May 1, 1923.

1,453,895

C. K. SWIFT

STOPCOCK REMOVER

Filed Dec. 22, 1921

Fig. 1.

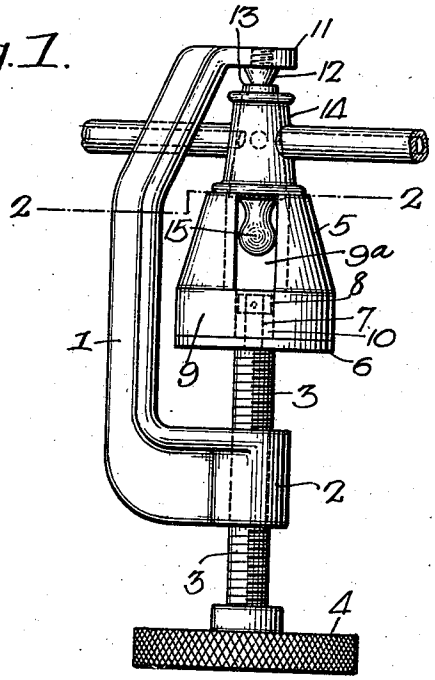


Fig. 2.

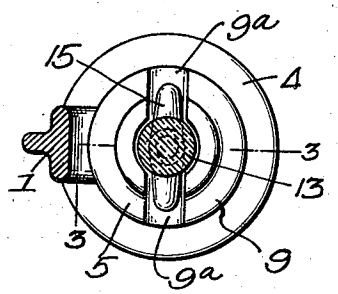
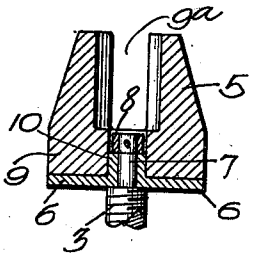


Fig. 3.



Inventor-
Clement K. Swift.
by his Attorneys.—
Howson & Howson

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UNITED STATES PATENT OFFICE.

CLEMENT K. SWIFT, OF HIGHLAND PARK, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO MILTON I. HARTMAN AND ANDREW HARTMAN, BOTH OF PHILADELPHIA, PENNSYLVANIA, TRADING AS H. S. LABORATORY.

STOPCOCK REMOVER.

Application filed December 22, 1921. Serial No. 524,173.

To all whom it may concern:

Be it known that I, CLEMENT K. SWIFT, a citizen of the United States, residing in Highland Park, Pennsylvania, have invented a Stopcock Remover, of which the following is a specification.

My invention relates to devices for releasing the plugs of glass stop cocks or valves of the type employed with chemical apparatus; though it may find application to the release of the plugs of other valves or cocks, and of the stoppers of bottles or other containers.

Those acquainted with the art are well aware of the difficulty often experienced in removing or loosening the plugs of glass stop cocks after they become "set" or "frozen" in the body, as is their tendency.

It is common practice in such cases, where it is impossible to move the plug by turning or by tapping, to expand the body by application of heat and thereby release the plug. In the methods employed at the present time for releasing the plugs, there is, so far as I am aware, none which can surely be relied upon to release the plug without danger of breakage. A considerable breakage of this particular type of apparatus is experienced every year owing to the tendency of the plugs to become fast and to the difficulty of releasing them.

I have discovered means whereby these stop cocks when they become "frozen" may be released with practically no danger of breakage either of the plug or of the associated parts.

My invention will be more readily understood by reference to the attached drawings, in which:

Figure 1, is a side elevation of a device made in accordance with my invention illustrating the method of operation;

Fig. 2, is a section on the line 2—2, Fig. 1, and

Fig. 3, is a section on the line 3—3, Fig. 2.

The device comprises a substantially U-shaped body portion 1 having in the end of one of its arms 2 a threaded opening for the reception of a threaded stem 3, the latter having at its outer end a suitable handle or knob 4, by means of which it may be turned, and having at its other end a swivelly mounted head 5 so formed as to be capable of receiving the plug of a stop cock, as best shown in Fig. 1. The swivel mounting of this head is obtained in the present instance by means of a plate 6 mounted upon an unthreaded and reduced extension 7 of the stem 3, said plate 6 being held upon the extension 7 by means in the present instance of a collar or sleeve 8 pinned to the outer end of the extension. It will be noted that in the present instance that portion 9 of the head which is shaped to receive the plug of the stop cock is not integral with the plate 6, but is a separate piece detachably held to the said plate by reason of a side projection or hub 10 of the latter which enters a central aperture in the base of the portion 9. As clearly shown in the drawings, the portion 9 of the head has a slotted recess 9^a extending inwardly from the top, said slot being enlarged at the center to accommodate the enlarged usually conical portion of the plug. The recess 9^a thus in effect constitutes a pocket for the reception of the plug when it is forced from the body of the stop cock, the plug being retained therein and prevented from falling to the floor or other hard surface.

Since there is apt to be irregularities in the construction of the stop cocks in connection with which the device is to be used, and since among other of said irregularities the plane of the top of the body of the cock against which the head 5 bears, is apt to lie slightly off the normal to the longitudinal axis of the plug, it is desirable in order that the head may always lie flush against the top edge of the cock body to give the former a slight lateral play. This can be accomplished, as in the present instance, by making a slightly loose fit between the stem 3 and the threaded opening which it occupies, or in other suitable manner.

The arm 11 of the body portion 1 has thereon in alignment with the stem 3 an inward projection 12, said projection in the present instance being in the form of a plug screwed into the body 1. The projection 12 preferably is of wood or other comparatively soft material such as bakelite, as also is that portion of the head 5 which engages the parts of the stop cock. By making the portion 9 of the head detachable, it is possible to employ a number of these elements of different sizes to conform with different sized stop cocks.

The operation of the device is as follows: The device is applied to a stop cock, the plug of which it is desired to release, in the manner illustrated in Fig. 1, the projection 12 resting against the bottom of the plug 13 and the edges of the head 5 bearing against the top edge of the body 14 of the stop cock, the exposed or handle portion 15 of the plug lying within the slot in the said head. The stem 3 is now fed inwardly, whereby if the alignment is correct a straight axial pressure is placed upon the plug of the stop cock at its bottom tending to force it bodily outward from the body 14 to which it adheres. Application of pressure in this fashion continues until the plug is expelled from the body, the plug entering the recess in the head and being held therein by reason of the aforedescribed corresponding shapes of the plug and recess.

The device has been found in operation to be extremely effective and capable of use without endangering the apparatus.

Considerable modification of the device is possible with no departure from the essential features of the invention.

I claim:

1. In a device of the character described, the combination with two relatively movable elements, of a head secured to one of the elements and adapted to engage the body of a stop cock and to receive and retain the plug of the cock when the latter leaves the body, a member on the other element adapted to engage the base of said plug, and means for effecting a relative movement of the elements to create an axial pressure upon the plug tending to force it from the body.

2. In a device of the character described, the combination with a body member, having a portion adapted to engage the plug of a stop cock, of an element movably mounted in the body, a head swivelly secured to the element and adapted to engage the body of the stop cock, said head being formed to receive and retain the plug when the latter leaves the body, and means whereby the movable element may be shifted in the body to create an axial pressure upon the plug tending to force it from the body.

3. In a device for releasing the plugs from the bodies of stop cocks and the like, a body member, an element carried by the body adapted to engage the plug, an element carried by the body adapted to engage the body of the stop cock, means for affording a lateral play to the latter element, and means for effecting a relative movement of said elements to create an axial pressure upon the plug tending to force it from the cock body.

CLEMENT K. SWIFT.