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H. BACHLI ET AL

2,489,360

TUBE FLARING DEVICE AND HOLDER THEREFOR

Filed July 14, 1948

2 Sheets-Sheet 1

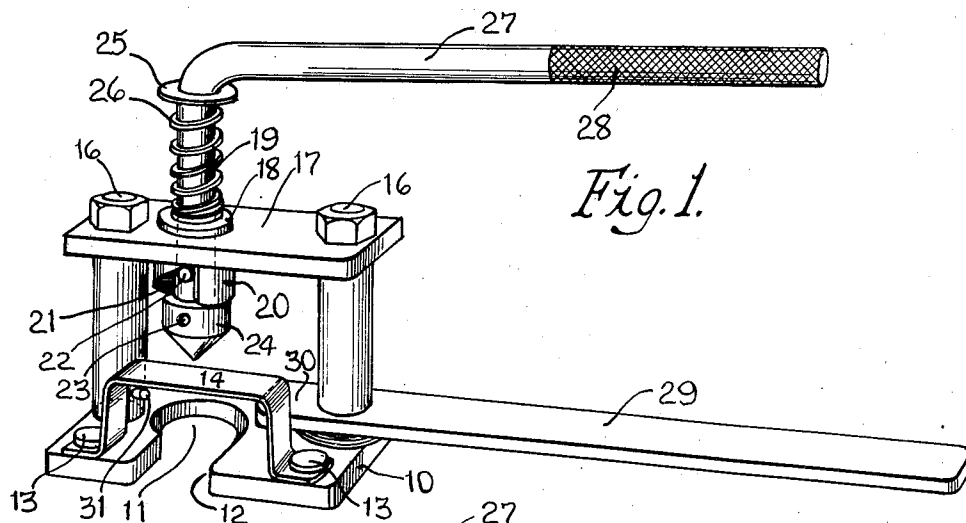


Fig. 1.

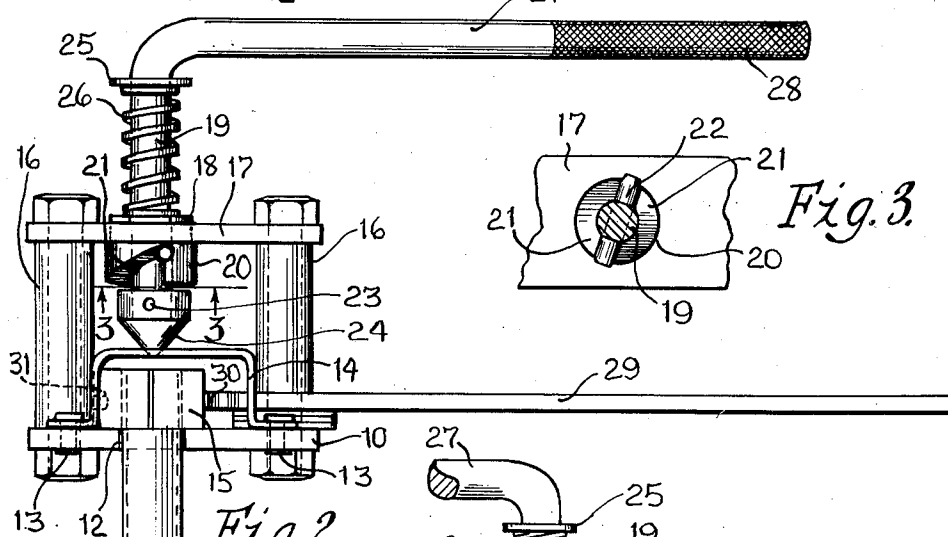


Fig. 2.

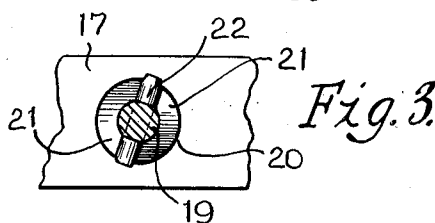


Fig. 3.

