(No Model.)

J. M. WINGER.

FORCE PUMP.

No. 408,564. Patented Aug. 6, 1889.

FIG. 1.

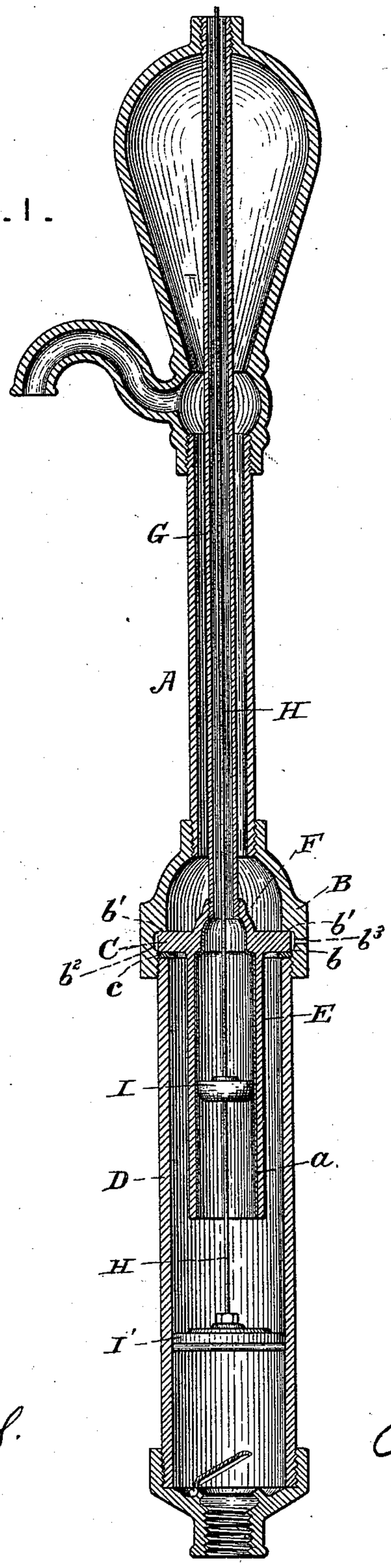
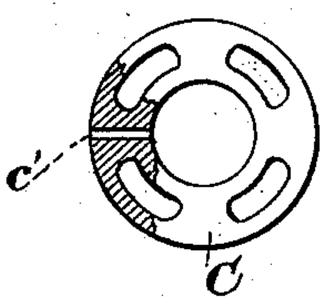


FIG. 2.



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UNITED STATES PATENT OFFICE.

JOHN M. WINGER, OF SPRINGFIELD, ASSIGNOR TO THE SUPERIOR MACHINE COMPANY, OF NEW CARLISLE, OHIO.

FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 408,564, dated August 6, 1889.

Application filed October 8, 1888. Serial No. 287,488. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. WINGER, of Springfield, county of Clark, and State of Ohio, have invented a new and useful Improvement in Force-Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to that class of pumps in which an inner cylinder is employed, suspended within the main or outer cylinder and within which a force piston or bucket is arranged to operate in conjunction with the usual plunger or piston operating the main pump-cylinder, and, more particularly, to the construction of said inner suspended cylinder and its diaphragm and the arrangement of the latter in connection with the outer main cylinder, whereby it is made to support and give vent to the inner cylinder, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a vertical section through a pump having my improvement applied, and Fig. 2 represents a plan view of the perforated diaphragm upon which the inner cylinder is formed and from which it is pendent.

The pump shown in the drawings, in its organization or general construction and arrangement of the parts, is similar to that shown in Letters Patent No. 305,955, granted to Paxson and Coffield, September 30, 1884, and need not therefore be described in detail further than is necessary to an understanding of my improvement.

