March 11, 1924. 1,486,448

O. A. NORLUND

LOCK HOUSING

Filed Oct. 14, 1922

Fig. 1

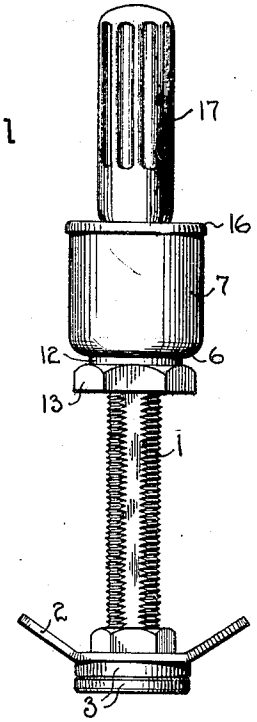



Fig. 2

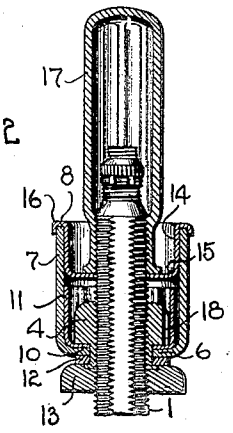



Fig. 3

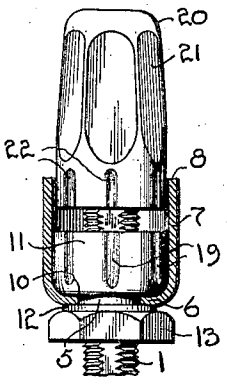



Fig. 4

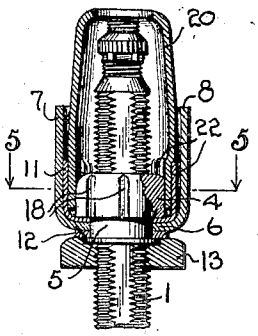



Fig. 5

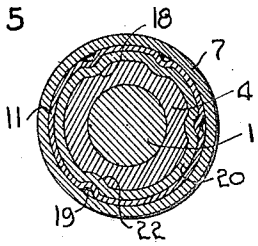
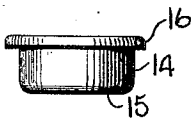



Fig. 6




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# UNITED STATES PATENT OFFICE.

OLOF A. NORLUND, OF WILLIAMSPORT, PENNSYLVANIA.

## LOCK HOUSING.

Application filed October 14, 1922. Serial No. 594,569.

*To all whom it may concern:*

Be it known that I, OLOF A. NORLUND, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented new and useful Improvements in Lock Housings, of which the following is a specification.

This invention relates to lock housings.

One object of the invention is to provide a housing for attachment to the valve stems of automobile tires whereby the latter may be securely locked to the wheel in a manner to prevent its removal therefrom by unauthorized persons.

Another object is to provide a housing capable of general use for the nuts or heads of screws or bolts, which housing may be unlocked only by the use of a specially designed key having a certain combination of coacting elements for insertion into the housing for the purpose, which combination is susceptible of wide variation and is inoperative by means of an ordinary key, a screw driver or any other tool.

The improved housing is designed as an improvement on the lock housing shown and described in my application for Patent Serial No. 514,362, patented March 6, 1923, No. 1,447,564, and is so applied to the valve stem in a manner to freely admit of the removal or application of the ordinary dust cap thereof, and may be applied in position without any alteration of the felly or stem, the said housing being capable of easy and cheap manufacture and adapted to clamp the valve and inner tube in position without defacing the felly.

A full and complete understanding of the invention may be obtained from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of this specification, it being understood that while the drawing shows a practical form of the invention, the latter is not to be confined to strict conformity with the showing thereof, but may be changed or modified, so long as such changes or modifications mark no material departure from the salient features of the invention, as specifically pointed out in the appended claims.

In the drawing, in which similar reference characters designate corresponding parts throughout the several figures:—

Fig. 1 is a side elevation of the improved housing shown mounted in position on an ordinary valve stem, removed from the tire and having the usual dust cap applied thereto.

Fig. 2 is a vertical, longitudinal section through the same, a portion of the valve stem being omitted.

Fig. 3 is a detail view in elevation of the device, the housing proper being in section and the special key in position for unlocking the housing.

Fig. 4 is a similar view showing the key in engagement with its coacting part.

Fig. 5 is a cross sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a detail view in side elevation of the dust cap for the lock housing.

In the drawing, there is shown an ordinary valve stem 1 provided with a clamp plate 2 and clamp nuts 3 at one end for attaching the same to an inner tube of an automobile tire in the usual manner, it being deemed unnecessary to illustrate any of the parts of the tire or wheel felly for the purposes of this application. The valve stem is threaded, as usual, throughout its length.

