R. ANDERSON.

METAL BENDING MACHINE.

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1,124,251.

Patented Jan. 12, 1915.

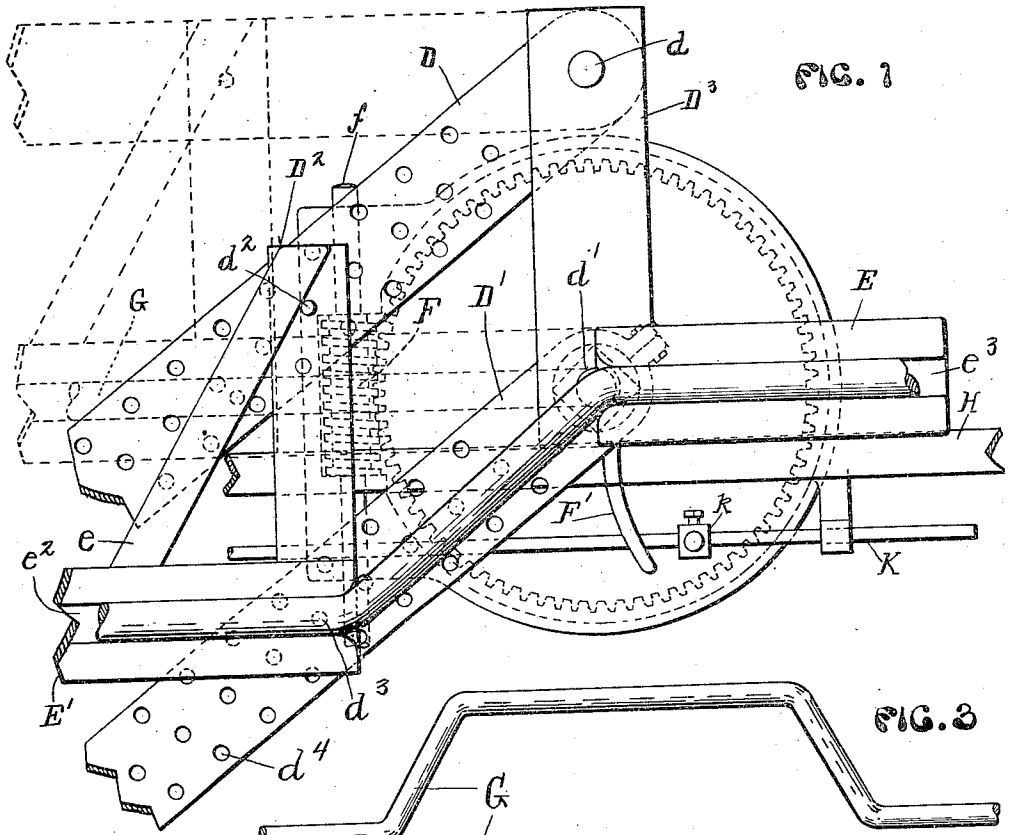


FIG. 1

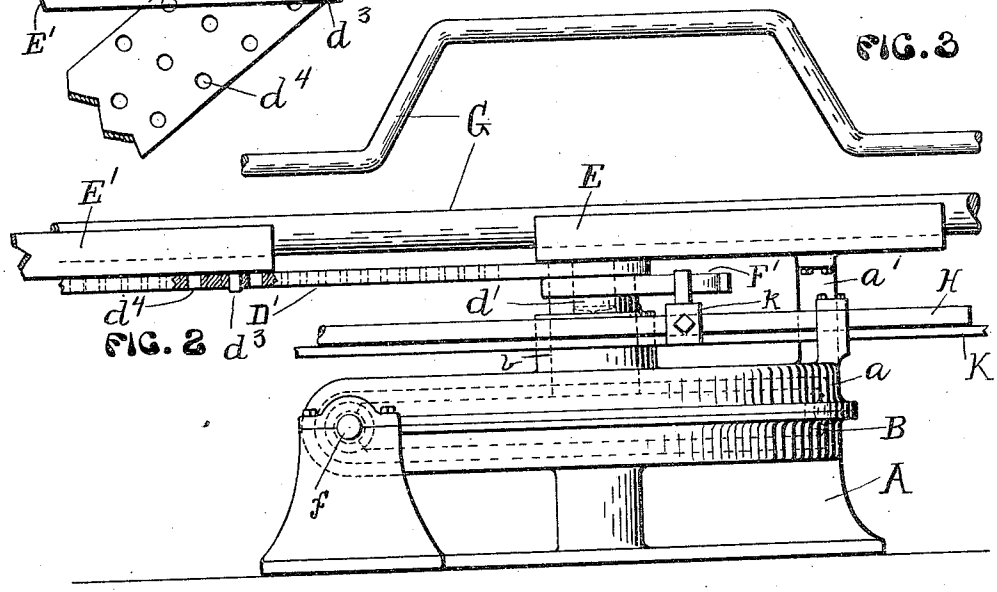


FIG. 3

FIG. 2

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METAL-BENDING MACHINE.

1,124,251. Specification of Letters Patent. Patented Jan. 12, 1915.

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To all whom it may concern:

Be it known that I, ROBERT ANDERSON, a citizen of the United States of America, and resident of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and uesful Improvements in Metal-Bending Machines, of which the following is a specification.

