Sept. 15, 1936. E. ERONEN 2,054,248

FENDER TOOL

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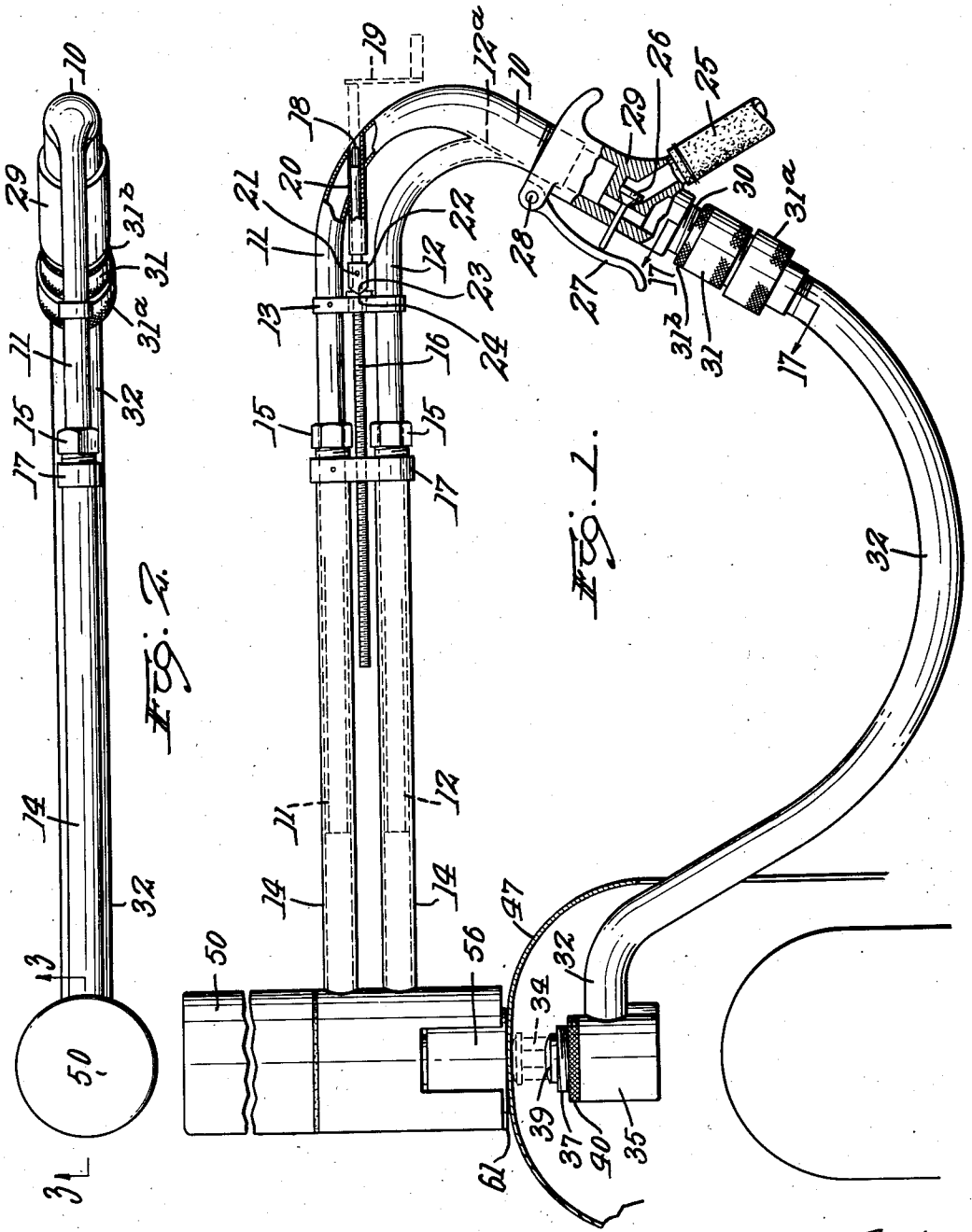


Fig. 2.

Fig. 1.

