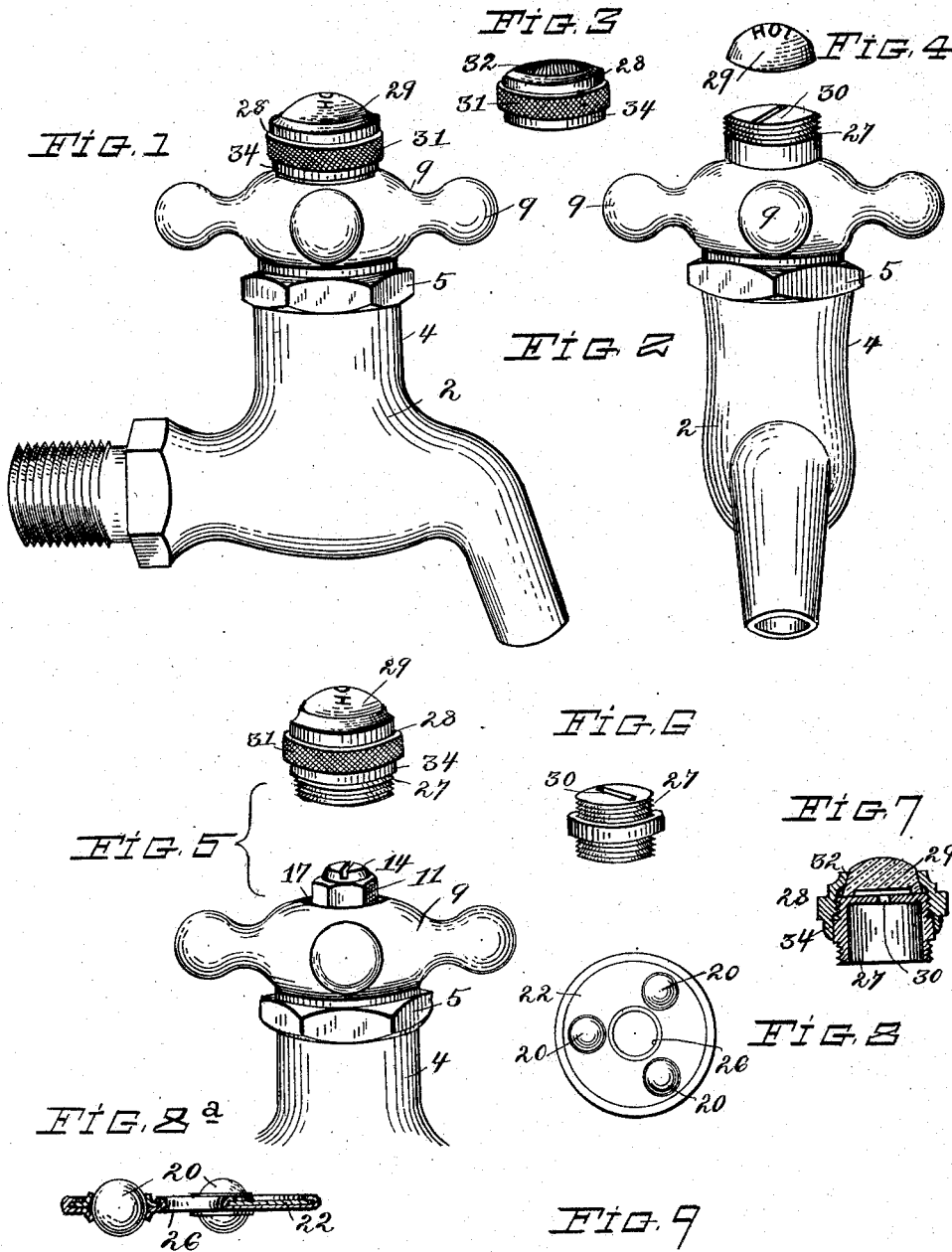


J. H. GLAUBER.
SELF CLOSING FAUCET.
APPLICATION FILED JAN. 12, 1911.

1,015,310.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 1.



Witnesses.
Em Fisher.
H. C. Mussun.

Inventor
JOSEPH H. GLAUBER
Fisher & Mussun

Attorneys.

J. H. GLAUBER.
SELF CLOSING FAUCET,
APPLICATION FILED JAN. 12, 1911.

1,015,310.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 2.

