No. 755,631. PATENTED MAR. 29, 1904.

H. E. DECKEBACH.

ROTARY PUMP.

APPLICATION FILED APR. 13, 1900.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

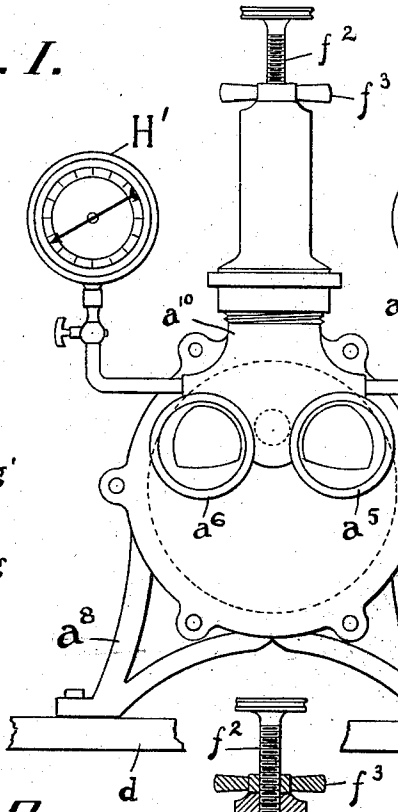


Fig. 5

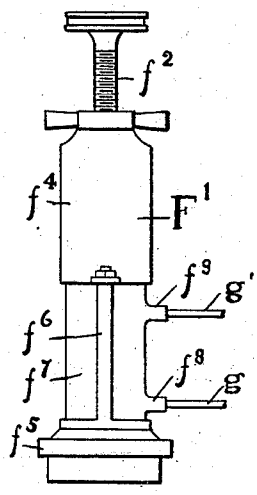


Fig. 6

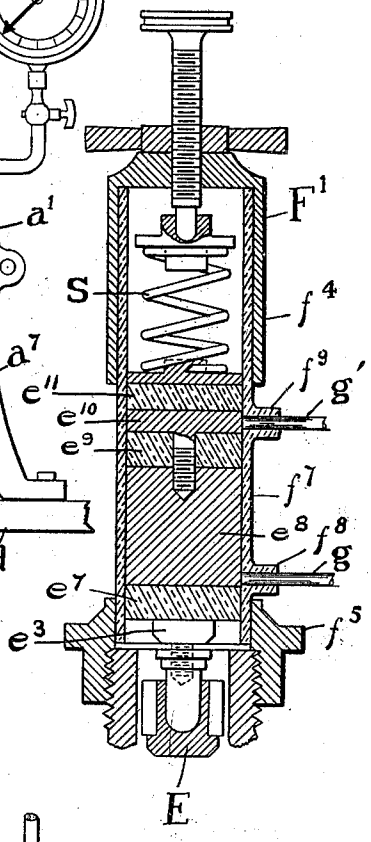
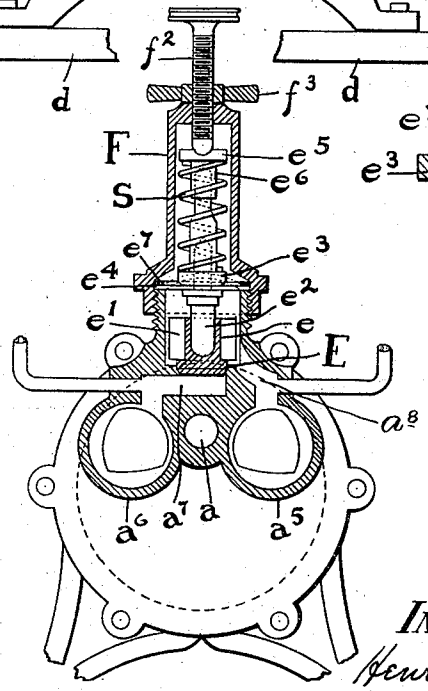


Fig. 2.



