

Aug. 24, 1954

G. M. SMITH  
METAL BENDING TOOL

2,687,162

Filed June 29, 1950

3 Sheets-Sheet 1

FIG. 1.

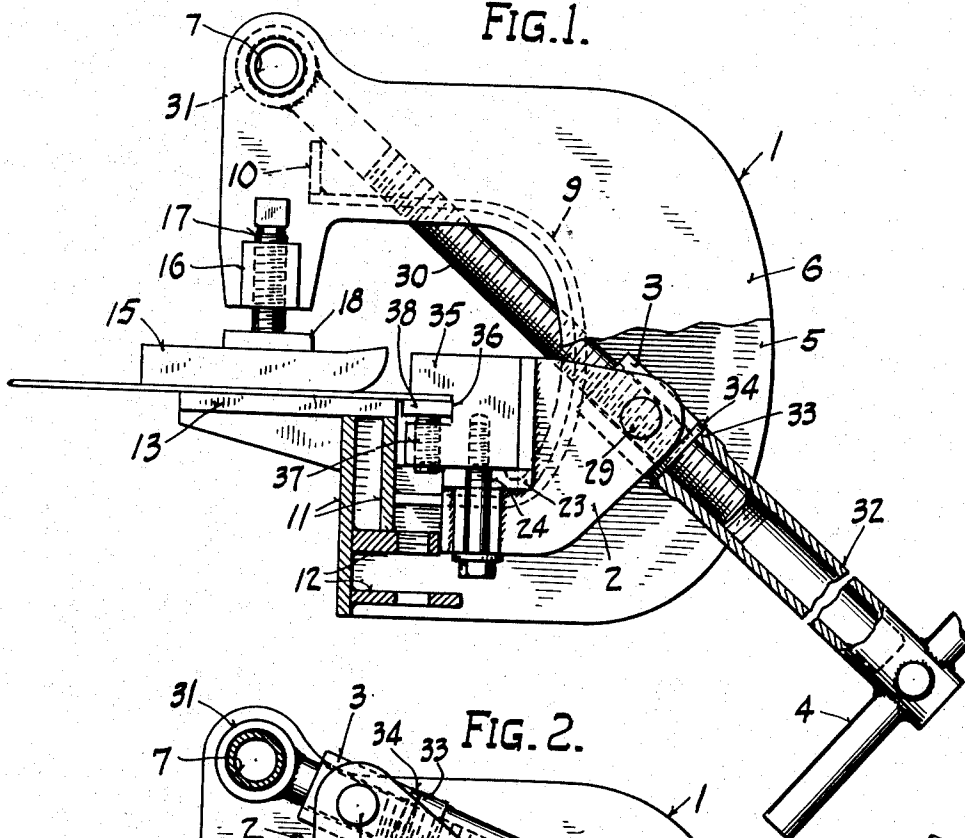
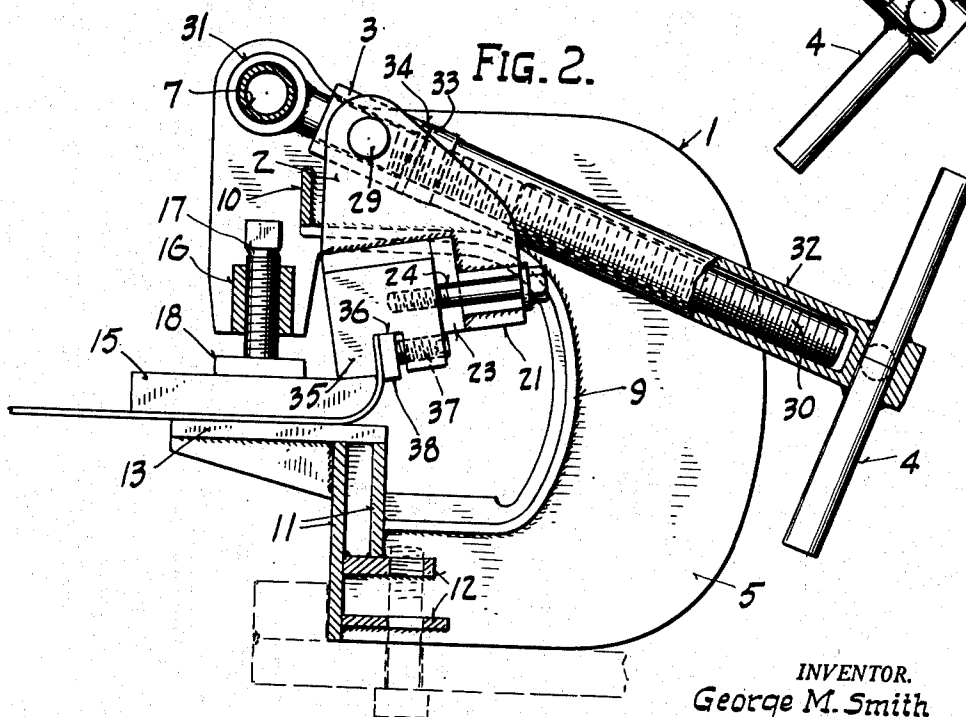


FIG. 2.



