Oct. 5, 1926. 1,602,367

J. H. MUTH

LOCK MEANS

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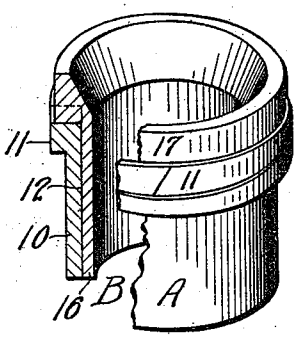


FIG. 1

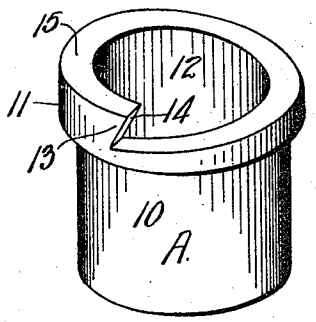


FIG. 2

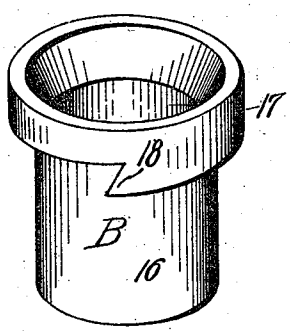


FIG. 3

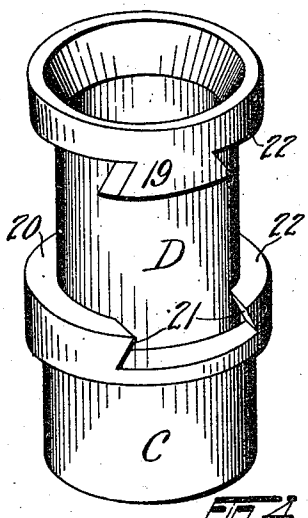


FIG. 4

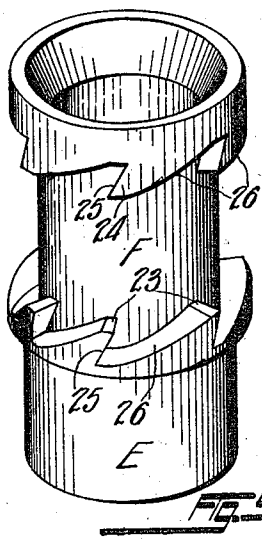


FIG. 5

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LOCK MEANS.

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My invention relates to lock means in which one or more members of a structure may be inserted into or removed from or held in certain relation to other members of the structure.

The main object of my invention is a simple and inexpensive lock means for such articles as guide bushing wherein one or more slip bushings can be inserted into or removed from a liner bushing without any auxiliary tools, which has the fewest possible parts, in which the parts do not get out of order, which is practically free from repairs, in which the locking means between the members of a structure is formed directly on the parts themselves, in which the members are held to each other longitudinally in both directions and radially in at least one direction, and in which the top of one of the members is always the same distance from a jig or in whatever other device the members are used.

I attain this object by the mechanism illustrated in the accompanying drawing in which:—

Fig. 1 is a perspective view, partly in section, of a complete guide bushing comprising nothing more than a liner bushing and a slip bushing and showing one design of a lock means for locking both of these bushings to each other longitudinally and of preventing rotation of one bushing in relation to the other in one direction.

Fig. 2 is a perspective view of the liner bushing of Fig. 1 showing one manner of forming one tooth thereon.

Fig. 3 is a perspective view of the slip bushing of Fig. 1 showing one tooth to engage the tooth of Fig. 2.

Fig. 4 is a perspective view of a complete guide bushing showing the slip bushing partly inserted into the liner bushing and also showing a modification of the tooth engagement between the two bushings.

Fig. 5 is a perspective view of a complete guide bushing showing the slip bushing partly inserted into the liner bushing and also showing another modification of the tooth engagement between the two bushings.

Similar reference characters refer to similar parts throughout the views.

In the several views of the drawing, I have illustrated my invention as applied to guide bushings; it is understood, however, that my lock means is applicable to other articles of a nature similar to guide bushings wherein a plurality of members are temporarily held in certain relations to each other.

The guide bushing illustrated in Figs. 1, 2, and 3 comprises nothing more than the liner bushing A and the slip bushing B; no other parts or appliances are necessary in the present invention.

The liner bushing A has the body portion 10, the head portion 11, on one end of this body portion, and the longitudinal bore 12.

As illustrated here, the outer end of the head 11 is formed with one tooth 13 extending longitudinally of the bushing having the side 14 thereof undercut or inclined in relation to the longitudinal axis of the guide bushing while the side 15 thereof is also inclined in relation to the longitudinal axis and is also inclined in relation to the side 15 and extends from the bottom of the side 14 inclinedly around on the end of the head 11 and terminates on the top of the side 14.

