

No. 860,668.

PATENTED JULY 23, 1907.

C. H. JAEGER.
ROTARY PUMP.

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Fig.1.

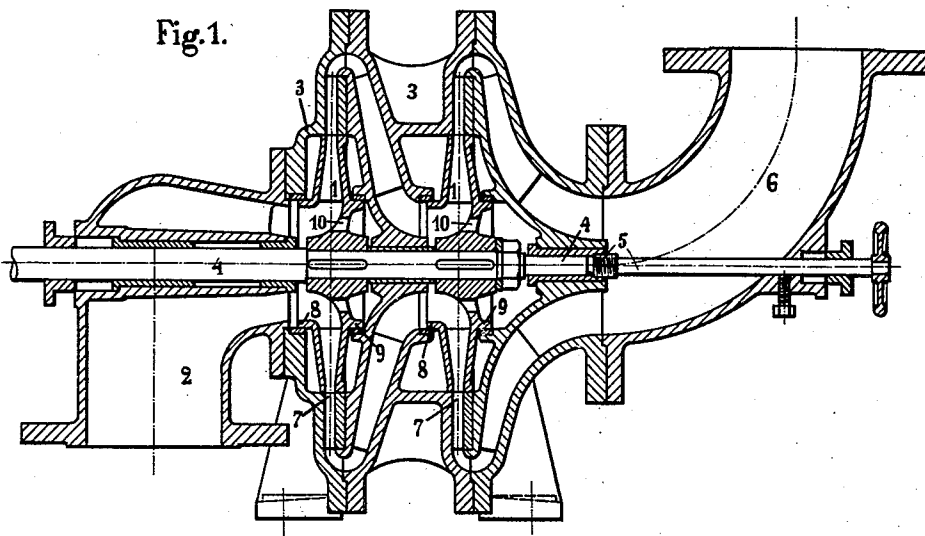
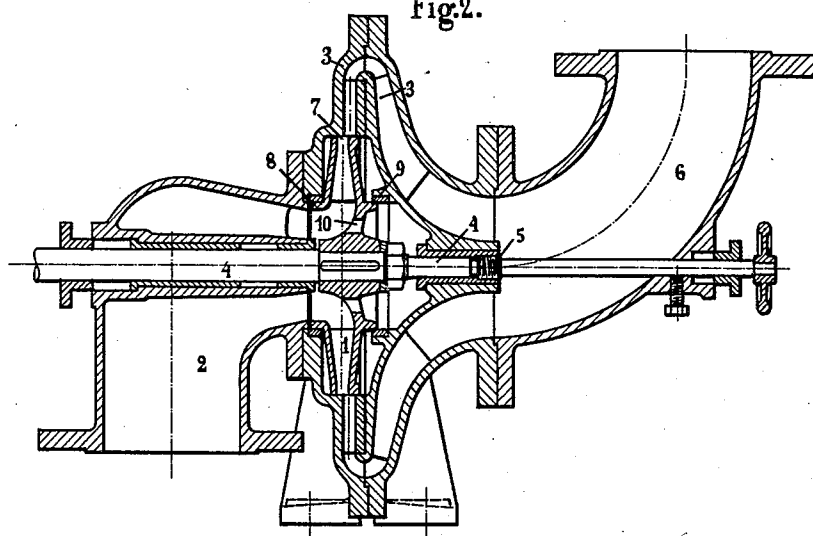


Fig.2.



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UNITED STATES PATENT OFFICE.

CARL HERMANN JAEGER, OF LEIPZIG-PLAGWITZ, GERMANY, ASSIGNOR TO INTERNATIONAL STEAM PUMP COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ROTARY PUMP.

No. 860,668.

Specification of Letters Patent.

Patented July 23, 1907.

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To all whom it may concern:

Be it known that I, CARL HERMANN JAEGER, a subject of the King of Saxony, and a resident of Klingenstrasse, Leipzig-Plagwitz, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Rotary Pumps, of which the following is an exact specification.

My invention relates to improvements in rotary pumps and has for its purpose to provide a rotary pump, in which the quantity of water or air to be pumped can easily be regulated without materially changing the useful effect of the pump.

In order to make my invention more clear, I refer to the accompanying drawing, in which

Figure 1 is a longitudinal section of a pump with two impellers, the suction inlets of which face in the same direction. Fig. 2 is a longitudinal section of a single pump, the impeller being situated in the position, in which the quantity of liquid to be pumped is diminished.

