June 22, 1943. M. O. ROSE 2,322,318

BUMPING MACHINE

Filed June 27, 1941

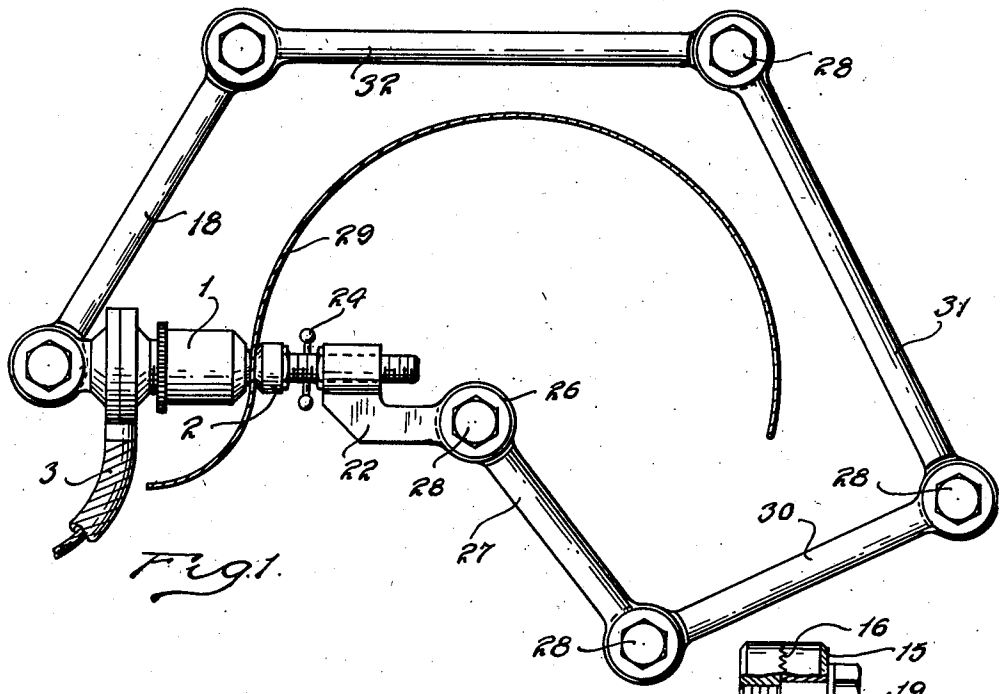


Fig. 1.

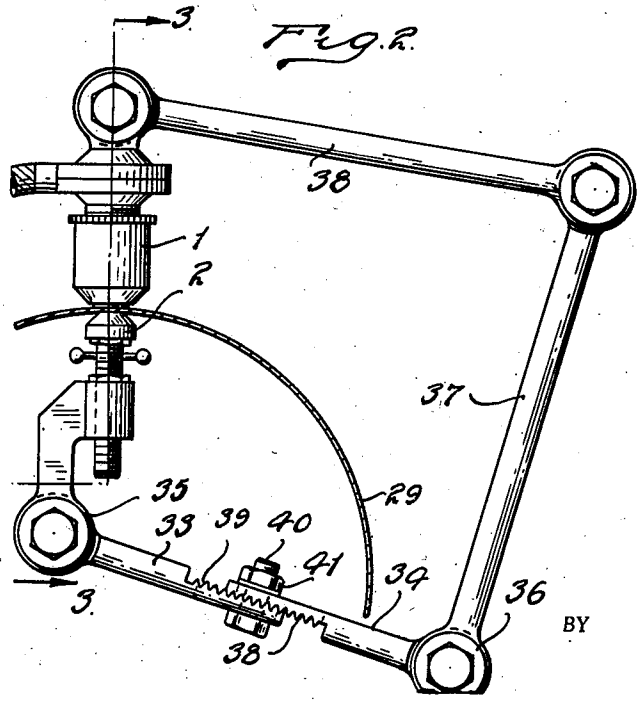


Fig. 2.

