May 20, 1952 P. R. ROPER 2,597,381

TOOL FOR REMOVING DOOR HANDLE RETAINING SPRINGS

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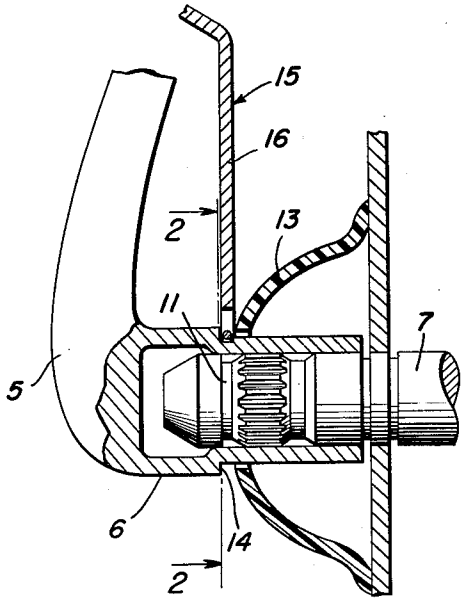


Fig. 1.

Fig. 2.

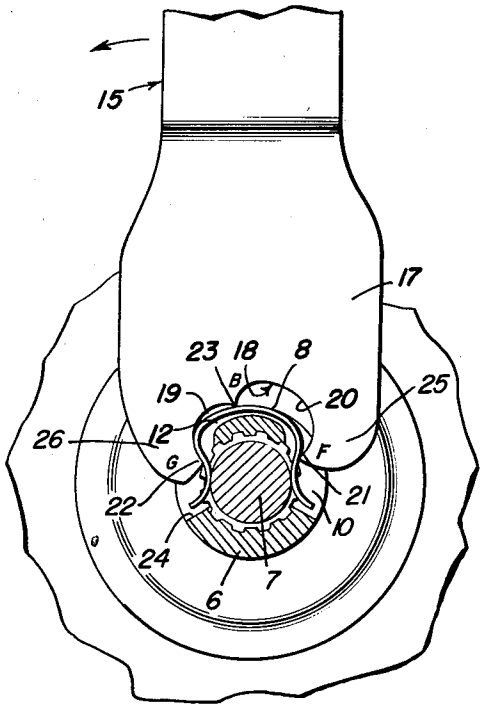


Fig. 3.

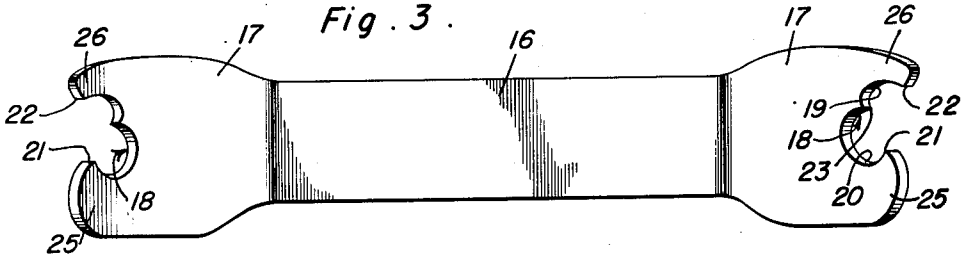
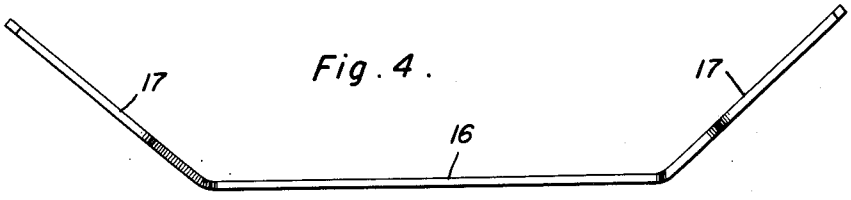


Fig. 4.



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TOOL FOR REMOVING DOOR HANDLE RETAINING SPRINGS

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4 Claims. (Cl. 29—229)

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The present invention relates to new and useful improvements in tools for use with the door handles of automobiles and more particularly to a tool for removing the door handle retaining spring or clip.

In many types of automobile door construction the door handle is removably held on the spindle by a substantially U-shaped resilient clip or split washer and it is an object of the present invention to provide a tool for facilitating the removal of the retaining clip or spring washer when necessary to repair the door lock.

A further object of the invention is to provide a tool of this character having right and left hand spring clip engaging heads to pry either end of the clip free from the door handle.

A still further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in use, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a longitudinal sectional view of a door handle and spindle showing the tool in use for removing the spring retaining clip therefrom;

Figure 2 is a sectional view taken substantially on a line 2—2 of Figure 1;

Figure 3 is a view in elevation of the spring clip removing tool and

Figure 4 is an edge elevational view thereof.

Referring now to the drawings in detail wherein for the purpose of illustration I have disclosed a preferred embodiment of the invention the numeral 5 designates an automobile door handle which includes a socket 6 at its inner end for sleeving over the spindle 7 of the door lock mechanism. The socket 6 is held in position on the end of the spindle by means of a resilient wire clip or spring washer 8 surrounding the socket 6 and having inwardly curved locking jaws 9 adjacent its ends received in openings 10 and circumferential groove 12 in the socket 6 and seated in an annular groove 11 in the spindle 7.