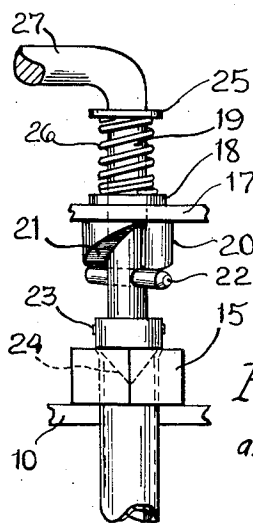


Fig. 4.

INVENTORS.
Herman Bachli
and Harry S. Shapiro
BY
Clarence E. Shredy
Their Attorney

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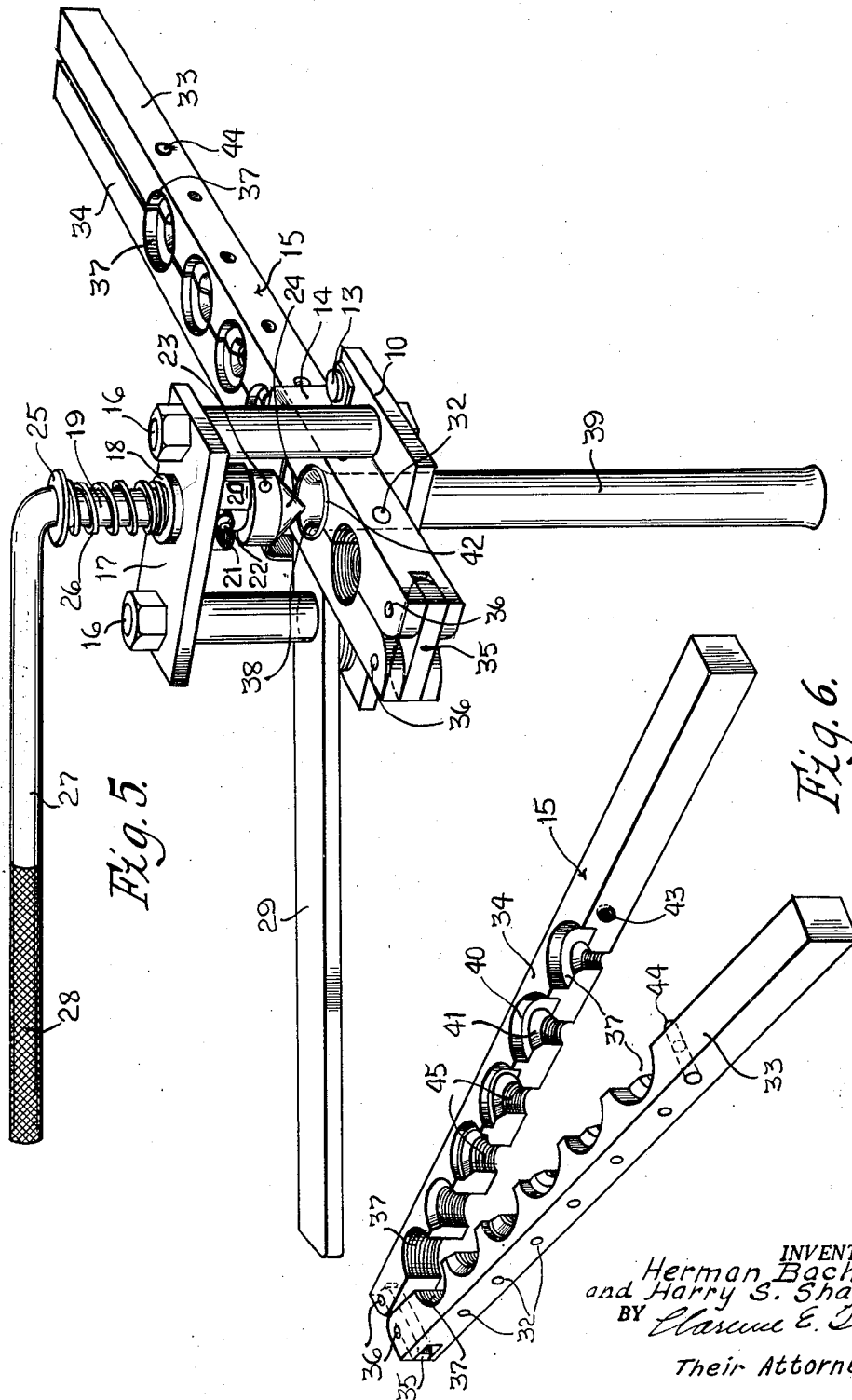
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2 Sheets-Sheet 2



