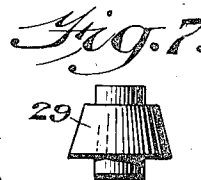
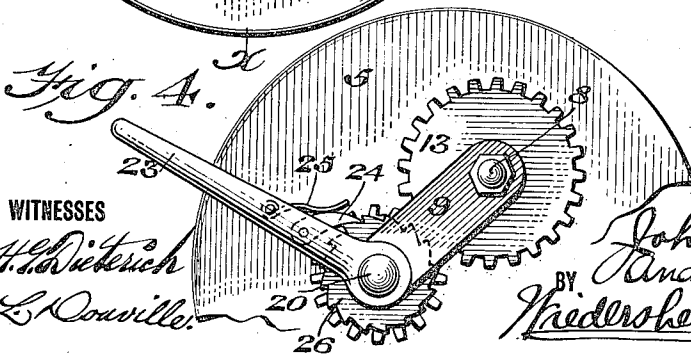
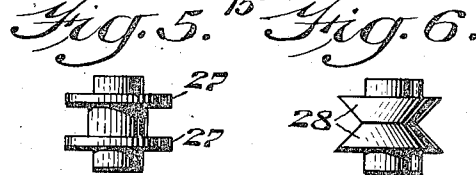
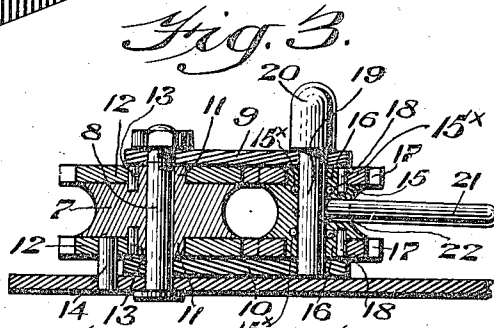
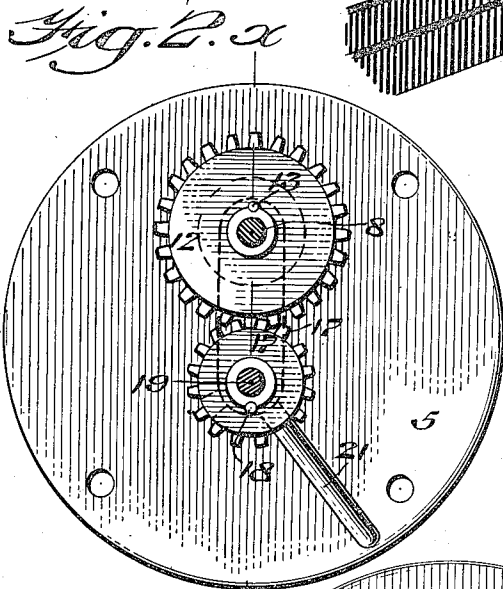
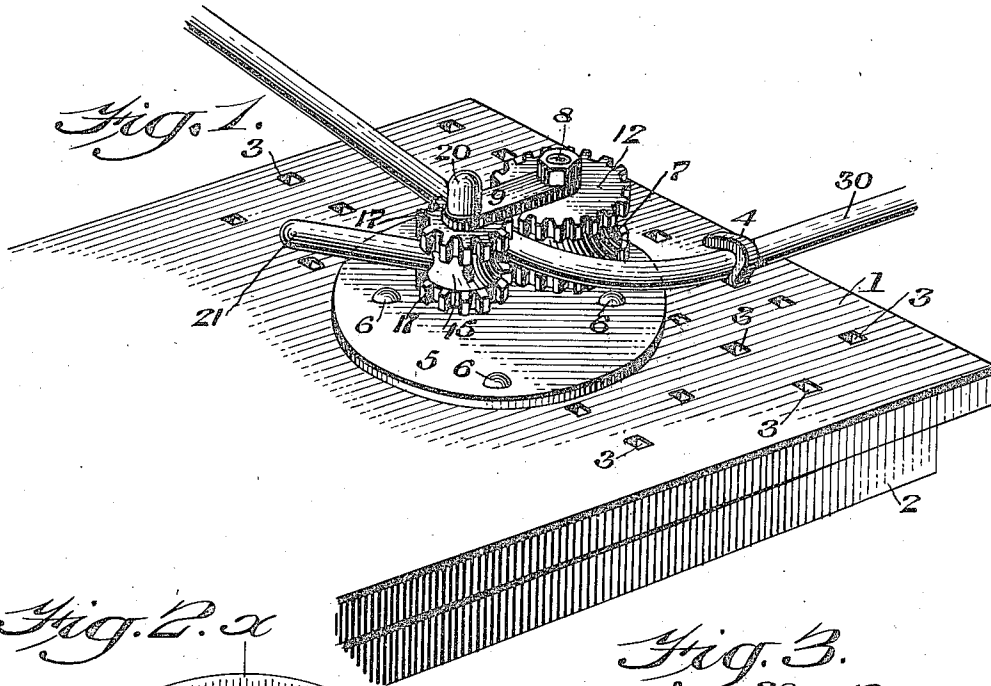


J. SCHLOSSER & A. W. CHRISTIAN.
BENDING MACHINE.

APPLICATION FILED JULY 29, 1909.

