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NUT OR BOLT LOCKING DEVICE

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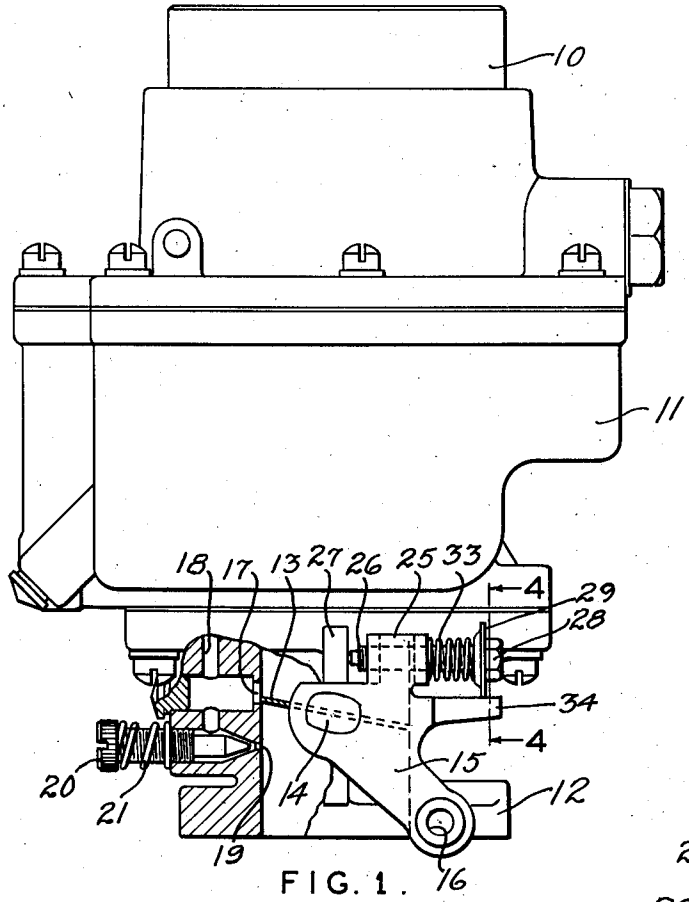


FIG. 1.

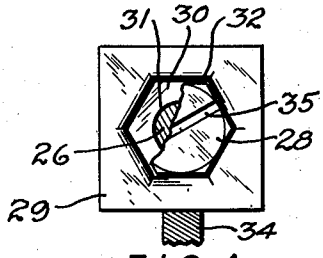


FIG. 4

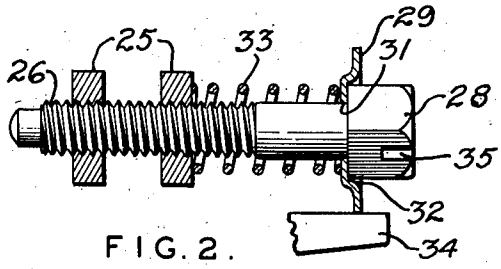


FIG. 2.



FIG. 5.

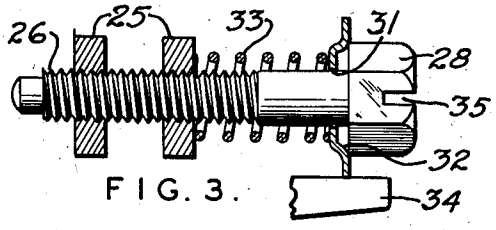


FIG. 3.

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NUT OR BOLT LOCKING DEVICE

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2 Claims. (Cl. 151—32)

This invention relates to locking devices for nuts or bolts and may be applied with particular utility to the throttle adjusting screw of an automotive carburetor. This screw is carried by the throttle arm and engages a stop to limit the maximum closing movement of the throttle valve and thereby establish the idling speed of the engine. For various reasons, it is frequently necessary to change the adjustment of this screw and, therefore, it cannot be set in such a manner that adjustment thereof will damage the parts. Various yielding locking devices have been tried for fixing the adjusting screw in its adjusted position, but these have not been wholly successful, largely because the vibration and jolting of the vehicle during operation causes the screw to creep, either increasing or decreasing the idling speed. An extra locking nut often cannot be used because the limited space prevents the application of a tightening wrench thereto. These conditions are greatly accentuated in military vehicles, such as tanks, which may vibrate violently in service.

An object of the present invention is to provide means for effectively locking a nut or bolt head against rotation due to vibration and jolting in service, while permitting adjustment of the nut, bolt, or screw when rotation thereof is enforced by a wrench or screw driver.