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FENDER TOOL

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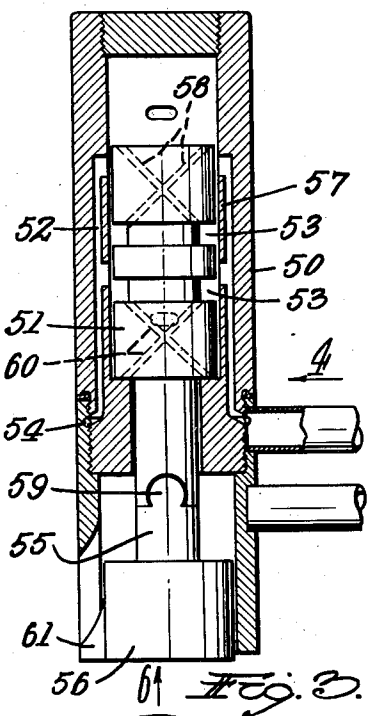


Fig. 3.

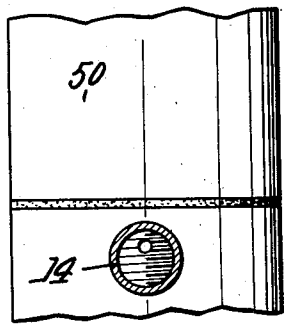


Fig. 4.

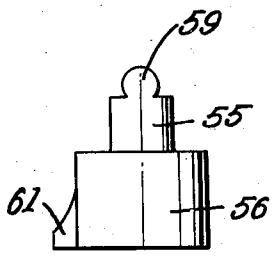


Fig. 5.

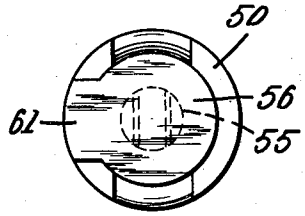


Fig. 6.

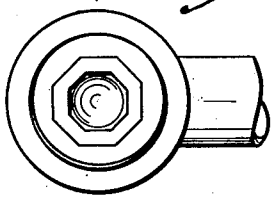


Fig. 8.

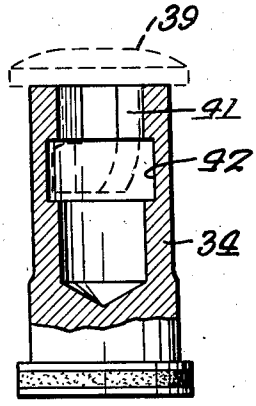


Fig. 11.

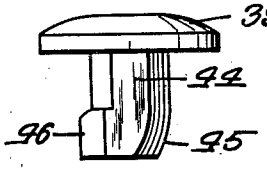


Fig. 9.

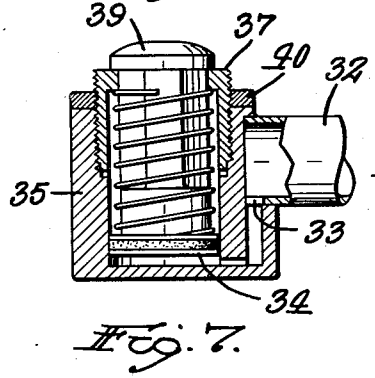


Fig. 7.

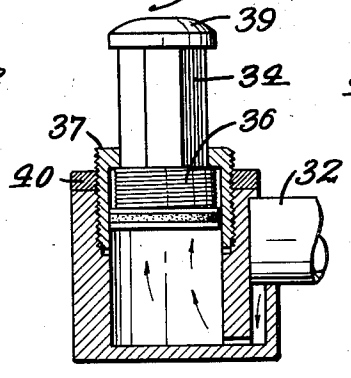


Fig. 12.

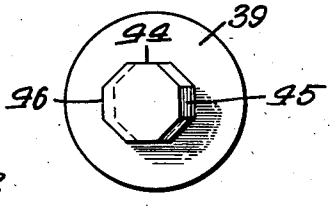


Fig. 10.

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FENDER TOOL

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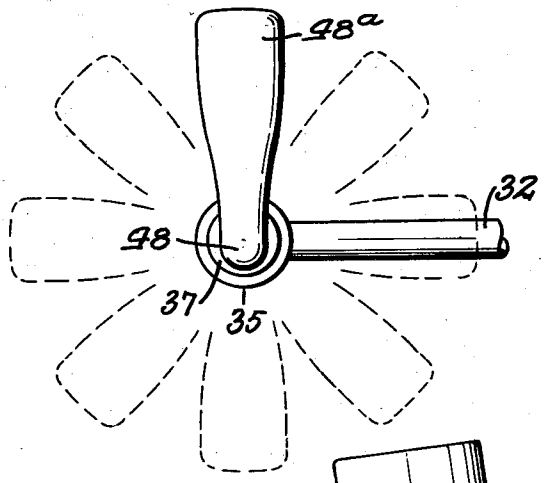


Fig. 13.

