Oct. 31, 1950 F. J. HAUSCHILD 2,528,361

SHEET METAL STRAIGHTENING TOOL

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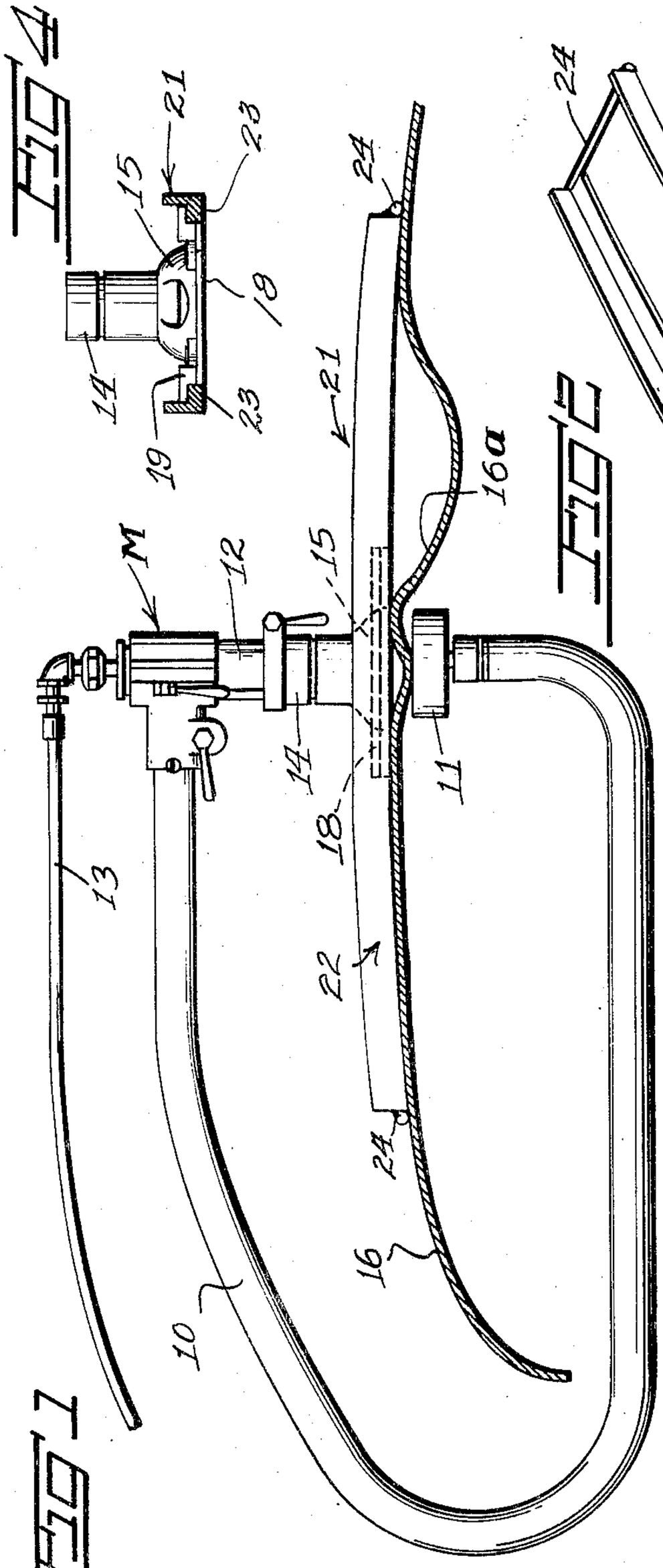

