

No. 657,571.

Patented Sept. 11, 1900.

G. H. F. SCHRADER.  
CAP FOR TIRE VALVES, &c.

(Application filed Apr. 25, 1898. Renewed May 5, 1900.)

(No Model.)

FIG. 1.

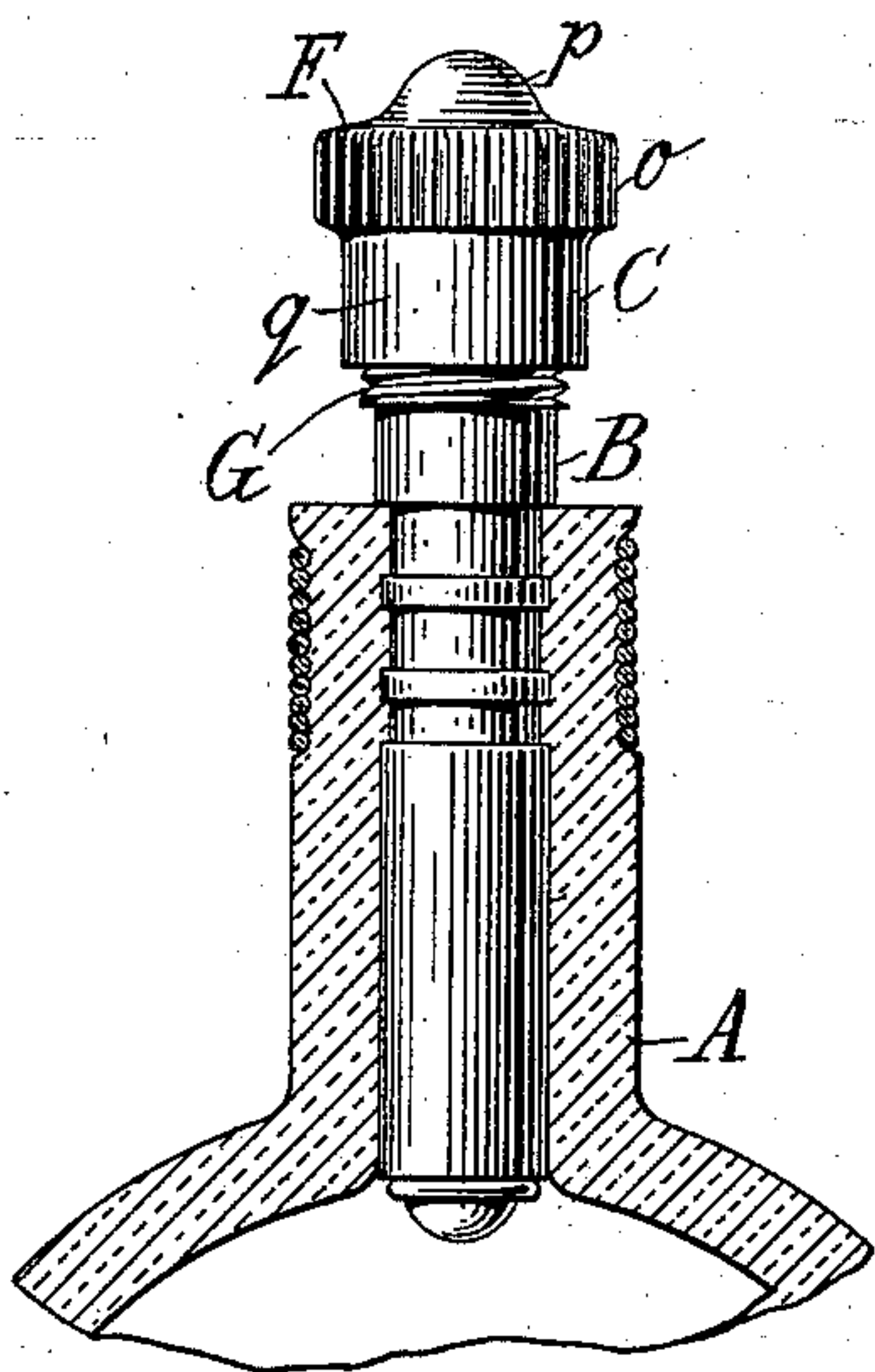


FIG. 2.

