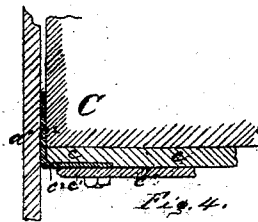
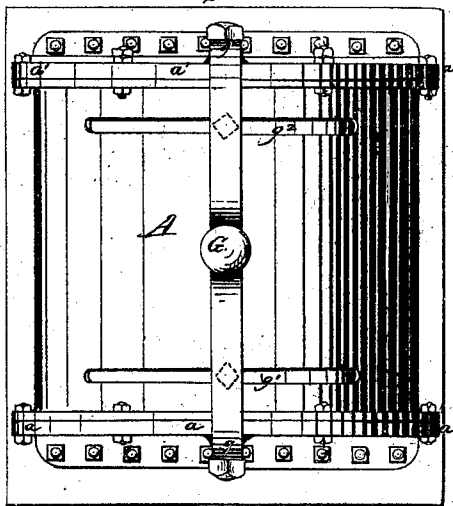
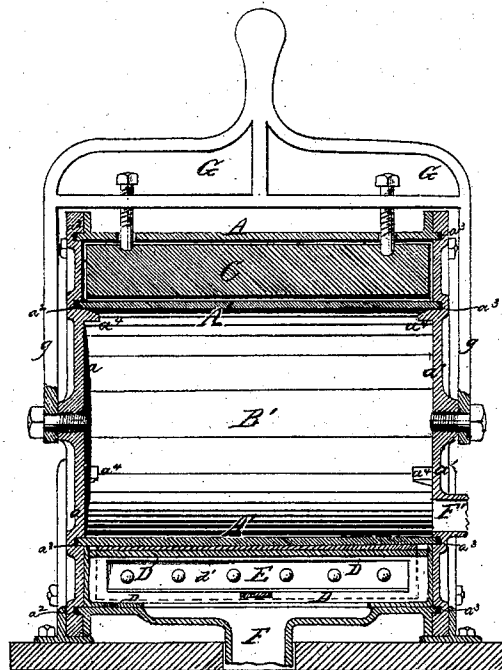
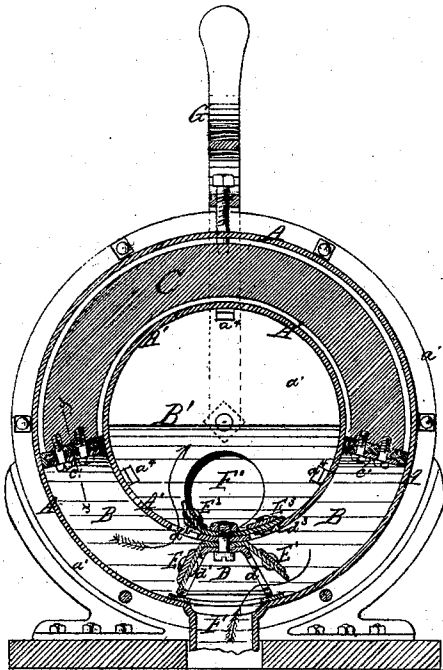


Force Pump.

Patented Aug. 29, 1871.



Witnesses:

J. W. Herbert,

Robert Burns.

Inventor.

ventor.
Charles E. Hutson

By His Atty

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UNITED STATES PATENT OFFICE.

CHARLES EMERY HUTSON, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN ROTARY PUMPS.

Specification forming part of Letters Patent No. 118,455, dated August 29, 1871; antedated August 18, 1871.

To all whom it may concern:

Be it known that I, CHARLES EMERY HUTSON, of St. Louis, in the county of St. Louis and State of Missouri, have made certain new and useful Improvements in Force-Pumps; and I do hereby declare that the following is a full and true description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

This invention chiefly consists in arranging within outer and inner cylinders or pump-barrels a semi-annular fitted plunger or piston, and in providing said barrels with reverse-acting valves, forming a double-acting force-pump.

To enable those herein skilled to make and use my said improvements, I will now more fully describe the same, referring to the accompanying—

Figure 1 as a transverse sectional elevation, to Fig. 2 as a longitudinal sectional elevation, to Fig. 3 as a top plan, and to Fig. 4 as a detail view at line *x y*, showing packing of pistons between cylinders.

My improved pump consists of two cast cylinders, *A A'*, arranged within each other, forming the pump-barrel *B* and discharge-chamber *B'*, Figs. 1 and 2. In the barrel *B* of the pump I arrange a semi-annular piston, *C*. Both ends of the cylinders are closed by heads *a a'*, the outer cylinder for this purpose having projecting flanges, to which said heads are bolted in manner usual. To form the required water-tight joint at the point where said heads come in contact with the annular rim of the cylinders *A A'*, the said heads *a a'* are properly cut with annular grooves *a² a³*, in which suitable packing material is fitted, as shown in Fig. 2. Also, said heads, to be properly and firmly secured, have guiding-lugs *a⁴*. In the barrel *B* of the pump, at its bottom, I have secured a valve-rest, *D*, extending horizontally the entire length of the pump. Said valve-rest *D* has the horizontal slots or ports *d d'* in each side, forming inclined seats for the receiving-valves *E E'*, as clearly shown in Figs. 1 and 2. Similarly the inner cylinder *A'* has corresponding slots *d² d³*, forming the seats for the discharge-valves *E² E³*. Said valves are of ordinary construction and arranged and secured to operate in manner indicated in Fig. 1. The piston *C* at its bottom face is packed with leather *c*, secured by metallic strips and fastenings, Fig. 1, the leather packing *c* partially enveloping the edges of said piston, prevent-

ing any water escaping between said piston and the cylinder-heads, as shown in detail, Fig. 4. *F* represents the suction-pipe, communicating with the pump-barrel *B*. *F'*, the discharge-pipe, being secured to the cylinder-head and arranged to communicate with the discharge or air-chamber *B'*.

To operate the plunger or piston *C*, the same is connected firmly to a pump-brake, *G*, secured by side rods *g* centrally to each cylinder in any proper manner. The outer cylinder *A*, on top, has slots *g¹ g²*, limiting and guiding the stroke of the pump-piston.

By such a construction and arrangement of parts the water is alternately drawn into and forced out from each cylinder-apartment *B B'* by means of the oscillating piston *C*, the motion to said piston being imparted by the pump-brake *G*, or in any other ordinary manner for operating pumps of this nature. When the piston is moved in the direction as shown by the arrows, the reverse-positioned valves *E¹ E²* are opened, and the water is forced into and discharged from the discharge-chamber *B'*. A reverse motion of the piston closes said opened valves and opens the remaining closed valves *E² E³*. Thus, by the oscillations of the piston or plunger, the water is alternately drawn into and forced out of each cylinder-apartment and finally discharged through the discharge-pipe *F*.

Having thus fully described my said invention, what I claim is—

1. The cylinders *A A'*, heads *a a'*, packing *a² a³*, slots *g¹ g²*, piston *C*, arranged substantially as described.

2. The reverse-operating valves *E E'* *E² E³*, valve-rest *D*, when arranged in pump-barrel *B* and discharge-chamber *B'* of cylinders *A A'*, substantially as and for the purpose set forth.

3. The arrangement of cylinders *A A'*, heads *a a'* having packing *a² a³*, slots *g g'*, semi-annular piston *C*, valve-rest *D*, reverse-operating valves *E E'* *E² E³*, suction and discharge-pipes *F F'*, when said parts are constructed and combined to operate substantially as and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

CHARLES E. HUTSON.

Witnesses:

WM. W. HERTHEL,
ROBERT BURNS.