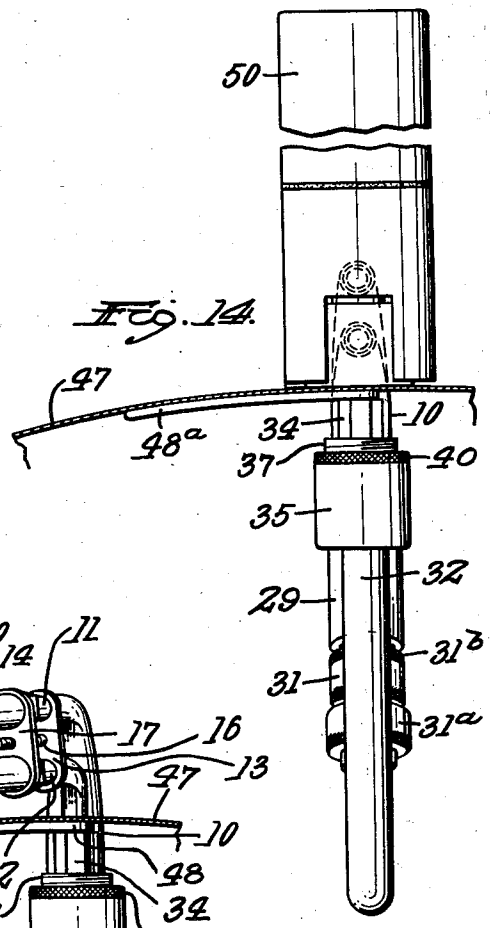


Fig. 14.

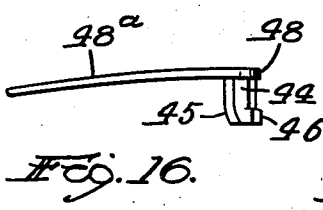


Fig. 16.

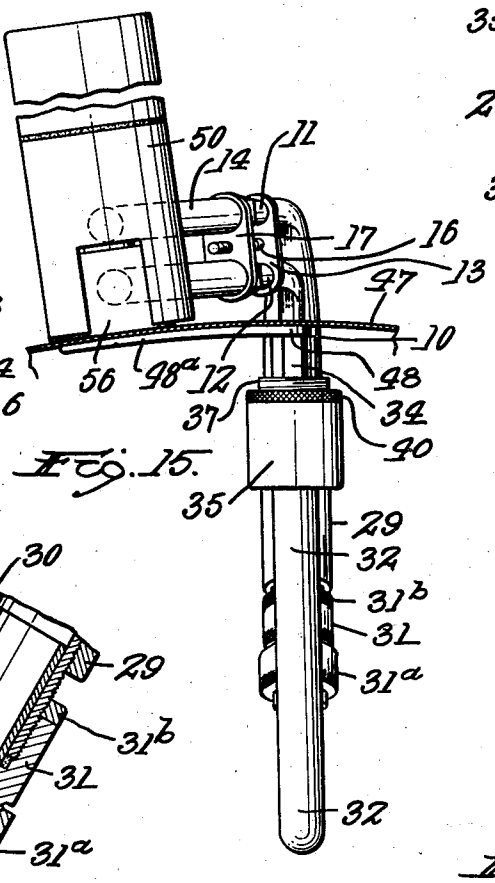


Fig. 15.

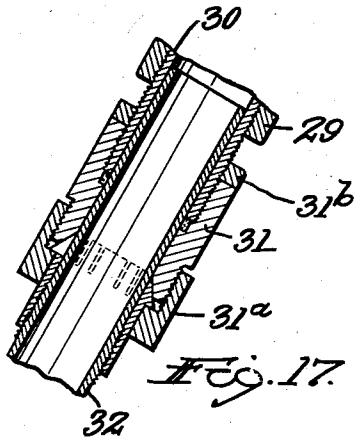


Fig. 17.

