Feb. 28, 1967 C. S. LYON 3,306,639

EXTENSIBLE TORQUE ROD

Filed Oct. 2, 1964

FIG. 1

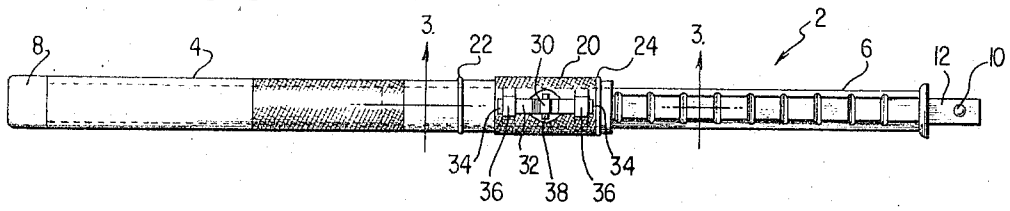


FIG. 2

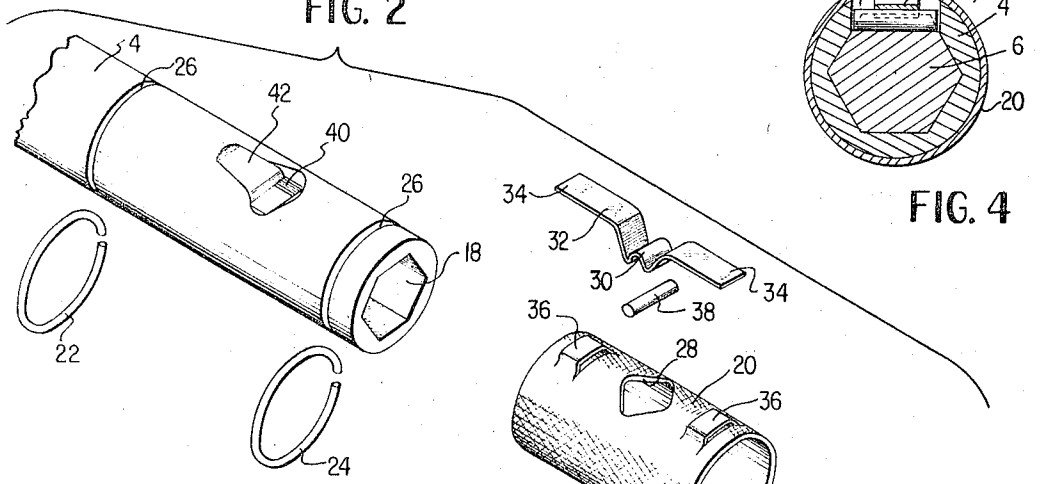


FIG. 4

FIG. 3

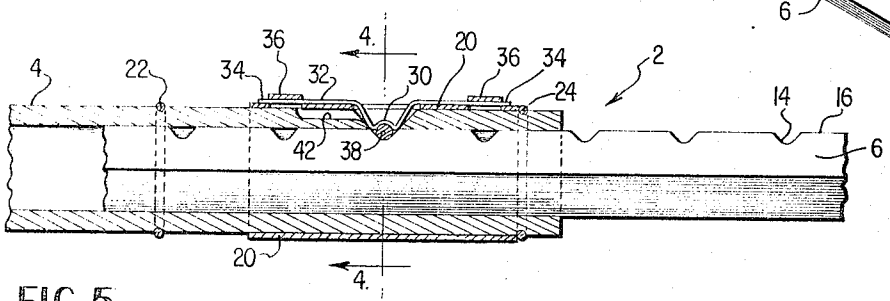
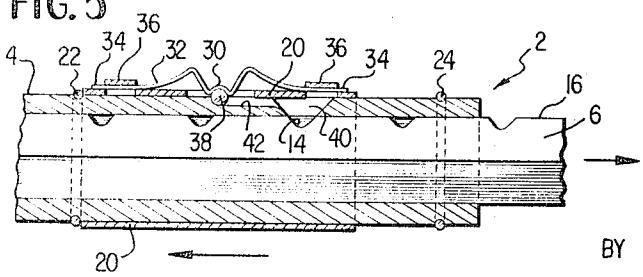


FIG. 5



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EXTENSIBLE TORQUE ROD

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This invention relates to extensible torque rods of the type used for driving socket wrenches and the like devices. It is an improvement over my prior Patent No. 2,893,765, of July 7, 1959, entitled, Extensible Torque Rod.

The primary object of this invention is to provide an extensible torque rod of extremely rugged characteristics comprising a pair of telescoping members which can be adjusted to any one of a number of selected over-all lengths and locked in adjusted position.

More particularly, it is intended now to provide a hexagonal rod telescopingly engaging in a tube having a hexagonal interior whereby relative rotation of the rod and tube is prevented. The rod is to be provided along one flat face with a series of transverse grooves, and around the periphery of the tube, which is preferably round, there is to be a longitudinally slidable sleeve carrying a spring-pressed roller which engages through a sleeve aperture into one of the transverse notches in the rod, in order to lock the rod and tube together. When it is desired to unlock the rod and tube so that they may be longitudinally adjusted, the sleeve is moved longitudinally along the tube so as to free the roller from its engagement with the rod notch. The improvement over the device disclosed in my prior patent resides in increased strength and durability, and in manufacturing advantages.