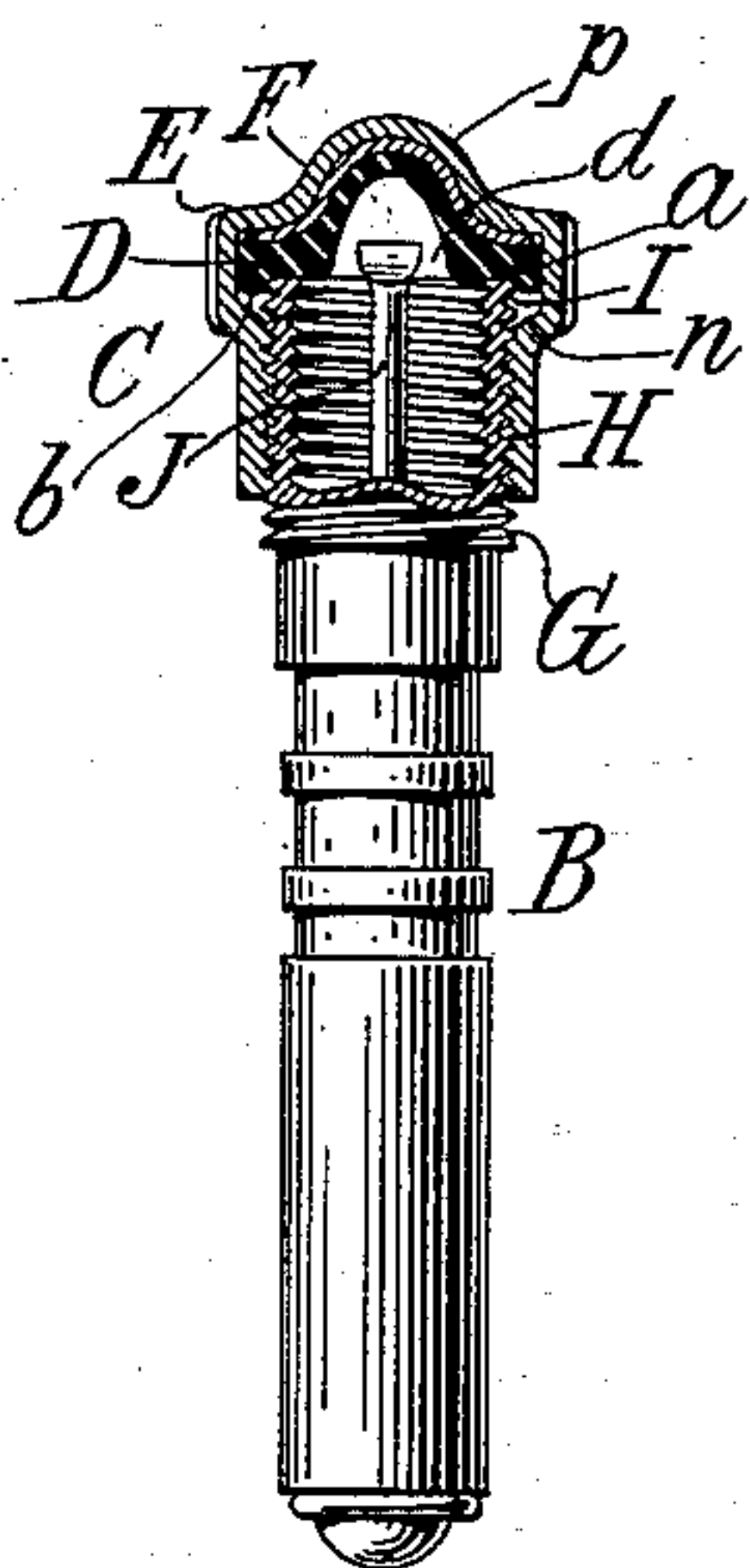


FIG. 3.

