W. P. FRANK.

TUBE BENDING MACHINE.

APPLICATION FILED JUNE 26, 1917.

1,283,140.

Patented Oct. 29, 1918.

2 SHEETS—SHEET 1.

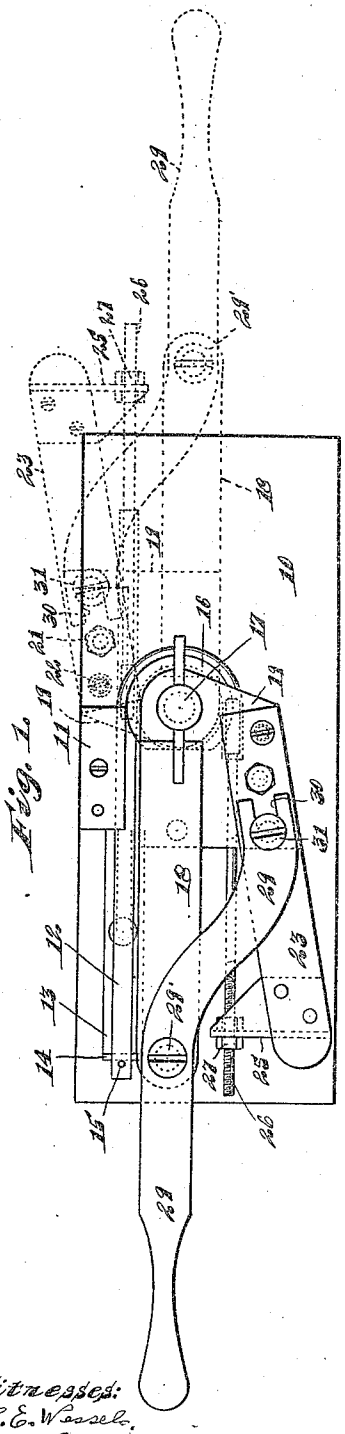


Fig. 1.

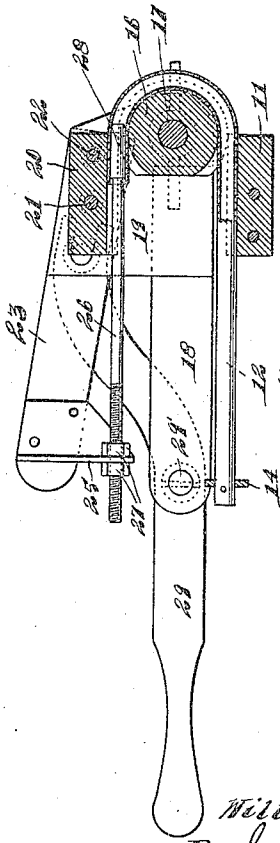


Fig. 3.

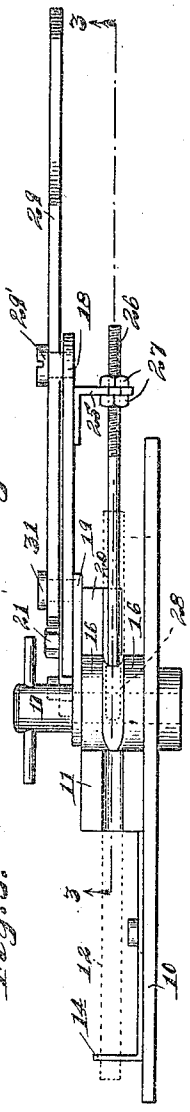


Fig. 2.

Witnesses:
C. E. Wessels.
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Inventor:
William P. Frank,
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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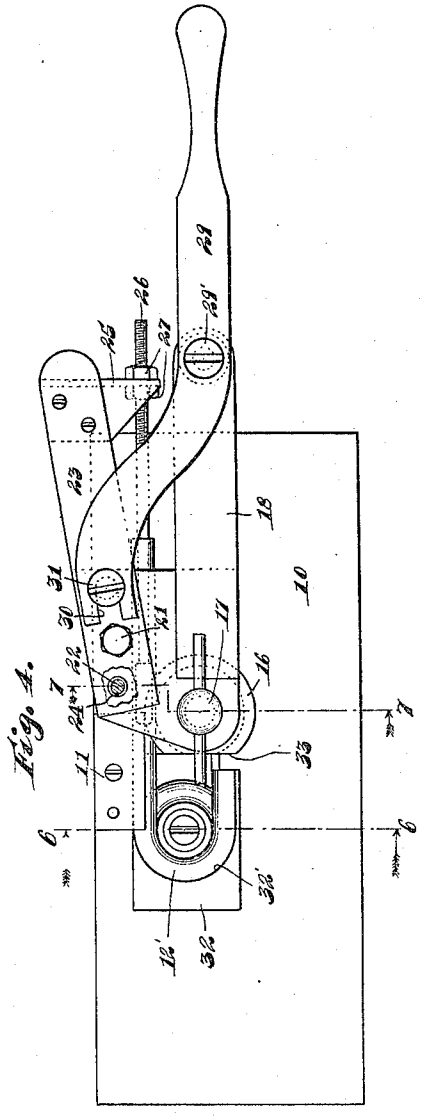


Fig. 4.

