W. Mullally

Pump Piston,

No. 36,825. Patented Oct. 28, 1862.

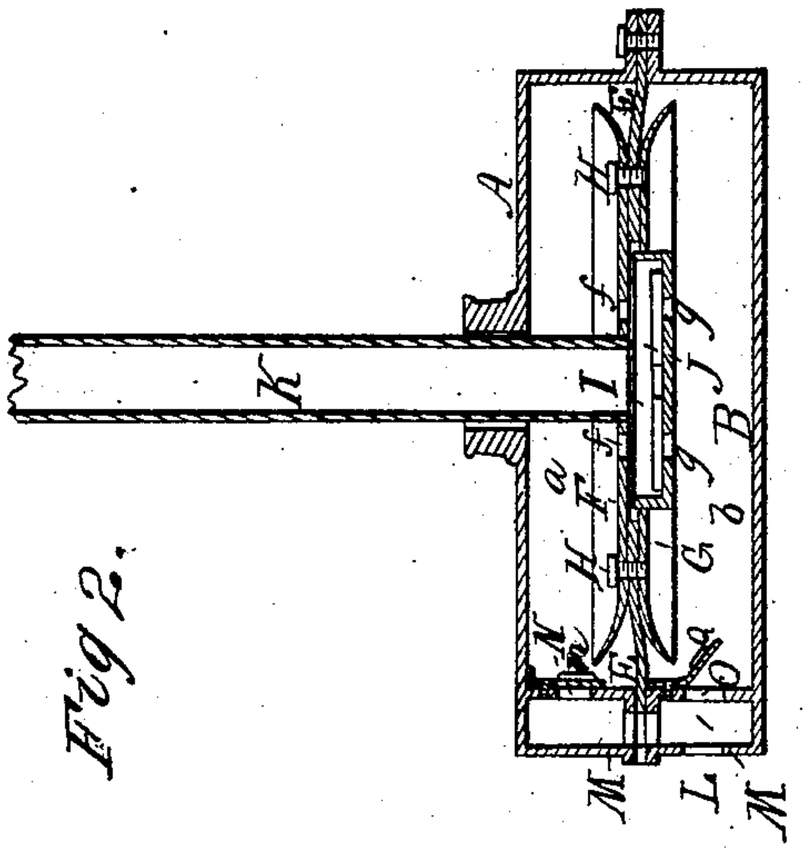

Fig 2.

