C. E. MOUNTFORD.

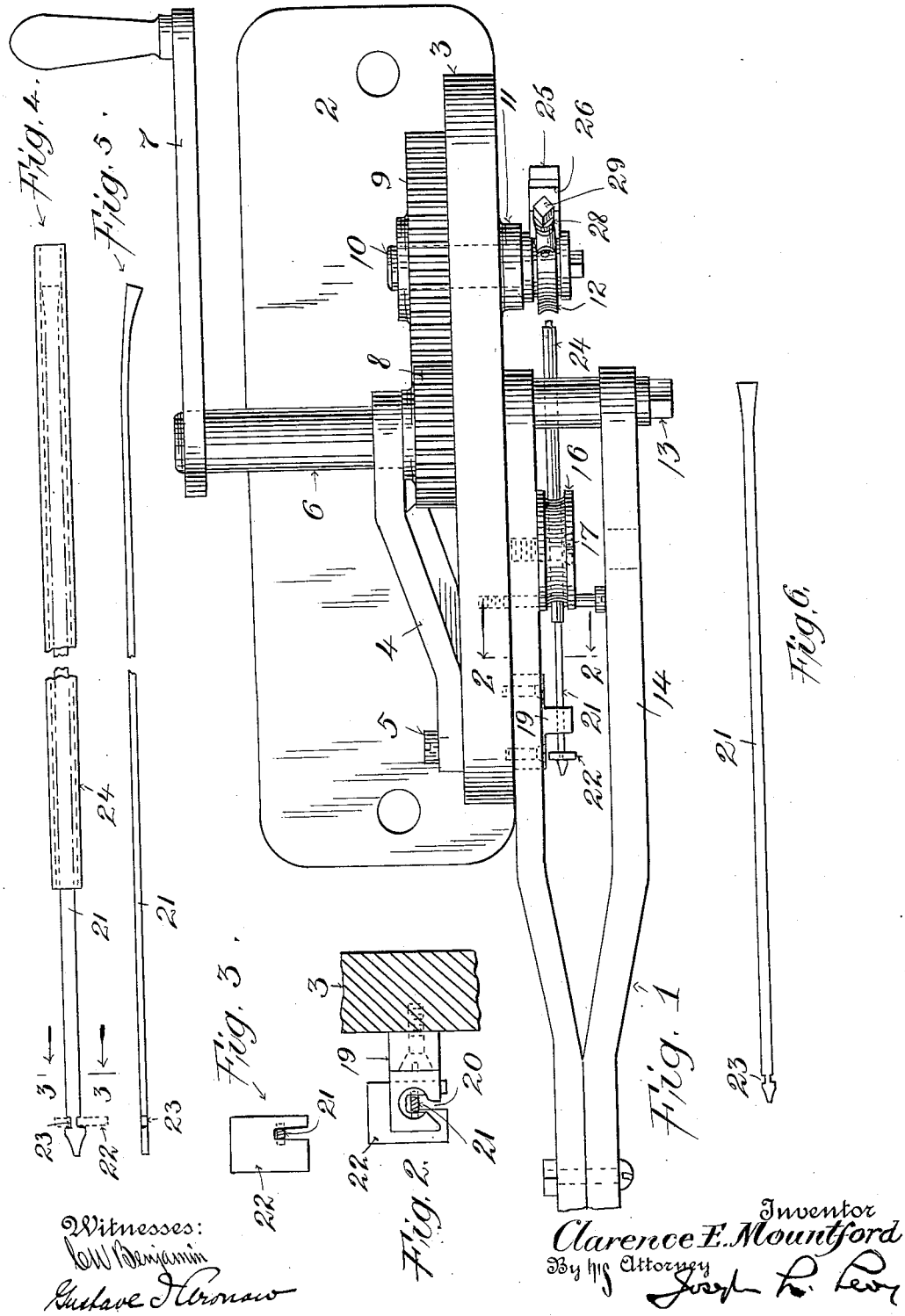
BRACELET BENDING MACHINE.

