

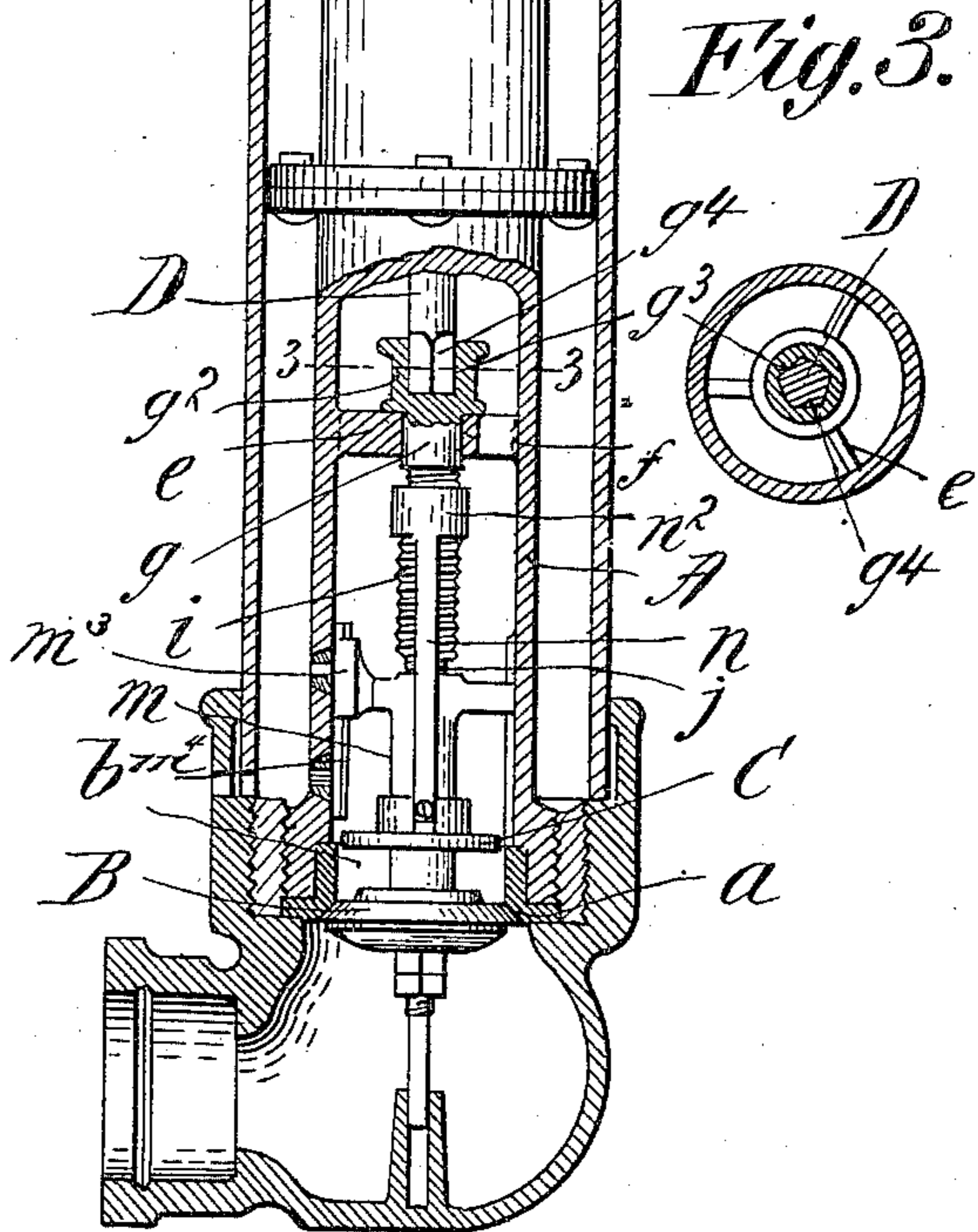
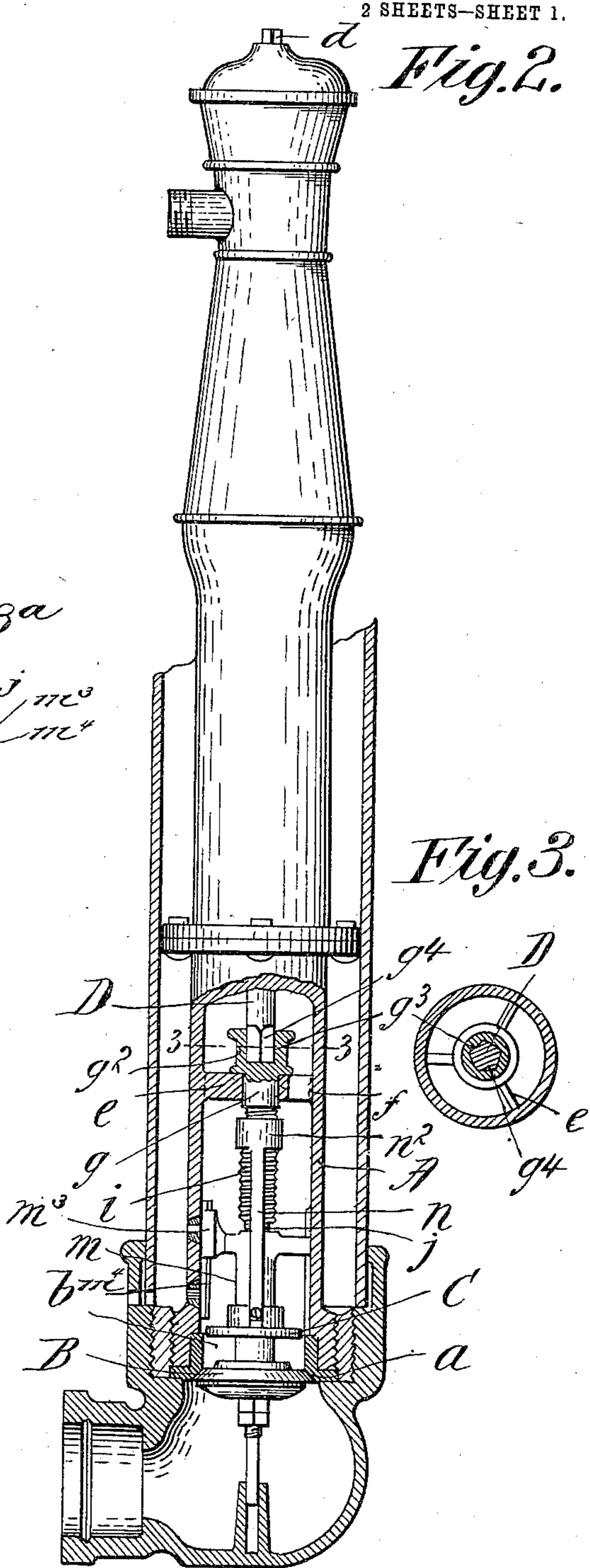
