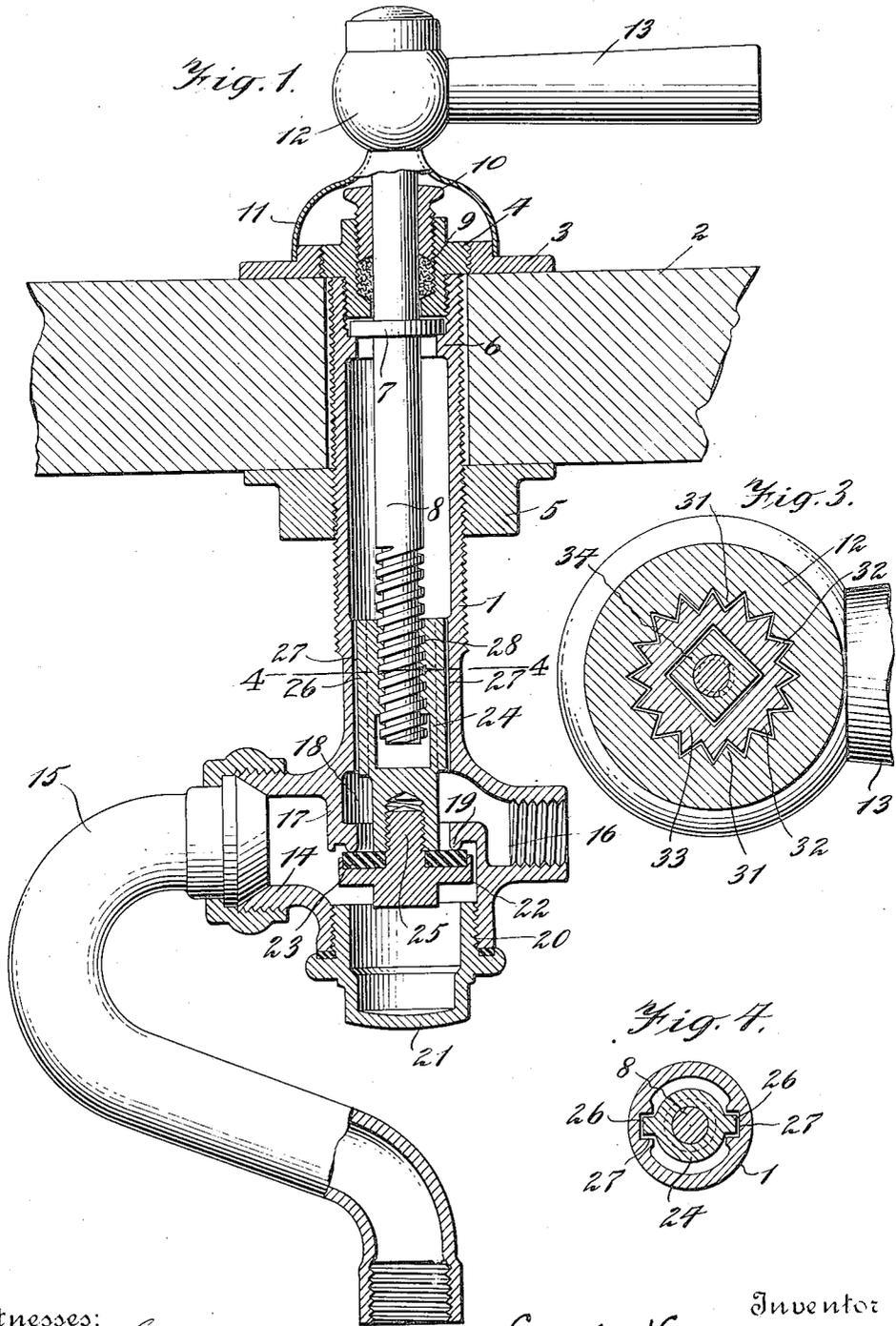


L. M. HOOPER.
 HANDLE MECHANISM FOR FAUCETS.
 APPLICATION FILED SEPT. 30, 1915.

1,211,585.

Patented Jan. 9, 1917.
 2 SHEETS—SHEET 1.



