T. A. BATEMAN.

CENTRIFUGAL PUMP.

APPLICATION FILED JAN. 15, 1917.

1,250,267.

Patented Dec. 18, 1917.

2 SHEETS—SHEET 1.

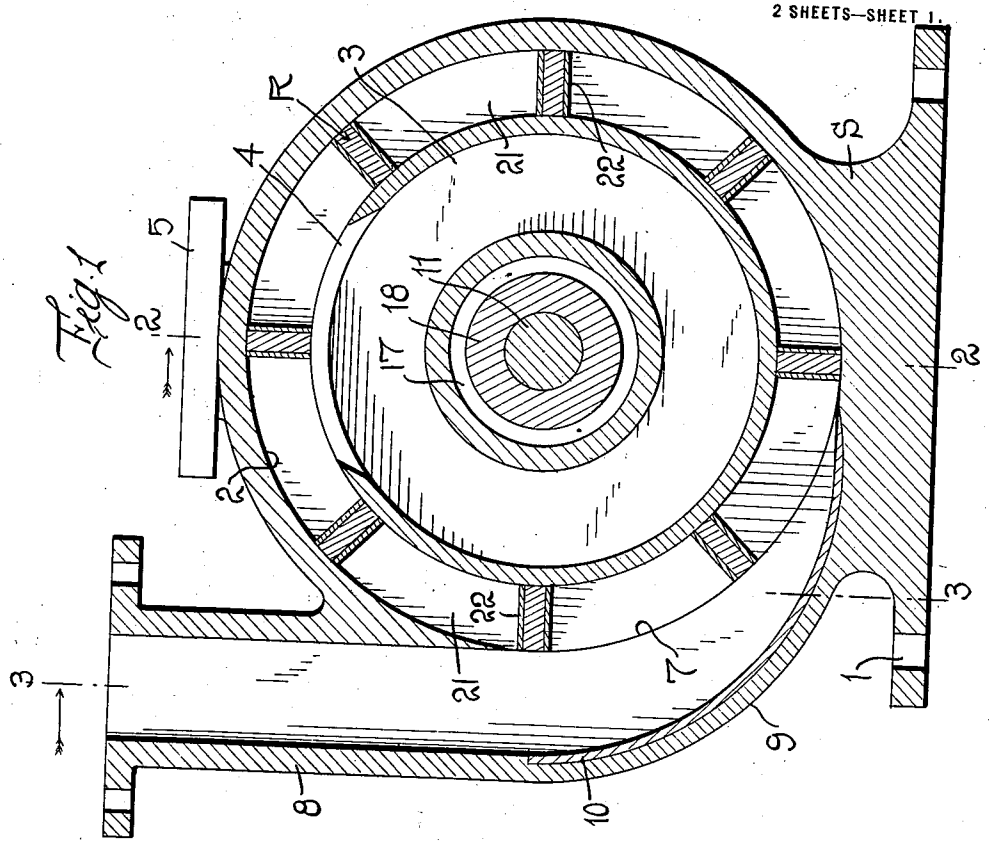


Fig. 1

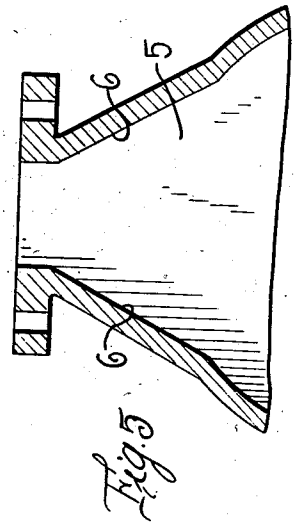


Fig. 5

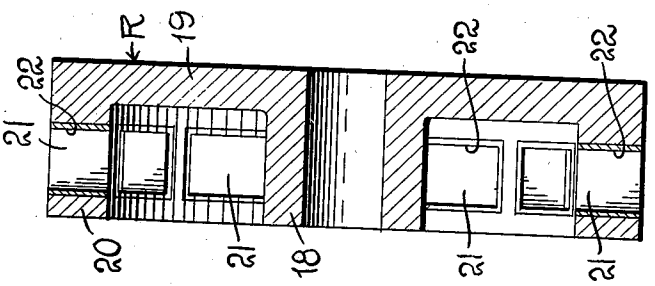


Fig. 4

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2 SHEETS—SHEET 2.

