Oct. 18, 1949. W. H. FERGUSON 2,485,490

TOOL FOR RESHAPING AUTOMOBILE PANELS

Filed Sept. 7, 1945

Fig. 1.

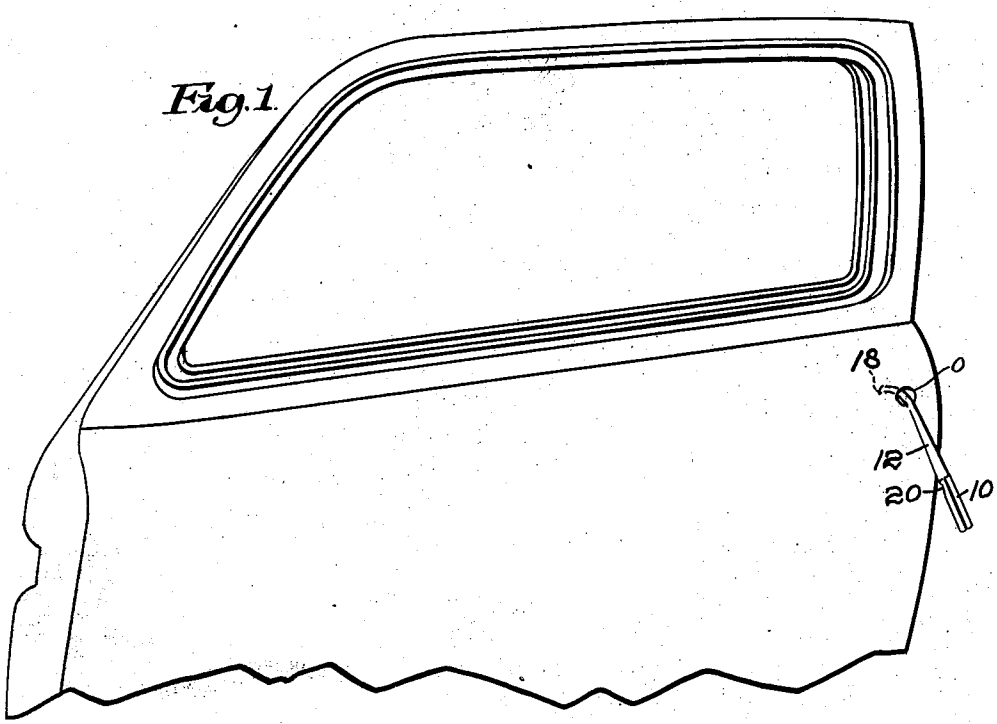


Fig. 3.

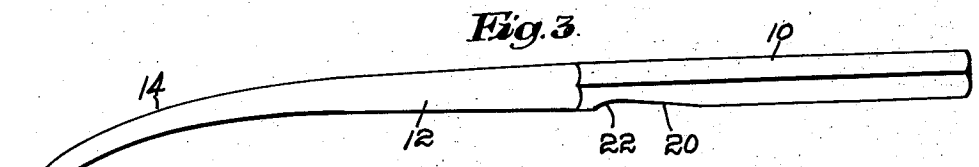


Fig. 4.

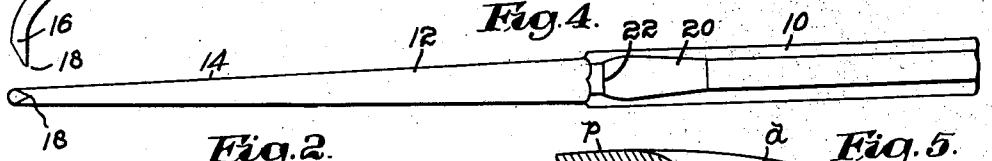


Fig. 2.

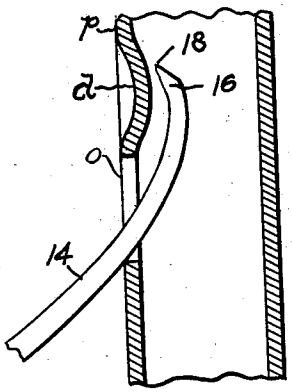


Fig. 5.

