W. E. VOLLMER.

DUST CAP FOR VALVE STEMS.

APPLICATION FILED JAN. 20, 1920.

1,338,054. Patented Apr. 27, 1920.

Fig. 1

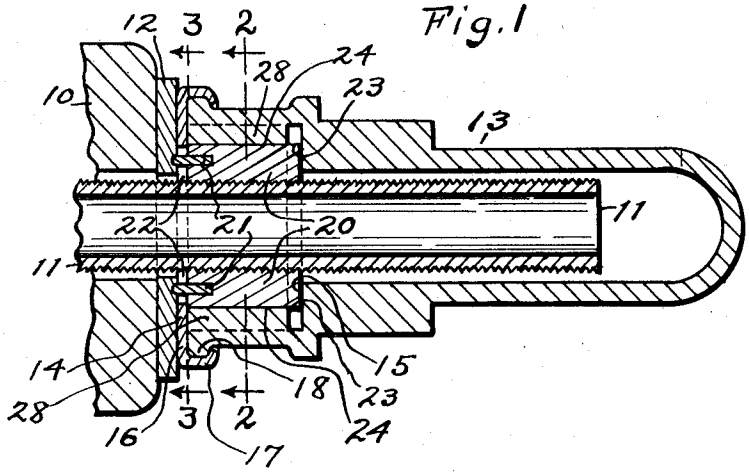


Fig. 2

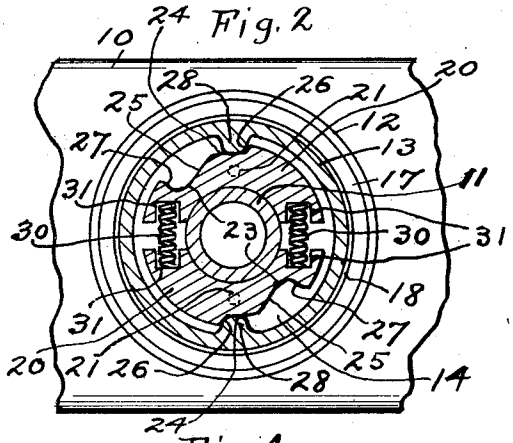


Fig. 3

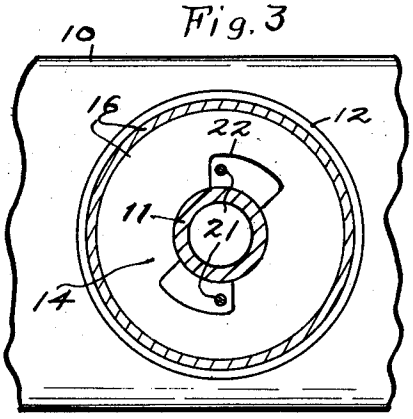
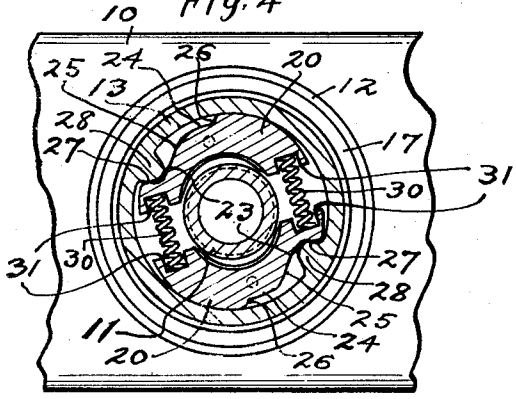


Fig. 4



Inventor.
Walter E. Vollmer

By Albert Dorer

His Attorney.

UNITED STATES PATENT OFFICE.

WALTER E. VOLLMER, OF SANDUSKY, OHIO.

DUST-CAP FOR VALVE-STEMS.

1,338,054. Specification of Letters Patent. Patented Apr. 27, 1920.

Application filed January 20, 1920. Serial No. 352,890.

To all whom it may concern:

Be it known that I, WALTER E. VOLLMER, a citizen of the United States, and residing at Sandusky, in the county of Erie and State of Ohio, have invented a new and useful Dust-Cap for Valve-Stems, of which the following is a specification.

This invention relates to improvements in dust-caps for valve-stems used in connection with pneumatic tires.

One object of this invention is to provide the dust-cap with improved means for facilitating removal of the cap from the valve-stem and its reattachment to the stem.

