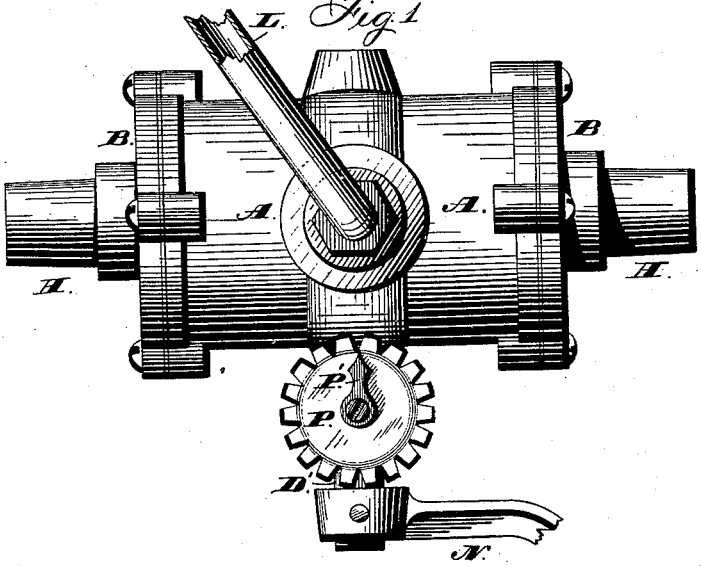
(No Model.) 2 Sheets—Sheet 1.

H. E. MARCHAND.

LIQUID MEASURING PUMP.

No. 264,312. Patented Sept. 12, 1882.

Fig. 1



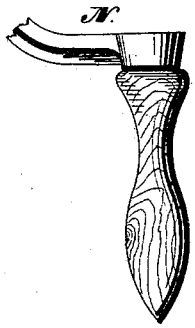
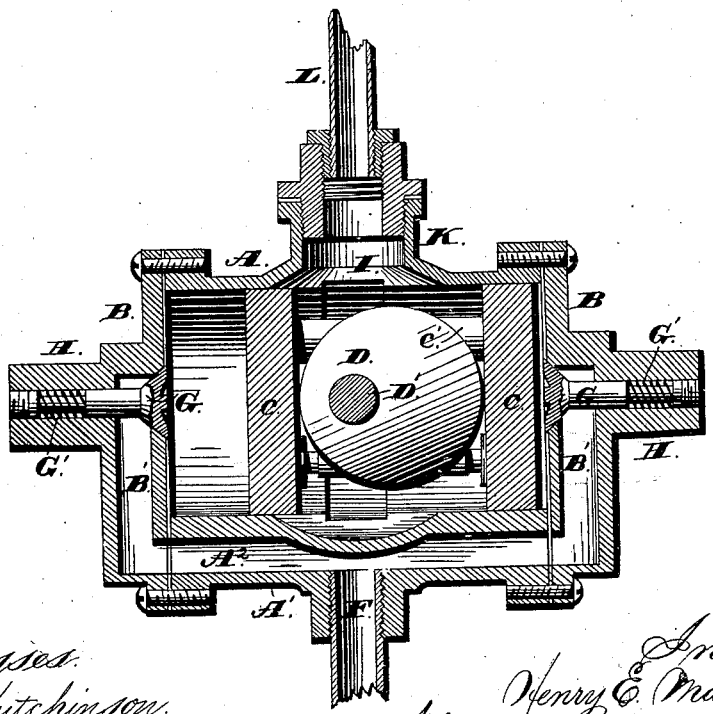


Fig. 2.



Witnesses.
Jas. E. Hutchinson.
J. A. Rutherford

Inventor.
Henry E. Marchand.
James L. Norris.
Atty

(No Model.) 2 Sheets—Sheet 2.

H. E. MARCHAND.

LIQUID MEASURING PUMP.

No. 264,312. Patented Sept. 12, 1882.

Fig. 3.

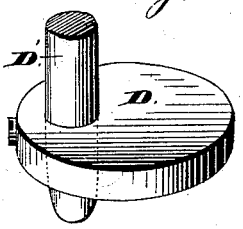


Fig. 4.

