A. H. DEAN & A. C. PIKE.
Double-Acting Lift-Pump.

No. 209,027. Patented Oct. 15, 1878.

FIG. 1.

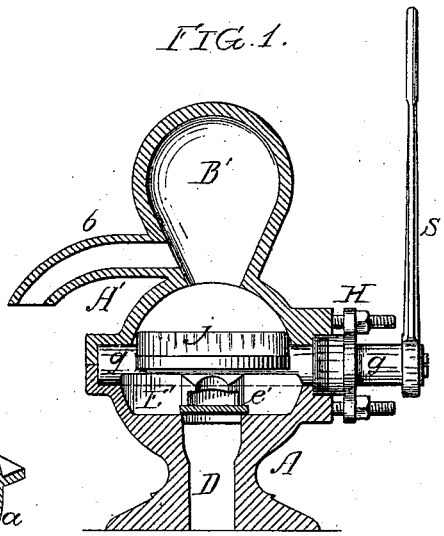


FIG. 3.

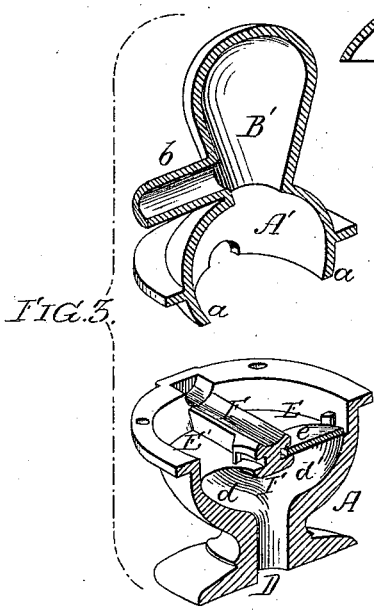


FIG. 4.

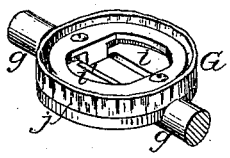
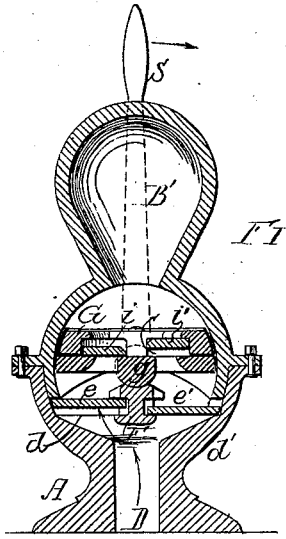


FIG. 2.



Witnesses
John R. Dennett
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Asahel H. Dean
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UNITED STATES PATENT OFFICE.

ASAHEL H. DEAN AND ALBERT C. PIKE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DOUBLE-ACTING LIFT-PUMPS.

Specification forming part of Letters Patent No. **209,027**, dated October 15, 1878; application filed August 26, 1878.

To all whom it may concern:

Be it known that we, ASAHEL H. DEAN and ALBERT C. PIKE, both of Philadelphia, Pennsylvania, have invented new and useful Improvements in Double-Acting Lift-Pumps, of which the following is a specification:

Our invention relates to that class of double-acting lift-pumps in which a vibrating valve-plate is employed; and the object of our invention is to make a pump of this character economical in construction, little liable to get out of order, and one in which the wear, while comparatively slight, is evenly distributed. This object we attain in the manner which we will now proceed to describe, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of the pump; Fig. 2, a transverse section; Fig. 3, a sectional perspective view of the two halves of the casing separated from each other; and Fig. 4 a perspective view of the valve-plate.

The casing of the pump is made in two parts, bolted together by suitable flanges, the upper portion, A′, of the casing being provided with an air-chamber, B′, and outlet-pipe *b*, while the lower half, A, of the casing is in communication, through an opening, D, at the bottom, with the supply of liquid to be pumped. This passage D has two branches, *d d′*, communicating through loose valves *e e′* with the valve-chambers E E′, respectively, these chambers being separated from each other by a bridge, F, extending across the casing. This bridge is so arranged in relation to the valve seats and passages that the said bridge is cast in one piece with the whole lower half of the casing.

Along the top of the bridge is a groove adapted to receive the pivot-rod *g*, which forms part of the valve-plate G, one end of this rod being adapted to a closed recess or bearing formed by the adjoining edges of the two parts of the casing, while the opposite end of the rod passes through a stuffing-box, H, and has attached to it a suitable handle, S, by which the valve-plate G may be vibrated. This valve-plate is provided with two loose valves, *i i′*, corresponding to the valves *e e′* in the valve-chambers E E′, and retained in place by a suitable plate, which, being screwed to the said valve-plate, also serves to secure the packing-strip *j*, surrounding the edge of the valve-plate.

In pumps of this class it has been usual to make the casings cylindrical, the flat ends being secured to the cylindrical portions by bolts. In our pump, however, the inside of the pump-chamber in which the valve-plate works is hemispherical in form, and the valve-plate consequently circular, the upper half of the casing being provided on opposite sides with extension-pieces *a a*, which are adapted to fit inside the lower half of the casing, so that the vibrating movement of the valve-plate may take place wholly within the upper portion of the casing.

By this arrangement it will be seen that the only part of the castings which requires to be ground, with the exception of the valve-seats and the bearing for the pivot-rod of the valve-plate, is the hemispherical interior of the upper half of the casing. This construction of casing is more economical to make, involves less wear in the movement of the valve, and enables us to use loose valves in place of the usual hinged valves, which are so liable to get out of order.

The operation of the pump will be readily understood without description.

We claim as our invention—

1. A double-acting lift or force pump in which a vibrating valve-plate of circular form is combined with a hemispherical pump-casing having portions *a a*, which extend beyond the limit of vibration of the valve-plate, all substantially as set forth.

2. The combination of the hemispherical pump-chamber and the vibrating valve-plate having loose valves with the valve-chambers provided with loose valves *e e′*, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

A. H. DEAN.
A. C. PIKE.

Witnesses:
HENRY POLSZ,
HUBERT HOWSON.