Dec. 28, 1926. 1,612,158

A. SOMA

DOUBLE ACTING PUMP

Filed August 18, 1924

Fig. 1.

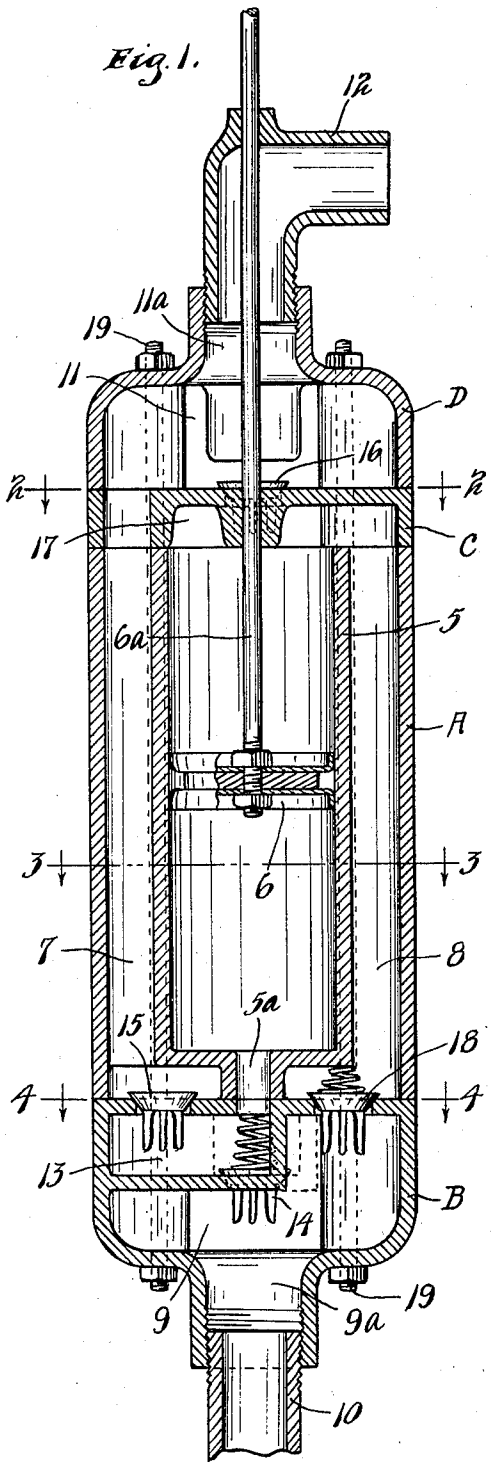


Fig. 2.

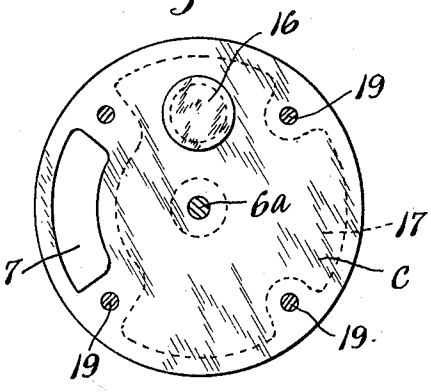


Fig. 3.

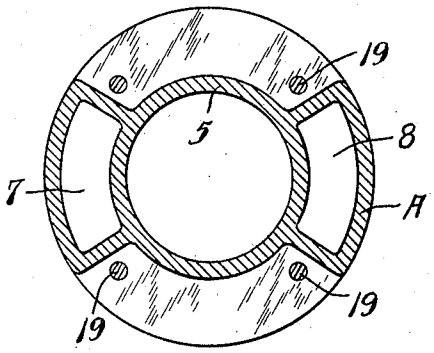
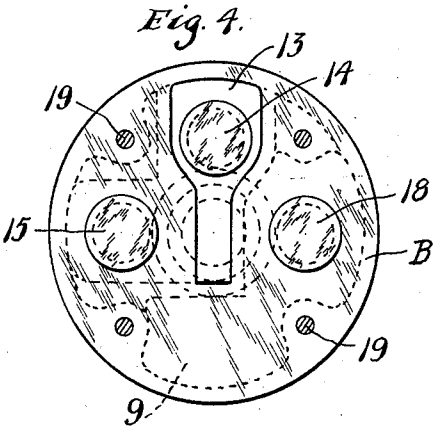


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DOUBLE-ACTING PUMP.

Application filed August 18, 1924. Serial No. 732,693.

This invention has for its object to provide a compact and highly efficient double acting pump for liquids which will expel a practically continuous stream when in operation.

It is a more specific object in such a pump to provide a casing therefor which may be readily slipped into a tube or pipe of proper diameter and lowered to a desired depth.

These and other objects of the invention will be apparent from the following description made in connection with the accompanying drawings, in which like notations refer to similar parts throughout the several views and in which—

Fig. 1 is a vertical longitudinal section of the pump;

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1; and

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 1.