Fig. 2

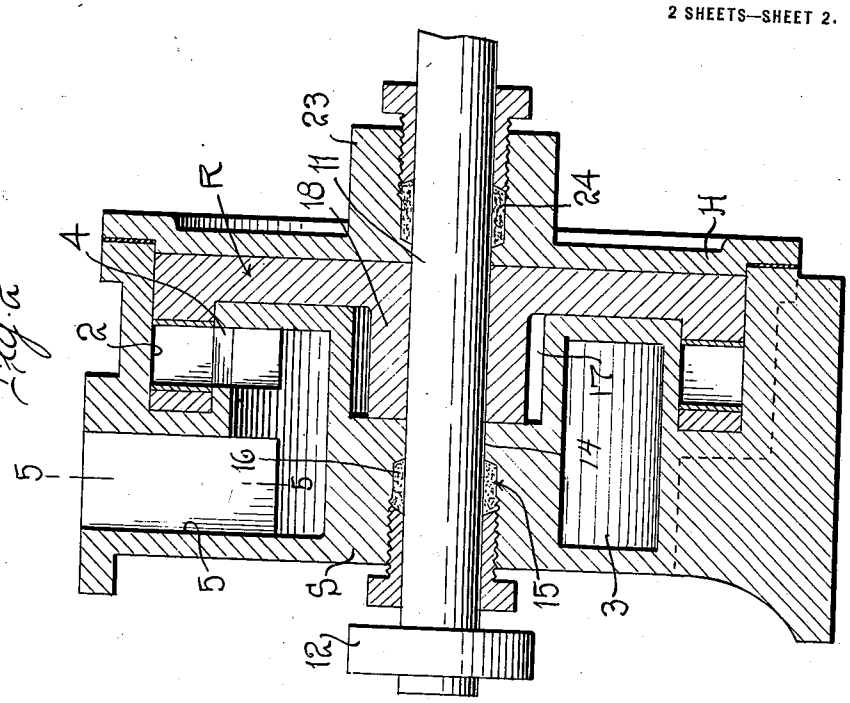
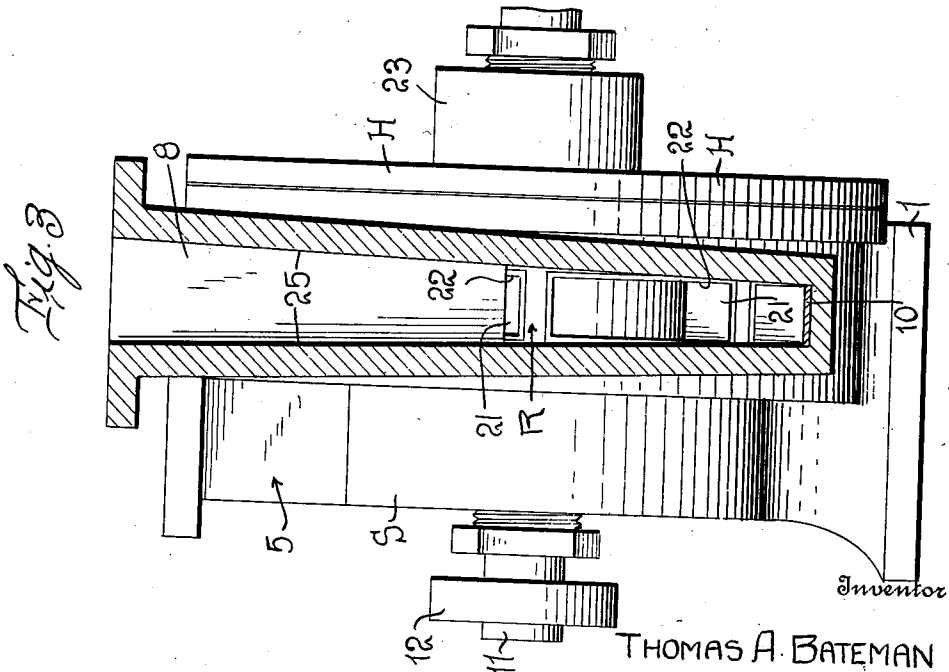


