

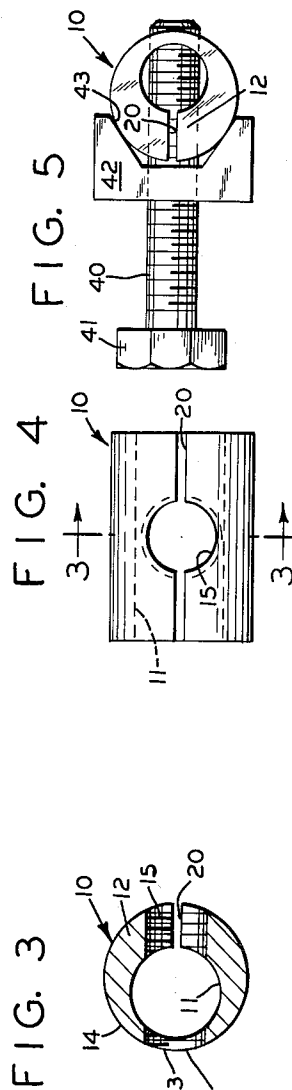
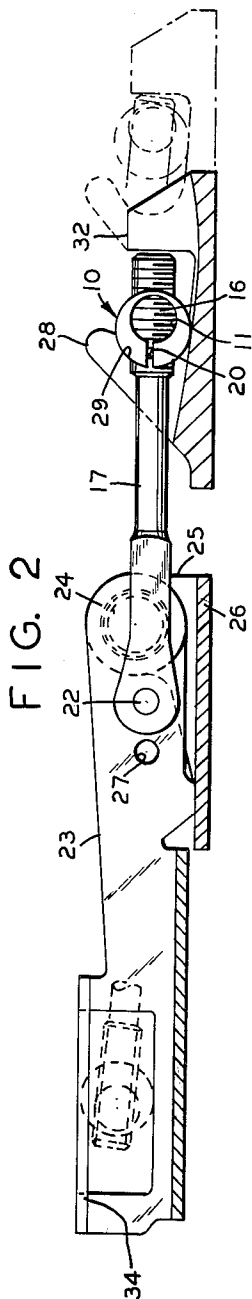
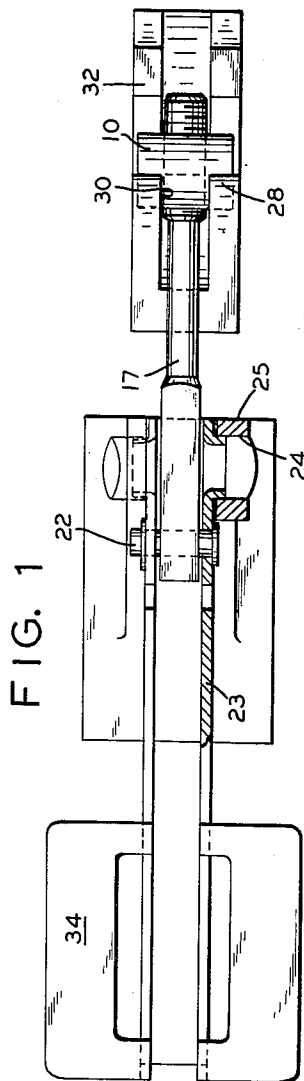
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TOGGLE LATCH

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TOGGLE LATCH

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This invention relates to latch fasteners and relates more particularly to a toggle fastener having a self-locking barrel type of nut used at the outer or securing end of a primary lever. Trunk latches for securing a trunk cover in closed position generally have a bail type of draw loop carried by a hinged primary lever on the trunk cover and the bail engages a suitable abutment or hook element on the trunk. When the lever is moved to locked position, the two relatively movable sections of the housing are tightly drawn together and are retained in the locked position by the act of having moved the lever to a past center position.

This type of latch has wide application in aircraft panels and in many other places where the parts must be securely locked together and wherein a considerable multiplication of force is sometimes necessary to urge the movable panel the final distance just prior to the parts being placed in locked position.