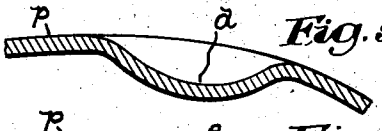


Fig. 6.

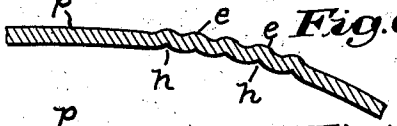
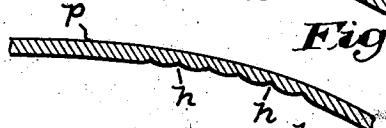


Fig. 7.



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TOOL FOR RESHAPING AUTOMOBILE PANELS

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1 Claim. (Cl. 81—15)

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This invention relates to a tool for reshaping the panels of automobile bodies in removing dents therefrom, more particularly by a series of localized pushing-out operations at closely spaced points by means of which the metal of the displaced portion is gradually returned approximately to its original contour. The individual operations are ordinarily prying ones. The tool herein disclosed and other tools devised by me for effecting such operations I term "picking tools."

My invention will be well understood by reference to the following description of the illustrative embodiment thereof shown by way of example in the accompanying drawing, wherein:

Figure 1 is a perspective view of the upper portion of an automobile door illustrating a characteristic application of the tool;

Fig. 2 is a sectional diagram further illustrating the use of the tool;

Fig. 3 is a side elevation and Fig. 4 a plan of one form of the tool; and

Figs. 5, 6 and 7 are diagrammatic views, not to scale or in relative proportion, illustrating successive stages of the picking operation performed.

In reshaping the panels of automobile bodies which have been injured on collisions the major deformations may be brought back to their approximate original position by use of pushing tools of suitable design conveniently powered by a hydraulic jack. Other dents, if easily accessible from both sides, may be hammered into their proper contour by use of a hammer and suitable dolly blocks. In modern automobile practice many parts are not so accessible because covered over by the interior construction through which avenues of access are most restricted. Frequently relatively small dents occur along margins of the panels to which access is most difficult. Even when not of functional importance, such dents are often particularly unsightly, detracting from appearance and from the resale value of the car.

I have found that by the use of suitable tools, of which that disclosed in the present application is an example, such dents may be quickly and satisfactorily reformed by a series of prying actions on the interior or convex surface of the dent performed at closely spaced points by means of a rigid, pointed tool formed to permit access from a relatively remote point either through an existing available opening or through an opening of restricted size formed for the purpose and which may thereafter be closed. As distinguished from pressing actions effected by means of contoured spoons, the successive pressures are concentrated substantially at single points of the

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work. While much of the reshaping, as directed by the skill of the operator, will be pressing back of the panel to its original contour, in general smaller reversed bends in the nature of small hollow domes will be formed representing a gathering of the stretched metal into smaller rugosities or sinuosities to permit it to lie in general along its original contour of smaller area. Characteristically the panel when so roughly reformed will show on the exterior minor excrescences or "pimples" at the points where pressure was applied at the interior, which should not be so high that their interior hollows extend outwardly past the contour line of the panel. These may be dressed off by filing or grinding to provide a smoothly contoured outer surface which may be refinished. The repair in some instances may be effected by repeated application of these steps.

Thus, referring to the diagrams Figs. 5, 6 and 7, in Fig. 5 I show, without pretense to dimensional verisimilitude, a contoured panel *p* in which there is an inward dent *d*. Fig. 6 shows the dent brought back approximately to the original contour by prying operations on the side which is lower in the figure, the work leaving the rebent part interrupted by smaller reverse bendings *e*, wherein the metal has been strained in the opposite direction and in part pressed up in such manner as to show small excrescences at the exterior. We may consider that a part of the excess area of metal as seen in Fig. 5 has been redistributed in a series of smaller sinuosities approximating the shorter simple curvature of the original contour. Fig. 7 shows the outer surfaces of these excrescences *e* dressed off to the original contour, the hollows *h* formed thereby at the underside of the figure, which represents the interior surface of the panel which is out of sight, being still present.

