E. R. HIBBARD.

LOCK NUT.

APPLICATION FILED AUG. 13, 1910.

1,111,382.

Patented Sept. 22, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

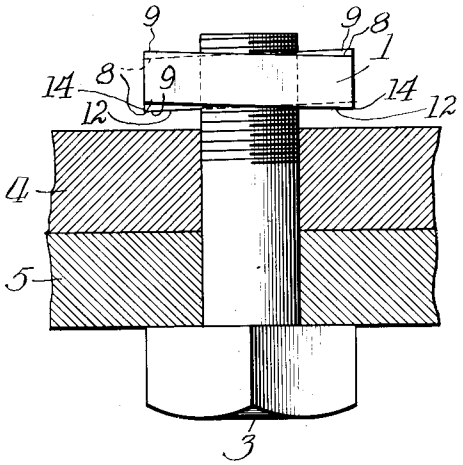


Fig. 3.

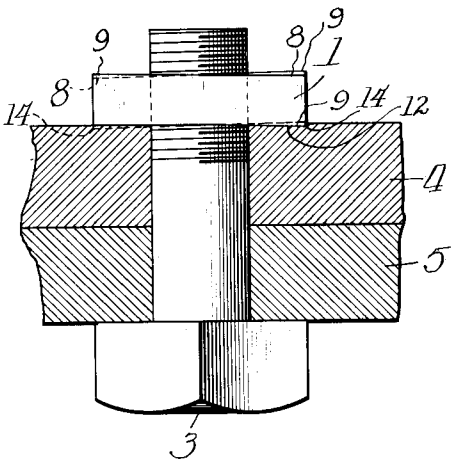


Fig. 2.

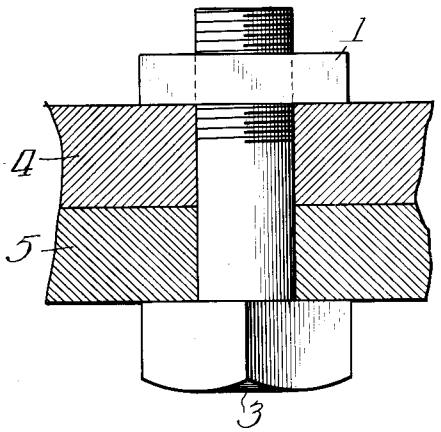


Fig. 4.

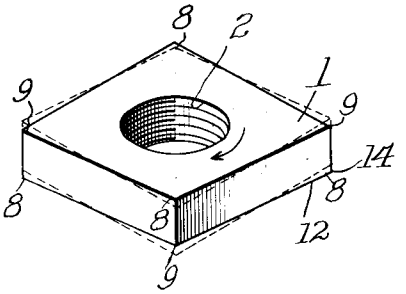


Fig. 5.

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2 SHEETS—SHEET 2.

Fig. 7.

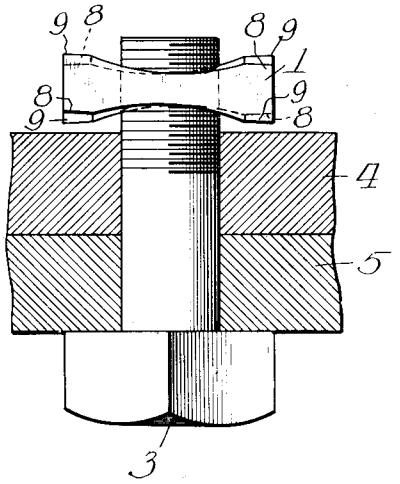


Fig. 8.

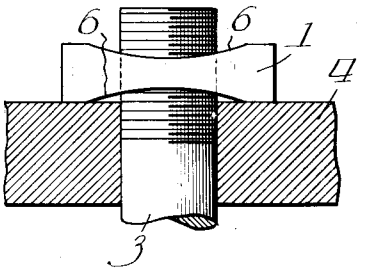


Fig. 10

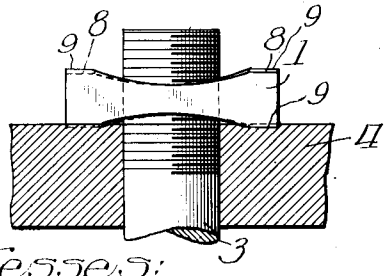


Fig. 11.