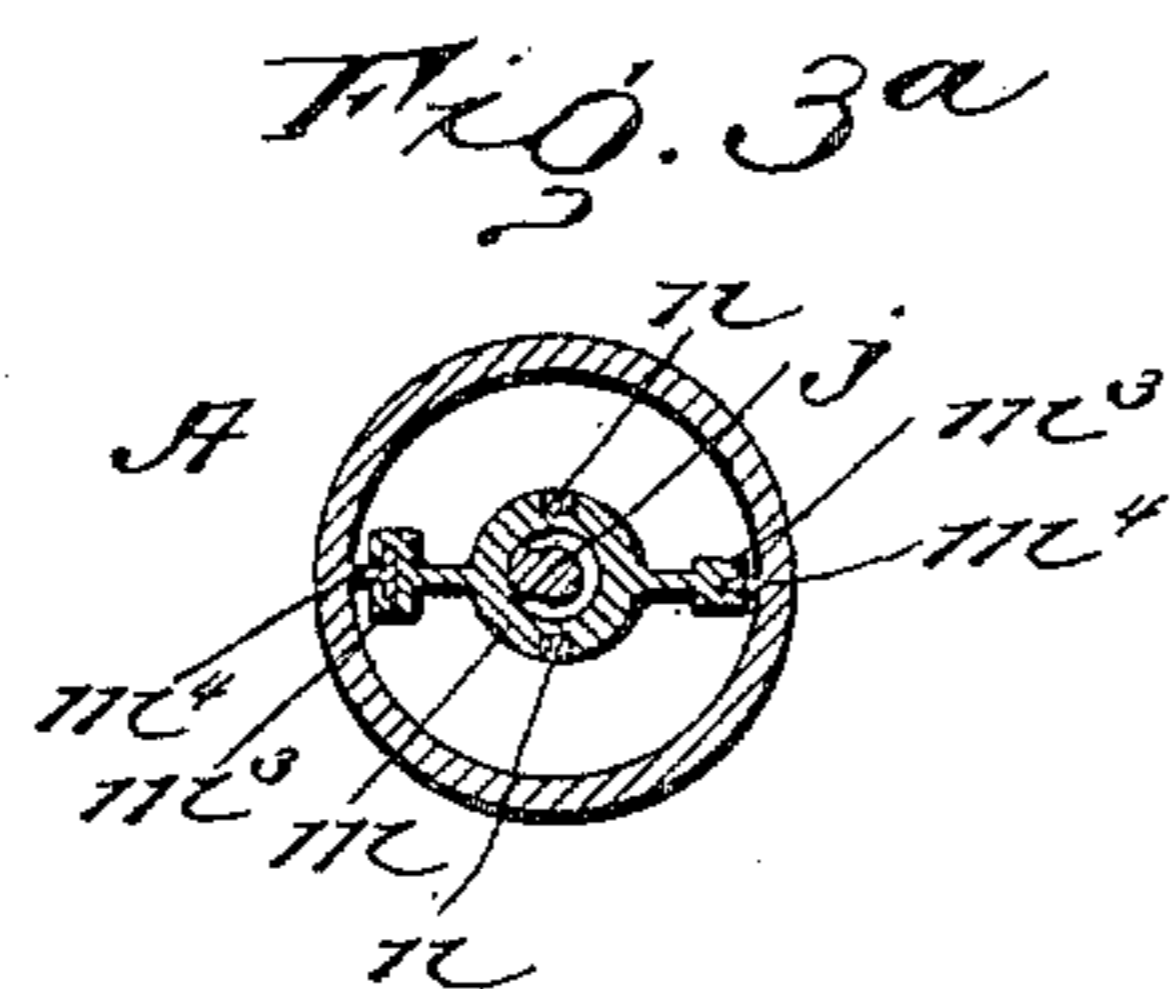
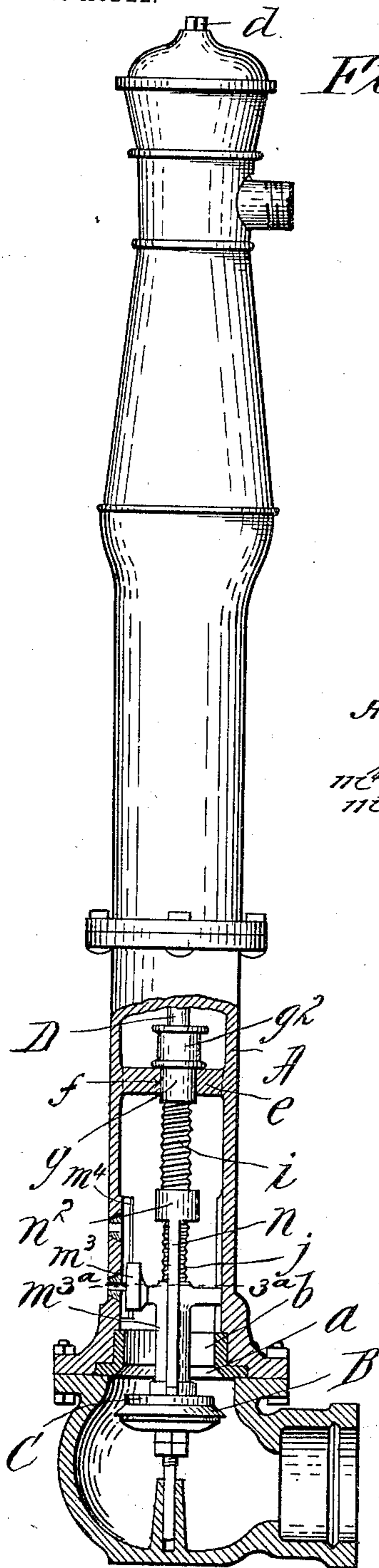
No. 726,369.

