No. 633,475. Patented Sept. 19, 1899.

R. J. NORTHAM.

HEAD FOR ROTARY PUMPS.

(Application filed Nov. 28, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

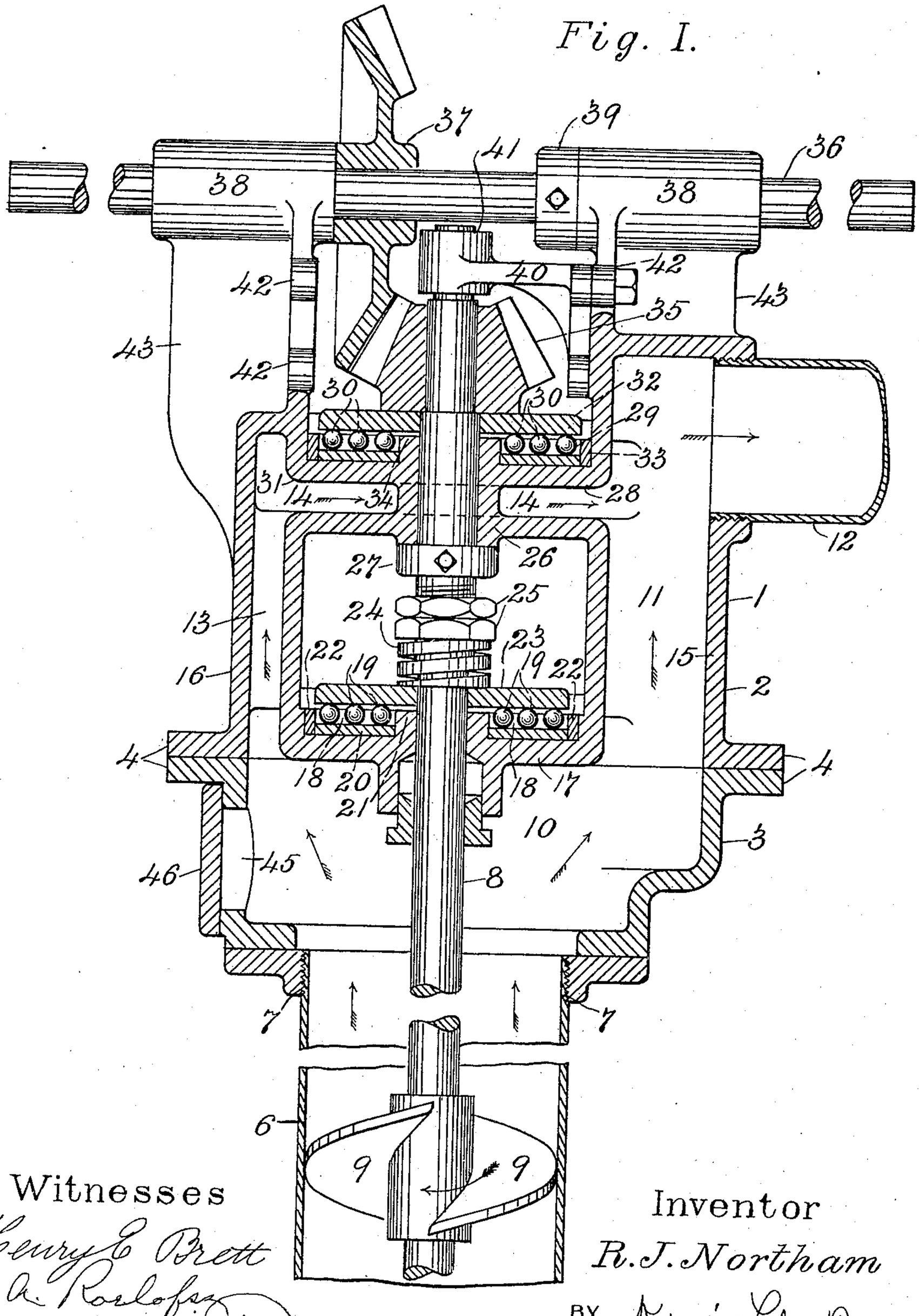

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Fig. III.

