

(No Model.)

2 Sheets—Sheet 1.

J. W. MELVIN.

CUT-OFF VALVE.

No. 543,259.

Patented July 23, 1895.

Fig. 1.

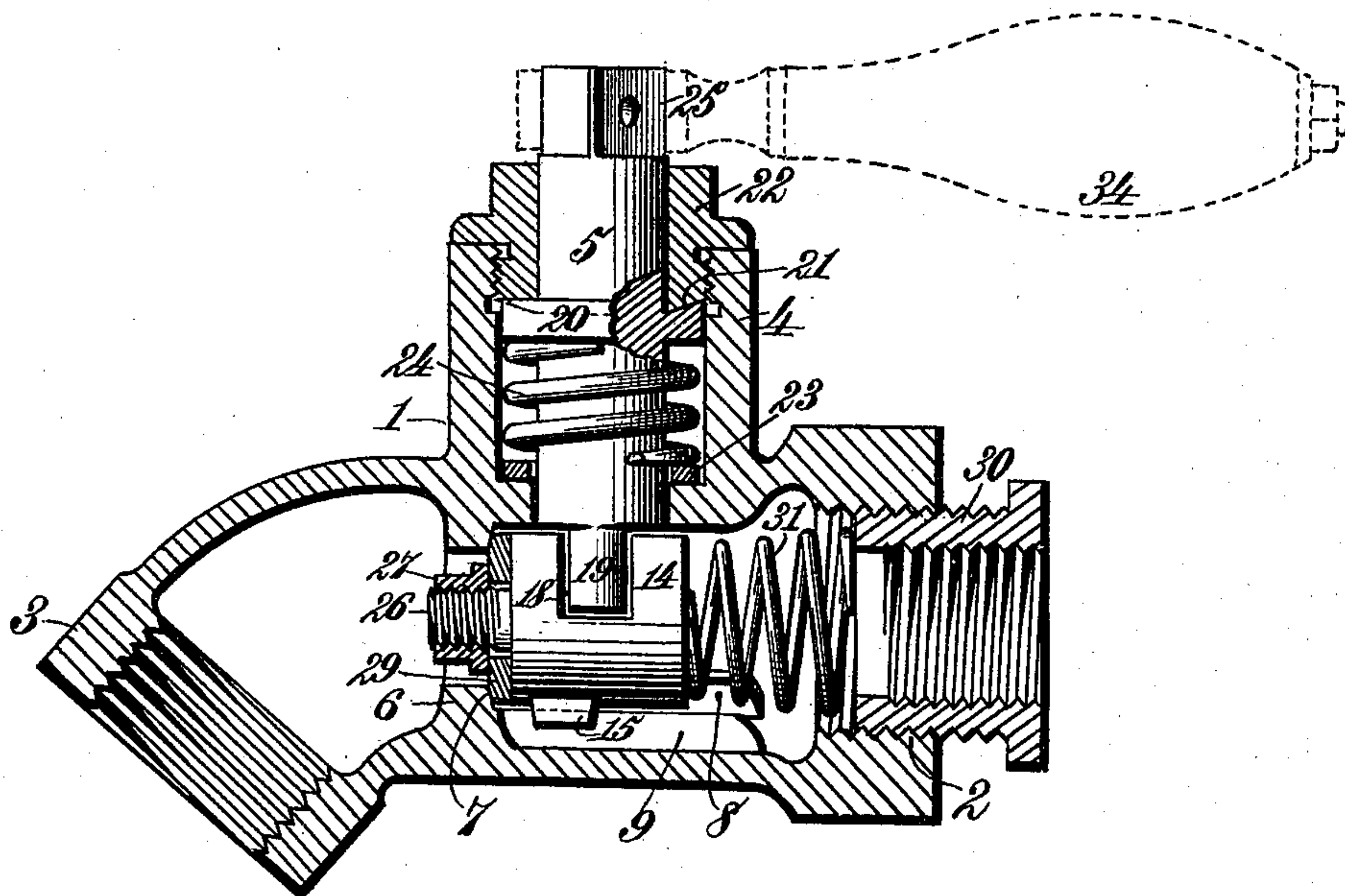


Fig. 2.

