June 29, 1948. W. H. FERGUSON 2,444,250

APPLIANCE FOR WORKING ON AUTOMOBILE BODY PANELS

Filed Aug. 17, 1945

Fig. 1.

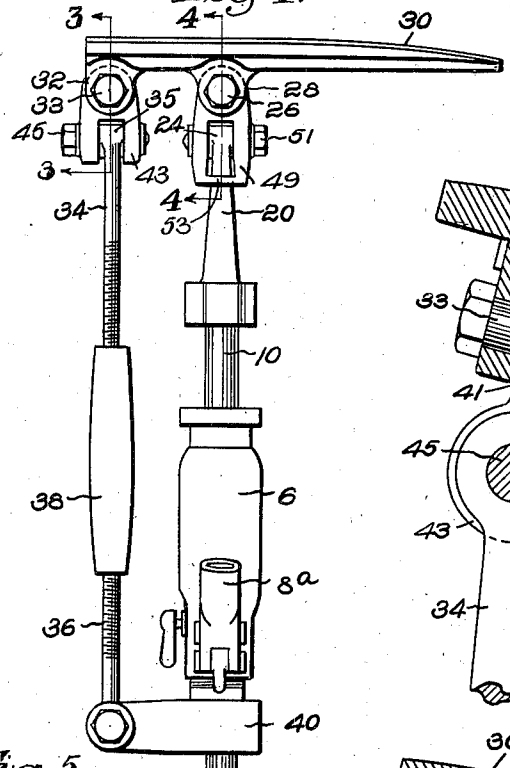


Fig. 2

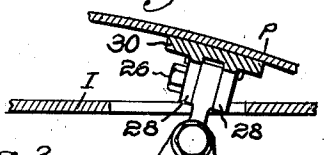
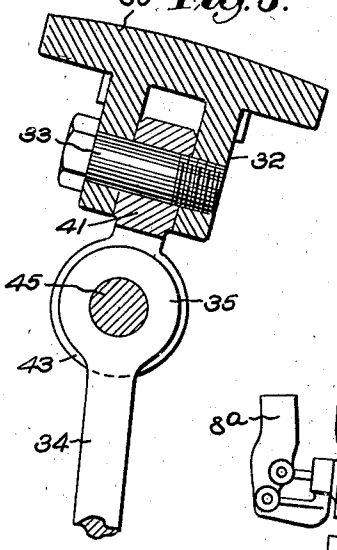


Fig. 3.



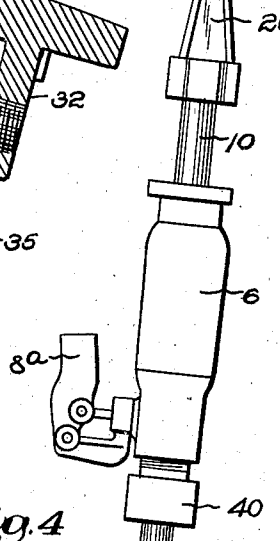


Fig. 5

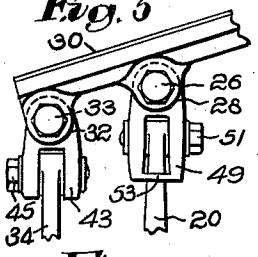


Fig. 4

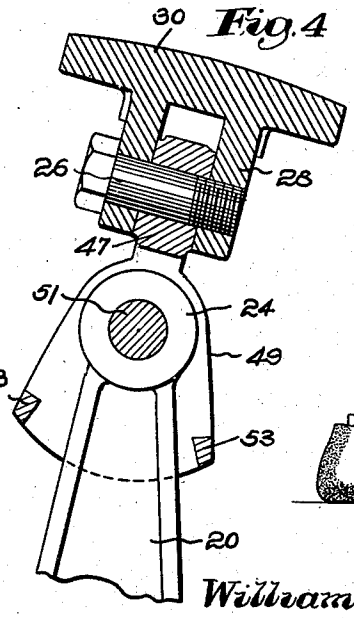


Fig. 6

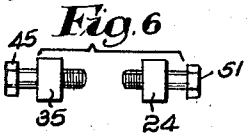


Fig. 7

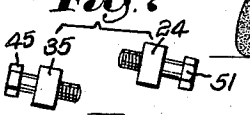
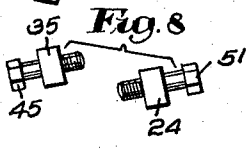