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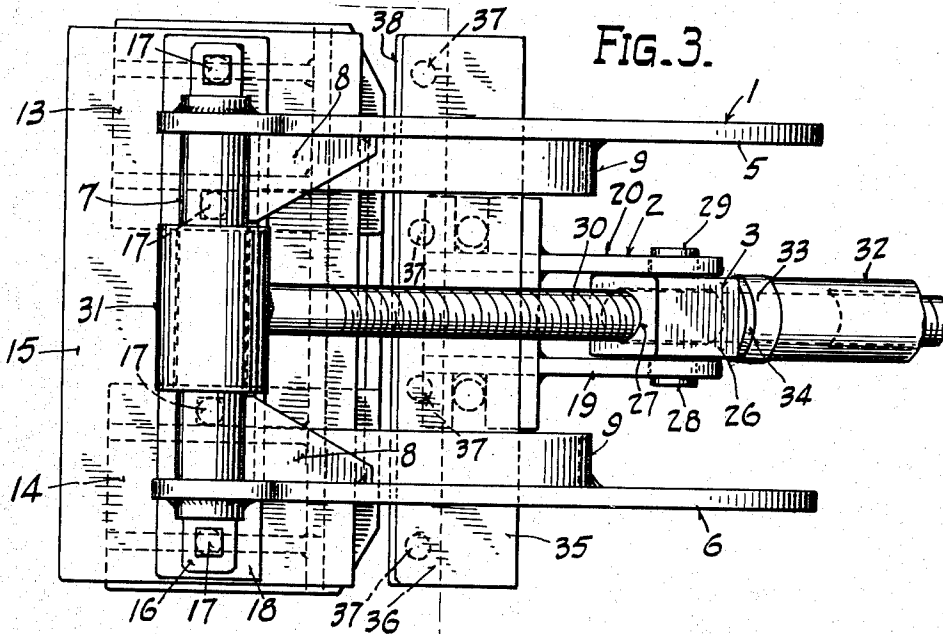
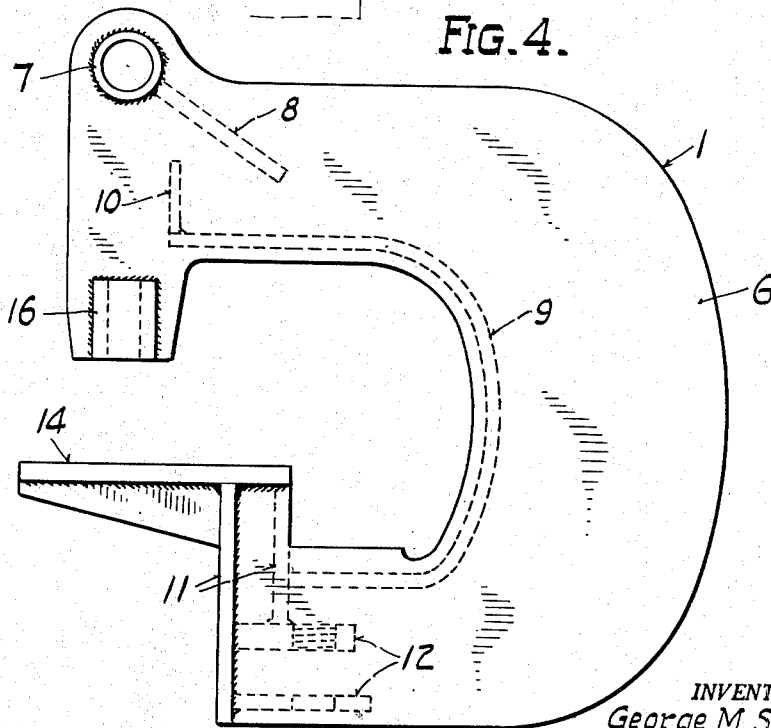
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FIG. 5.