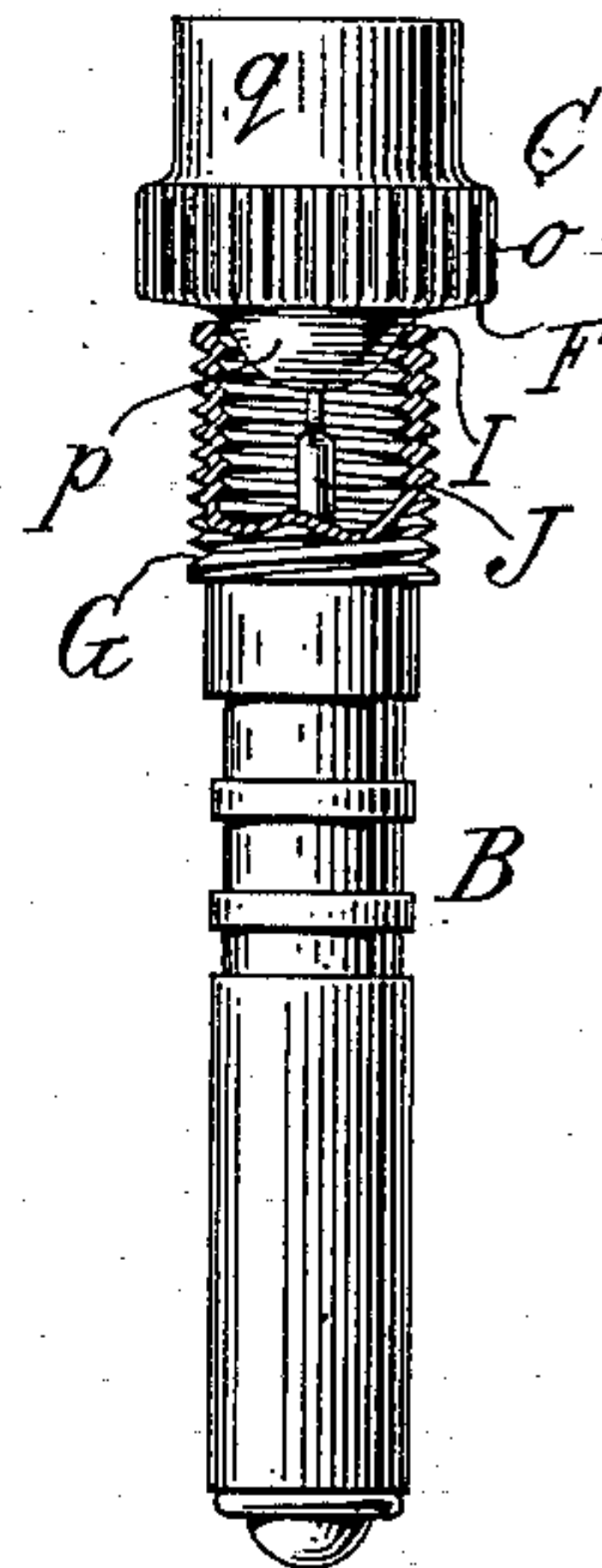


FIG. 4.

