

A. RYDEN & C. H. STAHL.

LOCK NUT.

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1,017,471.

Patented Feb. 13, 1912.

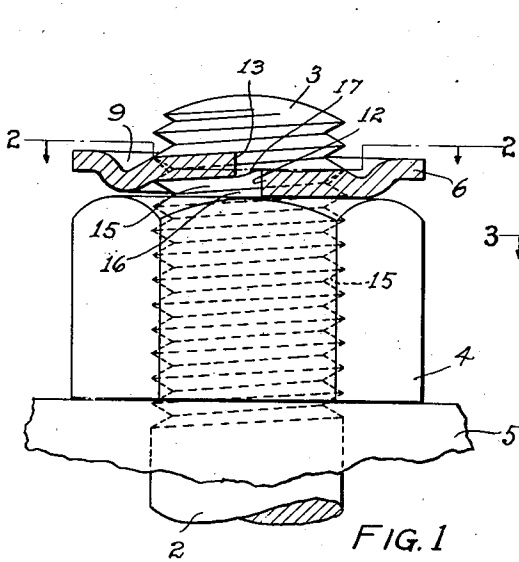


FIG. 1

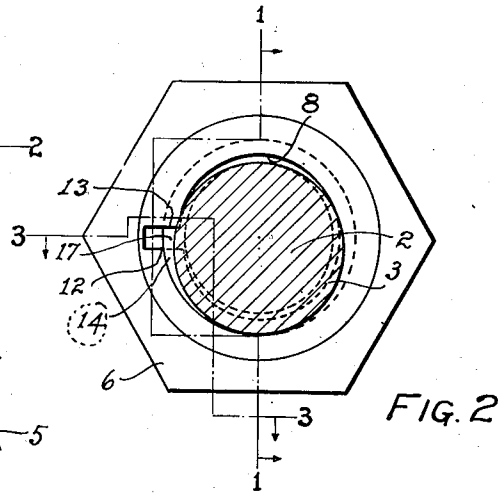


FIG. 2

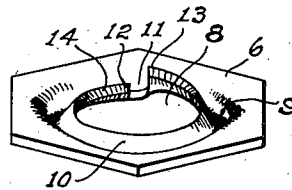


FIG. 4

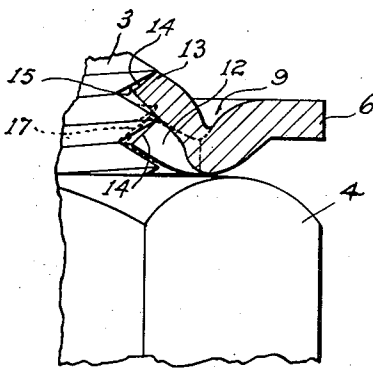


FIG. 3

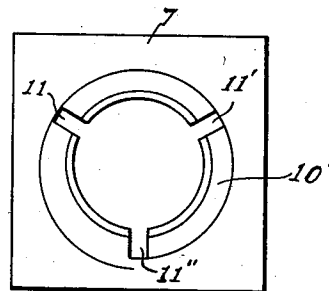


FIG. 5

WITNESSES:

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LOCK-NUT.

1,017,471.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, AXEL RYDEN, a citizen of the United States, and CARL H. STAHL, a subject of the King of Sweden, both residing in the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Lock-Nuts, of which the following is a specification.

Our invention relates to nut-locks and its object is to more nearly than heretofore achieve the aims of inventions of this class, namely, efficient locking means, simplicity of construction and operation, security of the lock, inexpensiveness, etc.

With these objects in view our invention consists of the novel construction of lock hereinafter described in detail, illustrated in the accompanying drawing and more particularly pointed out in the appended claims.

In the drawing—Figure 1 is a side elevation of a section of a bolt, a nut thereon, a fragment of a structure against which the nut is tightened, and a vertical section on line 1—1 of Fig. 2 of a lock-nut or nut-lock embodying our invention. Fig. 2 is a section substantially on line 2—2 of Fig. 1. Fig. 3 is an enlarged section substantially on line 3—3 of Fig. 2. Fig. 4 is a perspective view of our improved lock-nut, and Fig. 5 is a plan view of a modification of the form shown in Fig. 4.