WITNESSES

T. C. Mapher.

Emma Lyford

INVENTOR

Henry C. Deckebach

By Murray & Murray

Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3

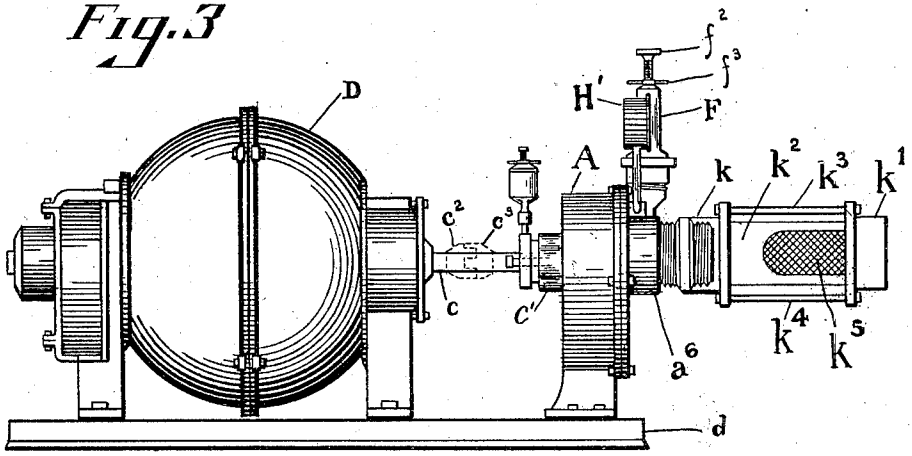
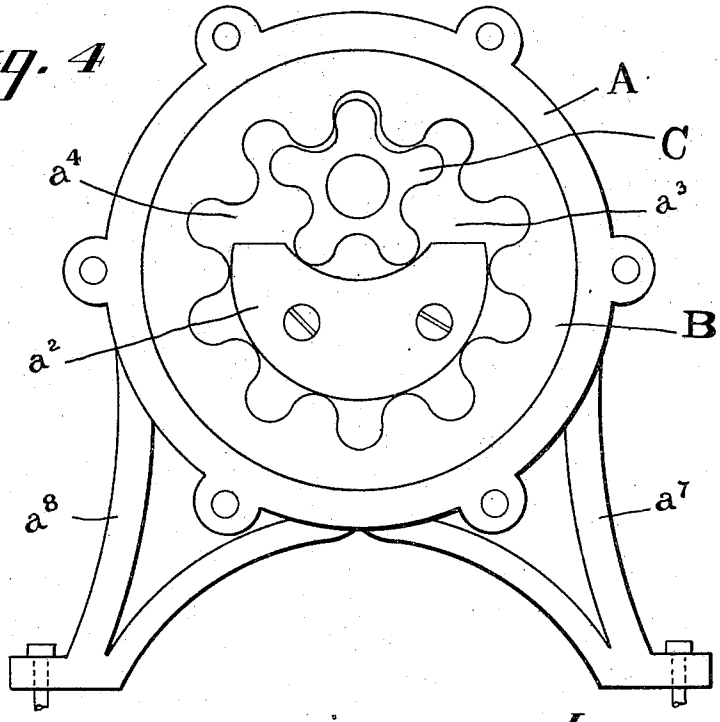


Fig. 4



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UNITED STATES PATENT OFFICE.

HENRY E. DECKEBACH, OF CINCINNATI, OHIO.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 755,631, dated March 29, 1904.

Application filed April 13, 1900. Serial No. 12,669. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. DECKEBACH, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification.

The object of my invention is a rotary pump whose shaft is in direct communication or formed integral with the shaft of an electric motor between whose induction and discharge ports is a by-pass the opening and closing of which is controlled by a valve which regulates the pressure of the fluid at discharge and when the pressure exceeds a certain limit cuts out the current from the motor and whose induction-port is provided with means for preventing foreign substances from entering the pump and for observing the condition of the fluid as it enters the port. This object is attained by the means described in the annexed specification and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a rotary pump with the by-pass and valve for controlling it embodying my invention. Fig. 2 is a similar view showing the by-pass and the valve for controlling it in longitudinal central section. Fig. 3 is a side elevation of the pump and an electric motor mounted upon the same bed and having a shaft in common, the dotted lines showing a means of coupling the shafts of the motor and the pump together when the same are not, as they are shown in full lines, formed integral. Fig. 4 is a detail front elevation of the pump, with the head-plate removed, upon an enlarged scale, showing the manner of mounting it upon the same bed with the motor. Fig. 5 is a detail elevation of the electric cut-out and the modified valve-case used with it. Fig. 6 is a sectional view of same upon an enlarged scale.

Referring to the parts, within cylindrical box A is seated a loose internally-toothed ring B, which is rotated by pinion C, whose shaft c is journaled in a journal-box a, formed in head-plate a', and extends rearwardly through a journal-box c' in the bottom of the box A, to the interior of which between the pinion and the ring is secured a plate a^2 in shape of a lune, with its ends cut off to form chambers a^3 and a^4 between the ring, the pinion, and said ends. The head-plate has an induction and a discharge port a^5 and a^6 to register with chambers a^3 and a^4. Now if pinion C be rotated toward the left, Fig. 4, fluid will be drawn under suction into chamber a^3 through port a^5, part of it carried around between the pinion and the lune and part between the ring and the lune into chamber a^4, from which it will be discharged under pressure through port a^6. Pinion C is made of a diamater such that chambers a^3 and a^4 are situated in the upper half of cylinder A and that the arc of the greater circle of the lune is greater than a semicircle. By reason of this construction the pinion when rotating toward the left keeps the teeth of the ring in contact with the right half of the lune, even though the teeth become worn, and thus prevents, first, any backlash of the fluid, and, second, the striking of the teeth of the ring against the left-hand corner of the lune.

