Sept. 5, 1967 G. R. BRINSON 3,339,262

TOOL FOR REMOVING AUTOMOBILE DOOR HANDLES AND WINDOW ROLLERS

Filed Aug. 26, 1965

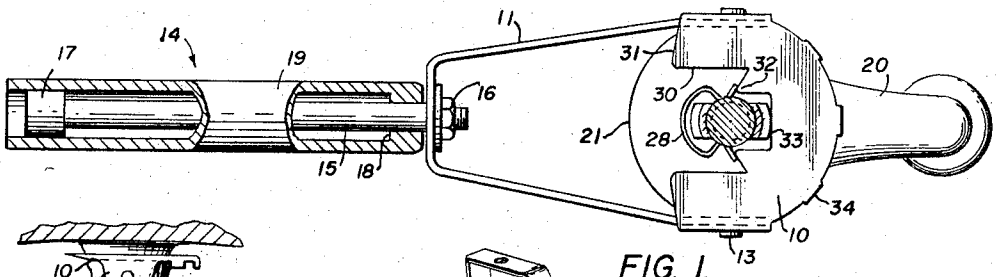


FIG. 1.

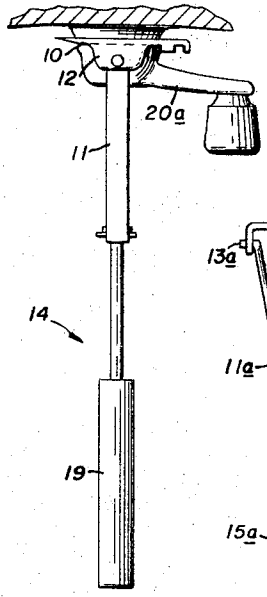


FIG. 2.

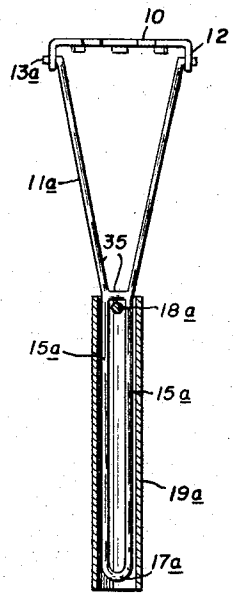


FIG. 8.

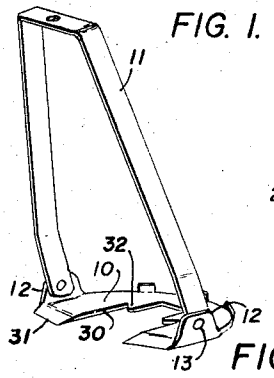


FIG. 3.

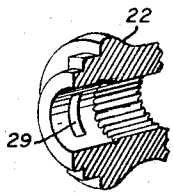


FIG. 6.

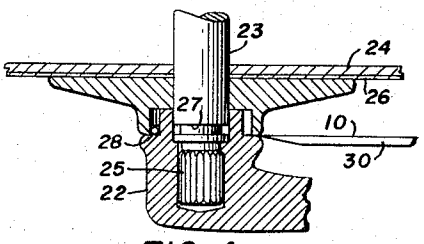


FIG. 4.

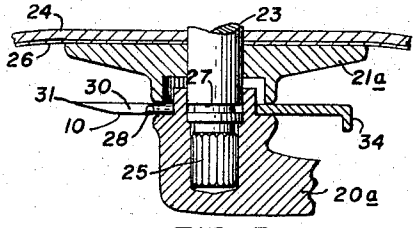


FIG. 5.

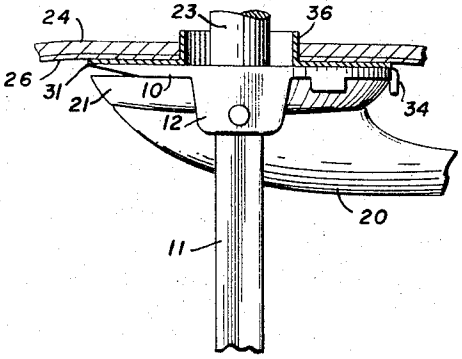


FIG. 7.