Referring in detail to the several views, 2 represents a bolt having a threaded portion 3, and 4 represents a nut having threaded engagement with said portion 3.

5 is a portion of structure through which the bolt is passed and against which the nut 4 is tightened.

6 represents the body of the preferred form of lock-nut and 7 the modified form. 6 and 7 may represent, respectively the body of the lock. The body 6 is shown as of the form of a hexagon disk having therein a bolt-hole 8, an annular depression 9 and a spiral rim or thread 10. The latter is substantially an open ring between the ends of which there is an opening 11, this ring being twisted in conformity with the pitch of a bolt-thread. In other words, it is a thread of a nut of peculiar formation, having ends 12 and 13. The end 12 is the active lock-forming end and the higher, or rear, end 13 is the imprisoned end of the lock against which a barrier is formed by the end 12 against ret-

rograde movement. The depression or fluted portion 9 serves the several purposes of lending rigidity to the body of the lock and substantially positioning the ring or thread 10 as nearly as may be in the plane of the outer portion of the body 6 or 7 to which a wrench or other operating tool is applied. The inner periphery of the thread 10 has a beveled portion or edge 14 which slopes inwardly more abruptly than the nut-thread 15, as indicated in Fig. 3. The lock-nut is turned onto the threaded portion 3 of the bolt 2 in the same manner as an ordinary nut by the end 12 of the thread 10 entering the outer end of the bolt thread in the same manner as the inner end of a nut-thread takes hold of the outer end of a bolt-thread. At the point 16 (Fig. 1) where the bolt-thread disappears within the nut 4 a wedge-shaped space is formed between the nut 4 and the bolt-thread 15. When the end 12 of the open-ring portion of our improved lock is forced into this space this end operates against a very small portion of the bolt-thread and distorts the bolt-thread producing a bulge 17 in the latter which is interposed in the return path of the end 13, as shown in Fig. 1. Even a heavy thread is comparatively weak when attacked in this manner in a single spot and yields readily to the wedging force of the end 12, the cut-away portion 11 being provided to remove the usual reactive support that would be provided in the ordinary nut where the thread of the nut would occupy the space into which the bulge or bend 17 is forced. The extent of lateral distortion, size of bulge, or the height of the obstacle in the return path of the end 13 will, of course, be in the ratio of the wedging power applied to the end 12. However, as the barrier formed is a positive one, a very slight distortion of the thread will be sufficient to form a perfect lock against accidental unscrewing of the lock or its becoming loosened by an ordinary coat of rust such as will loosen lock-nuts or nut-locks which depend entirely upon the friction-engagement. Such engagement can only exist while the friction surfaces remain intact or undamaged by corrosion or rust forming and falling away in the form of powder under constant jarring of the parts, such as that which takes place in railway-rail fastenings.

In order to facilitate the formation of the

bend 17 in the bolt-thread, especially when this is of V-shape or knife-edge form such as shown in Figs. 1 and 3, we incline the beveled edge 14 at an acute angle to the edge 15 of the bolt thread. This causes the upper edge of the beveled portion 14 to act first and at the apex of the thread 15 bending the under-surface of the latter into alinement with the beveled surface 14 of the lock as indicated by the dotted line at 17 in Fig. 3. While this absolute barrier 17 is interposed in the return path of the end 13 of the lock, the latter may nevertheless be removed by causing the end 13 to act as the active end in unscrewing the lock, the end 13 then acting to restore the distorted portion 17 to substantially its former position. The malleability of the ordinary thread will permit the distortion and restoring of the thread in the same spot several times, but it will require approximately as much force to restore the thread by the end 13, or to remove the barrier, as that required to form it, and in order that the elements shall be capable of permitting the present lock-nut to come off the entire bent or distorted portion of the thread must be eaten away by rust, acting in like manner upon the other parts of the thread, to make the threaded engagement of nut and bolt useless in any event.

