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H. A. UNKE

2,182,906

THREADING TOOL

Filed June 30, 1938

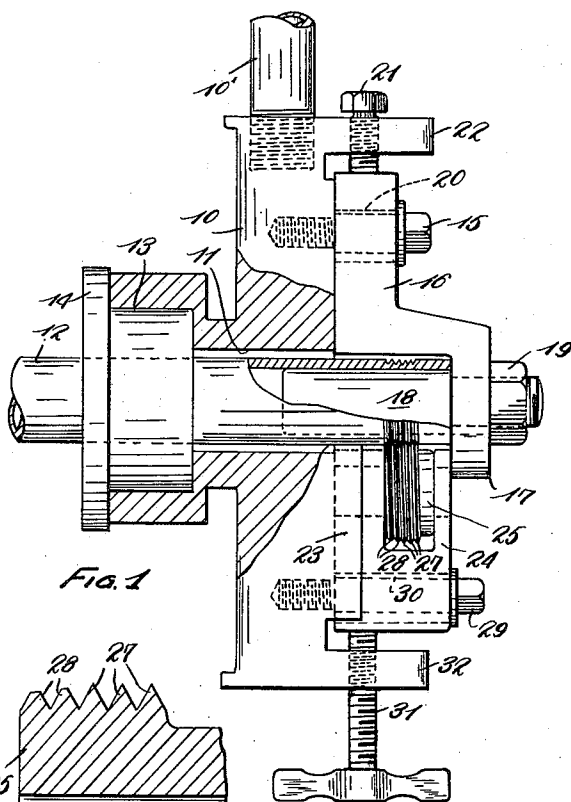


Fig. 1

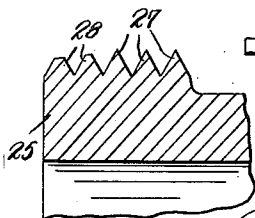


Fig. 3

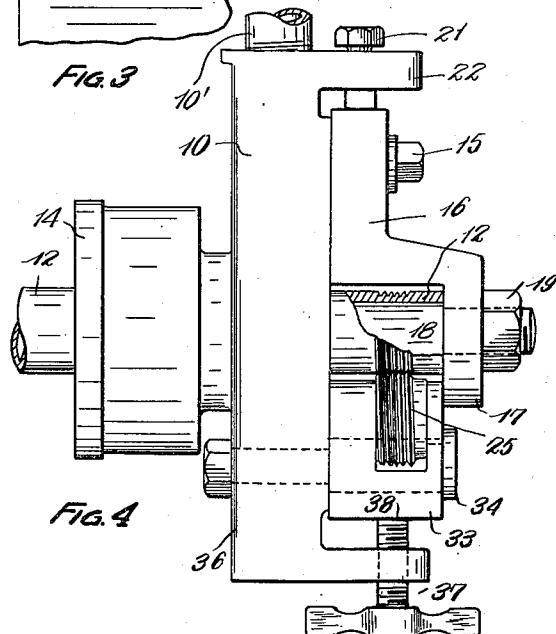


Fig. 4

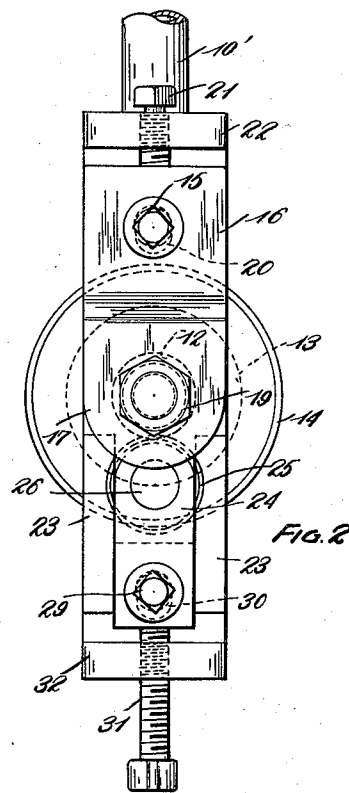


Fig. 2

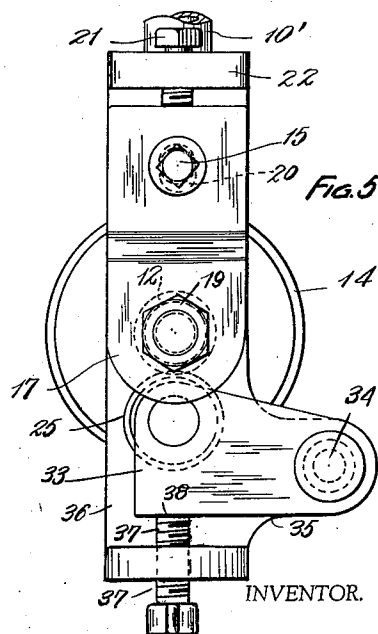


Fig. 5

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2,182,906

THREADING TOOL

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Application June 30, 1938, Serial No. 216,703

1 Claim. (Cl. 80-6)

This invention relates to tools especially adapted for rolling external threads on thin-walled tubing.

In my application Serial No. 215,189, filed June 22, 1938, I disclosed a novel form of threads especially adapted for thin-walled conduit and a method of forming the same, and the tool described and claimed in the present application is adapted to form this novel form of threads and carry out the method described in said application Serial No. 215,189.

It is one of the objects of the present invention to provide a tool that is adapted for use in the field for threading, by hand, any desired length of thin-walled tubing. While said tool is primarily intended for such purpose it is also adapted to be used in connection with a lathe or other machine for holding and rotating the tube so as to form the threads by power.