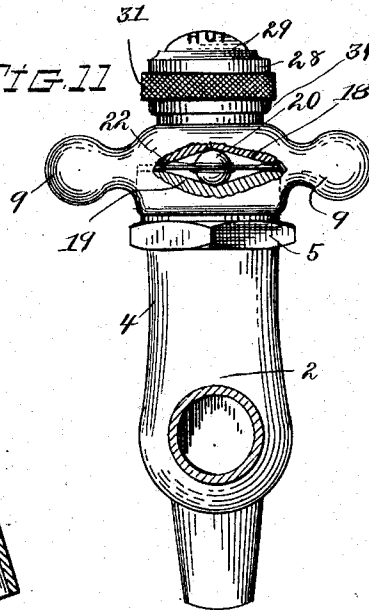
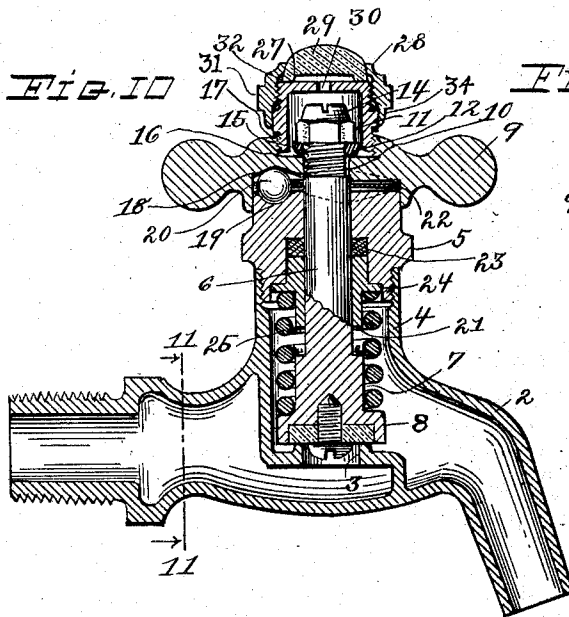


FIG. 13

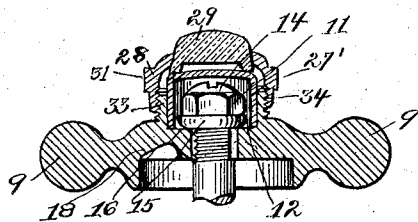
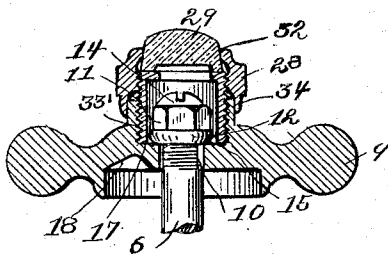
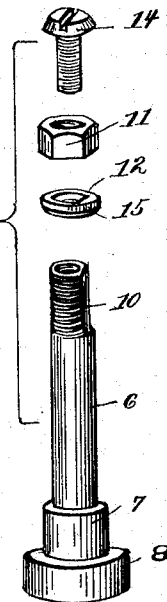


FIG. 14

FIG. 12



Witnesses.
E. M. Fisher.
J. Q. Museum.

Inventor
JOSEPH H. GLAUBER
by Fisher & Museum
Attorneys.

UNITED STATES PATENT OFFICE

JOSEPH H. GLAUBER, OF CLEVELAND, OHIO.

SELF-CLOSING FAUCET.

1,015,310.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed January 12, 1911. Serial No. 602,167.

To all whom it may concern:

Be it known that I, JOSEPH H. GLAUBER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Self-Closing Faucets, of which the following is a specification.

My invention appertains to improvements in self-closing faucets, and the improvement comprises the construction and arrangement of parts substantially as herein shown and described and more particularly pointed out in the claims.

The general object is to provide a faucet which is self-closing—one that can only be held open under hand control, and which will open by a turn of the handle either to the right or the left within limits. Closing is effected by a coiled spring, and opening is obtained by a series of balls confined within pockets having reversely inclined surfaces formed within the usual handle and nut at the top of the faucet. These features of construction are broadly old and very common in this type of faucet, but in order to overcome certain objections and disadvantages residing therein I have particularly provided a disk-shaped ball carrier and separator of relatively thin metal which positively causes a uniform and joint riding of the balls between the respective inclines, and being thin requires a minimum of space in its working relations between the handle and nut. In fact, one object in view is to make the faucet compact and as low in height as possible, and by making the ball-carrier and separator in a disk form and of relatively thin material, no additional room is required between the handle and the nut on the body of the faucet.

Another object is embodied in the screw cap and index holder, which parts have the double function of concealing the locking parts for the stem at the top of the handle and of independently fastening the index button removably in place. As constructed, the index button may be separately removed without uncovering the top interior of the handle, or jointly removed with the cap which conceals the top of the stem.

