Dec. 15, 1925. 1,565,253

R. H. BUTTERS ET AL

TIRE LOCK

Filed Sept. 21, 1923

Fig. 4.

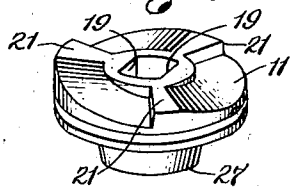


Fig. 3.

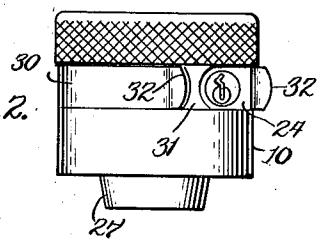


Fig. 2.

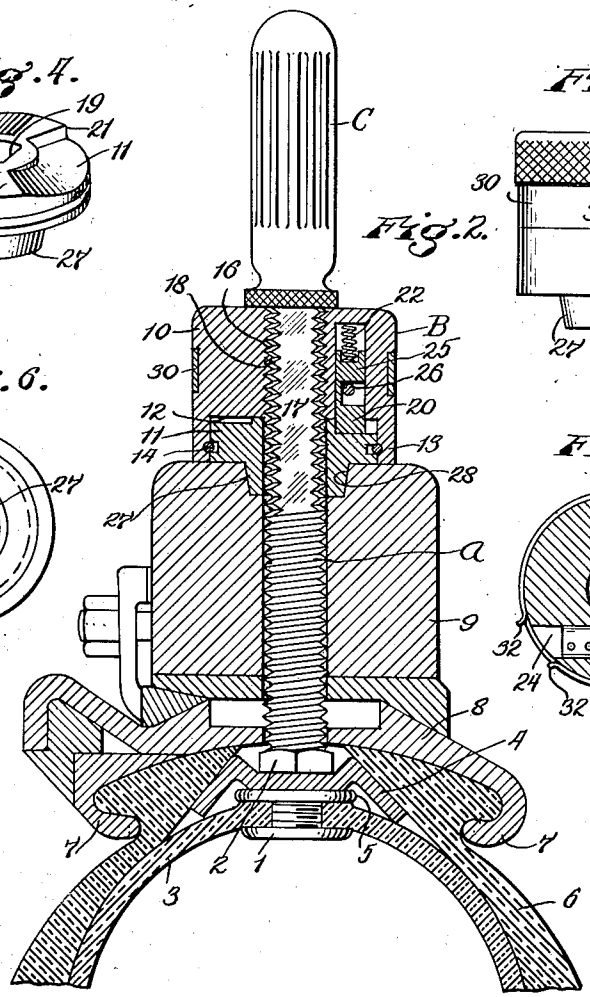


Fig. 6.

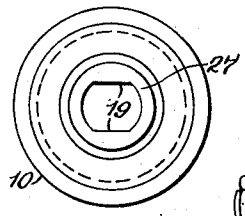


Fig. 5.

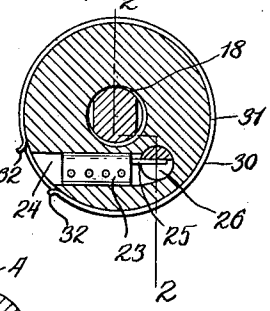


Fig. 1.

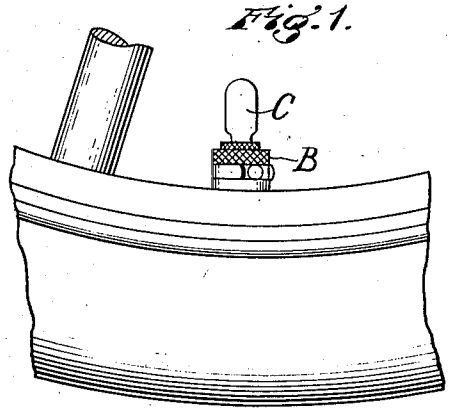
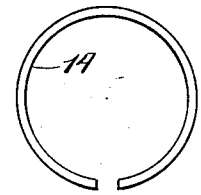


Fig. 7.



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UNITED STATES PATENT OFFICE.

ROBERT H. BUTTERS AND RICHARD W. STARKE, OF ATLANTA, GEORGIA.

TIRE LOCK.

Application filed September 21, 1923. Serial No. 663,936.

To all whom it may concern:

Be it known that we, ROBERT H. BUTTERS and RICHARD W. STARKE, citizens of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Improvement in Tire Locks, of which the following is a specification.

