March 2, 1937. A. C. DOBRICK 2,072,359

FLARING TOOL

Filed Oct. 4, 1935

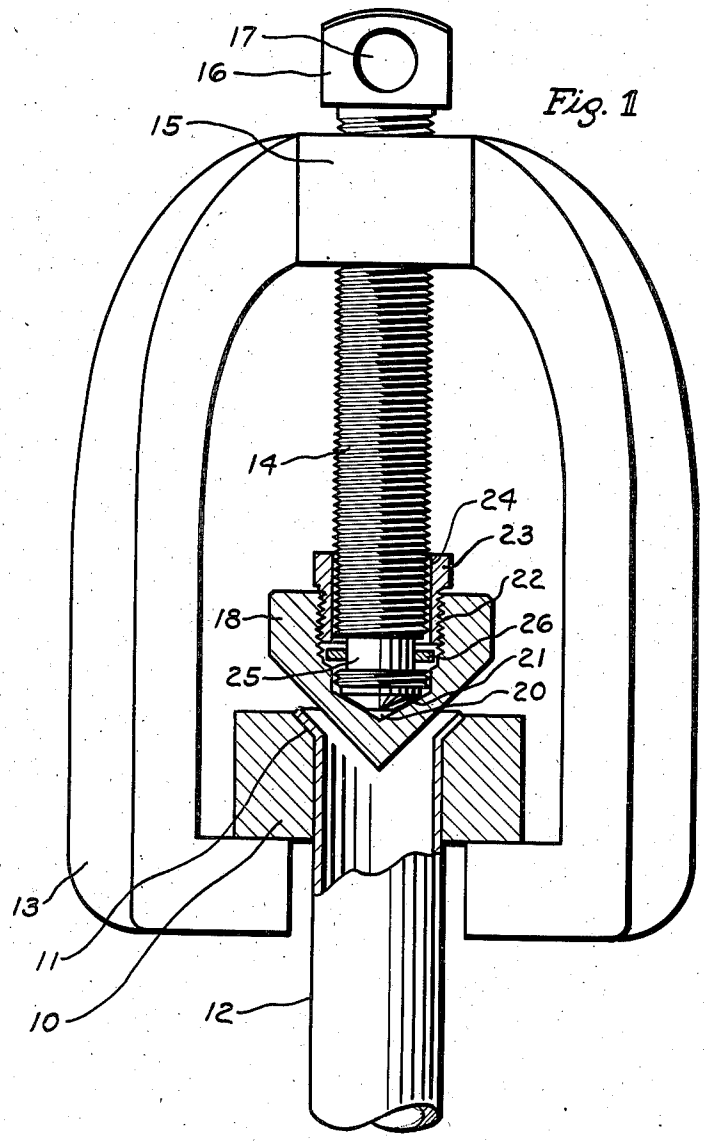


Fig. 1

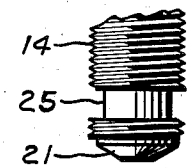


Fig. 2

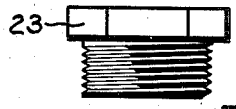


Fig. 3



Fig. 4

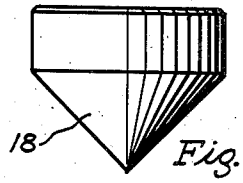


Fig. 5

Augusta C. Dobrick

INVENTOR.

Patented Mar. 2, 1937 2,072,359

UNITED STATES PATENT OFFICE

2,072,359

FLARING TOOL

August C. Dobrick, Chicago, Ill., assignor to The Imperial Brass Manufacturing Company, Chicago, Ill.

Application October 4, 1935, Serial No. 43,560

6 Claims. (Cl. 153—31)

My invention relates to flaring tools and more particularly to tools for flaring the ends of copper and aluminum tubing so that suitable fittings may be attached.

The principal object of my device is to supply a flaring tool in which the flaring action is correctly centered during the entire operation and in which the flaring member is extended directly into the tube without rotation.

Another object is to provide a flaring tool which operates easily with a minimum of friction and which produces no change in the thickness of the tube at the flare.

Another object is to provide a flaring tool in which the cone is self-centering upon the tube with the cone propelling shaft capable of centering itself in the cone to correctly direct the line of force during the flaring movement.

A further object is to provide a tube flaring tool wherein the flaring cone is swiveled upon the propelling shaft so that it does not rotate while being moved into flaring position and in which the propelling shaft by releasably centering itself in the cone assures a correctly proportioned flare, provision also being made for the withdrawal of the cone by the propelling shaft.

Further objects and advantages will become apparent as the description proceeds, taken in connection with the accompanying drawing which forms a part of this specification.

In the drawing Fig. 1 represents a part longitudinal section of my device immediately after being released from a flaring operation. Figs. 2, 3, 4 and 5 show separate views of the flaring parts.

While my invention is susceptible of many different forms I have shown in the drawing and will herein describe in detail one such embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the principle of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Flaring tools have been in use for some time and flared fittings are highly regarded in the trade as a reliable connection. Difficulty has been experienced, however, in making consistent flares on soft tubing, such as aluminum and copper. Another source of inconvenience is that in the flaring of tubes, especially those of large diameter, the friction is so great that oil must often be used to ease the resistance when screwing the flaring cone into position. Another objectionable feature is that when the cone becomes the least bit rough, or when friction becomes excessive, some of the metal is scraped from the flare resulting in a burred or roughened flare, frequently a slight degree off center and often thinner in section than the walls of the tube itself.