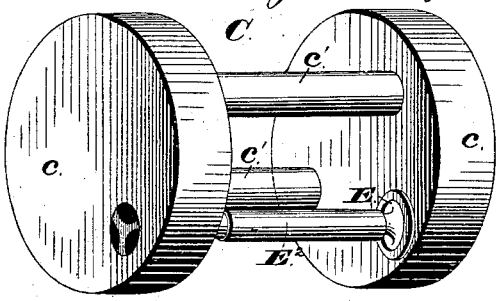


Fig. 5.

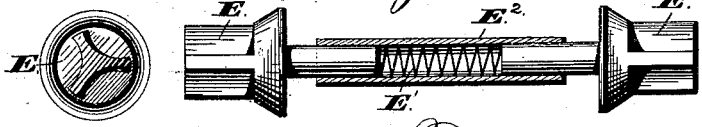
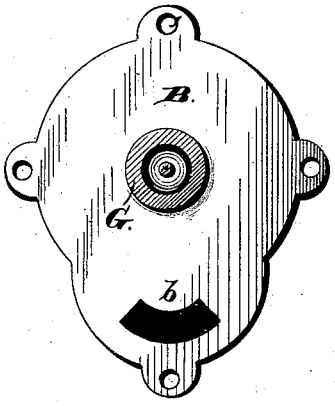


Fig. 6.



Witnesses.
Jas. E. Hutchinson.
J. A. Rutherford

Inventor.
Henry E. Marchand,
James L. Norris, Atty.

UNITED STATES PATENT OFFICE.

HENRY E. MARCHAND, OF PITTSBURG, ASSIGNOR OF TWO-THIRDS TO WILLIAM J. BECKFELD AND JACOB C. LANGE, SR., BOTH OF ALLEGHENY, PENNSYLVANIA.

LIQUID-MEASURING PUMP.

SPECIFICATION forming part of Letters Patent No. 264,312, dated September 12, 1882.

Application filed May 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. MARCHAND, a citizen of the United States, residing at Pittsburg, Allegheny county, Pennsylvania, have invented new and useful Improvements in Liquid-Measuring Pumps, of which the following is a specification.

This invention relates to a pump designed for pumping up and measuring oils and other liquids, the object being to force a given quantity of the liquid from the pump at each revolution of a crank, whereby the liquid can be accurately measured as it is pumped up, and then forced out from the pump. These objects I attain by means of a novel construction of piston and valves, and also by a novel construction of cylinders and cylinder-heads, all as hereinafter fully described, and shown in the drawings, in which—

Figure 1 is a side view of the pump; Fig. 2, a longitudinal section thereof. Fig. 3 represents the eccentric; Fig. 4, the double-headed piston; Fig. 5, the piston-valves, and Fig. 6, the inner side of one of the cylinder-heads.

A indicates the pump-cylinder, which is closed at its ends by the heads B, securely bolted to the ends of the cylinder by means of screws or bolts passing through lugs that are cast with the cylinder and its heads. The double-headed piston C, which works within the pump-cylinder, comprises two heads, *c*, rigidly connected together by means of bolts or rods *c'*. The heads, or, as they might be designated, two pistons, are set and held apart by means of the rods, and the rods are disposed so as to leave working room for an eccentric, D, that is located between the two heads, and employed for reciprocating this double-headed piston. Each head carries an inwardly-opening spring piston-valve E, both of which valves are normally seated by means of a spring, E', common to both. As a means for effecting this arrangement, the stems of the valves enter a tube, E^2, within which the spring is arranged, so as to press equally upon each valve-stem.

The cylinder is provided along one side with an enlargement, A', through which is formed a passage, A^2, running longitudinally with the cylinder and extending from end to end thereof. The inlet pipe F opens into this passage midway of the ends of the latter, so that the inflowing liquid shall be distributed equally in the passage, which is adapted to conduct the liquid into the chambers B' within the cylinder-heads, the openings *b* to said chambers or passages being formed and located so as to register with the ends of the passage which runs alongside the cylinder.

A port is provided in each one of the chambered heads for the inflow of liquid into the cylinder, and each port is closed by a spring-valve, G, opening inwardly—that is to say, within the cylinder—and normally seated by means of a spring, G', arranged around its stem, which extends into a tubular projection, H, formed upon the exterior of the head. The cylinder is somewhat enlarged at its discharge-orifice, as at I, and is formed at such point with a suitable tubular neck, K, with which the discharge-pipe L is coupled.