Other objects of the invention and features of novelty will be apparent from the following description taken in connection with the accompanying drawing, in which:

Fig. 1 is a longitudinal section through one form of tool embodying my invention.

Fig. 2 is an end elevation thereof.

Fig. 3 is an enlarged fragmentary section of the die shown in Fig. 1.

Fig. 4 is a side elevation of another form of tool embodying my invention, certain parts being shown in section.

Fig. 5 is an end elevation of the same.

Referring to the form of the invention illustrated in Figs. 1 and 2, 10 indicates a frame having a handle 10' attached thereto by which the frame may be rotated. The frame 10 has a bore 11 to receive the end of the tube to be threaded, the latter being indicated at 12. The frame 10 is also provided with a counterbore 13 to receive a collar 14 having a bore to fit the particular size of tube that is to be threaded, the collar 14 being rotatable on the tube, and it will be understood that in using the tool with tubes of different outside diameters, different collars 14 will be used to suit the particular size of tube. On the side of the frame 10 there is secured, by means of the bolt 15, an arm 16 the portion 17 of which is adapted to be engaged by the end of the tube 12 so as to position the tool longitudinally of the tube at the start of the threading operation. The arm 16 carries a mandrel 18 that is adapted to fit within the bore of the tube 12 and support the portion of the tube that is to be threaded. The mandrel 18 may be secured in position by means of the nut 19. The bolt 15

passes through an oblong hole 20 in the base of the arm 16 and an adjusting screw 21 is mounted in a lug 22, on the frame 10, and bears against the end of the arm 20 so as to provide for an accurate adjustment of the position of the arm to bring the mandrel 18 into alignment with the bore of the collar 14. The frame 10 is provided with parallel ways 23 between which there is a slide 24 which is movable toward and away from the axis of the mandrel 18 and carries the rotatable thread rolling die 25 that is mounted on a shaft 26 on the slide 24. An enlarged section of the die 25 is shown in Fig. 3, and it will be noted that the threads at one end of the die are of V-form as indicated at 27 and at the other end are truncated as indicated at 28.

The frame 10 carries a bolt 29 which passes through an elongated opening 30 in the slide 24 and this bolt holds the slide 24 in position between the ways 23. One end of the slide 24 also cooperates with the portion 17 of the arm 16, as shown in Fig. 1, so as to hold this end of the slide in its proper position. An adjusting screw 31 is mounted in an arm or lug 32, on the frame 10, and engages the end of the slide 24 so that by turning the screw 31 the slide may be forced toward the mandrel 18 and thereby cause the threads on the die 25 to cut into the outer surface of the tube 12 and form threads thereon.

In the operation of the tool illustrated in Figs. 1 and 2 the tube 12 is mounted in a suitable vise and the tool is slipped over the end of the tube so as to be in a position thereon as is illustrated in Fig. 1, with the end of the tube in engagement with the portion 17 of the arm 16 and with the mandrel 18 supporting the tube laterally. The screw 31 is then turned to force the die 25 against the tube 12 and the tool is then rotated around the tube and, as it rotates, the screw 31 is turned until the threads of the die 25 have cut into the tube sufficiently to form the threads thereon. In this operation the tool is rotated in the direction that will cause the die 25, because of the pitch of the threads, to roll in a spiral path toward the end of the tube and eventually off the end after a sufficient number of rotations of the tool. In this connection it will be noted that in the ordinary pipe threading tool the threading die first engages the end of the pipe or tube, and as the tool is rotated the die runs onto the tube until the desired length of tube has been threaded but, in the operation of my invention, the tool works in the opposite direction and starts at the inner end of the threaded portion and works off the end of the tube, all of which is in accordance

with the method described and claimed in my aforesaid application Serial No. 215,189.

In the form of the invention illustrated in Figs. 4 and 5 the construction of the tool is generally similar to that illustrated in Figs. 1 and 2, except that instead of mounting the thread rolling die 25 on a slide it is mounted on a swinging arm or holder 33 that is pivoted at 34 on an extension 35 of the frame 36. There is an adjusting screw 37 that may be similar to the screw 31, and the screw 37 engages the holder 33 at the point 38 so that the die 25 may be forced into the wall of the tube by tightening the screw 37, as in the form illustrated in Figs. 1 and 2. The operation of the tool shown in Figs. 4 and 5 is substantially the same as above described.

While in the foregoing description of the operation of a tool embodying my invention I have referred to its operation by hand, it will also be understood that it is possible to mount the tube 12 in a suitable rotating holder, such as the hollow spindle of a lathe, and by rotating the tube 12 and holding the threading tool stationary, the threads may be formed by power in what is substantially the equivalent of the hand operation.

While I have illustrated and described what I now consider to be the preferred forms of my invention, it will be understood that various changes may be made in the details of construction without departing from the spirit of the invention as defined in the appended claim.

Having thus described my invention, I claim:

A thread-rolling tool for forming external threads on a thin-walled metal tube comprising a frame, a collar on said frame for engaging the exterior of said tube, a stop on said frame for engaging the end of said tube, a smooth cylindrical mandrel on said stop adapted to fit the bore of said tube to support the latter, a holder movably mounted on said frame, a peripherally threaded die rotatably mounted on said holder, means for moving said holder to force the threads of said die against the outer surface of said tube to form the threads thereon, and means for rotating said frame and all of the parts thereon about said tube and to cause the same to move off the end of the tube in forming the threads thereon.

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