Mounted on the outer portion of the stem 1, or that portion which extends through the felly of the wheel towards the axis of the same, is a nut 4 having its bore or passageway threaded to receive the threads of the valve stem. The lower or inner portion of said nut is reduced and extended along the stem as at 5, the said extension being adapted to receive an inturned bottom or inner wall 6 of a revolving, shell-like sleeve or housing 7 of considerably greater diameter and length than the nut 4 and whose upper or outer end 8 is open and extends beyond the outer face of the nut.

Between the bottom or inner wall 6 of the housing and the shoulder formed by the lower extension 5 of the nut 4, there is interposed the bottom or inner wall 10 of a revoluble guard ring 11, the upper or outer end of which is open and extends substantially half way along the interior wall of the housing or sleeve 7, the said ring being formed of considerably thinner sheet metal than the said housing, and being adapted to freely revolve within the same and independently thereof. The diameter of the guard ring is somewhat greater than that of the nut 4 so that an annular space is formed entirely around the said nut between said elements.

The lower or inner end of the extension 5 of the nut 4 passes through the hole in an ordinary washer 12, and is sufficiently long to be outwardly turned thereunder or upset to retain the said washer, together with the housing 7 and the guard ring 11 thereon, and to allow the housing and guard ring to freely revolve about the same.

Beneath or beyond the washer 12 a clamp nut 13 is mounted on the valve stem for the purpose of clamping the valve stem in the felly of the wheel in the usual manner, said nut 13 having the usual polygonal faces for the reception of a wrench and adapted to bear against the inner face of the felly between the spokes of the wheel.

The upper or outer open end of the housing 8 is adapted to be closed by a cap 14, formed of thin sheet metal suitably stamped into a cup shape of a diameter to snugly fit within the open end of the housing 8, and having a bottom 15 which, when the cap is in position over the open end of the housing, is slightly above or beyond the upper or outer edge of the guard ring 11, and is provided with an opening adapted to receive the valve stem 1 and to freely slide up and down thereon. The upper or outer open end of the cap 14 is supported on the upper or outer edge of the housing 8 by means of a peripheral outstanding flange 16 having its margin turned downwardly or inwardly to engage over said housing, and to support the said cap in spaced relation to the upper end of the guard ring 11 and the nut 4. The usual valve stem cover 17 is adapted to be threaded onto the upper or outer end of the stem and to bear against the upper or outer face of the bottom 15 of the cap 14, and to hold the same in position within the housing 8.

The outer periphery of the nut 4 which is substantially circular, is provided with a plurality of vertically or longitudinally disposed grooves or other engaging elements 18 extending from the bottom to the top thereof, and the walls of the guard ring 11 are likewise provided with a similar series of vertically or longitudinally disposed grooves or other engaging elements 19 corresponding to the grooves 18, and formed by indenting the thin metal comprising the guard ring 11 from the bottom to the top thereof, and corresponding in spacing to the grooves of the nut 4. The indenting of the ring provides ribs on the inner side of the ring. The grooves 18 and 19 respectively comprise the changeable combination of the lock housing, and it will be seen that such combination may be altered by forming the said grooves different distances apart, some being closer together than others, and that an indefinite number of such devices may be manufactured each having a different combination.

A key for unlocking or locking the parts of the invention, after the caps 14 and 17 are removed, is shown in elevation in Fig. 3, said key comprising a thimble-like shell or casing 20, having its upper or outer end tapered and closed and its inclined side walls provided with facets 21 for the reception of a wrench, the lower or inner end of the key being open and having its walls indented, as at 22, to provide groves on the outside and ribs on the inside, the ribs of the key fitting into the grooves 18 of the nut 4 and the grooves of the indentations in the key receiving the ribs of the guard ring 11, respectively. By this means, the key is held to the nut 4 and the ring, and both will be turned when the key is rotated, so that the entire device may be removed from the valve stem to allow the same, together with the inner tube, to be withdrawn therefrom.

The thickness of the metal comprising the key 20 is equal to the space between the nut 4 and the ring 11, and it will be seen that no device other than one shaped exactly like the key 20 may be introduced therebetween to turn the nut 4, so that it is impossible to remove the tire from the wheel except by use of the key having the particular combination of grooves adapted to the particular nut and ring in the lock housing.

From the foregoing, it will be seen that a simple, cheaply-manufactured and efficient lock housing has been provided for use on valve stems of automobile tires which will prevent the unauthorized removal of the same, and that the device is susceptible of manufacture in a great variety of combinations, and that the device is capable of use in many other positions and relations, and therefore I do not wish to be limited to the particular use shown.

