No. 758,897. PATENTED MAY 3, 1904.

S. L. BUDD.

BENDING MACHINE.

APPLICATION FILED OCT. 5, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

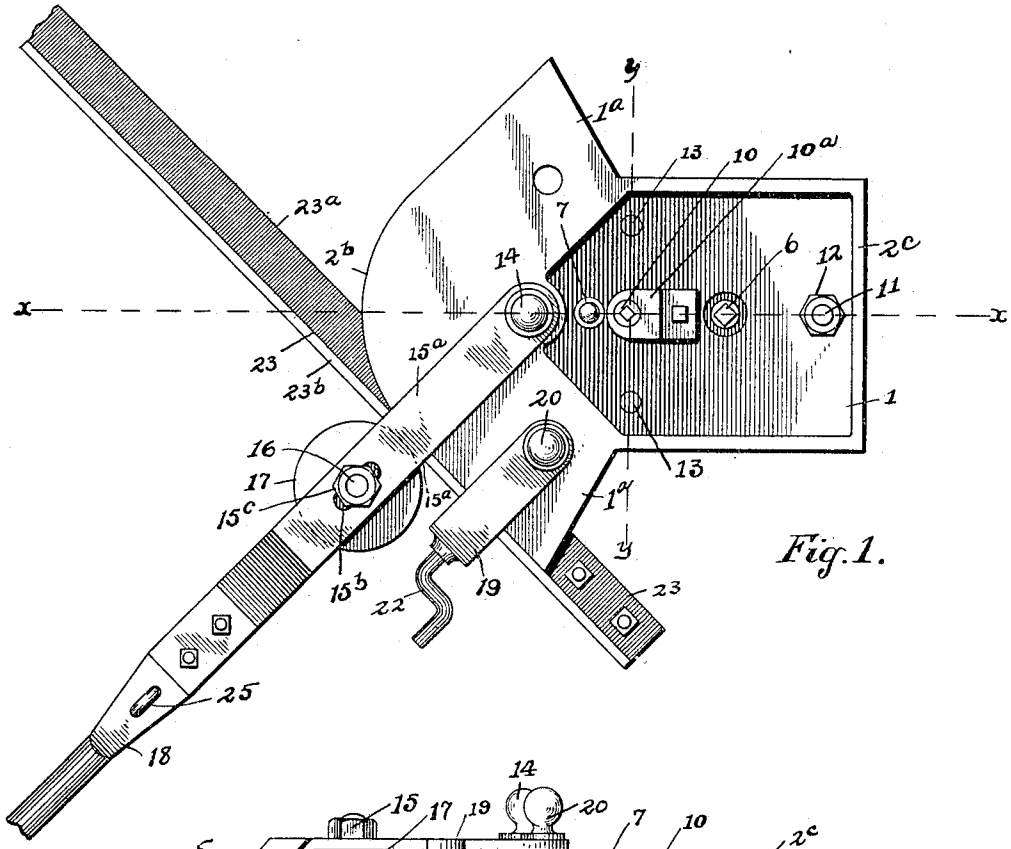

Fig. 1.

