such distances of separation that when the valves are made to lie close to the hub the free end of one will engage the hinged end of its next adjoining valve.

The reference-numeral 21 is used to indicate journals, which are formed on the outer end of each valve on each side thereof to project straight outwardly therefrom.

22 indicate segmental guides having openings therein to receive the said journals 21.

The reference-numeral 23 is used to indicate a groove formed in the head of the cylinder to receive the segmental guide 22 and permit the guides to describe a complete circle therein. These guides are of such a length and are so arranged and combined relative to the valves that when the valves are in a position so that the adjacent ends of two adjoining guides are in a position at the point where the hub is nearest the cylinder the said adjacent ends will contact with each other, and thus prevent the escape of steam through the slot in which they are mounted. At all other positions of the valves this precaution is unnecessary.

In practical operation it is obvious that at the top of the hub a water-tight joint is provided between the valves and cylinder at every position of the valve relative to the cylinder, and hence all water contained within the space between any given valve and the hub must be forced outwardly through the exhaust-port 14 before the said valve reaches a position where its free end engages the hub, and inasmuch as the space between the valves and the hub is constantly decreased as the exhaust-port is approached a stream of water will be forced from the pump in a uniform



and regular manner. Furthermore, the water will be drawn by suction into the pump in such a manner on account of the gradual increasing size of the partial vacuum between  
5 the valves and the hub as the inlet-port is approached. It is obvious that the pressure upon any valve is not applied or removed suddenly at any point throughout the movement of the valve, and hence the pump is not  
10 subject to excessive wear or "pounding" of the valves and a high degree of efficiency is attained.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—  
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A rotary pump, comprising a cylinder having an inlet and an outlet opening therein, cylinder-heads therefor each having circular grooves formed in their inner faces adjacent  
20 to the edge of the cylinder and concentric

therewith, a cylindrical hub mounted for rotation eccentrically within the cylinder, a series of valves pivoted to the hub, of such length that when lying close to the hub they will engage each other, and having their outer  
25 surfaces shaped to conform to the interior of the cylinder and their inner surfaces to fit the exterior of the hub, two narrow segmental guides for each valve mounted in said grooves and having said valves pivoted thereto and  
30 of such a length that the ends of two adjacent guides will meet and form a water-tight joint when the valve is passing through the narrowest part of the cylinder, for the purposes stated.

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Witnesses:

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