H. P. EILERS.

LOCKING NUT.

APPLICATION FILED DEC. 12, 1913.

1,123,505. Patented Jan. 5, 1915.

Fig. 1.

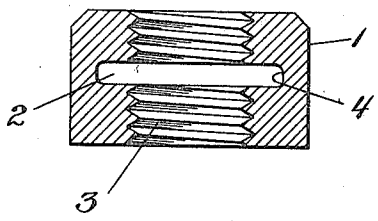


Fig. 2.

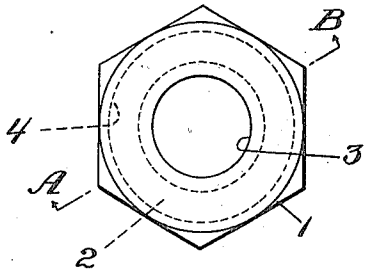


Fig. 3.

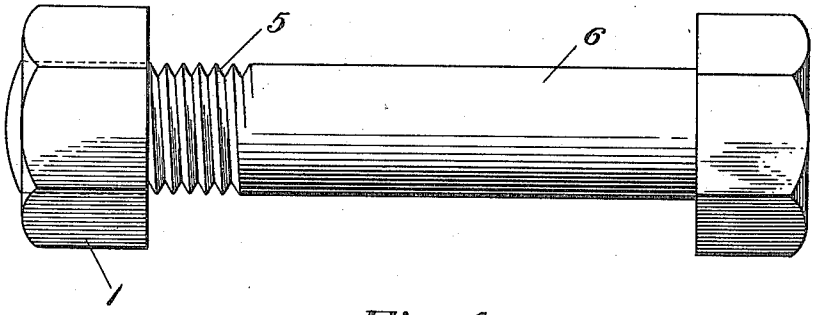
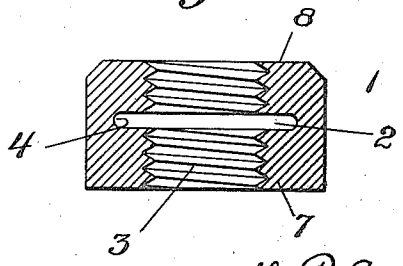


Fig. 4.



Witnesses:
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H. P. Eilers Inventor
By his Attorney John D. Morgan

UNITED STATES PATENT OFFICE.

HIO P. EILERS, OF NEW YORK, N. Y.

LOCKING-NUT.

1,123,505. Specification of Letters Patent. Patented Jan. 5, 1915.

Application filed December 12, 1913. Serial No. 806,210.

To all whom it may concern:

Be it known that I, HIO P. EILERS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Locking-Nuts, of which the following is a specification.

The invention relates to lock nuts, and more particularly to nuts which lock without the use of other members than the nut and the bolt or threaded rod upon which the nut threads or screws.

The objects and advantages of the invention will in part be set forth hereinafter and will in part be obvious herefrom.

The invention consists in the novel articles, parts, combinations, and improvements herein shown and described.

The accompanying drawings, referred to herein and forming a part hereof, illustrate one embodiment of the invention, and serve in connection with this description to explain the principles thereof.

Of the drawings: Figure 1 is a central sectional elevation, on line A—B of Fig. 2, of a nut constructed in accordance with the principles of the invention; Fig. 2 is a plan of the entire nut which is shown in section in Fig. 1; Fig. 3 is an elevation of a bolt including such a nut; and Fig. 4 is a view corresponding to Fig. 1, but with the two parts or sections of the thread displaced toward each other.

Referring to the accompanying drawings, illustrating by way of example, one embodiment of the invention a nut 1 is shown, of the well-known hexagonal form. Interiorly of the nut is a cavitated portion 2, extending from the thread 3 into the structure of the nut, said cavitated portion being preferably perpendicular to the axis of the thread and also preferably of circular or annular form, and circumscribing the interior threaded opening of the nut, as shown in Figs. 1 and 2. The peripheral wall of the cavitated portion is indicated by reference numeral 4, and when desired the cavitated portion may be so proportioned that its peripheral wall may be very close to the exterior surface at the middle of the "flats" of the nut, leaving relatively thin walls at such middle parts of the "flats," said wall gradually increasing to relatively thick portions at the edges of the nut between the "flats." The thread 3 is the same in lead on both sides of the cavity 2, that is, the lead of the thread is continuous as though the cavity did not exist. The thread on one side of the cavitated portion is displaced very slightly with respect to the thread on the other side of said cavitated portion in the axial direction of the thread 3. This relative displacement of the two parts of the thread is just sufficient to take up the play or lost motion between the thread 3 of the nut and the thread 5 of the rod or bolt 6. The amount of the relative displacement or set of the two parts of the thread may be governed by the amount of lost motion or play usually found in practice.