Another object is not only to have said means comprise a split nut composed of two sections embracing opposite sides respectively of the valve-stem and employed in securing the dust-cap in place, but to provide means for actuating the nut-sections radially outwardly, and also to have the nut-sections and the nut-surrounding portion of the aforesaid casing provided with simple and efficient means whereby the nut-sections are locked against radial outward movement and to necessitate only a partial rotation of said casing in the required direction to result in rendering said locking means inoperative.

Another object is to facilitate the assemblage of the component parts of my improved dust-cap, and to render the dust-cap simple and durable in construction.

With these objects in view, and to attain any other object hereinafter appearing, this invention consists in certain features of construction, and combinations and relative arrangements of parts, hereinafter described in this specification, pointed out in the claims, and illustrated in the accompanying drawings.

In said drawings, which are on an enlarged scale, Figure 1 is a central section of my improved dust-cap attached to a valve-stem and arranged at the outer face of a washer clamped by the dust-cap against the wheel-felly. Figs. 2 and 3 are transverse sections taken along the line 2—2 and line 3—3, respectively, Fig. 1, looking toward the felly. Fig. 4 is a transverse section showing the parts illustrated in Fig. 2, but in Fig. 4 the nut-sections and the nut-surrounding casing are shown relatively arranged as required to release the dust-cap from the valve-stem.

Referring to said drawings, 10 indicates a portion of the felly of a vehicle-wheel, and 11 indicates the tubular valve-stem applied to said felly in any approved manner and projecting from the felly. Said valve-stem is shown screw-threaded externally from within the felly to the outer or free extremity of the stem. A washer 12, of elastic and compressible material such, for instance, as leather, surrounds the valve-stem at the exterior of the felly and is interposed between the felly and the inner end of my improved dust-cap applied to said stem. Said dust-cap comprises a metal shell or casing 13 which (see Fig. 1) is arranged at and opposite the outer face of the washer 12 and forms a housing for and surrounds the valve-stem. Said casing is provided at its inner end with an inwardly projecting annular flange 14 arranged opposite said washer and surrounding the valve-stem. Said casing also has an internal shoulder 15 facing the flange 14 and spaced from said flange in the direction of the free extremity of the valve-stem. The flange 14 is preferably formed by the central portion of an annular sheet-metal disk 16 which forms the inner end face of my improved dust-cap and has its outer portion terminating in a marginal annular flange 17 tightly embracing an external annular flange 18 formed on the remainder or body of the casing so as to render said disk rigid with said body. The casing is large enough in internal diameter, between the flange 14 and the shoulder 15, to receive a split nut composed of two sections 20 embracing opposite sides respectively of the relatively stationary valve-stem and to permit radial movement of the nut-sections internally of the casing. My improved dust-cap is therefore provided internally of the casing (see Figs. 1 and 2), between said shoulder and said flange, with said nut which is threaded onto the valve-stem and clamps said flange and the washer 12 to the felly. Each nut-section 20 has a projecting member preferably formed by a pin 21 which is applied to and rendered rigid with the nut-section in any approved manner and movable with the nut-section, and said pin extends from the nut-section to and somewhat into the washer 12, as shown in Fig. 1. The pins 21 of the nut-sections project therefore into said washer, and the flange 14 is slotted or cut away, as

at 22, (see Figs. 1 and 3) to accommodate the location of said pins and to permit their movement with the nut-sections.