The clip 8 is fitted tightly between an escutcheon plate 13 mounted on the socket 6 and a shoulder 14 formed on the socket, the clip thus being substantially concealed between the escutcheon plate and the socket of the handle.

The subject matter of the present invention

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comprises a tool 15 that is formed of a length of flat metal bent at the ends to form an intermediate shank portion 16 and flat tool ends or heads 17 at the ends of the shank portion inclined at an angle to the plane of said shank portion.

The ends or heads 17 are similar and each comprises a bifurcation provided with integral coplanar opposed jaws or arms 25 and 26 spaced one from the other to form a retainer-receiving notch 18 therebetween. Said notch is divided into a small pocket 19 and a large pocket 20 by a spring-holding or bearing projection 23. On arms 25 and 26 there are provided respective inwardly directed sharp projections 21 and 22 constituting lips flanking the entrance to notch 18. As will later be seen, projection 21 is a gripping projection and is sharp to bite into the clip, and projection 22 a fulcrum projection around which the tool is swung or rotated in operation. Said gripping projection provides a biting edge that faces bearing projection 23.

In the operation of the tool, one of the heads 17 is placed between the escutcheon plate 13 and shoulder 14 of a door handle to position the central portion of retaining spring or clip 8 in the notch 18, the projections 21 and 22 at the entrance to the notch snapping over the spring or clip and closely engaging the sides of the clip at the openings 10 in socket 6 and with the projection 23 bearing against the center or back of the clip as shown in Figure 2.

A turning movement of the tool 15 in a direction shown by the arrow in Figure 2 will raise projection 21 and, because the same bites into the chip, will raise the adjacent end of the clip in slot 10 and at the same time lower projection 22 to force the other end of clip 8 downwardly until arm 26 strikes the end of slot 10 at the point 24. Bearing projection 23 holds the clip firmly against projection 21 during this movement to prevent slipping of the tool and the continued turning movement of the tool around said fulcrum will cause the projection 21 to lift the end of the clip engaged thereby out of the slot 10.

Larger pocket 20 allows clip 8 to give and enter the pocket during the removing action of the tool.

The heads 17 are bent at an angle from the plane of shank 16 to facilitate gripping of the tool when engaged with the door handle.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art.

A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A tool for removing spring retainer clips comprising: a length of flat metal bifurcated to provide integral coplanar arms spaced one from the other to form a retainer receiving notch, a pointed fulcrum projection on the free end of one of the arms located in the plane of the length of metal and extending inwardly from the inner edge thereof, a pointed gripping projection on the free end of the other arm located in said plane and extending inwardly from the inner edge thereof and a bearing projection on the inner edge of one of said arms located in said plane and at a point intermediate said first and second projections, the gripping projection providing a biting edge facing said bearing portion, said first and second projections adapted to snap on to a retainer and as said tool is rotated in said plane around said fulcrum projection at one side of the retainer, the gripping projection is adapted to bite into the other side of the retainer to press the retainer against said bearing projection and withdraw the same.

2. A tool for removing spring retainer clips comprising: a length of flat metal bifurcated to provide integral coplanar arms spaced one from the other to form a retainer receiving notch, a fulcrum projection on the free end of one of the arms located in the plane of the length of metal and extending inwardly from the inner edge thereof, a pointed gripping projection on the free end of the other arm located in said plane and extending inwardly from the inner edge thereof and a bearing projection on the inner edge of one of said arms located in said plane and at a point intermediate said first and second projections, the gripping projection providing a biting edge facing said bearing portion, said first and second projections adapted to snap on to a retainer and as said tool is rotated in said plane around said fulcrum projection at one side of the retainer, the gripping projection is adapted to bite into the other side of the retainer to press the retainer against said bearing projection and withdraw the same.

3. A tool for removing spring retainer clips comprising: a length of flat metal bifurcated to provide integral rigidly set and nonadjustable coplanar arms spaced one from the other to form a retainer receiving notch, a fulcrum projection on the free end of one of the arms located in the plane of the length of metal and extending inwardly from the inner edge thereof, a pointed gripping projection on the free end of the other arm located in said plane and extending inwardly from the inner edge thereof and a bearing projection on the inner edge of one of said arms located in said plane and at a point intermediate said first and second projections, the gripping projection providing a biting edge facing said bearing portion, said first and second projections adapted to snap on to a retainer and as said tool is rotated in said plane around said fulcrum projection at one side of the retainer, the gripping projection is adapted to bite into the other side of the retainer to press the retainer against said bearing projection and withdraw the same.

4. A tool for removing spring retainer clips comprising: a length of flat metal bifurcated to provide integral rigidly set and nonadjustable coplanar arms spaced one from the other to form a retainer receiving notch, a pointed fulcrum projection on the free end of one of the arms located in the plane of the length of metal and extending inwardly from the inner edge thereof, a pointed gripping projection on the free end of the other arm located in said plane and extending inwardly from the inner edge thereof and a bearing projection on the inner edge of one of said arms located in said plane and at a point intermediate said first and second projections, the gripping projection providing a biting edge facing said bearing portion, said first and second projections adapted to snap on to a retainer and as said tool is rotated in said plane around said fulcrum projection at one side of the retainer, the gripping projection is adapted to bite into the other side of the retainer to press the retainer against said bearing projection and withdraw the same.

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