C. H. Hersey.

Rotary Pump.

No. 82,833. Patented Oct. 6, 1868.

Fig. 1.

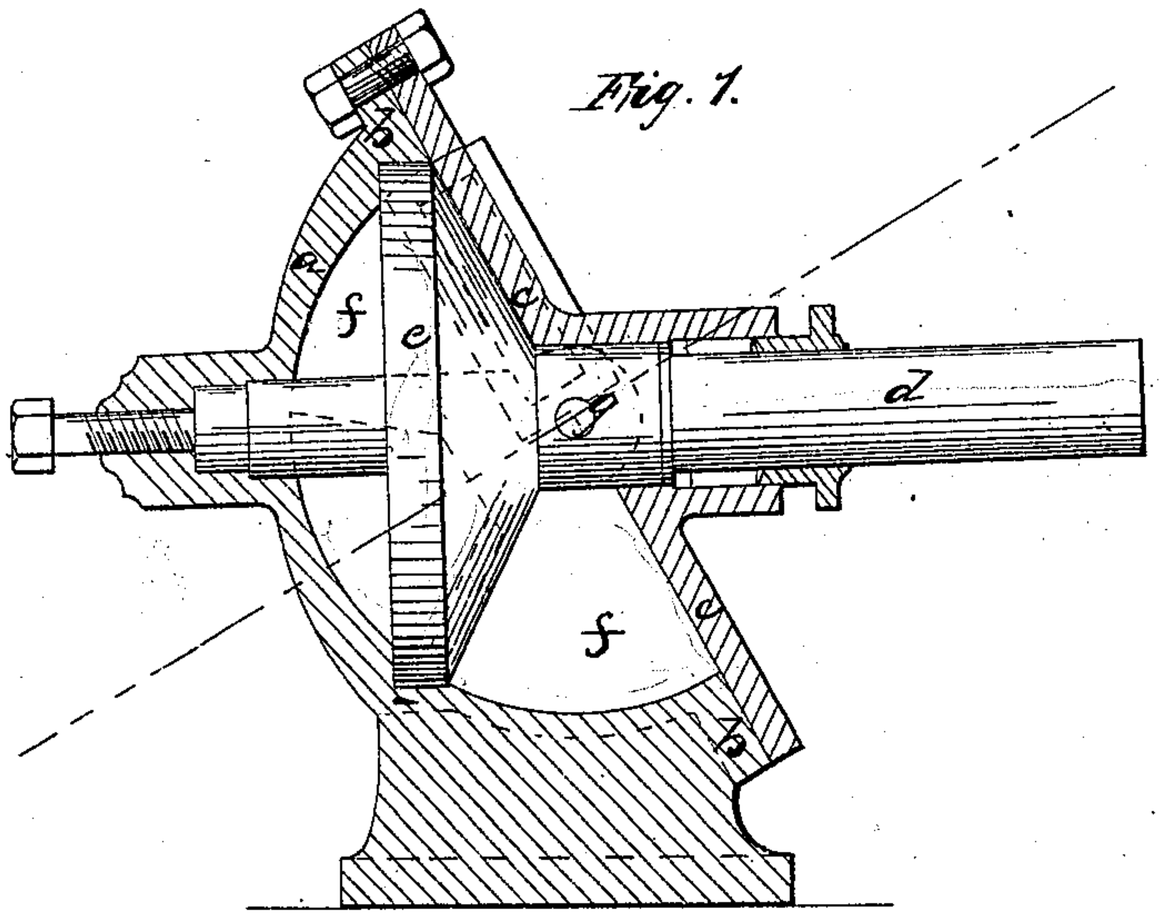
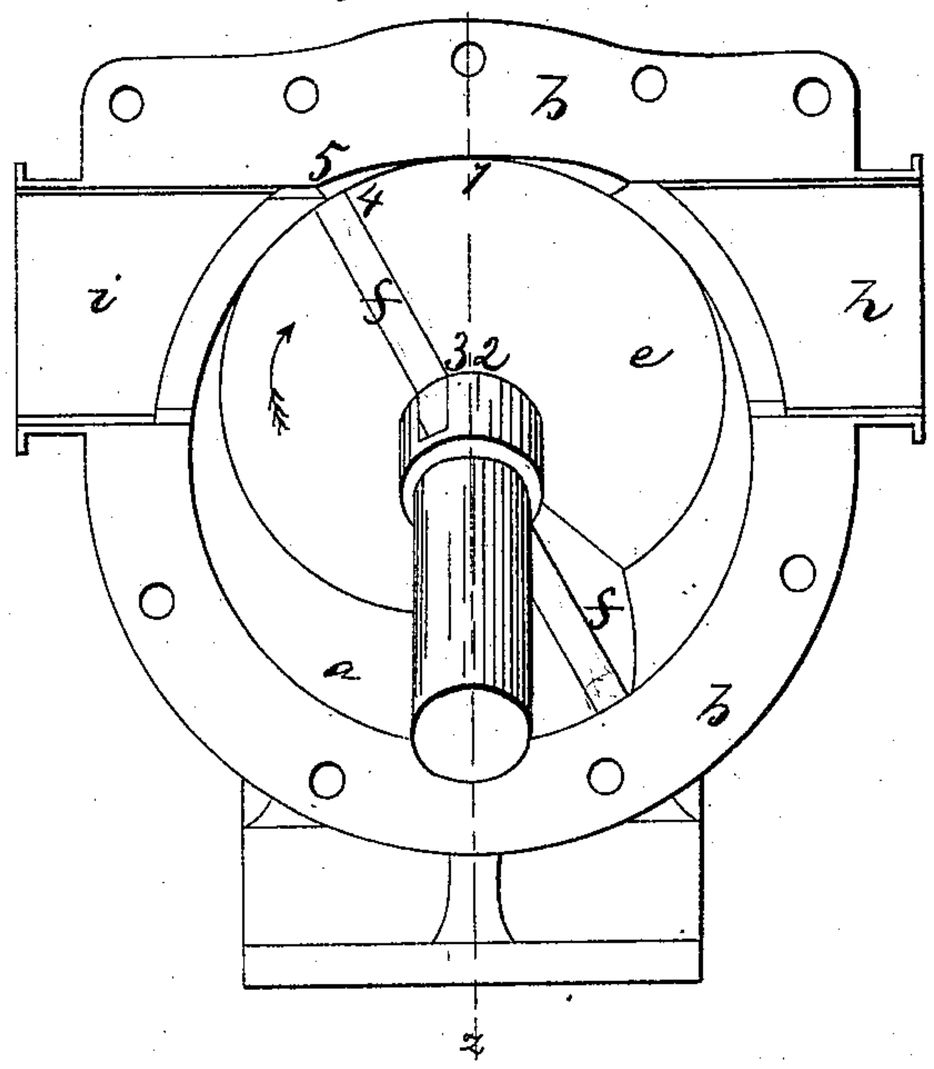