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TOOL FOR REMOVING AUTOMOBILE DOOR HANDLES AND WINDOW ROLLERS

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ABSTRACT OF THE DISCLOSURE

A tool for removing inside crank type door handles and window roller handles in automobiles and comprised of an operating plate including a forward end having a recess therein shaped to engage and spread a U-shaped keeper spring which normally locks the window handle on its shaft and a tool handle pivotally mounted on opposite sides of the plate in line with the plate recess whereby the automobile window handle may be pulled off of its shaft without canting.

In its preferred form, the invention includes a slidably extensible handle with stop means for manually imparting a hammer action on the window handle to be removed.

This invention relates to tools for removing inside crank type door handles and window roller handles in automobiles. In many makes of automobiles such handles are detachably secured on their shafts by U-shaped keeper springs having diverging ends. Each shaft has a circumferential groove near its end, and the socket of the handle has opposing openings receiving converging portions of the spring which normally extend into the first said groove. The shafts and the sockets of the handles are correspondingly splined to assure rotation of the shafts by the handles.

To remove a handle, it is necessary to spread the keeper spring and then pull the handle socket off of the shaft. Obviously, reaching the ends of the spring is a blind operation, and in many cases the socket is difficult to remove because of corrosion. Sometimes the sockets are tight on their shafts by reason of hammering at the time of installation. Another problem in the removal of handles is binding by reason of canting the socket when using tools heretofore intended for the described purpose.

The primary object of the invention is to provide a tool for conveniently and easily expanding a keeper spring for removing a door handle or a window roller handle from its shaft in an automobile.

A particular object of the invention, in addition to the foregoing object, is to provide a tool capable of a hammering action for removing a tightly secured handle after the keeper spring has been released from the shaft.

Another object is to provide a tool of the described class which will retain the keeper spring throughout the handle removal operation so that the spring will not be dropped and lost.

Another object is to provide an automobile handle removing tool wherein the pulling operation is parallel with the handle shaft so as to avoid canting.

Another object of the invention is to provide a tool of the described class which will not damage the material of the door pad.

These and other objects of the invention will become apparent from the following description and the accompanying drawing, in which:

FIGURE 1 is a bottom plan and fragmentary sectional view of a handle removing tool according to the invention and applied to a keeper spring on a handle shaft.

FIGURE 2 is a top plan view of the tool applied to a handle on the inside of an automobile.

FIGURE 3 is a perspective view of the operating plate of the tool and its hinged bracket.

FIGURE 4 is a longitudinal sectional view along a length of shaft and showing the leading edge of the operating plate just prior to inserting the same between a handle socket and an escutcheon plate.

FIGURE 5 is a view similar to FIGURE 4 but showing the sockets fully received in the operating plate.

FIGURE 6 is a fragmentary perspective view of a handle socket showing one of the openings through which a converging portion of the keeper spring projects.

FIGURE 7 is a top plan and sectional view of the tool applied to a handle of the type having an integral escutcheon plate, and

FIGURE 8 is a modified form of the invention wherein the handle is shown in longitudinal section to illustrate a handle support comprised of spaced parallel rods.

The form of the invention shown includes a flat operating plate **10**, and a U-shaped bracket **11** hingedly mounted at its ends on upstanding ears **12** on opposite sides of the plate by means of pins **13**.

The handle assembly **14** illustrated in FIGURES 1 and 2 is comprised of a rod **15** secured to the bracket **11** at one end by means of a nut **16**. On the remaining end of the rod **15** there is a cylindrical stop **17** for engagement with an internal shoulder **18** in a tubular handle **19**. As best shown in FIGURE 1, the handle **19** is slidably mounted on the rod **15** and arranged so that the shoulder **18** engages the stop **17** when the handle is fully extended.