Fig. 3



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UNITED STATES PATENT OFFICE.

THOMAS A. BATEMAN, OF PORTLAND, OREGON.

CENTRIFUGAL PUMP.

1,250,267. Specification of Letters Patent. Patented Dec. 18, 1917.

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To all whom it may concern:

Be it known that I, THOMAS A. BATEMAN, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Centrifugal Pumps, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in centrifugal pumps and it is an object of the invention to provide a novel and improved device of this general character wherein the operating shaft for the rotor is effectively protected against sand or the like.

It is also an object of the invention to provide a novel and improved centrifugal pump wherein the stator and the rotor are subjected to a minimum of wear especially from the action of the fluid passing through the stator.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved centrifugal pump whereby certain important advantages are attained and the device is rendered simpler, less expensive and otherwise more convenient and advantageous for use, all as will be hereinafter more fully set forth.

The novel features of the invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein—

Figure 1 is a vertical sectional view taken through a pump constructed in accordance with an embodiment of my invention;

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1 looking in the direction of the arrow;

Fig. 3 is a sectional view taken substantially on the line 3—3 of Fig. 1 looking in the direction of the arrow;

Fig. 4 is a transverse sectional view taken through the rotor as herein embodied; and

Fig. 5 is a sectional view taken substantially on the line 5—5 of Fig. 2.

As disclosed in the accompanying drawings, S denotes a stator adapted to be anchored in applied position, as at 1, in any desired manner and which is provided in one of its faces with an annular recess 2, the outer wall of which being of a diameter in excess of the inner wall. The stator S is also provided with an annular chamber 3 arranged inwardly of but concentric to the recess 2, said chamber underlying said recess and extending a predetermined distance therebeyond, as indicated more particularly in Fig. 2 of the accompanying drawings.

The outer wall of the chamber 3 at the upper part thereof is provided with an elongated opening or port 4 affording communication with the annular recess 2, and said annular chamber 3 at its upper part is in communication with the inlet port 5, the end walls 6 of which converge upwardly, as is more particularly illustrated in Fig. 5 of the drawings.

The lower portion of the outer wall of the annular recess 2 at one side of its vertical center is cut out, as indicated at 7, for a distance substantially equal to one-quarter of its peripheral dimension and which affords communication with the vertically disposed outlet 8. The outer wall of the outlet 8 adjacent the portion 7 is arranged on a predetermined curvature, as indicated at 9, toward the lowermost portion of the recess 2, and said curved portion 9 is provided with a lining 10 of suitable material which may be readily replaced as required or when said lining has become unduly worn by the action of the water thrown thereagainst before passing through the outlet 8.

Disposed through and rotatably supported by the stator S at the axial center of the recess 2 and the chamber 3 is the shaft 11 which extends beyond opposite sides of my improved pump and is adapted to be provided at either side of the device, as indicated at 12, with suitable means whereby the requisite rotation may be imparted to the shaft 11.

The opposite end portions of the opening 14 in the stator S through which the shaft 11 is directed, are enlarged, the enlarged portion 15 having suitable packing 16 arranged therein for a purpose which is believed to be self-evident, while the second or inner enlarged portion 17 has arranged therein the hub 18 of the rotor R, said hub 18 being positioned at one side of said rotor and suitably affixed to the shaft 11 so that said shaft 11 and rotor R will be caused to rotate in unison.