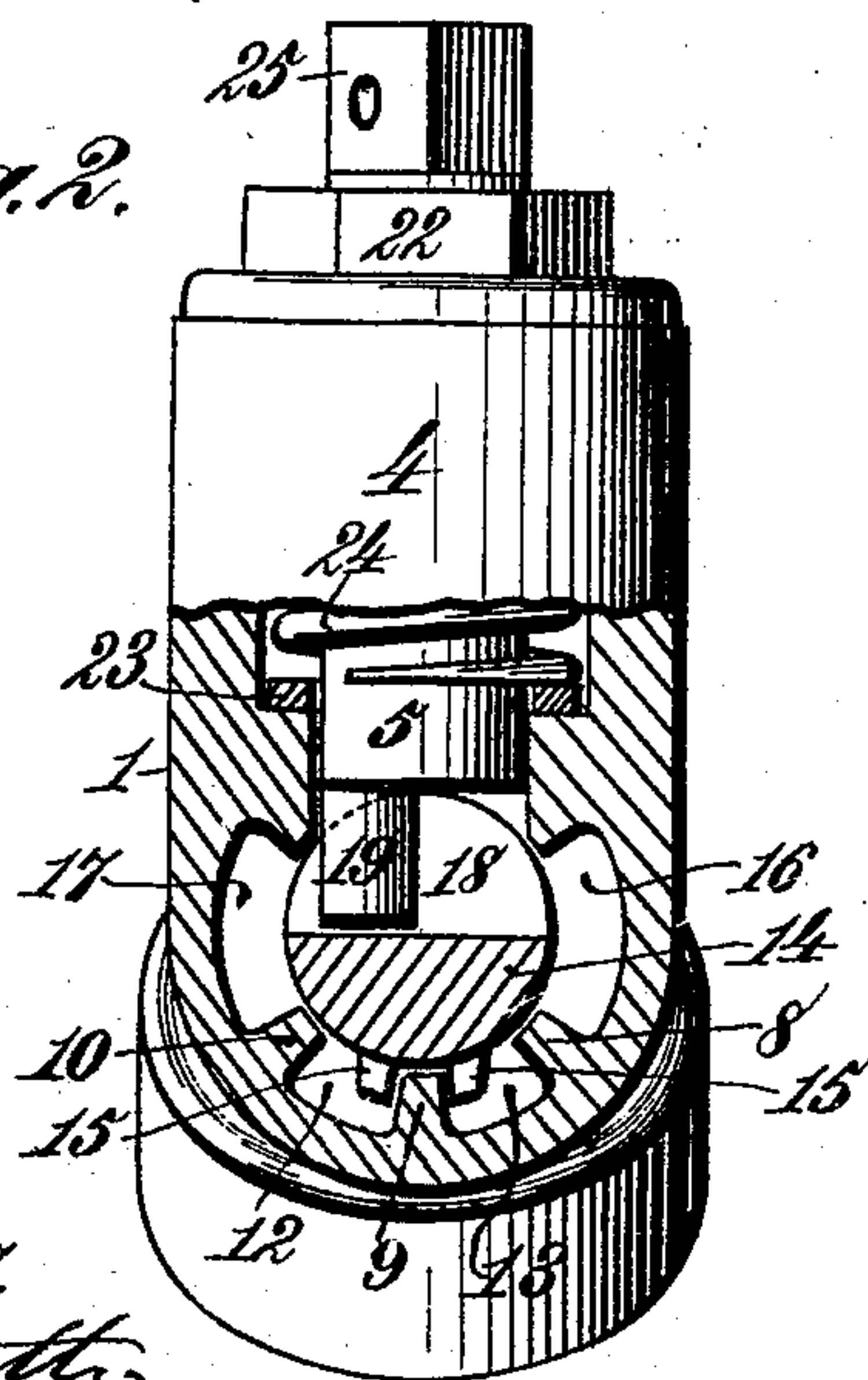


Fig. 3.

