April 11, 1939. E. R. MARCHOU 2,154,174

DEFORMABLE SELF-LOCKING NUT

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Fig. 1

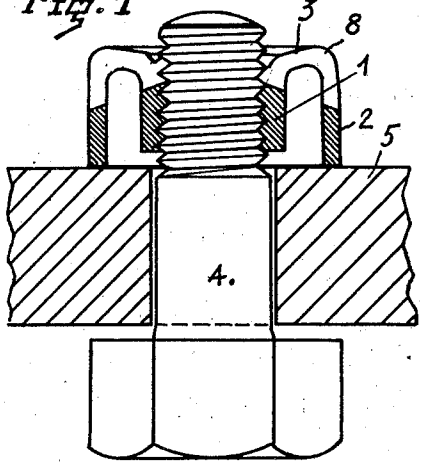
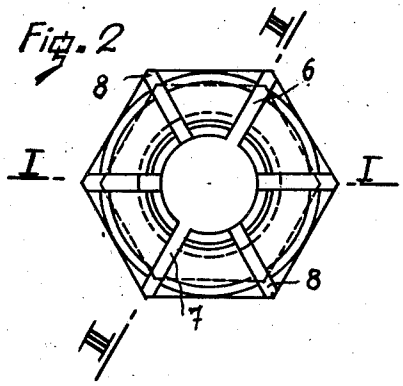


Fig. 2



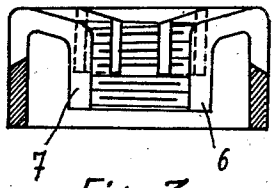
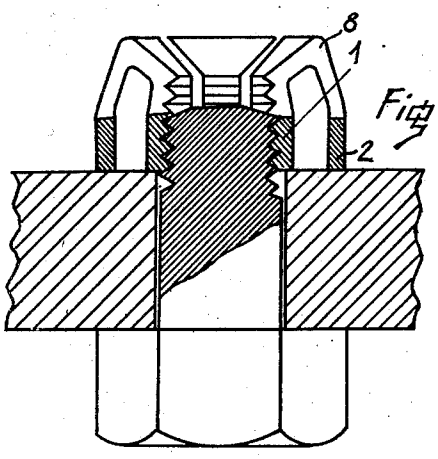


Fig. 3

Fig. 4



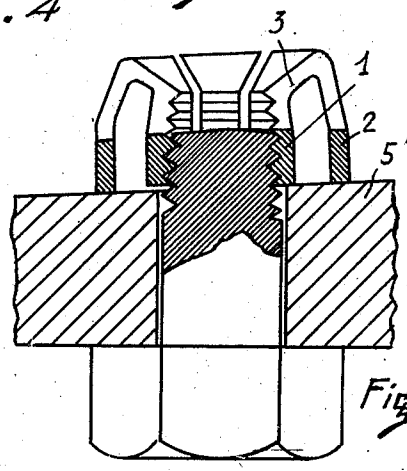


Fig. 5

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DEFORMABLE SELF-LOCKING NUT

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4 Claims. (Cl. 151—21)

The present invention relates to a deformable nut which automatically locks itself when tightened and the bearing face of which automatically sets itself parallel with the face of the part to be clamped.

The nut according to the invention is characterised by the fact that it comprises an inner tapped part or barrel and an outer part or skirt which is arranged parallel with the barrel, said two parts being connected together by a web which is substantially perpendicular to the axis of the nut on the opposite side to the part on which the nut is tightened and the barrel being shorter than the skirt.

According to another feature of the invention, the barrel is slit along one or a plurality of generatrices so as to make the part resilient.

According to a further feature of the invention, the web, substantially perpendicular to the axis of the nut, and optionally the upper parts of the barrel and of the skirt are slit, for the same purpose.

Other advantages and peculiarities of the invention will become apparent from the ensuing description of embodiments which are given by way of example with reference to the accompanying drawing, in which:

Fig. 1 shows the nut according to the invention in vertical section along the line I—I of Fig. 2, and not tightened on a bolt shown in outside elevation.

Fig. 2 shows a top plan view of the nut.

Fig. 3 is a section along the line III—III of Fig. 2.

Fig. 4 is a view similar to Fig. 1, but showing the nut locked on the bolt.

Fig. 5 is a similar view to the previous one, but showing the nut bearing on a face which is oblique relatively to the axis of the bolt.

As stated above, the nut according to the invention comprises three parts, viz: a barrel 1 which is internally tapped and forms the nut proper, a skirt 2 and a web 3 which is perpendicular to the axis and connects the barrel to the skirt. The barrel 1 is shorter than the skirt 2, as shown in an exaggerated manner in Fig. 1, in which the nut is seen screwed on a bolt 4, but not tightened on the part 5. In this position the skirt 2 bears against said part 5, whereas the barrel 1 is a certain distance from said part. By means of this arrangement, it can be seen that when the nut is tightened in such a manner that the head of the bolt comes into contact with the part on one side and the skirt 2 on the other, if the tightening action is continued, which is possible since the barrel has not yet touched the part, the reaction of the skirt on the part tends to cause a gripping of the barrel on the thread of the bolt, as seen in Fig. 4.