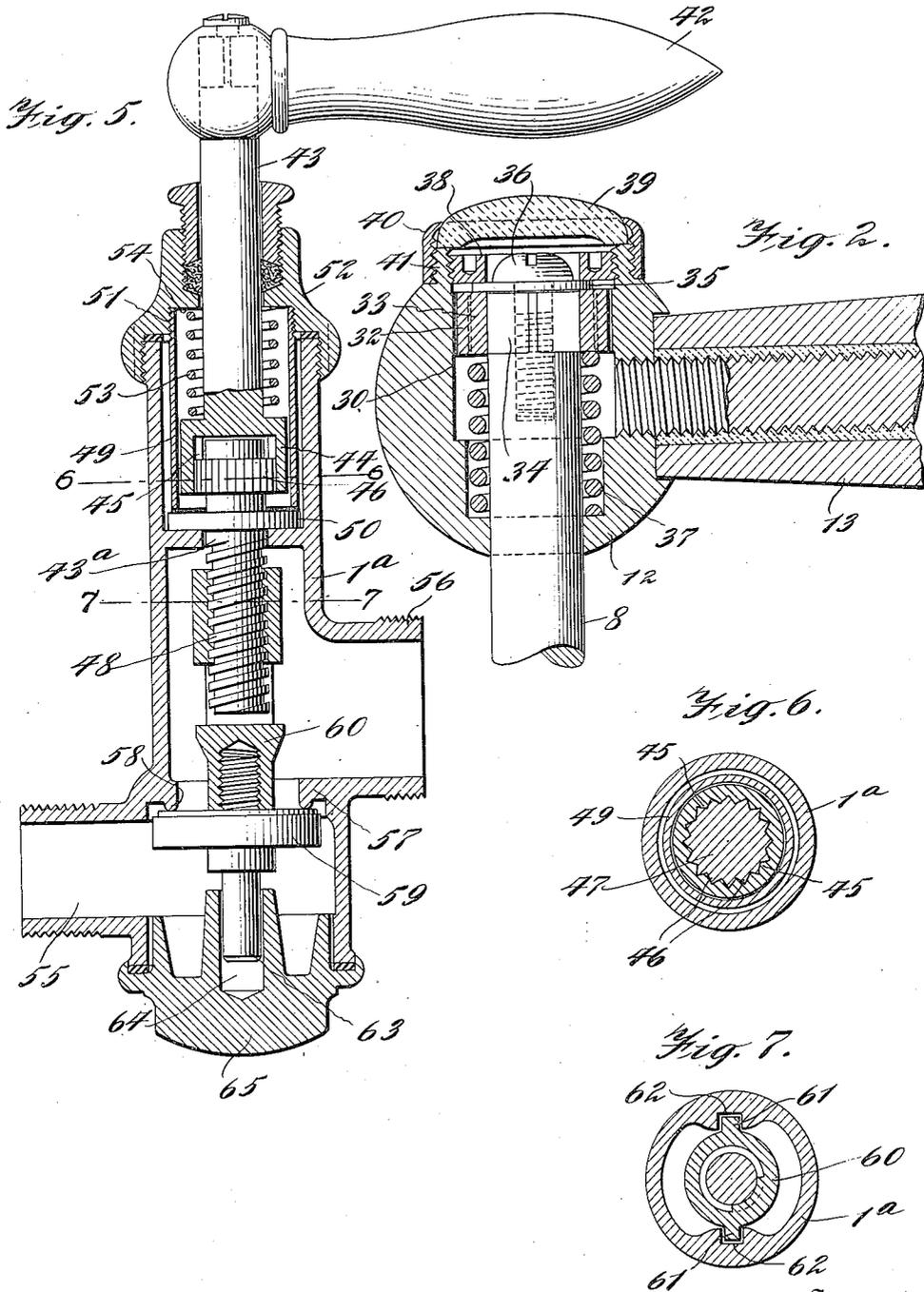
Witnesses:
E. C. Cheney
G. Helmcke

Inventor
Louis M Hooper
 By his Attorney
Eifford Bull

L. M. HOOPER.
 HANDLE MECHANISM FOR FAUCETS.
 APPLICATION FILED SEPT. 30, 1915.

1,211,585.

Patented Jan. 9, 1917.
 2 SHEETS—SHEET 2.



