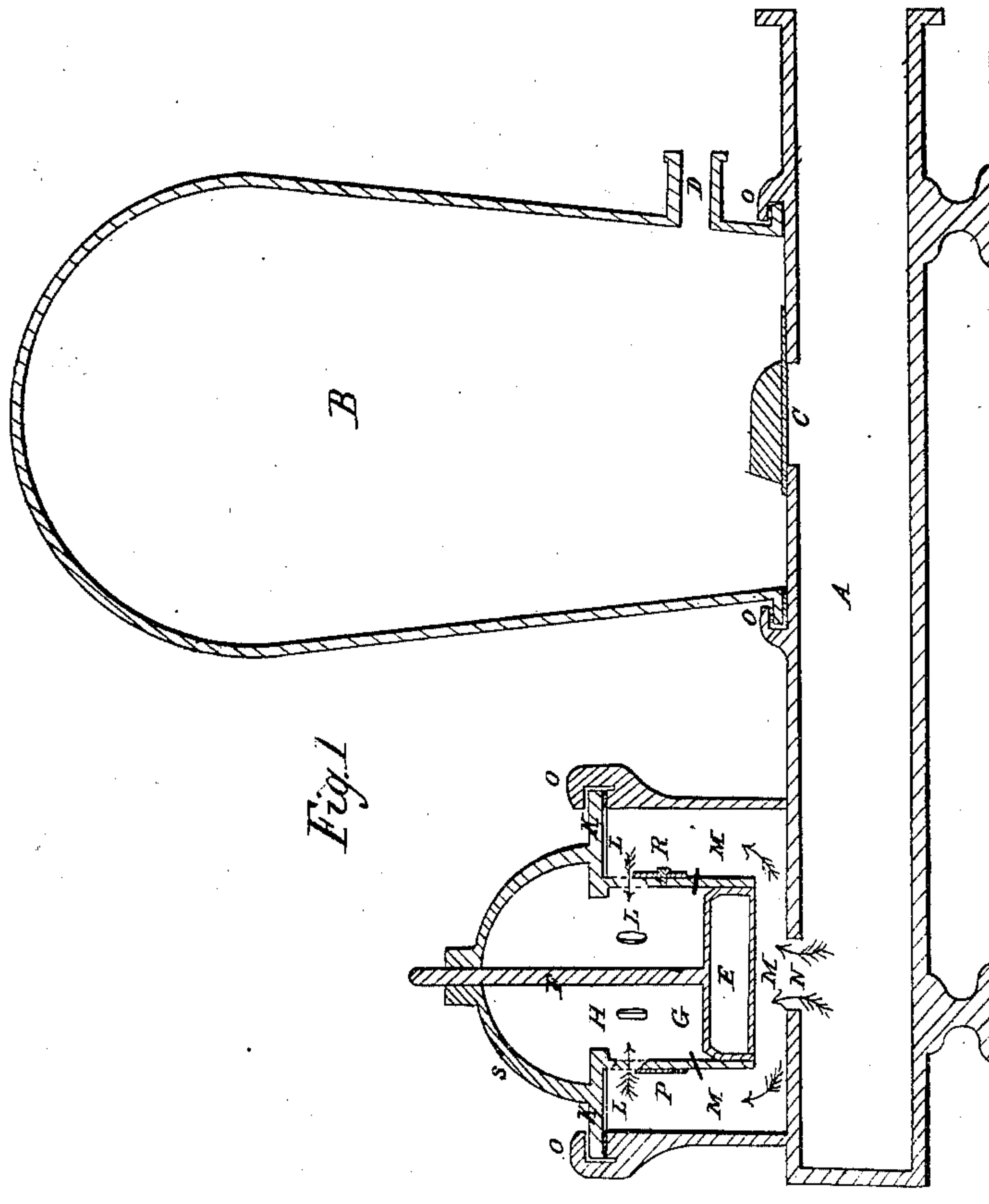