The pump comprises an elongated casing having centrally formed therein the pump cylinder 5, in which reciprocates a piston 6 of the usual type, connected to the pump rod 6^a which passes upwardly and out of the casing. The casing has also formed therein passages 7 and 8 extending longitudinally of the cylinder 5 at either side thereof. In the lower part of said casing a chamber 9 is formed communicating through an opening 9^a with an intake pipe 10. The top portion of the casing forms a discharge chamber 11 having an opening 11^a in communication with the discharge pipe 12 of the pump. The cylinder 5 communicates with the chamber 9 through an opening 5^a in communication with a small horizontally disposed chamber 13 having seated in an opening at its bottom the upwardly moving check valve 14 spring pressed into normal closed position. The bottom of cylinder 5 is also in communication with the passage 7 thru the chamber 13 having in its top wall an opening in which an upwardly opening check valve 15 is seated, the upward motion of which is limited by the bottom wall of the cylinder 5. The passage 7 also communicates with the discharge chamber 11 above the cylinder. The upper end of cylinder 5 also communicates with the discharge chamber 11 through the upwardly opening check valve 16. The upper end of the cylinder 5 is in communication with the passage 8 through the small channel 17. The lower end of passage 8 communicates with the intake chamber 9 through an upwardly moving check valve 18 seated in an opening in the bottom wall thereof.

The structure of the above described parts within the casing is effected by a series of alined lateral sections or castings secured tightly together in proper position by elongated nut equipped bolts 19 passing longitudinally through the several sections. The main or central section A constitutes the main portions of the cylinder 5 and passages 7 and 8 also comprising the bottom walls of the cylinder 5 and the upper part of the opening 5^a. The lower section B of the casing forms the valve equipped bottoms for the passages 7 and 8, the connecting chamber 13 and the lower part of the conduit opening 5^a equipped at its bottom with the valve 13, and also the intake chamber 9 at the lower end of the casing. The smallest section of the casing C located directly above section A forms the valve equipped top of the cylinder with the conduit 17 communicating with the passage 8 and also forms a continuance of chamber 7 communicating with the discharge chamber 11. The top section D forms the discharge chamber 11 of the conduit. The passages 7 and 8 at either side of cylinder 5 are of fluted formation, the cross section of which may be observed in Fig. 3, and the perimeter of which is included within the outer edge of the cylinder sections B, C and D.

In operation, assuming that the piston 6 is at the bottom of cylinder 5 when the same is raised, suction will be created in the lower portion of the cylinder and water will be drawn through the pipe 10 and valve 14 into the cylinder. When the piston is depressed on the succeeding down stroke the valve 14 will be forced closed by the spring and the downward force of the water and the water will be forced through the opening 5^a into chamber 13 and into chamber 7 through valve 15 and discharged through the pipe 12 on the succeeeding down stroke. Simultaneously with the down stroke of the piston, a strong suction will be exerted in the top of the cylinder and this portion, being in communication with chamber 8, water will be drawn therein through the valve 18 and will partially fill the passage. The succeeding down stroke will force this water into the top of the cylinder above the piston

where, on the up stroke, it will be lifted into the discharge chamber 11 and out through the pipe 12. This next up stroke will close the valves 15 and 18, the water tending to move down through chambers 7 and 8. Thus, at each stroke of the piston, water is drawn into the cylinder from either the top or bottom and discharged on the succeeding stroke through the pipe 12. The pump is thus a double acting force pump and the water is discharged in practically a continuous stream.

Because of the sectional structure of the casing and the structure of the various parts within, the sections may be easily cast and the casing assembled with the parts secured together in vertical alinement.

Extensive actual usage and experimenting have shown the pump to be highly efficient for the purposes intended.

Due to the shape of the casing, the pump is adapted to be slipped into a tube or pipe of proper diameter to any required position therein, where it may be operated as desired.

It is to be understood that various changes may be made in the form, details and arrangement of parts without departing from the scope of the invention.

What is claimed is:

A double acting pump consisting of an elongated substantially cylindrical casing and a reciprocating piston therein, said casing being composed of four sections, arranged and secured together comprising, a lowermost section, divided into two chambers, one chamber having communication at its lower side with an intake pipe, and also having an opening at its upper portion with a downwardly seating check valve therein, the other chamber having a medial opening at its upper side and an opening at its lower side communicating with said first chamber and having a downwardly seating check valve therein, said second chamber also having a third opening with a downwardly seating check valve therein in its top at one side of said first opening, a central lower section forming a pumping cylinder at its longitudinal medial portion and a pair of passages at the sides of the cylinder, one of said passage ways being adapted to communicate with said first chamber in said lowermost section through the upper opening therein, the other of said passage ways being adapted to communicate with said second chamber in said lowermost section through the third opening therein, an upper interposed section forming a top for said cylinder and having an opening in said cylinder top with a downwardly seating check valve therein, said last mentioned section having an opening therein for free communication between said first mentioned passage way in said medial section and the top of said cylinder, and said last mentioned section also having an opening extending vertically therethrough and registering with said second mentioned passage way, and a top section constituting a discharge chamber, said piston being interposed within said cylinder in said medial section.

In testimony whereof I affix my signature.

ANDREW SOMA.