Witnesses:
Goldschmied
E. Helmcke

Inventor
Louis M. Hooper
 By his Attorney
Gifford Bull

UNITED STATES PATENT OFFICE.

LOUIS M. HOOPER, OF RUTHERFORD, NEW JERSEY, ASSIGNOR TO THE J. L. MOTT IRON WORKS, A CORPORATION OF NEW YORK.

HANDLE MECHANISM FOR FAUCETS.

1,211,585.

Specification of Letters Patent.

Patented Jan. 9, 1917.

Application filed September 30, 1915. Serial No. 53,281.

To all whom it may concern:

Be it known that I, LOUIS M. HOOPER, a citizen of the United States, residing at Rutherford, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Handle Mechanisms for Faucets, of which the following is a specification.

This invention relates to improvements in handle mechanism for faucets, bath valves, etc., of the kind employed in connection with plumbing fixtures such as lavatory basins, and has for one of its objects to provide a faucet or valve of the compression type which may be fully opened by a partial revolution of a lever handle and in which the handle is adjustable relative to the valve stem so that it may be set to have its working movement through the same arc of its revolution regardless of the thickness of the valve washer and alteration of the relative arrangement of the parts through wear.

A further object is to provide the adjustment of the handle relative to the stem so that the handle may be at any time conveniently adjusted to maintain a desired scope and range of movement irrespective of changes in the movement of the stem due to wear on the valve parts.

A further object of the invention is to provide a faucet or valve having an adjustment of this character in which the adjustment may be effected by simple manipulation of the operating handle, without tools of any kind and without loosening or detaching any of the parts of the device.

A further object of the invention is to provide a faucet or valve of this type in which the extent of movement of the operating handle to fully open the valve may be reduced to a small angle, and which will be perfectly tight when closed, particularly when used in systems having considerable pressure.

With the above objects in view, my invention consists in the construction described and shown in the following specification and accompanying drawings, it being understood that the invention is not limited to the details of construction disclosed except in so far as recited in the claims.

In the said drawings, Figure 1 is a view

partly in elevation, and mainly in vertical section through one type of faucet embodying my invention; Fig. 2 is a vertical central sectional view through the handle connection and adjustment, embodying my invention, the section being taken longitudinally of the valve stem in Fig. 1. Fig. 3, is a horizontal sectional view through the handle connection and adjustment shown in Figs. 1 and 2. Fig. 4 is a sectional view on the line 4—4 of Fig. 1; Fig. 5 is a sectional view similar to Fig. 1 of a bath valve embodying a modified form of the invention; Figs. 6 and 7 are sectional views along the lines 6—6, and 7—7, respectively, of Fig. 5.

Referring to the drawings, and particularly Figs. 1 to 4 inclusive, 1 designates the outer casing or shell of a faucet or valve which is supported in the metal or marble slab 2 of the lavatory bowl or basin by means of an upper nut 3 threaded on the cap 4 of the said casing and a clamp nut 5 threaded on the casing and engaging the under face of the said slab 2. The cap 4 is threaded in the upper end of the casing which latter terminates substantially flush with the surface of the slab, and is formed at its lower end with an internal flange 6 constituting a thrust bearing for the collar 7 integral with the valve spindle 8 and held between the cap 4 and said flange 6 on the inner wall of the casing whereby the spindle is held against longitudinal movement. The cap 4 is recessed as at 9, in the usual manner to receive the stuffing box 10 which may be inclosed if desired by a shell 11 seated on the nut 3 and extending at its upper end to the under edge of the "ball" or head 12 of the lever handle 13.

The lower end of the casing 1 may be T-shaped to provide a nipple 14 for the connection of the intake pipe 15 and a nipple 16 for the outlet nozzle (not shown). The opposite nipple openings of the T are separated by the diaphragm 17 having a central orifice 18 for the passage of the water and provided with an annular valve seat 19 surrounding the orifice on the lower face of the diaphragm beneath which is the pressure chamber of the valve. The lower end of the outer casing 1 is enlarged to provide a central opening of greater diameter than the

valve seat, which opening is preferably closed with a cap or hollow plug 20 threaded into the wall of said opening and having an angular head 21 to permit its ready detachment.