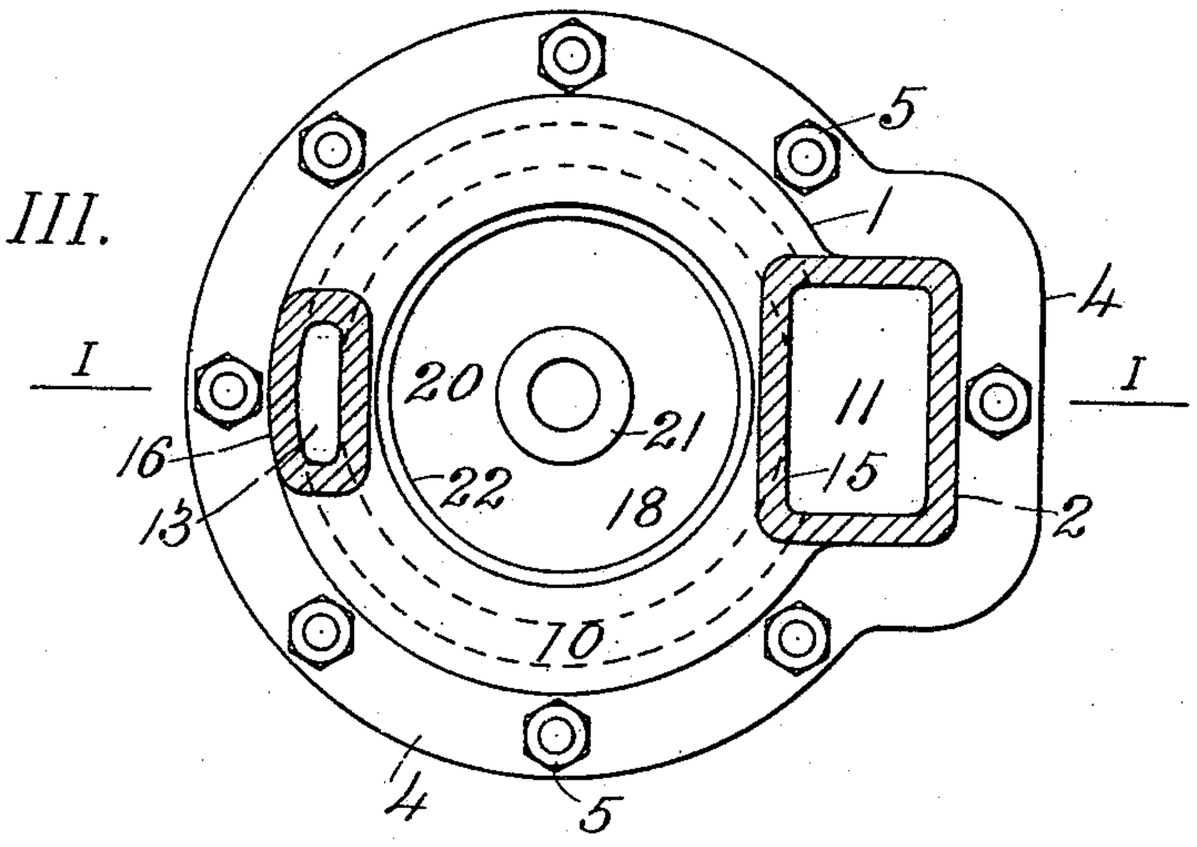