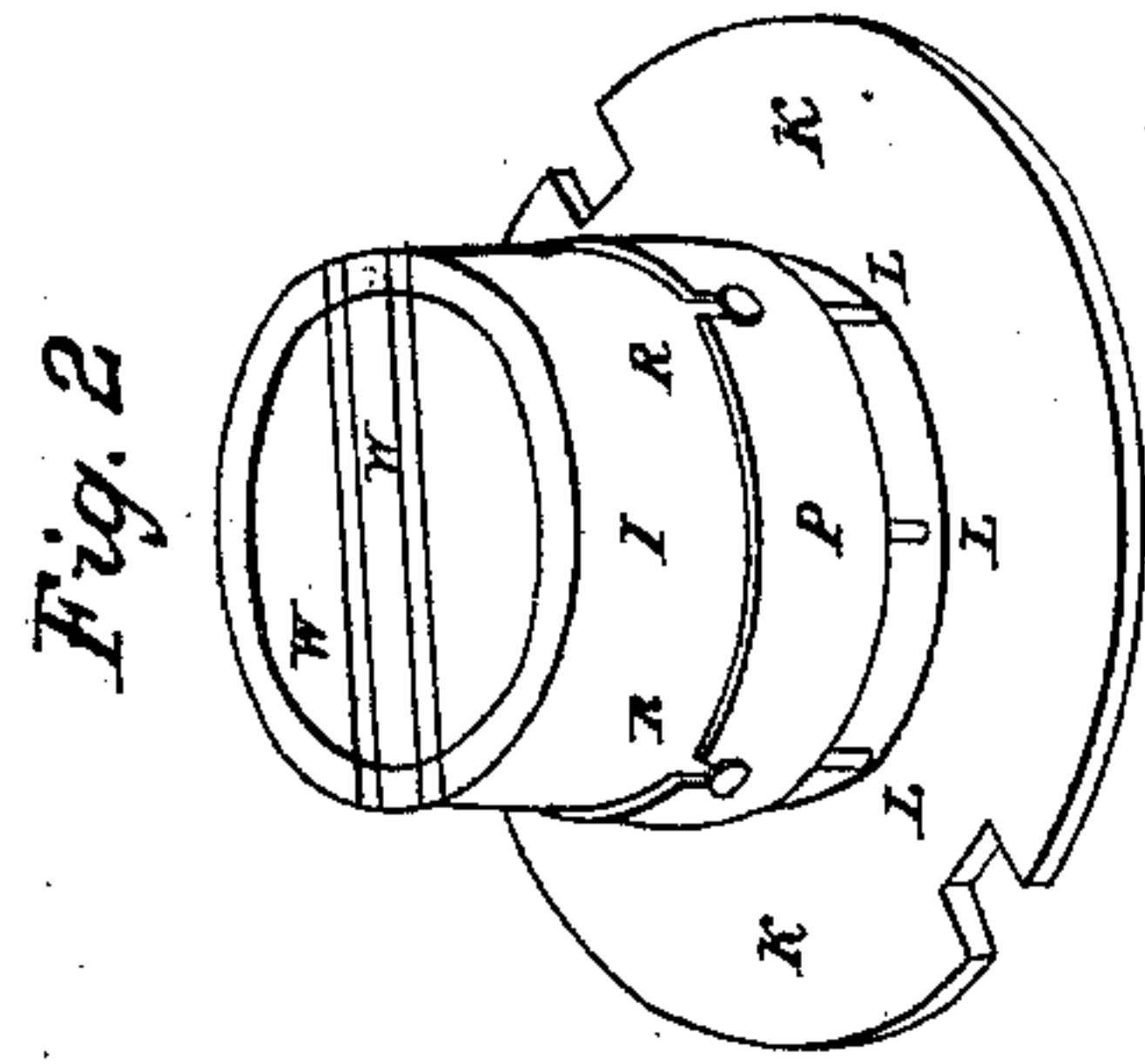


