

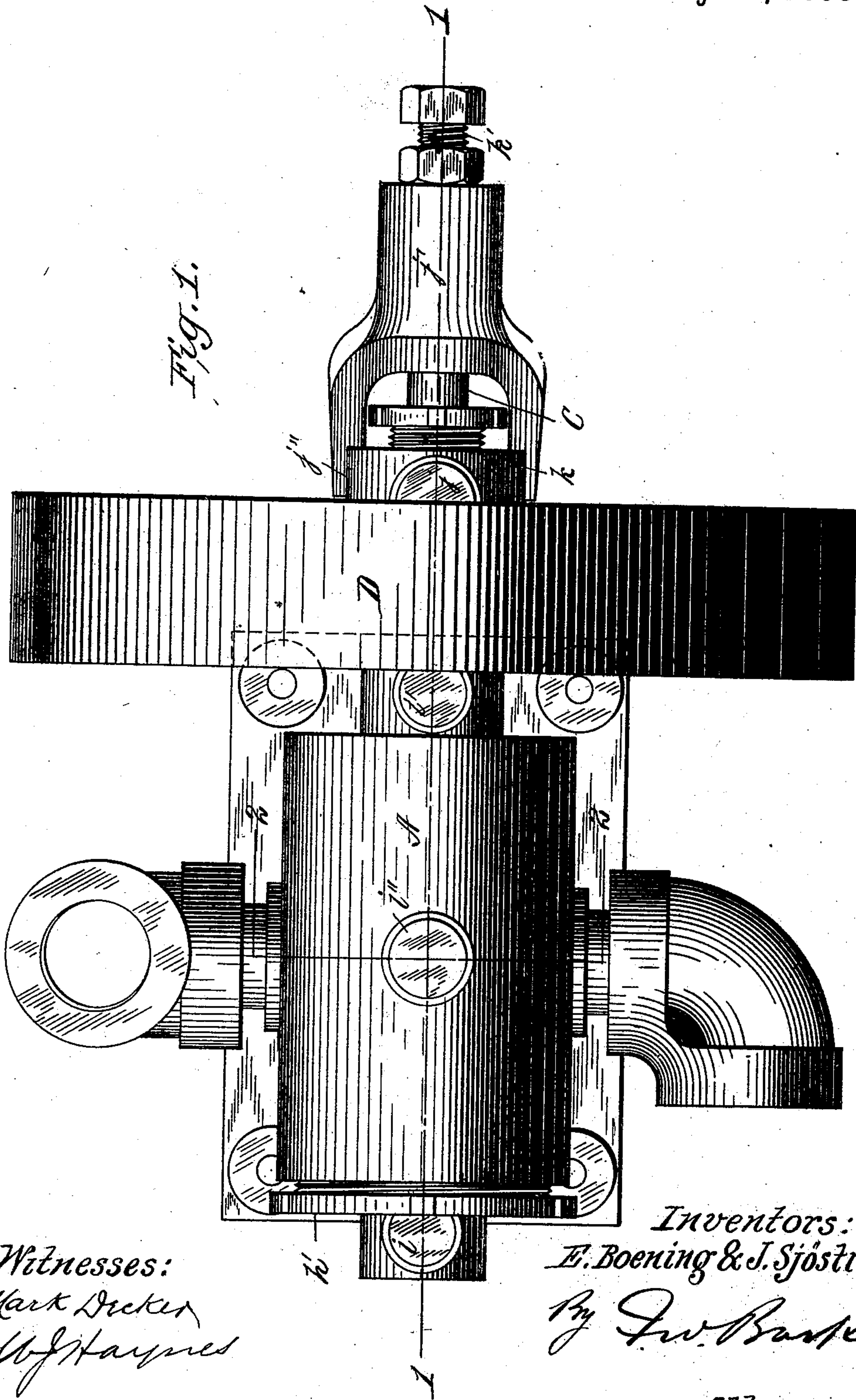
(No Model.)

4 Sheets—Sheet 1.

E. BOENING & J. SJÖSTRÖM.
ROTARY PUMP.

No. 501,864.

Patented July 18, 1893.



