

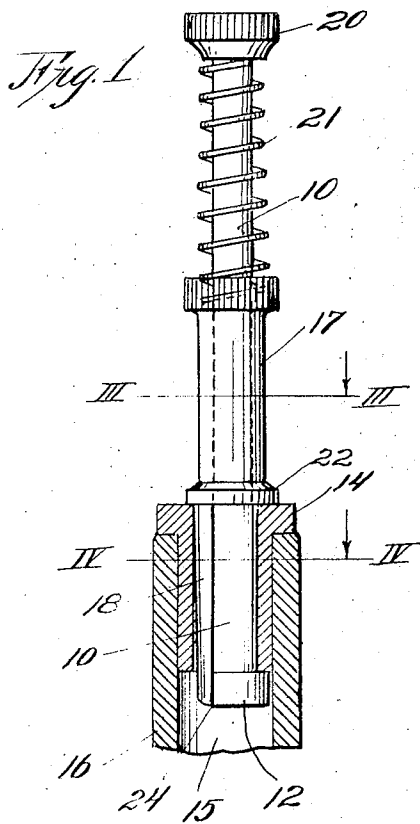
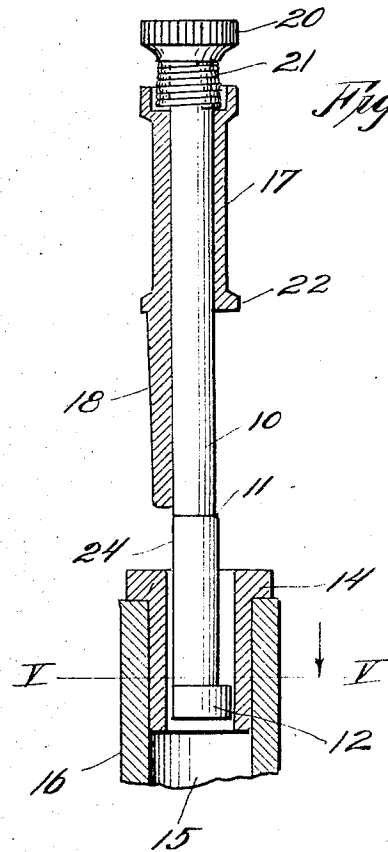
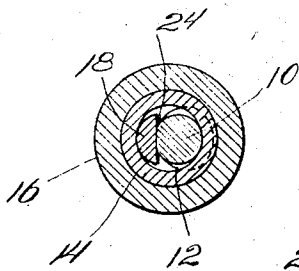
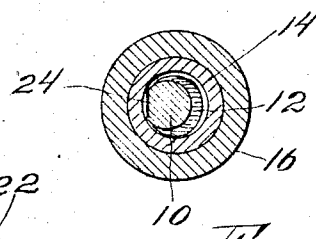
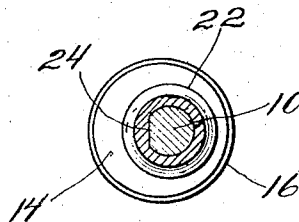
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H. J. LESLIE

TOOL FOR REMOVING BUSHINGS

Filed Jan. 21, 1924



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UNITED STATES PATENT OFFICE

HARRY J. LESLIE, OF ST. JOSEPH, MISSOURI.

TOOL FOR REMOVING BUSHINGS.

Application filed January 21, 1924. Serial No. 687,471.

To all whom it may concern:

Be it known that I, HARRY J. LESLIE, a citizen of the United States, and a resident of St. Joseph, county of Buchanan, State of Missouri, have invented a certain new and useful Improvement in Tools for Removing Bushings, of which the following is a complete specification.

The present invention relates to tools designed for use in extracting or removing bushings or ferrules from bearings or the like where such parts are used as linings, an operation which is frequently required to be performed in automobile repair work or similar shop work.

Accordingly, one of the objects of the invention is to devise a tool of this character adapted to be conveniently inserted within a ferrule or bushing and so engaged therewith as to permit a punch or the like to be applied to the inner end of the tool and thereafter driven to force the ferrule or bushing out of position.

In its preferred form as herein illustrated, the improved tool comprises a rod or bar having one end formed with a head for engagement with one end of the bushing, as well as by the operative end of a punch, this end portion of the tool being also provided with a movable finger forming a bar segment operating slidably along the end portion of the bar in such a manner as to cooperate with one side of the passage through the bushing for the purpose of maintaining the head of the bar effectively engaged with one end of the bushing during the extracting operation. The improvement further comprises suitable means for maintaining the said finger or bar segment yieldingly advanced into its operative position within the ferrule or bushing.

A further object of the invention is to provide an efficient tool for operation in the desired manner, and one which will be of simple and compact form, comprising few parts which will be inexpensive to manufacture.

With the foregoing general objects in view, the invention will now be described by reference to the accompanying drawing illustrating one form of construction which I have devised for embodying the proposed

improvements, after which those features deemed to be novel will be particularly set forth and claimed.

In the drawing—

Figure 1 is a plan view illustrating a tool constructed in accordance with the present invention, and in operative relation to a bushing which is to be extracted from a spindle, the latter parts being represented in section;

Figure 2 is a similar view, but illustrating the tool in the process of being inserted within the bushing, and with the sleeve and bar segment portions of the tool shown in section;

Figures 3 and 4 are transverse sections taken on the lines III—III and IV—IV, respectively, of Figure 1; and

Figure 5 is similar transverse section taken on the line V—V of Figure 2.