This object and other more detailed objects hereafter appearing are attained by the device illustrated in the accompanying drawing in which:

Fig. 1 is a side view of a carburetor, partly sectioned, having the novel locking device applied to the idle adjusting screw.

Figs. 2 and 3 are enlarged, detail sections taken along the axis of the adjusting screw mounting and illustrating the lock washer in set and released positions, respectively.

Fig. 4 is an enlarged section on line 4—4 of Fig. 1, and

Fig. 5 is a central transverse section through the washer.

The carburetor shown in Fig. 1 is of a more or less conventional type having a downdraft mixture barrel 10, constant level chamber 11, and flange 12 at the lower end for attachment to the engine intake manifold (not shown). The discharge of mixture from the lower end of the barrel is controlled by a butterfly throttle valve 13 mounted on a shaft 14 to one end of which is rigidly fixed a throttle arm 15. Arm 15 has a hole 16 for attachment of linkage extending to the accelerator pedal in the driver's compartment. An idling port 17 is positioned in the wall of the barrel adjacent the edge of the throttle valve, when closed, and connects with the fuel bowl by a passage 18. A second idling port 19 is adjustably controlled by a screw 20 resiliently held in adjusted position by a coiled spring 21. Screw 20 adjusts the richness of the idling discharge.

Formed on throttle arm 15 is a threaded boss 25 receiving idling speed adjusting screw 26 which engages a fixed abutment 27 on the outside of the carburetor barrel for limiting the closing position of the throttle valve under the influence of the usual throttle return spring (not shown) and, consequently, determines the quantity of idling mixture discharged and the idling speed. Screw 26 has an hexagonal head 28 on the inside of which there is received a rectangular washer, generally indicated at 29, having an hexagonally indented central part 30 and a central hole 31 for receiving the adjusting screw. As shown in Figs. 2, 4, and 5, this indentation, which closely conforms to the shape and size of the screw head, is surrounded by walls 32 which are inclined axially and radially of the screw. A coiled spring 33 is compressed between this washer and boss 25 and urges the washer against the screw head.

A finger 34 projects from throttle arm 15 along screw 26 and has a flat upper surface engaging the lower edge of washer 29. This finger, thus, prevents rotation of the washer and, as long as screw head 28 is seated against the washer and in registry with indentation 30, head 28, likewise, cannot be rotated. However, in case a screw driver is inserted in the kerf 35 provided in screw head 28, or a wrench applied to the head, and rotation of the screw is enforced thereby, the inner corners of head 28 will ride spirally along inclined walls 32, as indicated in Fig. 3, to cause inward movement of the washer against spring 33. The screw can then be rotated a small amount in either direction until head 28 again snaps into washer indentation 30. This process can be repeated to either farther insert or withdraw the screw to obtain the desired adjustment. The arrangement effectively prevents creeping of the screw in either direction under the influence of vibration or jolting while permitting desired adjustment of the screw without in any way damaging the screw, throttle arm, or locking part.

Obviously, the device may be used for locking either a nut or a bolt head of non-circular shape where it is desired to re-set the same from time to time. Moreover, the arrangement of the circumferential shoulders on the screw or nut head and the complementary inclined cam surfaces on the washer may be reversed or otherwise changed.

The invention may be modified in these and other respects as will occur to those skilled in the art without departing from the spirit thereof and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

We claim:

1. A locking device for a nut or bolt head of non-circular shape comprising a washer having a central, indented part of substantially the same shape and size as said nut or bolt head and side walls inclined therefrom for receiving the same, a spring to be seated against the work for urging said washer against said nut or bolt head in nesting relationship therewith to thereby resist rotation of the latter, and means to resist rotation of said washer relative to the work, said inclined walls of said washer functioning as cam surfaces to move said washer away from said nut or bolt head, upon enforced rotation thereof, to permit adjustment of the nut or bolt.

2. A locking device for a nut or bolt head comprising a washer having a non-circular depression adapted to closely receive the nut or bolt head when the washer is applied to the bolt shank, a coiled spring for application about the bolt shank to urge said washer against the nut or bolt head so as to resist rotation of the latter, and means engageable by said washer to resist rotation of said washer relative to the work, said washer depression having outwardly and axially inclined side walls for cooperating with the edges of the nut or bolt head, when rotation of the latter is enforced, to release the nut or bolt for adjustment.

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