

H. C. SPRENGLE.
METAL BENDING ATTACHMENT FOR PRESSES.
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1,002,329.

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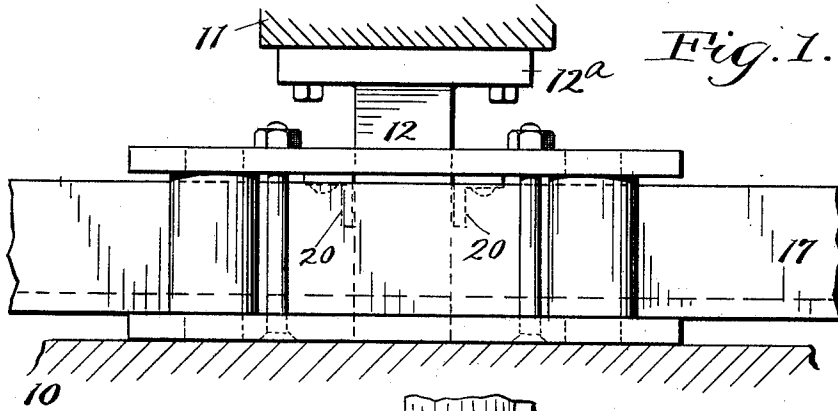


Fig. 1.

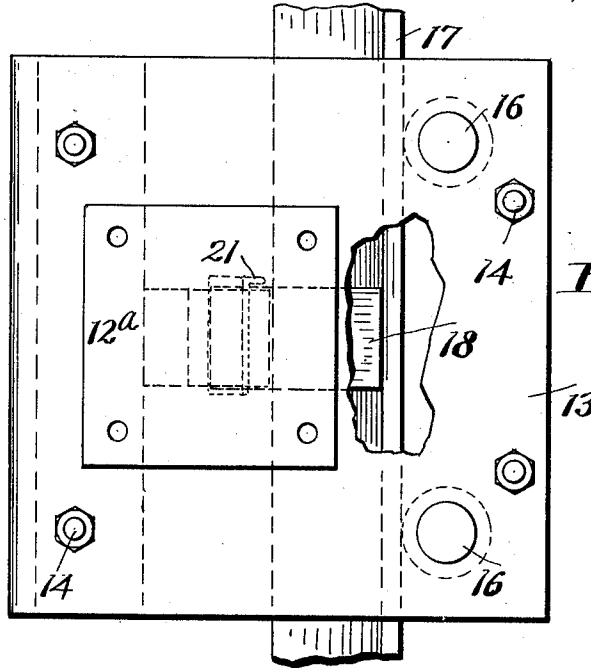


Fig. 2.

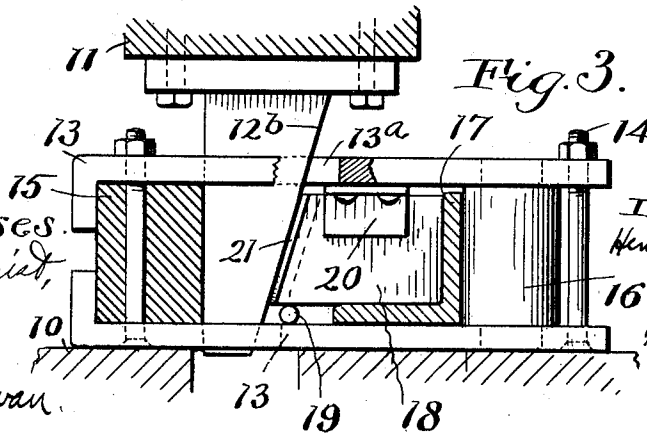


Fig. 3.

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UNITED STATES PATENT OFFICE.

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METAL-BENDING ATTACHMENT FOR PRESSES.

1,002,329.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY C. SPRENGLE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Metal-Bending Attachments for Presses, of which the following is a full, clear, and exact description.

