No. 677,137. Patented June 25, 1901.

F. M. LEAVITT.

PUMP.

(Application filed Oct. 19, 1898.

(No Model.)

FIG. 1.

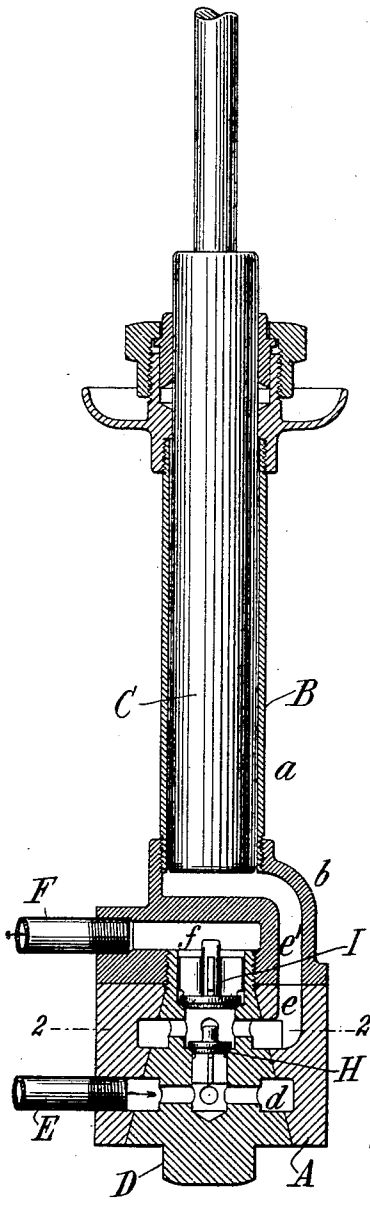


FIG. 4.

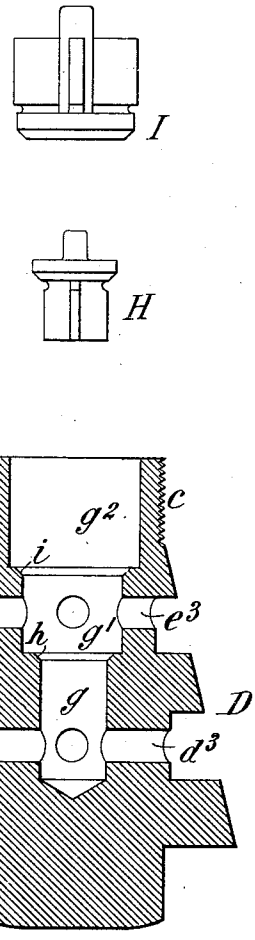


FIG. 3.

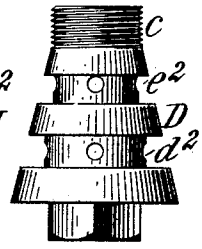
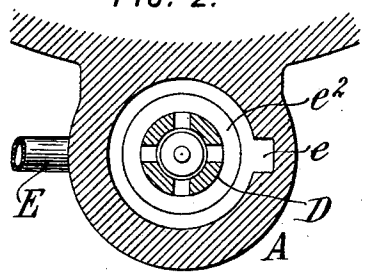


FIG. 2.



WITNESSES:

Fred White

Thomas F. Wallace

INVENTOR:

Frank M. Leavitt,

By his Attorneys,

Autun G. Fraser & Co

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK M. LEAVITT, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE E. W. BLISS COMPANY, OF SAME PLACE.

PUMP.

SPECIFICATION forming part of Letters Patent No. 677,137, dated June 25, 1901.

Application filed October 19, 1898. Serial No. 693,979. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. LEAVITT, a citizen of the United States, residing in Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention provides an improved construction of pumps, the improvements relating to the means for applying the valves whereby they are rendered readily accessible and to means for fastening the pump-cylinder in place, so that it may be easily dismounted.

The invention is applicable to pumps generally, although especially designed for an air or vacuum pump to be employed in connection with a low-pressure steam-engine.

In the accompanying drawings I have shown my invention as applied to a single-acting plunger-pump of simple construction.

Figure 1 is a vertical mid-section of the pump. Fig. 2 is a transverse section of the base thereof on the line 2 2 in Fig. 1. Fig. 3 is an elevation of the plug or valve-chest detached. Fig. 4 is a vertical mid-section of this plug, on a larger scale, with the valves in elevation detached therefrom.

Let A designate the base upon which the pump-cylinder is mounted; B, the cylinder; C, the piston or plunger, and D the conical plug or valve-chest. The base A may be of any suitable shape or construction and mounted or applied in any desirable manner in connection with other machinery or otherwise. When, for example, the pump is employed in connection with a steam-engine, the base A is formed as a projection upon the engine-base. The pump-cylinder B, I have shown as formed of a tube *a*, screwed into a foot *b*; but this construction is not essential. The cylinder-foot *b* rests upon the base A and is fastened thereto by any suitable means, preferably according to my invention by the conical plug D, which has a screw-threaded portion *c* at its upper end, which screws into a threaded socket in the foot.