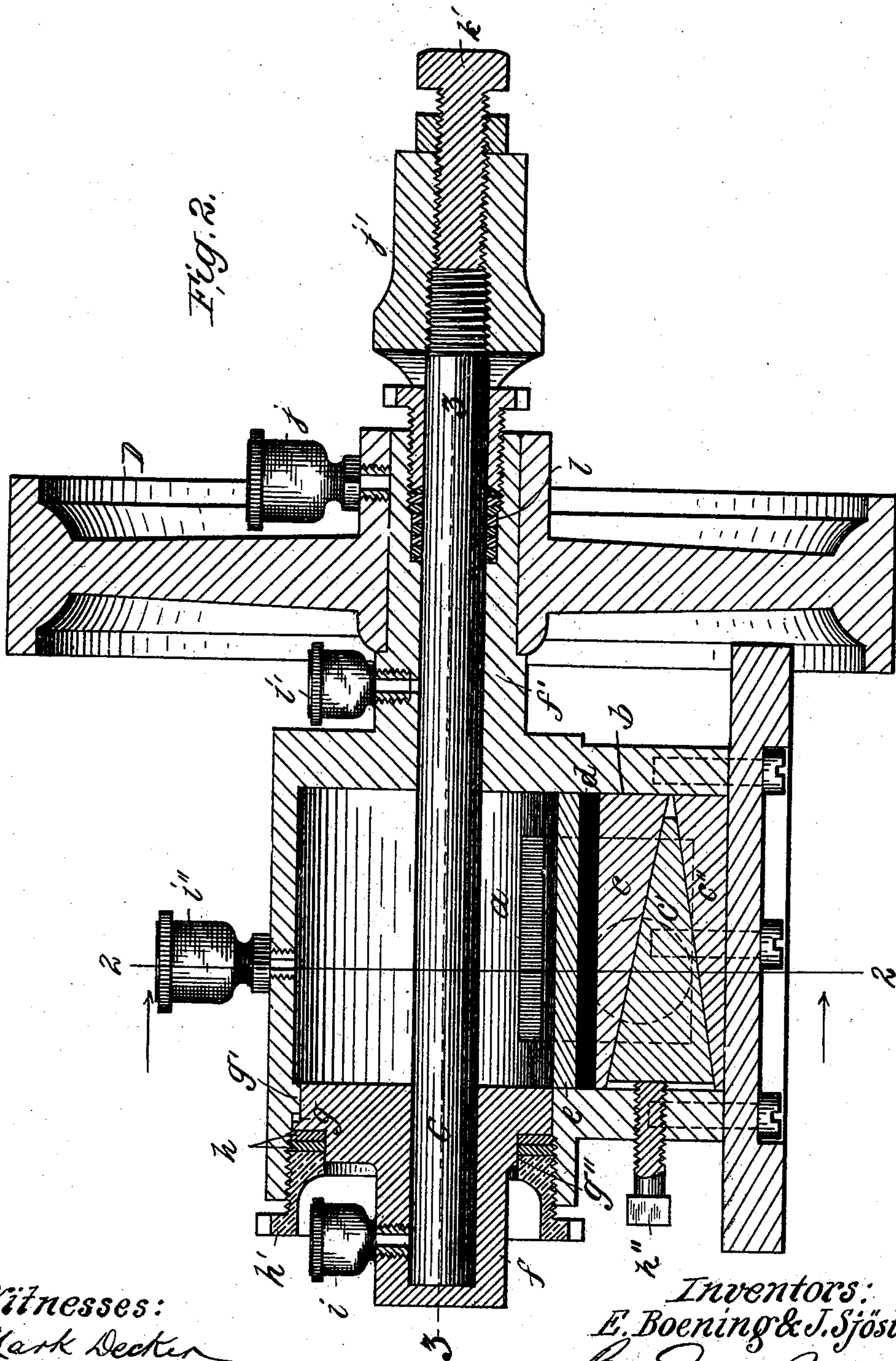
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4 Sheets—Sheet 2.

No. 501,864.

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Fig. 3.