PATENTED APR. 28, 1903.

J. J. SULLIVAN.
VALVED APPLIANCE.
APPLICATION FILED FEB. 1, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

Geo. E. Preck:
M. A. Campbell

John J. Sullivan Inventor.
by W. J. Bellows Attorney.

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2 SHEETS—SHEET 2.

Fig. 4.

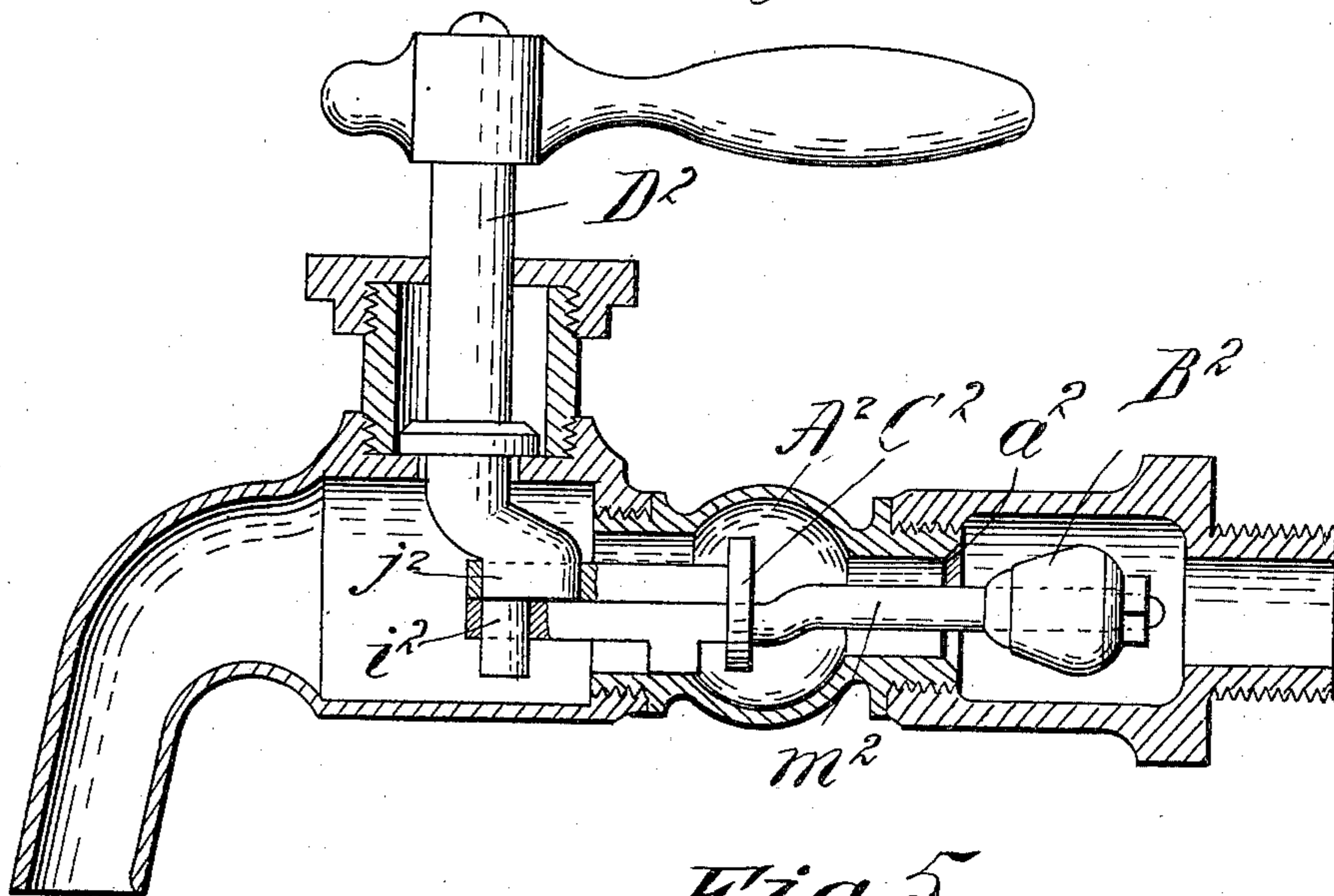


Fig. 5.

