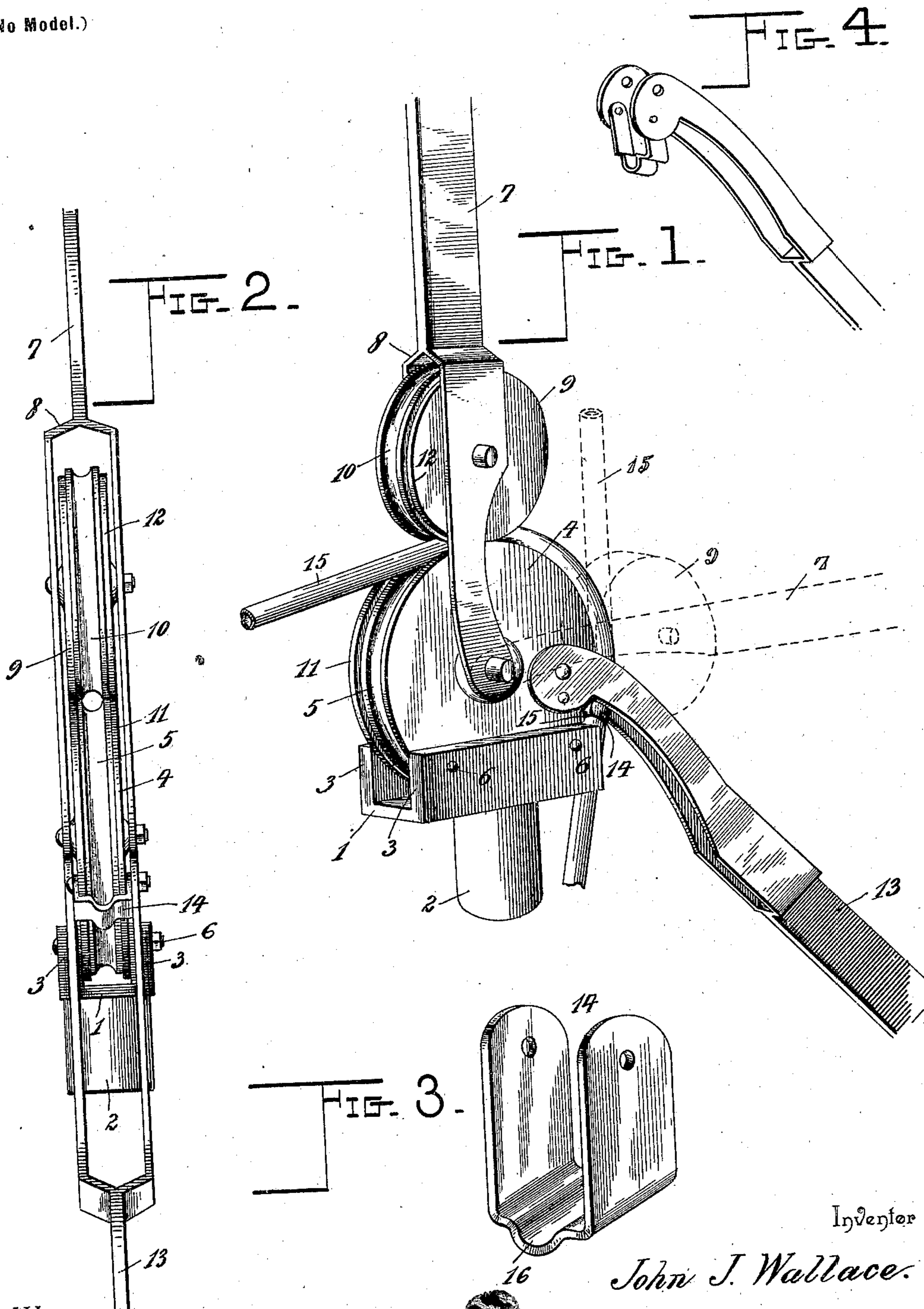


No. 627,162.

Patented June 20, 1899.

J. J. WALLACE.
TUBE BENDING MACHINE.
(Application filed Sept. 15, 1897.)

(No Model.)



Witnesses

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JOHN J. WALLACE, OF OKLAHOMA, OKLAHOMA TERRITORY.

TUBE-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 627,162, dated June 20, 1899.

Application filed September 15, 1897. Serial No. 651,735. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. WALLACE, a citizen of the United States, residing at Oklahoma, in the county of Oklahoma and Territory of Oklahoma, have invented a new and useful Tube-Bending Machine, of which the following is a specification.

My invention relates to a tube or pipe bending machine adapted especially for bending sheet-metal pipes whether soldered, brazed, or drawn, of any thickness, diameter, and material, to form curves of the desired extent without the use of a core or filling material, such as rosin or the equivalent thereof; and the object in view is to provide means for accomplishing the above operation, while preserving the original cross-sectional shape of the tube.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a tube-bending machine constructed in accordance with my invention. Fig. 2 is a front view of the same. Fig. 3 is a detail view in perspective of the clamp by which the extremity of a tube or pipe is engaged and held during the bending operation. Fig. 4 is a detail view showing the connection between the clamping-jaw and the lever by which it is carried.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a standard having a reduced portion 2, which is adapted to be fitted in a suitable socket in a table, bench, or equivalent support, (not shown,) said standard being provided with parallel ears 3, between which is secured a curved or circular-faced form 4, having a peripheral groove 5 to receive a tube or pipe, said form being secured between the ears 3 by means of transverse bolts 6 or their equivalents. Fulcrumed concentrically with the form 4 is an operating-lever 7, bifurcated, as shown at 8, whereby its arms are arranged upon opposite sides of the plane of said form, and also mounted for rotary movement between the arms of the operating-lever and in

