E. S. BENNETT.

SCREW PUMP.

APPLICATION FILED APR. 6, 1908. RENEWED SEPT. 14, 1909.

950,563. Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.

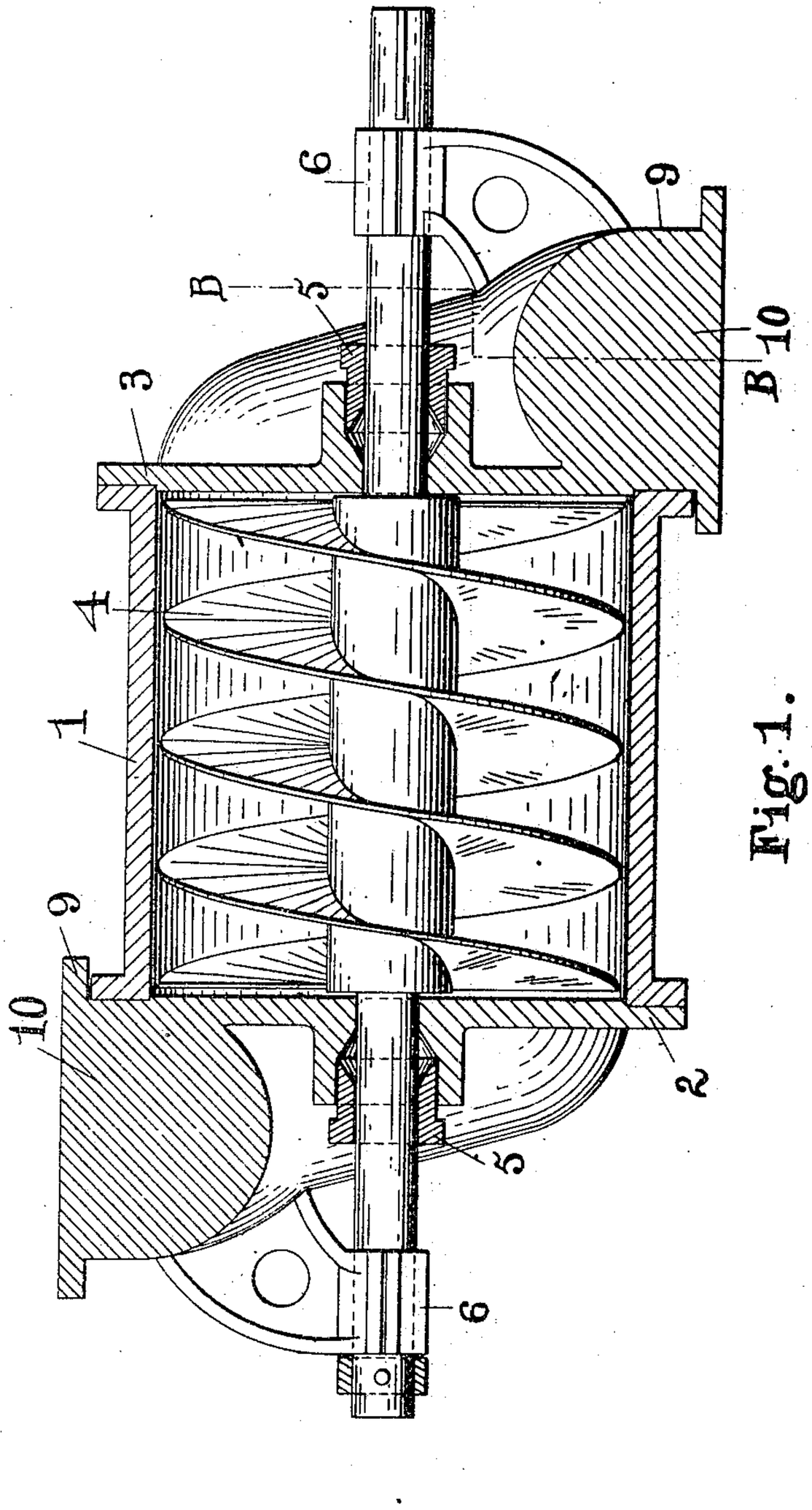

Fig. 1.

Attest:

Edwd. L. Tolson.