INVENTORS.
Herman Bachli
and Harry S. Shapiro
BY Clarence E. Shredy
Their Attorney

UNITED STATES PATENT OFFICE

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TUBE FLARING DEVICE AND
HOLDER THEREFOR

Herman Bachli and Harry S. Shapiro, Chicago,
Ill., assignors to Chicago Specialty Mfg. Co.,
Inc., Chicago, Ill., a corporation of Illinois

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1 Claim. (Cl. 153—79)

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This invention relates to a tube flaring device and holder therefor and has for its principal object the provision of an improved construction of the character hereinafter described which will be highly efficient in use and economical in manufacture.

The tube flaring tool embodying this invention is especially designed for forming on the end of a tube an outwardly extending flange against which a coupling nut or the like is adapted to bear when two tubes are connected together by such coupling nut or "union" as it is commonly termed.

In this view of the invention, it is the object to provide a tool for providing this flange with the minimum effort upon the part of the operator.

It is also the object of the invention to provide a tool for this purpose which can be conveniently held in the hands during operation thereof and which is capable of operation upon tubes of various diameters.

Another object of the invention is to provide in a tool of this character a simple and easily operable means for effectively latching the tube holding structure in proper alignment with respect to the flaring tool and in which the tool holder is self-aligning for properly positioning the tube in alignment with the flaring tool.

Another object of the invention is to provide in such a tool a fast-acting cam whereby it requires but half a revolution of the flaring tool to perform the flaring operation.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of the tool with the tube holder removed therefrom;

Fig. 2 is an elevational view of the flaring tool embodying our invention;

Fig. 3 is a fragmentary sectional detail view taken substantially on line 3—3 of Fig. 2;

Fig. 4 is a fragmentary elevational view showing the flaring tool in operation upon the tube;

Fig. 5 is a perspective view showing the tube holder in position upon the support embodied in the invention;

Fig. 6 is a perspective view of the self-aligning tube holder embodied in the invention.

The several objects of the invention are ac-

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complished by the preferred form of construction shown in the accompanying drawings.

In this connection, a base plate is indicated at 10. This plate has formed therein an opening 11 and communicating with this opening is a slot 12 through which the tube to be operated upon is passed for positioning in the opening 11.

Secured to the base plate as at 13 by means of rivets or the like is a guide strap 14, beneath which and on top of the base plate 10 the tube holding tool 15 is adapted to be positioned.

Extending upwardly from the base plate 10 are spaced posts 16, and mounted on the upper end portion of these posts 16 is a supporting plate 17. This supporting plate 17 carries a bushing 18, and journaled in this bushing 18 is a shaft 19. This shaft 19 passes through a cam head 20 having a cam surface 21. This cam head may be formed as an integral part of the bushing 18. The shaft 19 carries a transversely extending pin 22 adapted to ride on the cam surface 21. Fixed to the shaft 19 by means of a pin 23, is a flaring head 24 of a conventional shape and design.

Surrounding the shaft 19 and disposed between the bushing 18 and the washer 25 carried by the shaft 19, is an expansion spring 26 which normally retains the pin 22 at the base of the cam surface 21.

Preferably formed as an integral part of the shaft 19 and extending at right angles with respect thereto, is a handle 27 having a knurled end portion 28 providing a gripping surface.

Pivotaly carried by one of the posts 16 is a holding bar 29 of elongated formation. This holding bar 29 provides a latch head 30 which is adapted to engage an adjacent side of the tube holder 15 in a manner hereinafter explained.

Carried by the opposite posts 16, is a laterally extending pin 31 adapted to be projected into one of several openings 32 formed in one of the bar sections 33 of the tube holder 15.

This tube holder 15 comprises, in addition to the bar section 33, a bar section 34 having the same configuration and shape as the bar section 33. These sections are connected together by means of a link 35 connected to the ends of the bar sections 33 and 34 by means of pins 36.