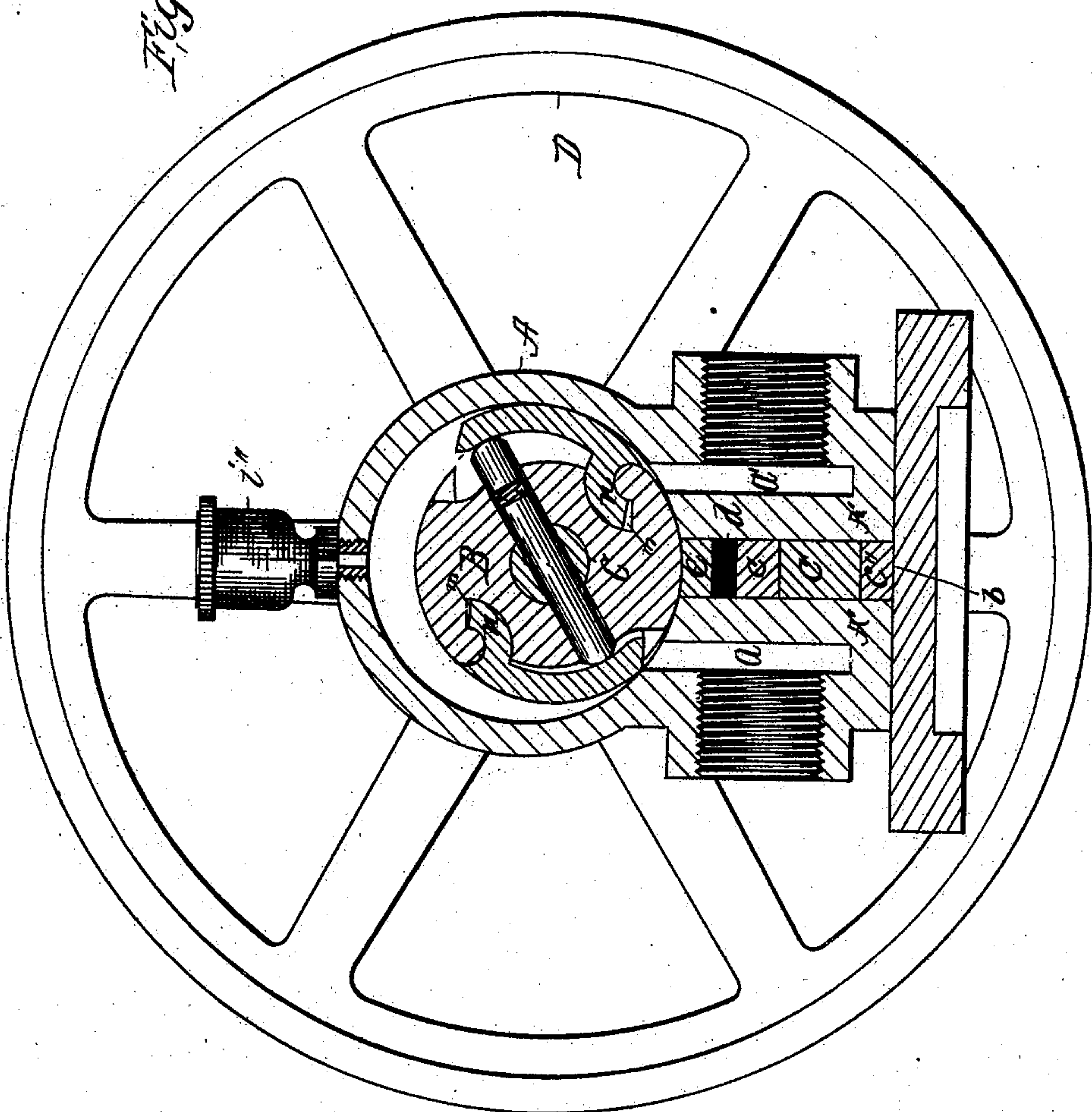


Fig. 5.



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(No Model.)