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Inventor:

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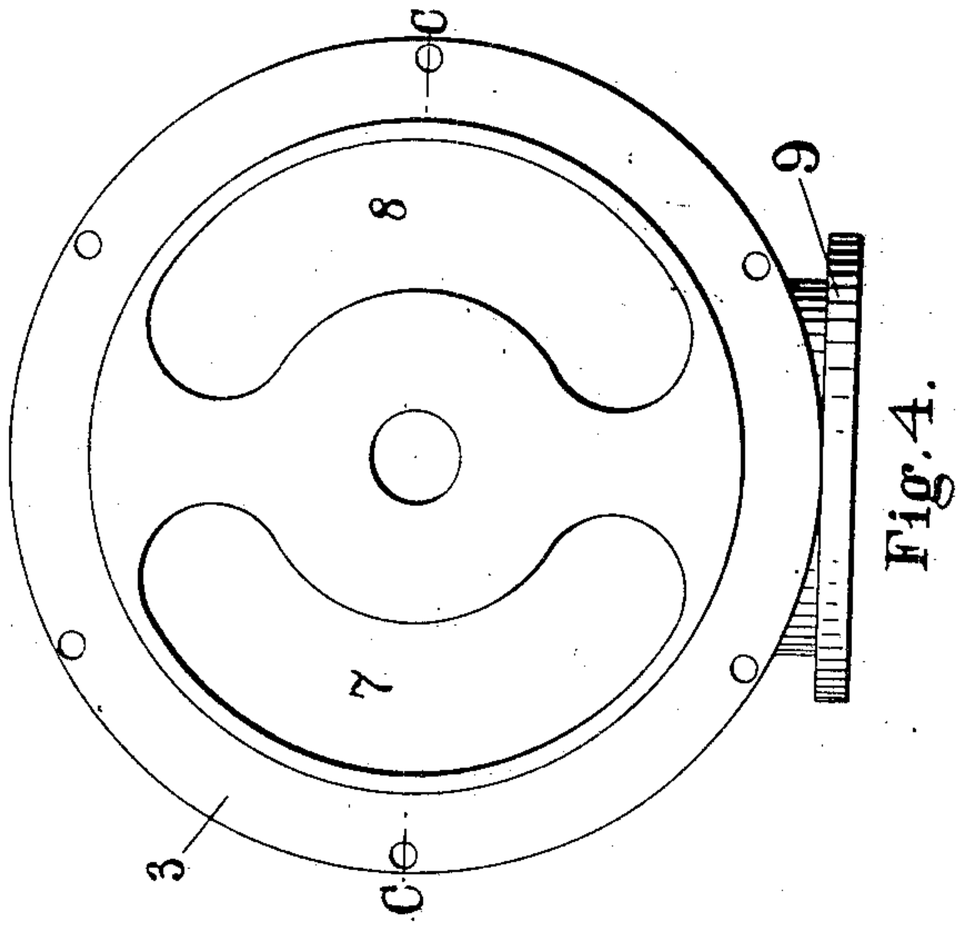

Fig. 4.

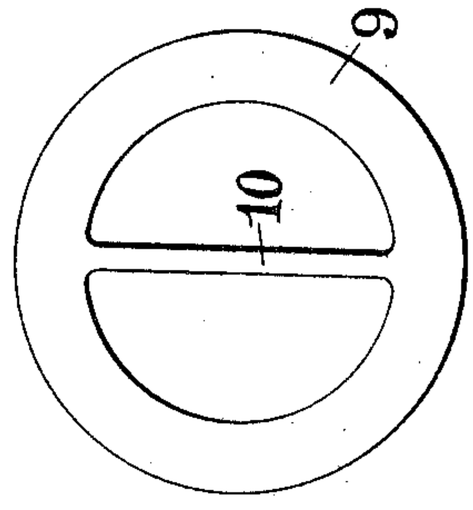

Fig. 5.