This action is enhanced by the fact that a number of slits may be provided in the nut which make the latter resilient. In the first place, the barrel may be slit parallel with the axis of the nut over its entire height, along one or a plurality of planes passing through the axis. In the drawing two diametrically opposite slits 6 and 7 of this kind have been provided, through which pass the section plane III—III of Fig. 3. Said slits impart resiliency to the barrel and help the latter to grip the bolt as explained above and as seen in Fig. 4.

In addition to said slit or slits in the barrel, other slits 8 may be provided in the web 3 and in the upper part of the barrel and of the skirt. In the drawing one of same has been provided along each of the angles of the nut. This imparts resiliency to the web 3 and considerably facilitates the downward movement of the central portion of the latter when the nut is screwed home, as seen in Fig. 4.

It will be seen that with the nut according to the invention, contrary to what occurs with ordinary nuts, the part carrying the tapping contracts more and more on the bolt as the barrel is more strongly urged towards the tightening plane and the nut is screwed up tighter.

In Fig. 5, the case has been shown in which the nut bears on a surface 5' which is not perpendicular to the axis of the bolt. The extreme part of the bolt has not been shown so as to enable the operation of the device to be better understood. When the nut is first screwed on the bolt and the skirt 2 comes into contact with the surface 5', it only bears on the latter on the highest side of same, that is to say on the right hand side in Fig. 5. When the tightening is continued, this part of the skirt, by reacting on the surface 5', first of all causes the web 3 to bend on the same side until the other side of the skirt 2 also bears on the surface 5', after which the device operates as above, but, in the extreme tightened position, the right hand part (Fig. 5) of the barrel 1 is more contracted against the bolt and the corresponding part of the partition 3 is more bent, as can be seen in an exaggerated manner in said figure, but results are nevertheless obtained which are not obtained with an ordinary nut, viz: that the whole periphery of the device is closely pressed against the surface 5' with the greatest possible adherence, that the barrel 1 re-

mains substantially in the axis of the bolt and that the stem of the latter remains in its initial axis without undergoing the deformation which would be caused by the tightening of an ordinary nut which bears against a tightening plane which is not perpendicular to the axis of said bolt.

The nut according to the invention has a great number of advantages with respect to ordinary nuts and with respect to the so-called "self-locking" nuts which have been constructed hitherto. Such nuts are nearly always made in a plurality of parts, thereby considerably increasing their cost of manufacture or again said nuts have a special thread which is difficult to construct and furthermore costly to manufacture, or again they are provided with locking projections which decreases their strength and makes their manipulation for screwing and unscrewing complicated and unpractical. There is nothing of this kind in the nut according to the invention, which furthermore has with respect to ordinary nuts the advantage of being lighter for the same size and of producing a particularly efficient locking. Said nut can furthermore be manufactured at very low cost since it has a standard thread and is in a single piece of the same mass; it can, in particular, be obtained by stamping, thereby considerably increasing the strength of the metals, and permits of the use of ductile or light metals; it does not require any special tool for tightening or loosening since it can be made in standard dimensions. It will be noted that the nut according to the invention constantly exerts a pull on the bolt, since the barrel is always urged in this direction by the resiliency of the whole device. The play which occurs in use owing to the elongation of the stem of the bolt or the caulking of the bearing surfaces of the head of the bolt and of the nut or of the assembled parts and which is one of the reasons for the loosening of bolts, is thus automatically taken up. A particular advantage of the nut according to the invention is that it eliminates the necessity for using the ordinary resilient lock washer.

It is of course understood that the invention has only been described and illustrated in a purely explanatory and nonlimitative manner and that it be subjected to any variation or modification of detail in accordance with its spirit. In particular, the nut according to the invention could have a barrel which is as long as or longer than the skirt and moves in an appropriate housing, without changing the invention.

I claim:

1. A self-locking nut comprising an inner tapped portion, an outer portion concentrically surrounding the inner portion and forming a skirt extending beyond the inner portion at one end, and a web connecting said two portions together at the other end, said web and the adjacent inner and outer portions having radial slits, the slits being also parallel to the axis of the nut through the connecting web.

2. A self-locking nut comprising an inner tapped portion, an outer portion concentrically surrounding the inner portion and forming a skirt extending beyond the inner portion at one end, and a web connecting said two portions together at the other end, said web being provided with a plurality of radial slits, and said inner portion being provided with a radial slit along its entire length.

3. A self-locking nut comprising an inner tapped portion, an outer portion concentrically surrounding the inner portion and forming a skirt extending beyond the inner portion at one end, and a web connecting said two portions together at the other end, said web and the inner and outer portions having radial slits, the slits along any one radial plane being continuous from the two portions through the connecting web, the slits being also parallel to the axis of the nut through the connecting web.

4. A self-locking nut comprising an inner tapped portion, an outer portion concentrically surrounding the inner portion and forming a skirt extending beyond the inner portion at one end, a web connecting said two portions together at the other end, said web and the adjacent ends of the inner and outer portions being provided with slits cut along diameters of the nut, and said inner portion being also provided with slits along its entire length cut on a diameter of the nut.

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