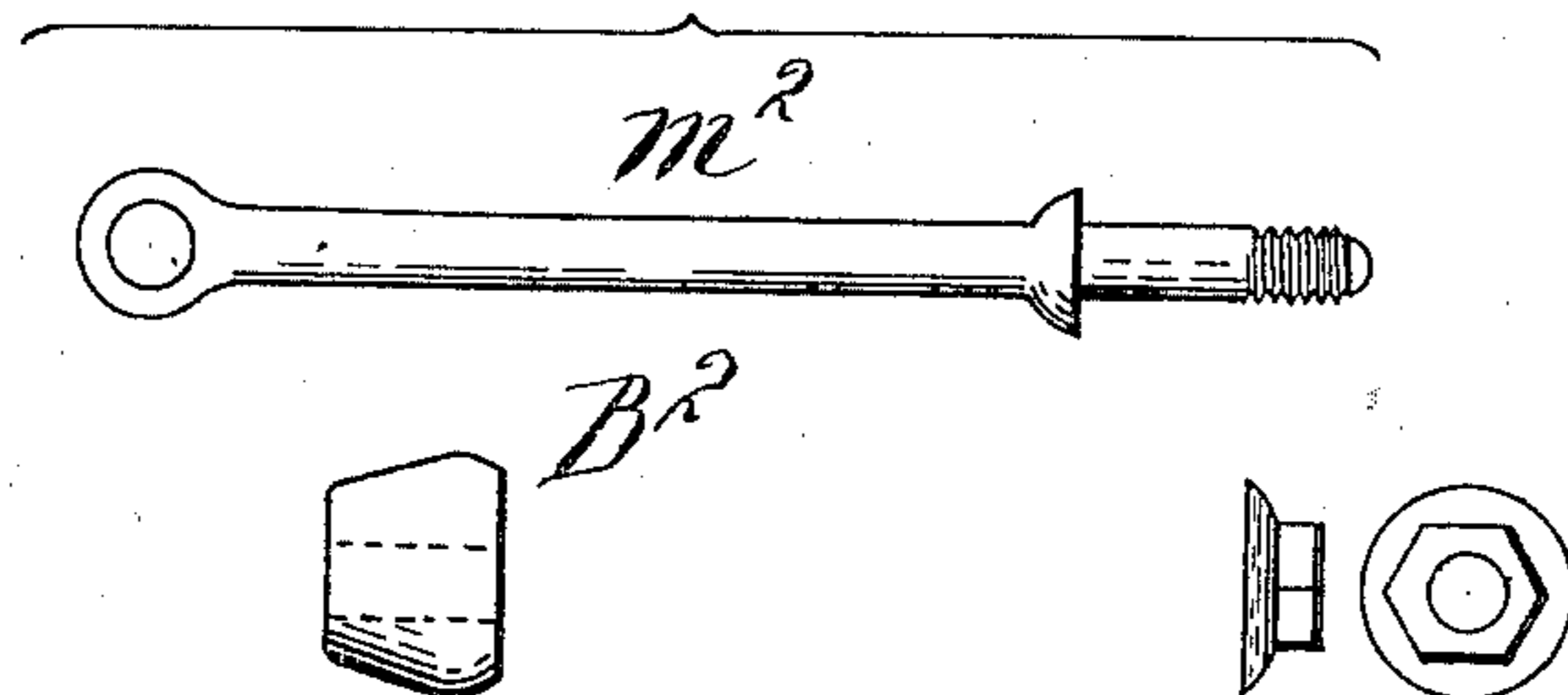


Fig. 7.