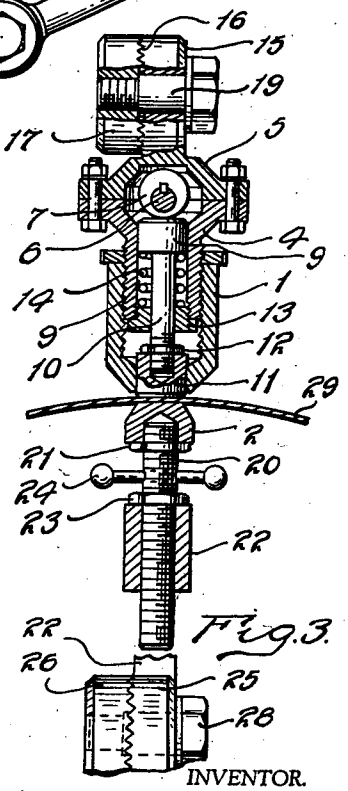


Fig. 3.

INVENTOR.
MILLARD O. ROSE.
BY Charles E. Nixon
ATTORNEY.

Patented June 22, 1943 2,322,318

UNITED STATES PATENT OFFICE

2,322,318

BUMPING MACHINE

Millard O. Rose, Detroit, Mich.

Application June 27, 1941, Serial No. 400,011

1 Claim. (Cl. 153—48)

This invention relates to bumping machines the purpose being to provide a new and improved device for removing dents from fenders and other sheet metal surfaces of automobiles and for straightening or re-shaping bent portions thereof.

The invention comprises an anvil adjustable relative to a hammer operable in opposed relation to the anvil to straighten the sheet metal piece therebetween.

A particular feature of the invention is involved in the means including an arm of angularly adjustable links connecting the anvil and the hammer permitting the anvil and hammer to be properly positioned in opposed relation on the article to be operated on and held in the adjusted position for the bumping operation.

These and other novel features and objects of the invention are hereinafter more fully described and claimed and the preferred form of a bumping machine embodying my invention is shown in the accompanying drawing in which—

Fig. 1 is an elevation showing my improved bumping machine in position for operation upon an automobile fender and showing one typical arrangement of the jointed arm.

Fig. 2 is an elevation showing the apparatus arranged in different position on a fender and with a less number of links or parts in the arm supporting the hammer and anvil.

Fig. 3 is a longitudinal section of the anvil and hammer.

In the form of the invention shown in the drawing, the hammer element is indicated at 1 and the anvil at 2 positioned on opposed surfaces of a sheet metal element as, for instance, an automobile fender. The hammer is preferably of a vibrating type and by way of illustration but not of limitation I have shown a flexible shaft 3 entering a housing formed of a base 4 and a cap 5 containing a shaft-like portion 6 having an eccentric 7 thereon bearing on the upper end of a plunger 8 reciprocable in a cylinder 9 and having a shaft-like portion 10 in threaded engagement with the upper side of a hammer head 11, a lock nut 12 being provided to secure the hammer to the shaft 10. The cylinder 9 has a cap 13 secured therein and a spring 14 serves to maintain the plunger 8 in contact with the eccentric 7 whereby rotation of the shaft reciprocates the hammer. The cap 5 has an upper extension 15 provided with a toothed face 16 to engage with a similar toothed face of an end 17 of a link 18 of the jonted arm. A cap screw 19 passes through the extension 15 of the cap 5 in threaded relation with the end of the link 17 and, by loosening or tightening the screw, the teeth of the extension 15 and the end of the link 17 may be separated to permit rotative adjustment of the parts 15 and 17 and then locked together by the cap screw 19 to maintain the same in adjusted position.

The anvil 2 may be of any approved form and is here shown as being threaded on the end of a threaded rod 20 and secured by the lock nut 21. The rod 20 in turn is threaded in the end of a holder 22 threaded to receive the same and a lock nut 23 secures the rod in adjusted position.

For rotation of the threaded shaft 20, I provide a short bar 24 extending through the rod to opposite sides thereof providing a means for rotating the shaft 20 to thread the same inwardly or outwardly of the holder 22. The holder 22 terminates in a radially toothed end 25 for association with a similar toothed end 26 of an arm 27 and the two radially toothed faces are secured together by a cap screw 28.

