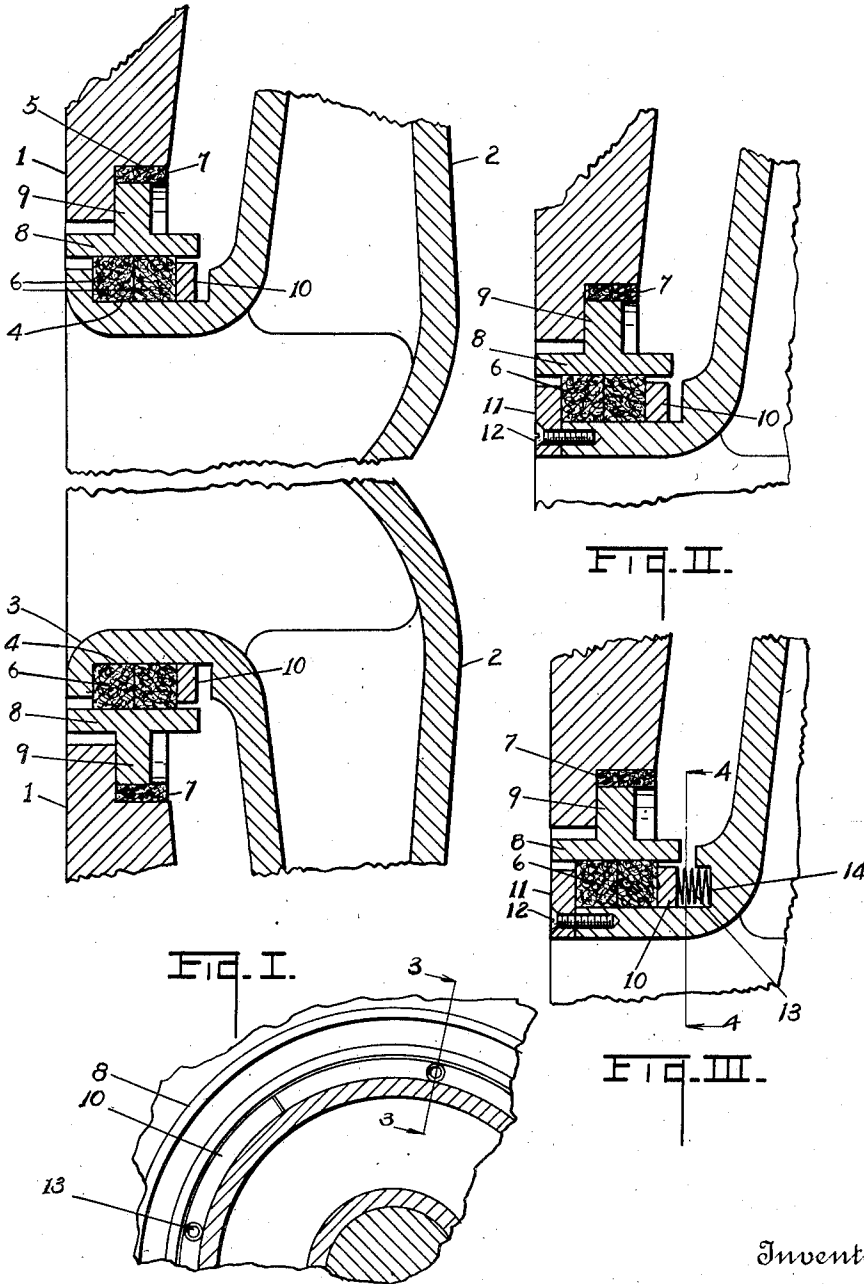


P. G. BOGDANOFF.
CENTRIFUGAL PUMP.
APPLICATION FILED JAN. 3, 1920.

1,369,379.

Patented Feb. 22, 1921.



Witnesses
Lenny Gilman
Fred Ullrich

FIG. IV.

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UNITED STATES PATENT OFFICE.

PAUL G. BOGDANOFF, OF BATTLE CREEK, MICHIGAN.

CENTRIFUGAL PUMP.

1,369,379.

Specification of Letters Patent.

Patented Feb. 22, 1921.

Application filed January 3, 1920. Serial No. 349,257.

To all whom it may concern:

Be it known that I, PAUL G. BOGDANOFF, a citizen of Russia (who have applied for and taken out first citizenship papers in the United States,) residing at Battle Creek, county of Calhoun, State of Michigan, have invented certain new and useful Improvements in Centrifugal Pumps, of which the following is a specification.

