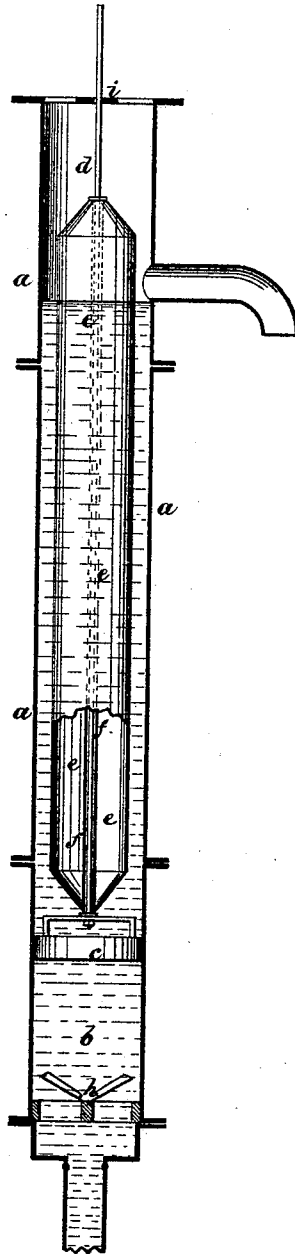


J. K. J. FOSTER.

PUMP.

No. 175,686.

Patented April 4, 1876.



WITNESSES:

Wm. Hollingsworth
Solow C. Kemmon

INVENTOR:

John K. J. Foster
BY *Wm. V. B.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN K. J. FOSTER, OF HORBURY, NEAR WAKEFIELD, ENGLAND.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **175,686**, dated April 4, 1876; application filed December 15, 1875.

To all whom it may concern:

Be it known that I, JOHN K. J. FOSTER, of Horbury, in the county of Yorkshire, England, have invented a new and Improved 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 part of this specification.

This invention relates to certain improvements in that class of pumps in which a displacer is attached to the pump-spear, so as to discharge a portion of the water contained in the pump-barrel upon the downward stroke of the piston, and by its buoyancy assist in the elevation of the piston upon the lift or upward stroke.

My invention consists in constructing the displacer in the form of a hollow cylindrical sheet-metal vessel, with a tube running through the same longitudinally, so that several of the displacers may be placed upon the same pump-spear, if desired.

In order that my invention may be more readily understood, I have illustrated it, by way of example, in the accompanying drawing, which represents a vertical section of an ordinary suction-pump, provided with the improvement constituting my invention.

As here shown, *a* is the pump-tree or upper part of the barrel; *b*, the working-barrel in which operates the piston *c*; *d*, the piston-rod; *h*, the bottom valve; and *i*, a cross guide-bar, all of the ordinary or any other suitable construction. Upon the piston-rod is arranged the displacer *e*, which is made with conical ends, to pass more readily through the water, and is constructed of sheet metal, so as to form an air-chamber of greater buoyancy than the same volume of water. Through the dis-

placer is arranged a hollow tube, *f*, which passes the entire length of the displacer, and opens at each end to allow the passage of the pump-spear through the same. This tube forms around it a tightly-closed air-chamber, whose air-tight character is independent of its attachment to the rod, which construction enables me to readily attach and detach the displacer, or place a number of displacers upon the same pump-spear, which latter could not be done without the tube, except a rigid joint be made between each displacer and the pump-spear. The displacer, with its longitudinal tube, is detachably fastened to the pump-spear by a collar with set-screw, or any other suitable device which will cause it to move with the piston.

I am aware of the fact that it is not broadly new to employ a displacer in a pump-barrel, this being shown in English patent No. 2,946, of 1865, and also in the patent to John Rerfrew, June 16, 1846. I therefore confine my invention to the particular construction of the displacer.

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

The combination, with the pump-barrel and the pump spear, of the cylindrical displacer *e*, having an open longitudinal tube, *f*, running therethrough and forming a detachable air-tight displacer, as and for the purpose described.

The above specification of my invention signed by me this 20th day of October, 1875.

JOHN KISSACK JOSHUA FOSTER.

Witnesses:

HENRY RYDOR CASSONS,
WILLIAM HENRY GREEN.