By rotation of the screw 20 in one direction, the anvil may be pressed against the sheet metal element 29 while the end of the hammer casing 2 is held in engagement with the opposite surface of the sheet by means of the jointed arm. By rotation of the shaft 6, the hammer may be vibrated while the metal 29 is clamped in place between the hammer casing and anvil.

The jointed arm holds the hammer casing and anvil under pressure and includes the links 30, 31, 32 connecting the above mentioned links 18 and 29, all of which links are successively united at their ends by radially toothed faces held in contact and locked in position by bolts, such as the bolts 28 heretofore described. The series of links between the hammer casing and anvil are provided to permit the positioning of the hammer and anvil at various points about the surface of a fender, for instance, and then locked in such position and supporting the hammer casing and anvil in opposed relation on opposite faces of the sheet metal element requiring to be straightened.

In Fig. 2 is shown a link consisting of the parts 33 and 34 each having at adjacent ends a serrated face 35 and at the other end an opposed serrated portion to fit a similar serrated end 36 of a link 37. This in turn is connected by a similar joint with a link 38 connected with serrated end of the hammer element. The two portions 33 and 34 of the arm having one end connected to the anvil and the other connected with the link 37 have opposed transversely serrated faces 38 and 39 and one of the members is slotted to receive the bolt 40, the nut 41 therefor being

loosened to permit varying the length between the serrated end **35** of the arm **33** and similar end of the arm **34**. The adjustment of this arm having the portions **33** and **34** in respect to its length adapts the same to extend inwardly a greater or less distance to support the anvil in the proper position to operate upon a dented portion of a fender, for instance, and to position the opposite end beyond the end of the fender.

It is pointed out that heretofore bumping machines are rather large and cumbersome and are not of a character to extend over or about some portion of a fender to position the anvil and hammer in proper relationship on opposed sides of a dented fender as an example. By my improved structure the bolts **28**, which extend through similar connected ends of the several arms, are loosened and thus enabling the arms to be arranged in various angular relationships to permit the hammer and anvil to be properly positioned in opposed relation.

When the parts are in position, the anvil is turned to clamp the metal piece being operated upon between the nose of the hammer casing and the anvil. The bolts **28** are then tightened to secure the arms in the adjusted position. Bearing in mind that the portion of the article being operated upon is securely clamped between the casing or shell for the hammer and the anvil the apparatus is directly upon the element being operated upon and the arms are sufficiently rigidly united to maintain the same in position.

The apparatus, therefore, is inexpensive, comparatively light in weight, may be readily handled and placed in position on a part to be straightened or removed therefrom and provides a device adapted to operate on parts heretofore usually bumped out by hand by the holding of an anvil in one hand and using a hammer having proper form of face to perform the straightening of the dented portion of the fender which is a tedious method.

It is believed evident from the foregoing description that the apparatus is of simple construction, is light in weight adapting the same to be readily moved about and positioned in place for use on sheet metal part or removed therefrom. It is also pointed out that various changes and modifications may be made in the apparatus without departing from the spirit and scope of the invention as set forth in the appended claim and, while I have shown a hammer element operated by a cam or eccentric on a rotating shaft, other means for operating the hammer may be utilized within the defined scope of the invention.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is—

A bumping machine comprising a hammer and an anvil, a casing for the hammer, means for reciprocating the hammer in the casing, an anvil, an arm carrying the anvil at one end, means for adjusting the anvil toward or from the face of the element being bumped opposite that engaged by the casing, a series of arms in a jointed relationship, the arm at one end of the series being rotatably adjustable relative to the hammer casing, and the other end of the series of arms being rotatably adjustable relative to the anvil carrying arm, the series of arms between the two end elements thereof being joined in a rotatably adjustable relationship, and means for rigidly securing the respective arms in adjusted relation one to the other and to the hammer and anvil portions, whereby the said anvil and hammer are held in operative position with the work during the bumping operation.

MILLARD O. ROSE.