APPLICATION FILED OCT. 23, 1912.

1,094,676.

Patented Apr. 28, 1914.

3 SHEETS—SHEET 1.



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COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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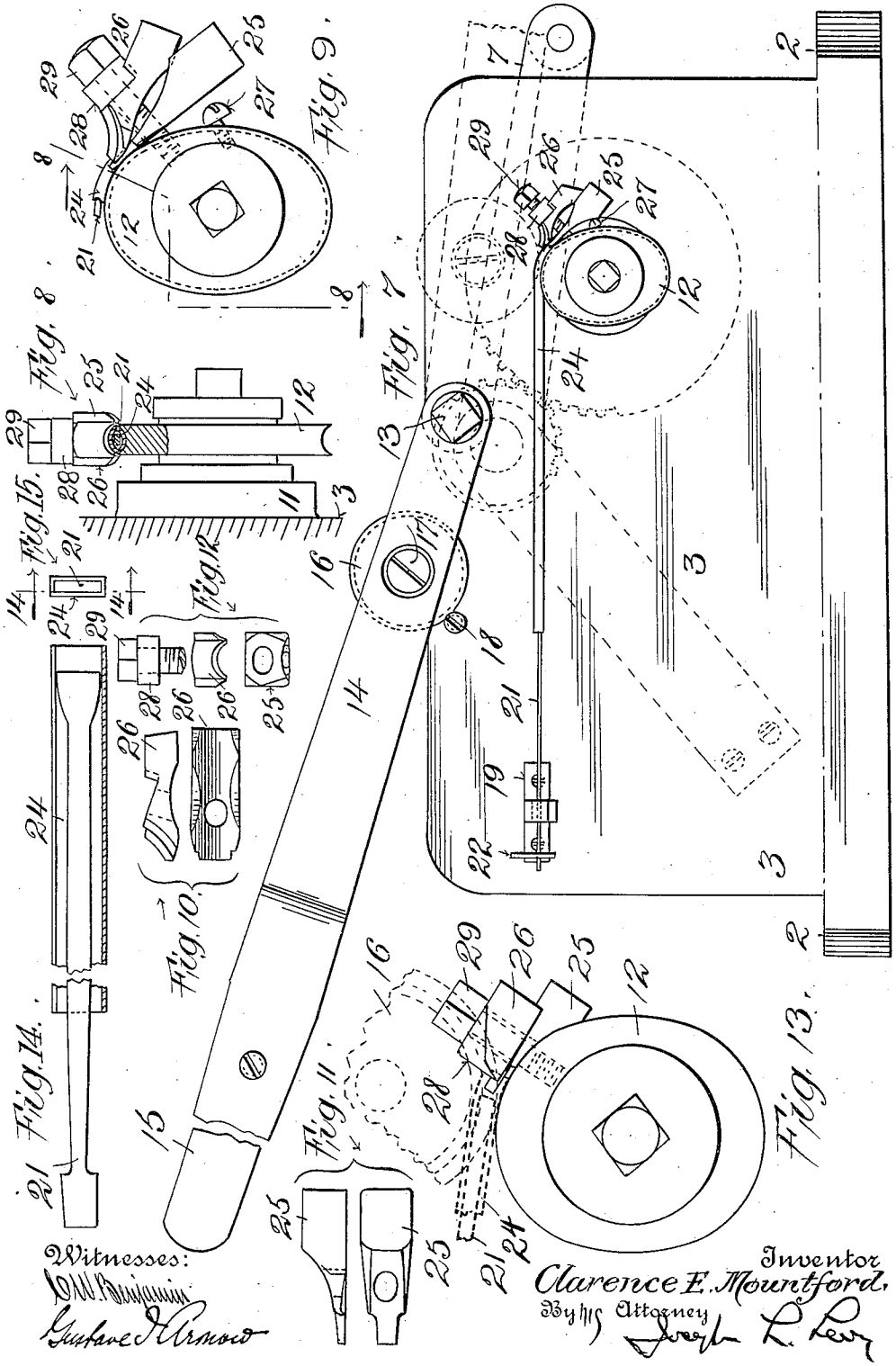
