J. HOLST.

PUMP.

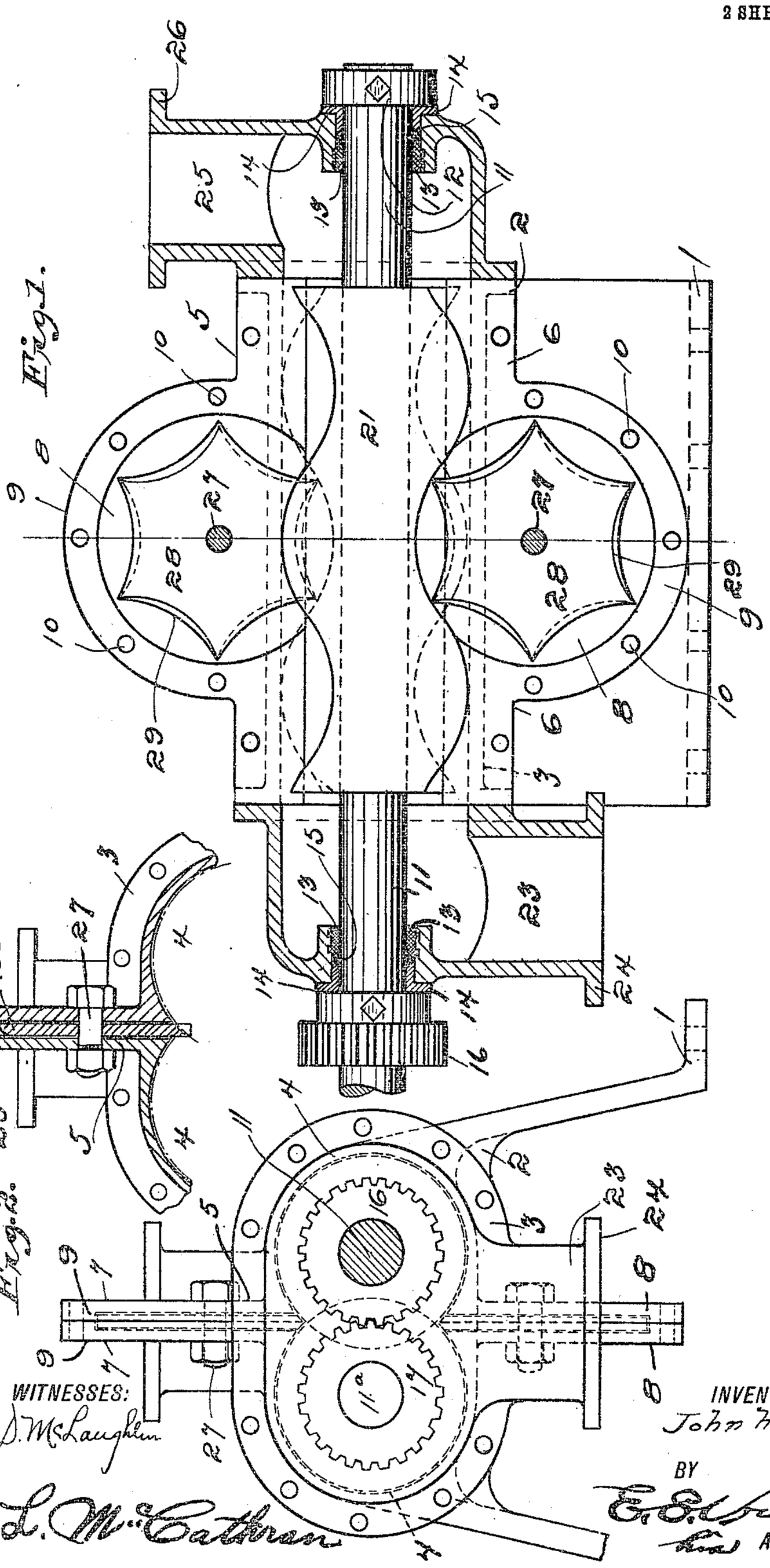
APPLICATION FILED APR. 15, 1909.

959,533.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 5.