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UNITED STATES PATENT OFFICE

2,054,248

FENDER TOOL

Edward Eronen, Gardner, Mass.

Application June 21, 1934, Serial No. 731,700

10 Claims. (Cl. 153—32)

This invention relates to a hand manipulated pneumatic implement for correcting dents and projections on automobile fenders and for other similar uses.

The principal objects of the invention are to provide a construction which, while operated by compressed air or hydraulically, will provide the same pressure on the anvil or dolly underneath as on the hammer and always introduce these pressures at the same time; to provide a construction which will be capable of adjustment longitudinally to provide for repairing at a distance from the center of the dolly; to provide a frame for the tool capable of adjusting the dolly on an inclined axis so as to provide for operation at a distance from the center of the dolly sideways; to provide an improved dolly to facilitate the operation of the device when the hammer and center of the dolly are out of alignment, and to provide improvements in the form of the dolly and of the hammer.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a side view of a preferred embodiment of this device, partly in section, showing it in its normal condition ready for operation;

Fig. 2 is a plan of the same;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2 on enlarged scale showing the interior of the hammer;

Fig. 4 is an elevation of the hammer looking in the direction of the arrow 4 in Fig. 3;

Fig. 5 is an elevation similar to Fig. 2 of the head of the hammer;

Fig. 6 is a bottom plan view of the hammer head, as indicated by the arrow 6 in Fig. 3;

Fig. 7 is a sectional view of the anvil taken on the same line as Fig. 3;

Fig. 8 is a plan of the same;

Fig. 9 is a side view of one form of dolly adapted to be used with this invention;

Fig. 10 is a bottom plan view of the same;

Fig. 11 is a central sectional view on enlarged scale of the anvil part of the device showing the dolly illustrated in Figs. 9 and 10;

Fig. 12 is a view similar to Fig. 7 showing the plunger and dolly elevated in operative position;

Fig. 13 is a plan of the anvil part of the device showing a form of dolly used for eccentric action and illustrating in dotted lines the various positions which it can take;

Fig. 14 is an end view of the implement showing one use of the dolly illustrated in Fig. 13 in the position shown there in full lines;

Fig. 15 is a similar view showing the adjustment of the frame to provide for operation on the said dolly at a distance from its center;

Fig. 16 is a side view of the dolly shown in Fig. 14, and

Fig. 17 is a sectional view on the line 17—17 of Fig. 1.

This invention relates to the type of tools or implements now on the market which, although capable of general use, are designed particularly for the correction of damages which are done to automobile fenders by collisions and the like. These implements are used to smooth out either projections or indentations on the fenders but, as usually constructed, they are open to several objections.

The hammer and anvil or dolly are made substantially alike, usually one or them convex and the other flat and operating on the same center. That is, the hammer reciprocates along the line that is central with respect to the dolly. For that reason the operation on a dent is the same as that on a projection and it is very difficult to straighten either of them out. Furthermore, it is impossible to reach positions adjacent to the frame or brackets which support the fender without removing it therefrom. This invention is designed in part to overcome these difficulties.

The frame of the device comprises a supporting part 10 which may be considered as the stationary element of the frame and is shaped for use as a handle. It is formed of two tubes 11 and 12 which are united to form the frame 10. These two tubes are provided with a yoke 13 fixed thereto. A slidable frame comprising two tubes 14 is arranged to be telescoped to the tubes 11 and 12. Packing nuts 15 prevent loss of air. Preferably the tube 12 is closed by a wall 12a so that the lower tube 14 is not supplied with air.

The adjustment is secured through a screw 16 which operates in connection with an end piece or yoke 17 uniting the two tubes 14 at one end and in which there is a screw thread in which the screw 16 fits to move the frame composed of tubes 14, 14 longitudinally. For the purpose of operating this screw it is provided with a square end 18 on which a wrench or spanner 19 can be provided and the tube 11 is provided with a tube 20 extending through it into which the end of this screw 16 projects. It opens out of the tube 11 for the reception of the wrench.

On the shank of the screw 16 is secured by a pin 21 a member 22 which has two projecting

ends 23 adapted to engage in notches 24 provided in a part of the yoke 13 to hold it in adjusted position.

