

W. S. McLEOD.
Pump.

No. 226,093

Patented Mar. 30, 1880.

Fig. 6.

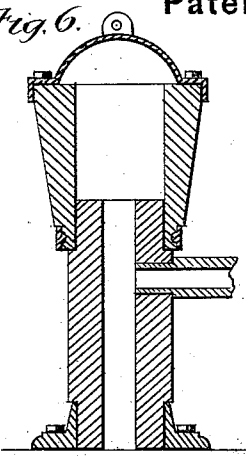


Fig. 1.

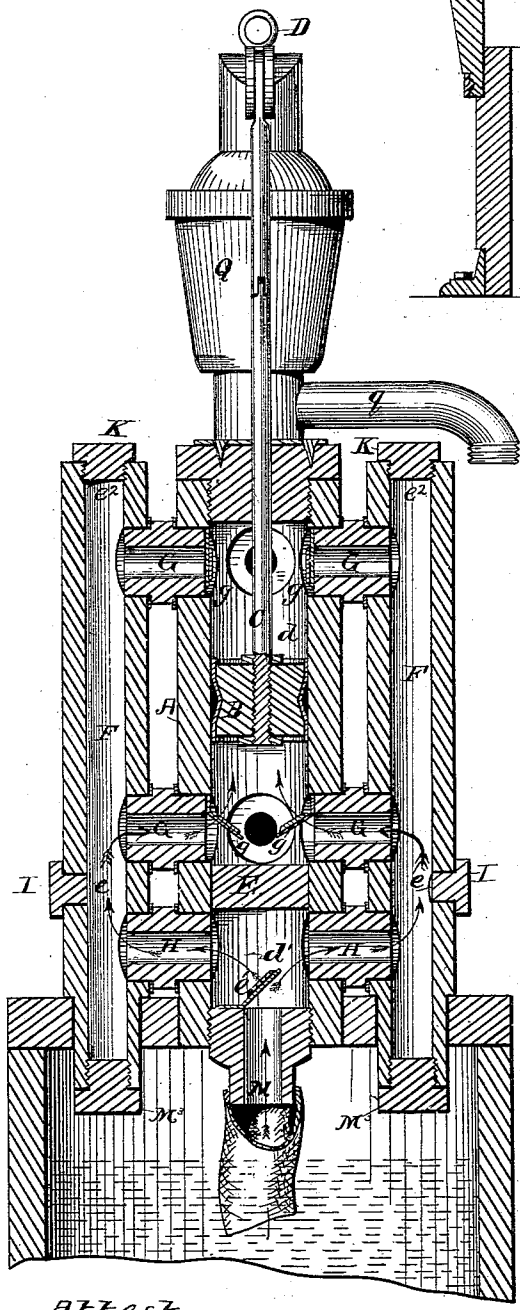
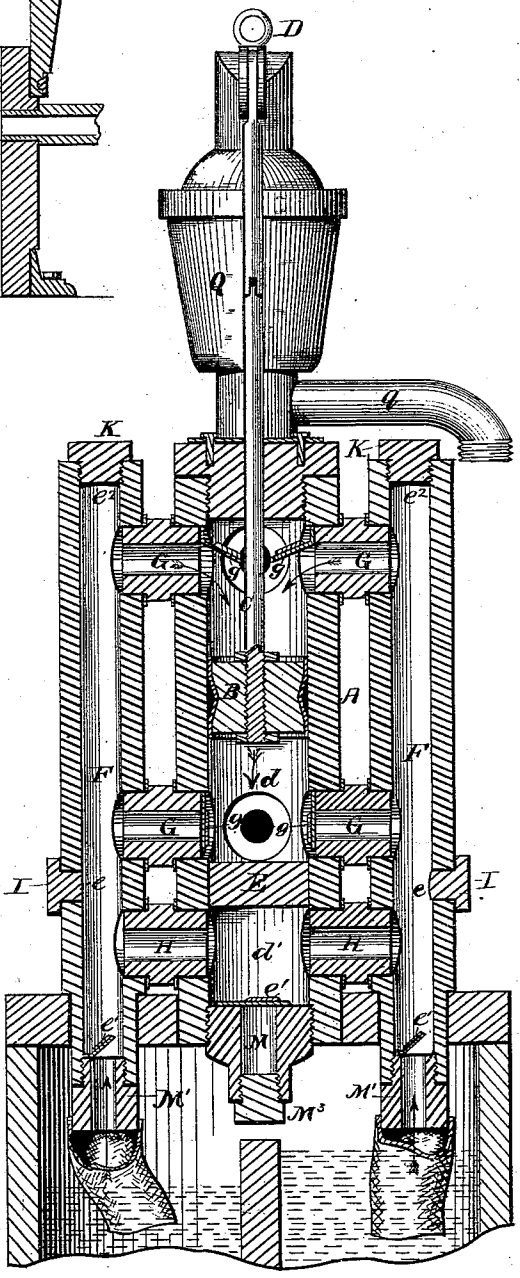


Fig. 2.



