No. 688,298. Patented Dec. 10, 1901.

W. O. FOSS.

VALVE.

(Application filed Apr. 10, 1901.)

(No Model.)

Fig. 1.

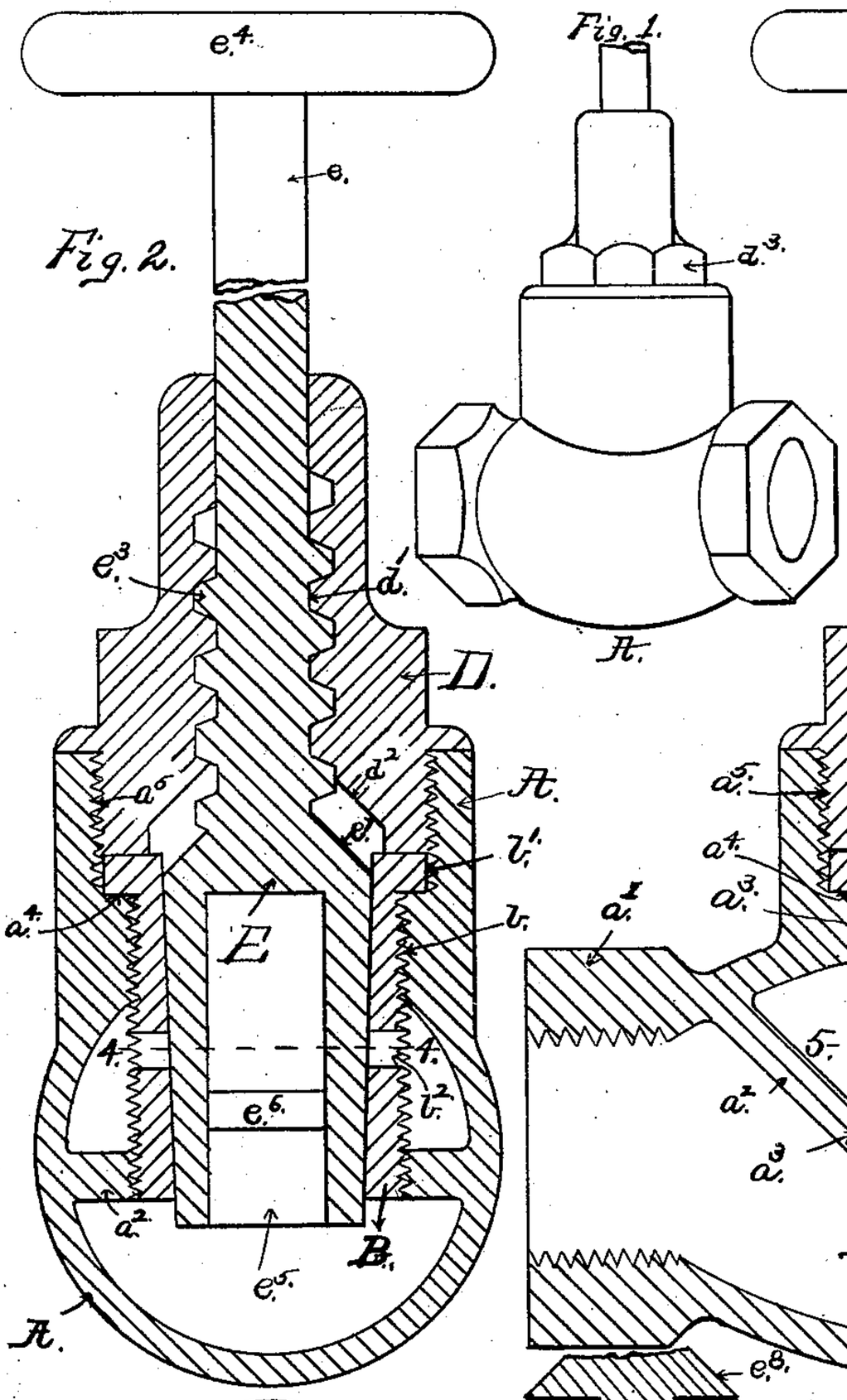

Fig. 2.

