Oct. 18, 1949. W. H. FERGUSON 2,485,487

TOOL FOR RESHAPING AUTOMOBILE PANELS

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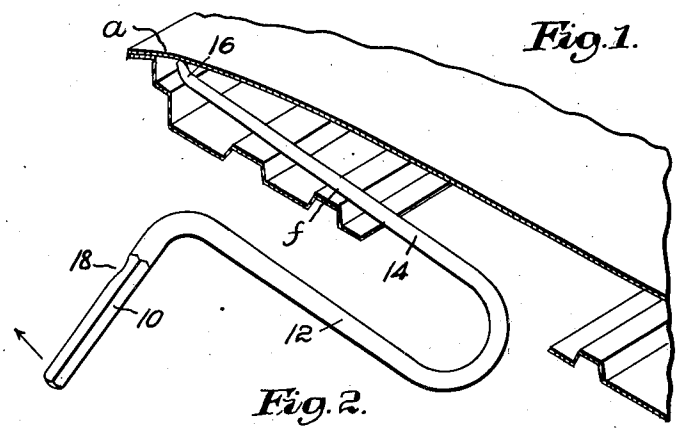


Fig. 1.

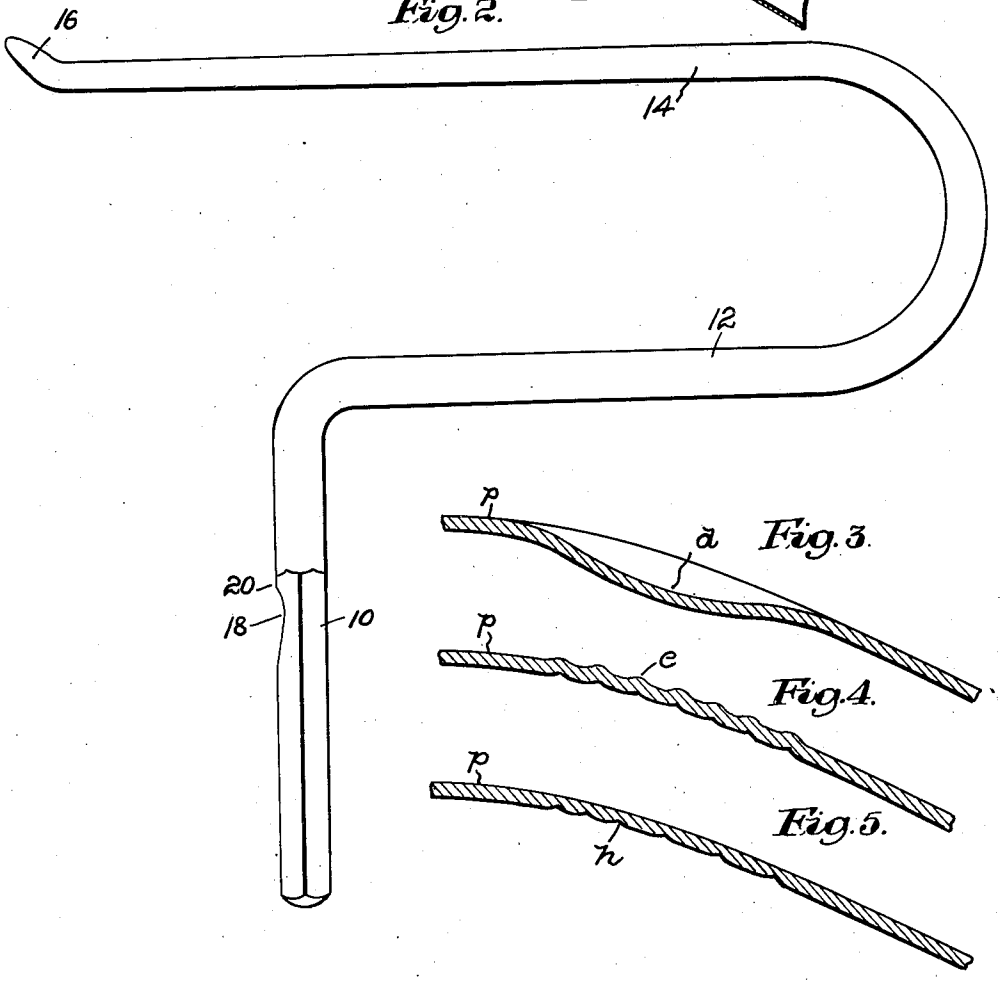


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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Fig. 6.