The raised open ring 10 and the depression 9 adapts our invention also to form a lock by friction-engagement, the form of engagement relied upon in nut-locks in the form of disks interposed between the nut 4 and the body 5. In that case the pressure of the nut against the disk would tend to force in the edges of the ring 10, or contract it. Pressing out the depression 9 would simultaneously have the same effect and the combined forces of contraction of the opening 8 would, obviously, provide a very powerful friction-hold upon the bolt. By reference to Fig. 1 it will be observed that the present nut-lock is adapted to lock a nut 4 where the projecting thread portion is very short, a single circle of thread 15 being sufficient for the purpose of our invention.

The above-described lock-nut may be formed by a single operation of a die, or at a speed of manufacture substantially equal to that with which ordinary washers may be made, as the inward inclination of the up-turned portion 10 will place its edge at an angle to form a bevel 14 or inward inclination. As the substantial portion, at least, of this inclination of the surface of the up-turned edge is produced by the inward slant of the upturn 10 itself, but slight modification of the bevel need be made by the action of the forming-die.

The modification shown in Fig. 5 shows the body of the lock of square instead of hexagon form and its thread or ring 10' as having three cut-away portions 11, 11' and

11'' instead of only one opening 11 as in Fig. 4, and our invention may as to its embodiment be varied in numerous other ways without departing from the spirit thereof.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a nut-lock, the combination with a threaded bolt, of a washer or disk having a bolt-hole therein, a spiral flange commencing beyond one side and ending beyond the opposite side of the plane of said washer or disk, said flange being inclined to the plane of said washer or disk and having its ends spaced apart, whereby one end of said flange serves as a wedge adapted to operate against a nut and a portion of the thread of the bolt to raise said portion between the ends of said flange.

2. In a nut-lock the combination with a threaded bolt and an article to be locked upon said bolt, of a disk having a bolt-hole therein, a spiral flange formed around the edge of said bolt-hole, said flange having its ends spaced apart, and a depressed portion about said flange, said portion gradually receding from the edge of the flange from one of its ends toward the other end.

3. In a nut-lock, the combination with a threaded bolt and an article to be mounted and locked thereupon, of a disk having a bolt-hole therein, a spiral flange around said bolt-hole, a circular depression on one side and a circular bead, rib or rise on the opposite side of said disk around said flange.

4. In a nut-lock, the combination with a threaded bolt and an article to be mounted and locked upon said bolt, of a disk having a bolt-hole therein, a spiral flange around said bolt-hole and a spiral depression about said flange, the ends of said flange being spaced apart, one of said ends serving as a wedge adapted to form a bulge on the thread of the bolt intercepting a return movement of the opposite end of said flange.

5. In a nut-lock, the combination with a bolt-thread, of a washer or disk having a bolt-hole therethrough, a spiral flange about said bolt-hole, said flange being an outwardly bent rim of said hole, whereby a V-shaped thread is formed out of a square edge of said rim, the ends of said flange being spaced apart at right angles to the bolt-thread engaged by said flange, and the spaced-apart ends serving, respectively, to form a bulge or stop on the thread and a part of the flange to be engaged by said bulge or stop.

6. In a nut-lock, the combination with a threaded bolt and an article to be held upon said bolt, of a disk having a bolt-hole therein and a plurality of parallel edges adapted to be engaged by a wrench, a spiral flange having spaced-apart ends, and a bead offset from the surface of said washer or disk, said

head forming a contact-surface engaging said article and raising the body of said washer or disk above said article.

7. In a nut-lock, the combination with a
5 threaded bolt and an article to be mounted and fastened upon said bolt, of a disk having a bolt-hole therethrough, a spiral flange around said bolt-hole, said flange having
10 ends separated by planes at right angles to each other, and a bead upon said flange and

disk which forms a spring or yielding contact portion to engage said article.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

AXEL RYDEN.
CARL H. STAHL.

Witnesses:

AXEL BLAMFELDT,
M. C. ALLEN.