A indicates the pump stock or tube, to the upper end of which the usual air-chamber with its spout and the appliances for operating the pump may be applied in any usual or preferred manner. The lower end of the tube A is screw-threaded to receive the upper end of a perforated and internally-threaded cup-shaped (inverted) casting B, which is secured to the tube A by being screwed thereon, as shown. The bore of the casting is enlarged at its lower end at *b* to receive a diaphragm C, said enlargement of the bore terminating in an annular shoulder *b'*, against which the diaphragm C rests and is clamped, as will appear. At the lower end of this enlarged bore the casting is screw-threaded internally to receive the upper screw-threaded end of the pump-cylinder D or of the upper section thereof, as shown.

The diaphragm C has the inner cylinder E formed upon or cast in one piece with it on its lower side or face and pendent from it, so that when the diaphragm C is placed within the enlarged bore or socket *b*, and the cylinder-section D is screwed into place in said socket, the diaphragm rests upon and is held by said cylinder, and in turn upholds the inner cylinder E suspended within the outer main cylinder. A gasket *c* may be interposed between the cylinder D and the diaphragm C, and preferably the arrangement is such that when the cylinder D is screwed to place in the casting B the diaphragm will be snugly clamped against the shoulder *b'*, thereby effectually preventing relative movement of the cylinders D and E and holding the latter firmly in place.

By the construction of the diaphragm and inner cylinder in one piece or casting, as described, the expensive fittings heretofore required are dispensed with, all liability of accidental displacement of the parts is avoided, and the cost of manufacture materially reduced.

An annular flange or collar F is formed on the upper face of the diaphragm C, around the central perforation therein, and this flange is internally screw-threaded to engage the lower end of a tube G, in which the pump-rod H works, the latter being guided and steadied in its movements and kept from contact with the water thereby. The upper end of this tube G is secured to the head or top of the pump or air-chamber, and the force-piston and lift-bucket I and I' are connected to and operated by the rod H in the usual manner.

The diaphragm C and cylinder E being connected and supported independently of the tube G, as described, the latter may be dispensed with, if desired; but for the purpose of protecting the pump-rod from moisture and consequent danger of having its operation interfered with by frost in cold weather, it is preferred to use a pendent tube

of sufficient length for that purpose; but it is not necessary that it should extend down to and be connected with the diaphragm.

The diaphragm C is provided with one or more radial perforations c', which extend from its central perforation to the periphery of said diaphragm, connecting at the latter point with an annular groove b^2 in the casting or coupling B, and from which perforations b^3 extend outward through the latter, as shown, for affording a vent to water which may get above the piston I in the cylinder E.

The piston I works within the cylinder E, and for the purpose of protecting the latter from rust, which in time would interfere with the working of the piston and impair the operation of the pump, said cylinder has a lining, of porcelain or other vitreous enamel a, applied to its inner surface, in connection with which the piston I works, said enamel effectually protecting the cylinder and greatly increasing its durability as compared with the ordinary construction of said cylinder.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the pump tube or stock A and the outer main cylinder D, of the cup-shaped casting B, provided at top and bottom with internal screw-threads for receiving the stock A and cylinder D, and the inner cylinder E, diaphragm C, and screw-threaded flange F, formed in one piece and arranged substantially as described.

2. The pump-stock A, the outer main cylinder D, and the internally-screw threaded coupling B, provided with the annular groove b^2, for the reception of and in combination with the diaphragm C, and its integrally-formed inner cylinder E and screw-threaded flange F, all arranged to operate as specified.

3. The pump-stock A, the outer main cylinder D, and the internally-threaded coupling B, provided with the annular groove or recess b^2, for the reception of and in combination with the diaphragm C, whose diameter is less than the diametrical measurement of the groove or recess b^2, whereby space is provided between the periphery of the diaphragm C and the wall of the groove or recess b^2 for the passage of water, said diaphragm being provided with the perforation or vent c', and having the integrally-formed inner cylinder E, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 30th day of September, A. D. 1888.

JOHN M. WINGER.

Witnesses:

ROBERT C. RODGERS,

GEO. W. ROBISON.