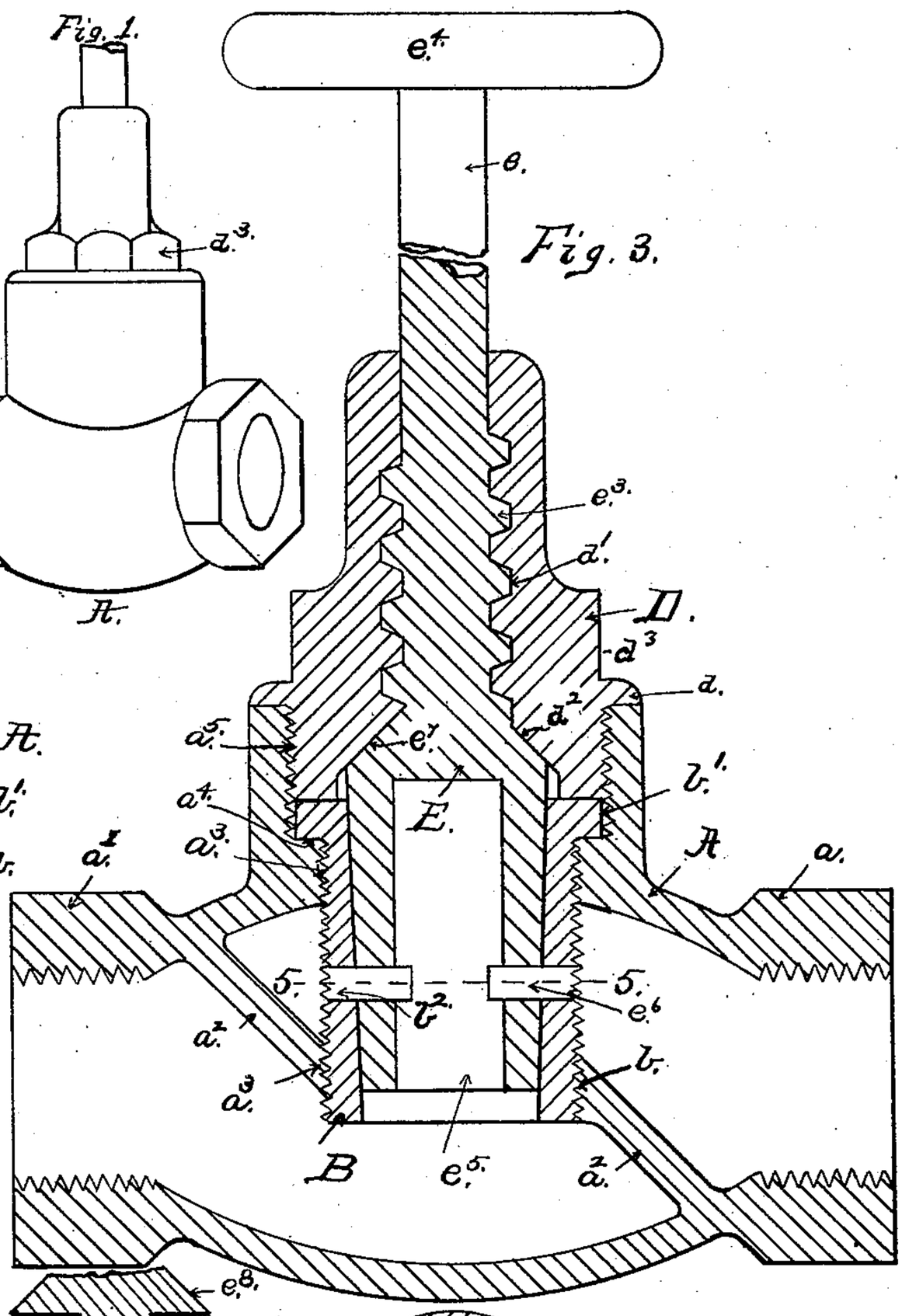

Fig. 3.