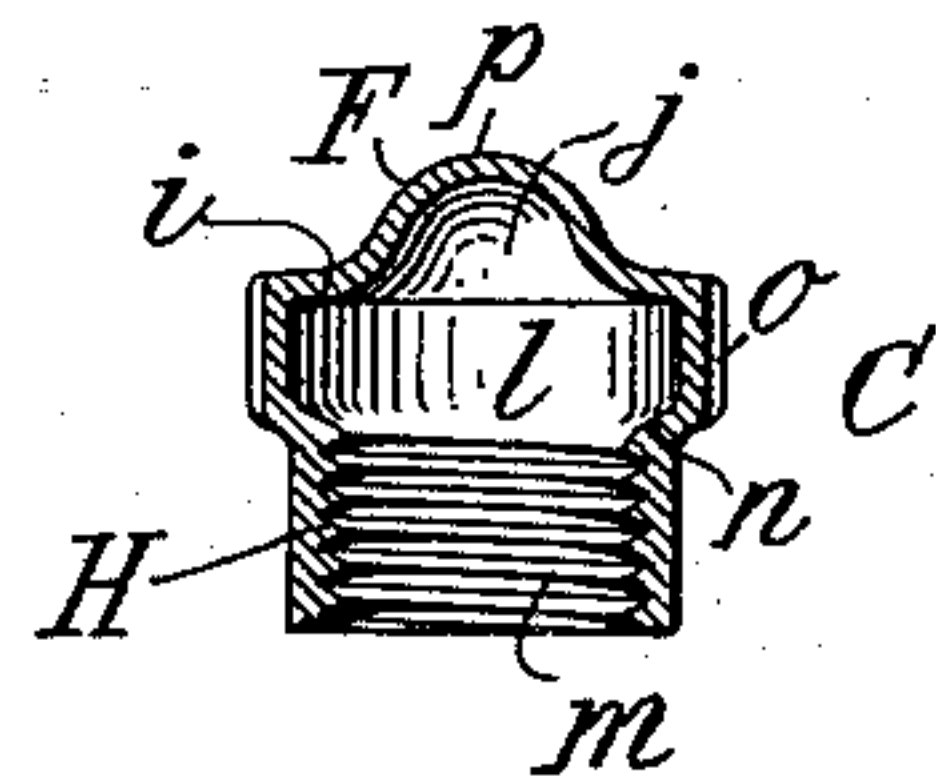


FIG. 8.

