E. EICKHOFF.

ROTARY PUMP OR BLOWER.

APPLICATION FILED FEB. 5, 1908.

928,034.

Patented July 13, 1909.

2 SHEETS—SHEET 1.

Fig. 3.

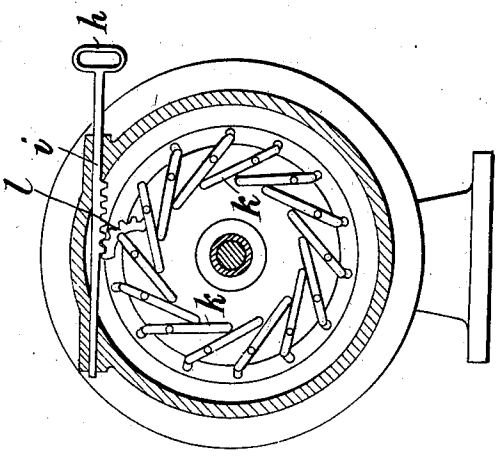


Fig. 2.

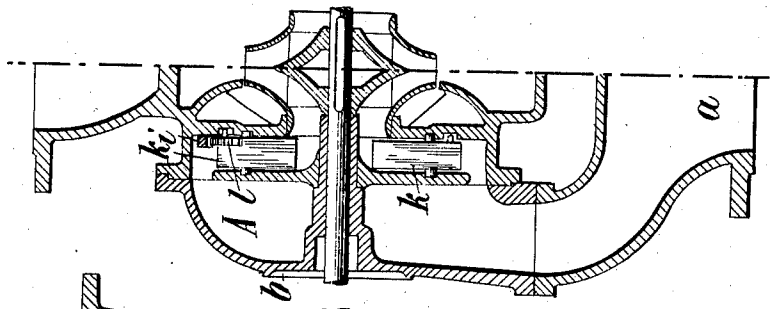
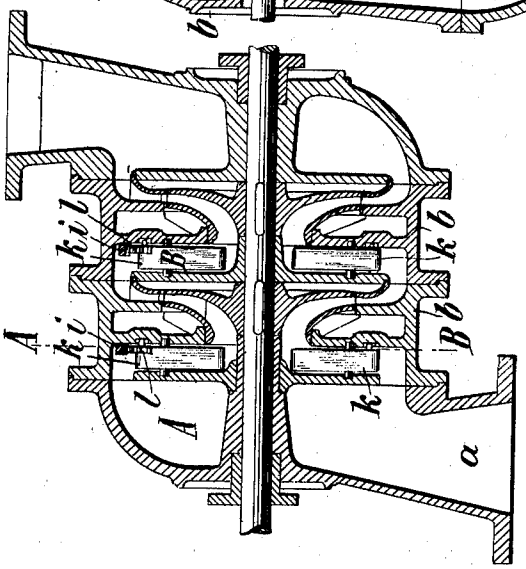


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 6.

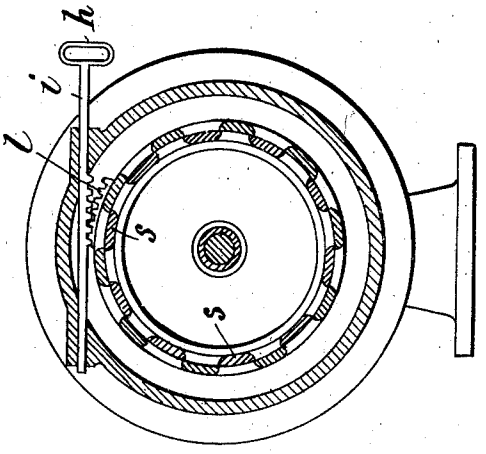


Fig. 3.