A. D. SMITH.
WATER RAM.

No. 6,346.

Patented Apr. 17, 1849.



UNITED STATES PATENT OFFICE.

ALPHEUS D. SMITH, OF MEREDITH, NEW YORK.

WATER-RAM.

Specification of Letters Patent No. 6,346, dated April 17, 1849.

To all whom it may concern:

Be it known that I, ALPHEUS D. SMITH, of Meredith, in the county of Delaware and State of New York, have invented a new and useful Improvement in the Hydraulic or Water Ram; and I do hereby declare that the following is a clear and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification.

Figure 1 is a sectional view; and Fig. 2, a view of the impetus valve tube and the governing slide, both in a reversed position.

A is the supply pipe, running underneath the air-chamber and water-chamber, and impetus-valve chamber.

B is the air-chamber, the water entering it at C through an aperture provided with a valve shutting downward.

D is the discharge pipe from the air-chamber.

E is the impetus valve; F the impetus rod; G the impetus valve chamber; I the tube in which the impetus valve moves, constituting the impetus-valve chamber, and forming also the inner walls of the water-chamber M; H the aperture in the top of the impetus valve chamber; K a lip extending around the top of the tube I, solid with it, fastening down over the water-chamber *m*, and extending also within the tube I sufficiently far to form a shoulder which shall prevent the impetus valve E, in its upward motion, leaving the chamber in which it moves; L, L, L, L, holes through the upper portion of the tube I, for the passage of water from the water-chamber to the impetus valve chamber; *m*, *m*, *m*, the water-chamber, surrounding the impetus-valve chamber; *n*, an aperture between the supply pipe, and the water chamber; O, O, O, O, projections over the lip of the tube I, and also over the air-chamber, and its base for the purpose of fastening them firmly; P, a governing slide fitting closely around the tube I, fastened by a screw or screws to the tube, through one or more holes R, which admit the slide to be moved up or down upon the tube; S a semi-circle springing from the top of the tube I or lip K, through which the impetus-rod F, moves; W, W, wires at bottom of tube I.

The nature of my invention consists in the removal, in a great degree of the back-action or the resistance to the backward or down motion of the impetus valve, which in

the water-rams, as heretofore constructed, has hindered the play of the impetus-valve; also in materially lessening the quantity of waste-water, in the working action of the ram.

To enable others, skilled in the art, to make and use my invention, I will describe its construction and operation.

I construct my water-ram, in any of the usual forms, so far as the supply-pipe, the air chamber, the valve belonging to it, (the air-chamber) and the discharge pipe extend. I construct two chambers, an impetus-valve chamber, and a water-chamber, whose relative diameters are generally as 1 to $1\frac{1}{2}$, or as 1 to 2. The impetus valve chamber, I place centrally within the water-chamber, leaving a space between the two equal to one quarter or one half the diameter of the former. The impetus valve chamber I generally make of the same diameter as the supply pipe, and extend it down within the water chamber, until the space between the bottom of it, and the bottom of the valve chamber is equal to one half of its, (the impetus-valve chamber's) diameter; a space large enough to admit sufficient water from below, into the water-chamber. To permit the water from above to pass backward and forward from the one chamber to the other, I make through the tube I (which constitute the impetus valve chamber, and also the inner side of the water chamber,) certain holes, L, L, varying in number and size according to the size and capacity of the ram. These holes are made at, or near the top of such tube, I, and are sufficiently large and numerous to permit the escape or passage of five-sixths of the water entering the ram, if necessary. By means however, of a governing slide, (P) fitting closely around the tube (I); these holes may be partially or wholly closed, and thereby the quantity of water escaping through them may be regulated by, and proportioned to the quantity of the supply. The aperture H, at the top of the impetus valve chamber I construct nearly as large as such chamber, being about one fourth of an inch less in diameter—the extent of the inward projection of the lip K, so that but slight, if any, resistance is offered to the free discharge of the water, which has entered the impetus valve chamber from the water chamber, and consequently but little obstruction is given to the upward motion of the impetus valve.

The impetus valve is solid, and is prevented from falling down or dropping out of the chamber in which it moves, by means of a wire or wires W, W fastened at the bottom of the impetus valve tube and upon which the valve rests when it has reached its further-most downward limit. The wires are represented in the drawing No. 2. The water-chamber is, in size, sufficient to admit the escape of five-sixths of the water or more. The impetus valve, the tube or part forming its chamber, the governing slide, and its fastening screws are constructed of brass,—the water chamber of iron, and cast solid upon that part of the ram, on which the air-chamber, also of iron, rests. When the impetus valve chamber, is properly and centrally placed within the water chamber, it is confined by fastenings or wedges running under the projections O, O.

The combined effect of the whole contrivance of my invention is to give a quicker motion to the impetus valve, both in its upward and downward motion; in the latter, by offering a way, through the water chamber *m*, and the holes L, L for the free passage of the water, and in the former, by removing the resistance occasioned by the water, above the valve, being forced through a small aperture, over the valve and by

enabling a portion of the water to pass back through the holes L, into the water chamber. The play of the valve being thus increased, there is less time, in any given number of its motions, for the water to waste and necessarily less wasted. The increased play of the valve, meeting no resistance in its motion, so as to cause it to lose its force or power, also forces more frequently, and a greater quantity of water into the air chamber.

What I claim as my invention, and desire to secure by Letters Patent, is—

The peculiar combination and arrangement of the parts, by which the impetus valve is made to work in a cylinder, placed for that purpose within a chamber, surrounding it; said cylinder being provided with openings in its sides, which may be enlarged or decreased, above the impetus valve, for the escape of the waste water, until its impetus becomes sufficient to act upon and close the valves, the whole constructed substantially in the manner, and for the purpose, as set forth above in my specification.

ALPHEUS D. SMITH.

Witnesses:

S. A. LAW,
I. ALBION LAW.