

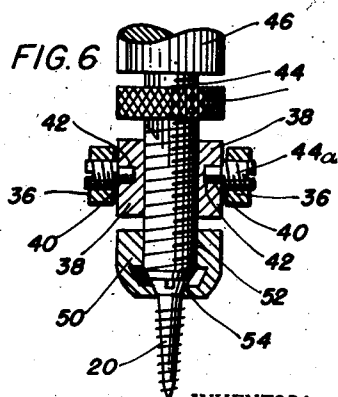
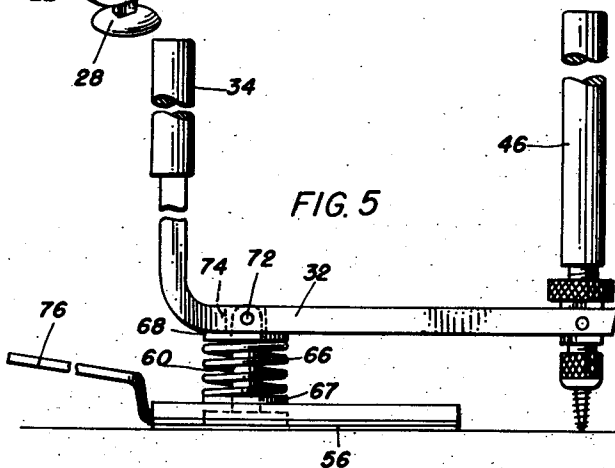
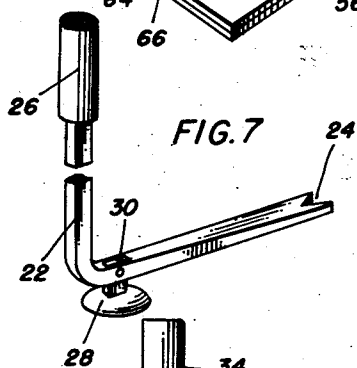
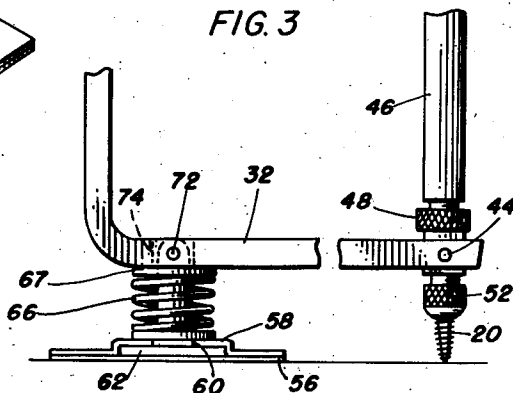
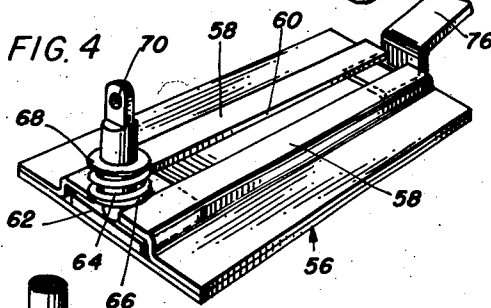
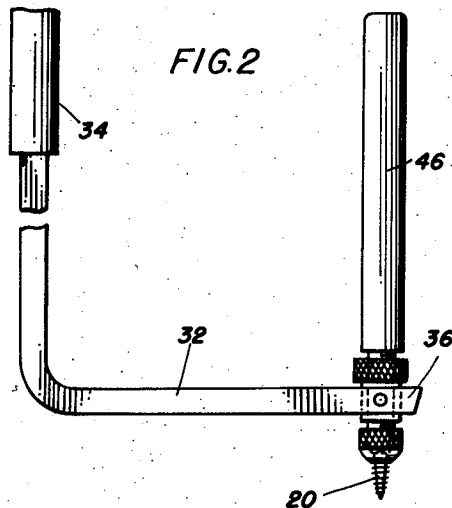
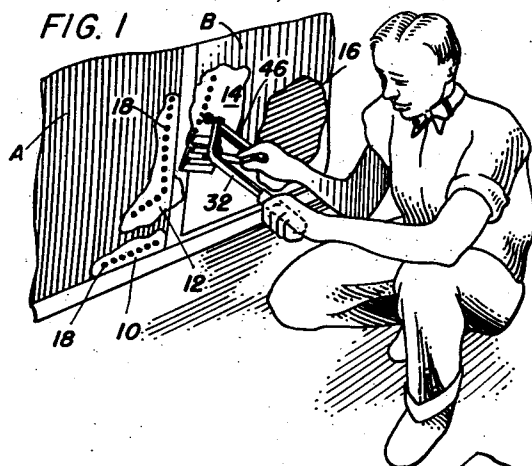
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APPARATUS FOR REPAIRING DENTS IN CAR BODIES

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APPARATUS FOR REPAIRING DENTS IN CAR BODIES

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5 Claims. (Cl. 81—15)

This invention relates in general to a system and an apparatus applicable to the outside of an automobile metal panel for removing dents therefrom without the necessity of access to the rear side of the sheet metal in which the dent is made.

