

R. J. GOULD.
Steam-Pumps.

No. 148,819.

Patented March 24, 1874.

Fig: 1.

Fig: 2.

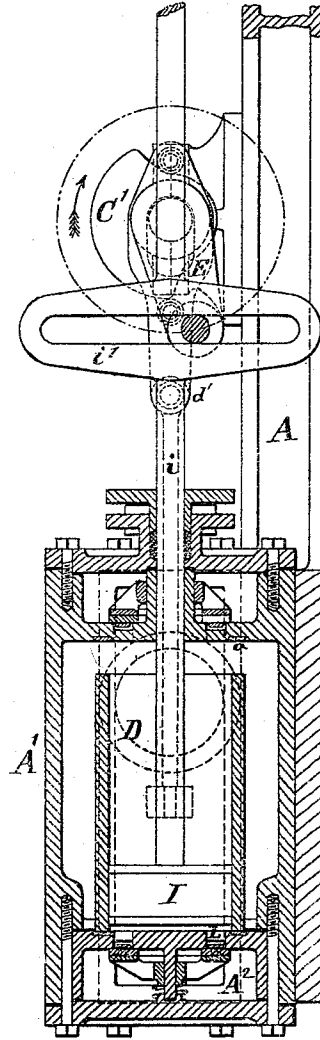
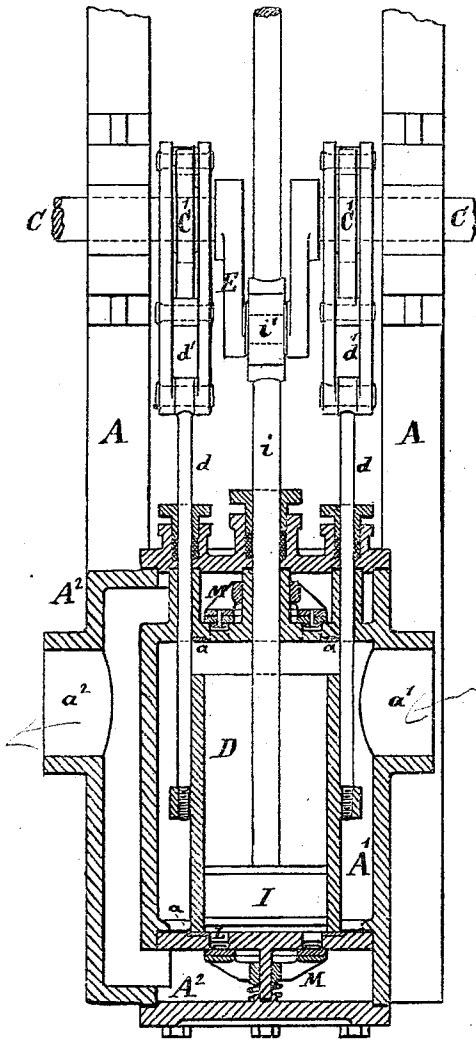
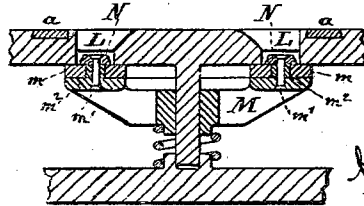


Fig: 3.



Witnesses;

R. J. Gould
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Inventor;

R. J. Gould
by his attorney
J. D. Stetson

UNITED STATES PATENT OFFICE.

ROSCOE J. GOULD, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. **148,819**, dated March 24, 1874; application filed February 26, 1874.

To all whom it may concern:

Be it known that I, ROSCOE J. GOULD, of Newark, county of Essex and State of New Jersey, have invented a new and useful Improvement in Steam-Pumps, of which the following is a specification:

The invention is intended more particularly for steam fire-engines, and analogous very quick-acting pumps, where an unusually free passage is desired for the induction; but it may be used with some advantage for various other classes of pumps. I adopt a construction and mode of operation whereby great freedom is obtained for the admission of water. My arrangement avoids some of the disadvantages which have attended other efforts in this line.

One advantage of my invention is that, while I operate with a puppet motion, and can thus endure any amount of grit in the water without inducing mischief, there is no loss of water, as in pumps with ordinary suction-valves, because there is no displacement or backward movement of the water, as in the closing of ordinary valves.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form part of this specification.

Figure 1 is a vertical section. Fig. 2 is a section at right angles thereto. Fig. 3 is a vertical section of one of the valves on a larger scale.

Similar letters of reference indicate like parts in all the figures.

