March 6, 1934. W. H. MARTIN 1,949,938

PIPE BENDING DEVICE

Filed July 26, 1933

Fig. 1.

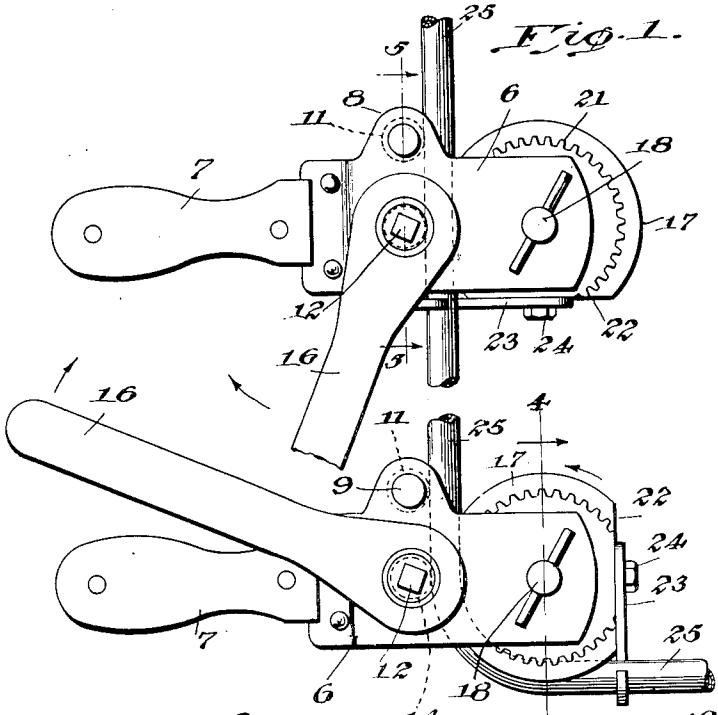


Fig. 4.

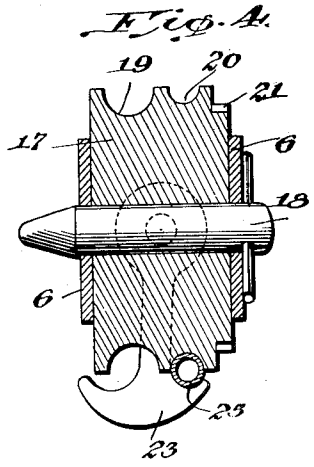


Fig. 2.

Fig. 5.

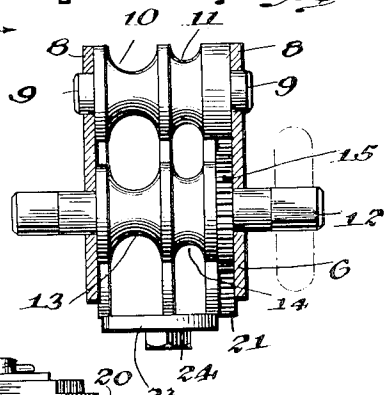
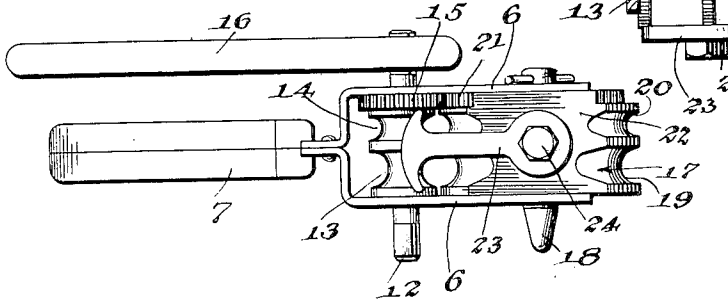


Fig. 3.



WITNESS

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PIPE BENDING DEVICE

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Application July 26, 1933, Serial No. 682,321

5 Claims. (Cl. 153—40)

My invention relates to improvements in pipe bending devices, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a device which is primarily intended for bending small pipes such as three-eighths inch and one-half inch copper tubing, which may be operated by the hands without the necessity of other holding devices, and with which bends up to and including 180 degrees can be made.

A further object of the invention is to provide a device in which friction is reduced and in which the scoring of the tubing is obviated by the provision of combination driving and forming rolls.

A further object of the invention is to provide a device of the type described which can be turned over and used from either side, making it convenient to make either right or left bends.

A further object is to provide idler and forming rolls so that two different sizes of tubing can be bent without changing rolls.

Other objects and advantages will appear in the following specification and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawing forming part of this application, in which:

Figure 1 is a side elevation of the device showing the apparatus in one position;

Figure 2 is a similar view showing it in another position;

Figure 3 is a bottom plan view;

Figure 4 is a section on the line 4—4 of Fig. 2, and

Figure 5 is a section on the line 5—5 of Fig. 1.

In carrying out my invention I provide a U-shaped frame 6 to which is secured a handle 7. As will be observed in Fig. 1, this frame has extensions like that shown at 8, on each side, in which are journalled the trunnions 9 of idlers 10 and 11 respectively, see Fig. 5.

In a plane common with the axis of the trunnions 9 are trunnions 12, which are journalled in the sides of the U-shaped member 6, by means of which driving rolls 13 and 14 respectively are carried. Secured to and integral therewith is a driving gear 15. The ends of the trunnions 12 project as shown in Fig. 5, and are provided with flat surfaces by means of which a ratchet wrench 16 may be applied to either end.