FIG. 7

FIG. 4

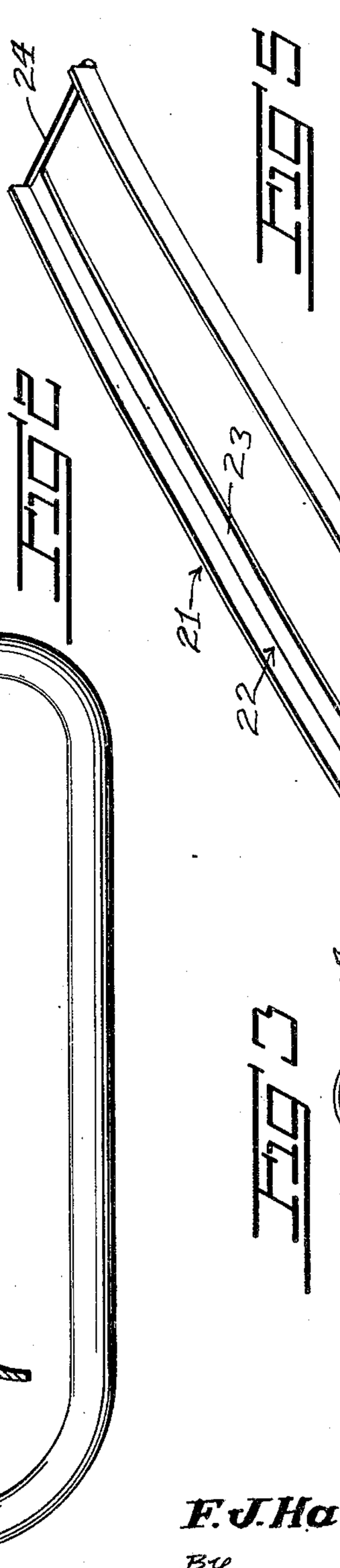

FIG. 2

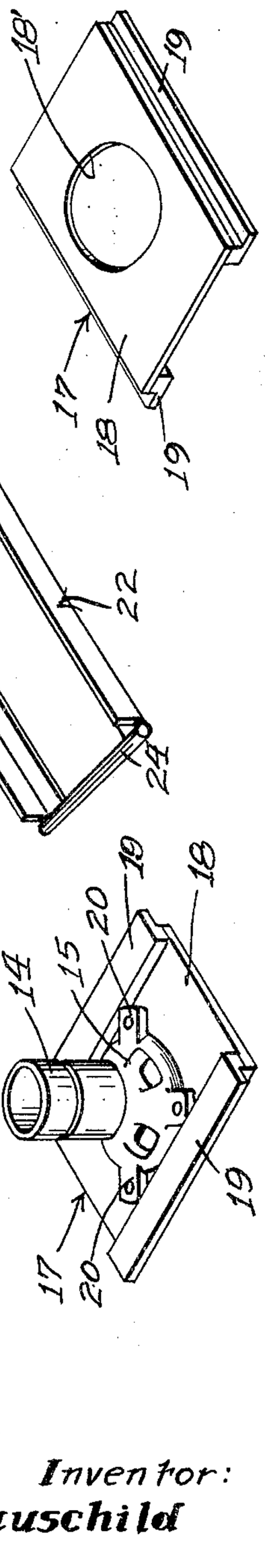

FIG. 5

FIG. 6

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SHEET METAL STRAIGHTENING TOOL

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7 Claims. (Cl. 153—32)

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This invention relates generally to the class of tools and pertains particularly to devices designed for use in connection with the repairing of, or straightening, sheet metal bodies, more particularly automobile bodies, and this application constitutes a continuation in part of my application Serial No. 653,452 filed March 11, 1946, now abandoned.

In the repairing of damaged automobile bodies where denting of the sheet metal material is involved, fluid operated hammering machines have been developed which involve the use of an anvil or dolly supported upon a frame in opposed relation to an air driven hammering unit whereby, when the dented sheet metal body is interposed between the hammering unit and anvil the dent may be hammered or ironed out to restore the metal to its former condition.

A machine of the character described is shown in my Patents Nos. 2,148,619 and 2,148,943, which issued February 28, 1931.

Tools of the character referred to are highly efficient where the dented area is not extensive or rather where the dent does not cover a large area but difficulty is involved in restoring the dented portion of the sheet metal to its former plane where there is a large dent covering a very large area and accordingly, it is a principal object of the present invention to provide an improved implement or air hammer accessory which is designed to facilitate the use of a standard dent removing machine of the character stated to straighten or iron out those large or extensive dents in sheet metal which are not readily restored by the use of the hammer and anvil units alone.

A further object of the invention is to provide an attachment for a tool of the character shown in my prior patents above identified, whereby the hammer unit and anvil of the tool may be easily moved over a large area to restore a dented surface to its former smooth form.

Still another object of the invention is to provide an attachment of the character stated for a machine of the character above identified, wherein the attachment not only provides a guide or supporting rail for a movable trolley unit to facilitate the movement of the trolley unit over a dent of extensive character but also functions as a template or die which, by bridging the dented area serves to align the hammered out dented portion with the undented surrounding portion of the sheet metal body.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of the specification, with the understanding however, that the invention is not to be understood as limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

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In the drawing:

Figure 1 illustrates an air hammer or dent removing machine of the character shown in my above identified patents in association with the attachment forming the subject matter of the present invention, the whole being shown applied to a dented portion of the metal top of a motor vehicle body.

Figure 2 is a view in perspective of the guide or trolley supporting rail.