My improved construction also provides a simple form of stop-sleeve to positively limit the turn of the handle in either di-

rection and to centrally support the coiled spring. Moreover, an anti-friction member is provided for the valve stem to produce up-lift thereof without twisting or rotating the stem and valve upon turn of the handle, and which member prevents bind and is conducive of easier operation of the handle.

Other objects are also embodied in other details of construction, all as hereinafter more particularly pointed out.

In the accompanying drawings, Figure 1 is a perspective view of my improved faucet completely assembled, and Fig. 2 is a front view in perspective thereof with the index ring and index button removed. Fig. 3 represents the index ring, and Fig. 4 the index button. Fig. 5 is a perspective view of the top portion of a faucet, showing a handle with the nut and screw exposed which fastens the handle in place upon the valve stem,—the index button and cap being removed and shown above and forming a part of this figure. Fig. 6 is a perspective view of the screw cap alone, and Fig. 7 a sectional view of the index button, ring and cap assembled. Fig. 8 is a plan view of the ball carrier and separator, Fig. 8^a is an enlarged section thereof, and Fig. 9 is a plan view of the nut having the reversely inclined pockets for the balls. Fig. 10 is a vertical section longitudinally of the faucet, with the valve stem and its lock nut and screw at the top in elevation. Fig. 11 is a cross section of the faucet on line 11—11, Fig. 10, and showing the handle and nut broken away to disclose the ball carrier and separator with one ball pocketed between the inclines. Fig. 12 is a perspective view of the valve stem with its anti-friction member, lock nut, and locking screw removed therefrom and shown separately above the same. Fig. 13 is a sectional view of a modified form of handle and index holder, and Fig. 14 is a similar view of a further modification.

As shown, body 2 of the faucet is merely illustrative of one type in which my improvement may be embodied, and comprises the usual valve seat 3 therein in line with tubular neck 4 which carries screw nut 5. A round valve stem 6 having an annular enlargement 7 and a valve head 8 extends centrally through nut 5 and also through handle 9, and is threaded at its exposed end. However, a segmental portion of the stem is removed to provide a flat face 10. The

end of the stem is threaded to secure a lock-nut 11 adjustably thereon, and flat side 10 is utilized to secure an anti-friction member 12 against independent rotation upon the stem beneath lock-nut 11. To further this purpose said member has a D shaped opening therein which is not threaded, thereby permitting axial movement thereof in setting and securing the parts together. Further fixed relation of the parts, particularly nut 11, is assured by a headed screw 14 which is adapted to screw into the end of stem 6, the pitch of thread of the screw being less than the external thread on the stem to assure permanent locking. It will also be noted that member 12 is rounded at its bottom edge 15, thereby reducing its bearing surface to a minimum where seated upon the flat bottom 16 of recess 17 within the top portion of handle 9. This is of advantage in eliminating friction when uplift of stem 6 is obtained by a rotative movement of handle 9 in either direction, and the elimination of friction not only makes the operation of the handle easy and aids self-return but also prevents a twist or rotative movement from being imparted to stem 6. It will also be understood that uplift of stem 6 is brought about by the reversely inclined grooves 18 and 19, within the bottom and top of handle 9 and nut 5, respectively, and by balls 20 confined in the pockets produced by these oppositely related parts. Thus, when handle 9 is rotated, it will ride upwardly upon the balls, which latter in turn ride also upwardly on inclines 19. If not checked, the balls will be carried forward into the next adjacent pocket and the valve will suddenly close itself, which obviously would be a great objection; and moreover, if the balls do not travel uniformly and jointly over like distances, there is always danger of one or more of them overriding into adjacent pockets to the detriment of operations. When this occurs, say if one ball only over-rides, the parts become jammed and inoperative. If force is now applied to turn the handle the seat or balls may be crushed or the faucet otherwise impaired. These objectionable results are more apt to occur after wear takes place or if the parts become loose or changed from their original setting. This possible contingency is generally understood and the parts are usually constructed to avoid troubles of this sort when the faucets are first produced, but positive means are not always originally provided to prevent occurrences of this kind after the faucet has been used and worn and when the play between the parts has become excessive. Therefore, in the first instance, I have provided a fixed and positive stop sleeve 21 at the bottom of nut 5 to limit the upward movement of stem 6 by engagement with

enlargement 7, and in the second instance, I have provided a disk-shaped carrier and separator 22 for balls 20 to compel a uniform travel regardless of wear. Stop sleeve 21 also serves to hold a packing gland 23 in place within nut 5 and a flange 24 on said sleeve rests against the bottom of the nut and provides a fixed seat for coil spring 25 which encircles enlargement 7 on stem 6 and bears constantly down upon head 8 to effect self-closing thereof. The degree of axial movement of stem 6 is fixed and determined by the amount of play between the bottom of sleeve 21 and the shoulder formed by the difference in diameters of the stem and its enlargement 7. Sleeve 21 and enlargement 7 are of the same diameter to hold spring 25 central and prevent tilting and buckling, particularly opposite the gap where stop engagement is obtained.