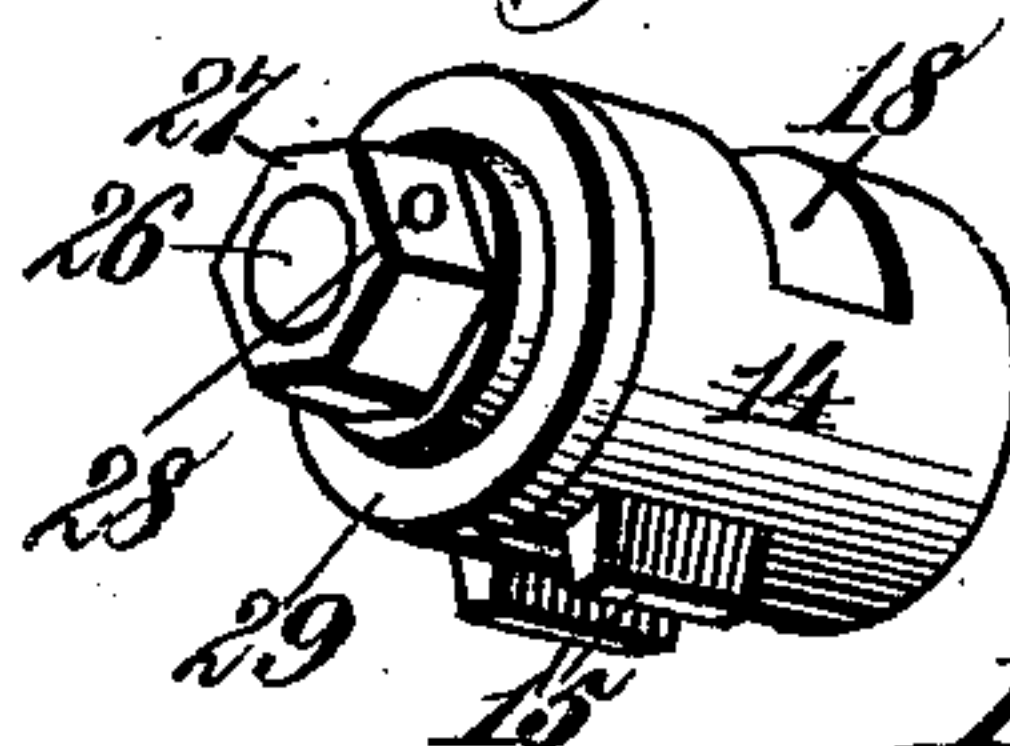
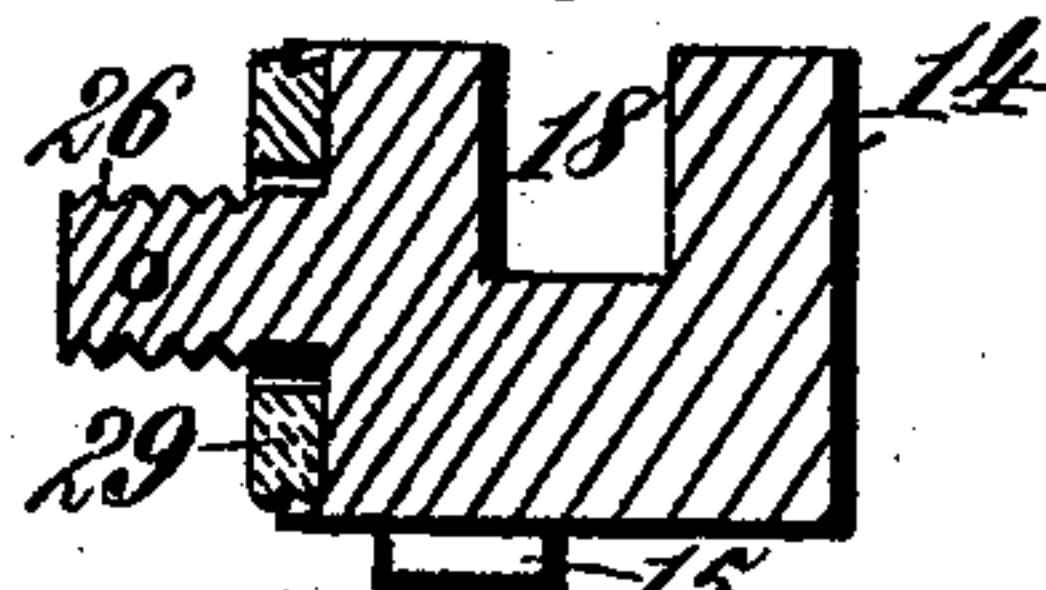


