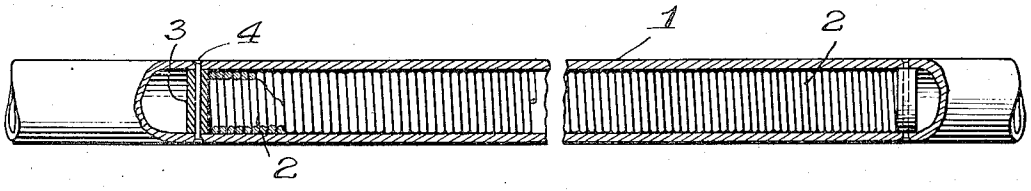
May 19, 1936. W. MILLIGAN 2,041,428

MEANS FOR BENDING TUBING

Filed April 4, 1934

Fig. 1



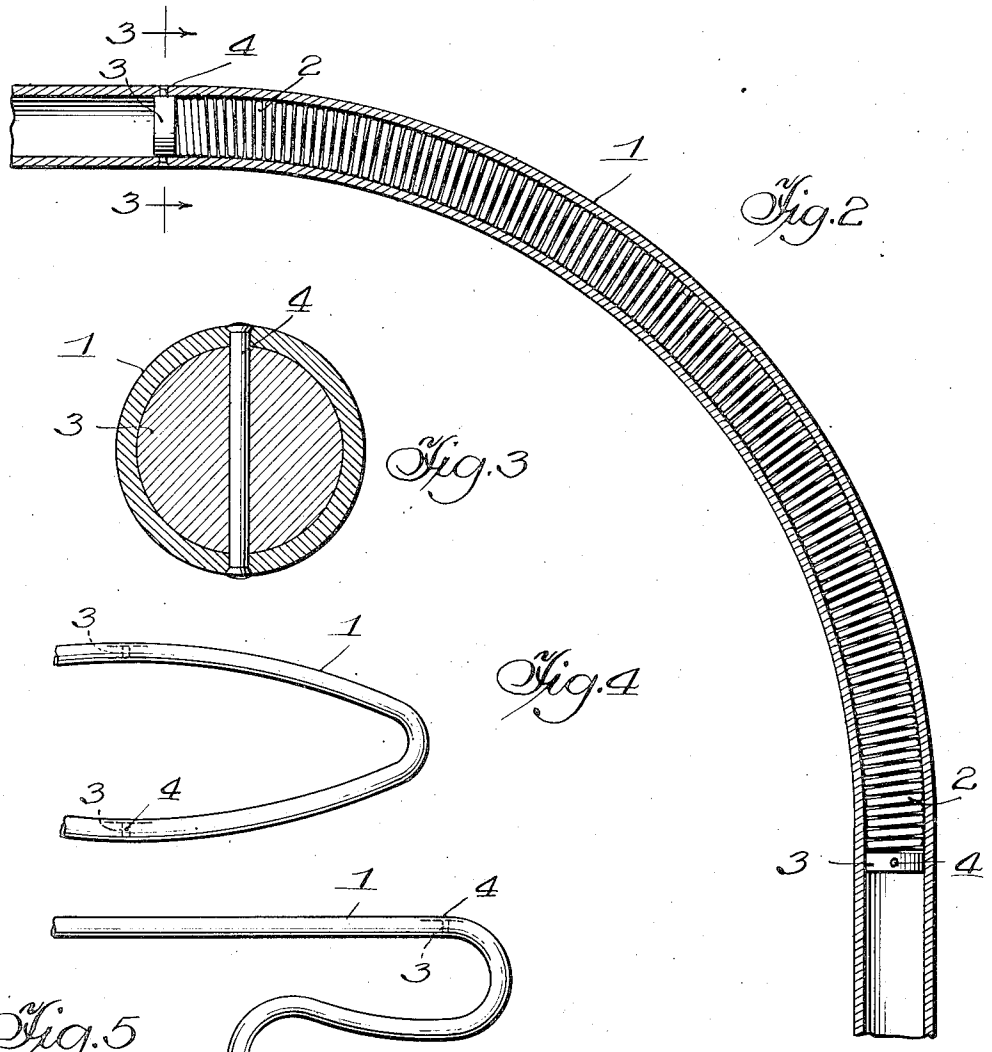


Fig. 2

Fig. 3

Fig. 4

Fig. 5

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MEANS FOR BENDING TUBING

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2 Claims. (Cl. 153—63)

The present invention relates to bending tubing or other tubular members and more particularly in the novel means and method of bending the same without danger of collapse.