The object of my invention is a machine, which, in a single operation will make two bends at predetermined distances apart in a rod, and will maintain the parts of the rod which come at opposite sides of the bends in parallelism, or other predetermined direction, relatively to each other.

I have shown a preferred embodiment of my invention in the accompanying drawing, in which,

Figure 1 is a plan view of so much of a metal bending machine as is necessary to illustrate my invention, the full lines showing the parts in the position they occupy after a rod has been bent, the bent rod being shown in position in full lines, and the dotted lines showing the position of the parts prior to the bending of the rod, which is shown in dotted lines in the position it occupies prior to the bending. Fig. 2 is a side elevation of the part shown in Fig. 1. Fig. 3 is a detail view of a rod which has been bent at both ends in the machine, the operation of bending this rod requiring two steps.

My machine consists of two parallel bars D, D′, which are mounted at one end upon fixed pivots, *d*, *d′*, and are coupled together in parallelism by a third bar D^2, which is pivoted to them, so as to permit of their rotation about their pivots, while maintaining their parallel relation to each other, and in two jaws E, E′, which receive the bar to be bent, when they are in alinement with each other, and one of which, viz., E, is fixed adjacent to the pivoted ends of the bars, and the other of which is mounted rigidly upon the coupling bar. The parallel bars may be rotated about their pivots, either by hand or by machine.

In the drawings, I have illustrated a mechanism for effecting this rotation and for throwing off the power after the bars have been rotated through a predetermined number of degrees.

Fixed frame A has secured upon it a cylindrical housing, *a*, within which is a rotatable gear wheel B, which is mounted upon the shaft which forms the pivot *d′*.

Gear wheel B intermeshes with the worm wheel F, which is mounted upon the actuating shaft *f*. Gear wheel, B, has an upwardly projecting hub, *b*, to the upper end of which D′ is secured, so that the jaw, D′, is rotated by the gear wheel, B.

Fixed jaw E is secured upon a standard *a′*, which projects upward from the housing and has projecting at right angles from it a fixed bar D^3, at the outer end of which the pivot *d* is secured. The bar D^2 has the jaw E′ secured to it at right angles and braced by brace rod, *e*.

Bar D^2 has projecting from its opposite ends pivot pins d^2, d^3, which are adapted to enter any one of the series of perforations d^4 which occur in the bars D, D′, and to maintain the bars in parallelism.

Jaws E, E′, have longitudinal grooves e^3, e^2 in which the rod to be bent is laid when these grooves are brought into alinement with each other.

Shaft *f* may be rotated by any means desired.

K is a rod for throwing a clutch for throwing off the power, when the stop *k* is contacted by the arm F′, which is secured upon the pivot or shaft *d′*.

H represents an arm for throwing in the power to start the machine. The means of actuating the shaft *f*, the clutch which is moved by the rod *k*, and the means which is actuated by the rod H for throwing in the power, are all illustrated in United States Letters Patent No. 947,288, granted to The Ferro Concrete Construction Company on January 25th, 1910, said parts being designated by the same reference letters herein as in said patent.

In operation:—The jaw E′ being brought into alinement with the jaw E, by rotating the bars D, D′, the rod, G, to be bent is laid in the grooves e^2, e^3, then the bars D, D′, are rotated about the pivots *d*, *d′*.

Since the frame consisting of the bars D, D′, D^2, D^3, form in effect a parallel ruler, the jaw E′ maintains a direction parallel to the jaw E, thus, the parts of the rod held within the jaws are kept parallel to each other, while the part of the rod between the jaws, is bent at an angle thereto, the degree of the angle depending upon the degrees of rotation through which the bars D, D′, are

moved. When the machine is actuated by power, the number of degrees through which the bars D, D′, rotate about their pivots may be fixed by the adjustment of the stop *k* upon the rod K, so that after moving through a fixed number of degrees, the rod F′ throws out the clutch and cuts off the power.

The length of the part of the bent rod adjoining the parallel portions thereof, may be regulated by adjustment of the bar D^2 toward and from the bar D^3. To get a rod of the form shown in Fig. 3, after one end has been bent in the manner just described, and the jaw E′ has been brought back into alinement with the jaw E, the rod is reversed and the opposite end is placed in the jaws, and the parts are rotated, as afore described, to obtain the second or reversed bend in the rod.

In the drawings, the grooves in the jaws have been made to fit the rod snugly, but the grooves may be larger than the rod, provided the two jaws E, E′, be made equal in length.

What I claim is:—

1. In a machine for bending a metal rod, the combination of two bars, pivots at one end of the bars, a jaw fixed adjacent to the pivoted ends of the bars, a third bar pivoted at its ends to the two bars and adapted to permit rotation of the bars around their pivots, adjustable means for pivoting the third bar to the said two bars, and a jaw secured to the third bar, the jaws being adapted to hold the rod to be bent.

2. A bending apparatus comprising two holders for the reception of the article to be bent, and movable means by which one of said holders may be moved in an arcuate path and kept parallel with the other holder during its movement, the said movable means comprising a pair of parallel pivotal rods, members adjustably mounted on the rods, and a carrier for said movable holder pivoted to said adjustable members.

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