Fig. 2.



Witnesses:

L B Kidder
L H Latimer

Inventor

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CHARLES H. HERSEY, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 82,833, *dated October* 6, 1868

IMPROVEMENT IN ROTARY PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES H. HERSEY, of Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

This invention relates to improvements on that class of rotary pumps of which the first specimen known to me is that shown in the patent, No. 11,776, to S. D. Carpenter, October 10, 1854.

In my improved pump, as in said Carpenter's patented pump, a fixed semi-spherical shell is employed, and so arranged that its central plane surface is at an angle (in practice, say of about sixty degrees) with a horizontal plane, and has a horizontal shaft, on which is fixed a diaphragm, made conical on that side presented to the plane surface of the semi-spherical shell to such an extent, that, in the vertical plane passing through the shaft, the diaphragm on one side thereof shall there coincide with the angularly-located plane of the semi-spherical shell, the edge of the diaphragm being fitted closely in the spherical part of the shell, in which it is made to revolve by application of power to the shaft.

In a slot or mortise in the diaphragm and shaft, a piece is fitted, which serves the purpose of a piston, and of the valves of a pump, said piece being pivoted so that its straight edge will, in any position which the piece is made to assume, always remain in the plane surface of the semi-spherical shell, the centre of the pivot of said piece being in said plane surface, and the shape of said piece being otherwise such as to come into contact with the semi-spherical surface of the shell or body of the pump, and to fill the distance in any position between the said surface, the conical surface of the diaphragm, and the central angularly-located plane surface of the pump-body, on which latter surface is fitted a plane-surfaced head or cover, through which is a journal-bearing for the shaft.