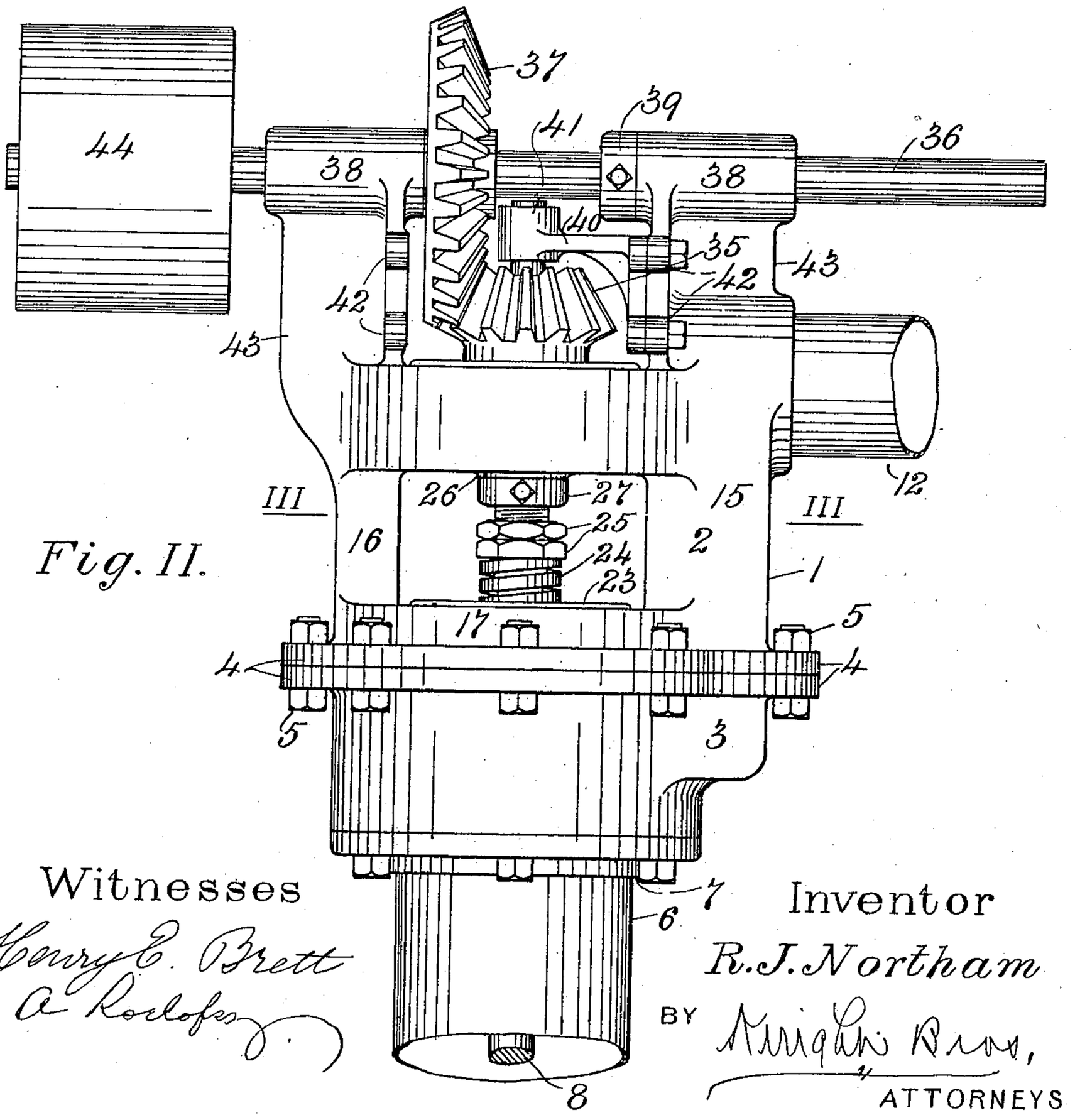