Now referring to ball carrier and separator 22, this device is preferably made of two thin superimposed layers of light sheet metal suitably secured together and slightly cupped in a plurality of places for the balls. These balls are thus spaced at equal distances radially about a central opening 26 and are bodily removed with the carrier, being permanently confined therein for all practical purposes, although the balls may be removed and replaced by pressure from either side—there being sufficient spring to the cupped edges to permit this to be done. This is of advantage in making repairs. In general the balls and carrier are jointly removable and replaceable to facilitate assembling and prevent loss of the balls, but in operation and when in its proper place in the faucet, the disk part 22 is actually supported by the balls and is lifted bodily to different planes as the balls ride up their respective inclines. Therefore this device is not strictly a carrier but more like a connecting collar for the balls, with which a uniform rotary travel of the balls about the stem is certain to occur when handle 9 is rotated, and if irregularities or unevenness in the opposed inclines should be met with in any given faucet, no unequal travel of the balls will result to cause a possible bind or check between the working parts, particularly upon a return or self-closing movement of the valve. Thus, even if a perfect fitting and uniform riding of all the balls is not obtained when the parts are first assembled—due to slight imperfections or irregular shrinkage in the castings, the subsequent wear will bring about a truing up of all the parts and the balls will soon ride evenly over the inclines at equidistant radial lines from the beginning to the end of their travel. This obviously is to the benefit of the faucet after its installation.

When the faucet is assembled or taken apart, access to lock-nut 11 and screw 14 is

necessary. If exposed, however, these parts are objectionable, both from the standpoint of appearance and for sanitary reasons. Therefore, I provide a suitable covering for the upper end of stem 6, and this covering rotates with handle 9, and is constructed of three separate and separable pieces comprising a cap 27, a screw ring 28, and an index button 29, the latter of porcelain usually, although not necessarily. Cap 27 may either be screw threaded or plain, and the first construction named is shown in Figs. 1 to 13, whereas the plain form 27' is disclosed in Fig. 14. In any event the cap becomes a seat or rest for index button 29 whenever a button is used. If the button is dispensed with a closed screw cover is substituted for ring 28 and cap 27.

In its threaded form cap 27 is adapted to screw into the top of handle 9 to encircle and cover nut 11 and screw 14, and has a narrow slot 30 in or through its flat top to introduce a suitable tool such as a screw-driver to screw or unscrew the same, either from above when index button 29 is removed as in Fig. 2, or from below when the index button is in place and the cap removed from handle 9, as in Figs. 5 and 7. Screw ring 28 is secured upon cap 27 by thumb engagement with knurled band 31 midway about the same, and has a flaring opening 32 conforming to the tapering walls of button 29 to lock the same immovably upon the top portion of cap 27. In Figs. 1 to 13, this locking of the button upon cap 27 is independent of handle 9, but in Fig. 14, screw ring 28 has screw engagement with a threaded flange 33 integral with handle 9 to fasten button 29 upon cap 27 and said cap in turn upon handle 9.

As shown in Figs. 1 to 11, cap 27 has a plain annular band between its threaded ends, and screw ring 28 has a skirting 34 to snugly fit about said band—the object being to make as close a joint as possible to prevent fouling and also to make a neat appearing joint. Skirting 34 in Fig. 13 is also placed on this screw ring 28 for the same reason, but in this instance said skirting encircles a flange 33' on the handle. Differences in shape or height of different buttons 29 make it quite necessary for screw ring 28 to have an independent play or adjustment in respect to cap 27 or handle 9, and the skirting allows this without leaving an unsightly gap for the accumulation of dirt.

Other locking means than nut 11 and screw 14 may be employed to seat and fix anti-friction member 12 upon stem 6, but this form is preferred on account of its simplicity and convenient manipulation by common tools.

What I claim is:

1. A self-closing faucet comprising a body having a valve-seat and a valve therefor

having a screw-threaded stem, a spring, an anti-friction member having slidable interlocking engagement with the screw-threaded end of said stem and having a rounded bottom, means to removably secure said member on said stem, a rotatable handle having a bearing surface for said anti-friction member, and means to cause up-lift of said valve stem upon rotation of said handle.