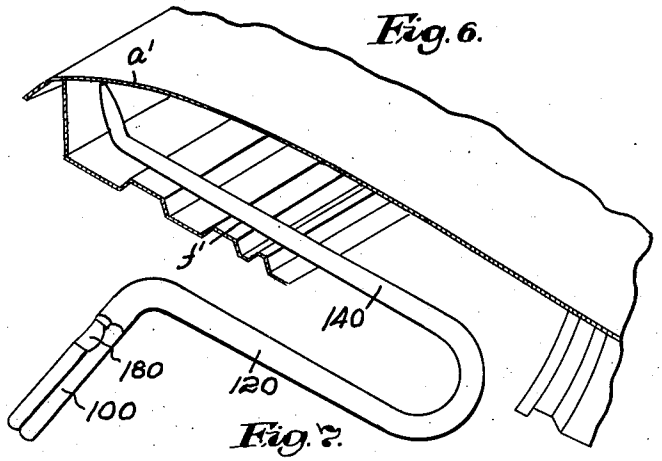


Fig. 7.

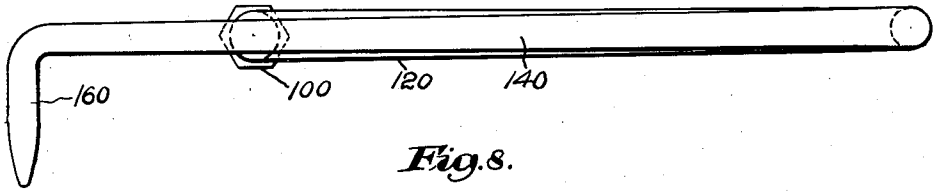
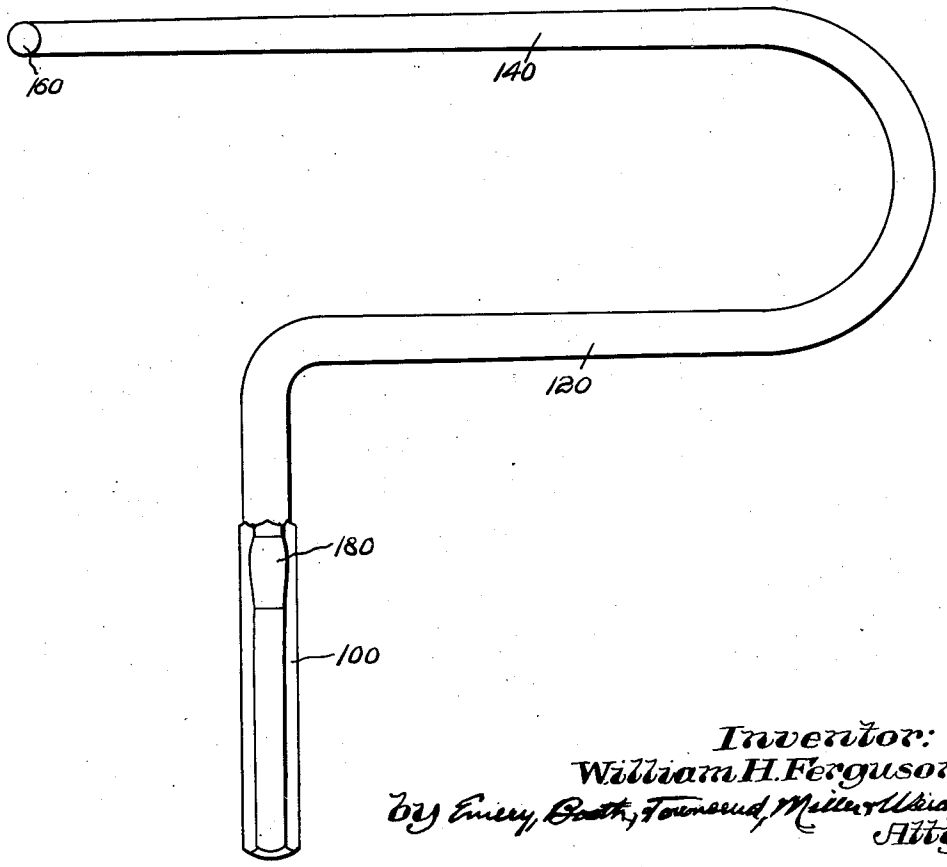


