

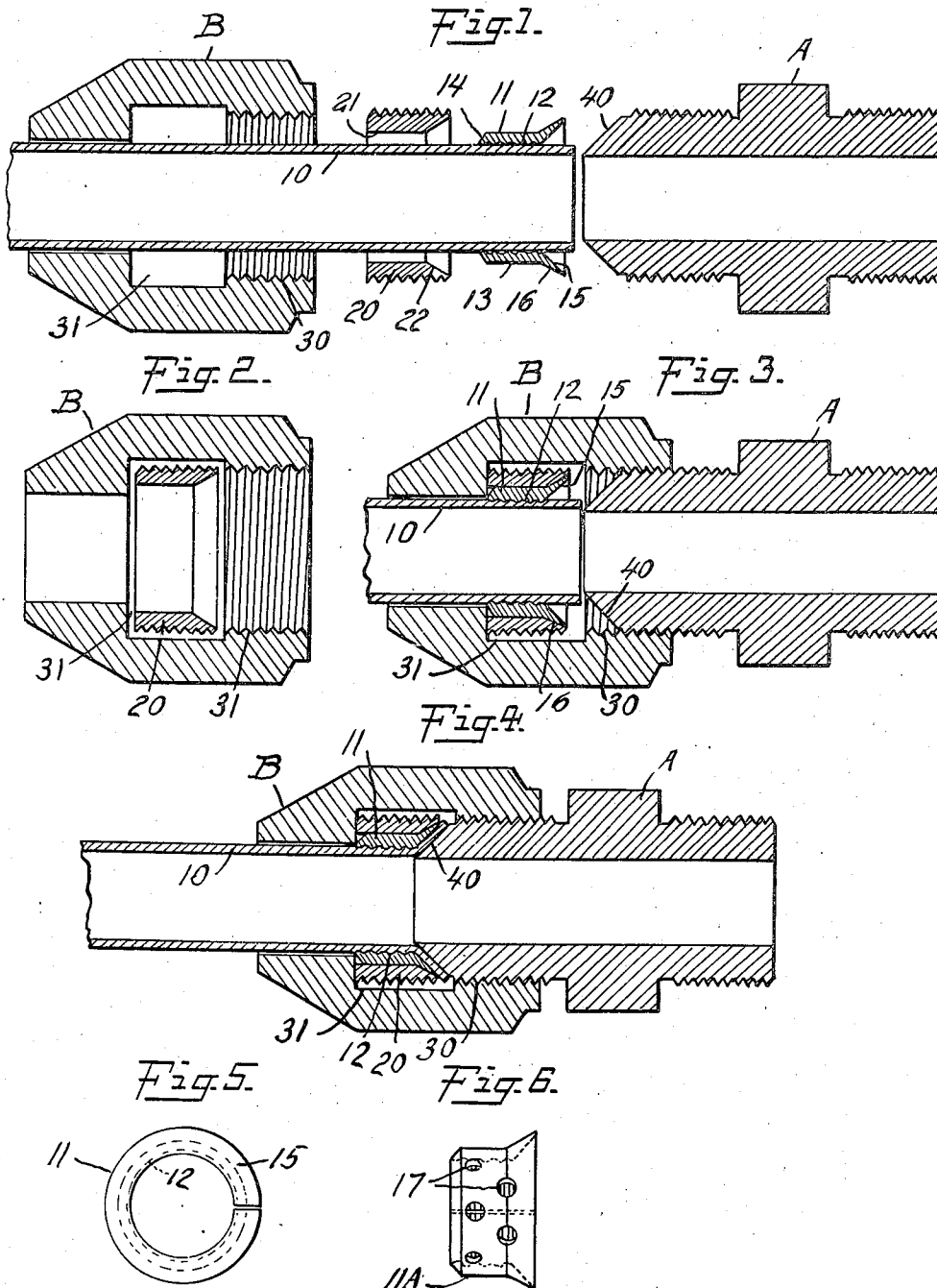
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COUPLING FOR METAL TUBING

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COUPLING FOR METAL TUBING

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1 Claim. (Cl. 285—124)

This invention relates to a coupling for metal tubing and its object is to provide a simple and practical method of flaring the end of a metallic tube and at the same time coupling the flared end in a solderless leak-proof fitting and to provide a coupling of the character specified which can be applied to the end of a metallic tube without the use of any tools.

Another object of this invention is to provide a coupling which may be applied to the tube without putting any torsional strain upon the tube.

Further objects of the invention will appear from the following specification taken in connection with the drawing which forms a part of this application.

This invention specifically is an improvement upon that disclosed in application, Ser. No. 67,624, filed by me on Mar. 7th, 1936.

Referring to the drawing—

Fig. 1 is a sectional elevation of a part of a metallic tube and the parts of a coupling device which embody the present invention.

Fig. 2 is a sectional elevation of two of the parts of the improved coupling shown in Fig. 1.

