June 3, 1930. C. H. DUFFY 1,760,977

INCASING LOCK

Filed Feb. 18, 1928

FIG. 1.

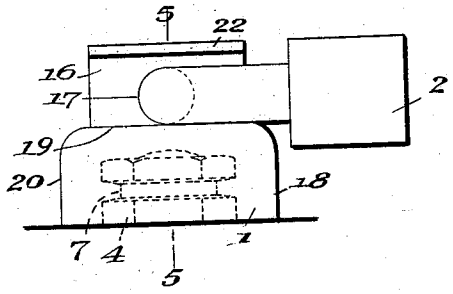


FIG. 7.

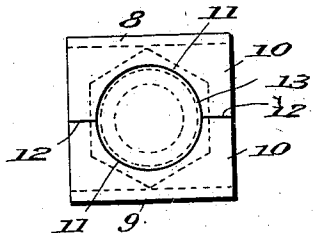


FIG. 2.

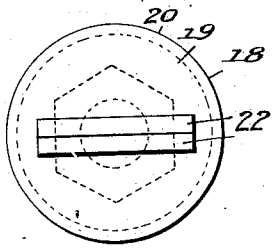


FIG. 8.

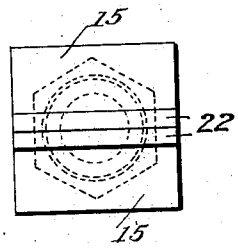


FIG. 3.

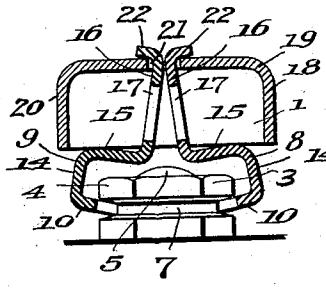


FIG. 4

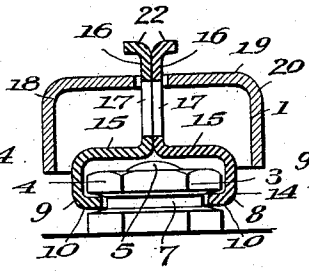


FIG. 5.

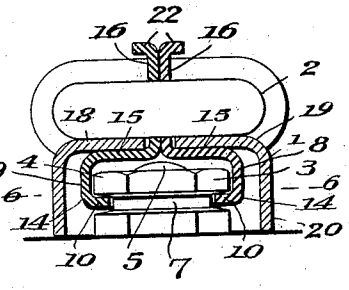
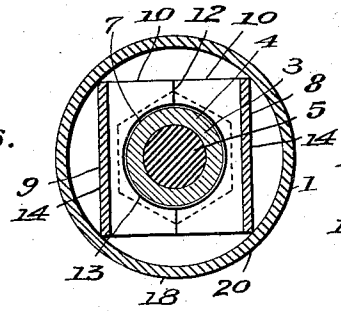


FIG. 6.



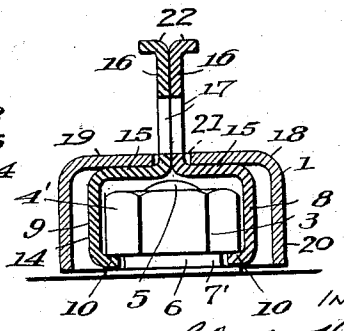


FIG. 9.

INVENTOR

Charles Hugh Duffy

BY Robert H. Young

ATTORNEY

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UNITED STATES PATENT OFFICE

CHARLES HUGH DUFFY, OF MIAMI, FLORIDA

INCASING LOCK

Application filed February 18, 1928. Serial No. 255,355.

This invention relates to a device for guarding a nut against the application of a wrench or other implement to prevent the surreptitious removal of the nut from its bolt or stud.

In many mechanical devices in which an article or member is attached or secured in place by one or more nuts and bolts, it is desirable to prevent the unauthorized removal of such article or member, either as an assurance against theft or as a guard against tampering. In such instances, it is equally desirable that the article or member be capable of instant removal by the owner or authorized operator, so that the article or member may be immediately available for use, replacement or other purpose.