As will be seen from Figs. 1 and 4, a cylindrical body portion 17 is rotatably mounted on a pin 18. This body portion is provided with grooves 19 and 20 respectively, to constitute forming rolls, and it is also provided with an integral gear 21, which is in mesh with the gear 15.

One side of the body portion 17 is flattened, as shown at 22, and to this side is pivotally connected a double pointed hook 23, by means of a pivot bolt 24, or in any other suitable manner.

From the foregoing description of the various parts of the device the operation thereof may be readily understood. The operator grasps the handle 7 with one hand, and with the other hand he passes the end of the tube 25 in contact with one of the guide rollers, such as the roller 11, and between the driving roll 14 and the forming roll 20. The hook 23 is now brought around to engage the tube, as shown in Figs. 1 and 4. The wrench 16 is now swung from the position shown in Fig. 1 to that shown in Fig. 2, and since the gears 15 and 21 are in mesh, the body portion 17, which bears the roll 20 is rotated counter-clockwise, and the hook 23 which is carried around by the body portion 17, drags the tube 25 with it.

In Fig. 2 I have illustrated a 90 degree bend, but it will be obvious that on further rotation of the handle 16, the tube will be bent at any angle up to substantially 180 degrees. On long tubes where it is necessary to make a bend at some distance from the end of the tube, and therefore inconvenient to thread the tube between the rolls, the pin 18 and the forming rolls 19 and 20 which are mounted on the pin, may be removed and the tube may then be laid between the frame arms against the idler and the driving roll. The hook 23 is then brought into engagement with the tube after the forming rolls are replaced and the pin 18 inserted. The operation of bending is then made by turning the wrench 16, as heretofore described.

To make opposite bends, that is, rights and left, in long lengths of tubing, the machine is simply turned over and the ratchet wrench placed on the trunnion on the opposite side and operated so as to cause the hook to drag the tube and bend it in an opposite direction from that described at first.

It will be noted that the driving rolls are smooth, and that the major driving movement is performed by the engagement of the gear 15 with the gear 21, so that there is no danger of scoring the tube by corrugations or teeth on the driving rolls.

It will be seen from the above description that the device is a light portable machine for bend-

ing tubes, pipes, etc., by means of the operator's hands, in such a manner that the tube is prevented from buckling or being scored.

I claim:

1. A pipe bending device comprising a frame, a forming roll rotatably mounted in the frame, a gear carried by the forming roll, a driving roll rotatably mounted in the frame, a gear carried by the driving roll and arranged to engage the gear carried by the forming roll, an idler roll rotatably mounted on the frame in a common axial plane with the driving roll, and a hook pivotally connected with the forming roll and arranged to engage the pipe.

2. A pipe bending device comprising a frame, a forming roll rotatably mounted in the frame, a gear carried by the forming rool, a driving roll rotatably mounted in the frame, a gear carried by the driving roll and arranged to engage the gear carried by the forming roll, a driving roll rotatably mounted on the frame in a common axial plane with the driving roll, a hook pivotally connected with the forming roll and arranged to engage the pipe, a handle for the frame on the opposite side of the driving roll from the forming roll, and means for actuating the driving gear to cause the rotation of the driving and forming rolls.

3. A portable pipe bending device comprising a U-shaped frame having a handle secured to the central portion thereof, a driving roll having trunnions rotatably mounted in said frame near said handle, said trunnions being extended beyond the frame on either side thereof, an integral gear carried by said driving roll, a forming roll rotatably mounted in said frame and having an integral gear arranged to engage the gear of the driving roll, said forming roll being removable and replaceable, an idler roll pivotally mounted in said frame on an axis parallel to the axis of the driving roll, and a hook pivotally secured to the forming roll and arranged to engage the pipe and to drag it when the driving and forming rolls are turned in a predetermined direction.

4. A pipe bending device comprising a U-shaped frame, a handle secured to the frame at the central portion thereof, a driving roll having trunnions rotatably mounted in said frame, said trunnions projecting beyond the frame and having flattened end portions adapted to receive a wrench on either of said flattened portions, a forming roll disposed between the arms of the frame, a removable pivot pin for said forming roll, a driving gear integral with said driving roll, a gear integral with the forming roll and arranged to enmesh with the gear of the driving roll, a portion of the forming roll being cut away to provide a flat surface, an idler roll rotatably mounted in the frame on an axis parallel to that of the driving roll, and a hook pivotally mounted on the flat surface of the forming roll and having oppositely directed end portions arranged to engage the pipe and to drag it when the driving roll is turned in a predetermined direction.

5. A pipe bending device comprising a U-shaped frame having a central extension, a handle member secured to said central extension, a plurality of grooved driving rolls of different sizes, a driving gear associated with said driving rolls, trunnions for said driving gear and driving rolls, said trunnions extending through the sides of the U-shaped frame and having flat portions for engagement by a wrench, a plurality of idler rolls rotatably mounted in the U-shaped frame on an axis parallel with that of the driving rolls, said idler rolls corresponding in size and position to the driving rolls, respectively, a cylindrical body portion disposed between the U-shaped arms, a pivot pin for rotatably mounting said cylindrical body portion, said body portion having peripheral grooves of sizes corresponding to the grooves of the driving rolls, a gear formed on said block and arranged to mesh with said driving gear, said block having a cut-away portion to provide a flat surface, a hook pivotally mounted on the flat surface of said block and having oppositely directed ends arranged to engage the pipe to be bent, and to drag it between the forming and driving rolls when the latter are turned in a predetermined direction.

WILLIAM H. MARTIN.