Among the objects of the present invention is to provide a novel means and method of bending tubular members and maintaining their cross section and reinforcing the same during and after the bending operation.

A further object of the invention is the provision of a novel means of reinforcing tubing to prevent collapse thereof during the bending operation. In the disclosed embodiment, such means comprises a spring or tension member suitably positioned and mounted in the tubing where the bend is to be made, such spring or tension member being pinned or attached thereto and retained therein to additionally strengthen the tubing.

Another object of the present invention is the novel means of mounting a member in a tube to additionally strengthen the same and to permit the tube to be bent in any desired shape or contour, but preventing the tube from collapsing or breaking under load.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear, and as are inherently possessed thereby.

The invention further resides in the combination, construction and arrangements of parts illustrated in the accompanying drawing, and while there is shown therein a preferred embodiment, it is to be understood that the same is susceptible of modification and change, and comprehends other details, arrangements of parts, features and constructions, without departing from the spirit of the invention.

In the drawing:

Fig. 1 is a fragmentary view of a tubular member, part in side elevation and part in vertical cross section to show the location and mounting of the coil spring.

Fig. 2 is a view in vertical cross section of the tube after the same has been bent.

Fig. 3 is a view in vertical cross section taken on the line 3—3 of Fig. 2.

Figs. 4 and 5 are fragmentary views in side elevation of sections of tubing bent into desired forms.

Referring more particularly to the disclosure in the drawing, when it is desired to bend the tube or hollow structural member 1, a coil spring or tension member 2 is inserted therein. Such spring or member is normally of a length extensive with the length of the section or part of the tube which is to be bent, and of a diameter or cross section closely approximating that of the interior of the tube.

Attached to each end of the spring is a block or disc 3 which in turn is suitably attached to the tube or member 1 by means of pins, rivets or the like 4. By mounting the spring in the tube and retaining it therein during and after the bending operation, the tube or structural member is greatly reinforced and strengthened.

In the bending operation, as the tube or structural member is being bent, the spring 2 is placed under tension and the diameter or cross section of the spring which is substantially equal to the inner diameter or cross section of the tube will prevent the tube from collapsing or breaking under load. The tube may be bent into any desired contour or configuration since its cross-section cannot be altered due to the coil spring.

By permanently mounting or positioning the coil spring or tension means in the tube or hollow member so that it is retained therein after the tube or member has been bent to the desired shape and extent, the tube or member will be greatly reinforced and will not be seriously deflected under stresses. It will be readily appreciated that the invention presents a unique and novel means and method of bending steel, metal or other tubing or structural member and maintaining the same against collapse, while at the same time strengthening the construction thereof whereby a member of smaller cross section or gauge of material may be employed to carry the same load as a tube or member of greater cross section or heavier construction.

Having thus disclosed my invention, I claim:

1. Means for maintaining the diameter or cross section of a tube during the bending operation and reinforcing the same during and after such bending, comprising an extensible member adapted to be inserted in said tube and placed under tension but at all times substantially maintaining its diameter or cross section, a block connected to each of the ends of said member and mounted within said tube intermediate the opposite ends thereof, and means for attaching said blocks to the tube whereby when the tube is bent, said member maintains the diameter and cross section thereof and reinforces the same.

2. Means for maintaining the diameter or cross section of a tube during the bending operation, comprising an extensible coil spring approximat-

ing the inner diameter of and adapted to be inserted in said tube and maintain its diameter during the bending operation, and means for permanently connecting the ends of the spring to the tube whereby when said tube is bent, the spring is placed under tension and its engagement with the inner wall of the tube prevents collapse thereof and after the tube is bent, said coil reinforces and additionally strengthens the tube, said means comprising blocks insertable in the tube and one connected to each end of the spring and having a configuration substantially that of the interior of the tube, and means for permanently anchoring said blocks in the side walls of the tube.

WALTER MILLIGAN.