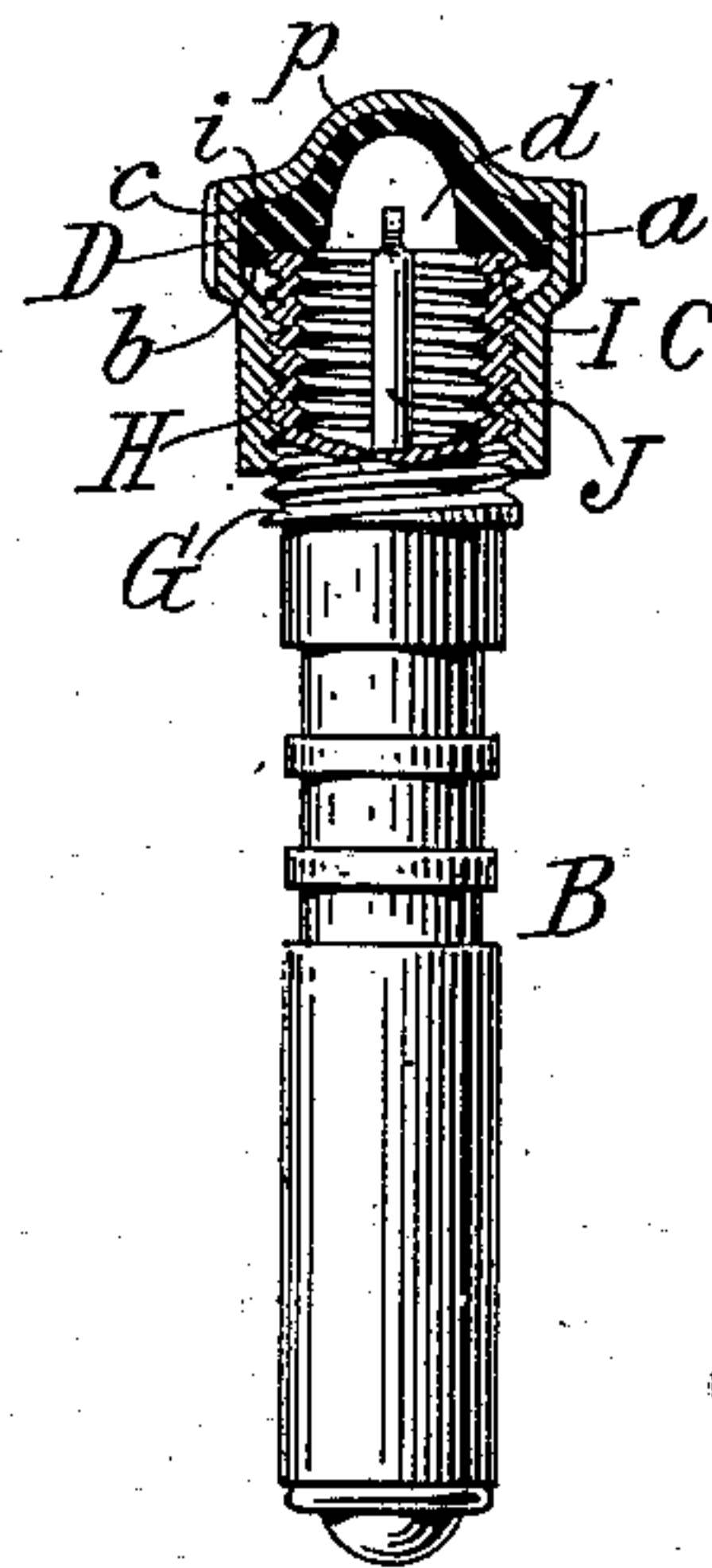


FIG. 7.

