(No Model.) 2 Sheets—Sheet 1.

H. E. MARCHAND.

MEASURING PUMP.

No. 287,697. Patented Oct. 30, 1883.

Fig. 1.

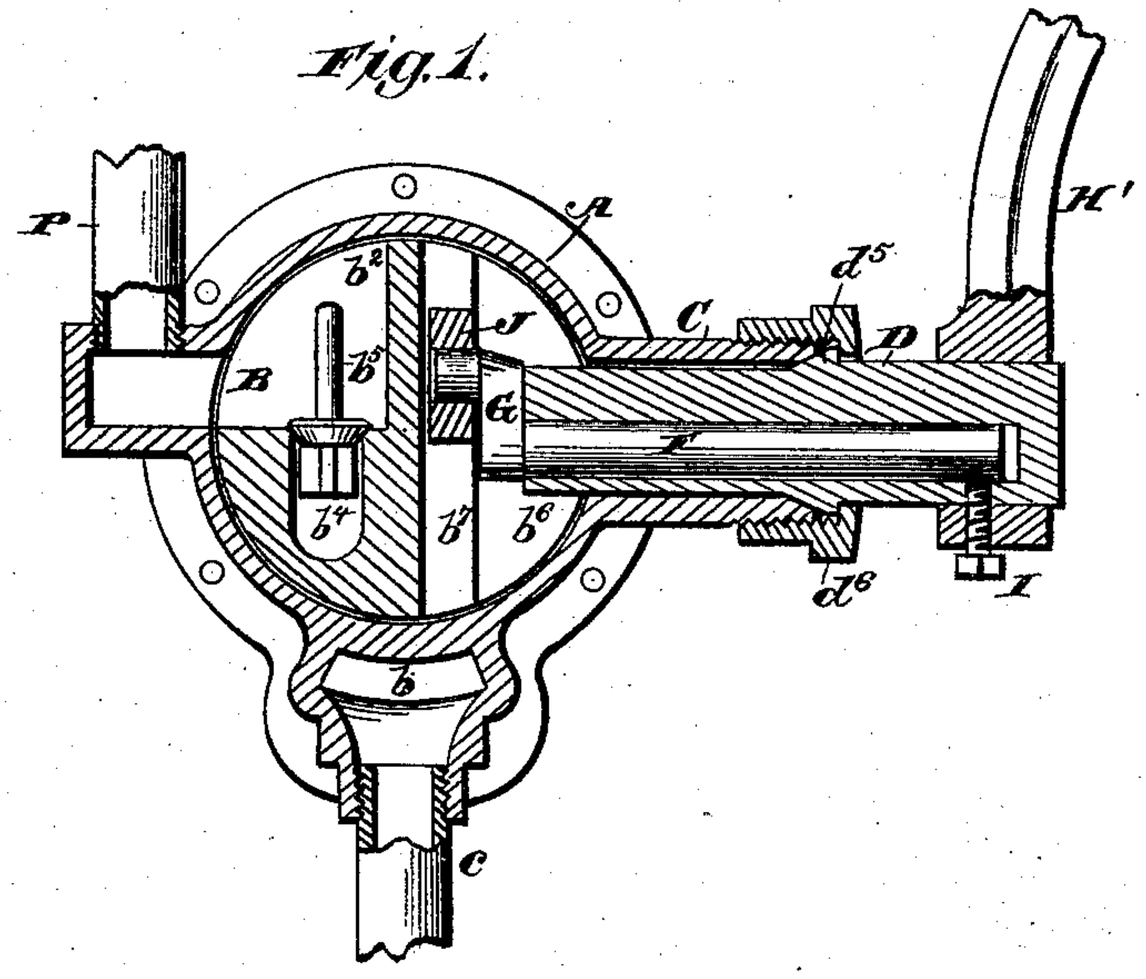
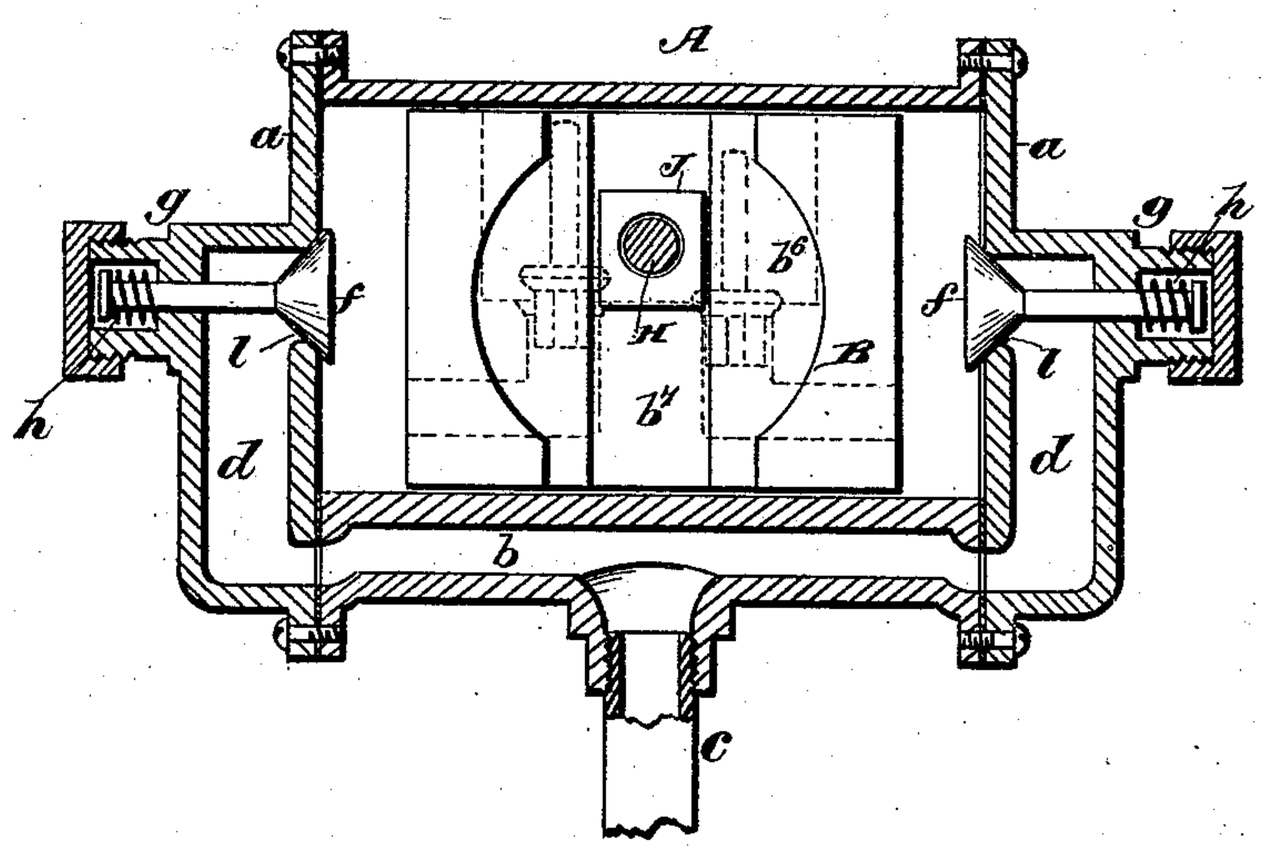