It is commercially desirable in such a device that the same be simple, light in weight and inexpensive. And it is essential to its utility that the device be capable of ready application to the article or member, and without the use of special tools. It is further desirable that such a device be capable of general application.

This invention has for its object to answer all of the foregoing requirements, and to that end the invention consists of the novel construction of the nut-guard or shield, and also in certain combinations of parts, all of which will be first fully described and afterwards specifically pointed out in the appended claims.

Referring to the accompanying drawing:

Fig. 1 is an elevation of the guard, the guarded nut being shown in dotted lines.

Fig. 2 is a top plan view of the same, with the pad-lock removed.

Fig. 3 is a vertical transverse sectional view through the guard, and illustrating the same in position for applying or removing the guard to a nut.

Fig. 4 is a similar view illustrating the guard partially applied to a nut.

Fig. 5 is a similar view taken on line 5—5 of Fig. 1 illustrating the guard in operative locked position over a nut.

Fig. 6 is a horizontal sectional view taken on line 6—6 of Fig. 5.

Fig. 7 is a bottom plan view of the pair of swivelling members and illustrating the nut in dotted lines.

Fig. 8 is a top plan view of the same, and

Fig. 9 is a vertical sectional view of the guard showing the same applied to a nut of conventional design.

Like numerals of reference indicate the same parts throughout the several figures, in which:

1 indicates the guard assembly, 2 indicates a pad-lock of any suitable key or permutation type, and 3 indicates the bolt assembly. In the drawing, with the exception of Fig. 9, the bolt assembly 3 may include the nut 4 and bolt or stud 5, while in Fig. 9, the bolt assembly 3 may include the nut 4′, bolt or stud 5 and washer 6, as will be hereinafter more fully described.

As in the first eight figures of the drawing, the nut 4 is provided with an annular neck 7, which is preferably formed therein during the initial process of manufacture of the nut. Nuts of the better grade are produced from hex-bar stock on a screw machine; are drilled, tapped, chamfered and cut off in a single operation, and may be provided with the annular neck 7 at the same time and without additional time or cost, as the said neck 7 may be formed in the nut in the same "position" as when drilling, so that both these forming and drilling operations are simultaneous. The depth of the neck 7 need only be such that the diameter at the base of the neck is slightly less than the distance across the flats of the nut, as will be seen from Fig. 6. When, therefore, a nut of this type is employed, the usual nut is simply replaced with the necked nut 4, and in this embodiment of the invention, the necked nut 4 is furnished with the device. In the embodiment of the invention shown in Fig. 9, however, the usual nut on the bolt or stud 4, may be employed; in which instance, a necked washer 6 is applied under the usual nut 4′. The washer 6 is formed with two diameters, the smaller one forming an annular neck 7′, when the nut 4′ is set down thereon, the diameter at the base of the neck being slightly less than the distance across the flats of the nut. In this em-

bodiment, the necked washer 6 is furnished with the device.

In the employment of the invention it may be found that in such applications of the guard as will require frequent removal of the nut, the necked nut may be preferable, while in such applications of the guard as will be of a more permanent nature, the use of the necked washer may be preferable. However, in either instance, the function and operation of the guard is the same, as will be presently apparent.

Referring now to the guard assembly 1, it will be seen that the same preferably includes a pair of sliding and swinging retaining members which will hereinafter in this specification be termed, and in the appended claims be identified as swivelling members 8 and 9, though an equivalent construction may embody these in a single unit. In the example shown, however, these swivelling members are duplicates and are a simple stamping and forming job of suitable sheet metal, having their bottoms 10 lying horizontally, and each provided with a semicircular cut 11, so that when brought together they abut at 12 and provide a circular opening 13, having a diameter only slightly greater than the diameter of the base of the neck 7 in the nut 4, as shown in Figs. 6 and 7, so that said members 8 and 9 may freely swivel in said neck 7 without imparting any rotary movement to the said nut 4.