Fig. 4



Witnesses.

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Dennis Sumbly.

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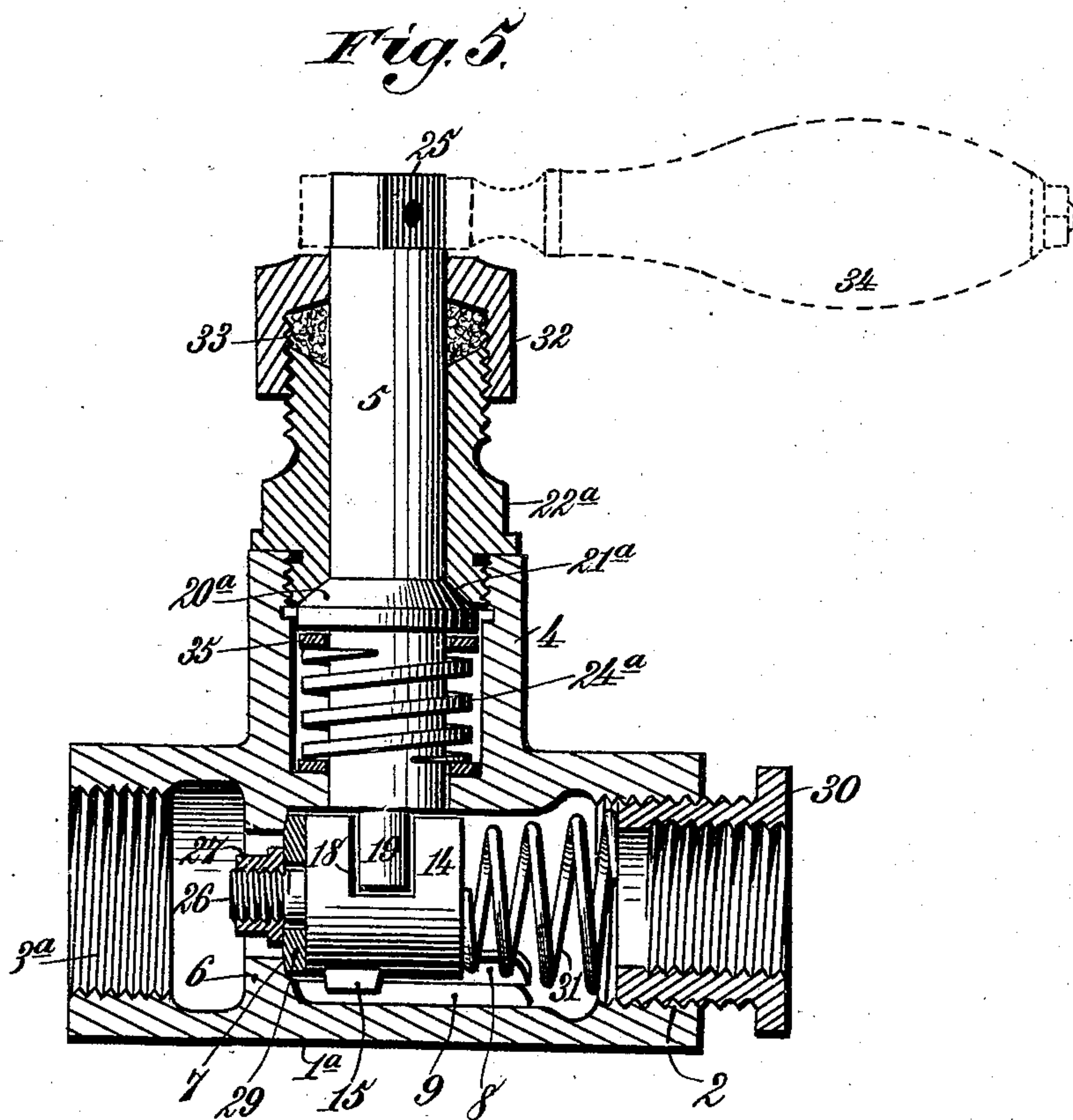
(No Model.)