A² is the exterior fixed casing, and A¹ is the interior fixed casing. These parts may be cast together, and the whole adapted to be firmly bolted upon a fixed frame-work, A. A pipe, a¹, conducts the water to the interior of the casing A¹, and a discharge-pipe, a², conducts the water away from the chamber between the two casings A¹ and A². D is a movable cylinder, connected by rods d d to yokes d' d', which are operated by cams C' on the main shaft C. This shaft carries a stout crank, E, which, as it revolves, traverses in the horizontal slot or yoke-frame i', which is rigidly connected by the rod i to the piston or plunger I, which works with a suitable packing in the

movable cylinder D. As the piston I is reciprocated up and down by the action of steam or other means, (not represented,) the movable cylinder D moves with a quicker motion alternately up and down, and forms a tight contact with the interior of the casing A¹ alternately at each end. A seat or face piece, a, of vulcanized rubber is provided to receive each end, the seats being made in a ring or annular form, and secured in the interior of the inner casing A¹ by dovetailing, riveting, or other suitable means. Before the piston I commences to descend, the movable cylinder D descends and forms a tight contact between its lower end and the rubber seat a, leaving a free space above its upper end, through which water may enter and follow the piston down. When the down-stroke of the piston I is completed, or nearly completed, the cylinder D moves upward by a rapid motion, transmitted through the rods d, and makes a tight contact at the top, leaving a similar liberal opening all around the bottom, through which the water may enter to follow the piston up. The discharge of the water from the interior of the movable cylinder D is effected through the openings L, controlled by ring-valves M, which are allowed to reciprocate vertically to a sufficient extent to make an ordinary opening for the delivery. The construction of these valves is peculiar. A flat rubber ring, m, is traversed both by the rivets m¹ and the thimbles m², surrounding the rivets. The rivets hold in firm contact with the lower face of the rubber, and hold a stout metal ring, N. This ring N is firmly pressed up against the rubber m, and also against the thimbles m². The seat for the valve is recessed to receive the metal ring N. When the valve strikes its seat the rubber m bears fairly on each side of the recess and forms a tight joint. On the pressure of the valve to its seat becoming severe, the rubber m is compressed a little, on which the metal ring N strikes the bottom of the recess, which receives it and supports the pressure, so that the rubber cannot be any further compressed. The openings L should be of a diameter about equal to the width of the ring N, and consequently of the annular recess in the seat which receives said ring. I prefer to taper these openings on the inner side, as in

licated in Fig. 3, so as to give as free a passage for the water as possible. The induction-passage a^1 leads the water freely into the liberal chamber existing around the movable cylinder D, and allows a free passage for the movement of the water alternately into either end of the movable cylinder. When, by the action of the piston I, it is expelled past the respective valves M, and is in the chamber between the casings A^1 and A^2 , it moves along that chamber to the discharge-pipe a^2 , and is discharged at such velocity and under such pressure as the conditions may induce. My valves M may be guided by their centers, as represented, or by any other suitable means. Their faces act through rubber or other contact without being affected by grit. So, also, the movable cylinder D makes and breaks its contact with the respective end pieces or seats a without being affected by grit. My pump can operate with any water, however subject to contain gritty particles, without liability to cut either valve or seat.

Many of the details may be modified in form or proportion within wide limits. The rubber seats a should be of sufficient thickness to allow, by their yielding, not only for slight imperfections in the construction, and irregularities in the springing of parts of the machine when rapidly and severely strained, and form a tight contact at each movement, but also to allow for the presence of small masses of grit or other foreign material which will sometimes be caught between them and the abutting ends of the movable cylinder D.

Although I have described the pump as upright, it will be obvious that it can be operated at various inclinations or in a horizontal position. I have represented a spring under the lower valve M. In working the machine in a horizontal position, it may be well to have a corresponding spring to act on each valve. When driven by steam, the steam-piston may be on a continuation of the piston-rod i and

the valve or valves may be operated from the shaft C.

Instead of causing what I have termed the outer casing A^2 to nearly inclose the inner casing A^1 , it may only extend along one side; but it is important that its ends cover the whole of the ends of A^1 , and that they be at a sufficient distance to give a good space for the flow of water from the valves M.

The movable cylinder D may receive the proper motion by other means than through the cams C' , so long as it has a tolerably prompt motion from one extreme to the other of its movement, and then rests.

I claim as my invention—

1. In combination with the reciprocating piston I and suitable fixed casings and passages, the movable cylinder D, with its ends serving as valves, operated by abutting alternately against the fixed casing, so that the contact of the abutting end closes the water-passage and the breaking of such contact opens it, as and for the purposes herein specified.

2. In combination with a reciprocating piston and a reciprocating cylinder, D, with its ends abutting alternately against the fixed casings, the elastic seat-pieces a , adapted to yield and accommodate themselves to the ends of the cylinder, as herein specified.

3. The valves M, constructed with the rubber portion m , and with the stout metal ring N, held firmly in position thereon, in combination with the corresponding recessed seat, and adapted to operate therewith, as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 23d day of February, 1874, in the presence of two subscribing witnesses.

R. J. GOULD.

Witnesses:

THOMAS D. STETSON,
M. A. VAN HAMEE.