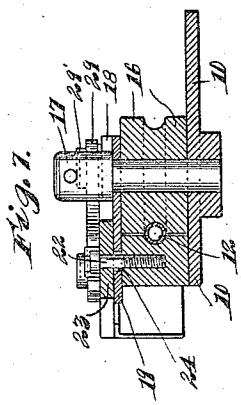


Fig. 7.

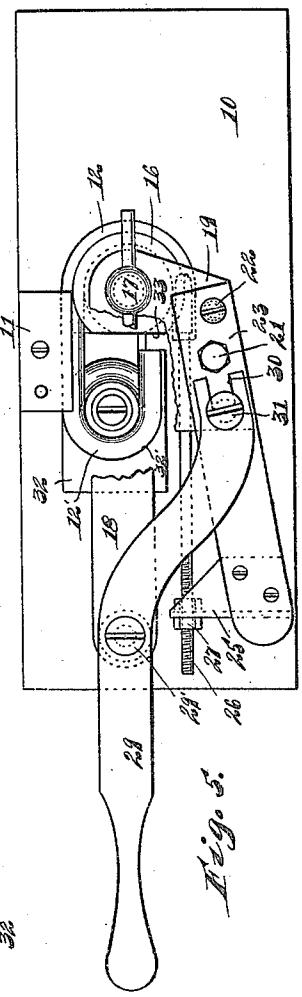


Fig. 5.

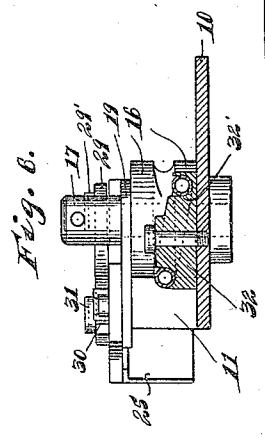


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM P. FRANK, OF CHICAGO, ILLINOIS.

TUBE-BENDING MACHINE.

1,283,140. Specification of Letters Patent. Patented Oct. 29, 1918.

Application filed June 26, 1917. Serial No. 176,960.

To all whom it may concern:

Be it known that I, WILLIAM P. FRANK, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Tube-Bending Machines, of which the following is a specification.

My invention relates to improvements in tube bending machines, and has for its object the provision of an improved machine of this character by means of which tubes may be readily bent in different forms without buckling or distorting the same, the present invention being an improvement over that disclosed in my prior patent for tube bending machines, granted May 8, 1917, No. 1,225,426.

The present invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a top plan view of a bending machine embodying my invention,

Fig. 2 a side view of the same, but showing the bending lever in full lines in initial position instead of in terminal position,

Fig. 3, a section taken on line 3—3 of Fig. 2, but showing the bending lever in terminal position,

Fig. 4, a top plan view of a machine shown as employed in bending a tube which already has one bend therein,

Fig. 5, a top plan view corresponding with Fig. 4 with portions removed and showing the bending lever in terminal position after the bending,

Fig. 6, a section taken on line 6—6 of Fig. 4, and

Fig. 7, a section taken on line 7—7 of Fig. 4.

The preferred form of construction, as illustrated in the drawings, comprises a suitable base plate 10 adapted to be secured in a vise or the like, said base plate being provided centrally at one side with a grooved die member 11 adapted to receive a tube 12 to be bent. A stop or gage member 13 is detachably secured to the upper face of plate 10, and is provided with an upstanding notched flange 14 adapted to receive the end of tube 12, said tube being locked against longitudinal movement by passing a pin 15 through a perforation in the end thereof. A die head 16 is removably arranged on base plate 10 to coöperate with guide 11, said die head being positioned on a removable stud 17 fitting through a suitable hole in said base plate. A bending lever 18 is pivotally mounted on stud 17 and carries a lateral extension 19 having a grooved die member 20 pivoted thereon at 21 in position to coöperate with bending head 16. The die member 20 is secured by a screw bolt 22 to a supplemental lever 23 also pivoted at 21, said screw bolt 22 passing through an enlarged hole 24 in the lateral extension 19 so as to permit of limited rocking of the die member 20 and lever 23, with reference to the lever 18 and the bending head 16. Lever 23 carries a depending bracket 25 on which is mounted a rod 26 adjustably secured to said bracket by means of lock nuts 27 as indicated. Rod 26 carries a plug 28 insertible in the end of tube 12 as indicated. A handle lever 29 is pivoted on lever 18 at 29′ and has a slotted end 30 loosely engaging a headed stud 31 on lever 23, the arrangement being such that initial force applied to handle lever 29 first rocks the die member 20 into close coöperation with bending head 16 before causing the bending lever 18 to sweep around the stud 17 and bending head 16.