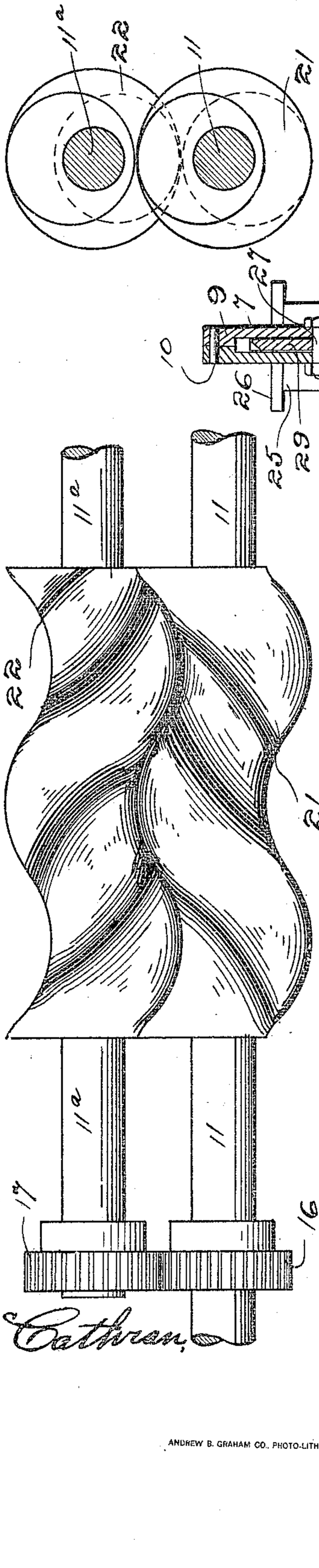

Fig. 4.

Fig. 6.

WITNESSES:

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PUMP.

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To all whom it may concern:

Be it known that I, JOHN HOLST, citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Pumps, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to pumps, and has specially in view a novel type of piston therefor which is formed of two screws arranged in the same horizontal plane and rotating toward each other so as to cause a constant flow of liquid from an intake pipe, through the cylinder in which said worms are mounted, and discharge the same through a discharge pipe at the end of the cylinder opposite to the intake pipe.

In connection with the foregoing, the invention also contemplates the employment of a novel type of sectional cylinder for the screw pistons which may be readily taken apart for cleaning or other purposes, said cylinder having mounted therein suitable disks which coöperate with the worm pistons to prevent any inert water being retained within the pump.

In carrying out the objects of the invention generally stated above it will, of course, be understood that the essential features thereof are susceptible of changes in details and structural arrangements, but one preferred and practical embodiment thereof is shown in the accompanying drawings, wherein—

Figure 1 is a central longitudinal sectional view of the improved pump. Fig. 2 is an end view thereof. Fig. 3 is a detail sectional view of the upper portion of the pump casing, showing one of the disks for agitating the inert water between the pistons. Fig. 4 is a detail plan view of the pump pistons. Fig. 5 is an end view of the same. Fig. 6 is a transverse sectional view taken on the line 6—6, Fig. 1.

Referring to said drawings by numerals, 1 designates an open base, the side members 2 of which form the rest for the piston cylinder 3. Said piston cylinder 3 is made in two sections, each being of duplicate construction and provided with a piston chamber 4 the inner longitudinal upper and lower edges 5 and 6 of which carry, respectively, an upstanding plate or flange 7 and a depending plate or flange 8, the longitudinal edges of each of which terminate in fastening flanges 9, the arrangement being such that when the two sections of the cylinder are brought together, the upstanding plates form a narrow chamber which is open to the cylinder, and the bottom or depending plates form a similar chamber which is also open to the cylinder. The fastening flanges 9 are held in detachable engagement by means of the bolts 10.

Piston shafts 11 and 11ª extend through the pump casing, one being in each piston chamber 4, and each being in the same horizontal plane. The piston shaft 11 extends beyond the outlet end of the casing and has mounted on its outer end a pulley 12 or the like adapted for connection with a suitable source of rotary power, not shown. As aforesaid, the two piston shafts 11 and 11ª are arranged in the same horizontal plane and have bearings in the ends of the said casing which may be in the form of Babbitt metal boxes 13, glands 14, and interposed packing 15. The said shafts project beyond the intake end of the pump casing and each carries a gear wheel 16—17, said gear wheels being held in mesh so that when power is applied to the piston shaft 11 the same will be communicated to shaft 11ª, thereby constantly rotating said shafts at the same speed, but in opposite directions. Each piston shaft has a worm 21—22 mounted on it, said worms being of substantially the same longitudinal length as the pump casing, and being so arranged that they will have a nesting engagement, as is shown in Fig. 4 with their spirals close together while being rotated, but yet sufficiently spaced apart to obviate any danger of contact therebetween.