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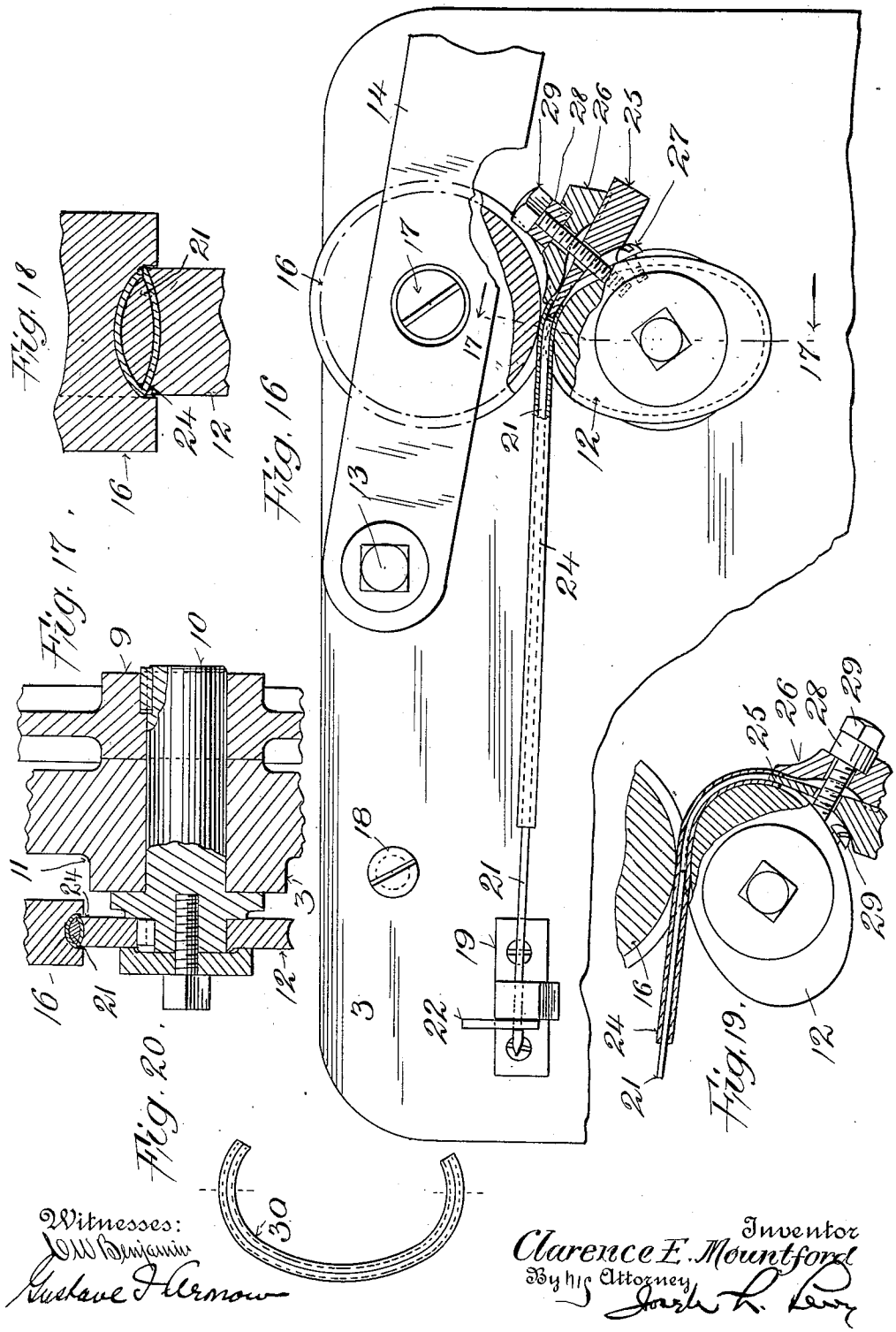
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CLARENCE E. MOUNTFORD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO GOLDSMITH, STERN & CO., OF NEW YORK, N. Y., A FIRM.