10 This invention relates to metal bending machines or devices, and particularly to devices for bending or straightening structural members, such as angles, channels, T or I rails, and other flanged members.

15 The object of the present invention is to provide a simple and inexpensive attachment which can be applied to any punch press or other machine having a suitable reciprocating plunger and when employed in connection with the latter, will bend metal members, such as the structural members above mentioned very effectively, quickly and to any desired shape or configuration.

My improved attachment or device for bending members which for convenience of description will be termed "the stock," includes two principal parts—a wedge or wedge-shaped device designed to be attached to the lower end of the plunger of a press and a frame which is adapted to rest on the bed of the press and receives the stock and contains certain devices which coöperate with the wedge when the latter is reciprocated, to bend the stock transversely of or at right angles to the direction of movement of the wedge and plunger. The frame preferably includes a pair of flat plates which are held a suitable distance apart to accommodate the stock, and receive between them a thrust or filler block against which the straight face of the wedge may bear, and a pair of spaced abutments, preferably in the form of rollers against which the stock may bear, and between which it is bent. A bending block which is adapted to be placed between the plates against the stock midway between the rollers, is adapted to be engaged by the inclined face of the wedge in its downward movements, and to be forced laterally or horizontally by the side thrust of the wedge which enters the top of the frame between the bending block and filler block, so as to bend the stock outwardly.

55 The invention may be further briefly summarized as consisting in certain novel combinations and arrangements of parts which

will be described in the specification and set forth in the appended claims.

Reference is had to the accompanying sheet of drawings wherein—

Figure 1 is an end view of the attachment shown applied to a punch press, the bed and plunger of which are shown in section, and showing a portion of an angle which is in position to be bent; Fig. 2 is a top plan view of the attachment with the wedge removed from the plunger of the press and certain portions broken away for the sake of clearness; Fig. 3 is a side view of the same showing the bed and plunger of the press, the angle, and the filler block of the attachment in section.

At 10 and 11 respectively are shown somewhat conventionally a horizontal bed or frame and a vertically reciprocating plunger of a punch press or other machine to which the attachment is adapted to be applied.

The attachment includes a wedge or wedge shaped member 12 having in this instance an upper head or flange 12^a by which the wedge is secured to the plunger, and a wedge shaped portion 12^b which extends downwardly from the head 12^a when the wedge is secured in operative position. The wedge shaped portion 12^b has a flat vertical rear face and a tapered or inclined front face, as shown most clearly in Fig. 3. The attachment also includes a frame which is adapted to rest on and to be bolted to the bed 10 and which in the preferred embodiment includes two flat rectangular plates 13 which are united by bolts 14 extending transversely through the plates. Extending between the plates, preferably along the rear of the frame is a stationary filler or thrust block 15 which is held in position in this case by two of the bolts 14, and arranged between the plates 13 near the forward corners thereof are two spaced rollers 16 with their axes vertical and with end portions engaging in suitable bearing openings in the plates 13. These rollers 16 constitute abutments against which the stock, in this case the angle section 17, is adapted to bear, and between which the stock is adapted to be bent. When the angle is to be bent with the horizontal flange on the inner or concave side, the vertical flange of the angle will rest directly against the rollers 16, as shown in the drawings.

The plates 13 are provided with openings 13^a which are arranged centrally with respect to the rollers 16, for the passage of

the wedge. The side thrust of the wedge is transmitted to the stock by means of a bending block 18 which is arranged between the plates 13 in line with the wedge and bears against the stock midway between the rollers, this block having in this case a vertical forward face which engages the vertical flange of the stock and a rear face which is adapted to be engaged by the wedge and is tapered or inclined in conformity thereto. When the angle is arranged as shown and is to be bent with the horizontal flange extending inwardly, the bending block rests on the inwardly extending horizontal flange and its rear portion may rest on a small roller 19 supported on the lower plate 13. To hold the bending block in proper position with reference to the wedge and to the stock, a pair of holding members in this case short angles 20 are secured to the lower face of the upper plate 13, these angles having downwardly extending flanges between which the bending block is held against sidewise movement.

