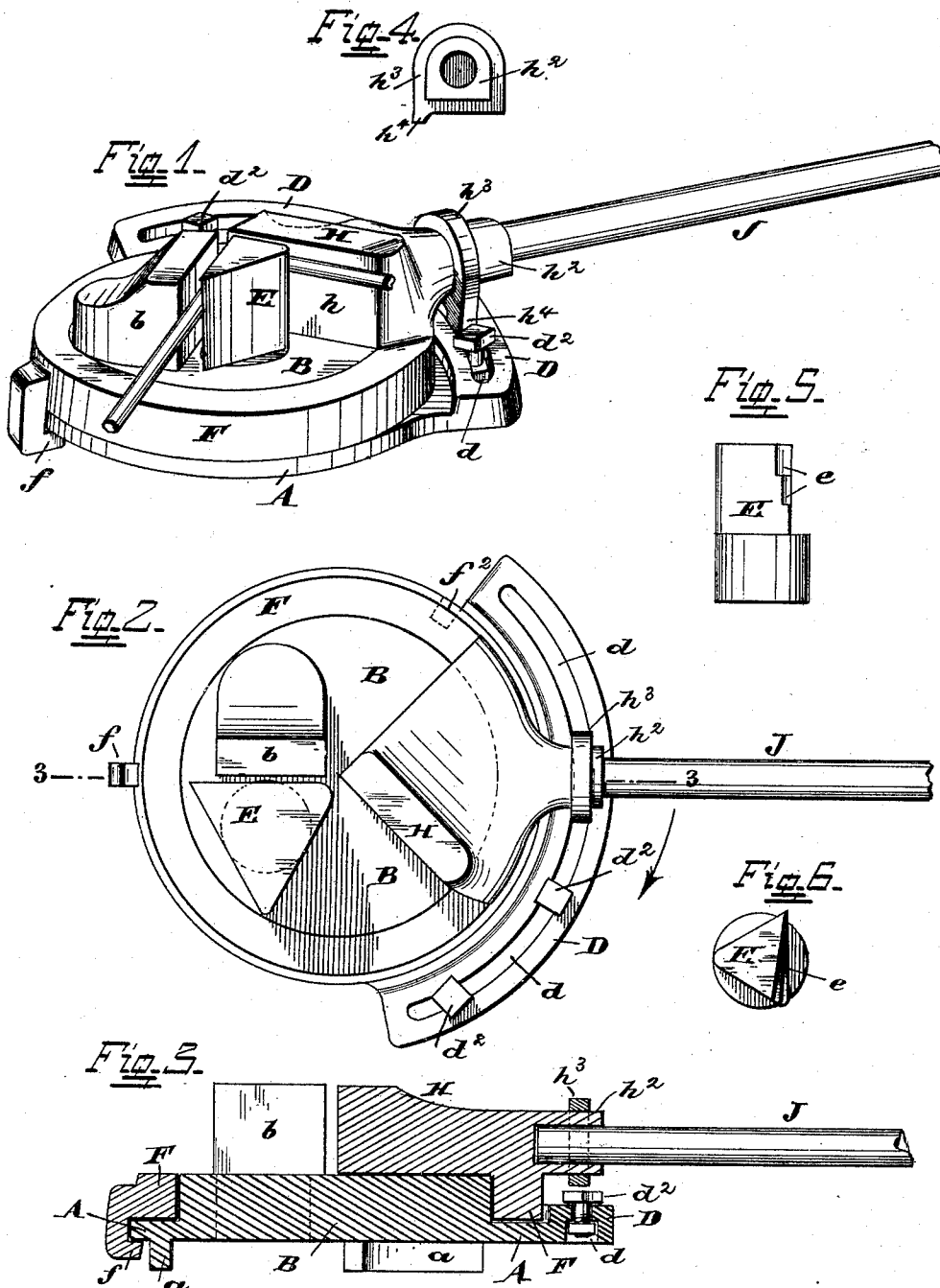


(No Model.)

H. SYMONDS.
METAL BENDING DEVICE.

No. 468,584.

Patented Feb. 9, 1892.



Attest
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METAL-BENDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 468,584, dated February 9, 1892.

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To all whom it may concern:

Be it known that I, HERBERT SYMONDS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in a Device for Bending Metal, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to provide a device for bending metal into varying angles, which device shall be simple of construction, accurate and reliable in operation, and cheap of manufacture.

My improved device is applicable to bend either flat or round bars of metal, as will more fully hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective view of my improved device for bending metal in an operative position, said view showing the relative position of the various parts going to make up my improved device after having bent a round bar of iron at substantially right angles. Fig. 2 is a top view of the device shown in Fig. 1, with one of the detachable mandrels for bending flat iron in position therein. Fig. 3 is a horizontal section through the device shown in Fig. 2, taken on the dotted line 3 3 thereof. Fig. 4 is a section taken through the stop-ring and socket shown in Fig. 1, with the handle removed. Fig. 5 is a view in elevation of the preferred form of detachable mandrel to be used in my improved device for bending varying thicknesses of round iron. Fig. 6 is a top view of the mandrel shown in Fig. 5.

My improved device for bending metal is preferably constructed as follows: The base A is cast or otherwise formed with a central raised portion B, which latter is circular in outline, to which raised portion is cast or otherwise suitably connected the stationary mandrel *b*, as shown. To a portion of the base A on its periphery is cast or otherwise suitably connected the gage-quadrant D, having the slot *d* therein, in which slot are secured suitable stop-bolts *d*², which latter are adjustably connected to said quadrant to accommodate varying bends or angles to be given the metal. Instead of stop-bolts *d*² any other suitable stop mechanism may be employed in connection

with the quadrant and the mechanism hereinafter described for determining the degree of angle to be given the metal.