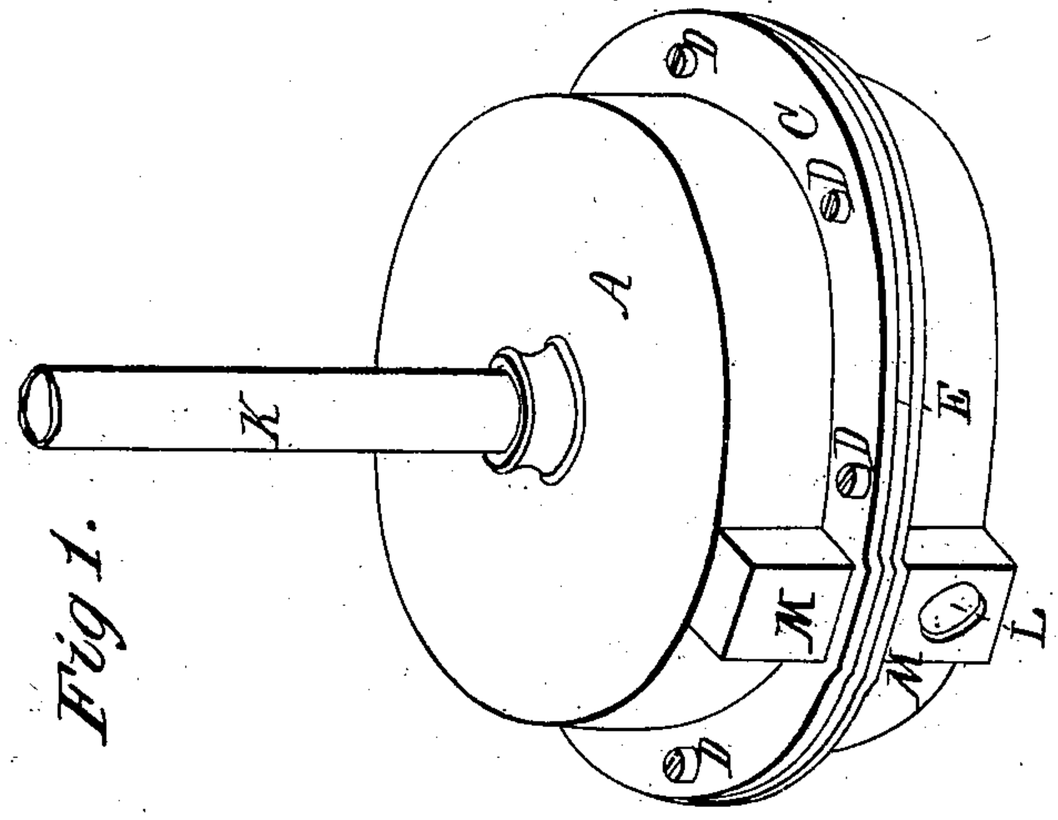

Fig 1.

Witnesses.

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IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **36,825**, dated October 28, 1862.

To all whom it may concern:

Be it known that I, WILLIAM MULLALLY, of St. Paul, in the county of Ramsey and State of Minnesota, have invented a certain new and Improved Double-Action Diaphragm-Pump; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, which are hereby made a part of this specification, in which—

Figure 1 is a perspective view of my improved pump, and Fig. 2 an axial section of the same.

Similar letters of reference indicate corresponding parts in both views.

The subject of my said invention is a double-acting pump, consisting, essentially, of an upper and lower water-space provided with valve-guarded ingress-ports and separated by a diaphragm constructed in part of metal and in part of flexible material, and operated by a hollow rod, constituting also the discharge-pipe, the central part of which diaphragm, being of metal, is provided with a chamber communicating with the water-spaces before named, through ports guarded by an internal valve, as will be hereinafter more fully described.

To enable others skilled in the art to which my invention appertains to fully understand and use the same, I will proceed to describe its construction and operation.

A B represent the two parts of the main outer shell of the pump, connected by means of flanges C and bolts D, or in any other suitable way.

E is an annular disk, of india-rubber or other flexible material, the periphery of which is clamped between the flanges C, and its inner edge between disk-shaped metal plates F G, placed with their convex sides toward the flexible ring or annular disk E, to accommodate its motion, as hereinafter explained.

H H represent screws or bolts by which the plates F and G are secured together. The plates F G and flexible ring E constitute the diaphragm.

I is a chamber formed within the diaphragm, and communicating with the water-spaces *a b* above and below through ports *f g* in the plates F G, which ports are guarded by a valve, J, within the chamber I. The said valve may be either perforated, as shown in the present illustration, or formed of such size and shape as to permit the water to pass around its margin.

K is a hollow rod passing through the upper shell, A, and attached at its lower end to the center of the plate F, so as to communicate with the interior of the chamber I. The said hollow rod constitutes the means of operating the diaphragm, and also forms the discharge-pipe of the pump.

L is the ingress-aperture, communicating with a chamber, M, from which the water flows into the water-spaces *a* and *b* alternately through ports N O, guarded by valves *n o*.

Operation: A reciprocating motion is imparted to the diaphragm by means of the hollow rod. The sectional view, Fig. 2, represents it moving upward. During this motion the pressure of the water within the chamber *a* closes the valve *n*, and the water is consequently forced through the ports *f* into the chamber I, closing the valve J upon the ports *g* and rushing upward through the hollow rod K. At the same time the chamber *b* will be filled with water forced through the ports N O by atmospheric pressure. The diaphragm having been drawn upward to the extent of its stroke, the motion is reversed, when the pressure upon the water in the chamber *b* beneath the diaphragm instantly closes the ports O and *f*, and the water is forced through the ports *g*, through or around the valve J, and up through the hollow rod K, as before.

Having thus described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The combination of the hollow operating and discharging rod K, hollow diaphragm E F G I, internal valve, J, chambers *a b*, and ports N O *f g*, the whole being arranged to operate in manner substantially as and for the purposes set forth.

WILLIAM MULLALLY.

Witnesses:

CHARLES SMITH,

JAMES H. GRIDLEY.