In manufacturing the nut, it may be first cavitated, then the thread may be tapped, and such tapping will preserve the lead the same on both sides of the cavity. Fig. 1 of the drawings constitutes an illustration of the nut at this stage. The nut may then be subjected to pressure in the direction of its axis, thereby closing together the cavitated interior sufficiently to give a slight permanent set or displacement to the two portions of the thread on either side of the cavity, sufficient to take up such lost motion as may exist between the thread of the nut and the thread of the bolt. By reason of the set given to the nut, when the nut is screwed on to the bolt, the thread of the nut on either side of the cavity will firmly grip the opposite faces or sides of the thread on the bolt. That is, in that part of the nut thread from the cavity 2 to the inner face 7 of the nut, the side or sides of the nut thread from the crown to the root which is toward the cavity will be brought firmly and strongly into gripping contact with the corresponding face of the bolt thread. On the other hand, in the part of the nut thread from the cavity 2 to the outer face 8 of the nut, the side or sides of the nut thread from the crown to the root which is toward the cavity will be brought into like gripping contact with the corresponding face of the bolt thread. Thus the gripping faces of the thread on either side of the cavity will be working in opposition to each other and will have a clamping or vise-like action. By turning or screwing up the nut sufficiently, it will be held firmly against jarring or turning loose by this coaction of the nut and bolt threads one with the other. In practice the set or displacement given to the nut thread may be made such that the nut will lock firmly at a desired point on

the bolt irrespective of any parts or surfaces except the nut and bolt themselves. It is thus immaterial whether or not the nut contacts with or jams against a part through which the bolt may pass, and the nut also can be made to lock with the end of the bolt just flush with the outer face 8 of the nut. The cavity 2 may be utilized, if so desired, to store a lubricant. The lubricant is inserted in the cavity before the nut is screwed on the bolt, and will assist in the unscrewing of the nut.

In actual manufacture of nuts in accordance with my invention, the process or steps pursued may be briefly as follows, and as set out in fuller detail in my copending application, Serial No. 835,471, filed April 30, 1914, for the process of manufacturing such nuts. The nut is blanked in the usual manner either cold or hot-pressed. After being so blanked, the nut is cavitated at some point along the interior aperture, the cavity being preferably annular. The width and likewise the depth of the cavitation will be dependent upon the size of the nut, and the amount of set to be given thereto as later more fully described. The nut so cavitated is then tapped in the usual manner, the threads being in lead the same on both sides of the cavity as though the cavity did not exist. The nut is then subjected to pressure in the direction of the axis of the bolt thereby closing together the interior portion of the nut sufficiently to give a slight permanent set to the two portions of the thread on either side of the cavity sufficient to take up such lost motion as may exist between the thread of the nut and the thread on the bolt. The set can be governed by the amount of lost motion or play usually found in practice. When the nut is screwed on to the bolt, by reason of the set given to the nut, the thread on either side of the cavity will firmly grip opposite sides of the thread on the bolt.

It will be understood from this description and illustration of the present preferred embodiment of my invention that a nut and bolt are provided realizing the objects and advantages herein set forth, together with other objects and advantages which will be obvious or which are ascertainable from use of the invention; and it will be understood that changes from such preferred embodiment may be made within the scope of the accompanying claim without departing from the principles of my invention and without sacrificing its chief advantages.

What I claim as my invention and desire to secure by Letters Patent is:—

An unassembled nut having an interior thread, and an internal cavity interrupting said thread, the thread being the same in pitch and inclination on both sides of said cavity, the thread on one side said cavity having a slight permanent set or displacement axially of itself with respect to the thread on the other side of said cavity.

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

HIO P. EILERS.

Witnesses:
JOHN D. MORGAN,
MARGARET WALSH.