In my new device I have attempted to improve upon the flaring operation by supplying a flaring cone which remains non-rotatably stationary and centered during the flaring movement. In the drawing 10 represents a block of the customary sort, with a flared opening 11 at the top, for securely clamping a tube 12. A frame 13 holds the block and flaring parts of the device in position. A propelling shaft 14 translates threadably thru the upper portion 15 of the frame 13, to and away from the tube. The shaft is surmounted by a head 16 thru which is a pin 17 to facilitate turning.

At the lower end of shaft 14 is mounted a flaring element or cone 18. In the upper face of the cone a deep recess is formed terminating at its bottom in a conical shaped cavity 20 whose sides correspond with the frusto-conical end 21 of the shaft 14. The upper portion of the recess is preferably screw threaded at 22 to securely position therein a sleeve 23. The inside surface 24 of sleeve 23 is drilled clean to slidably accommodate the shaft 14.

At the lower end of the shaft 14 an annular recess 25 is formed somewhat smaller in diameter than the threads and located a short distance from the end so that there is formed a slight shoulder at the bottom side of the recess. A ring 26 is provided which is somewhat U-shaped, the open side being wide enough to slip over the shaft 14 within the recess 25. In width the ring is narrower than the width of the recess 25 so as to permit longitudinal axial movement between the shaft and the ring for a certain limited distance. The outside diameter of ring 26 will be observed to be of a diameter greater than that of the central hole 24 of the sleeve 23 so that once the sleeve is slipped on the shaft and the ring inserted in the recess the sleeve cannot slip off the end though its movement in the opposite direction along the shaft is unrestricted. By securing the sleeve 23 in the cone 18 the shaft is effectively secured to it without restricting the desired freedom of motion. When the device is assembled the driving shaft 14 is first inserted in the frame, then the sleeve 23 is slid up along shaft 14, after which the split ring is inserted in the annular recess at the bottom. The sleeve is screwed tightly into the cone 18, clamping the split ring loosely between the cone and the shaft.

This permits a limited longitudinal motion by reason of contact of the ring 26 against the lower end of sleeve 23 in one direction and the direct thrust of shaft 14 against the cavity 20 of the cone in the opposite direction, providing thereby a free swinging swivel motion for the cone.

In operation the tube is inserted in the block and the frame placed over it. Shaft 14 is then screwed into the frame moving the cone 18 against the tube. Friction between cone 18 and tube 12 holds the cone in non-rotatable position while it enters the end of and flares the tube in the form illustrated. The direct action prevents any scraping away of the metal of the flare and the thrust necessary to produce a flare is not of itself sufficient to reduce the thickness of the tube at the flared portion. The loose connection between shaft 14 and the cone 18 further permits the cone to settle itself centerably over the end of the tube and then allows the shaft to push against and directly in register with the recess in the center of the cone. On withdrawal the first turn loosens the cone from the tube from which it is withdrawn by contact of the split ring against the smaller end of the sleeve 23.

Having thus described my invention what I claim as new and seek to secure by Letters Patent is:—

1. A tube flaring tool comprising a frame, a shaft threadable into said frame having a wide annular recess at the lower portion thereof, a threaded sleeve slidable along said shaft, a flaring cone having a recess in the upper side adapted to form a bearing surface for the lower end of said shaft and to freely allow rotation therein, the upper portion of said recess being threaded for engagement with said sleeve, there being a split ring secured between said cone and said sleeve engaged in the wide annular recess formed on the lower portion of said shaft and adapted to be received in the upper portion of said cone recess, whereby to limit the longitudinal movement of said shaft with respect to said cone.

2. A tube flaring tool comprising a holder for a tube to be flared, a frame positionable over said holder, a flaring cone, a shaft extendable into said frame for propelling said cone into flaring position, said cone being rotatably attached to said shaft, a sleeve rotatably attached to said shaft and non-rotatably positioned on said cone, said sleeve being connected to said shaft by means restricting longitudinal movement, whereby said cone remains non-rotatably in contact with said tube during propulsion into flaring position by rotation of said shaft and continues attached to said shaft on withdrawal.

3. A tube flaring tool comprising a frame, a shaft extendable into said frame, a flaring cone having a recess in the upper side adapted to receive the lower end of said shaft and supply a bearing surface therefor, said cone being rotatable with respect to said shaft, a sleeve slidable with respect to said shaft and adapted to be rigidly attached to said cone, and means on said shaft engageable with said sleeve to allow restricted longitudinal movement and prevent withdrawal of said shaft from said sleeve.

4. A tube flaring tool comprising a frame, a shaft extendable into said frame, a flaring cone having a recess in the upper side forming a bearing surface for said shaft, said cone being rotatable with respect to said shaft, a sleeve slidable with respect to said shaft and rigidly attached to said cone, and means on said shaft engageable with said sleeve to loosely allow restricted longitudinal movement therebetween.

5. A tube flaring tool comprising a frame, a shaft extendable into said frame, a flaring member having a recess in the upper portion adapted to centerably receive the lower portion of said shaft, retaining means rigidly attached to said member and rotatably attached to said shaft, and for allowing restricted longitudinal movement means on said shaft cooperable with said retaining means to rotatably permit direct bearing of said shaft on said member during flaring operation and prevent withdrawal of said shaft from said member on release.

6. A tube flaring tool comprising a frame, a propelling member extendable into said frame, a flaring member adapted to centerably engage said propelling member, retaining means rigidly attached to one of said members and rotatably attached to the other of said members, means on said propelling member for allowing restricted longitudinal movement cooperable with said retaining means and operable to rotatably permit direct bearing of said propelling member on said flaring member during the flaring operation and prevent withdrawal of said propelling member from said member on release.

AUGUST C. DOBRICK.