This arrangement provides an inclined face (15) on the end of the head 11 for the slip bushing to abut on longitudinally and also provides an abutment face for the slip bushing to abut on to prevent the rotation of the slip bushing in the liner bushing in one direction and also provides an undercut face (14) to force the slip bushing against the inclined face; the inclination between the sides 14 and 15 also provides a means for wedging or locking the tooth of the slip bushing to the tooth of the liner bushing.

The slip bushing B has the body portion 16 adapted to enter into and to be removed from the bore 12, and also has the head portion 17.

The under side of the head portion 17 is formed wth one tooth 18 extending longitudinally of the bushing and substantially a duplicate of the tooth 13 and the sides of the tooth 18 correspond to the sides 14 and 15 of the tooth 13.

The guide bushing shown here is designed to guide a tool rotating in the slip bushing in a right handed direction. It is observed that, when this tool rotates in the slip bushing and contacts the wall of the bore thereof, a certain amount of friction is created between this tool and this wall tending to rotate the slip bushing in the liner bushing.

Such rotation is here prevented by the tooth 18 abutting the tooth 13 on the side 14.

It is also observed that the slip bushing can not move longitudinally out of the liner bushing unless it is partly rotated left handedly since the undercut side 15 does not permit of such longitudinal movement unless the slip bushing is first rotated sufficiently far to permit the point of the tooth 18 to clear the point of the tooth 13.

From the foregoing description it appears clear now that the slip bushing can readily be inserted into the liner bushing by inserting the body portion of the slip bushing into the bore of the liner bushing and rotating the slip bushing right handedly until the tooth 18 abuts the tooth 13 whereupon the tooth 18 is wedged sufficiently tight between the sides 14 and 15 to lock the bushings to each other longitudinally and to prevent further rotation thereof.

In Fig. 4 I have shown a guide bushing also composed of nothing more than the liner bushing C and the slip bushing D with one tooth 19 formed longitudinally on the end of the liner bushing and a wider tooth 20 formed longitudinally on the slip bushing. The abutting faces 21 are disposed similar to the face 14 of Fig. 2 while the faces 22 are disposed at right angles to the longitudinal axis of the guide bushing and are not inclined as is the face 15 of Fig. 2. This arrangement of elements is a little more economical of manufacture but lacks the effect of the inclined face 15 and the slip bushing is not given the initial longitudinal movement which the inclined face produces when the slip bushing is rotated left handedly. The guide bushing of Fig. 4 has the advantage of preventing the rotation of the slip bushing in either direction in addition to preventing the longitudinal movement thereof although the wedging effect found in Fig. 1 is not so pronounced in this modification.

In Fig. 5 I have shown a guide bushing also composed of nothing more than the liner bushing E and the slip bushing F formed with a plurality of duplicate and longitudinally disposed teeth 23 and 24 between the two bushings. The sides 25 and 26 perform the same function as the sides 14 and 15 of Fig. 1, the only difference is the degree of inclination and consequent wedging action between these two sides.

The lock means of the present invention applied to the bushings shown in the drawing as well as to other articles of a similar nature, has a particular advantage in that it is easy of manufacture, has no parts built on or otherwise put onto the bushings or other members of an article to effect a locking means, all locking means are formed directly on the bushings or on the members of a similar article themselves, the head of the slip bushing or a surface of a similar member of a similar article always abuts the end of the liner bushing or of a similar member of a similar article which can easily be kept clean of chips and the like and in that the end of the slip bushing or of a similar member of a similar article is always the same distance from the liner bushing or other similar member and the jig or other device in which the guide bushing or other article is used so that a depth stop placed on the tool operating in the guide bushing for instance always abuts the head of the slip bushing at the same distance from the liner bushing or jig or other device to bore a number of holes to the same depth.

Modifications other than those shown and described may be made within the scope of the appended claims; therefore, without limiting myself to the precise constructions and arrangements of elements shown and described.

I claim:—

1. In combination, telescopable members, and lock means between said members comprising, a radial surface on one of said members, a corresponding radial surface on the other of said members to abut the first mentioned surface when said members are telescoped, teeth on each of said members and projecting longitudinally beyond other abuttable parts of said radial surfaces, and said teeth engaging each other to prevent the rotation of said members in relation to each other when said members are telescoped.

2. In combination, associable members, and lock means between said members comprising, a radial surface on one of said members, a corresponding radial surface on the other of said members to abut the first mentioned surface when said members are associated, teeth on each of said members and projecting longitudinally beyond other abuttable parts of said radial surfaces, said teeth engaging each other to prevent the rotation of said members in relation to each other when said members are associated, and the longitudinal faces of said teeth undercut to prevent longitudinal movement of said members in relation to each other when said members are associated.

3. A guide bushing comprising, a liner bushing having a radial surface, a slip bushing insertable into said liner bushing and having a radial surface corresponding to the first mentioned radial surface, teeth on each of said bushings and projecting longitudinally beyond other abuttable parts of said radial surfaces, said teeth engaging each other to prevent the rotation of said bushings in relation to each other, and the longitudinal faces of said teeth undercut to prevent longitudinal movement of said bushings in relation to each other.

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