The intake end of the cylinder terminates in an integral downwardly extending pipe 23 the end of which is provided with an annular flange 24 adapted for connection with a source of liquid supply, not shown. The discharge or outlet end of the cylinder is provided with an integral upwardly extending pipe 25 the flanged end 26 of which is adapted for connection with a discharge pipe, not shown.

A shaft 27 is mounted in each of the chambers formed between the upstanding and depending plates of the two sections of the cylinder or casing, said shafts each having mounted on it a disk 28 preferably star-shaped and having its edges 29 beveled. Said disks project down into the cylinder between each worm from opposite sides, as

is shown in Figs. 1 and 6 of the drawings, and at approximately their central portions.

In operation, the cylinder is primed in the usual manner, and power is applied to the piston shaft 11 which communicates the same to the piston shaft 11ª to cause said shafts to operate in opposite directions, thereby causing the worms to rotate toward one another and draw liquid through the intake end of the cylinder and discharge the same through the outlet end, as will be obvious. It has been found in practical operations of pumps of this character that owing to the spiral shape of the worms, an opening or pocket is formed at their central portions—that is between each worm, which retains some of the liquid in an inert state, and in order to agitate this liquid, the disks described in the foregoing are provided. The said disks project into the pockets or openings, and as they are being constantly rotated owing to their edges being in contact with the worms, it will be seen that the liquid in said pockets or openings will be constantly acted upon by the disks, thereby causing the same to be forced from the pockets.

It will, of course, be understood that while in the foregoing description particular stress has been laid on the star-shape construction of the disks, the same may be of any other convenient or desirable shape.

What I claim as my invention is:—

1. A pump comprising a cylinder having an inlet pipe and a discharge pipe, said cylinder being provided with oppositely arranged piston chambers, a shaft extending through each chamber and arranged in the same horizontal plane, a worm mounted on each shaft, said worms intermeshing, and upper and lower disks mounted in the cylinder and projecting between the said worms.

2. A pump comprising a cylinder having an inlet pipe and a discharge pipe, said cylinder being provided with oppositely arranged piston chambers, a shaft extending through each chamber and arranged in the same horizontal plane, a worm mounted on each shaft, said worms intermeshing, an upper and a lower disk projecting between said worms and rotated thereby, and means for rotating said shafts in opposite directions.

3. A pump comprising a cylinder having an inlet pipe and a discharge pipe, a shaft extending through each side of said cylinder, a worm mounted on each shaft and held in spaced relation, said worms intermeshing, an upper and a lower disk projecting between said worms, and means for rotating said shafts in opposite directions.

4. A pump comprising a cylinder provided with side chambers, a shaft extending through each chamber, a worm mounted on each shaft, said worms intermeshing, said shafts being provided with means for causing them to rotate in opposite directions, and disks carried by said cylinder and projecting between said worms and being rotated thereby.

5. A pump comprising a cylinder formed of two sections, each section being provided with a longitudinally arranged piston chamber, and also provided, respectively with an upstanding and a depending plate, whereby when the sections of the cylinder are together, upper and lower chambers are provided, a shaft extending through each side chamber of the cylinder, a worm on each shaft and extending longitudinally of its chamber, said worms being held in spaced relation and intermeshing, means for rotating said shafts, and a disk mounted in each upper and lower chamber of the cylinder and projecting between said worms and adapted to contact therewith.

6. A pump comprising a cylinder having an inlet pipe and a discharge pipe, said cylinder being also provided with longitudinally extending oppositely disposed piston chambers and with an upper and a lower chamber communicating with the central portion of the cylinder, a shaft extending through each piston chamber, a worm mounted on each shaft within the piston chambers so that a space will be formed between them and said worms adapted to intermesh, and a disk mounted in the upper chamber and the lower chamber and projecting between the said worms.

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

JOHN HOLST.

Witnesses:
H. C. SCHROEDER,
F. P. SCHROEDER.