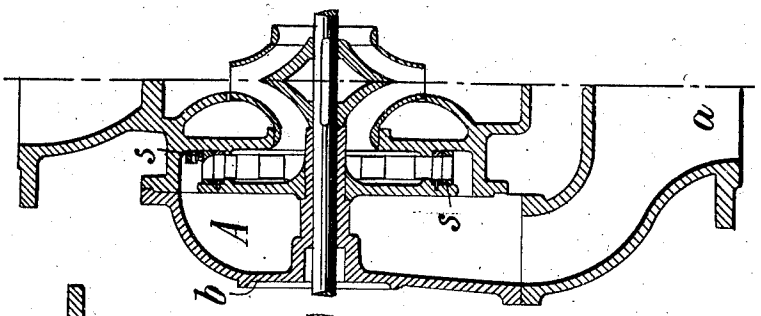
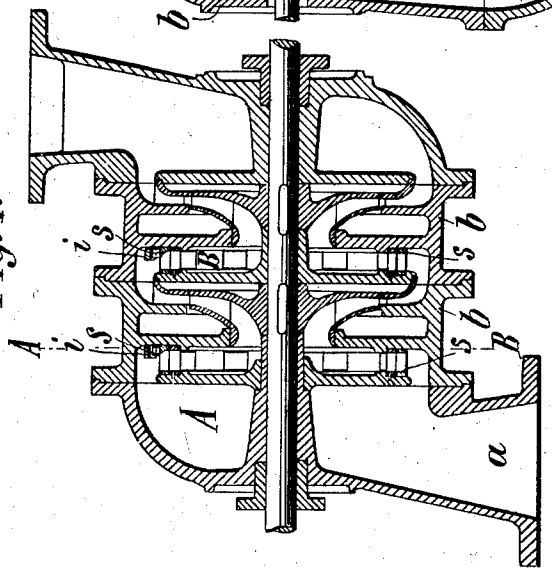


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROTARY PUMP OR BLOWER.

No. 928,034. Specification of Letters Patent. Patented July 13, 1909.

Application filed February 5, 1908. Serial No. 414,348.

To all whom it may concern:

Be it known that I, EGON EICKHOFF, a subject of the King of Prussia, residing at 34 Magdeburgerstrasse, Halle-on-the-Saale, Germany, have invented certain new and useful Improvements in Rotary Pumps or Blowers; and I do hereby declare the following to be a full, clear, and exact description of the invention.

The present invention relates to rotary pumps or blowers with regulation of the quantity of the medium which flows through the same.

Even if in principle rotary pumps or blowers are reversed turbines, the regulation of the turbines, the members and the arrangement of the latter can nevertheless not be at once transferred to rotary pumps, although hitherto all attempts at regulation in rotary pumps have been in direction of simply transferring the turbine regulating mechanism to them. The guide-blades have been made revoluble, or, as that is constructively difficult and therefore expensive, the housing or casing has also been built so that the guide-wheels could be rapidly exchanged. It has however been verified by experiments that the exchange of guide-wheels has little value; the exchange of rotors has been found more effective and in addition it is not expensive. All the same, whether guide-wheel or rotor is exchanged, running is interrupted, and therefore such regulation is not regulation in the usual meaning of the word. On the contrary, regulation must be able to be effected during running. Members for effecting this are, generally speaking, flaps or slides, rotary blades and reticulated slides. Now the question is where these members must be arranged in rotary pumps or blowers, if the conditions of flow are to be taken into account. In turbines the water flows from the guide-wheel into the rotor, and it appears a matter of course that the regulating device is arranged in front of the place of admission into the rotor. They have also proved good there in every respect, and it is certain that they would be but little effective behind the same.

In the rotary pump the medium flows in the reverse manner, and thus the hitherto unknown conclusion must be logically drawn that the regulating device must also in this case be arranged in front of the rotor namely in newly made chambers A, A (Figs. 1, 2 and 3) which no form of construction has had hitherto, and which therefore are the embodiment of the former idea and together with it are the subject-matter of the present invention.