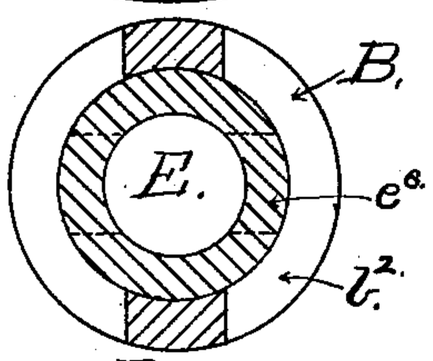

Fig. 4.

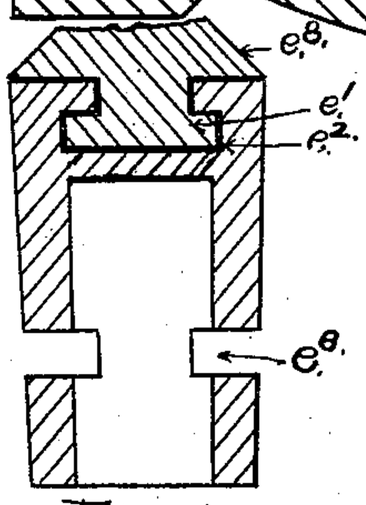

Fig. 6.

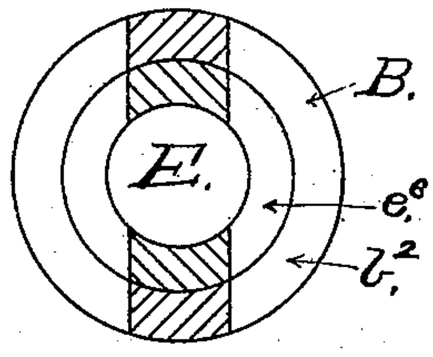

Fig. 5.

WITNESSES.

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WALTER O. FOSS, OF TEWKSBURY, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO MINOT JACKSON LINCOLN, OF NORTH RAYNHAM, MASSACHUSETTS.

VALVE.

SPECIFICATION forming part of Letters Patent No. 688,298, dated December 10, 1901.

Application filed April 10, 1901. Serial No. 55,184. (No model.)

To all whom it may concern:

Be it known that I, WALTER O. FOSS, a citizen of the United States, residing at Tewksbury, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Valves, of which the following is a specification.

This invention relates to valves; and it consists in the combinations and devices hereinafter described and claimed.

The valve herein described is adapted to be used for permitting or preventing the flow of any fluid.

The object of this invention is to furnish a valve which shall serve all the purposes of the ordinary so-called "globe-valve" and similar valves at much less cost for construction and repairs, to obviate the necessity of packing the valve or valve-stem, to avoid the dirt commonly made by the wearing of the packing, and to prevent leakage past the valve and between the valve-stem and the sleeve which serves as the valve-stem guide.

In the accompanying drawings, Figure 1 is a perspective view of my improved valve; Fig. 2, a vertical transverse central section of the same; Fig. 3, a vertical central longitudinal section of the same, the upper part of the valve-stem and hand-wheel being omitted in Fig. 1; Fig. 4, a horizontal cross-section of the sleeve or valve-seat on the line 4 4 in Fig. 2; Fig. 5, a horizontal cross-section of said sleeve and plug on the line 5 5 in Fig. 3; Fig. 6, a vertical central section of the plug or valve proper and of the lower part of the valve-stem, showing a modified form of my invention.

A indicates a shell, case, or chamber of usual form externally and provided with an inlet a, with an outlet a', and with a diaphragm or partition a^2, similar to what is commonly used in a so-called "globe-valve." Within the shell A is secured in any convenient manner a sleeve B, which serves as a valve-seat or part which coöperates with the movable valve E to permit or prevent the flow of a fluid through the shell A. In the drawings the sleeve B is represented as externally screw-threaded at b to engage a threaded hole a^3, formed in the shell A and partition a^2, and as provided also with an external annular flange b', which rests upon a shoulder a^4. in the shell A, the hole a^3 above said shoulder a^4 being enlarged or counterbored at a^5 and internally screw-threaded to receive a correspondingly externally-screw-threaded cap D, which rests upon the top of the flange b' and is preferably provided with an external annular flange d, which rests upon the top of the shell A.