The shaft D', upon which the eccentric is mounted, will have one of its bearings in the inner wall of the cylinder and its other bearing in a short tubular neck externally screw-threaded to receive a cap, M, which will be fitted upon said neck and formed with a central hole, through which the shaft passes. This shaft, which thus passes transversely through the cylinder, will not interfere with the rods connecting the piston-heads, since the rods are disposed so as to be out of the way of the shaft. The shaft D' is revolved to actuate the eccentric by means of a crank-handle, N, which is fast on the outer end of the shaft.

As the double-headed piston recedes from either head of the cylinder the valve closing the port of the chamber within each head will be opened against the spring by reason of the vacuum exerted within the cylinder. This action on the part of the piston causes the liquid to flow into the passage A^2, and thence into the chambers B' within the cylinder-heads, from whence it is drawn into the cylinder as the valves G are alternately opened by the double-headed piston. When the double-headed piston has completed its stroke in one direction, and liquid thus drawn into the opposite end

of the cylinder, the valve at such end of the cylinder will close, and on the return-stroke the piston-valves next to the liquid will be opened and the liquid be forced into the space or chamber formed by the opposing faces of the heads and the wall of the cylinder, while at the same time the valve at the opposite end of the chamber will open and liquid be caused to flow into the cylinder from the chamber within the head at such end. As the pumping continues the liquid will accumulate within and fill the space between the piston-heads, and then at each subsequent stroke of the piston the liquid forced into the space or chamber between the piston-heads will cause a proportionate displacement of liquid from said space or chamber, the liquid thus displaced flowing out through the discharge-pipe.

In this pump great care is required in grinding and fitting the cone-shaped valves G to their seats, since it is essential that they should fit accurately and nicely.

The pump can be made of any suitable metal and mounted upon any suitable frame or stand.

From the above it will be seen that when the space between the piston-heads is filled it constitutes in effect a reciprocating reservoir, from which, at each revolution of the handle, a determinate quantity of liquid is discharged, which is accurately measured. When not in use the handle will be turned up, so that oil cannot run down upon it.

I have shown a dial, P, and pointer P′ of a registering mechanism for indicating the revolutions of the shaft D′ and crank-handle N; but, as such register is of ordinary construction and forms no part of the invention, it is not specifically described.

In practice any of the usual forms of registering devices can be employed for indicating the revolutions of the shaft D′ and the crank-handle.

Heretofore a pump has been composed of a pump-cylinder provided with an inlet and an outlet and pivoted flap-valves at the end of the cylinder, a double-headed piston being arranged within the cylinder and reciprocated by a handle which is connected by intermediate devices with the rod connecting the two pistons. Such, however, is not my invention, and is not claimed by me. Further, a double-acting pump has been provided with two pistons connected by a rod and reciprocated by an eccentric arranged in a slot in the rod and operating on the inner surfaces of the pistons; but such is not broadly claimed by me.

What I claim is—

1. The double-headed pump-piston comprising the two heads *c*, secured together by rods, and the valves E, having their stems received in a tube, with a space between the ends of the stems, substantially as described.

2. The combination, with the cylinder A, having the horizontal passage A^2, and vertical end chambers, B′, of the double-headed piston comprising the two heads *c*, connected by rods, and the valves E, having their stems received in a tube, with a space between the ends of said stems, and the revolving shaft D′, provided with the eccentric D and crank-handle N for reciprocating the double-headed piston, substantially as described.

3. The combination of the double-headed pump-piston, comprising the two heads *c*, secured together by rods, the valves E, having their stems loosely fitted in the tube E^2, and the spring located in said tube and between the opposing ends of the valve-stems, substantially as described.

4. The pump-cylinder A, having its heads B provided with conical valves G, arranged within the cylinder and provided with stems fitted in exterior extensions, H, on the cylinder-heads, said valves being held to their seats on the inner surfaces of the cylinder-heads by springs, in combination with the double-headed piston comprising two heads, *c*, connected by rods *c*′, the valves E in said piston-heads having their stems fitted into a tube, E^2, with a space between the ends of the stems, and a shaft, D′, provided with an eccentric, D, and crank-handle N for reciprocating the piston, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

H. E. MARCHAND.

Witnesses:
HARVEY THOMPSON,
A. M. WATSON.