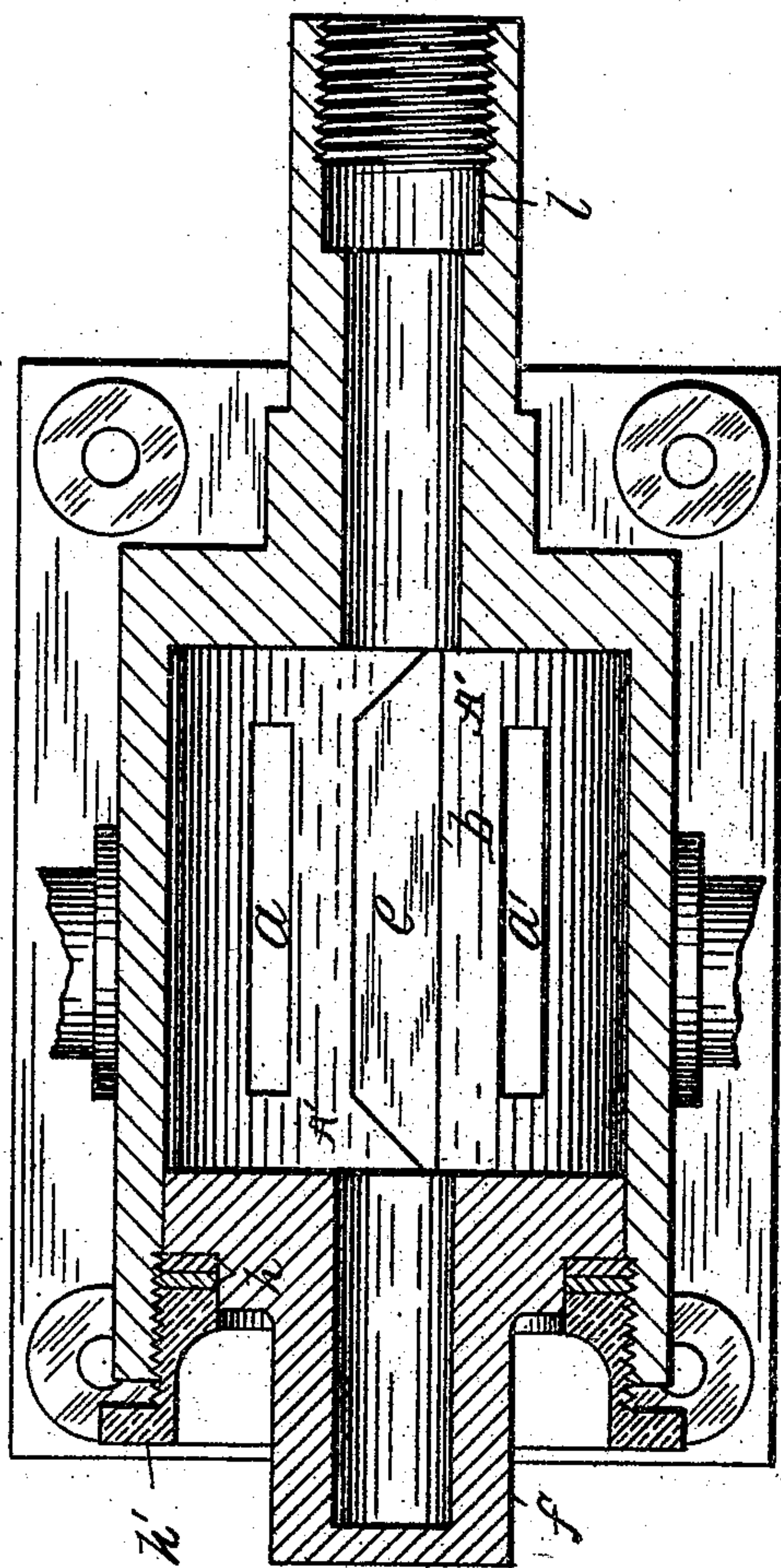
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Fig. 4.



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UNITED STATES PATENT OFFICE.

ERNST BOENING AND JONAS SJÖSTRÖM, OF YONKERS, NEW YORK,
ASSIGNORS TO JAMES SCOTT, OF SAME PLACE.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 501,864, dated July 18, 1893.

Application filed April 19, 1892. Renewed June 13, 1893. Serial No. 477,493. (No model.)

To all whom it may concern:

Be it known that we, ERNST BOENING, a citizen of the United States, and JONAS SJÖSTRÖM, a subject of the King of Sweden and Norway, both residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a full, clear, and exact specification.

Our invention relates to that class of rotary pumps in which two or more vanes are hinged, pivoted or otherwise fastened in a revolving drum, and are alternately forced outwardly and inwardly during the rotation of the drum.

The object of our invention is to obviate, as much as possible, the friction and binding action which constitutes one of the most objectionable features in machines of this type, heretofore used.

Another object is to construct the machine of as few parts and in as simple a manner as is consistent with effective operation; and further to make the vanes proper, readily removable and at the same time not liable to be deranged when in operation.

Suitable inlet and outlet ports are formed in the casing, one on one side of the point of closest approximation to the rotary drum, and the other port on the opposite side, their distance apart being such that the vanes serve to prevent the direct passage of the fluid from one port to the other.

Other features constitute a part of our invention, as will be fully set forth hereinafter and pointed out in the claims.

We will now proceed to describe the invention, having reference to the accompanying drawings, in which—

Figure 1 is a plan view of the machine, showing the clamping device for connecting the driving pulley with the shaft. Fig. 2 is a central vertical longitudinal section, taken on line 1—1 of Fig. 1, the drum being removed from the shaft. Fig. 3 is a transverse section on line 2—2 of Figs. 1 and 2. Fig. 4 is a horizontal section taken on line 3—3 of Fig. 2, showing the position of the ports and the slot containing the keys and packing, and Fig. 5 is a detail view of the telescoping casing containing the spring for actuating the vanes.