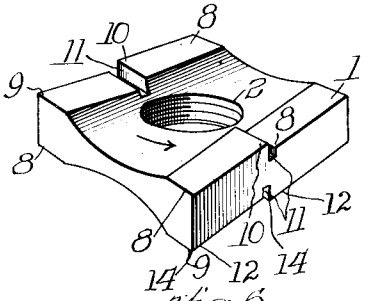


Fig. 6.

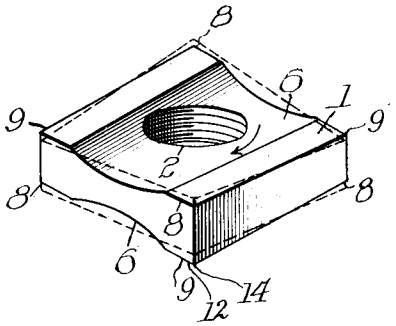
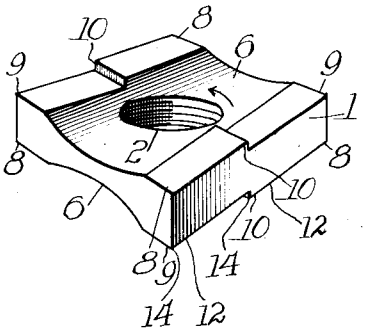


Fig. 9.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDWARD R. HIBBARD, OF OAK PARK, ILLINOIS, ASSIGNOR TO GRIP NUT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LOCK-NUT.

1,111,382. Specification of Letters Patent. Patented Sept. 22, 1914.

Application filed August 13, 1910. Serial No. 577,071.

To all whom it may concern:

Be it known that I, EDWARD R. HIBBARD, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lock-Nuts, of which the following is a description.

My invention belongs to that general class of nuts designed to operate in such a manner as to prevent loosening or accidental disengagement, and sometimes called lock nuts or grip nuts.

It consists in the novel construction and form shown and described in the specification and drawings and more particularly pointed out in the claims.

In the drawings wherein like reference characters indicate like or corresponding parts, Figure 1 shows a bolt provided with my improved nut, the nut having not yet been screwed down to the point to bear upon the proximate structure, Fig. 2 is a similar view showing the nut firmly seated, Fig. 3 shows a similar view indicating the tendency of the nut to impinge upon and engage the supporting or proximate structure when the nut has been seated for a considerable length of time or when it is attempted to back the same off, Fig. 4 is a perspective view of the nut showing the preferred form, Fig. 5 indicates an extension of the surface of the nut to more clearly indicate the outline, Fig. 6 is a modified form, Fig. 7 is a view similar to the Figs. 1 to 3 inclusive showing the position of the parts just before the nut is seated, Fig. 8 shows the nut in place, Fig. 9 shows a left-handed modified form of the nut shown in Fig. 6, Fig. 10 shows the said nut firmly seated and impinging upon and biting into the proximate structure, and Fig. 11 shows another left-handed modification.