Fig. 2.



Witnesses
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J. A. Rutherford

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

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

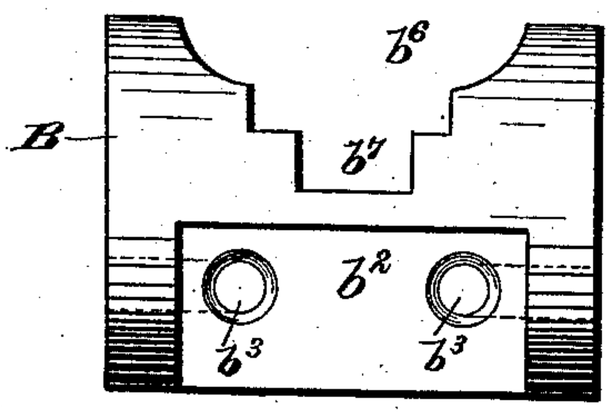


Fig. 4.

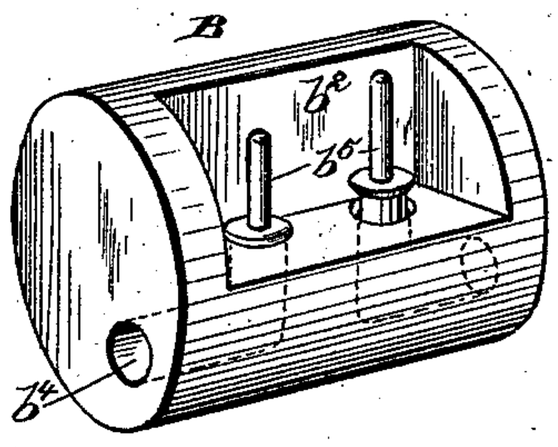
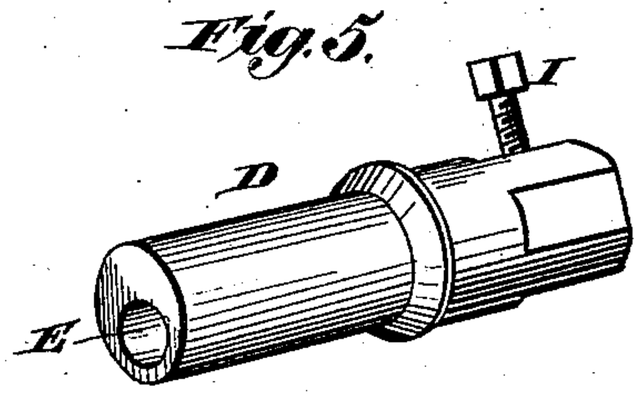
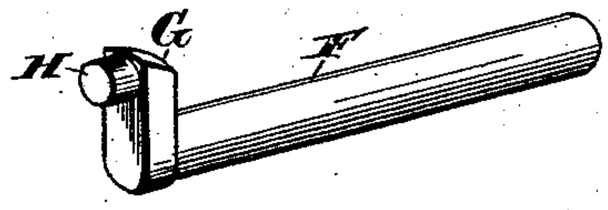


Fig. 5.





Witnesses,
Robert Everett.
J. A. Rutherford

Inventor:
Henry E. Marchand,
By James L. Norris
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UNITED STATES PATENT OFFICE.

HENRY E. MARCHAND, OF ALLEGHENY, PA., ASSIGNOR TO THE MARCHAND MANUFACTURING COMPANY, (LIMITED,) OF SAME PLACE.

MEASURING-PUMP.

SPECIFICATION forming part of Letters Patent No. 287,697, dated October 30, 1883.

Application filed September 18, 1883. (No model.)

To all whom it may concern:

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

This invention relates to that class of measuring-pumps in which is employed a double-headed piston having a liquid-chamber, ports opening into said cylinder through the heads of the piston, vertically-movable valves fitted in said ports, and devices for reciprocating the piston in a cylinder having end inlet-valves and a discharge-pipe communicating with the liquid-chamber in the piston.

The object of the present invention is to provide simple means for effecting the adjustment of the stroke of the piston from the outside of the cylinder, whereby the quantity of liquid received and discharged from the cylinder can be varied and a correct measurement attained regardless of the height the liquid is lifted. These means or devices consist of a revolving shaft or arbor, which carries a suitable operating-handle, and has an eccentrically-disposed bore or passage made through the same. A rod or spindle is inserted into said bore, and has a crank-arm at its inner end, which is provided with a wrist-pin, the latter being fitted in a block or nut that slides in a groove in the piston, and serves to move the same back and forth. The rod or spindle having the crank-arm and wrist-pin is retained in the eccentrically-arranged bore of the revolving shaft or arbor by means of a set-screw or equivalent fastening device, which, when loosened or removed, will permit the aforesaid shaft or arbor to be turned on the rod or spindle, so as to change the position of the crank and wrist-pin in relation to the inner end of the revolving shaft, this change of position of the crank-arm and wrist-pin being the means resorted to for varying the throw of the piston by causing the wrist-pin or the block or nut carried thereby to move in the groove in the piston to a greater or less extent.

In the drawings, Figure 1 is a transverse section of a measuring-pump embracing my improvements. Fig. 2 is a longitudinal section of the same, taken on the side of the pump on which the piston-operating devices are located. Fig. 3 is a top view of the piston, showing the recessed and grooved side for the reception of the means for moving it back and forth. Fig. 4 is a perspective view of the piston, taken on the liquid-chamber side thereof. Fig. 5 represents detached views of the driving-arbor, the spindle having crank and wrist pin, and the block adapted to fit on the wrist-pin.

The letter A designates the pump-cylinder, closed at its ends by the detachable heads *a*, securely fastened to the cylinder. A chamber, *b*, is made in the bottom of the cylinder into which the liquid enters from a barrel or other reservoir through a central tube, *c*. The end heads are formed with vertical chambers *d*, which communicate at all times with the inlet-chamber, as is shown in Fig. 2, while the communication of these end chambers with the piston or working chamber is through ports *e* normally closed by inwardly movable valves *f*. The stems of the valves project into tubular projections *g* on the cylinder-heads, and are encircled by springs *h*, for pressing the valves into their seats.