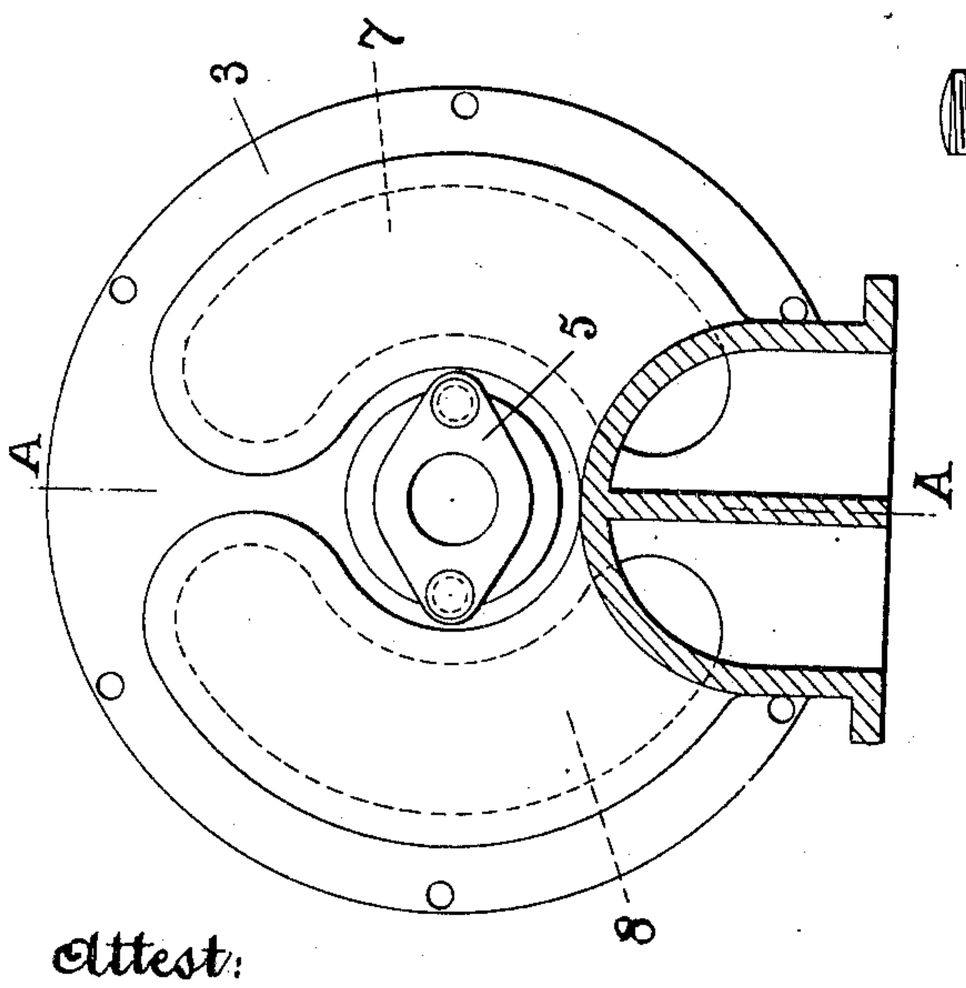

Fig. 2.

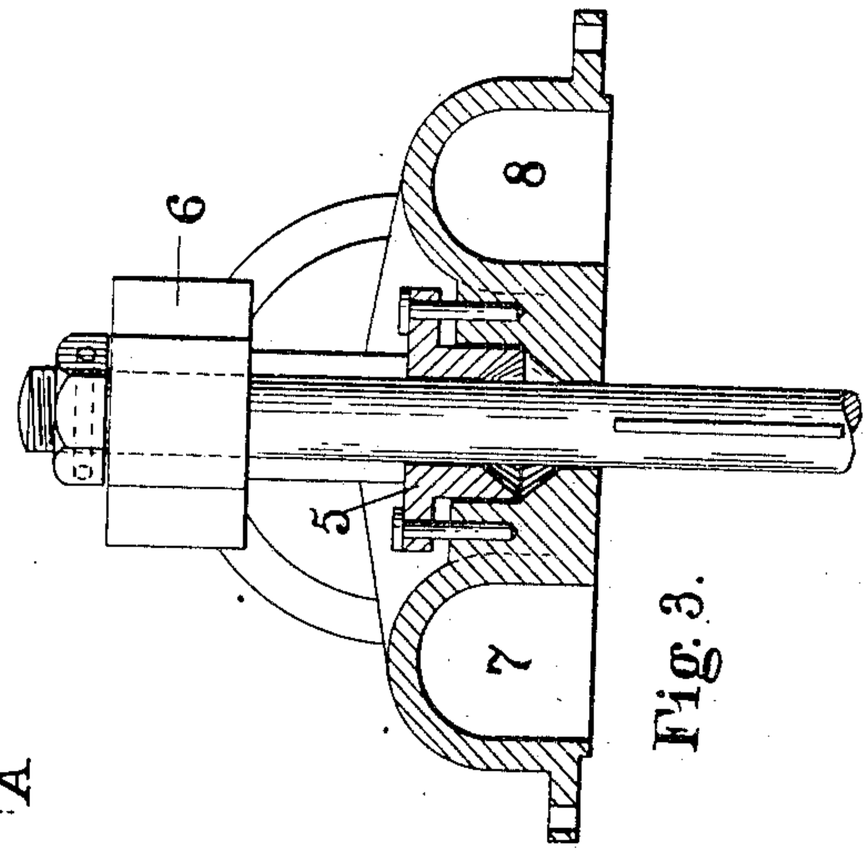

Fig. 3.

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UNITED STATES PATENT OFFICE.

ERASTUS S. BENNETT, OF NEW YORK, N. Y., ASSIGNOR TO CONTINENTAL ENGINEERING COMPANY, OF NEW YORK, N. Y.

SCREW-PUMP.

950,563. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed April 6, 1908, Serial No. 425,502. Renewed September 14, 1909. Serial No. 517,747.

To all whom it may concern:

Be it known that I, ERASTUS S. BENNETT, citizen of the United States, residing at New York, N. Y., have invented certain new and useful Improvements in Screw-Pumps, of which the following is a specification.

My invention relates to screw pumps, and the object thereof is to secure an effective and durable pump and one which may be constructed at low cost.