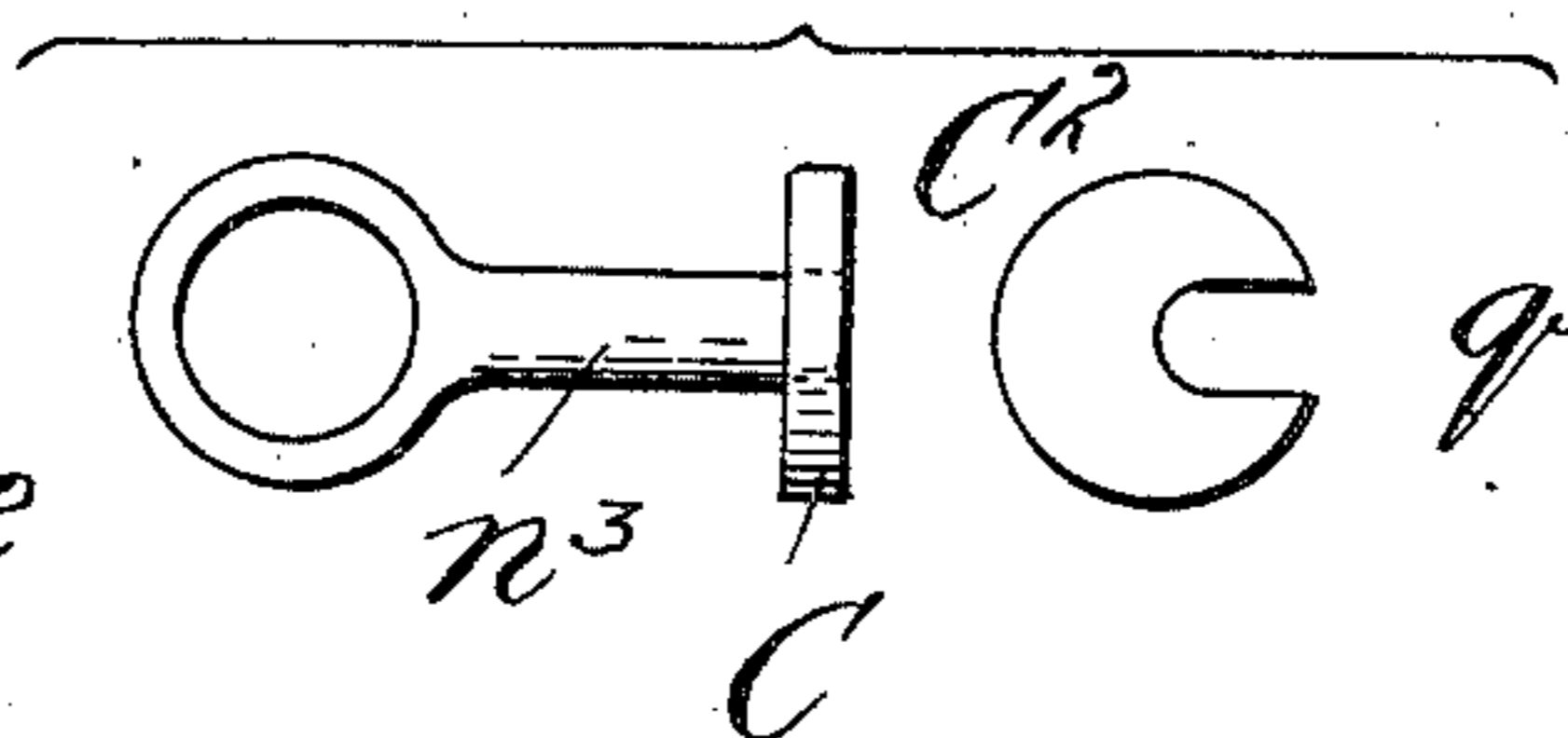
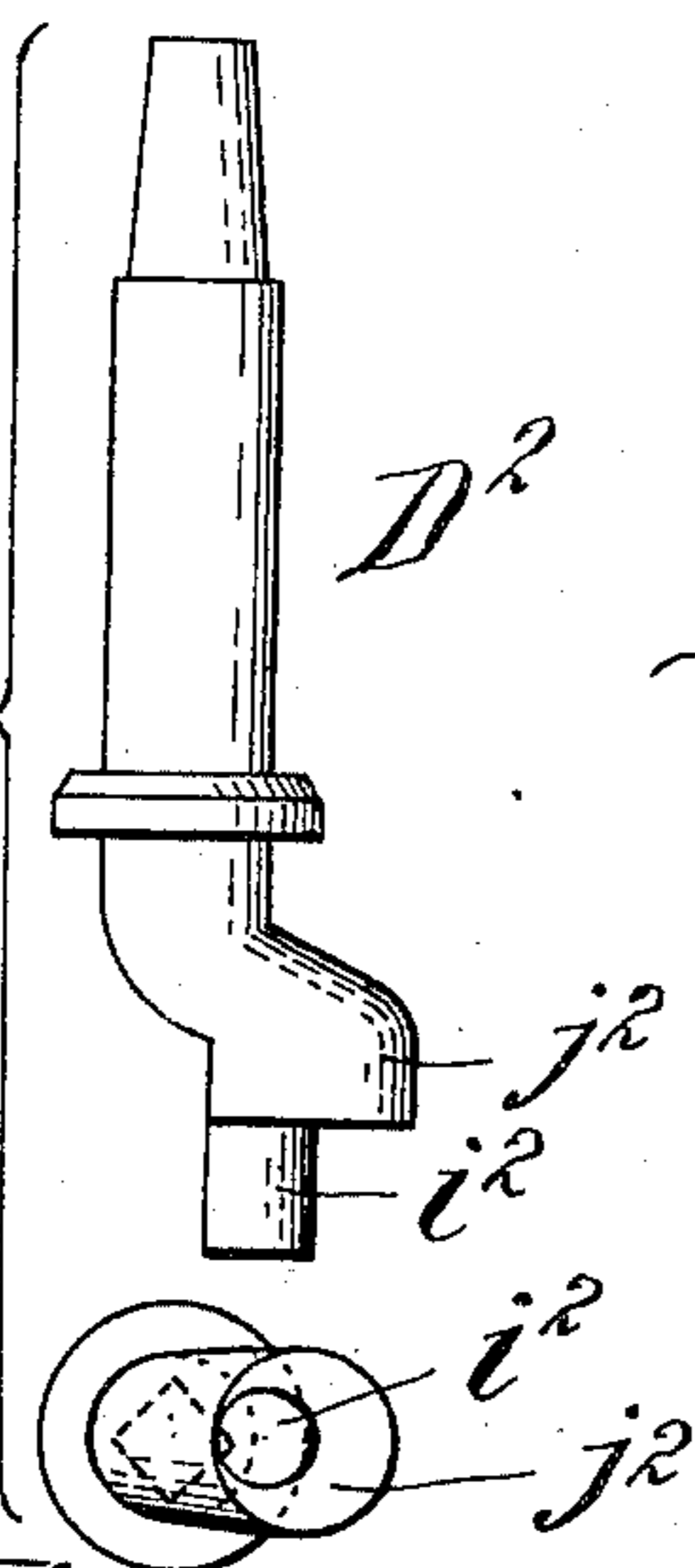


Fig. 6.



Witnesses:
M. A. Campbell
Geo. E. Puck.

Inventor,
John J. Sullivan
by *M. J. Bellows*
Attorney.

UNITED STATES PATENT OFFICE.

JOHN J. SULLIVAN, OF HOLYOKE, MASSACHUSETTS.

VALVED APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 726,369, dated April 28, 1903.

Application filed February 1, 1902. Serial No. 92,180. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. SULLIVAN, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Valved Appliances, of which the following is a full, clear, and exact description.

This invention relates to improvements in valved appliances—such as hydrants, faucets, and analogous devices for controlling the passage and delivery of water—wherein are comprised a main valve for absolutely shutting off the ingress of water and a secondary valve which is movable in conjunction with the primary valve to preliminarily partially shut off the water, so that the abrupt closing of the valve is avoided and in consequence thereof the objectionable water-hammering which is occasioned by the surging or vibratory action of the water against the primary valve.