Said members 8 and 9 also include the vertical walls 14 which are spaced apart sufficiently so that they may freely rotate around the nut 4 without touching the flats or corners of the same. In other words, the distance between said vertical walls 14 is slightly greater than the distance across the corners of the nut 4.

The said members 8 and 9 are then bent inwardly toward each other at 15 and preferably meet each other centrally above the nut, where they are again bent upwardly in vertical parallelism to form the upstanding portions 16. At a suitable point in the upstanding portions 16, the same are provided with transverse complemental holes 17, as shown.

18 indicates the guard housing. This element may be a simple blanking and drawing job of suitable sheet metal in the form of a cap having a top 19 and an annular vertical wall 20, the top 19 having a narrow central slot 21 therein through which the upstanding portions 16 of the swivelling members 8 and 9 freely pass. The depth of the guard housing is such that when the same is in operative position as shown in Figs. 1, 5, and 9, the inner portions of the swivelling members and the entire nut is completely enclosed and enveloped.

As will appear from Fig. 6, the internal diameter of the guard housing 18 is such that when it envelopes the enclosed portions of the swivelling members 8 and 9, it just passes over the edges of the vertical walls 14 of said swivelling members 8 and 9, to hold the same against any spreading movement and thereby securely and permanently holding said swivelling members within the neck 7 of the nut 4, so long as said guard housing is in such enveloping position. As soon, however, as the guard housing 18 is raised into position shown in Fig. 3, said housing passes beyond the said vertical walls 14 of the swivelling members 8 and 9, and allows the bottom portions 10 of said members 8 and 9 to separate and withdraw from the neck 7 of the nut 4, and permits the removal of the entire guard assembly 1 from the nut, as shown in said figure.

In order to embody this assembly 1 in a unitary device and facilitate the handling of the same, I prevent the removal of the swivelling members 8 and 9 from the guard housing 18 by any suitable means, such as by bending over the ends of the upstanding portions at 22, as shown in the drawing. This permits the application and removal of the guard assembly as a unit.

The foregoing description is applicable to the embodiment shown in Fig. 9, except that the bottoms 10 of the two swivelling members 8 and 9 enter and are retained in the necked washer 6 immediately under the nut 4′, in which event as before stated the usual nut on the bolt or stud is not replaced by a necked nut, but is used in connection with the necked washer 6, as shown in said figure.

Having thus described the invention, the same is employed as follows:

When the guard assembly is to be employed with a necked nut, the usual nut on the bolt or stud is removed and the necked nut is set down tight with a wrench on the bolt or stud. The guard assembly 1 is then applied over the nut 4, as shown in Figs. 3, 4, and 5, and the shackle of a pad-lock 2 is passed through the complemental holes 17 in the upstanding portions 16 of the swivelling members 8 and 9, as shown in Figs. 1 and 5. This locks the guard casing 18 in its effective operative position and locks the swivelling members 8 and 9 within the neck 7 of the nut 4. No wrench or other implement can be then applied to the nut 4 to turn or loosen the same. Nor is any access to the nut possible until the pad-lock has first been removed, though the entire guard assembly will freely swivel around the nut without imparting any rotating influence thereto, so that a tool or implement applied to the guard assembly to rotate the same has no effect upon the nut whatsoever.

When the guard assembly is to be employed with a necked washer, as in Fig. 9, the nut 4′ is removed from the bolt or stud, the necked washer 6 is applied on the bolt or stud and the nut 4′ is set down tight with a wrench on said washer. The guard assembly 1 is

then applied as heretofore described. In this instance, the bottoms 10 of the two swivelling members 8 and 9 enter the neck 7′ formed in the washer 6 under the nut 4′, and the pad-lock applied as just described.

The invention does not contemplate a device in which the locking means is within the guard housing, or is self contained within the device. Such a construction is not compatible with the inventive purpose of the device, which is primarily designed to be employed in connection with any ordinary form or type of pad-lock which the user may desire to apply thereto. Any self contained lock would obviously limit the device to the particular locking mechanism supplied as an integral part of the device by the manufacturer thereof, and would not permit the user his choice of locks, while the derangement or breaking of such self contained locking mechanism would destroy the usefulness of the entire device.