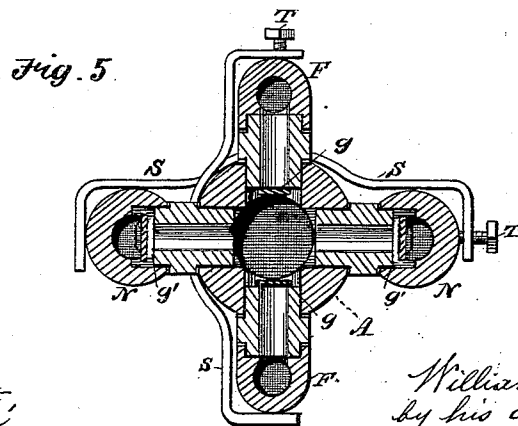
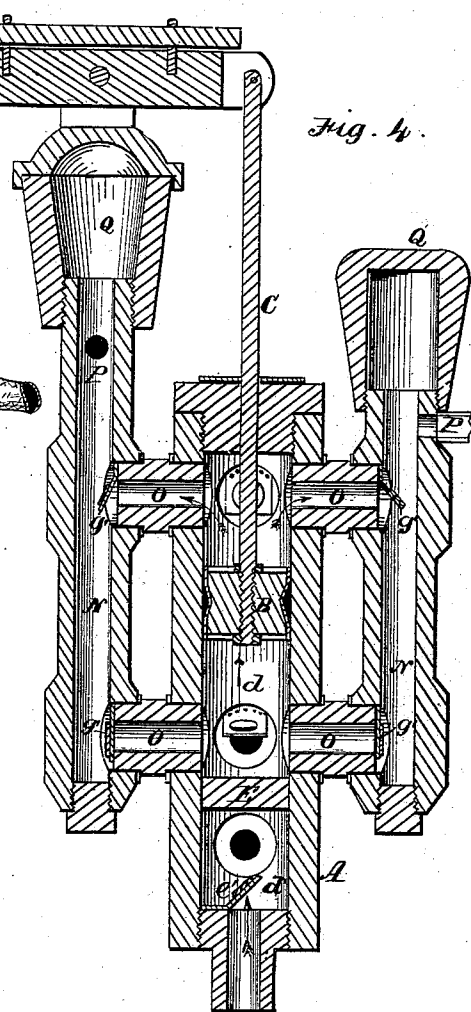
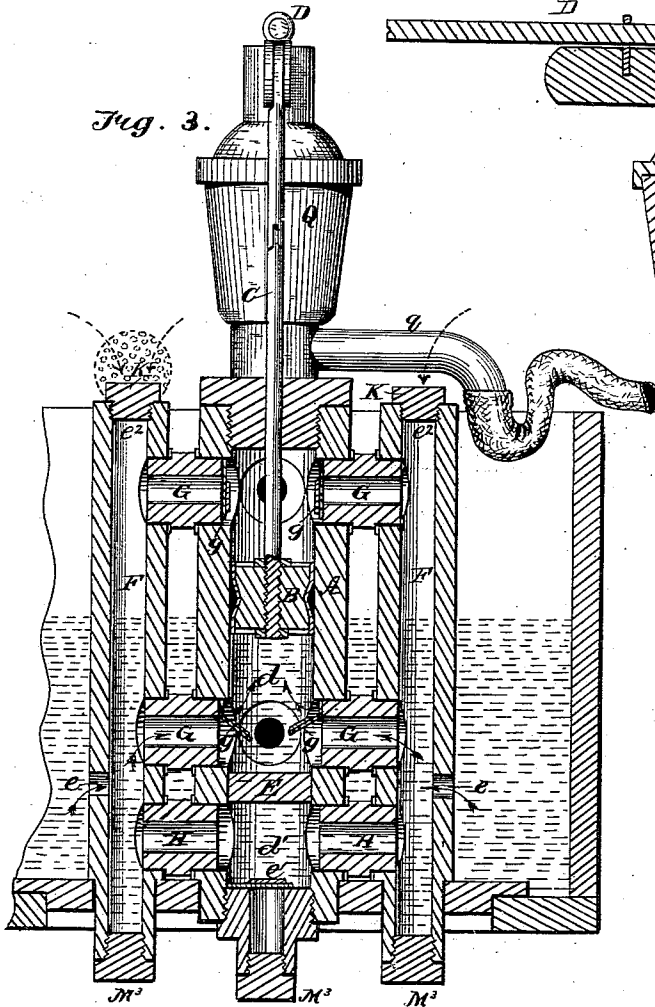
Attest,
W. H. Knight
Floyd Harris

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UNITED STATES PATENT OFFICE.