The valve 22 is of smaller diameter than the bottom opening of the casing to permit of its insertion and removal through the bottom opening, and is provided on its upper face with a seat for the washer 23, which is held in place by the clamping action of the valve plug or coupling 24 which is threaded on the stud 25 on the valve and projects upwardly through the orifice 18 into the body of the casing 1, the washer being clamped between the lower end of the member 24 and the valve head 22. The upper portion of the plug 24 is provided with opposite ribs 26 working in corresponding grooves 27 in the inner walls of the casing to prevent rotation of the plug but allow it free longitudinal movement. The movement of the plug is effected by a partial rotation of the spindle 8 through the medium of a thread 28 of quick pitch on the end of the spindle working in a correspondingly threaded bore in the center of the plug 24.

As stated above, one objection to faucets of this type as heretofore constructed, lies in the fact that the variance in the thickness of the washer 23 due to wear and other causes varies the position of the lever handle 13 relative to the wash basin thereby putting the handle 13 in an awkward position for operation, and also giving an unsightly appearance to the basin by reason of the fact that the handles of the hot and cold water faucets will not maintain symmetrical relative positions, and the legends on the heads of the faucets will not be in a position to be easily read. To overcome this objection I provide a novel connection between the lever handle 13 and spindle 8 as shown in enlarged detail in Figs. 2 and 3. The lever handle 13 is provided with a rigidly attached head, preferably in the form of the ball 12 rotatable on the stem 8. The ball is counter-bored around the stem at its upper end as at 30 and the counter-bore is provided with internal serrations or teeth 31 adapted to be engaged by corresponding external serrations 32 of the clutch member 33 fixed on the upper squared end 34 of the spindle 8 by means of a suitable washer 35 overlying the end of the spindle and said clutch member and held in place by a clamp-screw 36, threaded into the end of the spindle. The ball 12 is held in its lowermost position in which the clutch members are in engagement by means of an expansive coil spring 37 surrounding the end of the spindle 8 in the counter-bore of the ball 12 with its opposite ends engaging the clutch member 33 and the bottom of the counter-bore respectively. The upper end of the

ball is closed by a cap ball preferably consisting of a ring 38 threaded in the ball to engage the washer around the screw head and a porcelain plug 39 bearing the inscription "Hot" or "Cold" as the case may be, the plug being held in place by a clamping ring 40 working on a thread cut on a flange 41 at the top of the ball.

The operation of the construction to adjust the handle relative to the spindle will be obvious from the above description. The spring 37 normally holds the parts locked, but they may be released by a simple upward movement of the ball 12 on the spindle 8 against the force of the spring. When so released the handle may be turned relative to the spindle until the desired position is reached, when the spring will again lock the parts together when the handle is released. As the valve washer 23 wears gradually away the lever handle must be adjusted slightly from time to time to maintain it always in proper symmetrical position with regard to the basin and also so that the inscriptions on the plug 39 will be positioned correctly.

By my improved valve construction I am able to use an operating thread of usually abrupt pitch thereby allowing the full opening of the valve with a very slight movement of the lever handle for the reason that the valve is arranged to work against the pressure side of the diaphragm so that its closing is aided by the pressure of the water, hence the higher the pressure, the greater will be the compression of the washer through the same force applied to the operating handle.

My improved construction permits a much larger valve to be used for the same size casing for the reason that the valve is inserted through the bottom opening of the casing instead of through the top opening, as must be the case when the valve closes down against the pressure. The construction also permits of the ready detachment of the valve for renewing the washer, the operation being to simply remove the cap 21 and then rotate the spindle so that the plug 25 will be screwed off the end of the spindle and drop through the bottom opening. When the valve is replaced, the spindle is screwed into the plug until the valve is closed and then the lever handle is adjusted in the manner described above to give it its proper position.