2 Sheets—Sheet 2.

J. W. MELVIN.
CUT-OFF VALVE.

No. 543,259.

Patented July 23, 1895.



Witnesses,
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Inventor:
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UNITED STATES PATENT OFFICE.

JOSIAH W. MELVIN, OF HOUSTON, TEXAS.

CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 543,259, dated July 23, 1895.

Application filed March 23, 1895. Serial No. 542,948. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH W. MELVIN, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented new and useful Improvements in Shut-Off Valves, of which the following is a specification.

This invention relates to shut-off valves having valve-plugs mechanically actuated by rotary valve-stems provided with cranks or eccentric pins which loosely engage the valve-plugs and serve to shift the latter longitudinally to or from the valve-seats when the stems are rotated.

The objects of my invention are to improve the prior construction of valves of the character alluded to; to provide a novel valve-plug, which can be provided with either a rigid or flexible valve-face, according to the purpose for which the valve is to be used; to provide novel means for rectilinearly guiding the valve-plug and preventing axially-turning movements of the same which might interfere with its correct operative connection with the crank or eccentric pin of the valve-stem; to provide a novel arrangement of spring to aid in seating the valve-plug and holding it tightly against the valve-seat; to provide means for pressing the valve-stem upwardly and seating a flange thereupon against a nut screwed into the valve-casing; to prevent the passage of liquid or fluid at this point, and thus avoid leakage through that part of the valve-casing which contains the valve-stem, and to provide a novel construction of valve-casing whereby the valve-plug is accurately centered and supported by bearing against the internal surface of the casing nearly its entire circumference, while the passages for the fluid from the inlet to the outlet of the casing are wholly beneath the valve-plug.

To accomplish all these objects my invention involves the features of construction and the combination or arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a vertical central sectional view of my improved shut-off valve, the valve-stem and valve-plug being shown in side elevation. Fig. 2 is a sectional rear end elevation of the same. Fig. 3 is a detail perspective view of

the valve-plug. Fig. 4 is a detail sectional view of a portion of the valve-plug, showing a modification of the same, and Fig. 5 is a vertical central sectional view showing a slightly-modified construction of my improved valve which is particularly designed for application to a steam-conveying pipe.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a valve-casing having an internal screw-threaded inlet extremity 2, a curved internally-screw-threaded or other suitable outlet extremity 3, and an upwardly-projecting tubular portion 4 for containing the cylindrical valve-stem 5 hereinafter explained. The casing is constructed internally with a circular radially-projecting flange 6, the inner edge of which constitutes a valve-seat 7, and said casing is formed integral in its lower portion with a plurality of upwardly-projecting ribs 8, 9, and 10, separated from one another a suitable distance to provide longitudinal water-passages 12 and 13 under the lower side of the cylindrical valve-plug 14. The inner or upper edges of the ribs 8, 9, and 10 are concentric with the center of the cylindrical valve-plug 14, and serve to solely sustain the valve-plug in its rectilinear reciprocation motion. The central rib 9 extends into the space between two parallel guide flanges or ribs 15, formed on the under side of the cylindrical valve-plug, so that the latter is accurately guided in a right line in the direction of its length, and is held against axially-turning movements. The upper side of the valve-plug bears against the internal cylindrical surface of the valve-casing, and the valve-plug may also bear against the upper edges of the ribs 8, 9, and 10. The valve-casing is also formed with water-passages 16 and 17, located, respectively, above the ribs 8 and 10, so that when the valve-plug is opened the water will flow longitudinally through the water-passages 12, 13, 16, and 17 into the outlet of the valve-casing.