In the raised portion B of base A is formed an opening, (see dotted lines in Fig. 2,) in which opening the base of the detachable mandrel E is secured. This opening is so formed as that one point on its outline will come at or nearly on a line with the straight edge or face of the stationary mandrel *b*, as more clearly shown in Fig. 2. The detachable mandrel E is preferably secured within or to said raised portion in such a manner as to admit of a rotary movement being imparted to said mandrel, in order that the straight edge or face of the detachable mandrel may accommodate itself to the adjacent straight edge or face of the stationary mandrel *b* after the metal has been placed between said mandrels.

The before-described mechanism constitutes one of the leading features of my invention, the other leading feature to be used in connection therewith consisting of a circular ring F, adapted to encircle the raised portion B, as shown, said ring being detachably connected to the base A, preferably by means of a flanged lug or hook *f*, the latter being rigidly connected to said ring and in such a manner as that the flanged or hooked portion of said lug will engage beneath the outer surface of the base, and by this means said ring is rotatably connected thereto. To this ring F is cast or otherwise suitably connected the lug H, having a straight vertical face *h*, (see Fig. 1,) which lug acts as a mandrel to assist in bending the metal, as will presently appear. This lug H preferably terminates in a socket *h*², in which latter the handle J is secured; but, if desired, said socket and handle may be formed in one integral piece. This socket *h*² (or handle, if formed in one piece) is preferably flat on its under surface on that portion which is over the quadrant D, to which portion of the socket is loosely connected a ring *h*³, of a like configuration, which ring has a downwardly-projecting lug *h*⁴, which latter is rounded on its inner face, but approximately straight on its outer vertical face, as more clearly shown in Fig. 4. This stop-ring is adapted to slide

on said socket or handle, and is retained in a non-rotatable position by means of the flat surface on the under portion thereof.

The detachable mandrels E, when designed or desired to bend the metal at an angle, is preferably of a triangular configuration in cross-section, as shown, the corners of said mandrel being formed rounded or at an acute angle, according as it is desired to form a rounded or an acute sharp bend in the metal. When desired to bend round iron of varying thickness, it is preferred to form in one face of the detachable mandrel the offsets or ledges *e* of varying depths, as shown in Figs. 5 and 6, said ledges increasing in depth from one of the angles on said mandrel, as shown.

The operation of my improved device for bending metal is as follows: The ring F, with its rigid mandrel H, is free to rotate on the base A around the raised portion B thereof, which rotation is accomplished through the medium of the handle J. The operator rotates this ring until the face *h* of its mandrel is on a line with the face of stationary mandrel *b*, at which time he places the strip of metal to be bent between said stationary mandrel *b* and the detachable mandrel E, the metal extending outward along the face of the rotatable mandrel II. The operator now rotates the ring F and its mandrel II, which operation causes the metal to become clamped between the mandrels E and *b*, and the desired bend is thus given to the metal by the continued rotation of said mandrel II. In this manner any desired angle may be bent, said angle being determined by the rotation given to the mandrel H. The desired angle to be given the metal is governed by the set-bolts *d*² in the quadrant and the lug *h*⁴ on ring *h*³, which latter is so located on the handle or socket as that the vertical face of lug *h*⁴ will strike against the head of said bolt in the forward rotary movement of the handle and stop the movement of the rotary mandrel H. The set-bolts may be located at any desired point on the quadrant, according to the required angle. The lug *h*⁴ being rounded on its inner face, will permit of its sliding over the head of the stop-bolt as the handle is rotated backward, where more than one of such stop-bolts are used in the path of said ring and its lug. The base A is preferably provided on its under surface with projecting

ribs *a*, the latter serving as a support to clear the base from the bench when connected thereto, in order to permit of a free rotary movement to the hook *f*, the latter engaging said base through the cut-away portion *f*² shown by dotted lines in Fig. 2.

If desired, the device may be clamped in a vise, the jaws of the latter engaging with one of the ribs *a*.

The advantages of my improved device for bending metal are apparent, it being simple of construction, durable and reliable in operation, and cheap of manufacture. The detachable mandrels are a valuable feature of my invention, as well as the facility afforded for bending round iron of varying thicknesses.

The device is readily taken apart and can be crated in a compact form for shipment, and is readily and quickly put together ready for use.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a device for bending metal, the base A, having a circular raised portion B, with a stationary mandrel *b*, connected thereto, the mandrel E, detachably connected to said raised portion adjacent to said stationary mandrel, a ring F, rotatably connected to said base, said ring carrying a mandrel H, and suitable means for rotating said ring, for the purposes set forth.

2. In a device for bending metal, the base A, having the circular raised portion B and quadrant D, the latter having the opening *d* therein, mandrel *b*, connected to said raised portion of the base, the mandrel E, detachably connected to said raised portion adjacent to the stationary mandrel *b*, the ring F, rotatably connected to said base and carrying a mandrel H, a socket *h*², having a loose ring *h*³, the latter having a lug *h*⁴, and adjustable set-bolts connected to said quadrant, for the purposes specified.

3. In a device for bending metal, having a stationary mandrel and a rotatable mandrel, substantially as set forth, the detachable mandrel having ledges *e* formed in one of its vertical faces, for the purposes set forth.

HERBERT SYMONDS.

Witnesses:

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