In the drawing 1 are the impellers, 2 is the suction inlet pipe and 3 are the casings for the impellers, which casings may be connected to each other by means of flanges, so that the casings are separable and that several impellers can be placed one after the other if the lift or the pressure of the fluid or liquid at the discharge shall be increased. The arrangement of separate and separable pump casings has further the advantage, that the single casings can easily expand by heat, if hot liquids are to be pumped. The impellers 1 have sufficient room in the casing 3 in order to allow a lateral movement of the impellers. The impellers are fixed to a common shaft 4. At the end of this shaft a set screw 5 is provided, against which the shaft is pressed by means of the pressure of the liquid. By means of this set screw which is advantageously situated in the elbow piece 6 the shaft 4 as well as all the impellers situated upon the same can be shifted sidewise, as may be seen from Fig. 2. By shifting the impeller sidewise, the outlet slots 7 are partly closed and the quantity of water to be pumped is hereby diminished without materially changing the useful effect of the pump.

In order to effect that the shaft is pressed against the set screw 5 only with a low pressure and to herewith diminish the friction the single impellers may be disloaded in the following manner:—Each impeller 1 is provided with two sliding rings 8 and 9 projecting on both sides of the same, the diameter of which rings corresponds to the diameter of the inlet. The circumferential sliding surface of these rings is broad enough to allow an axial displacement of the impeller without the tightening surfaces leaving one another. By means of these rings the impellers are divided in two parts, the outer annular part situated outside the rings and the inner part. In the outer part the pressure on both

sides is the same, while in the inner part the pressure is different. In order to overcome these differences in the pressure, openings 10 are provided in the inner part of the impellers, which openings connect both sides of these parts. By the *vis viva* of the water the axial streaming direction of which has to be transferred into a radial streaming direction, the pressure of the shaft against the set screw will always still be sufficient for avoiding an unintended movement of the shaft. The pressure of the shaft against the set screw 5 may also be regulated by arranging tightening rings 8 and 9 of different diameters.

It will be understood that the arrangement may be used in connection with water and air pumps and with pumps with one or several impellers.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States is:—

1. In a rotary pump, the combination with an impeller casing having an outlet opening, and an impeller within the casing said impeller and casing being arranged for the movement of the impeller discharge partially out of register with the outlet opening, of means for moving the impeller axially across the outlet opening to vary the size of the outlet.

2. In a rotary pump, the combination with an impeller casing having an outlet opening, and an impeller within the casing said impeller and casing being arranged for the movement of the impeller discharge partially out of register with the outlet opening, of means for moving the impeller shaft axially to move the impeller across the outlet opening to vary the size of the outlet.

3. In a rotary pump, the combination with an impeller casing having an outlet opening, an impeller within the casing said impeller and casing being arranged for the movement of the impeller discharge partially out of register with the outlet opening, a chamber on the back of the impeller and an opening from the impeller suction to said chamber, of means for moving the impeller axially across the outlet opening to vary the pump discharge.

4. In a rotary pump, the combination of a plurality of impeller casings having outlet openings and impellers within the casings said impellers and casings being arranged for the movement of the impeller discharge partially out of register with the outlet openings, of a shaft carrying the impellers, and means for moving said shaft axially to move the impellers across the outlet openings to vary the impeller discharge.

5. In a rotary pump, the combination of a plurality of impeller casings having outlet openings and impellers within the casings said impellers and casings being arranged for the movement of the impeller discharge partially out of register with the outlet openings, of a shaft carrying the impellers, means for moving said shaft axially to move the impellers across the outlet openings to vary the impeller discharge, chambers on the backs of the impellers, and openings connecting the suction of each impeller with the chamber on the back of the impeller.

6. The combination with a casing having an outlet opening, of the impeller 1 within the casing mounted to move axially across the outlet opening, and having tightening rings 8, 9 on opposite sides of the impeller of greater width than the axial movement of the impeller, said casing and

impeller being arranged for the impeller discharge to be carried partially out of register with the outlet opening by said axial movement of the impeller.

5 7. The combination with a casing having an outlet opening, of the impeller 1 within the casing mounted to move axially across the outlet opening, tightening rings 8, 9 on opposite sides of the impeller of greater width than the axial movement of the impeller, and openings 10 through the impeller by which the spaces on opposite sides of the
10 impeller within said rings are constantly connected.

8. The combination with a casing having an outlet opening, of the impeller 1 within the casing mounted to move axially across the outlet opening, tightening rings 8, 9 on opposite sides of the impeller of greater width than the
15 axial movement of the impeller, openings 10 through the impeller by which the spaces on opposite sides of the im-

peller within said rings are constantly connected, shaft 4 carrying the impeller, and screw 5 for moving the shaft to shift the impeller.

9. The combination of a plurality of impeller casings 3, 20 impellers 1 within the casings, tightening rings 8, 9 on opposite sides of the impellers, openings 10 by which the spaces on opposite sides of the impellers inside the tightening rings are constantly connected, shaft 4 carrying the impellers, and screw 5 for adjusting the shaft. 25

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL HERMANN JAEGER.

Witnesses:

RUDOLEH FRICKE,
ERNST LUNGWITZ.