2. A self-closing faucet comprising a body having a valve-seat and a valve therefor having a stem, a spring, an anti-friction member axially adjustable without rotation on said stem and having a rounded bottom, means to removably secure said member in adjusted position on said stem, a rotatable handle having a bearing surface for said anti-friction member, a screw cap detachably secured upon the top of said handle to inclose said stem and parts thereon, and means to cause up-lift of said valve stem upon rotation of said handle.

3. In a self-closing faucet, a valve stem having a threaded end of substantially D shape in cross section, an anti-friction member having a rounded face and a central opening of substantially D shape, and means to adjustably fix said member in set position upon said stem, in combination with a handle having a recessed seat for said member and provided with means adapted to co-act therewith to raise said valve stem upon rotation of said handle.

4. In a self-closing faucet, a valve stem having a screw threaded end of segmental formation, a lift member for said stem sleeved upon said stem end and having a rounded bottom, a nut to adjustably fix said lift member in place upon said stem, and a locking device for said nut, in combination with a recessed handle to seat said lift member, a spring to depress said valve stem, and a series of balls and reversely inclined rests therefor and for said handle to cause uplift of said stem when the handle is rotated.

5. A self-closing faucet comprising a body having a valve-seat, a valve stem having a valve head and an annular enlargement above said head to centrally seat a spring and provide a stop shoulder on said stem, a screw-nut on said body to support said valve stem and provided with reversely inclined ball seats, balls for said seats, a rotatable lift handle for said stem seated upon said balls, a stop sleeve of the same diameter as said enlargement adapted to seat against the bottom of said nut and having its lower end spaced apart from the upper portion of said annular enlargement relatively less than the plane of uplift of travel of said balls up the said inclines, and a spring mounted upon said sleeve and valve stem enlargement.

6. In a self-closing faucet, a valve stem, a spring, and a rotatable handle having lift engagement with said stem and provided at

its bottom with reversely inclined ball seats, in combination with the valve body having a nut provided with reversely inclined ball seats, a series of balls for said seats, and a thin flat disk having cupped portions radially thereof for the balls to bodily carry said disk with and by the balls to different elevations while separating the balls in their travel.

7. In a self-closing faucet, a valve stem, a spring, and a rotatable handle having lift engagement with said stem and provided at its bottom with inclined ball seats, in combination with the valve body having a nut provided with inclined ball seats, a series of balls for said seats, and a thin spring-metal member having cupped edges to removably hold the balls.

8. In a self-closing faucet, a valve having a stem and a spring to effect self-closing thereof, a rotatable handle having a recessed bottom provided with a series of inclined planes radially thereof, and an anti-friction bearing member upon said stem engaged with said handle, in combination with a nut for said faucet having an opening for the valve stem and provided with inclined planes at its top, balls between said handle and nut, and a ball separator having an opening centrally for said stem, said separator being relatively thin and comprising two parts to confine the balls and movable with the balls to different planes upon rotation and uplift of the handle.

9. In a self-closing faucet, a rotatable handle having a central opening and a vertically movable valve stem projected through said opening and having fastening means to hold said parts in working relation, in combination with an inclosing cap for the top of said handle having an index button, and a removable screw ring to detachably secure said button upon said cap.

10. In a self-closing faucet, a valve stem, a handle having a recess in its top and an

opening centrally therein to receive said valve stem, and means confined within said recess to secure said stem and handle in working relations, in combination with a separate index button, cap, and screw ring removably mounted upon said handle to cover and protect the interior working parts.

11. In a self-closing faucet, a valve stem, a rotatable handle, and means to unite said stem and handle, in combination with a screw cap removably secured upon said handle to cover said uniting means, an index button seated upon said cap, and a separate screw ring to removably secure said button in place.

12. In a self-closing faucet, a valve-stem, a rotatable handle separably engaged with said stem, a screw cap removably secured upon the top of said handle, an index button, and a screw ring for said button removably mounted upon said cap.

13. In a self-closing faucet, a handle, a stem, and means to secure said handle and stem together, in combination with a removable cap for said handle having a slot within its top and provided with screw threads at its opposite ends, an index button seated upon said cap and covering said slot, and a screw ring to removably secure said button upon said cap.

14. In a self-closing faucet, a valve stem, a rotatable handle and means at the top of said handle to separably fasten said stem and handle, in combination with a removable index button, a removable seat for said button, and a screw ring having a skirting at its lower edge and adapted to fasten said button upon said handle to cover and protect the fastening means for the stem and handle.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH H. GLAUBER.

Witnesses:

R. B. MOSER,
E. M. FISHER.