The valve-plug is constructed in its upper side with a transverse slot 18, in which is arranged a cylindrical crank or eccentric pin 19, projecting from the lower end of the valve-stem 5. The valve-stem is formed integrally,

or is otherwise provided with an annular flange 20, having a beveled or inclined upper surface, seated upon a beveled or inclined seat 21, formed on the lower end of a nut 22, screwed into the upper end of the portion 4, and through which the valve-stem extends. In the lower part of the portion 4 is arranged a washer 23, which serves as a bearing for the lower end of a spiral or other suitable spring 24, resting at its upper end against the flange 20, so that the latter is constantly pressed upward and tightly seated upon the seat 21 of the nut 22 to prevent the passage of liquid or fluid at such point, and thus avoid leakage through that part of the valve-casing which contains the valve-stem. The upper end of the valve-stem is suitably constructed to receive a handle by which to rotate the stem, and thus shift the valve-plug 14 longitudinally to or from the valve-seat 7. I prefer to construct the upper end of the valve-stem with an angular head 25 to receive a crank-handle, but do not confine myself to this particular construction, as any suitable means may be employed for rotating the valve-stem from the exterior of the valve-casing.

The front end of the cylindrical valve-plug is provided at its center with a longitudinally-projecting screw-threaded stud 26, on which is mounted a screw-nut 27, adapted to be held against rotation after proper adjustment through the medium of a pin 28, inserted through the nut into engagement with the screw-stud. The screw-stud and the nut serve to detachably retain in position a valve-face 29, having a diameter co-ordinate with the diameter of the valve-plug.

The material of which the valve-face is composed depends on the purpose for which the shut-off valve is designed. If the valve is designed for the passage of steam, the valve-face will be composed of a metallic disk; but if the valve is designed for air, liquids, or water the valve-face will be composed of rubber, leather, or other suitable flexible material.

It will be obvious that the screw-stud and nut render it possible to quickly substitute one valve-face for another and to effect repairs in the most economical manner. If a rubber or leather valve-face is employed, it can be easily renewed whenever required. If a ground valve-seat is employed in connection with a metallic valve-face, the seat can be readily reground and the removable and replaceable valve-face easily fitted thereto at very small cost.

The internally-screw-threaded inlet end 2 of the valve-casing is provided with a screw-threaded reducing-plug 30, between which and the rear end of the valve-plug 14 is arranged a spiral or other suitable spring 31. The reducing-plug serves to connect with a pipe, and also to vary the tension of the spring, and thereby cause it to press with greater or less force against the valve-plug. The spring aids in seating the valve-plug and holds it

tightly against its seat, which is very desirable, particularly where a low head of water is present or the fluid-pressure is moderately low.

In some instances the front end of the valve-plug can be countersunk and a removable and replaceable leather or other flexible valve-face placed in the countersunk portion, as will be clearly understood by reference to the modification illustrated by Fig. 4.

The parts are so constructed and relatively arranged that when the valve-plug is moved to its open position the crank or eccentric pin 19 is on a dead-center, and when the valve-plug is moved to its closed position the crank-pin acts as a stop.

The valve illustrated in the modified construction, Fig. 5, is particularly designed for controlling the passage of steam through a steam-pipe. In this form of valve the casing 1^a is provided with a straight outlet 3^a, instead of a curved outlet, as in Fig. 1.

The reducing-plug 30, spring 31, valve-plug 14, longitudinal ribs on the interior of the valve-casing, and guide flanges or ribs on the valve-plug are all constructed the same as described with reference to Fig. 1.