BRACELET-BENDING MACHINE.

1,094,676. Specification of Letters Patent. Patented Apr. 28, 1914.

Application filed October 23, 1912. Serial No. 727,315.

To all whom it may concern:

Be it known that I, CLARENCE E. MOUNTFORD, a subject of the King of Great Britain, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, (whose post-office address is 33 Gold street, New York city,) have invented a new and useful Improvement in Bracelet-Bending Machines, of which the following is a specification.

Heretofore it has been common to bend bracelets by making a straight tube of substantially the desired cross section, then filling the same with sand, sealing the ends and then bending the same over suitable dies or rollers.

The object of my invention is to simplify this operation by eliminating the sand entirely and bending the bracelet true by holding a mandrel in the same while it is being bent, so that when the operation is finished, the mandrel is free and clear of the bracelet and half of the bracelet is properly formed. This object is accomplished by my invention, one embodiment of which is hereafter set forth.

For a more particular description of my invention, reference is to be had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1, looking in the direction of the arrows. Fig. 3 shows a portion of the mandrel holding mechanism, the section being taken on the line 3—3 of Fig. 4, looking in the direction of the arrows. Fig. 4 is a plan view of one form of mandrel in a tube ready to be formed into a bracelet. Fig. 5 is an edge view of the mandrel shown in Fig. 4. Fig. 6 is a plan view of the mandrel shown in Fig. 4. Fig. 7 is a side elevation of the machine embodying my invention. Fig. 8 is a sectional view taken on the line 8—8 of Fig. 9, looking in the direction of the arrows. Fig. 9 is a side elevation of a portion of the bending mechanism, somewhat enlarged. Figs. 10, 11, and 12 show further details of the clamp of the bending mechanism. Fig. 13 is a side elevation, somewhat enlarged, of a portion of the mechanism shown in Fig. 9, except that a bending roller has been changed. Fig. 14 is an enlarged longitudinal section of a mandrel inserted in the tube, both being ready to be placed in the machine, the section being taken on the line 14—14 of Fig. 15, looking in the direction of the arrows. Fig. 15 is an end elevation of the tube and mandrel shown in Fig. 14. Fig. 16 is a side elevation and sectional view of the structure shown in Fig. 7, somewhat enlarged. Fig. 17 is a sectional view taken on the line 17—17 of Fig. 16, looking in the direction of the arrows. Fig. 18 is an enlarged view taken on the same line as Fig. 17, but showing only a portion of the structure therein shown. Fig. 19 is a sectional view showing a more advanced state of the bending operation than that shown in Fig. 16; and Fig. 20 shows the bracelet section after being removed from the machine, when it is ready for the next operation. It is large enough to be reduced by cutting the ends to give it the right length.

Throughout the various views of the drawings, similar reference characters designate similar parts.

My improved machine is provided with a bed plate 2 which may be secured to any suitable support, as the top of a bench or table. The bed plate 2 carries an upright 3 which is preferably made integral therewith or secured thereto with sufficient firmness and rigidity to support all the moving elements of the machine. A bracket 4 is secured to this upright 3 by screws 5 or any other desired means and this bracket 4 has journaled therein a suitable shaft 6, which is also journaled in the upright 3. This shaft 6 carries a crank 7 of the conventional kind, by which this shaft may be driven by manual power. Between the bracket 4 and the upright 3 the shaft 6 carries a pinion 8 which is fixed on this shaft and meshes with a second pinion 9, mounted fixedly on a stud shaft 10, that is journaled in the upright 3, the upright 3 being provided with a boss 11, so as to give a good and sufficient bearing. The bending roller 12 is fixedly mounted on the shaft 10, but it is mounted in such a way that it may be removed and replaced by a similar roller of different contour according to the size of the bracelet to be made or bent and the cross section of the same, one roller 12 being suitable for a given size and cross section only. The upright 3 also carries a stud shaft 13, on which is mounted a bifurcated lever 14 which is provided at its