The rotor R comprises a cylindrical plate or disk 19 having its peripheral portion provided with an inwardly directed annular

flange 20 adapted to snugly fit within the annular recess 2.

The flange 20 is provided with an annular series of circumferentially disposed openings 21 of predetermined dimensions, the end walls of each of said openings 21 being substantially radial of the axial center of the rotor R or the annular recess 2.

The water or other fluid admitted within the chamber 3 through the inlet 5 will rise or pass through the opening 4 and into the openings 21 of the rotor R, and the travel of said rotor will result in the water or other fluid carried by the rotor within the openings 21 during the rotation of said rotor R, to be thrown through the outlet 8.

It has been fully demonstrated in practice that by having the end walls of the openings 21 radially disposed, and flat and unobstructed, a minimum of wear is imposed upon the rotor R. It is to be noted that the fluid contacts only with the walls of the openings of the rotor and for this reason I find it of particular advantage to seat within each of the openings 21 a removable lining 22 so that should the same become unduly worn by the action of the water, it can be readily replaced and thereby obviate the necessity of requiring the substitution of a new rotor.

H denotes a removable head adapted to be suitably secured to the stator S to close the side thereof with which the rotor R coacts, and as is particularly illustrated in Fig. 2, it will be noted that the shaft 11 is also directed through the head H and for which reason the head H is provided with the outstanding annular flange 23 concentric to the shaft 11 so that suitable packing 24 may be employed.

It is also to be noted that the side walls 25 of the outlet 8 diverge upwardly so that the travel of the water or other fluid therethrough may be materially facilitated.

It is thought to be self-evident that the particular mounting of the rotor R as afforded by the hub 18 disposed within the enlarged portion 17 of the opening 14 in the stator S will effectively protect the shaft 11 against sand, grit or the like. It is also thought to be self-evident that my improved pump obviates end thrust being imposed upon the rotor and also avoids the necessity of providing openings for the water balance as is generally required in pumps of this particular type.

From the foregoing description, it is thought to be obvious that a centrifugal pump constructed in accordance with my invention is of an extremely simple and comparatively inexpensive nature and is particularly well adapted for use by reason of the convenience and facility with which it may be assembled, and it will also be obvious that my invention is susceptible of some change and modification without material departure from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice, except as hereinafter claimed.

I claim:

1. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, and a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of openings.

2. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, and a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of circumferentially disposed openings.

3. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, and a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of circumferentially disposed openings, the ends of said openings being substantially radially of the axial center of the rotor.

4. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of openings, and a removable lining insertible within each of the openings.

5. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, a rotor, said rotor being provided with an annular flange

seated within the annular recess of the stator and provided with a series of openings, and a removable lining positioned within the outlet of the stator adjacent its point of communication with the annular recess of the stator.

6. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of openings, and a shaft disposed through the stator and the rotor and to which the rotor is fixed, said rotor being provided with an inwardly directed hub, said stator being provided with a recess to receive said hub.

7. A pump of the character described comprising a stator provided with an annular chamber and with an annular recess surrounding said chamber, a shaft disposed through the rotor at the axial center of the annular recess, a rotor fixed to said shaft and provided at its peripheral portion with a laterally disposed annular flange positioned within the annular recess of the stator, said flange being provided with a plurality of openings, said stator having a port affording communication between the annular chamber and the annular recess and provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess.

8. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess at the lower portion thereof and at one side of the vertical center of said annular recess, and a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of openings.

9. A pump of the character described comprising a stator having an annular chamber and an annular recess in communication with said chamber at the upper portion of the annular recess, said stator being provided with an inlet in communication with the chamber and with an outlet in communication with the annular recess, and a rotor, said rotor being provided with an annular flange seated within the annular recess of the stator and provided with a series of openings.

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

THOMAS A. BATEMAN.

Witnesses:
E. M. SCHARF,
F. S. HIGLEY.