The latch fastener of the present invention uses a transverse abutment in the form of a split nut at the outer end of a draw bar instead of the bail type of attachment previously mentioned, and this generally T-shaped draw bar is received in a centrally slotted bracket or receptacle carried by the fixed member to which the panel is to be secured. The improved split nut which forms the transverse portion of the T-shaped draw bar is of cylindrical or barrel shape with a longitudinal bore and has a threaded side wall opening which receives the outer end of the draw bar, which is threaded, so as to permit movement of the nut thereon to an adjusted, fixed position to produce a looser or tighter latching action.

An important object of the present invention is to provide a novel toggle latch employing a barrel shaped split nut of this character which has a self-locking action on the threads at the outer end of the draw bar with a persisting torque of about 4 to 6 pounds for most types of application. To accomplish this result the longitudinal bore in the nut is eccentric to the major axis leaving a thin wall and an opposed thicker wall, the latter one of which has the threaded opening for the draw bar earlier referred to, and this wall has a narrow longitudinal slot extending from end-to-end, the slot passing through the threaded opening.

The barrel shaped abutment at the outer end of the draw bar which is received within a generally C-shaped bracket having a slot for the bar has many uses other than in the latch fastener earlier described. The curved contour of the bracket is so proportioned as to cause this curved wall to exert a compressive action on the nut when a draw bar or bolt is under tension, thus more firmly receiving the nut thereon and eliminating or at least greatly reducing the possibility of stripping the threads.

Another object of the invention is to provide an improved tension latch employing the barrel nut as an important feature thereof and providing a structurally and functionally improved latch fastener.

In the drawing:

FIG. 1 is a plan view, partially in section, of a toggle latch embodying the present invention.

FIG. 2 is a central section taken through the toggle latch of FIG. 1.

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FIG. 3 is a section taken through the barrel nut which is mounted at the outer end of the draw bar, the section being taken on line 3-3 of FIG. 4.

FIG. 4 is a side elevation of the barrel nut.

FIG. 5 shows another application for the barrel nut of the present invention.

The split barrel nut 10 is of generally cylindrical shape and has a round eccentric bore 11 providing a thicker wall 12 and a thinner opposed wall 13 with inter-connecting tapered walls 14. The thicker wall 12 has a centrally disposed threaded opening 15 which receives the threaded end 16 of a draw bar 17. This wall further has a narrow slot 20 extending end-to-end and passing substantially through the center of the threaded opening. In most applications the opposed thinner wall 13 has a threaded opening 21 aligned with threaded opening 15.

The draw bar 17 is pivotally mounted at 22 on a channel shaped primary lever 23 pivoted at 24 in a sheet metal cage or bracket 25 having a base 26 which may be welded or otherwise secured to a structure which in most instances will be the movable panel. The primary lever 23 has a second pivot hole 27 to allow for adjustability, this second hole being used for maximum take-up and minimum mechanical advantage.

The barrel nut at the outer end of the draw bar is received in a receptacle or hook element 28 which is suitably secured to the other or fixed structure and which may be die-cast. This receptacle has an upwardly extending, generally C-shaped transverse socket 29 provided at its center with a longitudinal slot 30 to receive the draw bar. A knock-open abutment 32 extends upwardly adjacent the rear end of the base of the receptacle and if the parts do not readily release upon arcuate movement of the primary lever towards the receptacle the outer end of the draw bar, acting against the abutment, forces the structure apart. This position of the parts is shown in broken lines at the right hand end of FIG. 2. Also, in FIG. 2 at the left hand end there is shown in broken lines the outer end of the draw bar 17 and the barrel nut 10 in stowage position when the housing cover or the removable panel are in open position. This end of the primary lever 23 has laterally extending handle sections 34.

