H. M. WYETH.

DOUBLE-ACTING ANTI-FREEZING FORCE-PUMP.

No. 190,946. Patented May 15, 1877.

Fig. 1.

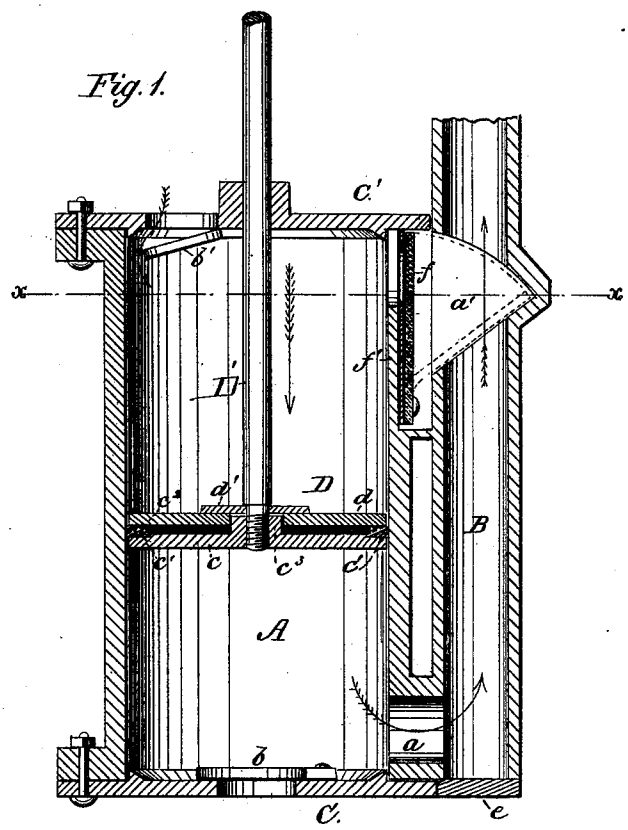

Fig. 2.

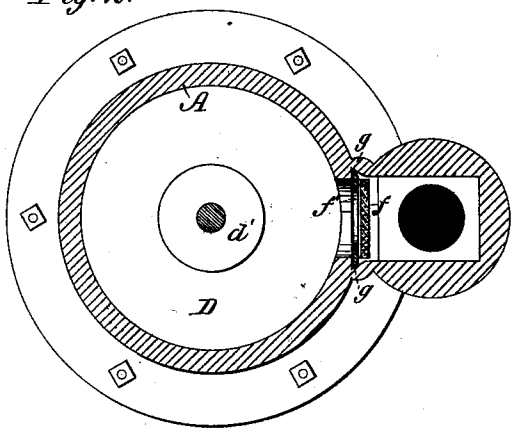

Fig. 3.

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HENRY M. WYETH, OF RICHMOND, INDIANA.

IMPROVEMENT IN DOUBLE-ACTING ANTI-FREEZING FORCE-PUMPS.

Specification forming part of Letters Patent No. **190,946**, dated May 15, 1877; application filed March 2, 1877.

To all whom it may concern:

Be it known that I, HENRY M. WYETH, of Richmond, in the county of Wayne and State of Indiana, have invented a new and Improved Double-Acting Anti-Freezing Pump; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a vertical longitudinal section; Fig. 2, a transverse section through the line *x x* of Fig. 1. Fig. 3 is a detail side view of the double-acting valve and its detachable seat.

My invention is intended chiefly to provide a submerged double-acting porcelain-lined pump, which shall be of a simpler construction and less expensive manufacture than those heretofore made. It is an improvement upon that form of pump in which two inlet-valves are employed in connection with a single outlet-valve arranged in a side pipe, which opens into both ends of the cylinder.

The invention consists, mainly, in casting the pump and the side pipe in a single piece, the ends of both cylinder and pipe open, and with the greater portion of the said pipe offset or removed from the periphery of the cylinder so as to leave a space between. By casting both cylinder and pipe in one piece, I am enabled to secure the desideratum of cheapness, while, by offsetting the pipe from the cylinder I am enabled to successfully line the interior of the pump-cylinder with porcelain, which results could not be successfully attained in this form of pump in any other way, as hereinafter more fully explained.