The invention consists in the features of construction and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view on line A—A of Fig. 2; Fig. 2 is a section on line B—B of Fig. 1; Fig. 3 is a section on line C—C of Fig. 4; Fig. 4 is a face view of one of the heads removed; and Fig. 5 is a face view of one of the double conduits communicating with the heads.

In these drawings 1 is the cylinder of the pump provided with the heads 2 and 3, and 4 is the double threaded screw the shaft of which passes through stuffing boxes 5 in the heads. 6 are the bearings for the said shaft.

As will be seen the screw is double threaded and of uniform pitch, and this provides two intaking cutters and two discharging blades. The heads of the cylinder are duplicates of each other, one being used as an inlet and the other as an outlet. Each head is provided with two openings 7 and 8 each in the form of an arc of a circle, the outer diameter being substantially that of the inner diameter of the cylinder. Attached to each head is a pipe 9 which has an interior web 10 therein which divides said pipe into two conduits. Said pipes communicate with the openings in each head and are adapted to receive the induction and discharge pipes respectively.

It is thought the operation of the device will be clear from the above. The water enters one of the pipes 9, flows through the arc shaped openings 7 and 8 in one head and is caught by the cutting blades of the screw 4 and forced by said screw to the other end of the cylinder, where it passes through the openings 7 and 8 in the head 3 into and through pipe 9 to the discharge.

In operation, the screw being double, is exactly balanced, the two cutting ends operating at precisely opposite sides, as do also the two discharging ends. The uniform pitch of the screw prevents loss of power due to varying pitch or pitches in the same pump. Of course the volume of water discharged can be varied by changing the pitch of the screw, the larger volume being obtained by greater pitch (within certain limits) of the screw. The force or head against which the pump will discharge can also be governed by the pitch of the screw, the greater force being obtained by the lesser pitch (also within limits). Additional force is also imparted by increasing the speed of the screw, since the water in each thread space acts as a packing and obstruction to back pressure.

By this construction I am able to secure a close cut off (without actual contact of metal) at either end. The stuffing boxes are easy to get at, the journals are well outside and away from the water. The screw need not fit closely in the cylinder, that is to say no actual contact of moving parts is necessary except that of the shaft in its bearings.

In construction very little machine work is required, the weight and size of the pump is exceeding small as compared to the volume of water handled and for these reasons an exceedingly low cost and obviously very durable pump is produced. None of the force is wasted either by friction of metal, movement of numerous parts, or through the conversion of the power into centrifugal force to be largely lost in packing a large body of water against the inside of a comparatively large circular case as in centrifugal pumps. In this case the power is applied directly to the water, and is exerted to push it forward in the direction intended, or directly to the discharge. Hence, a given body of water can be moved by this pump with much less power than the same can be moved with any of the pumps in ordinary use.

It will be noted that the screw is of the full length of the casing and acts on what may be termed for convenience a "plug" of water extending from head to head of said casing. The end of the screw at the inlet end has a shearing or positive cut off action in connection with the surface of the head cutting off successively bodies of the water from the inlet in the successive revolutions of the screw. The division walls or divided inlet and outlets play an important part not

only in connection with a double screw but they serve to prevent whirling or eddy currents of the water at the inlets and outlets.

I claim as my invention:—

1. A pump comprising a cylinder having each head provided with two arc-shaped openings, and a central opening, a double threaded screw in the cylinder having both ends of each thread working closely against said arc-shaped openings, a shaft for the screw passing through the central openings in the heads, and inlet and discharge pipes connected to the heads, one of the blades of said screw being displaced in relation to the other blade.

2. A pump comprising a cylinder having each head provided with two arc-shaped openings and a central opening, a double threaded screw in said cylinder having both ends of each thread working closely against said arc-shaped openings, a shaft for the screw passing through the central openings in the heads, and an inlet and discharge pipe communicating with the openings in the said heads, each pipe having a central web therein dividing the pipe into two conduits, one of the blades of said screw being displaced in relation to the other blade.

3. A pump comprising a cylinder having a head at each end with a plurality of inlet openings in one and a plurality of outlet openings in the other, a screw within the cylinder having a plurality of threads displaced circumferentially in respect to each other, one thread acting in connection with one inlet and outlet while simultaneously the other thread acts in connection with the other inlet and outlet, the ends of the screw threads working close against the said heads, substantially as described.

4. In combination in a pump a casing having a head at each end with a plurality of openings leading through the same, a shaft, a double screw in the casing on the shaft and supply and delivery pipes having division walls therein forming spaces communicating each with one of the openings in the heads, said supply and delivery pipes being counterparts of each other and each having an external bearing for the shaft of the screw, substantially as described.

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

ERASTUS S. BENNETT.

Witnesses:

MYRON L. JUSTIN,

CLINTON D. GANSE.