The present tool is intended, primarily, for removing handles **20** of the type illustrated in FIGURE 7 where the base **21** is large and round and is integral with the handle. The socket **22**, FIGURE 6, is contained within the base **21** and is integral with the handle **20**. The tool is also capable of use with older types of handle assemblies such as the one illustrated in FIGURES 2, 4 and 5 wherein the base, such as **21**, is separate from the handle **20***a* and is herein referred to as an escutcheon plate **21***a*. Other parts of the handle assemblies are identical and have the same reference numerals. Each handle assembly includes a door or window operating shaft **23**, the end of which that projects through the door pad **24** and is splined at **25**. The door pad **24**, which is capable of flexing inwardly, has a decorative surface **26** which the present tool does not contact. Spaced from the splined end **25** of the shaft **23**, there is a circumferential groove **27** for receiving the opposing converging portions of the U-shaped keeper spring **28** having angularly diverging ends. The handle socket **22**, which is splined to fit the splines **25** of the shaft **23**, has opposing openings **29** receiving the referred to converging portions of the spring **28**. When the handle **20** is in place, the converging portions of the spring **28** engage the groove **27** in the shaft **23**.

The forward portion of the plate **10** is recessed at **30** and on the sides of the recess there are beveled edges which slope slightly rearwardly from the forward ends of the recess. On the sides of the recess **30** and rearwardly of the transverse center of the recess **30** there are forwardly directed triangular prongs **32** which are shaped to engage the diverging ends of the keeper springs **28**. The inner end **33** of the recess **30** is located to serve as a stop when applied to that type of handle assembly such as illustrated in FIGURES 2, 4 and 5 so as to spread and release the spring **28** from the shaft groove **27** without entirely removing the spring from the socket openings **29**. Thus, the spring **28** will not be dropped during the handle removing operation. For that type of handle **30** including an integral base **21**, as illustrated in FIGURE 7, there are stops **34** which project upwardly from the plate **10** for engaging a portion of the periphery of the base.

The form of the invention illustrated in FIGURE 8 is identical with the foregoing, except the handle support and the hinged bracket. In this form of the invention, the handle support is comprised of two parallel spaced rods **15***a* which are looped at their outer ends at **17***a*. There is a transverse pin **18***a* in the tubular handle **19***a* in the end thereof toward the plate **10**, which pin has the same function as the previously described internal shoulder **18**, that is, it makes contact with the looped end **17***a* which corresponds with the stop **17** when the handle **19***a* is fully extended. The bracket **11***a* of this form of the invention is a continuation of the handle support rods **15***a* which are bent at their ends to provide hinge pins **13***a*. A spacer **35** is provided, as by welding, between the rods **15***a* adjacent the bracket **11***a*.

When removing a handle **20** such as illustrated in FIGURE 7 the pad **24** is pushed inwardly along with an internally flanged washer **36** which surrounds the shaft **23**. The handle **19** or **19***a* is positioned parallel with the operating plate **10** and the leading edge **31** is positioned between the handle base **21** and the washer **36**. By gently pulling on the handle **19**, **19***a*, the prongs **32** of the plate **10** spread the spring **28** a distance so that the converging portions of the spring are removed from the groove **27** in the shaft **23**. The handle **19**, **19***a* is then turned 90° and pushed toward the plate **10**, after which it is jerked outwardly, causing the handle shoulder **18** or pin **18***a* to strike the stop **17** or looped end **17***a* and thereby jar the socket **22** from the splined end **25** of the shaft **23**. To remove a handle **20***a* such as illustrated in FIGURES 2, 4 and 5, the operation is the same except the leading edges **31** are inserted between the socket **22** and the escutcheon plate **21***a* instead of the handle base **21** and the washer **36**.

The invention is not limited to the exemplary constructions herein shown and described, but may be made in various ways within the scope of the appended claim.

What is claimed is:

A tool for removing a crank handle from the end of a splined shaft where said crank includes a socket which fits over the end of said shaft, where said shaft includes a circumferential groove therearound and located within said socket, openings in opposite sides of said socket and aligned with said groove and a U-shaped keeper spring, said spring having diverging ends and converging portions adjacent thereto adapted to be received in said openings and extend into said groove, said tool comprising: an operating plate including a forward portion having a recess therein, projections on the sides of said recess positioned to engage said diverging ends of said spring, a handle pivotally connected with opposite sides of said plate, said handle including an elongate support member, a handle member slidably mounted thereon, and stop means limiting the outward movement of said handle member.

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