Fig. 8.



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TOOL FOR RESHAPING AUTOMOBILE PANELS

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2 Claims. (Cl. 81—15)

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This invention relates to tools for reshaping the panels of automobile bodies and 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 tools 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 embodiments thereof shown by way of example in the accompanying drawings, wherein:

Fig. 1 is a schematic view illustrating broken away a portion of an automobile door and the tool in use thereon;

Fig. 2 is a side elevation of the tool;

Figs. 3, 4 and 5 are diagrammatic views, not to scale or in relative proportions, illustrating successive stages of the picking processes performed;

Fig. 6 is a view similar to Fig. 1 showing a modified form of the tool;

Fig. 7 is a top plan view of such second form of tool; and

Fig. 8 is a side elevation thereof.

In reshaping the panels of automobile bodies which have been injured in 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

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substantially at single points of the 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. 3, 4 and 5, in Fig. 3 I show, without pretense to dimensional verisimilitude, a contoured panel *p* in which there is an inward dent *d*. Fig. 4 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. 3 has been redistributed in a series of smaller sinuosities approximating the shorter simple curvature of the original contour. Fig. 5 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.

Referring now to Fig. 2, the tool there shown is of a size to be wielded in one hand, as will appear, but is of a section which provides substantial rigidity under manually exerted strains in use. Thus the drawings illustrate an actual tool which was forged from a steel rod of hexagon cross section measuring ¾ of an inch across. The tool includes a straight proximal portion **10** providing a hand grip and which may be of hexagonal form as shown for better grip thereon, an intermediate portion which is cranked at **12** and recranked in the same plane at **14** providing a throat for embracing an obstruction between the operator and the work, as will appear from Fig. 1 hereinafter to be more particularly referred to. The portion **14** may extend past the axial line of the grip **10** as

illustrated and terminates distally in an angularly directed pointed tip 16. Herein I have shown the tool as tapered toward the distal end from a point about the beginning of the curve where the portion 12 merges into the portion 14. This makes the tool somewhat more wieldy and facilitates the introduction of the end thereof into tight places. At the same time the proportioning of the parts is such that the resistance to flexure on account of the force exerted at the tip 16 is substantially the same for different fulcrum points along the length of the portion 14. The shorter lever arm compensates for the smaller section.

I have referred to the portion 16 as a point. It will be understood that it is not needle sharp but is to be distinguished from the broad face or peen of ordinary hammers or from chisel-shaped edges, being tapered substantially conically and having a generally rounded off apex as illustrated.