Interposed between induction-port a^5 and the pipe which conveys the fluid to the pump is a strainer K, which consists of two couplings k and k', between which a glass tube k^2 is held by bolts k^3 and k^4. An oblong screen or strainer k^5 covers the mouth of the coupling, into which the pipe which conveys the fluid to the pump is inserted for retaining foreign substances. The glass tube enables one to observe the condition of the fluid as it enters the pump.

Box A has standards a^7 a^8, by which it is secured to a base-plate d, upon which an electric motor D is mounted. Shaft c of the pump also constitutes the shaft of the electric motor, as shown in full lines, Fig. 3, or the shafts of the pump and the motor may have attached to them clutches c^2 and c^3, whose teeth interlock, as shown in dotted lines, Fig. 3. As is seen in Fig. 3, by reason of the small diameter of pinion C it may be run at as high a speed as the shaft of the motor.

To regulate the pressure and the rate of discharge, the following means are used: Between the induction and the discharge ports a^5 and a^6 is a by-pass whose opening and closing is controlled by a valve E. The part of the by-pass

leading from the discharge-port a^6 leads up beneath the valve-seat and the part a^8, leading to the induction-port, is above the valve-seat. Communicating with port a^5 and port a^6 are pressure-indicators H H′ to indicate the pressure at the induction and the discharge ports. The lower externally-screw-threaded portion a^{10} of the valve-case, together with the by-pass, are formed integral with the head-plate a' of the pump. Valve E has an upward-projecting annular flange or cup e, with wings e', which bear against the walls of the lower part a^{10} of the case to guide the valve to its seat. Within the cup is seated the lower part e^2 of the valve-stem, which is screw-threaded to fit into the upper part e^3 of the stem. Between the parts e^2 and e^3 a rubber disk e^4 is held secured. Valve E is held to its seat by a coiled spring S, which is held between collar e^3 upon the valve-stem and a disk e^5, which has a downwardly-projecting annular lug e^6, into which the upper end of the valve-stem projects. Surrounding the valve-stem and the spring is a cylindrical casing F, having an enlarged and internally-screw-threaded portion at its lower end to fit over the lower portion a^{10} of the valve-case. Between case F and the portion a^{10} of the valve-case is a loose ring e^7, which holds the rubber disk e^4 in place when case F is screwed down in place. When the valve is raised from its seat, the rubber disk assumes a concave form, as shown in dotted lines in Fig. 2. The tension of spring S is regulated by a hand-screw f^2, which passes through the head of case F and bears down upon disk e^5. After spring S has been set at the desired tension by lowering or raising screw f^2 it is locked by lock-nut f^3.

In Figs. 5 and 6 is shown a form of valve-case and valve-stem modified to form the means for automatically cutting out the current from the motor when the valve is raised from its seat. Case F′ is cut away in the center, leaving the upper part f^4 and the lower, f^5, connected by two ribs f^6 at diametrically opposite sides, and between the top of the lower portion a^{10} of the case and the top of case F′ is inserted a glass tube f^7, with annular lugs f^8 and f^9 to receive the severed ends g g' of one of the wires connecting the rheostat (not shown) to motor D. Within tube f^7 upon valve-stem e^3 rests a glass disk e^7, upon which rests a copper cylinder e^8, upon the upper end of which rests a glass ring e^9 and upon that a copper disk e^{10}, with a screw-threaded stem extending down through ring e^9 and being tapped into cylinder e^8. Upon disk e^{10} rests another glass disk e^{11}, upon the top of which spring S bears down. When the valve is held to its seat, end g of the wire abuts against the lower edge of cylinder e^8, just above glass disk e^7, and end g' abuts against copper disk e^{10}, just above glass ring e^9, and the current from the rheostat to the motor is uninterrupted; but when the valve is thrown from its seat glass disk e^7 abuts against the end g of the wire and glass ring e^9 against end g', cutting out the current from the motor.

What I claim is—

The combination of a rotary pump, an electric motor for rotating it, an induction and a discharge port in the pump, a by-pass connecting the ports, a valve controlling the opening and closing of the by-pass to be raised by a predetermined pressure at the discharge-port, an electric switch resting upon the valve, wires for conveying the motive power to the motor running into the switch and connected thereby when the valve is seated, and disconnected when the valve is raised from its seat, whereby when the pressure exceeds a predetermined limit, the by-pass is opened for releasing the pressure and for decreasing the speed of the motor, substantially as shown and described.

HENRY E. DECKEBACH.

Witnesses:
W. F. MURRAY,
EMMA A. LYFORD.