F. BROWN.
Valve.

No. 202,785. Patented April 23, 1878.

Fig. 1.

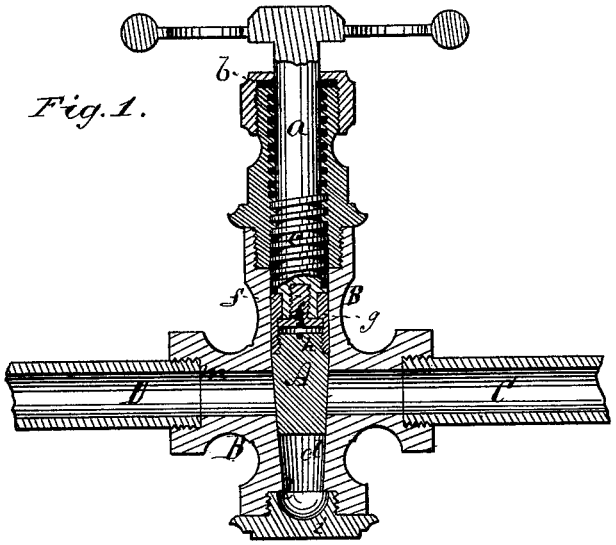

Fig. 3.

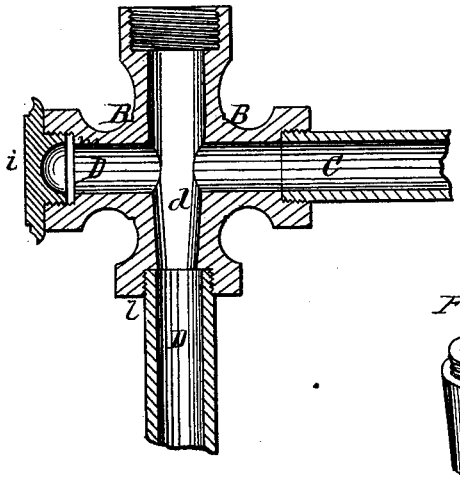

Fig. 4.

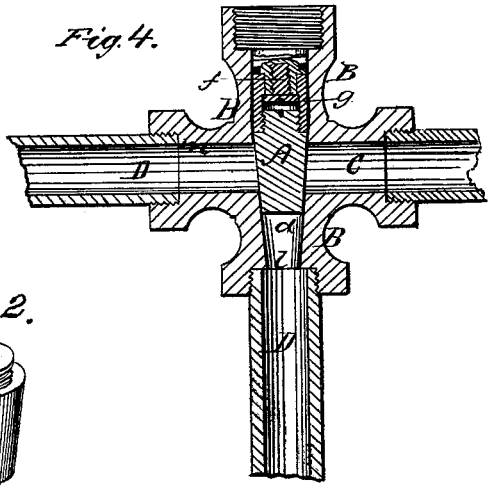

Fig. 2.

Attest:
Chas. H. Searle.
Fred. G. Dieterich

Inventor,
Freeman Brown,
By J. S. Brown, his atty.

UNITED STATES PATENT OFFICE.

FREEMAN BROWN, OF HAVERHILL, MASSACHUSETTS.

IMPROVEMENT IN VALVES.

Specification forming part of Letters Patent No. **202,785**, dated April 23, 1878; application filed April 2, 1878.

To all whom it may concern:

Be it known that I, FREEMAN BROWN, of Haverhill, in the county of Essex and State of Massachusetts, have invented an Improved Valve; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a central axial section of the valve as applied to a straight pipe; Fig. 2, a view of a part detached; Fig. 3, a central section of a part of the valve-case, showing the mode of applying it to pipes at right angles to each other; Fig. 4, a similar view with the valve-plug, showing the mode of applying the valve to an induction and two eduction or branch pipes.

Like letters designate corresponding parts in all of the figures.

My improvements are upon stop-valves for pipes and passages employed to conduct water, steam, or other fluid.

The principal feature of my invention consists in a conical plunger-valve plug closing into a seat of the same form by a longitudinal movement, and being free to turn on its axis, and thus fit unrestrained into its seat, substantially as hereinafter specified.

By the term "longitudinal," as herein used for the movement of the valve-plug, I mean in the direction of the axis of the said valve-plug.