remote end with a suitable handle 15, by which it may be manipulated. This bifurcated lever 14 also carries a grooved roller 16, mounted on a suitable pin 17, so as to run freely thereon, but absolutely true. This roller 16 is grooved, so as to correspond with the groove in the roller 12, so that the rollers 12 and 16 will appropriately engage and press against a bracelet, which is being bent between them. The roller 16 is held against the bracelet at all times during the bending and finishing operations by manual power applied to the handle 15. A screw or other stop 18 fixed in the upright 3 limits the movement of the lever 14, when it is thrown into its inoperative position. The upright 3 is also provided with a suitable bracket 19, which is placed as shown and provided with a suitable slot 20, near its outer end. It will be noted that the slot 20 opens downwardly and is made of such a shape and size that a mandrel 21 may pass through the same and turn freely therein. This mandrel 21 may have a small head, in which event a holder or plate 22 is employed, which rests in a slot 23 near the end of the mandrel 21 and presses against the projection 19, so that the mandrel 21 can move only a limited amount in the direction of its length. This mandrel 21 is enlarged at one end, so as to fit snug at the end against the interior of the tube 24 and bent so as to fit the interior of the tube at substantially the place of bending, without regard to the exact shape of the roller 12. The mandrel 21 has to be carefully set, so as to reach substantially the position shown in the various views of the drawing, when the machine is in operation. The enlarged end remote from the holder 22 must be so shaped that it fits snug against the interior of the tube, so as to prevent it from collapsing, while being bent; that is, the mandrel must fit snug against the interior of the tube at substantially the plane which passes through the respective axes of the rollers 12 and 16. It is obvious that the mandrel 21 must, as a rule, be changed whenever the rollers 12 and 16 are changed. If only the roller 12 is changed, so as to make a bracelet of a different size, but with the same cross section of tubing, then, in this event, it is not necessary to change the mandrel.

Before the tubing 24 can be bent, it is necessary to insert a flexible mandrel 21, as shown in Fig. 4. It will be noted that the mandrel 21 does not reach to the end of the tube. The vacant space at the end of the tube 24 is sufficient to enable this tube to be placed on the roller 12 with one jaw 25 entering the same and a second jaw 26 placed on top of the same. The jaw 25 has its rear end resting on a cap screw 27 which passes into the periphery of the roller 12 and the jaw 26 has a suitable recess that receives a washer 28 held in place by a cap screw 29, which passes through suitable perforations in the jaws 26 and 25 and into the bending roller 12, so that by tightening on the cap screw 29, the jaws 26 and 25 may be made to grip the tube 24 to such an extent, that it is somewhat crushed and thereby firmly held on the roller 12. When so held, the lever 14 is swung over and the roller 16 is then forced against the tube 24, as shown in Fig. 16 with a gentle but firm pressure applied manually through the handle 15. The crank 7 is then moved upwardly, so that the roller 12 will move clock-wise and as this roller moves the tube 24 is drawn over the large end of the mandrel 21 at the point of bending and is completely bent to the form shown in Fig. 20, at which time the crank 7 is given a very slight reverse movement, which immediately takes the tension off the mandrel 21 and allows it to fall through the slot 20 in the bracket 19. The backward movement of the crank 7 is then continued and the roller 12 is oscillated two or three times, while the roller 16 is pressed, as above described, these giving a good and correct and smooth outline to the bracelet. After this, the handle 14 is thrust back, the screw 29 loosened and the bracelet removed from the roller 12. It will be noted by examining Fig. 20, that the tube 24 is of such a length, that the bracelet 30, when formed by this machine is only a little more than half the required length, so that by taking two parts 30, and cutting them off at the right length and uniting them in the conventional manner, a complete bracelet may be formed.

It is to be noted that in Fig. 15 is shown a suitable mandrel and tube for forming a bracelet rectangular in cross section, and in Figs. 17 and 18 is shown a mechanism for forming a bracelet from a tube elliptical in cross section. Figs. 7 and 13 show different forms of bending rollers.