The principal object of the present invention is to provide in the hydrant, faucet, or like appliance the primary and secondary valves, which are capable of movements independently of each other, and to combine therewith such operating means therefor as to cause in the opening and closing actions a different extent of movement to the primary valve from that of the secondary valve, so that when both the valves are open they will both have non-obstructing positions relatively to the waterway and yet so that when the valves have their closing motions imparted thereto the secondary valve will, for instance, move faster than the primary valve to have the effect of obstructing, though not entirely closing, the waterway seasonably before the primary valve becomes seated.

The invention consists of a valved appliance having a waterway therethrough, a primary valve for entirely closing the entrance of the water into and through said way, a secondary valve movable to obstruct and nearly but not quite close the passage of the water and to be withdrawn from such obstructing position, leaving the waterway practically clear, means for opening and closing the primary valve, and means for concurrently imparting to the secondary valve a different extent of movement from that of the primary

valve; and the invention furthermore and otherwise consists in combinations and arrangements of parts, substantially as hereinafter described, and set forth in the claims. 55

Reference is to be had to the accompanying drawings, in which the present improvements are exemplified as in their applicability both in a hydrant and in a faucet.

In said drawings, in Sheet 1, Figure 1 is a side and central vertical section of a hydrant, showing the improved valves and valve-operating devices, the primary and secondary valves being shown as opened and occupying proximate relations. Fig. 2 is a substantially similar view to Fig. 1, but showing the primary and secondary valves as in the positions for closing the waterway of the hydrant, said valves here having assumed distended relations. Fig. 3 is a horizontal cross-sectional view taken on the line 3 3, Fig. 2. Fig. 3^a is a horizontal cross-section taken on the line 3^a 3^a, Fig. 1. In Sheet 2, Fig. 4 is a central sectional view through the faucet constructed under this invention, the primary and secondary valves thereof being shown as in their opened positions. Figs. 5, 6, and 7 are groups of views showing the details comprised in the novel parts of the faucet. 60 65 70 75

Referring to Sheet 1 of the drawings, A represents the hydrant-casing, of the usual or any suitable construction, having the usual provision whereby it may be coupled to the water-main. The hydrant-casing has in its lower end the annular bushing, formed with the inlet-opening *a*, the downwardly-flaring wall of which forms the seat for the primary valve B. 80 85

The waterway leading upwardly above the valve-seat *a*, as seen at *b*, is a round cylindrical passage, within and below which the secondary valve C is movable, the diameter of this valve being such as to permit it to play loosely within the portion *b* of the waterway and even when located therewithin to permit the passage between its rim and the surrounding wall of the waterway of a restricted quantity of the water upwardly through the hydrant. 90 95

D represents the valve-operating rod or shaft, the same extending axially through the hydrant-casing and has at its upper end the 100

squared portion or nut d , as usual, by means of which to turn it. The hydrant-casing suitably above the valve-seat a is constructed with the spider-frame e , having the central socket-hole f , through which fits for rotation an upper portion g of a screw-shaft, this part having above the portion g the portion g^2 , which is in the form of an enlarged hub having extending downwardly there-
 10 within from its upper end the central polygonal socket g^3 , in which engages the correspondingly-shaped lower end portion g^4 of the operating-shaft D. The upper half or portion i of the screw-shaft has its threads comparatively quick or coarse, while the lower
 15 portion j of this shaft has its threads finer and slower than those of the portion i .

The stem or shank m of the primary valve B is, in effect, a nut, the same having internal
 20 screw-threads corresponding to and engaging with the finer screw-threads j of the differentially-threaded shaft.

The secondary valve C is constructed annular, so as to play sleeve-like over the shank
 25 or stem m of the primary valve, and connected to the hub of the secondary valve are the depending arms n of a yoke, the upper uniting and central portion n^2 of which is also in substance a nut, it having internal screw-
 30 threads corresponding to and in engagement with the quick threads i of the screw-shaft. Both valves being, as shown in Fig. 1, in their opened positions and brought the one closely near or against the other, by properly turning
 35 the operating-shaft D both valves will be moved upwardly; but the secondary valve C will enter within the cylindrical bore next above the valve-seat and check the flow of the water through the hydrant considerably
 40 before the main valve reaches its seat, and in this manner of preliminarily checking but not absolutely preventing the flow of water through the hydrant and amply in advance of the seating of the main valve establishes
 45 such conditions of the water in the main behind the valve as obviates the water-hammering, which is not only objectionable, but destructive of the valve appliances. Of course the turning of the rotatable oper-
 50 ating part D in the reverse direction causes as the primary valve moves downwardly to its opened position the secondary valve to move downwardly faster, so as to overtake and be next to and as a part of the main
 55 valve, whereby the inlet-opening may now be as little obstructed as possible, it being understood that if the secondary valve were to move downwardly only the same distance as that of the movement of the primary valve it
 60 would even when the primary valve were fully open occupy more or less of an obstructing position in the inlet of the waterway. The same idea of means is illustrated in connection with the waterway in and through
 65 the faucet, (shown in Sheet 2,) although the details and arrangements of the parts are somewhat modified, and in Fig. 4 A² repre-

sents the casing, within which is the seat a^2 for the primary valve B², while the secondary valve C² closes into and opens rearwardly
 70 from a secondary bore or portion of the waterway in advance of the valve-seat inlet and between the latter and the discharge-nozzle.