Figure 3 is a view in perspective of the trolley or movable unit which is attached to and carried by the bell of the air hammer.

Figure 4 is a view in transverse section of the track and trolley showing the attached bell in elevation.

Figure 5 is a view in perspective of the underside of the trolley unit to which the hammer sleeve and bell are attached, showing the opening through which the air hammer operates.

Referring now more particularly to the drawing the reference character M generally designates the fluid operated hammering machine disclosed in my prior patents and in association with which the present invention is used.

The machine M includes the relative long substantially U-shaped yoke **10** upon one end of which is supported the anvil or dolly **11**. Upon the other end of the yoke is secured a pneumatic hammer unit which includes the hammer cylinder **12** and a fluid supply pipe **13**. This hammer unit has the air driven hammer, not shown, which is within the cylinder **12**, positioned to move in cooperation with the anvil **11** so that when a sheet metal body is interposed between the hammer and the anvil, the dented area can be hammered or ironed out.

Also forming a part of the patented machine M is a sleeve **14** which is removably secured around the hammer cylinder **12** and which carries upon its outer end the enlarged portion or bell **15** which, in the patented machine, rests upon the dented sheet metal body to stabilize the hammer unit.

The numeral **16** generally designates a sheet metal body which is represented as forming a portion of a turret top of a motor vehicle body although, obviously, the machine is not confined

to this particular use but may be used in connection with any sheet metal bodies which are to be straightened or hammered out to a former smooth condition, after being dented. The body 16 is here shown as having a depressed or dented portion 16*a* of extensive area which could not be readily ironed out or removed by the use of the patented machine.

In accordance with the present invention there is provided the trolley unit generally designated 17 which comprises the plate portion 18 and the raised laterally projecting and oppositely positioned slide flanges 19. The plate 18 is of relatively large area and is here shown as being rectangular in outline but it may be square if desired.

Formed in the plate 18 is the hole or opening 18', which is of the maximum diameter permitted between the slide flanges 19.

The bell 15 of the machine is provided with the integral radially extending attaching ears 20 and the face of the bell is applied to the top of the trolley plate 18 between the flanges 19 over and concentric with the opening 18'; and the attaching ears 20 are secured to the plate 18 in a suitable manner as, by welding or by the use of rivets or other securing devices which are flush upon the underside or working face of the trolley plate. The hammer (not shown) which reciprocates within the cylinder 12, is projected through the opening 18' against the body 16, against the under face of which the dolly 11 presses.

The numeral 21 generally designates a support or bridge for the trolley unit 17, which bridge is of substantial length and is designed to extend across or bridge the dent or depression 16*a* in the sheet metal body, which is to be straightened or flattened out.

The bridge 21 comprises the two spaced parallel rails 22 which are longitudinally arcuate and are preferably of angular cross section as shown, with a flange 23 of each directed inwardly in edge opposed relation with the opposite flange. These rails 22 are connected together at their ends in any suitable manner as, for example, by the application of the cross rods 24 which are welded or otherwise connected to the ends of the rails to lie in or above the plane of the undersurfaces of the opposed flanges 23.

The distance between the opposed edges of the flanges 23 is substantially equal to the width of the plate 18 and this plate is designed to position between the guide rail flanges with the track flanges 19 of the trolley plate resting upon the top surfaces of the guide rail flanges 23 as shown in Figure 4.

As shown in Figure 4 when the trolley 17 is mounted upon the bridge 21 the under face of the plate 18 will be in the plane of the under surfaces of the flanges 23 and when the bridge is placed upon the top of the sheet metal body 16 across the indentation and the machine M is placed in working position with the trolley 17 attached and resting upon the bridge it will be seen that the machine can be moved back and forth longitudinally of the bridge, the trolley sliding on the bridge over and maintaining the hammer (not shown) in proper opposed relation with the underlying dolly. Accordingly as the air hammer is operated the dented portion 16*a* will be gradually forced back until it is pressed against the underside of the bridge flanges 23 and the under face of the trolley plate 18. Thus the bridge and trolley plate, in effect, constitute a die or template for aligning the restored portion

of the sheet metal body with the surrounding undented portion thereof.

While the trolley and bridge units are here shown and have been described as being used in conjunction one with the other it will be readily apparent that use may be made of the trolley unit 17 without the bridge 21, where the dents which are to be removed are not of the extensive character illustrated in Figure 1.

From the foregoing it will be readily seen that there is provided in the present invention a novel and desirable accessory for the dent removing machine of the character referred to whereby the utility and efficiency of such machine is greatly increased.