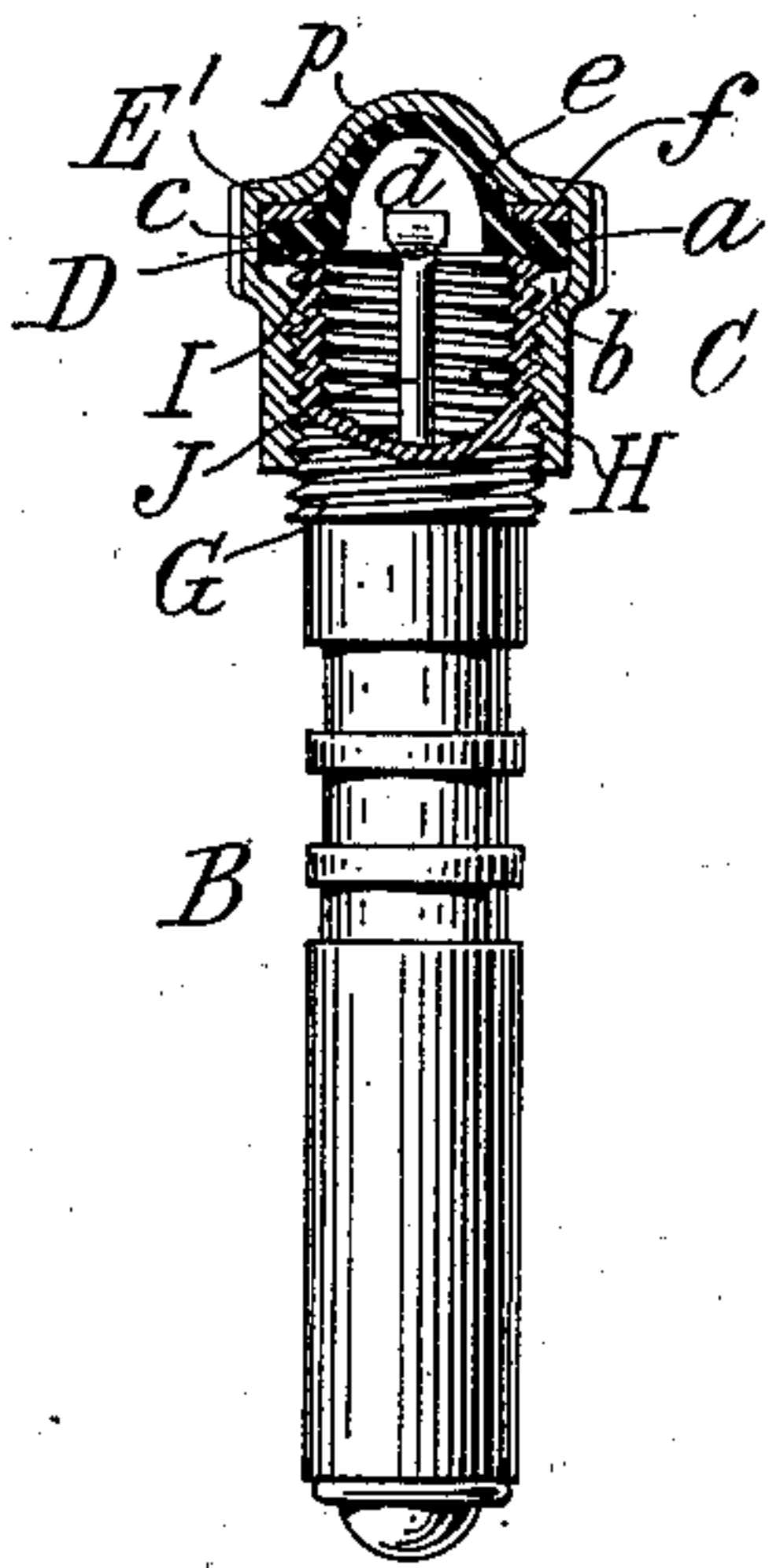


FIG. 5.

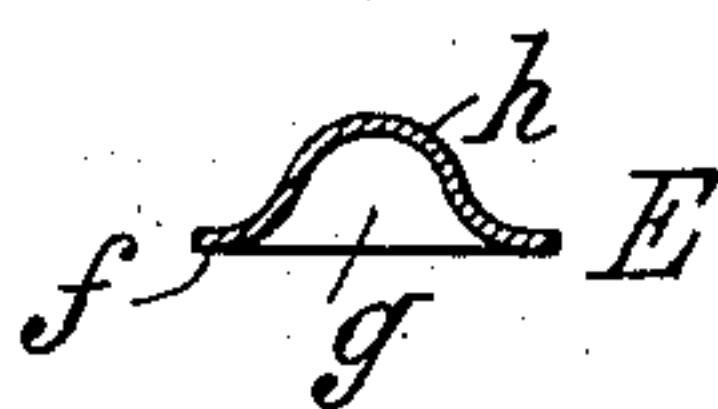


FIG. 6.



WITNESSES:

*Ed. White*  
*Thomas F. Wallaef*

INVENTOR:

*George H. F. Schrader*

By his Attorneys,

*Arthur C. Fraser & Co.*



# UNITED STATES PATENT OFFICE.

GEORGE H. F. SCHRADER, OF NEW YORK, N. Y.

## CAP FOR TIRE-VALVES, &c.

SPECIFICATION forming part of Letters Patent No. 657,571, dated September 11, 1900.

Application filed April 25, 1898. Renewed May 5, 1900. Serial No. 15,647. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. F. SCHRADER, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Caps for Tire-Valves and the Like, of which the following is a specification.

This invention relates to caps for tire and other valves, and aims to provide certain improvements therein.

Heretofore it has been common to construct tire-valves with a screw-threaded socket and an externally-screw-threaded end, providing a valve-stem projecting from the interior out into the socket and terminating some distance within the end thereof, which stem for deflating the valve could be pressed inwardly by inserting a special tool—as, for example, a deflating-tip formed on the head of a valve-cap. The cap has usually been an internally-screw-threaded cover adapted to screw over the end of the valve-shell and formed at its upper end with a flat top wall on which a flat metal disk was seated, below which disk a flat washer, of rubber or other packing material, has been located, the packing-washer being designed to press against the end of the valve-shell when the cap is screwed home to make a tight closure and the metal disk acting as a swivel or antifriction member between the packing-washer and cap to prevent twisting or distortion of the packing-washer during screwing on and off of the cap. It has been difficult to upset the end of the valve-stem, so that it would not fall into the valve-chamber, because as the end terminated within the socket a very small tool was necessary to grasp it therein. It has also been found that in time the end of the valve-shell has so cut into the packing-washer that when screwing the cap tightly home this washer has bulged into the socket sometimes a sufficient distance to strike the end of the valve-stem and unseat the valve. My invention aims to provide means whereby a valve-stem projecting beyond the valve-shell can be employed, means insuring against deflation of the valve by the packing-washer, and an improved construction of packing-washer, antifriction-disk, and cap. To this end in carrying out the preferred form of my invention I provide a packing-washer having a flat peripheral