The rotatable operating device D² comprises two eccentrics i^2 and j^2 , one of which is not
 75 only eccentric to the other, but of different size.

The stem m^2 of the primary valve has a ring-shaped extremity which embraces the smaller eccentric, while the stem n^2 of the
 80 secondary valve C² has a ring-shaped head which embraces the larger eccentric, and the secondary valve is recessed, as indicated at q , to embrace the stem of the primary valve, and the whole arrangement is such that on
 85 the turning of the operating-spindle D² the larger eccentric causes simultaneously a longer extent of movement of the secondary valve than is imparted by the smaller eccentric to the primary valve.
 90

Other variations and departures from the detailed constructions and arrangements shown may be made under and within the scope of my invention without departing
 95 from the spirit thereof.

Of course it is understood that the nuts or screw-engaging extensions m and n^2 of the primary and secondary valves are constrained against rotational movements and yet in a manner to permit of their axial movements,
 100 and the stem or extension m^2 is provided with a lateral arm having a runner m^3 , which engages and slides along a way m^4 , formed on or secured vertically to the inner wall of the hydrant-casing, and the opposite side mem-
 105 bers n of the yoke extension of the secondary valve have rotation-preventing engagements against the opposite sides of the internally-threaded stem of the primary valve.

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

1. A valved appliance having a waterway therethrough, a primary valve for absolutely closing said waterway, a secondary valve
 115 movable to partially close, and to leave clear, the waterway, a rotatable operating part, means between the latter and the primary valve for opening and closing such valve on the turning of said operating part, and addi-
 120 tional means between said operating device and the secondary valve, for operating, on the turning of the rotatable part, the latter valve with a longer extent of movement than that of the primary valve.
 125

2. A hydrant having a waterway, with a valve-seat inlet, and a cylindrical formation of its passage next thereabove, a differential screw and means for rotating it, a primary valve-screw engaged with the slower-acting
 130 portion of said differential screw, adapted to fully close, and open downwardly from the valve-seat inlet, and a secondary valve having, in the normal closed position of said pri-

mary valve a position adjacent, but above and separated from the primary valve, and its location in the cylindrical portion of the waterway above the valve-seat inlet, and
 5 nearly, but not completely closing said cylindrical portion of the waterway, screw-engaged with the quicker-acting portion of the differential screw, and operative, by the action of the differential screw to open the primary
 10 valve, to assume a position below the valve-seat inlet, and of less separation from the primary valve, for the purpose set forth.

3. A hydrant having a waterway, with a valve-seat inlet at its lower portion, and with
 15 a cylindrical formation of its passage next thereabove, a differential screw and means for rotating it, a primary-valve screw engaged with the lower, slower-acting portion of said screw, adapted to fully close, and to open
 20 downwardly from, the valve-seat inlet, the secondary valve constituted by a disk of slightly less diameter than the aforesaid cylindrical portion of the waterway, having, in the normal closed, and partially-closed, position of
 25 the primary valve, a position of obstruction in said cylindrical portion of the waterway, above, and separated from the primary valve, and screw-engaged with the upper, quicker-acting portion of the differential screw, and
 30 means for preventing the primary and secondary valves against rotational movements,

substantially as and for the purposes set forth.

4. A hydrant, having a valve-seat inlet at its lower portion, and having the waterway 35 next thereabove of a cylindrical formation, and provided with a vertical runner-way in its inner side, a differential screw and means for rotating it, a primary valve having an up-
 40 standing internally-threaded stem m , which screw engages the lower and slow-acting portion of the differential screw, provided with lateral arms, having the portion m^3 engaging the said vertical runner m^4 , a centrally-apertured
 45 disk, movable vertically on the exterior of said valve-stem m , and of a diameter slightly less than that of the said cylindrical portion of the waterway, and having vertical exten-
 50 sions n , provided with the nut n^2 screw-engaging the upper and quicker-acting portion of the differential screw, said extensions n having a non-rotatable engagement with the exterior of said valve-stem m all substantially
 as described and shown, and for the purposes set forth.

Signed by me at Springfield, Massachusetts, in the presence of two subscribing witnesses.

JOHN J. SULLIVAN.

Witnesses:

WM. S. BELLOWS,
 M. A. CAMPBELL.