position to traverse the form 4 is a traveler or bending-roll 9, having a peripheral groove or tube-seat 10, which corresponds and registers with the groove or tube-seat 5 in the form. The peripheries of the traveler and form are constructed to interlock, and thereby prevent lateral displacement during the operation of the machine, and in the construction illustrated the periphery of the form is provided with parallel side flanges 11 to fit in rabbets 12, contiguous to the lateral faces of the traveler. Also fulcrumed upon the form, preferably contiguous to the plane of the standard 1, is a clamping-lever 13, carrying a clamping jaw or clip 14 of approximately U shape, the arms of said jaw or clip being pivotally mounted upon the arms of the clamping-lever upon opposite sides of the plane of the frame and eccentrically with relation to said clamping-lever, whereby as the free end of the clamping-lever is depressed the closed or looped end of the jaw or clip is drawn toward the periphery of the form to clamp a tube or pipe, such as that illustrated at 15, in the seat of the form. The clamping jaw or clip is also preferably provided with a seat 16 of curved shape to avoid bending or denting the tube or pipe when brought into forcible contact therewith.

With the parts constructed as above described the extremity of the tube or pipe is engaged between the clamping jaw or clip and the periphery of the form, preferably at a point contiguous to the plane of the standard 1, while the operating-lever and traveler or bending-roll are in the positions illustrated in dotted lines in Fig. 1, after which said operating-lever is swung in the direction indicated by the arrow in said figure until the desired extent of the tube or pipe has been bent to correspond with the peripheral curvature of the form.

By means of the construction above described a tube or pipe, whether of uniform cross-sectional diameter or of tapered shape, can be bent to form a curve of the desired extent without crushing or kinking and without the use of a core or filling, such as is ordinarily employed in this art to prevent crushing and kinking, and the construction of the device, furthermore, is such as to adapt it to

be applied to an ordinary tinner's or plumber's bench, where it is within convenient reach of the operator.

In connection with the bending of thin sheet-metal pipes or tubes the main difficulty consists in avoiding the crushing or flattening thereof, and it is well known that the slightest lateral movement of the bending-roll or traveler, such as the roll 9 of my improved apparatus, with relation to the form will cause this flattening of a thin tube. The interlocking construction of faces of the traveler and the form, as shown and described in connection with my invention, positively prevents such lateral movement, and hence enables a thin tube to be bent uniformly without the distortion above mentioned. Furthermore, it is difficult in bending light or thin sheet-metal tubing to obtain a sufficient clamping action on the end thereof to prevent slipping without crushing the end, and this difficulty increases as the extent of the bend is increased. For instance, when the bend reaches or exceeds a semicircle the liability of the tube slipping from under the clamp is vastly increased, and as the slightest movement of the tube from under the clamp spoils the bend by causing the tube to kink I have found it desirable to employ the herein-described clamping-lever having a clamping jaw or clip of looped form, which is pivotally mounted upon said lever eccentrically with relation to the pivot thereof. Thus the jaw or clip is adapted to swing about its pivot and adapt itself to the direction of pressure thereof upon the tube.

The reduced extension 2 of the standard 1 is adapted to fit in the ordinary socket of a tinner's bench, and hence enables the apparatus to be mounted and detached with facility, according to the requirements of its use. Furthermore, said extension is preferably of cross-sectionally round construction to adapt the standard or support of the form to be turned to accommodate the preferred position of the operator, and as, when not in use, the operating-lever 7 and the clamp-carrying lever 13 are arranged at the same side of the form in approximately parallel and contiguous positions it is obvious that this rotary movement of the standard will enable said levers to be swung back over the bench out of the way of the operator when the machine is temporarily out of use.

Having described my invention, what I claim is—

1. A tube or pipe bending machine, having a swiveled standard provided with parallel spaced side walls 3, a circular peripherally-

grooved form fitted at one edge between said flanges of the standard, means for securing the form to the standard, a pivotal lever fulcrumed concentric with the form and carrying a grooved roller for traversing the periphery of the form, and a clamping-lever mounted eccentrically upon said form and carrying a pivotal clamping jaw or clip mounted eccentrically with relation to said clamping-lever, substantially as specified.

2. A bending-machine having a curved periphery, and bending devices including a lever and a traveler for traversing the periphery of the form, in combination with a clamping device having a lever and a looped clamping jaw or clip, pivotally connected to the clamping-lever eccentrically with relation to the fulcrum thereof, and adapted to span the face of the form, substantially as specified.

3. A tube or pipe bending machine having a peripherally curved and grooved form, a peripherally-grooved traveler mounted to traverse the periphery of the form, and a tube or pipe clamping device consisting of a pivotal lever, fulcrumed upon the form, and a looped clamping jaw or clip having its arms pivotally connected to said lever eccentrically with relation to the fulcrum of the lever, substantially as specified.

4. A tube or pipe bending machine having a standard provided with a reduced extension adapted for engagement with a suitable support, a form having a curved contour and provided with a peripheral tube-seat, a bifurcated operating-lever fulcrumed upon the form concentric with its curved contour, a traveler or bending-roll mounted in a bifurcation of the operation-lever to traverse the periphery of the form and having a tube-seat registering with that of the form, the peripheries of the traveler and form being constructed to interlock to prevent lateral displacement, one of said parts being provided with lateral flanges engaging corresponding rabbets in the other part, a clamping-lever fulcrumed upon the form, and a looped clamping jaw or clip having its arms pivotally connected to the clamping-lever upon opposite sides of the plane of the form and eccentrically with the fulcrum of said lever, and having a seat registering with the tube-seat in the form, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN J. WALLACE.

Witnesses:

FRANK V. BRANDOM,
LOUIS KERKER.