To facilitate control of the tool and to indicate to the workman the position of the end 16, which in use will ordinarily be hidden from him by intervening portions of the interior structure of the automobile, the inner portion of the grip 10 on the side thereof which has the same angular relation to its axis as does the point 16 may be formed with a recess 18, the wall of which inclines inwardly of the grip and outwardly from the butt end of the tool to provide a shallow, rearwardly facing shoulder 20, the construction as a whole forming a seat for the ball of the thumb when the grip is grasped by the fingers of the hand. Fig. 1 illustrates a characteristic although simple application of the tool in which we may suppose that there is a dent in the outer panel of a door near the bottom thereof at the point *a*. The interior surface of this panel is not readily accessible because it is distant from the opening in the inner panel and close to that panel, as seen in Fig. 1. The tool may be inserted through the opening referred to, finding a fulcrum at some suitable point *f* on the interior panel. The fulcrum point for various types of work may, of course, occur at various points along the portion 14 of the tool. When the grip portion 10 of the tool is pulled upwardly, viewing Fig. 1, in the direction of the arrow in the figure, swinging the tool in its plane about the fulcrum *f*, the point will be forced up to operate on the dent in the manner explained in connection with Figs. 3, 4 and 5. In the example shown in Fig. 1, the operator would naturally stand at the exterior of the door opposite the lower edge, looking downwardly on the panel to permit him to observe the progress of the work, grasping the grip 10 of the tool with his right hand, his thumb resting on the seat 18. The distal part of the tool and its point 16 are hidden from him but the position of the latter is indicated by the thumb seat and a control of the presentation of the point of the work is facilitated by the grasp of the thumb thereon.

In Figs. 6, 7 and 8 I have illustrated a similar but modified form of tool having a hand grip 100 and cranked and recranked portions 120 and 140 similar to the portions 10, 12 and 14 of the tool shown in Fig. 2. The distal end 160 of the part 140 of the tool is bent at right angles to the plane of the rest of the tool, as best seen in Fig. 7, and terminates in a point, similar to the point of part 16 in the modification of Fig. 2. The thumb rest 180 in this instance is positioned at the side of the grip 100, but as before has the same angular orientation as the point of the tool at 160. In use of this tool, as shown in Fig. 6, to operate on a dent at the point *a'* the portion 140 finds its fulcrum at a point *f'*, but the tool is not swung in the plane of the crank portion but turned on this fulcrum substantially about the axis of the portion 140. That is, there is a sort of rolling action of that part of the tool which forces the point 160 upwardly with a prying action against the inner surface of the panel.

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 claims to indicate those principles of the invention exemplified by the particular embodiment described and which I desire to secure by Letters Patent.

I claim:

1. A one-hand tool for picking up dents in sheet metal panels by repeated prying actions thereon at closely spaced points and substantially rigid under manually applied stress comprising a metal rod having a straight proximal portion providing a hand grip, an intermediate portion cranked and recranked to provide a throat spaced substantially rearwardly from the grasping hand for embracing an obstruction between the operator and the work, said recranked portion extended distally beyond the line of the grip, having a smooth and tapered cross sectional form, and terminating in a relatively short, angularly directed tip, having a substantially conical blunt point, the recranked portion and its extension providing a lever of substantial length adapted to find a fulcrum support along said length for the forceful operation of the point by manipulation of the hand grip.

2. A one-hand tool for picking up dents in sheet metal panels by repeated prying actions thereon at closely spaced points and substantially rigid under manually applied stress comprising a metal rod having a straight proximal portion providing a hand grip, an intermediate portion cranked and recranked to provide a throat spaced substantially rearwardly from the grasping hand for embracing an obstruction between the operator and the work, said recranked portion extended distally beyond the line of the grip, having a smooth and tapered cross sectional form, and terminating in a relatively short tip having a substantially conical blunt point extending at an angle to the plane of the throat, the recranked portion and its extension providing a lever of substantial length adapted to find a fulcrum support along said length for the forceful operation of the point by manipulation of the hand grip.

WILLIAM H. FERGUSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
412,479	Davis	Oct. 8, 1889
1,385,948	Norlund	July 26, 1921
1,783,078	Ferguson	Nov. 25, 1930
1,829,804	Loomis et al.	Nov. 3, 1931
1,883,684	Garrett	Oct. 18, 1932