Fig. 8



Inventor:
William H. Ferguson

by Emery, Booth, Townsend, Miller & Ufheim
Attys

Patented June 29, 1948 2,444,250

UNITED STATES PATENT OFFICE

2,444,250

APPLIANCE FOR WORKING ON AUTOMOBILE BODY PANELS

William H. Ferguson, Malden, Mass., assignor to H. K. Porter, Inc., Everett, Mass., a corporation of Massachusetts

Application August 17, 1945, Serial No. 611,045

4 Claims. (Cl. 153—39)

1

This invention relates to an instrumentality for reforming panels of automobile bodies which have been bent out of shape as a result of collisions or the like, and the object is to provide means whereby effective supporting or bending pressures may be applied to the inner sides of such panels at locations not exposed at the rear but on the contrary overlaid by interior construction, without the necessity of removing any of such interior construction.

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 drawings, wherein:

Fig. 1 is a side elevation of my improved device organized as a unit in connection with a hydraulic jack;

Fig. 2 is an elevation as seen from the right of Fig. 1 but with parts in a somewhat different position of adjustment. This figure also indicates somewhat diagrammatically a portion of the automobile structure being operated upon;

Figs. 3 and 4 are sections in the plane of lines 3—3 and 4—4 respectively of Fig. 1, the parts, however, being in the position illustrated in Fig. 2;

Fig. 5 is a fragmentary view similar to a portion of Fig. 1 showing the parts in another position of adjustment; and

Figs. 6, 7 and 8 are diagrammatic views illustrating the position taken by certain of the pivot bolts in different positions of the parts.

The device here shown may be considered as an improvement on the device shown in my Patent 2,311,041, Feb. 16, 1943, to which reference may be made for a fuller understanding of the field of application of the device. Where parts here shown are substantially identical with those shown in the aforementioned patent I have designated them by the same reference numerals to facilitate consideration of the two specifications in correlation, which will account for the irregular occurrence of the numerals in the following description. In general even numerals designate parts counterparts for which are found in the previous disclosure, while odd numerals refer to parts at least superficially different.

Referring now to Fig. 1, I there show a mechanism of the general type referred to in my prior patent organized as an operative unit with a hydraulic jack of well known construction constituting an example of a power-translating device. The jack proper herein comprises the body 6 housing suitable mechanism which may be operated by a handle in handle socket 8a for moving the ram 10. In the arrangement shown in the drawing the jack is supported from a suitable abutment surface by means of a heavy rubber pad 12 engaging the latter between which and the jack body 6 is interposed a tubular column 15 of suitable length, the part 40 hereinafter to be referred to constituting in the present instance a coupling between the base of the housing 6 and the upper end of this column 15. The ram of the jack has mounted thereon the member 20 by means of a threaded socket (not shown) and this member has at its outer end a perforated ear 24 to receive a pivot pin, thus providing an anchorage for a portion of the mechanism to the movable member of the jack, that is, the ram 10. An anchorage is also provided to the stationary portion of the jack, herein by means of the member 40 which has laterally projecting ears between which is pivoted one of the threaded rods of a turnbuckle 38, the other rod 34 having a terminal eye 35, illustrated in the prior patent referred to but bearing no numeral therein. Through the ear 24 and eye 35, but by intermediate means presently to be described, there is secured to the movable member and the stationary member of the jack respectively the pivot bolts 26 and 33 which pass respectively through spaced ears 28 and 32, the latter being located near one end of the elongated spoon member 30 and the former near the middle thereof. Thus, assuming the parts to be in the position of Fig. 1, if the jack is operated to extend the ram, the spoon is swung in the manner illustrated in Fig. 5 to raise the overhanging end thereof shown at the right in Fig. 1 which is, at least at its distal portion, contoured to provide a body reforming surface.