The frame 10 screws into a combined hand grip and bracket 29 provided with a tube or hose 25 for the admission of compressed air, or other fluid, and a valve 26 for controlling the same, this valve being operated by a valve lever 27 pivoted on a pivot 28 carried by the bracket 29. This admits air through the bracket to the upper tube 14 and it also admits air through a hollow screw 30 carried by the bracket 29 into a lower tubular frame 32. The parts 30 and 32 are swivel jointed together through a connection 31 held by a nut 31a and check nut 31b. The screw 30 is located at an inclination governed by the shape and size of the part to be mended or operated upon. This joint affords adjustment about an inclined axis and adjustment of the lower frame along that axis for repairing metal of different thicknesses.

The tubular frame 32 is bent downwardly in a curve and then upwardly at a point well back of the operating end of the device to form a horizontal part which, through a port 33, admits air under a plunger 34 in a head 35. This plunger is provided with a spring 36 resting against a screw threaded and adjustable guide 37 perforated at the top to fit the octagonal sided plunger 34 carrying a dolly head 39. The guide 37 and plunger 34 are shown as octagonal for the purpose of preventing rotation and permitting the dolly to be inserted in any one of these different positions to compensate for wear and for other purposes, as will appear. The bottom of the plunger 34 is packed. It will be obvious that when air is admitted to the upper tube 14 it is also simultaneously admitted to the plunger and the dolly forced upwardly, as shown in dotted lines in Fig. 1 and in Fig. 12. The spring restores the dolly to retracted position when the air pressure is cut off. The head 35 is supplied with a check nut 40 to hold the adjustment of the screw threaded guide 37.

The plunger 34 is hollow and provided with an octagonal passage 41 extending in from the top and with an enlargement or recess 42 which may be circular. In this case the dolly 39 is provided with a head which has a flat top and convex sides and with a shank 44. This shank is octagonal most of the way, rounded off inwardly at 45 on one side, and has a projection 46 on the opposite side adapted to enter the recess 42. This construction permits of the insertion of the dolly in its support by sideways motion to the right in Fig. 11 and the rounded portion 45 is made to facilitate that operation and enable it to be performed. When finally inserted, as shown in Fig. 11, the projection 46 prevents accidental dislodgment of the dolly from its support.

In Figs. 13, 14, 15 and 16 another form of dolly 48 is shown which is provided with an octagonal shank and with a portion 43a extending substantially at right angles thereto but at a slanting curve representing in general the curvature of the fender 47 of a car or other piece of mechanism on which the device is to be used.

Fig. 14 shows the parts in their normal position. Fig. 15 shows the swinging of the frame about the axis of the inclined part of the frame about which the parts in Fig. 17 are pivoted.

It is on account of this inclination that this curved dolly is employed as shown in Fig. 15. The dolly is the part that is swung on this inclined axis to bring some part of its curved portion directly in line with the hammer, which will be described later, so that an operation can be performed on a curved fender 47 at some otherwise inaccessible point.

If the dolly is in the position shown in Figs. 13, 14 and 15, the frame has to be swung directly on its inclined axis to bring the dolly and hammer into the relative positions in Fig. 15. If it is desired to perform the operation at a distance beyond the normal axis of the dolly or inside it, the results are similar except that the frame 14 has to be adjusted back and forth. When the dolly is swung to an intermediate position, both adjustments have to be made. By the use of this type of dolly, the implement is rendered practically universal and can be employed for operating next to a supporting bracket for the fender or in any other otherwise inaccessible place, either with the dolly 48 or a similar one shaped to provide for the intermediate angles.

The upper tube 14 enters the hammer 50 and introduces compressed air at the bottom of the plunger 51 through a circumferential groove 54 and two passages 52 connected by one of two circular grooves 53 on the plunger. The upper groove 53 is connected to the top of the plunger by two inclined ports 58. This forces the plunger down.

The plunger is designed to operate on the shank 55 of the hammer head 56 in a well known way. When the plunger descends, as shown in Fig. 3, the upper groove 53 is cut off from receiving pressure by a wall 57 but the lower groove 53 is opened to it. Then air passes to the bottom of the plunger by the inclined ports 60 and the plunger rises. The plunger is connected to the head 56 by a ball joint 59.