Fig. II.



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UNITED STATES PATENT OFFICE.

ROBERT J. NORTHAM, OF LOS ANGELES, CALIFORNIA.

HEAD FOR ROTARY PUMPS.

SPECIFICATION forming part of Letters Patent No. 633,475, dated September 19, 1899.

Application filed November 28, 1898. Serial No. 697,662. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. NORTHAM, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Heads for Rotary Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improved head and bearing intended more especially for rotary pumps, but which may be applied generally to where a vertical shaft is rotated; and my invention consists in certain features of novelty hereinafter described and claimed.

Figure I is in part a side elevation and in part a vertical section taken on line I I, Fig. III. Fig. II is a side elevation. Fig. III is a transverse section taken on line III III, Fig. II.

Referring to the drawings, 1 represents my improved head, formed of upper and lower sections 2 3, said sections being coupled together by means of flanges 4 and bolts 5.

6 represents a well casing or pipe to which the head 1 is secured, as shown at 7. The pipe may be screwed into the head, as shown in Fig. I, or may be otherwise secured.

8 represents a vertical shaft connected with the head and extending down into the pipe 6.

9 represents blades formed in screw shape and secured to the shaft 8, whereby when said shaft is rotated water is forced up through the pipe 6. There may be any number of blades 9, according to the depth of the well and the height to which the water has to be raised. The water passes upwardly through the pipe 6, as shown by arrows in Fig. I, and enters into a chamber 10, where it divides, the main portion of the water passing through a duct 11 and being discharged through a pipe 12, a portion of the water passing up through a leg 13 on the opposite side of the head and circulating freely through an annular chamber 14, where it again joins the main body of water passing upwardly through the duct 11.

15 represents the wall of the duct 11, and 16 the wall of the water-leg 13.

17 represents an annular plate which is a part of the casting forming the walls of the duct and water-leg, said plate forming a base for one of the bearings of my improved head.

18 represents an annular groove in the plate 17, in which antifriction-balls 19 rotate, the balls 19 resting upon a steel plate 20, placed in the bottom of the grooves 18, said balls being limited in their inward travel by a boss 21 on the plate 17.

22 represents an annular steel ring set into the grooves 18 and forming a side bearing for the outer balls, said ring taking the wear that would otherwise come upon the softer casting which forms the walls of the water-leg and duct.

23 represents a steel plate resting upon the balls 19.

24 represents a coil-spring surrounding the shaft 8, having its lower end resting upon the bearing-plate 23 and having jam-nuts 25 secured to the shaft 8, resting upon its upper end. The bearing just described supports a portion of the weight of the shaft 8, and the amount of weight or thrust that this bearing supports is governed by means of the spring 24 and the adjustment of the nuts 25.

26 represents a hub in the head 1, which forms a side bearing for the shaft 8 near its upper end, and 27 represents a set collar adjustably secured to the shaft 8, said collar limiting the upward thrust of the shaft 8 by coming in contact with the lower face of the hub 26.

The object in having the water circulate, as described, is to cool the bearing when the pump is working at a high speed, the water freely circulating on the under side of both the upper and lower bearings. The upper bearing is of the same construction as the lower bearing in so far as the bearing balls and plates are concerned, there being an annular bearing-plate 28, which is an integral part of the head 1, a groove 29 in said plate, in which bearing-balls 30 revolve, a lower steel bearing-plate 31, placed in said groove, an upper steel bearing-plate 32, resting upon the balls, an outer steel ring 33, against which the outer balls rotate, and an inner hub 34, limiting the inward movement of the balls.

35 represents a beveled gear secured near the upper end of the shaft 8.

36 represents a driving-shaft having a bev-

eled gear 37 mounted thereon, said gear meshing with the gear 35.

38 represents the journal-bearings of the shaft 36, said bearings being an integral part of the head 1.

39 represents a set collar on the shaft 36, which limits the movement of said shaft to the right.

40 represents a bracket having a hub 41, in which the upper end of the shaft 8 is journaled, said bracket preventing vibration of said shaft.

42 represents ears in the head 1, said ears being placed at each side of the gear 35 on a U-shaped extension 43 of the head. The object in having the ears 42 on both sides of the gear 35 is that the gear 37 may be interchanged with the collar 39 in case it is found desirable to operate the pump from that side of the gear 35.

44 represents a pulley for operating the drive-shaft 36.

45 represents a peep-hole leading into the water-chamber 10, said peep-hole being normally closed by a movable plate 46.

I claim as my invention—

1. In a pump-head the combination of the body of the head having a water-duct and a water-leg walls surrounding said duct and leg, a bearing-plate supported by said walls and having a groove therein, ball-bearings resting in said groove, upper and lower bearing-plates, an outer annular ring in said groove, a vertically-extending shaft, a spring surrounding said shaft and jam-nuts secured to said shaft, substantially as set forth.

2. In a pump-head the combination of the head proper, a vertically-extending shaft, suitable bearings for said shaft and a bracket secured to the pump-head forming a bearing by the upper end of the shaft, said bracket being interchangeable to either side of the pump-head, substantially as set forth.

In testimony of the above I hereby affix my signature in the presence of two witnesses.

ROBERT J. NORTHAM.

Witnesses:
FRANK S. LIVINGSTON,
JAS. E. KNIGHT.