In the drawing, A represents the pump-cylinder, and B the side pipe, both cast in a single piece of metal, the said pipe being offset or removed from the periphery of the pump-cylinder so as to leave an open space between the same and the cylinder throughout its entire length, except at the points *a a'*, at which it must necessarily connect with the said cylinder in order to be cast homogeneous therewith. C C' are the two cylinder-heads, which are bolted to the flange of the cylinder, and contain inlet-valves *b b'*. D is the piston attached to a rod, D', that passes upward and parallel with the continuation of the delivery side pipe B to the handle and spout. This piston is constructed in part of a disk, *c*, having a groove or rabbet, c^1, at its periphery to receive a packing-ring, c^2, of leather or other elastic material, and a central projection or boss, c^3, provided with a central screw-threaded perforation, in connection with which a plain-faced disk, *d*, is employed, which has a central perforation corresponding to the boss c^3 of the disk. This latter disk is held in position upon the piston-rod by a washer, *d'*, while the screw-threaded end of the piston-rod enters the screw-threaded boss c^3 of the disk *c*, and by drawing the two disks together clamps the elastic packing-ring, thus forming the completed piston. The side pipe B of the pump, which opens into the cylinder at both ends of the latter, is closed by a cap, *e*, at one end, and at the other is enlarged to form a chamber for the double-acting valve *f*. This valve is attached to a removable valve-seat, *f'*, which, together with the valve, is slid into ways *g g* at the orifice of the pump-cylinder opening into the valve-chamber, and held in its position there by means of the top cylinder-head, which fits upon the top of the same.

In operating the pump the valve *f* is double-acting in its effect; thus, as the piston rises it rests upon the inclined seat of the chamber *a'* in the pipe B, as shown in dotted lines, to operate as a check-valve, while the valve *b* opens to admit water beneath the piston, and at the same time it permits the escape of water from above the piston while valve *b'* is operating as a check-valve. As the piston descends, on the contrary, the said valve *f*, rises from its inclined seat and simultaneously closes communication between the pipe and the space above the piston, and opens communication between the pipe and the space below the piston.

In relation to the casting of the pipe B and pump-cylinder in a single piece, and offsetting the pipe as described, I would state that I am aware that it is not new to cast a side pipe upon a pump-cylinder, which pipe is adjacent to and connected with the cylinder throughout its entire length, and that pipes offset from the cylinder, but not open at both ends, have been also cast with the cylinder, and hence I do not claim, broadly, the casting of the two in one piece; neither do I claim,

broadly, the lining of the pump-cylinder with porcelain. I prefer to line the said cylinders with porcelain, however, for the reason that it gives a smooth glossy surface to the inside, which decreases friction and renders the pump more durable and easier in its working, while it also prevents rust, and keeps the water pure and clean.

In applying the porcelain lining to the cylinder, the metal of the latter must be brought to nearly a melting-point, and if the cylinder is thicker on one side than another, as a pipe cast in the usual way, adjacent to the cylinder, would make it, the cylinder will be more tardy in cooling on the thick side, and the consequence will be that the pump will be irregular and oblong in transverse direction instead of a true cylinder, and will be entirely unfit for use, so that when the cylinders are porcelain-lined the side pipe, if applied otherwise than in accordance with my invention, must be separately fitted on at considerable expense by machine-work. By casting the pipe solid with the cylinder, with both ends of both pipe and cylinder open, and yet entirely independent and away from the cylinder, so that it will not be affected by the expansion or contraction caused by heating and cooling, the same thickness of cylinder is preserved all around, and both pipe and cylinder being connected at outlet-holes, but not in a way that will cause any inconvenience in any part of the construction, the casting of the same may be easily effected. By casting the cylinder and pipe, then, in a single piece, I dispense with the machine-work of planing and fitting and secure the desideratum of cheapness, while the arrangement of the pipe permits the successful lining of this class of pumps with porcelain, and also gives more room for the chamber of the double-acting valve *f*.

The peculiar detachable character of the valve *f* and its seat permits also its easy removal for inspection or repairs, while there is always a communication between the cylinder and discharge-pipe, so that the water from the latter may run back into the cylinder, thus preventing the water from ever freezing in the discharge-pipe. By casting the cylinder and the pipe in one piece, with both ends of the cylinder open, and also both ends of the pipe open, I am enabled to not only successfully line the cylinder with porcelain, but also the pipe; and instead of using a separate cap, *e*, for closing the lower end of the pipe, the said cap and lower cylinder-head may be formed in one piece.

Having thus described my invention, what I claim as new is—

1. The pump-cylinder A and side pipe B, offset as described, and both cast in one piece with their opposite ends open, as and for the purpose described.

2. The valve *f* and its seat *f'*, made together removable, and combined by means of guideways with cylinder A and pipe B, and held in place by the cylinder-head, substantially as and for the purpose described.

3. The disk *c* of the piston, having circumferential groove c^1 and central boss c^2, with screw-threaded perforation, in combination with the packing-ring c^2, the disk *d*, having perforation corresponding to the boss, and the piston-rod D, having screw-threaded end and a washer, *d'*, as and for the purpose set forth.

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Witnesses:
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