In the drawings 1 is a nut of the usual form provided with a screw threaded aperture 2. The nut is preferably of such dimensions and material as to have a slight spring when firmly seated. In the simplest form shown in Figs. 1 to 5, the nut after being formed and preferably screw threaded, is struck up on a suitable form to give it a slight twist, which may if desired be sufficiently pronounced to extend to and slightly distort the threads, causing them to form a tighter frictional fit with the bolt threads. The corners of the nut are preferably comparatively sharp, and it will be seen that when the nut is placed upon the bolt 3 and screwed down upon the intervening structure 4, 5 that the advancing corners of the nut are slightly elevated above the rear corners so that the first contact of the nut with the structure is on what may be called the following corners, the same first dragging on faces or corners 12 in seating. Firmly seating the nut in the usual manner serves to spring the nut downward into its normal position, firmly seating the whole proximate face upon the structure, as shown in Fig. 2. The spring of the nut tends to firmly bind the threads in frictional contact with the threads of the bolt, and the reaction of this spring contact serves to press the impinging corners of the nut firmly upon the intervening structure 4, tending to form a positive connection, to a greater or less extent, between the impinging corners and the structure, and to an extent depending upon the comparative quality or hardness of the two proximate parts. As time passes the continued pressure increases this action tending to firmly lock the nut in position and to prevent accidental disengagement. Any attempt to back the nut off, in the usual movement, tends to force the impinging corners 14 firmly upon the structure and if the proximate structure 4 is of softer material, into the same, which has to be overcome by the force exerted in removing the nut. The nut is cheaply and economically made and is adapted for a large number of uses, particularly where the intervening structure 4 is of softer material than the nut and where there is no likelihood of there being any necessity to separate the parts. Should the nut ever become loose by reason of shrinking of the intervening material, it may be readily tightened again with substantially the same force and effect by the use of a suitable wrench. It is obvious that the twist to the nut may be given before or after the thread is cut therein, preferably after, as previously pointed out. In either case the spring of the metal aids in the locking operation. Any well known means may be employed to prevent the bolt accidentally turning in its seat.

While in the preferred form the nut is made quadrangular, and is so shown in the drawings for the purpose of more clearly indicating the action, it is obvious that the

same effect may be secured to an appreciable extent in a hexagonal or other desired form of nut.

In the form shown in Figs. 6 to 10 inclusive, an old style of nut is shown in which the opposite faces are reduced by parallel grooves 6, 6 providing a transverse spring in the nut. In the form shown in Figs. 6, 7 and 8, substantially the same twisted form is shown as before described in which the advancing corner as the nut is screwed into position is slightly elevated above the rear corner. The operation is substantially the same with the exception that in addition to the slight torsional strain before described in seating the nut the transverse spring provided for also comes into action to a slight extent, serving perhaps to more tightly lock the nut upon the bolt. The result of pressing the advanced or impinging points upon the intervening structure is substantially the same and the effect resulting from any effort to remove the nut is also substantially the same.

In the form shown in Figs. 9 and 11, (in which a left handed nut is shown) the nut just described is further modified by providing an intervening impinging point between the corners of the nut on either side. As here shown, the advancing corners 8, 8 are balanced by the impinging corners 9, 9 when the nut is firmly seated in position. In addition to this two additional impinging points 14, 14 (or 10—10 in the opposite side when the nut is reversed) are provided, extending in the same direction as the points 9, 9. In either of these modified forms the nuts drag in seating on the faces 12—12, etc. In this form the principal spring of the nut relied upon is the transverse spring caused by means of the grooves 6—6 on opposite faces of the nut. It is obvious that if desired but one face of the nut need be grooved, such form, aside from the impinging features being old and well known in the art.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A bolt nut, threaded to coöperate with a suitable bolt and given a slight twist extending therethrough, slightly distorting the thread and thus forming the nut with one or more portions on the bearing face bent downward beyond the plane of the face of the nut in the direction of the travel of the same when backed off the bolt, substantially as described.

2. A bolt nut, threaded to coöperate with a suitable bolt, the nut having a slight twist extending therethrough at right angles to its axis, and provided on its opposite faces with parallel central depressions and formed with one or more portions on its bearing face bent downward beyond the plane of the face of the nut in a direction of the travel with the same when backed off the bolt, substantially and for the purpose set forth.

3. A bolt nut, normally formed with a slight twist at right angles to the axis thereof, with a thread cut therein while in its normal position, whereby when the nut is screwed to place upon a structure the thread is slightly distorted as the proximate surface of the nut is straightened and one or more points are abnormally pressed upon the proximate structure in opposition to the direction of the nut when backed off the bolt.

4. A bolt nut, composed of slightly resilient material and normally formed with a slight twist at right angles to the axis thereof, with a thread cut therein while in its normal position, whereby when the nut is screwed to place upon a structure the thread is slightly distorted as the proximate surface of the nut is straightened and one or more points are abnormally pressed upon the proximate structure in opposition to the direction of the nut when backed off the bolt.

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

EDWARD R. HIBBARD.

Witnesses:
JOHN W. HILL,
CHARLES I. COBB.