The valve E and its stem e may be rigidly secured to or integral with each other, as shown in Figs. 2 and 3; but I prefer, in order to avoid the necessity of using extreme care in adjusting the bearing-surfaces of these parts to each other and to the bearing-surfaces of the cap D and sleeve B, to attach the valve to the stem loosely, as shown in Fig. 6, where the lower end of the stem is provided with a transverse dovetail e', which loosely fills a dovetail slot e^2 in the upper end of the valve in such a manner that the stem and valve must rotate together, but may have a slight lateral motion with respect to each other.

The valve E is very slightly tapered throughout its length toward its lower or free end to fit the opening of the sleeve B.

The valve-stem e is provided with a comparatively coarse screw-thread e^3, which engages with a corresponding screw-thread d' on the inside of the hollow cap D. The upper end of the valve-stem is provided with a hand-wheel e^4, handle, or other similar well-known means, which may be grasped by the hand or a suitable instrument to rotate said valve and valve-stem, and thereby to raise said valve in the sleeve B, which internally closely fits said valve when the latter is in its lowest position.

The valve E is provided with a central longitudinal chamber e^5, open at its lower end and closed at its upper end, and with passages e^6, which pass from said chamber to the outer surface of said valve. When the valve is closed, the passages e^6 are below other passages b^2, which lead through the walls of the sleeve B; but when said valve is raised to its greatest height the passages e^6 b^2 are at the same level and allow the steam or other fluid

to pass through said passages into the chamber e^5 and out of the bottom of the same. This construction allows the steam or other fluid to escape without passing between the valve and the sleeve and diminishes the wear of these parts.

The upper end of the valve E and the lower end of the central opening of the cap D in Figs. 2 and 3 are provided with parallel faces e^7 d^2, which fit each other like a valve and seat and prevent the escape of fluid through the central opening of said cap.

In Fig. 6 the lower end of the valve-stem is enlarged and provided with a conical face e^8, adapted to fit the face d^2 of the cap D to prevent leakage around the valve-stem. Above the screw d' the valve-stem is preferably cylindrical—that is, not tapering—and fits the central opening of the cap so closely as to prevent leakage between the valve-stem and cap. The enlarged part d^3 of the cap D just above the flange d is many-sided to enable the cap to be secured in place or removed therefrom by a wrench in an obvious manner.

It will be seen that the sleeve B is arranged in the shell A in such a manner as to leave a way for the fluid on all sides of said sleeve above the partition a^2, and the passages b^2 e^6 in said sleeve and in the valve are of sufficient capacity to permit the passage of the fluid into the hollow of said plug when said passages are at the same level, even if the ends of said passages do not exactly coincide with each other in position.

I claim as my invention—

1. The combination of the shell, the sleeve secured therein and having a lateral passage from the outside to the inside thereof, a space or fluid-way within said shell communicating with said passage, a diaphragm or partition forming the bottom of said way, a valve or plug arranged in said sleeve and having a central hollow chamber, closed at one end to prevent the entrance of a fluid and open at the other end and having a lateral passage leading into said chamber and means of raising said valve or plug until said passages in said sleeve and valve or plug are continuous with each other.

2. The combination of the shell, the sleeve secured therein and arranged to leave a space or fluid-way on all sides of said sleeve, within said shell, a diaphragm or partition, arranged at the bottom of said way, the valve or plug, arranged in said sleeve, and having a central hollow chamber, open at its lower end, closed at its upper end and having lateral passages leading into said chamber, and means of raising said valve or plug until said passages are continuous with other lateral passages, with which said sleeve is provided.

3. The combination of a shell, a sleeve secured therein and arranged to leave a space or fluid-way on all sides of said sleeve, within said shell, and provided with lateral perforations, a diaphragm or partition, arranged at the bottom of said way, the valve or plug, arranged in said sleeve, and having a central hollow chamber, open at its lower end, closed at its upper end and having lateral perforations, the valve-stem movable with said valve and externally screw-threaded, the cap, internally threaded to engage said stem to raise or lower said stem and valve, the lower end of said stem having an enlargement adapted to fit the lower end of said cap around said stem.

In testimony whereof I have affixed my signature in presence of two witnesses.

WALTER O. FOSS.

Witnesses:
ALBERT M. MOORE,
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