In Figs. 5, 6 and 7 I have shown a bath valve containing a modified construction in which the clutch connection to permit the adjustment of the lever handle is arranged in the casing instead of in the ball or head of the lever handle. In this construction the lever handle 42 is rigidly attached in the usual manner to the upper portion 43 of the spindle which in this form of device is con-

constructed of two pieces in longitudinal alignment with each other. The lower end of the upper part 43 terminates in a cup 44 having internal teeth 45 cooperating with the external teeth 46 of the clutch member 47 formed on the upper end of the lower part 43^a of the spindle which is provided with the operating thread 48 for opening and closing the valve. The spindle part 43^a is held against longitudinal movement by means of a sleeve 49 resting at its lower end on a collar 50 formed on the spindle beneath the clutch member, the sleeve being threaded at its upper end as at 51 into the upper cap 52 which is also threaded on the upper end of the casing 1^a. The two clutch members are held in operative engagement by means of a spring 53 working between the upper face of the cup 44 and the inner shoulder 54 of the cap 52, the length of the spring being sufficient to permit the clutch to be disengaged by lifting the spindle 43 through the medium of the lever handle 42.

The valve shown in Fig. 5 is provided with inlet and outlet nipple projections 55 and 56 respectively, which are arranged one above the other and separated by a diaphragm 57 having a valve seat 58 on its lower face for the valve 59. The plug or coupling 60 which is threaded on the spindle 43^a is guided in the wall of the casing by inter-engaging ribs 61 and grooves 62, respectively, as shown in Fig. 7. The valve 59 is also guided at its lower end by a stem 63 working in a central seat 64 in the cap 65 which closes the large opening in the lower end of the casing. The stem 63 works loosely in its seat 64 to give a dash-pot effect to cushion the action of the valve.

The operation of the modified form of construction is the same in all respects as the preferred form. The valve and plug may be removed for renewing the washer by taking out the cap 65, and turning the handle to disconnect the plug and spindle, while the entire upper mechanism may be removed from the casing by detaching the cap 52 and thereby allowing the lower spindle 43^a to be lifted off its seat.

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

1. In a valve mechanism, the combination of a spindle for opening and closing the valve, an operating handle therefor, devices connected to said spindle and said handle respectively, for locking them together in various positions of angular adjustment, and means for holding such devices in operative engagement, such means being operable by a movement of the handle to release said devices.

2. In a valve mechanism, the combination of a spindle for opening and closing the valve, an operating handle therefor, devices

connected to said spindle and said handle respectively, for locking them together in various positions of angular adjustment, and a spring for holding such devices in operative engagement, such spring being operable by a movement of the handle to release said devices.

3. In a valve mechanism, the combination of a spindle for opening and closing the valve, an operating handle therefor a clutch member on said spindle, a cooperating clutch member connected to said handle, said clutch members being designed to be released by relative axial movement and a spring for yieldingly holding said members in engagement and resisting such relative axial movement as effects their disengagement.

4. In a valve mechanism, the combination of a spindle for opening and closing the valve, an operating handle therefor, cooperating clutch members connected to said spindle and handle respectively, said members comprising concentric interlocking parts, and a spring for yieldingly holding said members in engagement and resisting such relative axial movement as effects their disengagement.

5. In a valve mechanism, the combination of a spindle for opening and closing the valve, an operating handle therefor, cooperating clutch members connected to said spindle and handle respectively, said members comprising concentric serrated members adapted to interlock in various positions of relative angular adjustment, and a spring yieldingly holding said members in engagement.

6. In a valve mechanism, the combination of a spindle for opening and closing the valve, and having a clutch member, a handle having a part surrounding the spindle and movable longitudinally thereof and having a clutch member adapted to be engaged with and disengaged from the clutch on said spindle by said longitudinal movement, and a spring for holding said clutch members in engagement.

7. In a valve mechanism, the combination of a spindle for opening and closing the valve, and having a clutch member, a handle having a part surrounding the spindle and movable longitudinally thereof, and having a clutch member adapted to be engaged with and disengaged from the clutch on said spindle by said longitudinal movement, and a spring to maintain said clutch members in operative engagement, but permitting relative longitudinal movement between the handle and the spindle to effect the disengagement of the clutch members.

8. In a valve mechanism, the combination of a spindle for opening and closing the valve, and having a clutch member, an operating handle having a part surrounding the spindle and movable longitudinally

thereof, and having a clutch member adapted to be engaged with and disengaged from the clutch member on the spindle by said longitudinal movement, a spring surrounding the spindle and housed within said part and exerting its force to maintain said clutch members in clutching relation.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS M. HOOPER.

Witnesses:

JOHN C. DILLON, Jr.,
GEORGE E. DOUTH.