flange or portion adapted to be clamped between the cap and valve-body and a deep concavity on its face opposite the valve-stem for receiving the latter if the stem projects beyond the valve-body, preferably bulging the washer outwardly, so that the center of its body is dome-shaped, and I provide an antifriction metal washer having an annular flat portion resting on the flange of the packing-washer and transmitting the pressure of the cap thereto and preferably having a dome-shaped central portion corresponding with the convex top of the washer, and I preferably construct the cap with an internally-concave top corresponding substantially in contour with the contour of the washer and ring.

In the accompanying drawings, which show certain adaptations of my invention, Figure 1 is a side elevation of a tire-valve provided with the preferred form of my present improvements, a fragment of the tire being shown in section. Fig. 2 is a fragmentary side elevation of such a valve, showing the upper end and the cap applied thereto in axial section. Fig. 3 is a side elevation, partly in axial section, of the valve, showing the cap removed and inverted for pressing the stem inwardly to deflate the valve. Figs. 4, 5, and 6 are respectively axial sections of the cap, the antifriction member, and the disk, respectively. Fig. 7 is a view corresponding to Fig. 2, showing a modification in which the antifriction member consists of an annular plate through the center of which the dome of the washer passes; and Fig. 8 is a similar view showing the use of the cap and packing-washer without the antifriction member.

Referring to the drawings, let A indicate a pneumatic tire or other vessel; B, a valve-shell applied thereto; C, a cap for the outer end of this shell; D, a packing-washer in the cap; E, an antifriction member above the packing-washer; F, the top of the cap; G, the external screw-thread on the shell; H, the internal thread on the cap; I, the outer end of the shell, and J the valve-stem. These parts may be of any suitable or general construction and operation, those shown being in their general features of ordinary construction.

According to one feature of my present improvements the packing-washer D is con-



constructed with a substantially-flat annular edge or seating-flange *a*, having wide flat top and bottom faces *c* and *b*, inwardly of which seating portion the under face of the washer is formed with a deep cavity *d*, preferably formed in a dome *e*, projecting upwardly from the top surface *c* of the washer. This washer is adapted to be sprung into the cap C and be held therein with its bottom face *b* opposed to the end I of the shell B and its concavity *d* opposite the end of the valve-stem J. The washer is clamped with a leak-tight joint against the valve-shell by pressure exerted on the top surface *c* of the washer with the screwing on of the cap.

According to another feature of improvement the antifriction member is provided with an annular bearing portion *f*, adapted to rest on the top *c* of the flange A of the washer, and with a recess *g* opposite the concavity *d* of the washer and preferably of suitable size to freely receive the dome *e* of the latter. The antifriction member is adapted to transmit the pressure of the cap to the flange *a* of the washer and permit rotation of the cap independently of the washer. In its preferred form the antifriction member consists of a plate or disk of sheet metal pressed or stamped into such form that its edge shall constitute an annular bearing portion and its center shall be of inverted-cup shape, so that on its under side it shall have the recess *g* and on its top it shall have a dome *h*.

According to another feature of improvement, the cap C is constructed with an annular bearing-face *i* around the edge of the inner side of its top F and with a concavity *j* inwardly of this bearing portion. The bearing portion and cavity are preferably of such contour that they will substantially fit the antifriction member E throughout its upper surface. The cap is preferably formed of a single piece of imperforate sheet metal spun, stamped, or pressed into a hollow cup having an internal washer-chamber *l* at top, to which the internally-screw-threaded socket *m* leads, a contraction or shoulder *n* between the socket and chamber serving to retain the packing-washer and the antifriction member in place when they are applied to the cap. In the construction shown the antifriction member is inserted in the cap and then expanded into its final shape therein, so that it overhangs the shoulder *n*, and the packing-washer is sprung through the socket *m* and allowed to expand in the chamber *l*, so that its edge overhangs the shoulder *n*. Externally the cap has a knurled or handle portion *o* between an upwardly-projecting dome *p* and the contracted and cylindrical lower part *q*.