This invention relates to improvements in locks, more particularly of the type which embodies as co-operating elements a block and a stem upon which the block may be fitted and locked, a structure corresponding to such type being shown in our pending application, Serial No. 492,584, filed August 15, 1921, and now Patent No. 1,531,174 dated March 24, 1925.

Locks of this type are preferably provided with key controlled lock mechanism which is incorporated with the block; and as heretofore constructed the use of the key is required in connection with the fitting of the block upon the stem and the key may not be removed from the lock barrel until the bolt has been snapped into locking position. This has introduced a complicating factor in the operation of such locks and has been further disadvantageous in that an individual may carelessly attempt to remove the key before the bolt has become engaged in its keeper and if sufficient force be used in such attempt may break or mutilate the key.

The principal object of the present invention is to obviate the disadvantages described while retaining the advantages of a key controlled locking mechanism; in other words to provide a key controlled lock of the type described wherein the use of the key in connection with the locking operation is not required and the key may at all times be withdrawn from the lock barrel without liability of being broken or mutilated and with the lock ready to exercise its locking function or in course of exercising such function.

With the above objects in view the invention consists generally in a construction wherein one of the relatively rotatable parts of the block is formed as a ratchet which is engaged by the bolt in the manner of a pawl and the use of the key is required only for the unlocking operation in order to hold the bolt clear of the ratchet teeth. By virtue of such features the block may be fitted on the stem in the manner of a nut and without the use of the key and as engaged with the stem in any position required is automatically locked, no operation other than the engagement of the block against axial movement on the stem being required in order to effect or provide for the operation of the lock mechanism.

The invention is shown in the accompanying drawing as an element of an organization for locking a tire to its mounting but it will be understood that the invention may be used as a device of general utility and that the particular useful application disclosed is selected merely as an example.

In said drawings:

Figure 1 is a perspective view showing a segment of a felly and tire and the locking block in operative position on the valve stem.

Figure 2 is a cross section, the locking block being shown on the line 2—2 of Figure 5.

Figure 3 is an elevation of the locking block.

Figure 4 is a perspective view of the keeper part of the locking block.

Figure 5 is a horizontal section of the locking block in which the lock mechanism is shown in plan.

Figure 6 is a bottom plan view thereof.

Figure 7 is a view of the key by which the two parts of the block are connected.

The lock comprises a stem A and a locking block B in co-operation with said stem. As used for the purpose of locking a tire to its mounting the stem A may be constituted by the valve stem which is provided at its inner end with a head 1 for co-operation with a nut 2 by means of which the stem is secured in the inner casing 3. Externally of the inner casing the stem carries a spreader 4 which is confined between the nut 2 and a washer 5 and which presses from within against the marginal beads of the outer casing 6 and holds them engaged in the flanges 7 of the rim 8. The stem projects through openings in the rim 8 and felly 9 and the block B is secured to the projecting portion of the stem.

The block B comprises two co-axial parts 10 and 11 which are provided with central openings to take over the stem A and have relative turning movement. In the construction preferred these parts are connected together whereby the block is a unitary

device. For these purposes the part 11 has a rotatable fit within a recess 12 formed in the under face of the part 10 and providing a flange 13 which encloses and prevents access to said part 11; the parts thus related are connected together by a key 14, preferably in the form of a split ring (Figure 7) which engages in matching annular grooves of the flange 13 and part 11, thereby to hold the parts 10 and 11 against relative axial displacement while permitting them to be turned relatively to one another.

The projecting portion of the stem is provided with threads 16 interrupted by flat sides 17 and the block is formed to engage said threads and flat sides whereby it will be held against endwise and turning movement on the stem. In the construction disclosed the threads 16 are constituted by the usual threads of the valve stem and are continued to the outer end of the stem to provide for the attachment of the usual dust cap C. The relative turning movement of the parts 10 and 11 is effective to complete the engagement of the block with the stem and the block having been moved on the stem to the position desired the parts 10 and 11 are automatically locked against retrograde relative turning movement. Thus the central opening of the part 10 is provided with threads 18 for engagement with the threads 16 and the central opening of the part 11 is provided with flat sides 19 which fit closely and conform to the flat sides of the stem. As shown in the drawing the part 10 has clockwise rotation relative to the part 11 and said parts are locked against relative counter-clockwise rotation by a bolt 20 which is mounted in the part 10 for slidable movement in the direction of the axis of said part and co-operates as a pawl with ratchet shoulders 21 formed on the inner face of the part 11.