A characteristic application of the tool here shown is illustrated in Fig. 1 wherein I have illustrated the end of the tool as inserted through the opening in the outer panel of an automobile door through which the door handle shank usually projects for the purpose of working out forwardly, or toward the outside of the panel, a dent adjacent such location.

The tool herein shown comprises a generally straight stock with a working end suitably shaped as will be more fully described. While the particular dimensions may vary, in any instance the tool is of a size to be wielded in one hand but of a section which provides substantial rigidity under manually exerted strains in use. The present tool characteristically finds its application in tight places which, however, may be ap-

proached fairly closely by the operator's hand. Figs. 3 and 4 of the drawing illustrate an actual tool which was forged from a steel rod of hexagon cross section measuring ½ an inch across and about 11 inches long, providing the wieldability and rigidity referred to.

Referring now to Figs. 2 and 3, the tool there shown is provided with a proximal grip portion 10 adapted to be encircled by the grasping hand and thus of a length approximating a hand's breadth, from which extends a straight tapering shank 12, the distal portion of which is deflected along a smooth curve 14 of gradually decreasing radius and terminates in a portion 16 directed outwardly from the shank and inclined backwardly, this shank terminating in a blunt point 18. By "inclined backwardly" is meant that, if the distal end of the tool were pressed against a plane (a vertical line at the left in Fig. 2) with the axis of the straight portions 10 and 12 perpendicular to that plane, then in following along the distal side of portion 16 toward the point 18 we move further and further from that plane. I have characterized the point 18 as a blunt point. It is not needle sharp but nevertheless is adapted to make contact with a substantially single point of the work and is to be distinguished from a broad face or peen and also from a chisel-shaped edge.

An exemplary application of the tool is illustrated somewhat diagrammatically in Fig. 2 in which there is shown a panel *p* having a dent *d*, access to the rear of which may be had through an opening *o* in the panel close to the dent. The shank of the tool may be inserted through the opening, the lower margin of which provides a bearing therefor at some point along the curve 14. When the butt of the tool is swung downwardly, as indicated by the arrow in the figure, the dent is picked up toward the left in the figure in the manner described in connection with Figs. 5, 6 and 7. In Fig. 2 the hole *o* may be considered one such as the door-handle shank opening illustrated in Fig. 1 which is conveniently available. Other applications are found in connection with various moldings and marginal portions of body elements. In some instances an opening may be made for purposes of access where it can thereafter be inconspicuously closed up In other instances the access of the hand and tool to the dent may be relatively easy but an available fulcrum point adjacent the dent provides for operation in the manner illustrated in Fig. 2.

The tapering of the shank 12 of the tool provides a better balance and facilitates the introduction of the pointed end without, however, detracting from its essential rigidity. If we consider a fulcrum along the length of the portions 12 or 14 about which the prying action is exerted in the radial plane which contains the point, the strain on the portion nearer the point will act through a relatively short lever arm so that the

resistance to the tool to bending strains thus exerted is substantially uniform throughout its length. Ordinarily with a tool of this type the fulcrum support would be along the curve 14 which as described is of gradually decreasing radius. This provides that the point will be presented to the work in substantially the same manner whatever the location of the fulcrum point along that curved portion.

To facilitate control of the tool and to indicate to the workman the position of the point 18, which in use will ordinarily be hidden from him, the nearer portion of the grip 10 on the side is formed with a recess 20, the wall of which inclines inwardly of the stock and outwardly from the butt end of the tool to provide a shallow, rearwardly facing shoulder 22, the construction as a whole forming a seat for the ball of the thumb when the stock is grasped by the fingers of the hand, which seat is disposed transverse to the plane defined by the axis of the shank 12 and the point 18 of the tool and is on the side nearer the point.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claim to indicate those principles of the invention exemplified by the particular embodiment described and which I desire to secure by Letters Patent.

I claim:

A tool for picking up dents in sheet metal panels by repeated prying actions thereon at closely spaced points comprising a lever wieldable in one hand and of a section rigid under manually applied stress, the lever comprising a hand grip and a coaxial shank merging into a distal portion extending laterally from the axis of the shank in a smooth curve of progressively decreasing radius and terminating in a point directed outwardly from the shank and inclined backwardly.

WILLIAM H. FERGUSON.

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