Formed in the bar sections 33 and 34 are complementary recesses 37 which form together, when the bar sections are in abutting relation with respect to each other, an opening in which the end portion 38 of a tube 39 is adapted to be positioned. These openings are of different diameters and, as shown, certain of the openings

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are countersunk as at 40, and the base of these countersunk openings provides a tapered seat 41 against which the flared end portion 42 of the tube is adapted to bear.

In the bar section 34 there is provided a socket 43, and adapted to engage in this socket 43 when the bars are in abutting relation with respect to each other is a pin 44.

A tube holder constructed in accordance with the disclosure herein and as shown particularly in Fig. 6, permits the bar sections 33 and 34 to be self-aligning, in that the pin and socket 43 and 44, respectively, properly locate the recesses of the bar sections with respect to each other to provide the openings into which the tubes are adapted to be mounted.

In operation a tube is positioned in an opening having a diameter corresponding to the outside diameter of the tube. This is accomplished by pivoting the bar sections 33 and 34 to the position shown in Fig. 6, after which the tube is located in its proper opening and the bar sections then moved into abutting relation with respect to each other. The wall portions 45 of the openings engaging the tube are knurled so as to provide a gripping surface to hold the tube against rotation during the flaring operation. After the tube has been properly mounted in its respective opening, the tube holder is mounted upon the base plate 10 by inserting the holder beneath the guide strap 14. In this position the tube will be located in the opening 11 and by reason of the engagement of the pin 31 with the adjacent socket 32, the tube will be properly aligned with respect to the flaring tool 24. In this position of the tube holder, the holding bar 29 is pivoted to bear the latch head 30 thereof against the adjacent side of the tube holder whereby the tube holder will be latched upon the plate 10 for flaring operation. Generally, it is the practice to hold this bar 29 in the left-hand with the bar bearing against the body and then grasping the handle 27 by the right-hand and rotating the handle in a clockwise direction as viewed in Fig. 1. This bears the pin 22 against the cam surface 21. As the handle 27 is rotated in said clockwise direction, the cam surface and pin will project the rotating flaring head 24 into flaring operation upon the tube 39. After the flaring tool has been rotated half a revolution, the pin will move off the cam surface 21, and under the action of the spring 26 the flaring head 24 will be quickly and automatically moved back into its normal position of rest as shown in Fig. 1.

From this it is apparent that the flaring operation is completed by a half revolution of the flaring head, thus increasing the speed of the flaring operation. It is apparent that a simple arrangement is provided by which the tube holder is releasably latched in tube flaring position and that the flaring operation requires the minimum effort upon the part of the operator. These and

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other features of our improved flaring tool result in its efficient operation, and, as it requires but a simple operation upon the part of the operator, the flaring operation may be accomplished quickly and with the minimum of effort upon the part of the operator.

As the holding bar 29 is held firmly in the hand, it is manifest that displacement of the tube holder is prevented during the flaring operation.

Our improved flaring tool may be manufactured at an economical cost.

While we have illustrated and described the preferred form of construction for carrying our invention into effect, this is capable of variation and modification without departing from the spirit of the invention. We, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail ourselves of such variations and modifications as come within the scope of the appended claim.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

A flaring device and tube holder comprising a substantially flat mounting plate having an opening formed therein and an entrance slot for the opening leading from one edge of the plate, a pair of spaced posts carried by the plate and extending upwardly therefrom, a supporting plate carried by said posts above and in spaced relation to the mounting plate, a guide strap carried by said mounting plate over the entrance slot, a tube holder adapted to be slidably positioned upon said mounting plate beneath said strap to move a tube through the entrance slot to a position to be supported in said opening by said holder, means for latching said tube holder upon said mounting plate with the tube located in said opening, a rotatable flaring tool carried by said supporting plate in alignment with the tube carried by said holder, and a handle for rotating said flaring tool extending in a horizontal plane substantially parallel with the supporting plate, said latching means having a hand bar by which said mounting plate is supported during flaring operation of the flaring tool on said tube, said hand bar extending in the same plane as the handle and pivotally connected to the mounting plate by one of said posts.

HERMAN BACHLI,
HARRY S. SHAPIRO.

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