WILLIAM S. McLEOD, OF KINGSVILLE, ONTARIO, CANADA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 226,093, dated March 30, 1880.

Application filed January 19, 1880.

To all whom it may concern:

Be it known that I, WILLIAM SCOBIE McLEOD, of Kingsville, in the county of Essex and Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My improved pump is specially designed for use at will as a surface or suction pump, or be submerged in a well, cistern, or reservoir, or used in a portable tank, and as a double-acting pump for raising water from different wells or cisterns and discharging the same in one or more streams; and to this end the invention consists in a pump-cylinder divided into two chambers, in the upper one of which the piston is adapted to work with induction and eduction side pipes, connected to each end of the upper chamber by horizontal reversible valved sections, the induction side pipes being connected with the lower chamber by means of non-valved sections, the lower ends of the pump-cylinder and induction side pipes being provided with bottom and side openings and interchangeable plugs and valved sections, whereby the valve-ports may be changed to adapt the pump to the different kinds of work required.

In the accompanying drawings, Figure 1 represents a vertical section of a pump embracing my improvements, said section being taken through the induction side pipes, and the pump being shown for surface or suction use in a well, the cylinder communicating therewith by a valved connection at its lower end; Fig. 2, a similar section, the lower end of the cylinder being closed and the induction side pipes communicating with separate wells or cisterns, the pump being shown for surface or suction use above the wells or cisterns; Fig. 3, a similar section, showing the pump as used with an inclosing portable tank for submerged action, the lower ends of the cylinder and of the induction side pipes being closed and the side plugs of said induction-pipes removed, said pump being also thus used in a cistern or well with the openings *e* closed and the top openings, *e'*, open; Fig. 4, a similar section taken through the eduction side pipes with the pump used as in Fig. 1, and Fig. 5 a horizontal section through the upper valved

connections of the induction and eduction side pipes.

The pump-cylinder A is constructed of any suitable material, and is provided with a piston, B, and a piston-rod, C, the latter extending through the head of the cylinder and connected with an operating-lever, D, fulcrumed to the pump or some other suitable support.

The pump-cylinder is provided near its lower end with a partition, E, dividing it into an upper and a lower chamber, which are connected with induction side pipes, F, at three points, two above and one below the partition E, by means of short removable tubular sections G H, the sections G G being provided with valves *g*, and the sections H H are without valves in the lower chamber, *d'*, for the purpose hereinafter more fully set forth.

The induction-pipes F, near their lower ends, are provided with side openings, *e*, which may be closed with plugs I, and the upper ends of said pipes F are also provided with similar plugs K, which can be inserted or removed to change the operation of the pump.

The pump-cylinder and induction-pipes, at their lower ends, are provided with removable valved sections M M' and removable plugs M³, by means of which the pump may be adapted to the different kinds of work required. The pump-cylinder is provided, also, with two eduction-pipes, N, which are connected with said cylinder at each end of the upper chamber, *d*, thereof by means of removable sections O, which are provided with valves similar to the sections G. Each of the eduction-pipes is provided with an opening, P, for the discharge of water, and air-chambers Q, the discharge-opening having a discharge-spout, *q*, to which a hose may be attached for throwing water in any direction.

The removable valve-sections are provided with suitable packing-rings, by means of which water-tight joints are formed, and the pump-cylinder and induction and eduction pipes are held together by means of the clamps S, provided with the clamping-screws T, by means of which they can be tightened upon the parts to be held together.

When the pump is to be used as a surface lifting and force pump the plugs I are inserted in the openings *e* of the induction-pipes, as are

also the plugs K and M³ in the upper and lower ends of said pipes, as in Fig. 1. The valve-sections G of the induction-pipes F are arranged with the valves *g g* opening into the pump-cylinder, and the valve-sections O of the eduction-pipes N have their valves *g'* opening into the said eduction-pipes, as shown in Figs. 4 and 5.

The lower end of the pump-cylinder is fitted with its valved section M, and this section is attached to the suction-pipe extending into the well, cistern, or reservoir. Upon operating the piston, as shown in Fig. 1, the valved section M is used, the induction-pipes being closed by the plugs M³ and I, and water will be taken into the cylinder, passing first into the lower chamber, *d'*, of the same, then alternately into each end of the upper chamber, *d*, through the valved sections G H of the induction-pipes F, and finally out through the valved sections O of the eduction-pipes N and the discharge opening or openings, as shown by the arrows, Figs. 1 and 4.

When desired to employ the pump submerged, all the lower openings of the pump-cylinder and induction-pipes are closed and the plugs K removed and the pump placed in a well, cistern, or reservoir. The piston-rod is then connected with suitable mechanism at the surface for operating it, and the water surrounding the upper part of the pump will be taken in through the top openings, *e*², in the induction-pipes, and will follow substantially the same course as above described.