In use the parts are first disassembled and a tube to be bent placed over plug 28 and rod 26, whereupon the parts are assembled with said tube fitting the groove in guide 11 and the notch in flange 14, the corresponding end of the tube being perforated and a pin 15 being passed therethrough to lock said tube against longitudinal movement. Then the lever 18 and its associated parts are swept around bending head 16 by means of handle lever 29. This causes the tube to be nicely bent against the bending head 16, the plug 28 always traveling in said tube substantially tangent to head 16 at the place where the bending takes place. By this arrangement, the tube will be nicely bent without buckling or other distortion and very expeditiously. To remove the bent tube the stud 17 is first removed, whereupon the parts may be readily disassembled and the bent tube removed. A flattened place 33 on the bending head 16 also facilitates removal of the tube from said bending head.

When it is desired to bend a tube which

has already had one end thereof bent, I insert a grooved block 32 having a groove 32′ therein shaped to fit the bend 12′ in said tube as best indicated in Figs. 4 to 7 inclusive. The groove 32′ in the groove 32 is inclined with reference to the groove in bending head 16 as indicated in Fig. 6, and simply rests against the flattened portion 33 of the bending head 16. By this arrangement, it will be observed that a tube having the bend 12′ therein may be again bent in a plane at an angle to the plane of bend 12′ thus forming a part adapted for use in ordinary bugles.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A tube bending machine comprising a bending head; a bending lever coöperating with said head; a supplemental bending lever pivotally mounted on said lever; a die member carried by said supplemental bending lever and coöperating with said head; and a handle lever pivoted on said bending lever and operatively connected with said supplemental lever to press said die member against said head in operating said bending lever, substantially as described.

2. A tube bending machine comprising a bending head; a bending lever coöperating with said head; a supplemental bending lever pivotally mounted on said lever; a die member carried by said supplemental bending lever and coöperating with said head; a handle lever pivoted on said bending lever and operatively connected with said supplemental lever to press said die member against said head in operating said bending lever; and a plug carried by said supplemental lever and insertible in a tube operated on by said die member and head, substantially as described.

3. A tube bending machine comprising a bending head; a bending lever coöperating with said head; a supplemental lever pivotally mounted on said bending lever; a die member carried by said supplemental bending lever and coöperating with said head; a handle lever pivoted on said bending lever and having a slot and pin connection with said supplemental lever arranged to press said die member against said head in operation of said bending lever; and a plug carried by said supplemental lever and insertible in a tube operated on said die member and head, substantially as described.

4. A tube bending machine comprising a grooved bending head; a bending lever cooperating with said head; a plug carried by said lever and insertible in a tube operated on by said lever and head; and a grooved block coöperating with said head and adapted to receive a bend in a tube the groove in said block being inclined with reference to the groove in said head, substantially as described.

5. A tube bending machine comprising a grooved bending head; a bending lever cooperating with said head; a grooved die member carried by said lever and coöperating with said head; a plug carried by said lever and insertible in a tube operated on by said die member and head; and a grooved block coöperating with said head and adapted to receive a bend in a tube the groove in said block being inclined with reference to the groove in said head, substantially as described.

6. A tube bending machine comprising a grooved bending head; a bending lever cooperating with said head; a die member carried by said lever and coöperating with said head; a handle lever carried by said bending lever and operatively connected with said die member to throw said die member into close coöperation with said head; a plug carried by said lever and insertible in a tube operated on by said die member and head; and a grooved block coöperating with said head and adapted to receive a bend in a tube the groove in said block being inclined with reference to the groove in said head, substantially as described.

7. A tube bending machine comprising a grooved bending head; a bending lever cooperating with said head; a plug carried by said lever and insertible in a tube operated on by said lever and head; and a grooved block coöperating with said head and adapted to receive a bend in a tube, the groove in said block lying in a different plane from that in said head, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM P. FRANK.

Witnesses:
JOSHUA R. H. POTTS,
HELEN F. LILLIS.

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