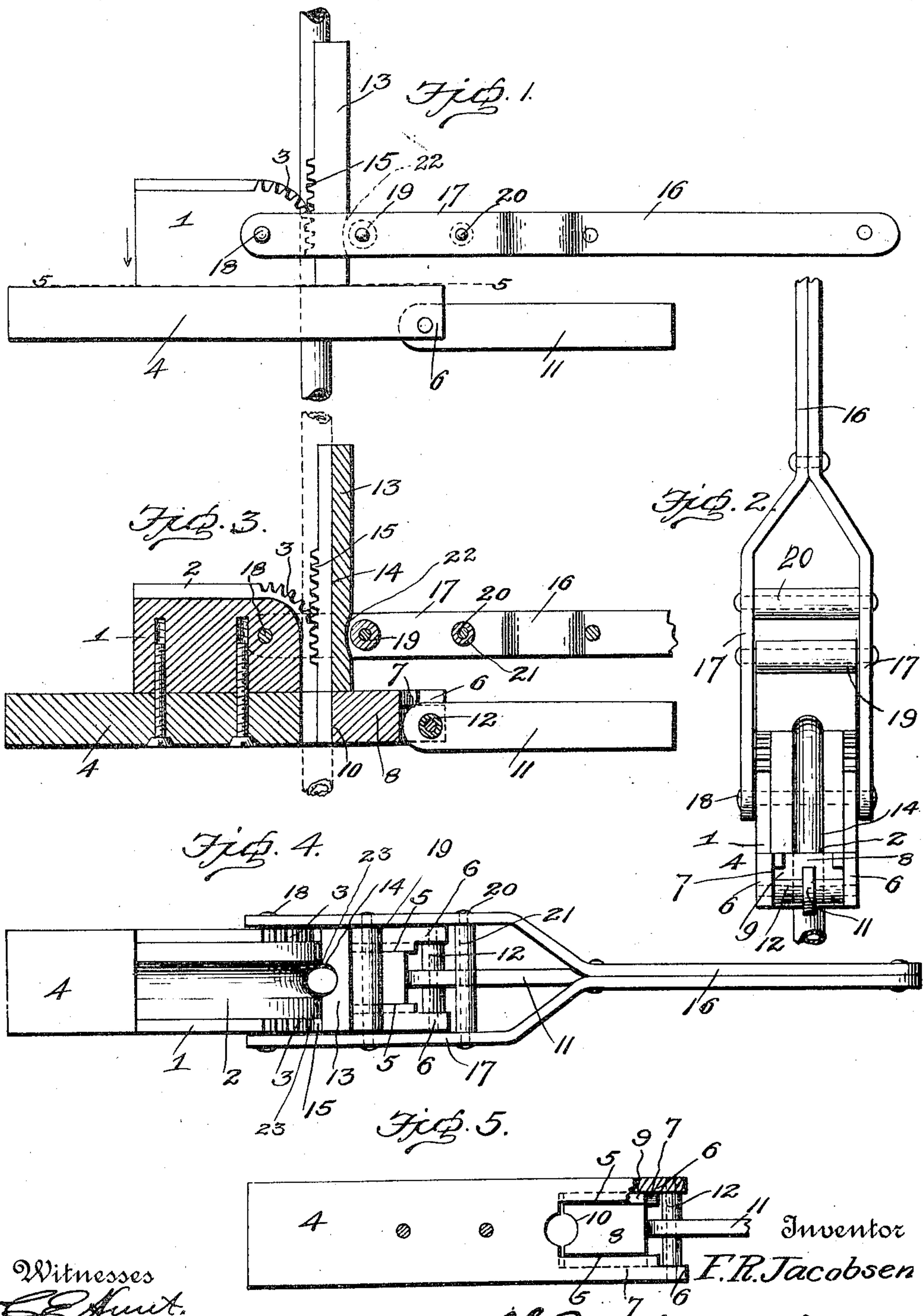


F. R. JACOBSEN.
PIPE BENDING TOOL.
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985,597.

Patented Feb. 28, 1911.



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UNITED STATES PATENT OFFICE.

FREDERICK R. JACOBSEN, OF PORTLAND, OREGON.

PIPE-BENDING TOOL.

985,597.

Specification of Letters Patent.

Patented Feb. 28, 1911.

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To all whom it may concern:

Be it known that I, FREDERICK R. JACOBSEN, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Pipe-Bending Tools; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in tube bending tools.

One object of the invention is to provide an improved tool of this character which is particularly adapted for bending brass annealed tubing without danger of crushing or kinking the same, and having means to securely hold the pipe or tube while being bent.

Another object is to provide a device of this character which will be simple, strong and durable in construction, efficient and reliable in operation and well adapted to the purpose for which it is designed.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side view of a tool constructed in accordance with the invention; Fig. 2 is an end view of the same showing the operating lever and bending block swung up; Fig. 3 is a vertical longitudinal sectional view; Fig. 4 is a plan view of the tool; Fig. 5 is a detail sectional view on the line 5-5 of Fig. 1.