The working-chamber of the cylinder contains a double-headed piston, B, which is composed of a solid cylindrical body having a segmental liquid-chamber, b^2, into which open two vertical ports, b^3, that communicate with horizontal passages b^4 leading out through the ends of the cylinder. The ports b^3 contain vertically-movable valves b^5, which are raised by the entering liquid and held closed by their own weight. The side of the piston opposite the liquid-chamber is provided with a recess, b^6, having curved sides, and a groove, b^7, extends vertically in the bottom of this recess from the top to the base of the piston.

A tubular horizontal projection, C, formed on the side of the pump-cylinder contains an arbor or shaft, D, the inner end of which projects into the recess b^6 in the piston. This arbor or shaft has an eccentrically-arranged bore or passage, E, formed in the same, as is shown in Figs. 1 and 5, said passage terminating near the outer end of the arbor.

A rod or spindle, F, fitted in the eccentric

bore of the arbor D, has a crank-arm, G, at its inner end, and this arm is provided with a wrist-pin, H, as is clearly shown in Fig. 5. The crank-arm rests against the inner end of the arbor or shaft D, and the spindle or rod F is made of the same length as the eccentric bore in said arbor. The outer end of the latter is generally made with square faces, so as to form a head or stem which is adapted to receive the crank-handle H′, and prevent the same from turning.

A set-screw, I, passed through the hub of the handle H′, projects through the arbor D and bears upon the spindle or rod F seated in the bore made in said arbor. It will thus be perceived that the screw serves to lock the arbor to the spindle so as to cause the same to turn together. In place of the screw, I may employ any other suitable device for connecting the crank-spindle with the driving-shaft or arbor. A flaring shoulder, d^5, is also formed on the arbor D, the same being seated in the flaring end or mouth of the projection C on the pump-cylinder. A screw-cap, d^6, is also applied to the outer end of said projection C for securing a liquid-tight joint thereat and holding the arbor D in position.

The wrist-pin on the crank-arm of the spindle or rod F is inserted into a block or nut, J, which fits in the groove b^7 in the pump-cylinder, and moves up and down therein when the arbor is turned so as to move the piston back and forth. It will be obvious that the degree of movement of the piston can be changed or varied by causing the block carried by the wrist-pin to move in its guide-groove to a greater or less extent. By loosening the screw I the spindle F is unlocked from the arbor or shaft D, so as to permit the latter to be turned on said spindle, in order to set the crank-arm and wrist-pin on the inner end of the spindle at different angles in relation to said arbor. The crank-spindle having been properly adjusted, the screw is again tightened so as to cause the arbor and spindle to turn as one part or member for effecting the reciprocating movement of the piston. As the latter moves from either head of the cylinder, the vacuum created therein will cause the valve at the receding end of the cylinder to open and permit liquid to enter the cylinder, and during the return-stroke of the piston the liquid which has thus entered is caused to enter the chambered piston by the opening of the upwardly-movable valve and pass out through the discharge-pipe P, which communicates with the chamber in the piston during its entire stroke.

It will be manifest that the lengthening or shortening of the stroke of the piston by the means described, will permit the amount of liquid received into the cylinder and ejected therefrom to be varied. By such adjustment, I secure a uniform regulated and specific quantity of liquid, no matter what the length of the lift may be.

Having thus described my invention, what I claim is—

1. In a measuring-pump, the combination of a reciprocating piston, a cylinder having inlet and outlet ports, and means for operating the piston, adapted to be adjusted from the outside of the cylinder, for shortening or lengthening the stroke of the piston and varying the quantity of liquid passing through the pump at each stroke of the piston, regardless of the height the liquid is lifted, substantially as described.

2. The combination of an arbor or shaft having an eccentric bore or socket, and a rod or spindle having a crank-arm and wrist-pin fitted in said arbor and detachably secured thereto, with a pump-cylinder having a bearing for the arbor or shaft, a reciprocating piston adapted to engage with the wrist-pin on the spindle carried by said arbor, and suitable means for turning the latter, substantially as described.

3. The combination of the arbor or shaft having an eccentric bore or socket, a square or angular outer end portion, a flaring collar and a set-screw, and the spindle or rod having a crank-arm, wrist-pin, and slide-block or nut, with the pump-cylinder having a tubular projection with flaring mouth, and a screw-cap, the reversed piston, and a suitable operating-handle, substantially as described.

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

HENRY E. MARCHAND.

Witnesses:
A. B. STEVENSON,
C. S. FETTERMAN.