The hammer head 56 is provided with a radial projection 61 having an operating surface in the same plane as the operating surface in the head. This projection extends out a short distance so that it can be used for the peening operation itself and extends the surface of the hammer in one direction. It is especially useful when the hammer or anvil is adjusted slightly out of the center. This hammer head can be taken out and put back in so that this projection can be extended in any desired direction therefrom. This is an additional feature of importance in the mending of certain kinds of distortions in fenders.

It will be seen that by the pivoting of the frame on an inclined axis the device is capable of use in places not otherwise accessible. Also by the shape of the hollow tube or frame 32, in which it extends from the head 35 for a distance horizontally and then curves downwardly, recesses are provided under the tube on the outside and over the tube on the inside so that the ordinary fender can be reached without interference from this tube or frame.

Furthermore, in the longitudinal adjustment it cooperates with the adjustment about the inclined axis and the projection 61 on the hammer head also cooperates to render the device suitable for reaching inaccessible parts and performing the operation efficiently at points outside the center of the hammer.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In a tool for straightening sheet metal objects, the combination with a hammer and a dolly located normally in alignment with each other,

of a frame for supporting them comprising two parts adjustably and pivotally connected together on an axis inclined with respect to the axial line of the hammer, whereby the dolly can be adjusted with respect to the hammer on the arc of a circle centered on said inclined axis.

2. In a tool of the character described, the combination with a hammer and dolly adapted to be mounted in alignment, of a frame for supporting them, said frame comprising two parts, means for introducing an operative fluid into both parts for operating the hammer and moving the dolly against the hammer, said parts being pivotally connected together on an axis inclined with respect to the common axis of the hammer and dolly.

3. In an implement of the characted described, the combination with a hammer and dolly adapted to cooperate, of a frame for supporting them comprising two parts, each of tubular construction, means for admitting compressed air into both parts to operate the hammer and move the dolly toward the hammer, said parts being pivoted together on an axis inclined with respect to the axis of the hammer and dolly, and means for adjusting one of said parts of the frame longitudinally.

4. In an implement of the character described, the combination of a hammer and a dolly normally mounted in axial alignment, of a frame comprising two parts each of hollow construction to conduct fluid to both the hammer and dolly, said two parts being connected together on an inclined axis, the part of the frame supporting the dolly having a horizontal portion extending inwardly from the dolly for a distance and a downwardly bowed part extending from the inner end of the horizontal portion to facilitate the insertion of the dolly under an automobile fender or the like.

5. In an implement of the character described, the combination with a hammer and dolly normally in alignment, of a frame for supporting them comprising an upper tube and a lower tube, said tubes being pivotally connected together, means for introducing an operating fluid into both tubes simultaneously, whereby the hammer will reciprocate and the dolly will be raised against the hammer, the upper frame having two telescoping tubular parts, two yokes, each connected to one of the telescoping parts, a screw passing freely through one yoke and threaded to the other, whereby upon the turning of the screw the adjustment of the telescoping parts will be effected, and means for holding the screw in adjusted position.

6. In an implement of the character described, the combination of a hammer and a dolly, means for introducing a fluid to operate the hammer and to move the dolly toward the hammer and to hold it in that position, said dolly having a lateral projection curved on the top and being adapted to be mounted in different radial positions, and means whereby the dolly as a whole is adjustable with respect to the hammer laterally to permit the hammer to operate on the dolly at a distance from its center.

7. In a tool for straightening sheet metal objects, the combination with a hammer and a dolly located normally in alignment with each other, of a frame for supporting them comprising two parts adjustably and pivotally connected together on an axis inclined with respect to the axial line of the hammer, whereby the dolly can be adjusted with respect to the hammer on the arc of a circle centered on said inclined axis, and means for adjusting the two parts of the frame in the direction of said inclined axis.

8. As an article of manufacture, a dolly for a metal straightening tool having a polygonal base on which it can be held in any one of a plurality of positions and having a radial projection curved and slanted on top, for the purpose described.

9. As an article of manufacture, a dolly for a tool for straightening metal articles, comprising a convex head and a shank having a polygonal cross section, with a radial projection on the inner end of the shank on one side, the opposite side being curved inwardly for permitting the insertion of the shank in a holder.

10. As an article of manufacture, a hammer for a metal straightening tool comprising a head of a general circular shape, the head being provided with a lateral radial projection flush on the end with the end of the hammer, and means whereby said head may be turned to different positions to bring the projection to any desired side of the hammer.

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