These and other objects will be apparent from the following specification and drawing, in which:

FIG. 1 is a plan view of my extensible torque rod;

FIG. 2 is an exploded view showing the parts in perspective;

FIG. 3 is a longitudinal cross section along the line 3—3 of FIG. 1 showing the sleeve and roller in locking position;

FIG. 4 is a transverse corss section along the line 4—4 of FIG. 3; and

FIG. 5 is a longitudinal cross section similar to FIG. 3, but showing the sleeve and roller in unlocking position.

Referring now to the drawing in which like reference numerals denote similar elements, the extensible torque rod **2** consists of a tube **4** in which telescopically engages a hex rod **6**. Tube **4** has on its free end a non-round surface **8** adapted to be driven by a wrench or similar driving element and hex rod **6** has on its free end a spring-biased ball **10** and a non-round driving surface **12** for receiving a socket or like device adapted to be driven by a torque rod **2**. Hex rod **6** has a series of transverse grooves **14** spaced along one flat face **16** thereof and a tube **4** has a hexagonal interior **18** which closely surrounds hex rod **6** so as to prevent relative rotation between tube **4** and rod **6**.

Longitudinally slidable around the exterior of tube **4** is a knurled sleeve **20** whose lengthwise movements are limited by split rings **22** and **24** engaging in annular grooves **26** in the surface of tube **4**. Sleeve **20** has a diamond-shape opening **28** through which engages a W-shape bend **30** of a spring strip **32** whose ends **34** fit through and are held by raised straps **36** on sleeve **20**. Engaged beneath the central portion of W-shape bend **30** is a roller **38** slightly shorter in length than the transverse width of diamond-shape opening **28** which, in locking position, fits through an aperture **40** in tube **4** and engages a select one of notches **14** in hex rod **6**. Part of the material at the outer surface of tube **4** is cut away to provide a ledge **42** for purposes described hereinbelow.

In operation, when it is desired to adjust the length of torque rod **2**, sleeve **20** is slid lengthwise to its FIG. 5 position, thereby withdrawing roller **38** from the transverse notch **14** on hex rod **6** in which it had previously been engaged and, instead, lodging roller **38** on ledge **42** on the exterior of sleeve **4**. In the FIG. 5 position of the parts, hex rod **6** is free to slide in tube **4** to the desired lengthwise position. When it is desired to lock tube **4** and hex rod **6** in lengthwise adjusted position, sleeve **20** is slid forwardly along rod **4** to its position in FIGS. 3 and 4, whereupon roller **38** snaps into one of transverse grooves **14**. It will be noted that ring **24** limits the sliding of sleeve **20** in one direction beyond the position in which roller **38** engages through aperture **40**, and ring **22** limits the sliding of sleeve **20** in the other direction beyond the position in which roller **38** lies at the end of ledge **42**. In event one of transverse grooves **14** does not happen to be immediately below aperture **40** at the time sleeve **20** is slid forwardly to its locking position, rod **6** and tube **4** are telescoped in one direction or the other until a transverse groove **14** comes beneath roller **38**, whereupon roller **38** steps into the transverse groove.

The invention is not limited to the details of the structure described and shown herein, but is intended to cover all substitutions, modifications and equivalents within the scope of the following claims.

I claim:

1. An extensible torque rod comprising: a rod member of polygonal cross-section having a series of longitudinally-spaced transverse grooves along one flat face thereof, a tube member having an interior of polygonal cross-section complementary with the rod member and telescopically engaging thereover in non-rotative relationship therewith, said members having surfaces on free ends thereof adapted respectively to engage driving and driven tools, said tube member having an aperture therethrough and having the material adjacent a side of said aperture which is disposed towards one end of said tube cut-away whereby to provide a ledge, a longitudinally slidable sleeve disposed around said tube in the region of said aperture, said sleeve having an opening therethrough and being longitudinally slidable on said tube between two positions, in the first of which positions said opening overlies said aperture and in the second of said positions said opening overlies said ledge, a spring strip having its length disposed axially on the exterior of said sleeve, means securing the ends of said spring strip to said sleeve, said strip having a substantially W-shape bend intermediate the ends thereof extending downwardly through the opening in said sleeve, and a roller engaged beneath said bend, said roller being biased by said spring strip to snap into one of the transverse grooves in the rod when said sleeve is in said first position and to ride up upon said ledge when said sleeve is moved to said second position.

2. The combination claimed in claim **1**, and means on said tube member for limiting the longitudinal sliding movement of said sleeve thereon between said first and second positions.

3. The combination claimed in claim **1**, said opening being substantially diamond-shaped and being slightly longer in the circumferential direction of the sleeve than the length of the roller.

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