2

The connection between the ears 28 and 32 respectively with the end of the fitting 20 and the end of the rod 34 is herein made by two fittings providing relatively perpendicular pivots. Thus, referring to Fig. 3, a fitting is provided having a male portion 41 received between the ears 32 and receiving the pivot bolt 33 and a female portion 43 receiving the eye 35 on the end of rod 34 and accommodating the pivot bolt 45 whose axis is transverse to the axis of the bolt 33.

Referring to Fig. 4, the ears 28 receive a similar male member 47 formed integrally with a female member 49 receiving the ear 24 on the end of fitting 20 and pivoted thereto by bolt 51 whose axis is transverse to that of bolt 26. Herein the parts 49 are extended downwardly for a considerable distance past the pivot and are con-

nected by bars 53 which oppose the sides of the fitting 20 and limit swinging movement of the parts about the center 51. As illustrated by Figs. 2, 3 and 4, the provision of the pivots 45 and 51 permits the face of the spoon to be swung about a short radius angularly to the plane through the axes of the ram 10 and of the connecting turnbuckle in which plane the swinging movement of the spoon between such positions as are illustrated in Figs. 1 and 5 takes place.

In Fig. 2 the tool is shown inserted through an opening in part of the interior structure I of the automobile to act on the interior face of an external panel P. It might be inconvenient to so position the tool as a whole that the axis of the jack would extend perpendicularly to the curvature of the panel but in the arrangement shown by virtue of the tilting movement as illustrated in Figs. 2, 3 and 4 about the pivot bolts 45 and 51, the face of the spoon 30 may by initial adjustment or by automatic adaptation adjust itself to the face of the panel P in some such manner as is illustrated in Fig. 2 and the operation will proceed. As the jack is extended, the parts move to a position similar to that illustrated in Fig. 5, the rocking movement of the spoon 30 being, generally speaking, in its longitudinal median plane.

In Fig. 1 it will be noted that in the position of the parts there shown pivot 45 and pivot 51 are aligned and thus define an axis on which the spoon can swing out of the plane of the paper within the limits determined by the stops 53. When, however, the ram is moved up and the parts assume the position like that of Fig. 5, these pivots are no longer in line and the reader may inquire how the adjustment out of the plane of the paper can be effected with the parts in that position or why the parts do not bind if they are initially set at an angle as illustrated in Figs. 3 and 4 and the jack then extended. In Figs. 6, 7 and 8 various positions of the pivots have been illustrated to make this clear. In Fig. 6 the position of the pivots as they would be in Fig. 1 with the spoon either directly over their centers or tilted to one side as in Fig. 2 and also as they would be in the position of Fig. 5 with the spoon directly above their centers. Now, if we move the spoon in Fig. 5 away from us or, moving it away from us in Fig. 1, extend the jack, the parts take the position shown in Fig. 7. Because the connecting turnbuckle 38 is long and rather loosely connected to the ears of the part 40, its eye 35 may throw over to one side, as illustrated at the left of Fig. 7. Also the screw 34 may turn slightly in the turnbuckle without materially altering its length and the ram 10 is free to rotate in its cylinder so that the eye 35 and ear 24 assume the positions shown in Fig. 7, the axes of the two pivot bolts 45 and 51 being parallel and providing for the angular positioning of the spoon. If the turnbuckle were rigidly confined to the plane of the paper in Fig. 1, the two parts 24 and 35 would be horizontally aligned but they would turn in the manner indicated to put the pivots in parallelism at a suitable distance apart. Fig. 8 illustrates the position of the parts when the spoon is tipped over toward the reader, viewing Figs. 1 and 5.

As is set forth in my previous patent, a turnbuckle is a most desirable means for connecting the rocking spoon to the stationary portion of the jack and inherently it provides for the angular adjustment of the pivot pin 45 and without any marked alteration of its length since the angular movement is small. The conventional hydraulic jack as used in body work has a freely turning ram 10 so that no special construction is required to permit this adjustment of the pivot 51. Under other circumstances those skilled in the art can in view of the explanation herein given provide for the necessary swivelling movements.