When the parts are arranged as shown and the plunger is reciprocated, the side thrust of the plunger forces the bending block in a direction away from the stationary thrust block, gradually bending the stock outwardly, until it assumes the desired shape without injuring the stock. If the stock is to be bent or curved a greater amount than the inclination of the wedge permits when the latter is forced the full distance between the thrust block and bending block, shims 21 of different thicknesses may be inserted between the thrust block and adjacent face of the wedge. In this manner, the bend or curvature that is given to the stock may be made as great as desired, within the limits imposed by the size and dimensions of the attachment. Each of the shims is preferably provided at one end with a flange or shoulder which extends at right angles to the main portion and which bears against the side of the bending block, as shown by dotted lines in Figs. 2 and 3. This flange tends to hold the shim in position against the end of the bending block.

The mechanism above described has a wide range of use as far as the particular shape of the stock or member to be bent and the direction or manner in which it is bent, are concerned. For members of different shapes, I employ bending blocks of different lengths, the length of the bending block required depending on the distance of the vertical face, web or flange of the stock from the wedge or thrust block. I also employ wedges with faces inclined different amounts for use when the stock is to be bent different amounts. If the angle 17 is to be bent with the horizontal flange outward or on the convex side, the position of the angle will be

reversed so that the vertical flange is toward or adjacent the wedge and the horizontal flange extends outwardly toward the rollers. In this case, a shorter bending block than the one here shown will be employed between the wedge and the vertical flange and instead of having the horizontal flange bear against the rollers, abutment blocks may be employed between the rollers and the outer face of the vertical flange. When an angle or other member of considerable length is to be bent into a curve, it will be fed endwise through the frame so that it will be acted on by the bending block at different points in its length. If it is to be bent a greater amount than is possible by passing it through the frame once, it may be passed through a second time after a shim of suitable thickness has been placed between the wedge and bending block.

It will be understood, of course, that the bending device may be employed for straightening crooked or curved members.

Having thus described my invention, what I claim is:

1. In combination with a press having a stationary bed and a reciprocating plunger, a metal bending attachment comprising a wedge adapted to be secured to the plunger, and a frame adapted to be secured to the bed, said frame comprising upper and lower members between which the stock is adapted to be inserted, said members supporting between them a thrust block for one side of the wedge, a pair of spaced abutments for the stock, and a bending block adapted to engage the stock between the abutments and to be shifted by the wedge laterally or at right angles to the movement of the plunger so as to bend the stock.

2. In combination, a horizontal bed, a vertically reciprocating plunger, a wedge shaped member attached thereto, a frame on the bed and comprising upper and lower plates spaced apart so as to accommodate the stock to be bent, said frame having an opening for the wedge and provided between the plates with a thrust block for one side of the wedge, a pair of spaced abutments for the stock when inserted horizontally between the plates, and a bending block adapted to engage the stock between the abutments and to be engaged by the tapered face of the wedge so as to be shifted horizontally and thereby bend the stock outwardly between the abutments.

3. In combination with a press having a horizontal bed and a vertically reciprocating plunger, a metal bending attachment therefor comprising a wedge adapted to be secured to the plunger, a frame adapted to be placed on the bed below the plunger, and comprising a pair of plates having openings for the wedge, and spaced apart so as to accommodate stock to be bent, said plates

having between them a thrust block for one
side of the wedge, a pair of spaced rollers
constituting abutments for the stock when
inserted horizontally between the plates, and
5 a bending block adapted to engage the stock
between the rollers and to be engaged by
a tapered face of the wedge so as to be
shifted horizontally by the wedge and to

bend the stock outwardly between the
rollers.

In testimony whereof, I hereunto affix my
signature in the presence of two witnesses.

HENRY C. SPRENGLE.

Witnesses:

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