From what has been said, it is apparent that this machine may, by changing the rollers and mandrels, be made to form a bracelet of any desired cross section and size.

While I have shown and described one embodiment of my invention, it is obvious that it is not restricted thereto, but that it is broad enough to cover all structures that come within the scope of the annexed claims.

Having thus described my invention, what I claim is:

1. In a machine of the class described, bending rollers grooved to conform to the shape of the tube to be bent, a flexible mandrel with one end fitting said tube, and slotted means for holding the same under tension, so that when a tube is drawn off the mandrel, the mandrel will fall clear of the tube and the mechanism supporting the tube during the bending operation.

2. In a machine of the class described, a

pair of bending rollers grooved so as to conform to the shape of a tube being bent, means for driving one of the same, a mandrel with one end fitting said tube, and means constructed to hold the mandrel under tension while the machine is in operation but open to release the same when not under tension whereby the mandrel may drop clear of the tube and the bending rollers may be rounded in either direction to smooth the tube, as set forth.

3. In a machine of the class described, rollers adapted to bend a bracelet, a mandrel, a bracket with a downwardly disposed opening adapted to hold one end of a mandrel while a tube is bent over the same and between said rollers, so that said mandrel will fall clear of the bending mechanism when the bending operation is finished, and means for driving one of said rollers.

4. In a machine of the class described, a bracket having a downwardly disposed slot and a mandrel therein, so mounted as to be freely rotatable therein, the mandrel having at one end a means for fitting it within a tube, and means, whereby during the operation of the machine, the mandrel is held by tension and is dropped from the machine when the bending operation is completed.

5. In a machine of the class described, rollers, a mandrel, a jaw connected to one of the rollers and adapted to enter a tube and a coöperating jaw combined with the first mentioned jaw to rest on the exterior of the tube and to hold the same during the bending operation, and means for holding said mandrel so that when the machine is in operation the mandrel will be held while under tension while the tube is being bent, but will be permitted to drop clear of the tube when not under tension and after the completion of the bending operation.

6. In a machine of the class described, rollers, a mandrel with one end fitting the tube to be bent, and a pair of jaws, with means for securing the same to one of the rollers so that one of the jaws will enter the interior of the tube and the other may be secured to the exterior of the tube, when the device is in use, whereby a tube may be secured between said jaws, and means constructed to hold the mandrel under tension while the machine is in operation but open to release the same when not under tension whereby the mandrel may drop clear of the tube.

7. In a machine of the class described, a roller and means for driving the same, means for mounting the same, a second roller and a lever in which said second roller is mounted, means for pivoting said lever to the machine eccentric of the first mentioned roller, a mandrel, means for mounting the same and means for fixing an end of a tube to be bent to the first mentioned roller, and means constructed to hold the mandrel under tension while the machine is in operation but open to release the same when not under tension whereby the mandrel may drop clear of the tube.

8. In a machine of the class described, a roller and means for driving the same, a lever pivotally mounted above said roller, means constructed to hold the mandrel under tension while the machine is in operation but open to release the same when not under tension whereby the mandrel may drop clear of the tube, a second roller carried thereby for coöperation with the first named roller so that when the machine is in use pressure on the lever may cause the rollers to coöperate when bending a tube.

9. In a machine of the class described, a grooved roller, means for driving the same, a lever pivotally mounted above said roller, a grooved roller carried thereby for cooperation with the first roller, combined with a mandrel having one end adapted to fit within a tube and jaws on one of said rollers, one of said jaws being adapted to enter the tube and the other to engage the outside thereof when the said jaws clamp a tube to the roller, means constructed to hold the mandrel under tension while the machine is in operation but open to release the same when not under tension whereby the mandrel may drop clear of the tube.

Signed at the city of New York, county of New York, and State of New York, this 21st day of October, 1912.

CLARENCE E. MOUNTFORD.

Witnesses:

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GUSTAVE I. ARONOW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."