It frequently happens that the fenders, doors and sides of automobiles are severely scored and dented in collisions and accidents, and it is difficult and expensive to remove the dents and any depressions except by access to the under surface of the metal panels or sheets to pry or pound out such depressions.

The present invention provides a method and suitable apparatus for accomplishing the result of removing dents from metal bodies, sheets and fenders with access to the outer or exposed face only so that a great saving of time and expense is effected in such repairs which are ordinarily very difficult and expensive.

An important object of the invention is to provide an apparatus by which the method can be carried out in a simple manner and in a relatively short space of time.

More specifically, the invention comprises a tool having a lever member mounted upon a base intermediate its ends and adapted to loosely engage a screw element for pulling outwardly upon the panel which is damaged by inserting the screw in holes previously inserted through the panel from the outside thereof.

A further object of the invention is to provide a series of holes at the deepest portions of a dent adapted to be engaged by screw means operated by a lever for pulling outwardly upon the damaged body panel, restoring the dented or bent panel to its ordinary or normal position or approximately thereto.

A further object of the method is to smooth or level any inaccuracies of the outer surface of the damaged panel by applying a quick setting metal or a plastic thereto which may be sanded and smoothed to provide a base for refinishing paint or lacquer.

A still further object of the invention is to provide a tool in the form of a bell crank lever having a handle at one end and a screw member at the other end adapted to be turned into the holes made in a damaged panel, the bell crank being mounted at its apex upon a base which engages the surface of a panel at a distance from holes made therein and engaged by the screw element.

Other objects of the invention will appear in the specification and will be more apparent from the accompanying drawings in which,

Fig. 1 is a perspective view illustrating the application and use of an apparatus by which the method is carried out as applied to dents in car bodies.

Fig. 2 is a side elevation of a dent repairing tool in accordance with this invention.

Fig. 3 is a side elevation of a portion of a tool as shown in Fig. 2 to which a spring supported base is attached.

Fig. 4 is a perspective view of a base as shown in Fig. 3.

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Fig. 5 is a view similar to Fig. 3 showing the base with its handle at a different angle than in Fig. 3.

Fig. 6 is a sectional view of the screw holding mounting at the end of the tool; and

Fig. 7 is a perspective view of a simplified tool having a claw at one end and a suction cup intermediate the ends.

It is a great advantage to be able to operate upon the exterior surface of car bodies in particular for removing dents and bent portions caused by accidents. As it may be extremely difficult to reach the back of the indented surface to push it outwardly which can sometimes be accomplished by removing the inside of a door or the seat portions for access to the interior surface of the damaged body. The present invention is designed and intended to provide both a new method of repairing such dented surfaces from the outside only and to provide suitable tools for accomplishing the desired results.

Referring now more particularly to the drawings, a portion of the side A and door B of a car body is represented as having several dents 10, 12 and 14 and a repaired dent 16, the dented portions 10, 12 and 14 each having a series of perforations 18 extending through the dents and preferably at the deepest portions thereof. These perforations are small in size and close together and are quickly made by a mechanical or electrical drill in the hands of an operator.

To remove the dents, a screw 20 is partially inserted in each of the perforations 18 until the threads thereof engage tightly in the perforation and it is not necessary that the perforations be threaded as the threads of a screw are graduated from the point thereof so that when the screw is partially inserted in the perforation, the threads of the screw will engage tightly in the perforation. The head of this screw is then engaged and pulled outwardly, moving the dented material with it, and by quickly inserting and engaging the screw in the successive openings and pulling outwardly thereon, the dent is gradually restored in alignment and flush with the remaining undented portion of the metal body or such other dented material.

A simple tool comprising a bell crank lever 22 as shown in Fig. 7 may be employed for this purpose, the lever having a forked claw 22 open at one end and a handle 26 at the other end. If desired, the lever may also have a contact pad or a suction cup 28 connected by a pivot 30 near the bend of the bell crank lever. By engaging the claw with the head of a screw placed in one of the openings and pressing the lever against the body at the angle bend thereof preferably against the cup 28, and operating the handle, the screw at the other end may be pulled outwardly, thereby pulling out the dent.

In another form of the invention as shown by the remaining figures, a bell crank lever 32 has a handle 34 at one end and a fork 36 at the other end. Between the angular portions of the fork, a nut 38 is mounted by pivots 40 extending inwardly into opposite recesses 42 from a stud screw 44a threaded through the ends of the fork 36.

Extending through this nut 38 is a screw bar 44 having a handle 46 at one end and a knurled lock nut 48 between the nut 38 and the handle 46 adapted to be moved in a position to limit the turning of the screw bar 44 in the nut 38.