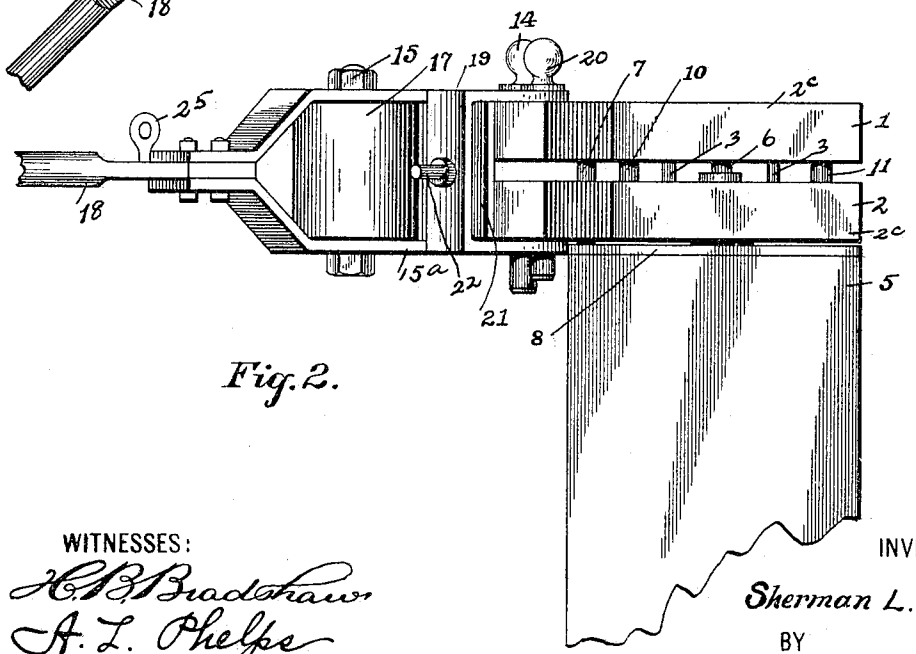

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

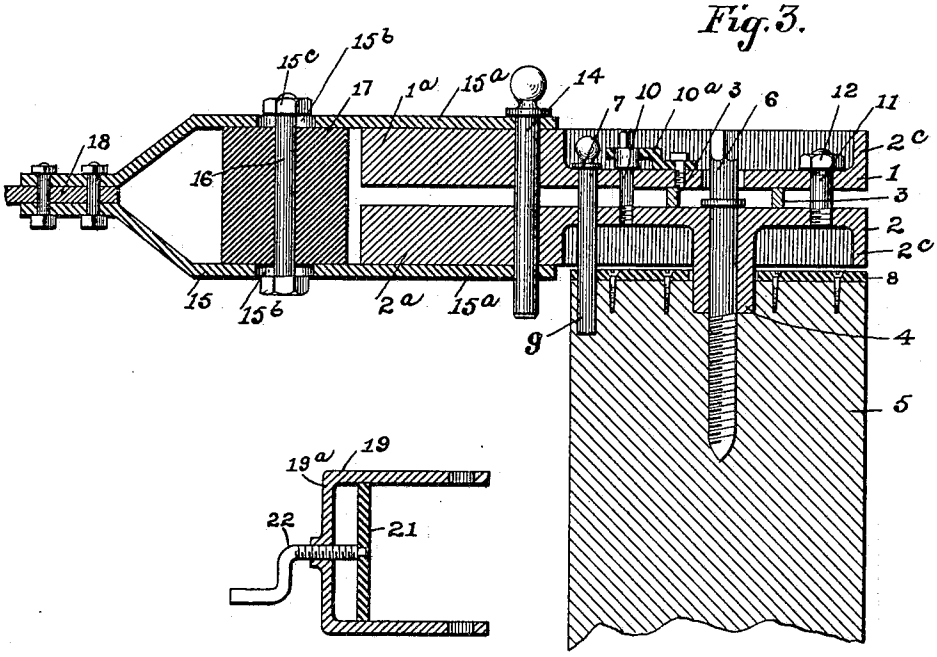

Fig. 4.

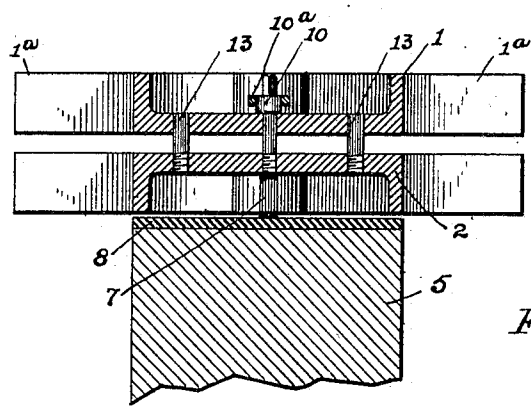

Fig. 5.

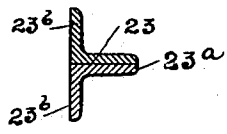

Fig. 6.

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No. 758,897. Patented May 3, 1904.

UNITED STATES PATENT OFFICE.

SHERMAN L. BUDD, OF MOUNT VERNON, OHIO.

BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 758,897, dated May 3, 1904.

Application filed October 5, 1903. Serial No. 175,762. (No model.)

To all whom it may concern:

Be it known that I, SHERMAN L. BUDD, a citizen of the United States, residing at Mount Vernon, in the county of Knox and State of Ohio, have invented a certain new and useful Improvement in Bending-Machines, of which the following is a specification.

My invention relates to bending-machines, and has particular relation to that class of bending-machines which are designed for bending metal bars.

The objects of my invention are to provide an improved bending-machine of this class of improved construction and arrangement of parts by means of which metallic angle and **T** irons or bars, such as are ordinarily employed in bridge and other construction, may be easily and readily bent and to produce certain improvements in details of construction and operation, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my improved bending apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional view on line $x\ x$ of Fig. 1. Fig. 4 is a detail sectional view of a clamp which I employ in the manner hereinafter described. Fig. 5 is a sectional view on line $y\ y$ of Fig. 1, and Fig. 6 is a transverse section of two united angle-iron bars which are adapted to be bent by my improved machine.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ upper and lower horizontal and parallel bed plates or sections 1 and 2. Each of these plates comprises a head portion, the latter being indicated, respectively, at 1^a and 2^a, the outer sides of said head portions extending at right angles with each other, as shown in Fig. 1, said angular portions being connected by a curve, such as is shown at 2^b. From this head portion extends rearwardly a narrower portion 2^c. The blocks or plates 1 and 2 are separated and retained parallel through the medium of separating-bars 3, and the lower block or plate 2 has its portion 2^c recessed on the under side and provided with a central downwardly-extending tubular boss 4, which enters a socket in a suitable upright supporting-block 5. The upper side of the portion 2^c of the plate 1 is also recessed, and through the central opening in the same is made to pass a vertical bolt 6, which extends through the boss 4 of the lower plate 2 and has its threaded lower end portion engaging an opening in the post or block 5. The plates 1 and 2 are locked against independent rotary motion by a vertical locking-pin 7, which, as shown, is dropped through oppositely-located openings in the plates 1 and 2, thence through an opening in a top plate 8 of the supporting-block 5 into a socket 9 of said block. The plates 1 and 2 are further connected in their portions 2^c by bolts 10 and 11, the bolt 10 passing through the bodies of said plates and having its lower threaded end engaging a threaded opening in the lower plate 2. The upper and enlarged end portion of the bolt 10 is provided with an additional bearing by being made to pass through a slightly-elevated portion of an angular bearing-plate 10^a, the remaining end portion of which is bolted to the plate 1. The bolt 11, which also passes through both the plates 1 and 2 and has its threaded lower end portion engaging a threaded opening in said plate 2, is provided at its upper end within the recess of the plate 1 with a nut 12. As indicated in Figs. 1 and 5 of the drawings, I also provide vertical guide-pins 13, the upper unthreaded portions of which pass loosely through openings in the upper plate or section 1 and the lower threaded ends of which engage threaded openings in the lower section 2.