It is clear from what has been said that such swivelling movement takes place as the jack is operating, but the movements are in all instances small and with the parts under stress of the jack there is merely an adaptation of the parts to the strains without altering essentially the direction of thrust on the panel to be reformed and without any such shifting of stresses as would endanger the position of the parts of the tool and its actuating means. The provision of the stop shoulders 53 prevents the spoon from swinging over to a position remote from those which would be used in practice and keeps the position of the pivots within such limits that easy adjustment and movement of the mechanism is provided for at all times.

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. An instrumentality for use with a jack for reshaping automobile panels comprising a supporting member arranged for rigid attachment at one end thereof to the movable element of the jack and a link arranged for pivotal connection to the stationary element of the jack, an elongated spoon member, connecting means joining said spoon member at spaced points therealong to the opposite ends of the supporting member and link respectively, the spoon member having an overhanging portion for entry within the interior structure of an automobile and having at least the distal part of said portion contoured as a panel-reforming tool, said connecting means in each instance comprising a universal joint structure wherein is found a pair of parallel axes on which the spoon may move freely angularly in its longitudinal plane as the supporting member is moved by operation of the jack and a pair of axes generally transverse to the first and movable between aligned and parallel positions whereby a swinging movement of small radius of the spoon transverse to the plane is provided for in all positions of the latter.

2. An instrumentality for use with a jack for reshaping automobile panels comprising a supporting member arranged for rigid attachment at one end thereof to the movable element of the jack and a link arranged for pivotal connection to the stationary element of the jack, an elongated spoon member, connecting means joining said spoon member at spaced points therealong to the opposite ends of the supporting member and link respectively, the spoon member having an overhanging portion for entry within the interior structure of an automobile and having at least the distal part of said portion contoured as a panel-reforming tool, said connecting means

in each instance comprising a universal joint structure wherein is found a pair of parallel axes on which the spoon may move freely angularly in its longitudinal plane as the supporting member is moved by operation of the jack and a pair of axes generally transverse to the first and movable between aligned and parallel positions whereby a swinging movement of small radius of the spoon transverse to the plane is provided for in all positions of the latter, at least one of the connecting means comprising shoulders delimiting the latter movement.

3. An instrumentality for use with a jack for reshaping automobile panels comprising a supporting member arranged for rigid attachment at one end thereof to the movable element of the jack and a link arranged for pivotal connection to the stationary element of the jack, an elongated spoon member having an end portion for entry within the interior structure of an automobile, at least the distal part of said portion being contoured as a panel-reforming tool, intermediate members supporting relatively perpendicular pivot pins which are rotatably connected on the one hand to the ends of said supporting member and link and on the other hand to said spoon at spaced points therealong remote from said distal part, certain of said pins, one on each of said members, providing an axis adjacent the ends of the supporting member and link about which said spoon may have an adjusting movement to alter the presentation of its working face relative to the axis of the supporting member and the others of said pins providing for enforced swinging movement of the spoon about one of them as a movable center when the jack is operated.

4. An instrumentality for use with a jack for reshaping automobile panels comprising a supporting member arranged for rigid attachment

at one end thereof to the movable element of the jack and a link arranged for pivotal connection to the stationary element of the jack, an elongated spoon member having an end portion for entry within the interior structure of an automobile, at least the distal part of said portion being contoured as a panel-reforming tool, intermediate members supporting relatively perpendicular pivot pins which are rotatably connected on the one hand to the ends of said supporting member and link and on the other hand to said spoon at spaced points therealong remote from said distal part, certain of said pins, one on each of said members, providing an axis adjacent the ends of the supporting member and link about which said spoon may have an adjusting movement to alter the presentation of its working face relative to the axis of the supporting member and the others of said pins providing for enforced swinging movement of the spoon about one of them as a movable center when the jack is operated, at least one of said members having cheek portions extending laterally of and beyond the adjacent pin of the first mentioned pair and lying adjacent the sides of the jack connected part to which said pin is connected to limit the range of adjusting movement.

WILLIAM H. FERGUSON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
258,558	Cook	May 30, 1882
503,437	Pilcher	Aug. 15, 1893
1,973,056	Fleming et al.	Sept. 11, 1934
2,311,041	Ferguson	Feb. 16, 1943