In order that the invention may be clearly understood reference is made to the accompanying drawings in which several embodiments are represented by way of example, and in which:

Figure 1 is a vertical longitudinal section through a multi-stage rotary pump or blower, whereas Fig. 2 shows in vertical longitudinal section one half of a double blade-wheel rotary pump or blower, and Fig. 3 is a vertical transverse section on the line A—B in Fig. 1. Fig. 4 is a vertical longitudinal section through a multi-stage rotary pump or blower of a modified form. Fig. 5 is a vertical longitudinal section of one-half of a double blade-wheel rotary pump or blower, and Fig. 6 is a vertical transverse section on line A—B in Fig. 4.

Hitherto in machines of the present kind, the suction pipes *a* were directly connected with the casing *b*. In accordance with the present invention the casing *b* is enlarged so that a chamber A is formed in which the regulating device can be conveniently arranged. Characteristics of the newly formed chambers A, A are, (1) their clear width in rotary pumps or blowers having one and more stages (Fig. 1) is approximately equal to the clear width of the casing, and in double blade-wheel rotary pumps or blowers (Fig. 2) is preferably equal to the diameter of the circle on which the interior spiral of the casing begins, and, (2) they are preferably so constructed that the interior of the chamber is easily accessible so that the regulating members can be built into the same.

The regulating members themselves are either flaps *k* or reticulated slides *s*, as already mentioned above. They are based on the same fundamental idea as the revoluble guide-blades and reticulated slides used in turbines, but because the water in the present devices, when the regulating devices are not in operation, flows purely radially to the interior of the periphery of the wheel, whereas in the turbine it impacts at an acute angle on the circumference of the wheel, they are here materially different in shape. The regulating members are moved from the outside by a toothed rod *i* provided with a handle *h*, the teeth of which rod engage with a toothed segment *l* connected with the

regulating members. The flaps are simply rectilinear and can be rotated to both sides until they contact with each other, whereby the water is rotated in the same or opposite direction of rotation, as well as being throttled, the consequence of which is that the blades can draw less water on the one hand, and more on the other hand, analogously as when a person walks toward rain falling slantwise he gets wetter than when he moves in the direction of the rain. The reticulated slide likewise differs substantially from known constructions; it allows the water to pass through quite radially, whereas the water flows slantwise through known forms of construction.

What I claim as my invention and desire to secure by Letters Patent is:

1. A rotary pump or blower of the type described comprising in combination a two or more part casing having an inlet and an outlet, a blade-wheel revoluble in said casing, said casing having a circularly arranged chamber between the inlet and said blade-wheel, regulating means circularly arranged in said chamber in front of the blade-wheel, said chamber being accessible through a division on the casing, and means on said casing for operating said regulating means.

2. A rotary pump or blower of the type described comprising in combination a two or more part casing having an inlet and an outlet, a blade-wheel revoluble in said casing, said casing having a chamber between the inlet and said blade-wheel, regulating means circularly arranged in said chamber in front of the blade-wheel, said chamber being accessible through a division in the casing, and means on said casing for operating said regulating means.

3. A rotary pump or blower of the type described comprising in combination a two or more part casing having an inlet and an outlet, a plurality of blade-wheels revoluble in said casing, said casing having a chamber between the inlet and said blade-wheels, regulating means circularly arranged in said chamber in front of the blade-wheel, said chamber being accessible through a division in the casing, regulating means circularly arranged in the overflow channel in front of the second and each succeeding blade-wheel, and means on said casing for operating said regulating means.

4. A rotary pump or blower of the type described comprising in combination a two or more part casing having an inlet and an outlet, a blade-wheel revoluble in said casing said casing having a chamber between the inlet and said blade-wheel, a cylindrical reticulated slide arranged in said chamber with its openings in front of the blade-wheel, said chamber being accessible through a division in the casing, and means on said casing for operating said slide.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

EGON EICKHOFF.

Witnesses:
HANS RUDOLPHI,
OTTO SCHRAMM.