My improved pump is shown, in—

Figure 1, of the drawings, in a vertical section taken in a plane passing through the shaft, and, in

Figure 2, in elevation, with the plane-surfaced head removed.

My invention consists in an improved arrangement of the ingress and egress-passages for the fluid, and in a construction by which the fluid is relieved from choking and retarding the pump at certain positions of the piston-piece.

The semi-spherical shell or body of the pump is denoted by *a*, the plane surface of which, arranged in an angular direction, is provided with flanges, *b*, to which the plane-surfaced head *c* is bolted. The shaft *d* is arranged horizontally, with its axis passing through the centre, from which the spherical part of the pump-body is described, a step or bearing for the shaft being formed in the body, as shown, and the shaft passing through a bearing in the head *c*, which is provided with a stuffing-box, as seen in the drawings.

The conical diaphragm *e* may be cast with the shaft, or may be fixed thereon, and is so shaped and arranged that it will be in contact with the head *c*, in the vertical plane denoted by line *z z*, from the point 1 to the point 2. The diaphragm *e*, and that part of the shaft contained in the spherical part of the body, are slotted or mortised, as indicated by the drawings, so as to receive the piston *f*, which is pivoted in the slot, as shown, the shape of said piston *f* being such that its straight edge, in all positions of the piston, will be in contact with the plane surface of the head *c*, and will at all times make a close partition or diaphragm between said surface and the conical surface of diaphragm *e*, the piston being oscillated on its pivot *g*, as the piston is turned in the pump-body, by the revolutions of the shaft *d*, the oscillations of the piston *f*, with relation to the diaphragm, being caused by the contact of the straight side or edge of the piston with the head *c*. In the previous constructions, the ingress and egress-passages were made directly through the head *c*, as may be seen by reference to Carpenter's patent aforesaid, and, at the locations where the edge of the piston passed the said passages, the head became grooved under wear, so as to cause leakage, and irregular movement or catching of the piston in the grooves so worn. My improvement in this matter is the change of location of said passages, so as to leave entire the whole surface of the head, thus equalizing its wear by the piston.

By inspection of fig. 2, it will be seen that the passages *h* and *i* are made through the material of the body *a*, and into the spherically-bounded space, so that in all positions of the piston *f*, its straight edge acts upon the unbroken surface of the head, which is consequently evenly worn. Either passage, *h* or *i*, may be the inlet, the other being the outlet, according as the shaft is rotated in one or the other direction.

Suppose the direction of rotation to be that indicated by the arrow on the drawing, then it will be evident that after the piston passes the passage *i*, the water contained between the piston, the head, and the diaphragm, between the points 1, 2, 3, 4, would jam or wedge the pump, unless it could find an outlet.

To prevent the water from straining the pump, and finding an outlet or escape from the space just designated, by opening the joints, I connect said space with the outlet-passage, by cutting away the material of the case, as seen at the point 5, which cutting is duplicated on the other side of the line *z z*, to provide for a reverse rotation of the shaft, which would make the passage *h* the outlet, and the passage *i* the inlet.

It will be observed that the fluid-passages *h* and *i* are made wide, extending from near the top of the pump to or nearly to a horizontal plane passing through the axis of the shaft. This construction of the passages is to prevent the fluid from being driven from the large space contained in the pump, below the aforesaid horizontal plane, into or toward a smaller space above, without vent, by which the parts of the pump would be strained asunder. By extending the fluid-passages down to or near to the aforesaid horizontal plane, it will be seen that when the piston *f* is horizontal, the contents of the cubic space beneath will find vent, the moment the piston is inclined by the rotative movement of the shaft, sufficient to depress one end of *f* below the lower boundary of one passage, and to elevate the other end above the lower boundary of the other passage.

I claim the pump, constructed as described, with semi-spherical shell or body, conical diaphragm, and flat-surfaced head, when the inlet and outlet-passages are located and arranged as and for the purpose set forth.

Also, in combination with the parts last above named, I claim the construction shown at 5, for the purpose specified.

CHAS. H. HERSEY.

Witnesses:

J. B. CROSBY,

L. H. LATIMER.