At the outer end of the bar is a screw holder 50 having a threaded perforation 52 to fit over the end of the screw bar 44 and a perforated outer end 54 adapted to engage the head of a screw 20, but to allow the threaded portion to project beyond the end of the screw holder 50. When the screw is inserted through the threaded opening 52 and into engagement with the beveled opening 54, the screw holder is then inserted on the end of the screw bar until the outer end of the head of the screw engages the end

of the screw bar 44 thereby holding the screw bar tightly in place.

The screw bar 44 is threaded rather loosely through the nut 38 so that the screw 20 may be turned rapidly into and out of engagement with the dent holes 18 by rotating the screw bar handle 46. The nut 38 is also mounted upon the opposite pivots 40 so that it may have a limited angular movement conforming the screw with the inclination of the dented surface as it engages the perforations 18.

Intermediate the ends of the bell crank lever 32 and preferably near the angle of its bend, a contact member 56 may be connected. This member has upper plates 58 offset centrally to provide a slot 60 below which a thin flat member 62 is slidable and guided for longitudinal movement by the offset portions of the plates 58. Secured in this slidable member 62 is a short stem 64 extending through the slot 60 having a partly contracted spiral spring 66 surrounding the stem and bearing at the lower end against a washer 67 at the upper sides of the plates 58 and against a washer 68 at the upper end adapted to bear against the lower side of the lever 32. The upper end of the stem has a perforation 70 for securing it by means of a rivet 72 in an opening 74 through the lever 32 so that a slight rocking action of the plate 56 is possible relative to the lever 32.

The spring 68 tends to hold the lever resiliently in any position in which it has been set or moved relative to the contact member 56. The spring also permits a limited yielding rocking movement of the lever relative to the contact member 56 without changing the position of the latter.

At one end of the contact member 56 is a projection 76 which forms a handle for moving the member so that the contact member may be moved relatively to the lever 32 and holding the contact member in one place, the lever 32 may be moved by sliding it relative to the contact member 56. By this action, it is not necessary to set or relocate the contact member for each different position of the operating lever 32.

With this construction, in order to repair a dent in a car or other plain surface from the outer or dented portion, it is necessary only to provide a series of perforations in the dented or depressed portion and then to apply the tool by first inserting the screw 20 in one of the openings by rotating the screw bar handle 46 and then by adjusting the contact member 56 to any desired position usually free and outwardly from the dent, the handle end of the lever 32 is operated to pull the screw 20 outwardly moving with it the dented material and restoring or partially restoring the dent to its original position. Sometimes it is necessary to go over the dented material several times in order to pull out the dent and to make it conform more nearly to its original position. This is readily determined in operating the tools and in progressively removing the dent.

After the dented surface is restored as nearly as possible to its original location, the entire dented surface is usually coated with a plastic quick setting metal such as aluminum which hardens quickly and fills up the perforations 18 and also fills up any inequalities in the surface of the dented body or sheet metal so that it can be smoothed and polished to conform to the remaining undented surface after which a coating of paint or lacquer is applied similar to the remaining paint or coating on the sheet metal of the body.

While preferred apparatus for carrying out this method

is described in some detail, this should be regarded by way of illustration and example rather than as restrictions or limitations thereof, as many changes in the construction, combination and arrangement of the parts may be made without departing from the spirit and scope of the invention.

I claim:

1. In an apparatus for repairing dents in sheet material from the dented side thereof in which a number of small perforations are made in the dents; a member movable to engage in and removable from each of the perforations in succession, a bent lever having means at one end to engage said member at the outside of the perforation and having a handle at the other end of the lever, contact means intermediate the ends of the lever and at a bend thereof engageable with the outer surfaces of the sheet material at a distance from the engaged perforation to pry the member and the dent outwardly when the lever is manually operated, the movable member being a screw, the said end of the lever being forked and having a nut hinged therein between the extremities of the fork, the inside of the nut being threaded and the means for engaging the screw member comprising a bar rotatably adjustable in the threads of the nut.

2. In an apparatus for repairing dents in accordance with claim 1, a handle attached to the free end of the bar above the nut for turning the bar and the screw member into and out of engagement with perforations in the dents.

3. In an apparatus for repairing dents in accordance with claim 2, a knurled nut mounted upon the said bar between the lever and the adjacent end of the handle and adjustable on the bar against the upper side of the mounting nut and movable between the nut and the handle to limit the turning of the bar for inserting the screw member in a dent perforation.

4. In an apparatus for repairing dents in accordance with claim 1, the lever being generally in the form of a bell crank and having a contact piece pivoted adjacent the apex of the lever and adapted to engage the surface of the material in which the dent is located at a distance from the perforation thereof, the contact piece including a handle at one end for holding it in place and a slotted guide in the top of the contact piece in which a mounting stem is slidable to vary the position of the contact piece relative to the lever.

5. In an apparatus for repairing dents in accordance with claim 4, a coil spring interposed between the top of the contact piece and the adjacent surface of the lever and surrounding the said stem, tending to press the contact piece resiliently away from the lever.

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