The result of this system of guarding a nut against the application of a wrench or implement to rotate or loosen the same, is that an article or element which is secured in place by a bolt and nut cannot be stolen, surreptitiously removed or tampered with without first removing the pad-lock 2, while the guard assembly employed is of such simple construction that the cost of the same is but a few cents.

In addition to the stability and efficiency of the device, the same offers the very material advantage of neatness and compactness, and in many instances entirely obviates the use of chains and other complicated and expensive locking paraphernalia now generally employed.

Having thus fully described the invention, I do not wish to be understood as limiting myself to the construction shown and described as the same is susceptible to changes, alterations and modifications in the construction and arrangement of the parts, and I consider myself clearly entitled to all such changes and modifications as fall within the limit and scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having their bottoms provided with a circular opening and adapted to enter within and encompass the base of the neck in the said nut, said swivelling members including upstanding portions provided with complemental transverse holes, said guard assembly including a cup shaped guard housing having a top and a vertical side wall, the said top being provided with an opening through which the said upstanding portions pass, the said vertical side wall of the guard housing being adapted to envelope the said nut and to engage the said swivelling members to retain the same within the said neck in the said nut, said holes in said upstanding portions being adapted to receive a pad-lock on the outside of the said guard housing.

2. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having their bottoms providing a circular opening and adapted to enter within and encompass the base of the neck in the said nut, said swivelling members including upstanding portions provided with complemental transverse holes, said guard assembly including a cup shaped guard housing having a top and a vertical side wall, the said top being provided with an opening through which the said upstanding portions pass, the said vertical side wall of the guard housing being adapted to envelope the said nut and to engage the said swivelling members to retain the same within the said neck in the said nut, and locking means adapted to pass through the said holes in the upstanding portions of the swivelling member above the top of the said guard housing.

3. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having their bottom portions adapted to enter within and encompass the base of the neck in the said nut, said swivelling members including upstanding portions provided with complemental transverse holes, said guard assembly including a cup shaped guard housing having a top and vertical side wall, the said top being provided with an opening through which the said upstanding portions pass, the said vertical side wall of the guard housing being adapted to envelope the said nut and to engage the said swivelling members to retain the same within the said neck in the said nut, and locking means adapted to pass through said complemental holes in the swivelling members above the top of the said guard housing.

4. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having their bottom portions adapted to enter within and encompass the base of the neck in the said nut, said swivelling members including upstanding portions provided with complemental transverse holes, said guard assembly including a cup shaped guard housing having a top and vertical side wall, the said top being provided with an opening through which the said upstanding portions pass, the said vertical side wall of the guard housing being adapted to envelope the said nut and to engage the said swivelling members to retain the same within the said neck in the said nut.

5. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having

their bottom portions adapted to enter within the said neck in the said nut, said swivelling members including upstanding portions, said guard assembly including a guard housing having a top and a vertical side wall and an opening in said top through which the said upstanding portions pass, the said side wall of the guard housing being adapted to envelope the said nut and retain the swivelling members within the said neck in the said nut, and means for locking the said guard housing against movement on the said swivelling members.

6. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having their bottom portions adapted to enter within the said neck in the said nut, said swivelling members including upstanding portions, said guard assembly including a guard housing having a top and a vertical side wall and an opening in said top through which the said upstanding portions pass, the said side wall of the guard housing being adapted to envelope the said nut and retain the swivelling members within the said neck in the said nut.

7. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having portions adapted to enter the said neck in the said nut, said guard assembly including a guard housing having a top and a vertical side wall adapted to envelope the said nut, the said swivelling members being provided with means on the outside of the guard housing to receive locking means for retaining the guard assembly in operative position.

8. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having portions adapted to enter the said neck in the said nut, said guard assembly including a guard housing adapted to encompass the said nut and retain the said swivelling members within the said neck in the said nut, the guard assembly being provided with means on the outside of the guard housing to receive locking means for retaining the same in operative position.

9. A device of the character described including a necked nut, a guard assembly including a pair of swivelling members having portions adapted to enter the said neck in the said nut, said guard assembly including a guard housing adapted to encompass the said nut, the device including means on the outside of the guard housing to receive a locking means for retaining the guard assembly in operative position.

10. In a device of the character described, a guard assembly including a pair of swivelling members and a guard housing, the said swivelling members having portions adapted for interlocking engagement with a neck on a bolt assembly, and having upstanding portions, the guard housing being provided with an opening through which said upstanding portions extend, and having a side wall adapted to encompass the nut of the bolt assembly and retain the said swivelling members within the said neck therein, the said upstanding members being provided with means on the outside of the guard housing to receive a locking means for retaining the guard assembly in operative position.

11. In a device of the character described, a guard assembly including a pair of swivelling members and a guard housing, the said swivelling members having portions for interlocking engagement with a neck on a bolt assembly, the guard housing having a side wall for enveloping the nut of the bolt assembly and to retain the said swivelling members within the said neck therein, the device being provided with means on the outside of the guard housing to receive a locking means for retaining the guard assembly in operative position.

12. In a device of the character described, a guard assembly including a pair of swivelling member and a guard housing, the said swivelling members having portions for interlocking engagement with a neck on a bolt assembly, the guard housing having a side wall enveloping the nut of the bolt assembly, the device being provided with means on the outside of the guard housing to receive a locking means for retaining the guard assembly in operative position.

13. In a device of the character described, a guard assembly including a swivelling member and a guard housing, the said swivelling member having means for interlocking engagement with a bolt assembly, the guard housing having an opening through which the swivelling member extends and having a side wall for enveloping the nut of the bolt assembly, the said swivelling member having means on the outside of the guard housing to receive a locking means for retaining the guard housing in operative position.

14. In a device of the character described, a guard assembly including a swivelling member and a guard housing, said swivelling member having means for interlocking engagement with a bolt assembly, the guard housing having a side wall for enveloping the nut of the bolt assembly, the device being provided with means on the outside of the guard housing to receive a locking means for retaining the guard housing in operative position.

15. In a device of the character described, a guard assembly including a swivelling member having means for interlocking engagement with a nut on a bolt assembly, the guard assembly including a guard housing having an opening through which the swivelling member extends and having a side wall

for enveloping the nut of the bolt assembly, the swivelling member being provided with means on the outside of the guard housing to receive a locking means for retaining the guard housing to operative position.

16. In a device of the character described, a guard assembly including a swivelling member and a guard housing, the swivelling member having means for interlocking engagement with a nut of a bolt assembly, the guard housing having a side wall for enveloping the nut of the bolt assembly, the device being provided with means on the outside of the guard housing for retaining the guard housing in operative position.

17. A device of the character described including means for effecting a swivelling connection with the nut of a bolt assembly, and means for guarding the nut of the bolt assembly against the application of a wrench thereto to rotate the nut, the device being provided with means on the outside of the nut guarding means to receive a locking means to retain the nut guarding means in operative position.

18. A device of the character described including means for effecting a swivelling connection with a bolt assembly, and means for guarding the nut of the bolt assembly against the application of a wrench thereto to rotate the nut, and means on the outside of the nut guarding means for locking the device in operative position.

19. A device of the character described including means for guarding the nut of a bolt assembly against the application of a wrench thereto to rotate the nut, and means for effecting a swivelling connection with the bolt assembly and adapted to carry a lock for retaining the nut guarding means in operative position.

20. A device of the character described including means for guarding the nut of a bolt assembly against the application of a wrench thereto to rotate the nut, and means for effecting a swivelling connection with the bolt assembly, the last mentioned means being provided with means on the outside of the nut guarding means to receive a lock for retaining the nut guarding means in operative position.

In testimony whereof I affix my signature.

CHARLES HUGH DUFFY.