E is the inlet or suction pipe, and F is the outlet or discharge pipe. In the preferred construction the inlet-pipe E enters the base A, as shown, and communicates with a channel or passage *d* therein. The base is formed with another channel or passage *e*, communicating with a passage *e'* in the foot of the cylinder, through which the fluid may flow to and from the cylinder. The discharge-pipe F is shown as screwed into the cylinder-foot and communicating with a chamber *f* therein.

The base A is formed with a conical socket, into which the conical plug D fits, the two being ground together to make a leak-tight joint. The passages *e* and *d* are made to communicate with the socket, and each extends circumferentially around the socket. The plug is formed with coinciding peripheral grooves d^2 e^2, which when the plug is in place form, with the passages *d e*, coincident annular passages extending circumferentially around the plug. The plug is internally bored, forming three chambers *g* *g'* g^2, one above the other and of successively larger size, Fig. 4, and between these chambers are valve-seats *h* and *i*, on which seat the valves H and I, respectively. The plug D thus forms the valve-chamber. The groove d^2 communicates by lateral passages d^3 with the chamber *g*, and the groove e^2 communicates by lateral passages e^3 with the chamber *g'*. The valves H and I are shown as gravity clack-valves having conical seating-faces which are ground to the conical seats *h i*; but other constructions of valves may be substituted. The plug D has a square or hexagonal head projecting from its lower end, by which to unscrew it in case it is desired to get access to the valves or to reach the passages *d e* or in case it is desired to disconnect the pump-cylinder.

In operation the suction-stroke of the pump draws fluid through the suction-pipe E into the passage *d*, whence it flows through lateral ports d^3 into chamber *g* and, lifting valve H, enters chamber *g'*, whence it passes out through lateral ports e^3 and by the passages *e e'* into the cylinder. During the return stroke the fluid flows back from the cylinder through passages *e' e* into chamber *g'*, seats valve H, and, lifting valve I, flows through chamber g^2 into chamber *f* and passes out by the delivery-pipe F.

The purpose of making the passages d d^2 and e e^2 continuous or circumferential around the plug is to provide free communication with the lateral ports d^3 e^3 irrespective of the rotative position which the plug D assumes when screwed in tight to its seat.

My invention provides a very simple construction, which by the removal of a single part gives immediate access to both valves of the pump, as well as to the passages leading thereto, or the same construction serves at the same time as the means for fastening the cylinder.

Although shown as applied to a single-acting pump, the application of my invention to a double-acting pump is obvious.

My invention may be considerably modified without departing from its essential features. For example, in some cases it may not be desirable to mount both valves in the plug, in which case one of the valves may be omitted therefrom and otherwise located. The feature of utilizing the plug as a means for fastening the cylinder to the base may also be dispensed with in cases where such means of attachment is not desirable.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. A pump comprising in combination a base, a cylinder mounted thereon, a piston, a removable plug fitting a socket in said base, and passing through the base and screwing into the foot of said cylinder, to attach the cylinder to the base, said base having fluid-passages leading to said socket, and said plug having a communicating passage and a valve-seat, and a valve carried by said plug.

2. A pump comprising a base, a cylinder mounted thereon, a plug passing through said base and screwing into the foot of said cylinder for attaching the cylinder to the base, said plug having a valve-seat, and a valve closing against said seat.

3. A pump comprising in combination a base A, cylinder B and piston, and a conical plug D, the base being formed with a conical socket open at its lower end, and tapering thence upwardly, and with lateral passages d and e entering said socket and the passage e communicating with the cylinder, and the plug fitting said socket, closed at its bottom end and formed with a chamber g and ports communicating therefrom with said passage d, with a chamber g' having ports communicating with said passage e and with a chamber g^2, an inlet-valve H between the chambers g and g', and an outlet-valve I between the chambers g' and g^2, said valves being removable through the inner open end of said plug.

4. A valve-chest for a pump consisting of a conical plug integrally closed at its outer end and having valve-chambers of different diameters formed within it, the chamber of smaller diameter formed nearest the closed end with valve-seats between them, and lateral passages leading from said chambers to the exterior of said plug.

5. A valve-chest for a pump consisting of a conical plug integrally closed at its outer end, and having valve-chambers of different diameters formed within it, with valve-seats between said chambers, exterior grooves corresponding to said chambers, and passages leading from said chambers to the respective grooves.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANK M. LEAVITT.

Witnesses:
WALTER B. BAILEY,
FRANK C. B. PAGE.