The nut 22^a is formed with a concaved seat 21^a in its lower end, and the flange or valve 20^a is beveled on its upper surface to fit the concaved seat. The upper end of the nut 22^a is provided with a packing-nut 32 for pressing a packing 33 against the stem 5, which operates the valve-plug 14. The angular upper end 25 of the valve-stem 5 is provided with a handle 34, which is indicated by dotted lines. The handle is preferably composed of a wooden sleeve, through which a metallic rod passes, and is constructed at one end to engage the angular upper end of the valve-operating stem.

The spring 24^a, which corresponds to the spring 24, Fig. 1, is preferably square in cross-section, and a packing-ring 35 is arranged between the upper end of the spring and the flange or valve-collar 20^a. The packing and the packing-nut, in connection with the flange or valve-collar 20^a, effectually prevent the leakage of steam around the valve-operating stem.

The reference-numerals in Fig. 5 which correspond with the reference-numerals on Fig. 1 indicate parts constructed the same as described with reference to Fig. 1, and therefore I do not deem it necessary to again specifically describe the parts in Fig. 5, which are the same as parts in Fig. 1, and are hereinbefore explained in detail.

Having thus described my invention, what I claim is—

1. The combination of a valve-casing having an inlet 2, an outlet 3, a valve-seat 7, and an upwardly-projecting portion 4, a valve-plug 14 guided in the valve-casing, a spring arranged in rear of the valve-plug and serving to force the same longitudinally against the valve-

seat, a valve-stem having a flange 20, and a crank or eccentric-pin 19 engaging the valve-plug, a nut 22 engaging the upwardly-projecting portion 4, and having a seat 21 to receive the flange on the valve-stem, and a spring 24 which presses the stem upwardly and forces the flange thereof against the nut, substantially as and for the purposes described.

2. The combination of a valve-casing having an inlet 2, an outlet 3, a valve-seat 7, a nut 22, and a plurality of longitudinal ribs 8, 9, and 10 to create longitudinal water passages, a longitudinally-movable, cylindrical valve-plug engaging and guided by one of the said longitudinal ribs, a spring arranged in rear of the valve plug and acting to press the same against the valve-seat, a valve-stem having a crank or eccentric-pin 19 engaging the valve-plug, and a flange 20 seated against the nut, and a spring 24 acting to press the valve-stem upwardly and force the flange 20 against the nut, substantially as described.

3. The combination of a valve-casing having an inlet 2, an outlet 3, a valve-seat 7, a nut 22, and an upwardly-projecting portion 4 having a washer 23, a cylindrical valve-plug 14, a rotary valve-stem 5 having a crank or eccentric-pin 19, and a flange 20, a spring 24 acting to press the valve-stem upwardly and force the flange 20 against the nut, a spring 31 arranged in rear of the valve-plug and acting to force the latter against the valve-seat, and a reducer 30 inserted into the inlet end of the valve-casing and bearing against the

spring 31, substantially as and for the purposes described.

4. The combination of a valve-casing having a valve-seat 7, a cylindrical valve-plug 14 adapted to reciprocate in the valve-casing and provided with a valve-face, a rotary valve-stem having a crank or eccentric-pin for shifting the valve-plug, a spring arranged in rear of the valve-plug and pressing against one end thereof, and an internally screw-threaded reducer screwed directly into and adjustable to and fro in the inlet end of the valve-casing, and bearing against one end of said spring, for varying the tension of the spring and connecting with a pipe.

5. The combination with a valve-casing having a valve-seat 7, and a fixed longitudinal guide-rib 9, of a cylindrical valve-plug 14 having guide-flanges or ribs 15, movable along said fixed rib, a screw-stud 26 carrying a nut 27, a removable and replaceable valve-face 29 supported by the screw-stud and nut, a spring 31 arranged in rear of the valve-plug and acting to force the latter against the valve-seat, and a reducer 30 screwed directly into, and adjustable to and fro in the inlet end of the valve-casing and bearing against one end of the said spring, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

JOSIAH W. MELVIN. [L. S.]

Witnesses:

H. W. NELSON,
W. H. MARTIN.