It will be understood from the foregoing that whereas in the machine illustrated in the patents referred to the bell 15 rests against the work and the hammer which is enclosed within the cylinder 12, drives or operates through the bell directly against the sheet metal body which is being straightened, in the use of the present accessories, the bell supporting plate rests against the work, with the bridge 21, and the hammer drives through the bell and through the opening 18', against the body 16. Thus the force of the hammer blows will be opposed by the anvil or dolly 11 and the dent will be rapidly flattened or eliminated from the sheet of metal.

I claim:

1. The combination with a sheet metal dent straightening machine having a hammer carrying cylinder and a coacting opposing anvil; of a plate disposed across an end of the cylinder, means securing the plate to the cylinder, the said plate having a flat work contacting face of large area and being disposed in a plane between the cylinder and said anvil, said securing means maintaining the plate rigidly in a plane substantially perpendicular to the cylinder, the plate having an opening through which the hammer in the cylinder operates against a dented body, and a long bridge to slidably support said plate.

2. The combination with a sheet metal dent straightening machine having a hammer carrying cylinder and a coacting opposing anvil; of a plate disposed across an end of the cylinder, means securing the plate to the cylinder, the said plate having a flat work contacting face of large area and being disposed in a plane between the cylinder and said anvil, said securing means maintaining the plate rigidly in a plane substantially perpendicular to the cylinder, the plate having an opening through which the hammer in the cylinder operates against a dented body, and a relatively long bridge and means coupling the bridge and plate to slidably support the plate for back and forth movement across the dent.

3. The combination with a sheet metal dent straightening machine having a hammer carrying cylinder and a coacting opposing anvil, of a bell unit carried by the hammer cylinder and extending beyond the end of the cylinder which is adjacent to the anvil, a plate of an area materially greater than the area covered by the bell and disposed across the bell, means securing the bell to the plate and rigidly holding the plate against movement independently of the bell and hammer cylinder, said plate having an opening for the hammer to work through against a piece of work, a relatively long bridge member designed to extend across a dent in a sheet metal body, and means for slidably coupling the plate

with the bridge member whereby said plate may be moved on the bridge member longitudinally thereof.

4. The combination with a sheet metal dent straightening machine having a hammer carrying cylinder and a coacting opposing anvil, of a bell unit carried by the hammer cylinder and extending beyond the end of the cylinder which is adjacent to the anvil, a plate of an area materially greater than the area covered by the bell and disposed across the bell, means securing the bell to the plate and rigidly holding the plate against movement independently of the bell and hammer cylinder, said plate having an opening for the hammer to work through against a piece of work, a relatively long bridge member comprising a pair of spaced parallel rails, means connecting the rails together at their ends, said bridge member being designed to extend across a dent in a sheet metal body, said plate being designed to position between said rails with the under surface of the plate and the under surfaces of the rails in the same plane, and means coupling the plate with the rails facilitating the movement of the plate longitudinally of the rails.

5. The combination with a sheet metal dent straightening machine having a hammer carrying cylinder and a coacting opposing anvil, of a bell unit carried by the hammer cylinder and extending beyond the end of the cylinder which is adjacent to the anvil, a plate of an area materially greater than the area covered by the bell and disposed across the bell, means securing the bell to the plate and rigidly holding the plate against movement independently of the bell and hammer cylinder, said plate having an opening for the hammer to work through against a piece of work, a relatively long bridge member comprising a pair of spaced parallel rails, means connecting the rails together at their ends, said bridge member being designed to extend across a dent in a sheet metal body, said plate being designed to position between said rails with the under surface of the plate and the under surfaces of the rails in the same plane, and means coupling the plate with the rails facilitating the movement of the plate longitudinally of the rails, said bridge member being longitudinally arcuate.

6. For use in removing dents in sheet metal bodies, a relatively long unit comprising spaced parallel rails, said unit being designed to position upon the surface of a sheet metal body to bridge a dent in such body, and a hammering unit supporting plate supported on and between said unit rails for sliding movement longitudinally of the unit, said plate having its under surface in the plane of the under surfaces of said rails, said plate having an opening through which the hammering unit works.

7. A structure of the character described in claim 6, in which said unit is longitudinally arcuate.

FREDERICK J. HAUSCHILD.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,427,299	Kennedy	Aug. 29, 1922
1,957,495	Fleming	May 8, 1934
2,148,943	Hauschild	Feb. 28, 1939
2,263,423	Kattrein	Nov. 18, 1941
2,282,111	Beckwith et al.	May 5, 1942