The bolt 20 is projected by a spring 22 and is retracted by lock mechanism, also carried by the part 10. Such mechanism may be of any suitable construction, as shown it includes a barrel 23 rotatably fitted in the part 10 with its axis at a right angle to the bolt 20. The barrel 23 is provided with a series of radially operating tumblers which normally project into recesses extending radially from the bore in which said barrel is fitted, all in the well-known manner. The barrel 23 with the tumblers is preferably of the cylinder type operated by a paracentric key which may be engaged with said barrel through an opening 24 extending to the face of the block. The bolt 20 is thrown by a pin 25 projecting eccentrically from the inner end of the barrel and which extends into a recess 26 in the side of the bolt, said recess providing an overhanging shoulder with which the pin 25 co-operates and being sufficiently deep to permit the upward movement of the bolt under the cam-like action thereon of the inclined faces of the ratchet shoulders 21.

The part 11 preferably has a central flange 27 and the opening formed in the felly (or other object) through which the stem projects is fashioned with a countersunk recess 28 into which the flange projects, the function of the flange being to prevent access to the stem with any instrument which might be used for cutting or breaking the stem from the tire at a point between the felly and the block B.

The block is preferably provided with a suitable dust guard for the lock barrel; as shown, a resilient contractile band 30 fits rotatably but closely in an annular groove 31 formed in the block. The ends of the band are fashioned to provide finger pieces 32 by which the band may be turned and are spaced apart sufficiently to provide a clearance by which the opening 24 may be uncovered, the band being normally positioned to cover said opening.

In use: With the barrel 23 held against turning by the co-operating tumblers, thereby permitting the projection of the bolt 20 by the spring 22, the block is slipped over the stem A in a position wherein the flat sides 19 of the part 11 lie adjacent the flat sides 17 of the stem and the part 10 is rotated (in the clockwise direction with reference to the drawing) to feed the block in the manner of a nut along and toward the inner end of the stem, the bolt 20 during such rotation of the part 10 riding over the ratchet shoulders 21. This rotation of the part 10 is continued until the inward movement of the block along the stem is arrested by the engagement of the block against the felly. At such time the block is automatically locked on the stem since it can only be removed by rotating the part 10 in the reverse direction and this is prevented by the engagement of the bolt 20 against the perpendicular face of the adjacent ratchet shoulder. As thus locked on the stem the block will rigidly and positively secure the objects with which it is associated; in the construction disclosed it will secure the tire, that is to say the outer casing, against removal from the rim or the carrier and will also secure the rim, whether of clincher or demountable form, against removal from the wheel or carrier. To remove the block from the stem the key is used to turn the barrel and thereby lift the bolt 20 clear of the ratchet shoulders 21 and with the bolt so held the part 10 is rotated in the reverse direction, that is to say counter-clockwise in the construction shown, whereby the block is fed along the stem toward its outer end and ultimately disengages the same at which time the objects to be secured are released and thereby made accessible.

Having fully described our invention we claim:—

1. In a lock, in combination, a stem and a locking block, the stem having threads and flat faces interrupting the threads, the block comprising two co-axial co-operating parts relatively rotatable and having central openings through which the stem may project, one of the parts engaging the flat faces of the stem against rotation, the other engaging the threads against endwise displacement, a bolt carried by one part, the other part having ratchet shoulders for engagement by said bolt, and lock mechanism carried by one part and operative to retract the bolt.

2. In a lock, in combination, a stem and a locking block, the stem having threads and flat faces interrupting the threads, the block comprising two co-axial co-operating relatively rotatable parts permanently connected together and having central openings through which the stem may project, one of the parts engaging the flat faces of the stem against rotation, the other part having threads whereby it may engage the threads of said stem and be turned thereon in the manner of a nut, one part having ratchet shoulders, a bolt carried by the other part and engaging said shoulders in the manner of a pawl, and lock mechanism carried by one part and operative to retract the bolt.

3. In a lock, in combination, a locking block and a threaded stem, said block including a part which may be turned in the manner of a nut and a part which engages said stem against turning movement thereon, said block having elements combined with its respective parts and which cooperate with one another in the manner of a pawl and ratchet during the relative turning movement of said parts whereby to prevent retrograde relative turning movement thereof and lock mechanism carried by said block and by which said elements may be placed in non-cooperative relation.

In testimony whereof we affix our signatures.

ROBERT H. BUTTERS.
RICHARD W. STARKE.