Referring now to the drawing in detail, this illustrates the improved tool as comprising a bar 10 of suitable length, provided with an intermediate shoulder 11, and also with a head or an enlarged terminal portion 12 which projects laterally or transversely toward one side of the axis of the bar 10, as clearly shown in Figures 1, 2 and 5. This transverse enlargement 12 is designed expressly for the purpose of permitting the same to be engaged over the edge of a ferrule or bushing 14 at one of its ends, as represented in Figure 1, and also to permit a punch or drift (not shown) to be applied to the outer face of said head 12 from the other end of the space 15 within the spindle or other bearing 16 in which the bushing 14 is located.

For maintaining the head portion 12 thus engaged with the inner end of the bushing 14, the intermediate portion of the rod 10 is provided with a sleeve 17 slidably mounted upon the rod, and also formed at one end with a longitudinal finger 18, preferably tapered as shown, and thus adapted for longitudinal sliding movement alongside the working end of the bar 10, and at the side of the bar which is opposite from the main projecting portion of the head 12. This provision of the sliding finger 18 serves as a bar segment for the working end of the tool, the purpose of this segment being to

permit the working end of the tool to be inserted within the bushing for engagement of the head 12 with the inner end of the bushing, and thereafter to maintain the head engaged with the bushing by allowing the finger or segment 18 to be thrust between the end portion of the bar and the adjacent side of the bushing. The tapered form of the finger or segment 18 is obviously to accommodate bushings of different diameters.

That end of the rod 10, opposite from the head or working end 12, is preferably provided with a suitable knob 20, between which and the corresponding end of the sleeve 17 is interposed a suitable coil spring 21, whose function is to yieldingly actuate the sleeve in the direction of the head 12 and thereby normally maintain the sleeve in the position illustrated in Figure 1, with the finger or segment 18 in operative position within the bushing 14. The sleeve 17 is also preferably formed with a suitable flange 22 for engagement with the outer end of the bushing being operated upon, while the shoulder 11 heretofore referred to also operates to limit the movement of the sleeve in response to the spring's action when the tool is not in use.

It is also preferred to construct the sleeve 17 and segment 18, and the corresponding side of the rod 10, with flat engaging surfaces, as indicated at 24, thereby preventing any rotation of the sleeve and its segment on the rod, and thus maintaining the segment always at the opposite side from the head 12.

From the foregoing description, and explanation of the different steps of the tool's operation, the mode of use of the same will be readily understood. All that is required for extracting a ferrule or bushing 14 of the ordinary form from the bore of a spindle or other bearing 16, is to retract the sleeve 17 and its finger or bar segment 18 into the position illustrated in Figure 2, and insert the working end of tool through the passage within the bushing 14, till the head 12 is engaged, as illustrated in Figure 1, with the inner end of the bushing. Thereafter the sleeve 17 is released, to allow the finger 18 to act as an auxiliary bar segment within the sleeve 14, as shown in Figure 1, thus serving to maintain the transverse enlargement or head portion 12 securely engaged with the inner end of the sleeve. This permits the application of a drift or punch to this head portion of the tool, from the opposite end of the passage 15 through the spindle or bearing 16, whereby the ferrule may be quickly driven out of the bearing by the action of a hammer or the like applied to said drift or punch. By this operation, the work of removing ferrules or bushings of this type may be carried out most speedily and expeditiously, and with

far greater efficiency than by means of the practice usually followed, wherein the bushing or ferrule is cut or otherwise mutilated, or attempted to be extracted by a tool fitted to the same at that end of the spindle or bearing from which it is sought to extract the bushing. With the present improved tool, the bushing is extracted not only quickly and with little effort, but without any danger of mutilating either the bushing or the bearing. The device may, of course, be made of any desired size, and obviously requires very few parts which are of extremely simple construction and not easily gotten out of order.

While I have illustrated what I now regard as the preferred form of construction, I desire to reserve the right to make all such changes and modifications as may fairly fall within the scope of the appended claims.

What I claim is:

1. In a tool of the character described, a bar having one of its ends formed with a transverse enlargement projecting laterally to one side of the bar, and a bar segment having a permanent sliding connection with said bar and movable longitudinally along-side the opposite side of the bar.

2. In a tool of the character described, a bar having one of its ends formed with a transverse enlargement projecting laterally to one side of the bar, and a sleeve slidably mounted on an intermediate portion of the bar and formed with a bar segment carried at the opposite side of the bar from said transverse enlargement.

3. In a tool of the character described, a bar having one of its ends formed with a transverse enlargement projecting laterally to one side of the bar, and a sleeve slidably and non-rotatably mounted on an intermediate portion of the bar and formed with a bar segment carried at the opposite side of the bar from said transverse enlargement.

4. In a tool of the character described, a bar having one of its ends formed with a transverse enlargement projecting laterally to one side of the bar, a sleeve slidably mounted on an intermediate portion of the bar and formed with a bar segment carried at the opposite side of the bar from said transverse enlargement, and means for yieldingly actuating said sleeve in the direction of said enlargement.

5. A tool for extracting bushings or the like, comprising a bar having an end portion for insertion through the bushing and formed with a terminal enlargement projecting laterally to one side of the bar for engagement with one end of the bushing, and a device mounted movably on the bar and provided with a finger portion adjustable longitudinally along the opposite side

of said bar for retaining said enlargement engaged with the end of the bushing during the extracting operation.

6. In a tool of the character described, a
5 bar having one of its ends formed with a transverse enlargement projecting laterally to one side of the bar, and a tapered bar

segment having a permanent sliding connection with said bar and movable longitudinally alongside the opposite side of the 10 bar.

In witness whereof I hereunto affix my signature.

HARRY J. LESLIE.