At the rear sides of the head portions 1^a and at the junction of the diverging arms of the latter I provide a vertical removable hinge-pin 14, the latter passing through opposing openings in said rear portions of the heads of the upper and lower horizontal and parallel members 15^a of a yoke 15, outwardly-extending members 15^a, and on the outer sides of the sections 1 and 2 is pivoted, through the medium of a pivot-bolt 16, a roller 17, and on the outer side of this roller the members 15^a of the yoke converge and are connected with and operate a suitable operating lever or han-

dle 18. As indicated more clearly in Figs. 1 and 3 of the drawings, the pivot-bolt 16 of the roller 17 is made adjustable in the direction of the length of the yoke 15 by causing said bolt to pass through slotted openings 15^b, formed in its members 15^a, which permits the nut 15^c of said bolt being tightened to hold the bolt in the desired proper position in said slotted openings.

19 represents a yoke or U shaped clamp, the parallel arms or members of which are designed to be made to embrace, as shown, the head portions 1^a and 2^a of the sections 1 and 2, the point of embrace being, as shown more clearly in Fig. 1, adjacent to one end of said head. The clamp-yoke 19 has its ends pierced and adapted to receive a removable pin 20, which is also adapted to pass through opposing openings in the heads 1^a and 2^a. Between the arms or members 19 of the clamping-yoke I provide a clamping-plate 21, with which is pivotally connected one end of a crank-handle 22, the latter having its inner arm portion threaded and engaging a threaded opening in the outer member 19^a of the yoke.

The manner of utilizing my improved bending device is substantially as follows: The two united angle-iron bars, which I have indicated in the drawings at 23 and which are to be provided with a curved bend, are so supported as to bring the tongues or webs 23^a of the rails or bars into the space between the outer sides of the upper and lower plate-sections 1 and 2 and with the rail-flanges 23^b bearing against the outer straight faces of corresponding portions of the plate-heads 1^a and 2^a. The lever-yoke 15 and the clamping-yoke 19, which have previously been removed, are now pivotally connected with the bending-heads in the manner heretofore described and the crank-handle 22 turned inward until the clamping-plate 21 effects a secure engagement or clamping contact between the rail 23 and the plate-heads. This being accomplished, the lever 18 is swung or forced laterally, with the result that the bar 23 is embedded between the roller and the plate-heads and said bar being bent until its straight portions are at right angles with each other. This being accomplished, the clamp 19 and lever 18 may be removed and the bent bar replaced by a straight bar to be likewise bent. It will be understood that the bolts 10 and 11 will serve to hold the upper plate-section against vertical movement or undesirable separation from the lower plate-section and that by the turning of these bolts the space between the two plate-sections may be regulated to accommodate key-bar tongues or webs of different thicknesses. It will also be understood that the pin 7 will operate to prevent any tendency of the plates toward rotary movement and that the pins 13 will serve as guides for the upper plate-section 1 when the latter is adjusted vertically.

In Figs. 1 and 2 of the drawings I have shown in connection with the lever 18 a projecting I-piece 25, which when the lever is removed may be made to engage a crane-hook or other suitable support.

From the construction which I have herein shown and described it will be understood that a comparatively simple although effective bending-machine is provided, by means of which the operation of bending metallic bars may be carried on rapidly and uniformly.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a bending-machine, the combination with the upper and lower separated plates 1 and 2, and means for varying the distance between said plates, of a bending-lever comprising a yoke detachably connected with said plates, a bending-roller journaled in said lever, a clamping-frame detachably connected with said plates, and an adjustable clamping-plate contained therein, as and for the purpose specified.

2. In a bending-machine, the combination with a body comprising upper and lower separated plate-sections 1 and 2, having angular heads, bolts 10 and 12 adjustably connecting said upper and lower plates, and guide-pins projecting from and connected with the lower plate and passing loosely through said upper plate, of a lever pivotally connected with said plate-heads, a roller adjustably journaled in said lever and a clamp detachably connected with said plate-heads and adapted to hold a metallic bar in engagement therewith, substantially as specified.

SHERMAN L. BUDD.

In presence of—
O. D. MILLER,
L. L. BAUGHMAN.