Fig. 3 is a sectional elevation of the parts shown in Fig. 1 but in different relative positions.

Fig. 4 is a sectional elevation of the parts shown in Fig. 1, shown in their fully assembled positions.

Fig. 5 is an end view of a split collar which is shown in the preceding figures.

Fig. 6 is a side elevation of a modification of the collar which is shown in Fig. 5.

The means used for accomplishing the purpose of this invention comprises two main coupling members A and B which are arranged to be screwed together to facilitate such operation with at least a part of the outer surface of each of these members so formed that it may be engaged by a wrench. According to the usual construction these parts are made hexagonal.

10 designates a metallic tube over the end of which is a split collar 11, which as shown has an inner surface as shown in Figs. 1, 3, 4 and 5, which is roughened to engage the tube 10. A convenient way of roughening this surface is to cut a screw thread on it, as shown at 12. This collar comprises a cylindrical portion 13, the end 14 of which is chamfered. The other end of it is constructed to form a conical surface 15 at an angle to cooperate in forming a flare on the end of the tube 10. The portion 16 surrounding this cone is also conical, but at a flatter angle which is arranged to perform a function which will

appear hereinafter. 20 is a ring, the outer surface of which as shown is cylindrical and threaded. This ring has an internal bore 21 into which the cylindrical part 13 of collar 11 is adapted to be forced. It also has a conical internal surface 22 which is inclined to cooperate with the surface 16 of the collar 11.

The coupling member B is threaded as at 30. Beyond this threaded portion is constructed with a cylindrical chamber 31 to receive the ring 20. The ring 20 is adapted to be screwed through the threaded portion 30 of coupling member B as shown in Fig. 2. The chamber 31 is larger in all of its dimensions than the ring 20 so that the latter is contained loosely within this chamber.

The other coupling member A has an internal bore slightly less than that of the tube 10 and its inner end 40 is conical and formed at the same angle as that of the part 15 of the collar 11. The cylindrical portion 13 of collar 11 is made of substantially the same diameter as that of the part 21 of ring 20. The internal diameter of the part 12 of the collar 11 is slightly less than the outside of the tube 10 to which it is to be applied. In operation the collar 11 is spread sufficiently to permit it to be placed over the end of the tube 10. It is then forced back on the tube to allow a portion of the tube to extend beyond it as shown in Fig. 1. Then the coupling member A is screwed into the coupling member B as shown in Fig. 3. As it advances its conical portion 40 engages the inside of the tube 10 and pushes it back with the collar 11 on it and at the same time starts to flare the outer end of the tube. As the collar 11 is moved toward and into the ring 20, its cylindrical portion 13 will be contracted by its engagement with surface 21 of the ring 20, causing its internal roughened surface 12 to grip the tube 10 tightly. As its movement into the ring 20 is completed, its surface 16 will engage the surface 22 of the ring with a wedge-like effect which causes these two parts to be securely gripped together as shown in Fig. 3. When in this position the coupling member B is freely rotatable about collar 11, ring 20 and tube 10. It may therefore be rotated about the tube without exerting any torsional effect upon the latter.

As the coupling members A and B are relatively rotated to complete their engagement, the conical surface 40 of coupling member A will further flare an end of the tube until the parts assume the positions in which they are shown in Fig. 4. This will form a leak-proof connection between the end of the tube 10 and the coupling member

A. This is accomplished easily and without the use of any tools other than such wrenches as may be applied to the coupling members.

Such couplings as have heretofore been made by outwardly flaring the end of a tube are weakest at the base of the flare. According to the method herein described, this difficulty is overcome because the flared end of the tube remains of substantially the same thickness as that of the body of the tube and it moreover is reinforced at the base of the flare by the collar 11.

The object of roughening the inside of collar 11 is to cause it to grip the tube 10 by deformation of the part of the outer surface of the tube which it engages in order to prevent longitudinal movement of the collar of the tube and any desired formation of the collar may be used which accomplishes this purpose, for example, collar 11^A, Fig. 6, is made with perforations 17, into which a part of the metal of the tube is extended during the operation of applying the coupling. Other modifications than this may be made and other

changes in the construction and in the arrangement of the various co-operating parts may be made without departing from the spirit or scope of the invention as expressed in the following claim.

What I claim is:

Means for connecting a ductile metal pipe to a fitting, said fitting having a configuration adapted to enter and flare the end of the pipe when the pipe and fitting are forced together, means for forcing the fitting into the end of the pipe to form a flare thereon, comprising a sleeve adapted to be fixed to the pipe at a point spaced from the end thereof and having an end portion corresponding to the configuration of the end of the fitting and having a circumferential shoulder forming an abutment and a second sleeve surrounding said first named sleeve and engaging said abutment, and means engaging said second sleeve and fitting for drawing the fitting into the end of the pipe.

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