This invention relates to improvements in centrifugal pumps.

The main objects of this invention are:

First, to provide an improved centrifugal pump of high efficiency.

Second, to provide in a centrifugal pump an improved packing which is effective and at the same time, simple and durable.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a longitudinal detail section of a centrifugal pump embodying the features of my invention, only a portion of the pump being shown.

Fig. II is a longitudinal detail section of a modified form of my invention.

Fig. III is a longitudinal detail section of another modification of my invention on a line corresponding to line 3—3 of Fig. IV.

Fig. IV is a longitudinal detail transverse section on a line corresponding to line 4—4 of Fig. III.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, 1 represents the casing and 2 the impeller of a centrifugal pump, such portions only being shown as are deemed necessary to illustrate an adaptation of my improvements.

The impeller 2 is provided with an annular flange-like projection 3 at its inlet end having an annular channel-like packing seat 4 therein.

The casing 1 is provided with an annular shoulder-like packing seat 5 opposed to the

packing seat of the impeller. The annular packing rings 6 are arranged in the seat 4 to project therefrom. A packing 7 is arranged in the seat 5 of the casing.

A floating annular packing member 8 has an annular rib 9 on its outer side disposed in the casing packing seat and coacting with the packing 7. The face of the packing member 8 coacts with the packing 6 on the impeller.

A follower ring 10 is arranged on the impeller at the inner side of the packing 6 to support it on its inner side and is subject to the pressure on the discharge side of the impeller.

In the embodiment shown in Fig. II, the outer flange 11 of the impeller packing seat is removably mounted by means of the screws 12. This permits the assembling of the follower ring and the packing without splitting the same.

In the embodiment shown in Fig. III, the follower member 10 is supported by springs 13 arranged in seats 14 in the impeller. This insures that the follower is always in position to receive pressure.

My improved pump is of high efficiency and is very durable and economical to produce. I have not illustrated or described certain other modifications or adaptations which I contemplate as I believe the disclosure made will enable those skilled in the art to which my invention relates to embody or adapt the same as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a centrifugal pump, the combination of a rotary impeller having an annular flange at one end with a peripheral channel-like packing seat therein, a casing having an annular packing seat opposed to said seat of said impeller, a floating annular packing member having an annular rib on its outer side disposed in said casing packing seat, resilient packings arranged in said impeller and casing packing seats to coact with said floating packing member, a follower ring arranged on said impeller packing seat at the inner side of said packing therein, and springs urging said follower against the packing.

2. In a centrifugal pump, the combination of a rotary impeller having an annular flange at one end with a peripheral channel-like packing seat therein, a casing having an annular packing seat opposed to said

seat of said impeller, a floating annular packing member having an annular rib on its outer side disposed in said casing packing seat, resilient packings arranged in said
 5 impeller and casing packing seats to coact with said floating packing member, and a follower ring arranged on said impeller packing seat at the inner side of said packing therein.

10 3. In a centrifugal pump, the combination of a rotary impeller having an annular flange at one end with a peripheral channel-like packing seat therein, a casing having an annular packing seat opposed to said seat
 15 of said impeller, a floating annular packing member having an annular rib on its outer side disposed in said casing packing seat, and resilient packings arranged in said impeller and casing packing seats to coact
 20 with said floating packing member.

4. In a centrifugal pump, the combination of a rotary impeller having a channel-like packing seat therein, a casing having an annular packing seat opposed to said seat
 25 of said impeller, a floating annular packing member engaging said casing packing seat, packings arranged in said impeller and casing packing seats to coact with said floating packing member, a follower arranged
 30 on said impeller packing seat in the inner

sides of said packings therein, and springs urging said follower against said packing.

5. In a centrifugal pump, the combination of a rotary impeller having a channel-like packing seat therein, a casing having
 35 an annular packing seat opposed to said seat of said impeller, a floating annular packing member engaging said casing packing seat, packings arranged in said impeller and casing packing seats to coact with said floating
 40 packing member, and a follower arranged on said impeller packing seat in the inner sides of said packings therein.

6. In a centrifugal pump, the combination of a rotary impeller having a channel-like packing seat therein, a casing having
 45 an annular packing seat opposed to said seat of said impeller, a floating annular packing member engaging said casing packing seat, and packings arranged in said impeller and casing packing seats to coact
 50 with said floating packing member.

In testimony whereof I have hereunto set my hand and seal in the presence of two witnesses.

PAUL G. BOGDANOFF. [L. S.]

Witnesses:

VADA E. MATER,
 EDNA S. MAGUIRE.