The device makes an admirable lock for the head of a screw or bolt, or a nut thereon, in locations and uses where it is desired to prevent the removal of the screw or bolt.

What is claimed is:—

1. In a lock housing for the heads or nuts of screws and bolts, the combination with a swiveled housing or sleeve surrounding the nut or head and extending beyond the latter, and a revoluble guard ring also surrounding the nut or head and arranged within the housing or sleeve, said guard ring having engaging elements thereon.

2. In a lock housing for the nuts or heads of screws and bolts, the combination with a swiveled housing surrounding the nut or head, a swiveled guard ring arranged on the inside of the housing and spaced from the nut or head, both the guard ring and the nut or head having elements corresponding with each other, and a key adapted to be inserted between the nut or head and the guard ring and having engaging elements corresponding with and adapted to interlock

with those provided on the nut or head and the guard ring.

3. In a lock for the heads or nuts of screws and bolts, the combination with the screw or bolt having a head or nut, a revolubly mounted sleeve or housing surrounding the head or nut and extending outwardly beyond the same, a revolubly mounted guard ring interposed between the head or nut and the housing or sleeve and having grooves formed therein, said head or nut having grooves formed therein and spaced from the guard ring to allow for the insertion of a key to turn the head or nut.

4. A lock for the heads or nuts of screws and bolts, comprising a revolubly mounted tubular sleeve surrounding the head or nut, a guard ring arranged within the sleeve and spaced from the head or nut and being of less length than the housing, said head or nut and said ring being provided with grooves which coincide with each other and are adapted to receive between them a key for turning the nut or head.

5. In a lock for the heads or nuts of screws and bolts, the combination with the screw or bolt having a nut or head thereon, said nut or head having spaced longitudinal grooves on the periphery thereof, of a swiveled housing of greater length than the length of the head or nut so as to project beyond the same, and a swiveled guard ring interposed between the head or nut and the housing, said guard ring having longitudinal grooves therein forming ribs to coincide with the grooves formed in the head or nut, a space being provided between the head or nut and the guard ring for the insertion of a key having ribs to correspond with the grooves of the head or nut and having grooves to coincide with the ribs of the guard ring.

6. A lock for the head or nut of a securing element, comprising a tubular sleeve open at one end and having an inturned wall at the other end, said sleeve being of greater internal diameter than the diameter of said head or nut, and of greater length than said head or nut, the outer face of the head or nut within the sleeve being provided with a plurality of longitudinal grooves spaced apart, a guard ring mounted within the sleeve and extending along the sides thereof and having its inner wall inturned and fitting between the inner face of said head or nut and the inturned wall of the sleeve, said guard ring being provided with a plurality of longitudinal grooves forming ribs coinciding with the grooves in the head or nut, and a removable tubular key having a polygonal head at one end and an open-ended socket at the other to pass over the head or nut within the guard ring, said socket having inwardly-directed indentations forming longitudinal ribs to fit the grooves of the head or nut and the grooves of said indentations receiving the ribs of said ring to turn the same when a wrench is applied to the polygonal head of the key.

7. A lock housing, comprising a nut adapted to be screwed on the threaded end of a stem, said nut having a swiveled, tubular housing mounted thereon, said housing being open at its outer free end and having its walls in spaced relation to the periphery of the nut, a guard ring carried by the nut within the housing and revoluble independently of the latter, a dust cap surrounding the stem and provided with a peripheral wall adapted to fit within the open end of the housing and having a marginal flange to fit over the edge of the same, the said nut and guard ring having their spaced, opposed walls provided with corresponding combinations of grooves, and a key having its open end provided with longitudinal ribs to fit between and into the grooves of the ring and nut to turn the latter off the stem.

8. In combination with a stem, a nut thereon, a housing swiveled to the nut, a guard ring also swiveled to the nut and extending beyond the latter, a cap for closing the outer end of the housing and extending within the latter, and a cover for the stem engaged with the latter and clamping against the said cap.

9. In a lock housing for the nuts or heads of screws and bolts, the combination with the screw or bolt having a nut or head thereon, of a lock housing swiveled on the screw or bolt and encircling the nut or head and extending beyond the same, said housing having an open end, and a cup-shaped cap engaging with the outer edge of the housing and arranged within the latter.

10. A lock for the head or nut of a securing element comprising a tubular swiveled sleeve or housing open at one end, and a cup-shaped cap for closing said open end of the housing, said cap being held in position to and within the housing or sleeve by a flanged engagement with the open end of the housing or sleeve.

In testimony that I claim the foregoing as my own I have hereto affixed my signature.

OLOF A. NORLUND.