950,212.

Patented Feb. 22, 1910.



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JOHN SCHLOSSER, OF WILMINGTON, DELAWARE, AND ANDREW W. CHRISTIAN, OF PHILADELPHIA, PENNSYLVANIA.

BENDING-MACHINE.

950,212.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed July 29, 1909. Serial No. 510,340.

To all whom it may concern:

Be it known that we, JOHN SCHLOSSER, residing at Wilmington, in the county of Newcastle, State of Delaware, and ANDREW W. CHRISTIAN, of the city and county of Philadelphia, State of Pennsylvania, citizens of the United States, have invented a new and useful Bending-Machine, of which the following is a specification.

10 This invention relates to a novel construction of a bending apparatus and has for an object to provide a simple and effective means for bending pipe and other materials of different sizes, the parts comprising the
15 same being few in number, cheap to manufacture and the liability of the same becoming broken or out of order reduced to a minimum.

It further consists of other novel features
20 of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating our invention, we have shown in the accompanying drawings one form thereof which is at present preferred by us, since the same has been
25 found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which our invention consists can be variously arranged and organized and that our
30 invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Referring to the drawings:—Figure 1 represents a perspective of a device embodying
35 our invention. Fig. 2 represents a plan of the same. Fig. 3 represents a section on line *x—x* of Fig. 2. Fig. 4 represents a plan showing a modified form of operating means. Figs. 5, 6 and 7 represent modified
40 forms of bending dies.

Similar numerals of reference indicate corresponding parts in the figures.

1 designates a bed secured to a work bench
45 2 or the like, the said bed having apertures 3 formed therein spaced at suitable intervals and preferably arranged irregularly in order to permit suitable pipe or material engaging hooks 4 to pass therethrough to
50 act as a retaining member for the material during the bending operation.

5 designates a plate preferably secured by bolts 6 or equivalent devices to the bed 1

and serving as a support for the novel bending mechanism now to be described. 55

7 designates a bending die fixedly secured to the plate 5, in the present instance a bolt 8 serving as a fastening means and being of sufficient length to retain a pair of links 9 and 10, one on either side of said bending
60 die. The bending die 7 in the present instance is provided with hubs 11 each of which are adapted to fit within a gear 12 and be fixedly secured thereto by means of a key 13 or the like as will be readily understood. The bending die 7 in the present
65 instance is a stationary member and is maintained against rotation relative to the plate 5 by means of a pin 14 which locks the parts securely. 70

15 designates a second bending die of similar contour to the die 7 and likewise provided with hubs 16 having gears 17 secured thereto by suitable keys 18.

19 designates a pin having in the present
75 instance a shouldered head 20 thereon, the said pin passing respectively through the link 9, die 15 and the link 10, thereby securely uniting the parts and forming a connection whereby the bending die 15 may be
80 rotated about the bending die 7.

As here shown we preferably provide roller bearings 15* for the die 15 in order to permit free rotary movement about the pin 19. It will be noted that the pin 19
85 is preferably mounted so that it may be readily removed in case it is desired to take out the die 15 at any portion of the bending movement. In the operation of bending it frequently happens that two or more bends
90 are given to the article whereby it would be practically impossible to remove the same from between the two dies and therefore it becomes necessary to take out the die 15 in order to release the article from between
95 the dies and this is done by withdrawing the pin 19 as will be readily understood. In order to effect this rotation as desired an operating arm 21 is employed which is adapted to engage with one of a number of
100 suitable openings 22 drilled or otherwise machined in the die 15.

In the modification disclosed in Fig. 4 we provide, in place of the arm 21, an arm 23 which is apertured to receive the pin 19
105 and rotate relative thereto, the said arm

carrying a pawl 24 thereon controlled by a spring 25 and positioned so as to contact with a ratchet wheel 26 mounted upon one of the gears 17.

5 In the modifications disclosed in Figs. 5, 6 and 7 we show a variety of dies which may be inserted in place of the dies 7 and 15 the same having surfaces which are adapted to correspond to the configuration
10 of the material to be bent. In Fig. 5 the die is provided with suitable flanges 27 spaced apart in order to receive the pipe or other material while in Fig. 6 the die is provided with beveled members 28 adapted for V work and in Fig. 7 a conical die
15 29 is employed.

It will of course be understood that a great variety of bending dies may be employed as desired for different kinds and
20 classes of work and that the faces of the dies may have different contours in order to conform thereto.