The application of the split barrel nut 10 shown in FIG. 5 illustrates one of the many applications of the invention. There is shown at 40 a threaded bolt with a head 41. A V block 42 has two inclined surfaces 43 which engage the outer surface of the thicker section 12 of the nut which is split at 20. Thus as the bolt on the nut is tightened the inclined sides of the V block cause the opposed segments forming the thickened section to exert a firm thread locking action on the bolt and secure all of the advantages of a lock nut with a fiber insert but at a far lower price. It also gives a tight fit on the threads without the usual thread tolerances.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that many modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and range of equivalency of the claims are intended to be included therein.

What is claimed is:

1. A nut of generally cylindrical shape and having an eccentrically disposed bore extending from end-to-end and forming opposed thinner and thicker walls, said walls

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having aligned threaded openings therein, the thicker wall having a narrow longitudinal slot extending end-to-end and passing through the opening therein.

2. A nut of generally cylindrical shape and having an eccentrically disposed bore extending from end-to-end and forming opposed thinner and thicker walls, said latter wall having a threaded opening therein and a narrow longitudinal slot extending from end-to-end and passing through said threaded opening therein.

3. The combination of a split nut of generally cylindrical shape and a substantially V-shaped keeper therefor which receives and constricts the nut circumferentially, said nut having a longitudinal bore extending from end-to-end, the wall of the nut having a threaded opening therein and a narrow longitudinal slot extending through said opening.

4. A toggle latch for securing two structures together and comprising a base secured to one structure and a receptacle secured to the other structure, said receptacle having a generally C-shaped socket and having a central longitudinal slot therein, a primary lever pivoted at one end thereof on the base and a draw bar, threaded at its outer end, pivoted at its inner end on the lever at a point spaced from the lever pivot, said draw bar being received in said slot when the latch is fastened, an abutment carried on the threaded end of the draw bar and comprising a nut of generally cylindrical shape and having an eccentrically disposed bore extending end-to-end and forming opposed thinner and thicker walls and having aligned threaded openings therein, the thicker wall having a narrow longitudinal slot extending end-to-end and passing through the opening therein.

5. A toggle latch for securing two structures together and comprising a base secured to one structure and a receptacle secured to the other structure, said receptacle having a generally C-shaped socket and having a central longitudinal slot therein, a primary lever pivoted at one end thereof on the base and a draw bar threaded at its outer end, pivoted at its inner end on the lever at a point spaced from the lever pivot, an abutment carried on the threaded end of the draw bar which is received within said socket when the latch is fastened and com-

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prising a nut of generally cylindrical shape and having an eccentrically disposed bore extending end-to-end and forming opposed thinner and thicker walls and having aligned threaded openings therein, the thicker wall having a narrow longitudinal slot extending end-to-end and passing through the opening therein, the draw bar being received in the longitudinal slot when the latch is fastened, the contour of the socket being such as to constrict the nut on the threads when the draw bar is under tension.

6. An elongated nut of cylindrical shape and formed with generally round, opposed end walls and having an eccentric longitudinal bore extending between said end walls and providing relatively thicker and thinner side walls, said nut having aligned threaded openings extending through said opposed side walls perpendicular to said bore, the thicker wall having a longitudinal slot extending from end to end and through the threaded opening therein, said slot permitting the wall sections lying on opposite sides of the slot to exert a compressive action on the threads of a stud positioned in said threaded opening in said wall when the walls on opposite sides of the slot are compressed.

7. An elongated nut of generally cylindrical shape which is substantially circular in cross section and having two bores extending therethrough at right angles to each other, one of said bores extending longitudinally and being positioned eccentrically of the cylindrical nut, thus providing relatively thicker and thinner side walls, and the other bore being threaded and passing through the thicker and thinner walls, said thicker wall having a longitudinal slot extending from end to end, said slot permitting the wall section lying on opposite sides of the slot to exert a compressive action on the threads of a stud positioned in said threaded opening in said wall when the walls on opposite sides of the slot are compressed.

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