Each nut-section 20 is cut away or recessed, as at 23, at its outer circumference from end to end of the nut, and the bottom of the recess thus formed is contoured to form a shoulder 24 and incline 25 which form outer circumferential surfaces of the nut, and preferably said shoulder is formed at said circumference about midway circumferentially of the nut-section and faces radially outwardly. Said shoulder is shown substantially concentric relatively to the valve-stem. The incline 25 on each nut-section extends from the shoulder 24 of said nut-section circumferentially of and in the direction of the valve-stem. The shoulder 24 and incline 25 of each nut-section are arranged between two walls 26 and 27 of the recess in said nut-section, and said walls face circumferentially of the nut and respectively in the direction of the inner end and outer end of the incline 25 of said nut-section. The casing 13 is provided internally, at the recess 23 in each nut-section and opposite the shoulder 24 of said nut-section, with a rib or projection 28 which projects into said recess and is in contact with said shoulder and abuts against the adjacent wall 26 of said recess. The relative arrangement of the parts is such that the walls 26 of the recesses 23 and the projections 28 constitute means for preventing rotation of the nut independently of the casing in the direction required to loosen it in relation to the flange 14. The projections 28 are preferably rounded and extend longitudinally of the nut-surrounding portion of the casing 13 and are substantially parallel with the valve-stem. The shoulders 24 and the projections 28 constitute locking means whereby the nut-sections are locked against radial outward movement. The relative arrangement and dimensions of the parts are such that the nut is only in contact at the projections 28 with the nut-surrounding portion of the casing and spaced at its outer circumference, save at said projections, far enough from said portion of the casing to permit radial outward movement of the nut-sections out of engagement with the valve-stem during the required forcible rotation of the casing in the direction of the inner ends of the inclines 25 as required to loosen the dust-cap in relation to the washer 12 and wheel-felly and to remove the projections 28 from the shoulders 24 to and opposite the inner ends of said inclines and into contact with and against the walls 27 of the recesses 23. I would here remark, that, although the valve-stem is shown threaded to its free extremity, obviously only the nut-embraced portion of the stem requires to be threaded so far as concerns the operation of the nut. Preferably each nut-section 20 has two cavities 31 formed at opposite sides respectively of the valve-stem and registering with the corresponding cavities in the other nut-section, and helical springs 30 engage said cavities and, being under compression, act to move the nut-sections radially outwardly, so that when the locking means comprising the shoulders 24 and the projections 28 are rendered inoperative and the nut is loosened in relation to the flange 14 and washer 12 the nut-sections are shifted radially outwardly out of engagement with the valve-stem. It will be observed therefore that the relative arrangement and dimensions of the parts are such that in the radially outer position of the nut-sections the inner ends of the inclines 25 are opposite and engaged by the projections 28, as shown in Fig. 4, and that said projections abut against the walls 27 of the recesses 23, and that the dust-cap is free to be removed from the valve-stem. The dust-cap, upon slipping it onto said stem, is manually held with the pins 21 somewhat pressed against and slightly into the washer 12, and as said pins and said washer coöperate in holding the nut-sections stationary and as the casing is in position with its projections 28 engaging the inner ends of the inclines 25 as shown in Fig. 4, obviously only a partial rotation of the casing in the direction of the outer ends of said inclines is required to cause said projections 28 to actuate the nut-sections radially inwardly against the action of the springs 30 and into engagement with threads on the valve-stem. The continuance and completion of the last-mentioned partial rotation of the casing, after said projections 28 during said rotation of the casing have moved into contact with the walls 26 of the recesses 23, results in positively rotating the nut and the washer with the casing after the actuation of the nut-sections into engagement with threads on the valve-stem and in the direction required to result in clamping the flange 14 and the washer 12 to the wheel-felly. Of course, the slots 22 in the flange 14 have the dimensions and arrangement required to permit the hereinbefore mentioned rotation of the casing and nut and to permit the hereinbefore mentioned radial movement of the nut-sections.

What I claim is—

1. The combination, with a wheel-felly, an externally screw-threaded valve-stem projecting from the felly, and an elastic and compressible washer surrounding said stem at the exterior of the felly, of a casing arranged at the outer face of the washer and surrounding said stem and having an internal flange opposite the washer, a split nut surrounded by said casing and threaded onto

said stem and clamping the flange and the washer to the felly and comprising two sections which embrace opposite sides respectively of said stem and have members projecting into the washer, and means for actuating the nut-sections radially outwardly, the nut-sections and the nut-surrounding portion of the casing having means whereby the nut-sections are locked against radial outward movement, said locking means being adapted to be rendered inoperative by a partial rotation of the casing in the required direction, and the aforesaid flange being cut away to accommodate the location of the aforesaid projecting members of the nut-sections and to permit said rotation of the casing and movement of the nut-sections radially outwardly.