In the embodiment of the invention I provide a bending die comprising an anvil member 1, which is preferably in the form of a rectangular oblong block, one corner of which is rounded off on the curvature at which it is desired to form the bend in the tube. In the upper side and one end and in the rounded corner of the block is formed a continuous substantially semi-circular groove or channel 2, the diameter of which corresponds to the diameter of the tube to be bent. In the rounded corner of the block on each side of the groove or channel therein are formed a series of gear teeth 3, the purpose of which will be hereinafter described.

The block 1 is bolted or otherwise rigidly secured to a base or fastening plate 4, the ends of which project beyond the opposite ends of the block, as shown. The plate 4 is adapted to be secured in a vise or other suitable fastening device for holding the tool in place while in operation. In the projecting end of the plate 4 adjacent to the rounded end of the block 1 is formed a centrally disposed recess or passage 5, while on the extreme end of said plate are formed apertured bearing lugs 6. In the opposite side walls of the recess or passage 5 are formed guide grooves 7 and slidably mounted in said recess or passage is a tube clamping block 8 having on its opposite side edges longitudinally disposed tongues 9 which are adapted to slidably engage the grooves 7 in the side walls of the passage 5, thereby slidably retaining the block 8 in place. In the inner end of the block 8 is formed a vertically disposed semi-circular notch 10 which is adapted to be engaged with the tube when the latter is engaged with the groove 2 in the anvil block 1 and a continuation of said groove 2 formed in the base plate 4 at the end of the passage or recess 5. The block 8 is adapted to be forced against the tube to clamp the latter against the anvil block and grooved end of the passage 5 by means of a clamping lever 11, having a cam or rounded end adapted to contact with the forward edge of the block 8. The clamping lever 11 is pivotally mounted on a bearing bolt suitably arranged in the lug 6 of the base plate and is spaced from the sides of the lug by means of sleeves 12, arranged on the bolt between the lever and the adjacent sides of the lug.

The opposing member of the bending die comprises a bending block 13 which, before the tube is bent, has its lower end in engagement with the upper side of the plate 4, as clearly shown in Fig. 1 of the drawing. The bending block 13 is provided on its inner side with a central longitudinally disposed groove 14 and on said inner side of the block on opposite sides of the groove 14 are formed series of gear teeth 15, which, when the block is operated to bend the tube, will engage the series of teeth 3 on the anvil block and thus prevent the slipping of the bending block.

The bending block is preferably operated by means of a hand lever 16 which is here shown and preferably consists of two bars

having their outer portions riveted or otherwise securely fastened together to form the handle portion of the lever and having their inner ends bent outwardly to form parallel roller supporting members 17, the inner ends of which are pivotally connected to the opposite sides of the end of the block 1 on a pivot bolt 18 which is arranged in the block 1 concentric to the arc or curvature of the rounded corner of the block and the gear teeth 3 formed thereon. Revolvably mounted on a suitable bearing bolt between the supporting members 17 of the hand lever is an operating roller 19, which is adapted to bear against the outer side of the bending block 13, whereby, when the lever is swung around on its pivot bolt 18, said bending block will be forced around the curved or rounded corner of the anvil block pressed before it and thereby bending the tube which is arranged in the groove 14 of said bending block and the groove 2 of the anvil block. The roller supporting members 17 of the hand lever are connected together adjacent to their inner ends by a rivet 20 on which is arranged a spreading sleeve 21 having a length slightly greater than the length of the roller 19, whereby the members 17 are spread or spaced apart and rigidly secured, thus preventing said members from binding against the ends of the roller 19.

In the outer side of the bending block 13 near its lower end is formed a recess or depression 22 which when the parts are in an inoperative position is opposite to the roller 19. The recess 22 permits the bending block to move back slightly to facilitate the engagement of the tube with the grooves in the anvil member and bending block.

The semi-circular groove or channel in both the anvil member and bending block is slightly narrower for a short distance opposite the point of the bend, as shown at 23 in Fig. 4, thus preventing the tube from flattening at this point while being bent.

By means of a bender constructed as herein shown and described, annealed brass tubing may be quickly and easily bent to an angle of ninety degrees or less without danger of kinking or crushing the pipe.

From the foregoing description taken in

connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined in the appended claims.

Having thus described my invention, what I claim is:—

1. In a tube bending tool, an anvil block, means whereby said block is held in position for operation, a tube bending block adapted to co-act with said anvil block, said tube bending block having a recess in its rear face to allow relative lateral movement of the block during the insertion of the tube, a lever freely movable upon said bending block to actuate the tool, and means to prevent said block from slipping during the bending operation.

2. A tube bending tool comprising an anvil block having formed therein a tube-receiving groove, a base plate upon which the anvil block is secured having its forward end bifurcated to form arms, the latter having longitudinal guiding grooves in their inner faces, a clamping block slidably mounted between the arms of the base plate and provided with extensions whereby it is slidably retained within said guiding grooves, a clamping lever pivotally mounted between said arms and having a rounded end adapted to contact with the clamping block to move the same into engagement with the tube to be bent, a bending block adapted to cooperate with the anvil block to bend said tube, and an operating lever having a roller adapted to rotatively engage the forward face of the bending block whereby the bending block is moved about the anvil block.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FREDERICK R. JACOBSEN.

Witnesses:

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FRANK BUCHET.