In the drawings, A represents the plunger-valve plug; B, the case; C, the induction pipe or passage, and D the eduction or discharge pipe or passage. The stem *a* of the valve-plug passes through a stuffing-box or packing, *b*, in the case, and has a screw-thread, *c*, on its periphery and in its way, by which to give the longitudinal movement to the valve-plug, as usual with valves of similar movement; or any equivalent construction for moving the valve-plug may be employed.

The valve-plug or plunger A is of somewhat conical or taper form, as shown, more or less, as I do not restrict myself to any particular degree of conicality, and it fits, when closed, in a surrounding seat or way, *d*, of the same form as shown, the lower or small end of the seat being continued somewhat beyond the closed valve-plug, as represented in Fig. 1, in order that room may be allowed for the valve-plug to sink farther into its seat, if the valve-plug and seat wear and tend to a looser fit, so that a tight fit is made sure for an indefinite time, the longitudinal movement of the valve-plug being always free to close the way at all times when driven completely home.

The movement of the valve-plug is allowed completely across the diameter of the water or steam way which it closes, so that, if desired, an opening may be given at the valve-plug of the full-flowing capacity of the pipe or passage itself. The diameter of the valve-plug may be about the same as that of the fluidway which it closes—preferably a little greater—so that the said way need not be contracted, and sufficient width of closing-surface between the valve-plug and its seat at the sides of the pipe or passage may be obtained. The valve-plug and its seat being of true circular form in cross-section, one always fits the other at whatever angle of the circle the valve-plug strikes its seat; and thus the valve-plug may be closed into its seat, or started from it by a partial turning movement, thereby insuring a close fit and an easy starting of the valve-plug from its seat. This form of the valve-plug and its seat also renders the original construction simple, easy, and accurate.

In order to allow this free turning or partially-revolving movement independent of the stem *a* of the valve-plug however the latter may be operated, I swivel the valve-plug to the stem, or otherwise connect them in an equivalent manner. The swivel construction shown in the drawings consists of a swivel-bolt, *f*, screwed up into the inner end of the valve-plug stem, while its head plays in a cap, *g*, of the valve-plug. This cap, being hollow, is screwed upon the upper end of the valve-plug, which is shown separate in Fig. 2. In this figure a screw-nick, *h*, is shown in its upper end, for receiving a screw-driver, in fitting it into its seat at any time when detached from its stem. This construction of the valve-plug as a separate piece allows of a renewal of the valve-plug without the renewal or dis-

turbance of any other part of the entire structure. Thus economy in use and repair is gained.

The cavity of the valve-plug seat, extending below the water or steam passage, opens through the case; and, if the valve is applied to a straight pipe, the cavity is here closed by a cap, *i*. It is also provided with a screw-thread for attaching a pipe. Then, if the valve is to be applied to pipes at right angles to each other, the eduction-pipe D is applied to the valve-seat opening *l*, and the cap *i* is screwed upon the other eduction-opening, *m*, as shown in Fig. 3; and if two eduction-pipes are desired to be connected with the valve, they are respectively attached thereto at the two openings *l m*, as shown in Fig. 4. Thus the same valve, without any change of the construction, is adapted to various uses and positions. Besides, by applying a spout to one of the eduction-openings, the other being closed by the cap *i*, a faucet is produced, and the opening closed by the cap may be then utilized, as, indeed, in the case of the ordinary use as a valve, for attaching a hose-pipe for washing and watering purposes.

With the same construction of valve, I also contemplate employing a larger number of eduction-pipes with one induction-pipe, as three or more. In such cases the cross area of the single induction-pipe should be equal, or thereabout, to the aggregate cross-sections of the eduction-pipes.

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

1. A conical plunger-valve plug closing by its longitudinal movement into a surrounding seat of the same form, and being free to turn on its own axis, substantially as and for the purpose herein specified.

2. A conical plunger-valve plug closing by its longitudinal movement into a seat surrounding it, in combination with two or more eduction pipes or passages, either at its sides or at its inner end, substantially as and for the purpose herein specified.

3. The conical valve-plug A, swiveled to its stem *a*, substantially as and for the purpose herein specified.

4. The valve-plug A, made detachable from its cap or holder *g*, substantially as and for the purpose herein specified.

FREEMAN BROWN.

Witnesses:
J. S. BROWN,
JOHN T. ARMS.