2. The combination, with a wheel-felly, an externally screw-threaded valve-stem projecting from the felly, and a washer surrounding said stem at the exterior of the felly, of a casing arranged at the outer face of the washer and surrounding said stem and having an internal flange opposite the washer, and a split nut surrounded by the casing and threaded onto said stem and clamping said flange and the washer to the felly and comprising two sections embracing opposite sides respectively of said stem, each nut-section having two cavities formed at opposite sides respectively of said stem and registering with the corresponding cavities in the other nut-section, and helical springs engaging the registering cavities and acting to move the nut-sections radially outwardly, the nut-sections and the casing having means whereby the nut-sections are locked against the action of said springs, and said locking means being adapted to be rendered inoperative.

3. The combination, with a wheel-felly, an externally screw-threaded valve-stem projecting from the felly, and a washer surrounding said stem at the exterior of the felly, of a casing arranged at the outer face of the washer and surrounding said stem and having an internal flange opposite the washer, a split nut surrounded by the casing and threaded onto said stem and clamping said flange and the washer to the felly and comprising two sections embracing opposite sides respectively of said stem, and means for moving the nut-sections radially outwardly, each nut-section having a radially outwardly facing shoulder and an incline extending from said shoulder circumferentially of and toward the valve-stem, the casing having internal projections in contact with the shoulders on the nut-sections, and the relative arrangement and dimensions of the parts being such that manipulation of the casing to remove said projections from said shoulders in the direction of the inner ends of the inclines on the nut-sections renders the nut-sections movable radially outwardly out of engagement with the valve-stem.

4. The combination, with a wheel-felly, an externally screw-threaded valve-stem projecting from the felly, and a washer surrounding said stem at the exterior of the felly, of a casing arranged at the outer face of the washer and surrounding said stem and having an internal flange opposite the washer, a split nut surrounded by the casing and threaded onto said stem and clamping said flange and the washer to the felly and comprising two sections which embrace opposite sides respectively of said stem and have pins projecting into the washer, and means for moving the nut-sections radially outwardly, each nut-section having a radially outwardly facing shoulder and an incline extending from said shoulder circumferentially of and toward the valve-stem, the casing having internal projections in contact with the shoulders on the nut-sections, the relative arrangement and dimensions of the parts being such that the casing is adapted to be manipulated to render the nut-sections movable radially outwardly out of engagement with the valve-stem, and the aforesaid flange being formed to accommodate the location of the aforesaid pins and to permit said manipulation of the casing and movements of the nut.

5. The combination, with a wheel-felly, an externally screw-threaded valve-stem projecting from the felly, and a washer surrounding said stem at the exterior of the felly, of a casing at the outer face of the washer and surrounding said stem and having an internal flange opposite the washer, a split nut surrounded by the casing and threaded onto said stem and clamping said flange and the washer to the felly and comprising two sections embracing opposite sides respectively of said stem, and resilient means acting to move the nut-sections radially outwardly, each nut-section having a radially outwardly facing external shoulder which is substantially concentric relatively to the valve-stem and also having an incline extending from said shoulder circumferentially of and toward said stem, the casing having ribs which are in contact with the shoulders on the nut-sections and substantially parallel with said stem, and the relative arrangement and dimensions of the parts being such that a partial rotation of the casing in the direction of the inner ends of the inclines on the nut-sections results in loosening the dust-cap in relation to the washer and in rendering the nut-sections movable by the resilient means out of engagement with the valve-stem.

6. The combination, with a wheel-felly,

an externally screw-threaded valve-stem projecting from the felly, and a washer surrounding said stem at the exterior of the felly, of a casing arranged at the outer face of the washer and surrounding said stem and having an internal flange opposite the washer, a split nut surrounded by the casing and threaded onto said stem and clamping said flange and the washer to the felly and comprising two sections which embrace opposite sides respectively of said stem, and means for moving the nut-sections radially outwardly, each nut-section having a recess which is formed at the outer circumference of the nut-section and has two walls spaced circumferentially of the nut-section and has its bottom contoured to form between said walls a radially outwardly facing shoulder and an incline extending from said shoulder circumferentially of and toward the valve-stem, the casing having projections in contact with the shoulders on the nut-sections, and the nut being spaced at its outer circumference, save at said projections, far enough from the nut-surrounding portion of the casing to permit radial outward movement of the nut-sections out of engagement with the valve-stem upon manipulating the casing to move said projections opposite the inner ends of the inclines on the nut-sections.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

WALTER E. VOLLMER.

Witnesses:
CHARLES W. GEASEW,
BASIL F. JOHNSON.