The operation is as follows:—The proper bending dies having been placed in position
25 upon the respective retaining means, the bolt 8 and the pin 19, a pipe as 30 or other material to be bent is placed upon the bed 1 and the hook retaining device 4 inserted in a convenient opening 3 thereby preventing
30 movement of the pipe or material during the bending movement. The arm 21 is now operated to move the bending die 15 about its center of rotation, the bolt 8, and the meshing of the teeth of the gears 12 and 17
35 effects a leverage producing a heavy bending movement upon the pipe 30 or material whereby the same is drawn out and bent as seen in Fig. 1. It will of course be understood that the shape and form of the
40 gear disks 12 and 17 may be varied according to the requirements as will be readily understood by those skilled in the art without departing from the spirit of our invention.

45 If desired the operating arm 23 with the ratchet adjustment may be employed whereby a step-by-step movement of the bending die is produced. It will be readily apparent that various means may be employed to rotate
50 the bending die, such as power driven mechanism, and we do not wish to be limited to hand operated means for the purpose.

It will now be apparent that we have devised a novel and useful construction of a
55 bending machine which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while we have in the present instance shown and described
60 a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification
65 in various particulars without departing

from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

70 1. In a device of the character described, a non-rotatable die, a second die removably supported with respect to said first mentioned die for complete revolution about
75 the same, an abutment for the material to be bent, and means connected directly with the movable die for causing the fulcrum point of said movable die to continuously change during the bending action of said die.

80 2. In a device of the character described, a non-rotatable die, a gear therefor, a second die movably supported with respect to said first mentioned die for complete revolution about the same, a pinion on said
85 second die and in mesh with said gear, an abutment for the material to be bent, and means connected directly with the movable die for causing the fulcrum point of said movable die to continually change during
90 the bending action of said movable die.

95 3. In a device of the character described, a non-rotatable die, a second die adjacent thereto and mounted for complete revolution about the same, a removable member
movably supporting said second die relative to said first mentioned die, means for applying power directly to the movable die and
an abutment for the material to be bent.

100 4. In a device of the character described, a non-rotatable die, a second die adjacent thereto and mounted for complete revolution about the same, a removable member
movably supporting said second die relative to said first mentioned die, an abutment for
105 the material to be bent, and means connected directly with the movable die for causing the fulcrum point of said movable die to continually change during the bending action of said die.

110 5. In a device of the character described, a bed having an opening therein, a plate secured to said bed, a plurality of bending dies carried by said plate, gear teeth at the top and bottom of each die, and means to
115 secure one die to the other for complete revolution about the same.

6. In a device of the character described, a bed having an opening therein, a plate secured to said bed, a bending die fixedly
120 mounted on said plate and having gear teeth thereon, a second bending die mounted for complete rotation about said first bending die and having gear teeth thereon, and means for actuating said second bending die
125 said means being connected directly with said movable die.

7. In a device of the character described, a bed having a plurality of openings thereon, a plate secured to said bed, a bending die
130

fixedly mounted on said plate and having gear teeth thereon, a second bending die mounted for complete rotation about said first bending die and having gear teeth thereon, and means for actuating said second bending die said means being connected directly with said movable die.

8. In a device of the character described, a bed having a plurality of openings therein, a plate secured to said bed, a bending die having gear teeth thereon, a fastening device securing said die to said plate, a second bending die having gear teeth thereon, a plurality of links carrying said second die and rotatably mounted on said fastening device, and means connected directly with said second die to actuate the latter and give it a complete revolution about the first-named die.

9. In a device of the character described, a bed having a plurality of openings therein, a plate secured to said bed, a stationary bending die on said plate, a second bending die mounted for complete rotation about said first mentioned bending die, gear teeth on both said dies, and means connected directly with said second bending die for actuating said second bending die with said gear teeth as a moving fulcrum.

10. In a device of the character described, a bed having a plurality of openings therein, a stationary bending die, means engageable with any one of said openings to hold the article to be bended, a second bending die mounted for movement and rotation relative to the first-mentioned die, intermeshing gearing on said dies, links extending from the centers of said dies, and removable means securing one end of said links to the rotatable die.

11. In a device of the character described, a non-rotatable die, a revoluble die for co-operation therewith, and means for actuating the movable die, embodying gears forming the fulcrum point and means connected directly with the revoluble die.

12. In a device of the character described, a non-rotatable die, a second die adjacent thereto, and means for actuating the latter, embodying means connected directly with said second die and a fulcrum point constantly changeable during the bending action.

13. In a device of the character described, a non-rotatable die, a second die adjacent thereto, intermeshing gearing between said dies, and a lever connected directly with the rotatable die for moving the same and utilizing the contact of the teeth of said gears as the fulcrum point.

14. In a device of the character described, a non-rotatable die, a second die adjacent thereto, intermeshing gearing between said die, and a lever connected directly with the rotatable die for moving the same and utilizing the contact of the teeth of said gears as the fulcrum point, said fulcrum point being constantly changeable during the bending action.

15. In a machine of the class described, a stationary die conforming in shape to the shape of the pipe to be bent, a movable die fast upon its shaft, directly intermeshed gearing between said dies, and a lever connected directly with the movable die.

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