When it is desired to employ the pump for raising from separate wells, cisterns, or reservoirs, the plugs I are inserted in the side openings, *e*, and the plug M³ in the lower end of the pump-cylinder. The valve-sections M', being in the lower ends of the induction-pipes, are connected with suitable suction-tubes leading to different wells or cisterns, as in Fig. 2, and upon operating the pump the water will be drawn into the pump from each well or cistern and discharged from the openings in the eduction-pipes in separate streams. If desired to discharge in a single stream, it is only necessary to stop one of the discharge-openings P.

The valves *e'* of the sections M' serve to prevent the water from falling back into the cisterns from the pipes F at the moment the motion of the piston is changed at each end of its stroke, at which point the piston for an instant is virtually at a stand-still. The said valves also serve to keep the pipes full of water when the pump is idle, so that it will commence operation at once when started, and there will be no delay consequent upon the necessity of drawing water from the wells to fill said pipes at the starting. The same function takes place with the valved section M of the cylinder, although it will be seen that these valves *e'* are perpetually open when the pump is in operation. They do not open and close with the up-and-down stroke of the piston, but are only employed to keep the pump charged with water at all times.

It will be seen from the above description that a pump having the capacity of four ordinary pumps can be compactly formed and secured in a box or casing, which may be mounted on rollers or wheels and used for household, farm, garden, or domestic purposes, or in case of fires. The whole may be made of wood except the caps of the air-chambers, piston, and bolts, the wooden parts being soaked in hot oil, which will render the pump more durable and cleanly.

By varying the positions of the interchangeable valved sections other combinations may be made, by which the capacity of the pump may be further increased. For instance, the valved sections G of one of the induction-pipes may be arranged to open into the pump-cylinder and the valves of the other out of the same into the opposite induction-pipe, the plug K at the upper end of one pipe being removed, and at the other pipe the plug is replaced by a pipe leading to an air-chamber and discharge-openings. By reversing the valve-sections the pump can be changed from suction to force.

The pump, as above constructed with the various openings and removable valve-sections and removable plugs, can be easily converted into an ordinary force-pump or double-acting lifting or force pump, and can be adapted for use as a surface pump or submerged pump or a portable garden-pump by making the proper changes of the parts, which can be readily made, and the whole, by suitable packings, bound together in a compact and water-tight condition of the joints.

In using the pump with a portable tank the bottom of the tank is provided with a flanged bottom, with openings for the lower end of the pump-cylinder of the induction-pipes, which openings must be suitably packed, as in Fig. 3. A separate head may be used in the bottom of the tank for this purpose, as shown.

In Fig. 6 I have shown in section the air-chamber and a section which connects with the top planking of the well by a flanged base, and for use as a submerged pump, in which the water is taken in through the top openings, *e*², all the lower openings being closed by the plugs M³ and I.

I claim—

1. The combination of the pump-cylinder, divided into two chambers, *d d'*, by a partition, E, near its lower end, its piston and induction and eduction ports, with the induction-pipes, provided with side openings, *e*, having removable plugs I, and the lower ends of the pump-cylinder and the lower and upper ends of the induction-pipes F, provided with interchangeable plugs and valved sections, whereby the pump may be adapted as a surface-pump or a submerged pump at will, substantially as specified.

2. The combination, with the pump-cylinder and the induction-pipes F, connected thereto, as described, of the eduction-pipes N, connected with the upper chamber, *d*, of the pump-cylinder by means of reversible valve-sections

G, and the interchangeable plugs and valved sections of the pump-cylinder and induction-pipes, whereby water may be lifted from two cisterns or reservoirs and discharged in single
5 or separate streams, substantially as specified.

3. In combination with the pump-cylinder, its induction and eduction pipes F and N, the reversible valve-sections G, whereby the ports of the pump-chamber may be changed at will
10 to adapt the pump to different uses, as specified.

4. The combination of the inclosing-box and flanged supporting-plate with the pump-cylinder, its induction and eduction tubes and
15 valves, and the detachable and interchangeable plugs and valve-sections, whereby the pump may be arranged to take water from the inclosing-vessel, or from a source outside of

the same, to adapt the apparatus to use as a garden or other portable pump, substantially 20 as specified.

5. The combination, in a pump, of the cylinder A, divided into an upper and a lower chamber, *d d'*, with the induction-pipes F F and the horizontal connecting-sections, the upper sections, G G, communicating with the chamber *d*, being valved, and the lower sections, H H, communicating with the chamber *d'*, being perpetually open, substantially as
25 and for the purpose herein set forth.

In testimony whereof I have hereunto set
30 my hand.

WILLIAM SCOBIE McLEOD.

Witnesses:

GODWIN CAMPAIGNE,
ETHAN McLEOD.