In use the concavity *d* in the bottom of the washer D will permit projection of the outer end of the valve-stem J, when the valve is seated, to a point flush with or considerably beyond the outer end of the valve-shell, so that the end of the stem is in the position

where it can be flattened with any ordinary tool and where it can be reached by the finger for pressing it inward for deflation. The compression of the packing-washer to make a tight fit cannot bulge the washer inwardly against the stem. Consequently all danger of accidental deflation or unseating of the valve will be avoided. The pressure on the packing-washer being confined to the flange thereof avoids danger of impairment or puncture of the center or body portion thereof. In screwing on or off the cap it will turn on the antifriction member without distorting or impairing the washer.

The improved caps can be cheaply and easily made, and will be of great lightness and compactness. The improved packing-washer constitutes a new article of manufacture, which can be readily and advantageously applied to any suitable valve.

It will be seen that my invention provides improvements which can be readily and advantageously availed of, and it will be understood that the invention is not limited to the particular details of construction, arrangement, and combination set forth as constituting the preferred form of the invention, since it can be employed in whole or in part, according to such modifications as circumstances or the judgment of those skilled in the art may dictate, without departing from the spirit of the invention.

What I claim is—

1. In caps for tire and other valves, a cap adapted to screw over the end of a valve-shell, in combination with a packing-washer within the cap having an annular bearing-face for being clamped by the cap against the end of the valve-shell, and having a central recess inwardly of such face for receiving a valve-stem.

2. In caps for tire and other valves, an internally-threaded cap, in combination with a packing-washer therein having an annular outer bearing portion, and a hollow central dome.

3. In caps for tire and other valves, an internally-threaded cap and a packing-washer therein, in combination with an antifriction member within the cap between the latter and said washer, having an annular bearing portion engaging the edge of the washer for transmitting to such edge the pressure of the cap when it is screwed on a valve-shell and having a recess inwardly of such portion.

4. In tire and other valves, a valve-shell and a stem therein, in combination with a cap screwing over the end of such shell and having an annular bearing portion and a central cavity within its upper end opposite said stem, and a packing-washer carried by said cap and adapted to be pressed around its edge by the annular bearing portion thereof against the end of such shell.

5. In caps for tire and other valves, a hollow cap and a packing-washer therein, in combination with an antifriction member hav-



ing a smooth annular bearing portion surrounding its edge, and having a recess opposite the center of said washer, said antifric-  
tion member transmitting the pressure of the  
5 cap to the outer edge of the washer for forcing it against the end of a valve-shell.

6. In tire and other valves, a shell, and a projecting stem therein, in combination with a cap C consisting of a single imperforate  
10 piece of sheet metal bent into cup shape, and having the screw-threaded socket *m*, annular bearing *i*, and curved dome *j*.

7. The improved article of manufacture consisting of an antifriction member for tire-  
15 caps, having a smooth outer bearing edge *f*, a central recess *g* on its under face, and a curved dome *h* at its center on its upper face.

8. The improved article of manufacture consisting of a valve-shell, a stem projecting

therefrom, a cap screwing over the end of  
such shell, and a packing-washer in said cap, having an annular outer bearing portion adapted to be clamped against the end of  
such shell, and having a central recess oppo-  
25 site said stem.

9. The improved article of manufacture consisting of the packing-washer D having an outer annular bearing-flange *a*, a dome *e* on one side, and a central concavity *d* oppo-  
30 site said dome and on its flat side.

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

GEO. H. F. SCHRADER.

Witnesses:

GEORGE H. FRASER,  
FRED WHITE.