Similar letters of reference indicate like parts in all the figures.

A represents the cylindrical casing of the machine, constructed as shown with a lower extension A' through which ports *a a'* lead from the outside direct to the interior of said casing A. In this lower extension is also a slot *b* which contains wedge shaped keys *c c'* *c''* and a piece of flexible material *d*, such as rubber, leather, &c., on top of which is placed a metallic packing *e* for the purposes hereinafter described.

The drum B is supported within the casing of the shaft C, (shown in Fig. 3,) which shaft rests in eccentric bearings *f f'*, one, or the bearing *f'*, being cast integral with the casing A, and the other or bearing *f* is a separate piece in itself, and is turned to fit the bore of the casing. This piece *f* is the bearing proper and has a slight groove *g* which adapts it to be slid over a lug *g'*, which is secured to the interior of the casing A. The object of this is to prevent the said bearing *f* from revolving with the shaft. A flange *g''* is turned on the bearing *f* to permit of the packing *h* and packing ring *h'* fitting over it. The ring *h'* is threaded into the casing A, and allows all wear arising from the friction of the drum against the end or bearing *f* to be entirely taken up, without necessitating the removal of the bearing in order to repack.

Referring now to the packing *e*, it will be seen that its ends are cut at an angle of about forty-five degrees (shown in Fig. 4), this being to prevent any knocking or pounding of the vanes as they come in contact with said packing, and allowing the pump to be run at a higher rate of speed. As the vanes, in revolving, press the packing down, the cushion of leather or rubber acts as a spring and returns the packing to its normal position. And as the packing *e* becomes worn by the friction of the vanes it is again adjusted by simply turning the set screw *h''*, which presses against the wedge shaped key *c'*, which moves inwardly and lifts the key *c*, the leather or rubber cushion *d* and the packing *e*. By this arrangement of adjustable keys the packing *e* may always be kept perfectly parallel and close up against the vanes and drum B.

The manner of hinging or attaching the

vanes to the drum is as follows: Semi-circular shaped grooves *m* are cut lengthwise of the drum (see Fig. 3) and correspondingly semi-circular shaped tongues *n* are formed on the
 5 vanes, which adapt them to be slid into place from one end of the drum. By this construction the hinge proper is brought out nearer the circumferential line of the drum, thus reducing the friction of the vanes on the drum
 10 to the minimum.

Oil cups *i i'* are provided on the bearings *f* and *f'* for oiling the shaft, and similar cups *i''* and *j* are provided, the former *i''* for oiling the interior of the casing, and the latter *j* for
 15 oiling the spindle on which the driving pulley D runs when disconnected from the shaft. The pulley D is connected with the shaft by a forked clamp *j'* which screws over the end of the shaft, the forks entering slots *j''* and *k*
 20 in the pulley. As here shown, a screw bolt *k'* with a jam nut is screwed in the end of said clamp until it bears against the shaft, when the jam nut is screwed up tight against the end of the clamp, preventing the clamp and
 25 shaft from turning independently of each other.

The bolt *k'* together with the jam nut may be dispensed with, and an ordinary shaft key would answer the purpose of connecting the
 30 clamp with the shaft.

A stuffing box *l* is provided in the outer end of the bearing *f'* to prevent any leakage which would otherwise naturally occur around the shaft.

It will be seen that all points where wear 35 would arise from friction are made readily adjustable, without the necessity of removing the parts in or to repack or replace them with new parts.

Having now described our invention, we declare that what we claim is— 40

1. In a rotary pump the combination with the casing A and drum B mounted on a shaft C journaled eccentrically in bearings *f* and *f'*, of semi-circular shaped grooves *m* running 45 lengthwise of said drum, and vanes with correspondingly semi-circular shaped tongues *n* adapted to fit in said grooves, said grooves *m* and tongues *n* forming a hinge or pivot between said drum and vanes, substantially as 50 shown and described.

2. In a rotary pump the casing A provided with a lower extension A' in which suitable inlet and outlet ports are formed, a slot *b* also 55 formed in said extension, said slot containing the metallic packing *e*, cushion *d* formed of leather, rubber or other suitable material, also the wedge shaped keys *c c'* and *c''*, and set screws for operating said keys, substantially 60 as shown and described.

In testimony that we claim the foregoing we have hereunto set our hands this 8th day of April, 1892.

ERNST BOENING.
 JONAS SJÖSTRÖM.

Witnesses:

J. P. SANDERS,
 W. J. EARL.