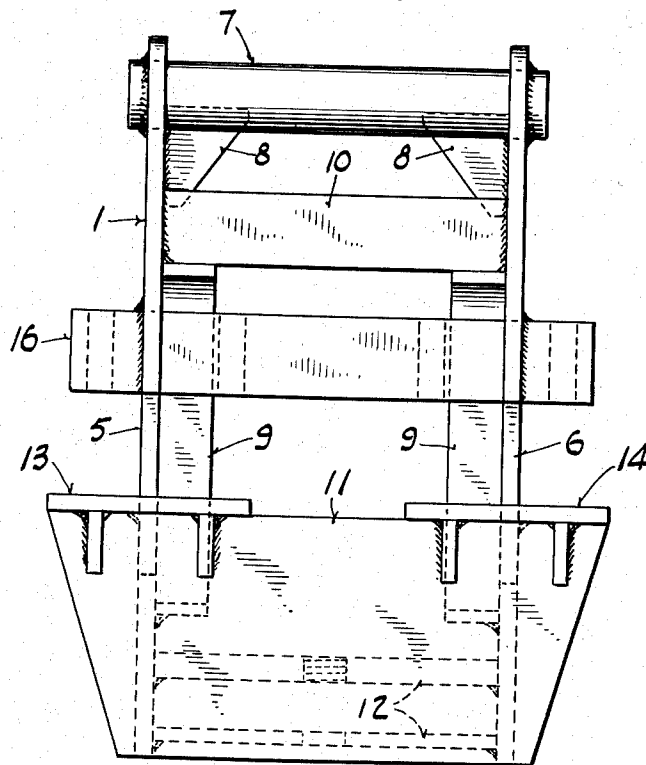


FIG. 6.

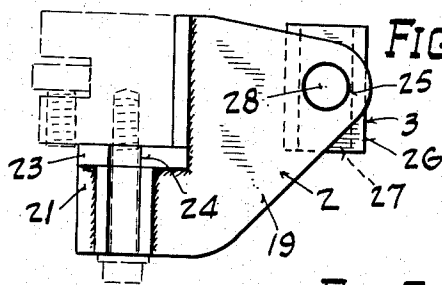
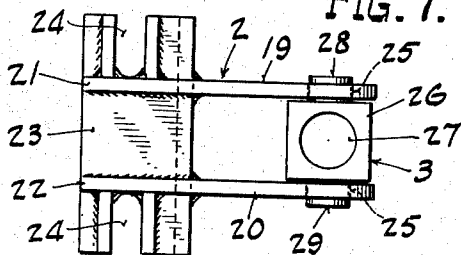


FIG. 7.



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## UNITED STATES PATENT OFFICE

2,687,162

## METAL BENDING TOOL

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Application June 29, 1950, Serial No. 171,017

1 Claim. (Cl. 153-16)

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This invention relates to a metal bending tool, and particularly to a tool for edging or flanging sheet metal.

The principal object of the invention is to provide a metal bending tool that has relatively few component parts and which therefore will not be subject to breakdowns sometimes found with metal bending tools of a more complicated nature.

Another object is to provide a metal bending tool of a construction such that it may be operated with great rapidity.

A further object is to provide a metal bending tool that is of simple and rugged construction, that is relatively easy to build, and which does not require the employment of a plurality of cams to operate the tool.

The accompanying drawings illustrate a preferred embodiment of the invention.

In the drawings;

Figure 1 is a side elevation of the tool of the invention applied to an edge of sheet metal stock prior to bending the same with parts being broken away and sectioned;

Fig. 2 is a view similar to Fig. 1 but showing the relative positions of various component parts of the device of the invention after an edge of the sheet metal stock has been flanged or bent.

Fig. 3 is a plan view of the metal bending tool with the parts shown in the position of Fig. 1;

Fig. 4 is a side elevational view of the frame;

Fig. 5 is an end elevation looking from the left at Fig. 4;

Fig. 6 is a side elevational view of the pull bracket; and

Fig. 7 is a bottom plan view of the pull bracket.

The structure of the invention comprises a generally C-shaped frame 1, a pull bracket 2 which is trunnioned to a slider 3 that moves in response to the turning of a hand wheel 4. The pull bracket is removably secured to the edge of a sheet of metal stock which edge is to be turned or flanged. The metal immediately adjacent the edge of the flat sheet is secured between a suitably shaped die and a support which forms part of the C-shaped frame. The pull bracket being pivoted, is capable of turning about its pivot and as this movement occurs the edge of the metal sheet is bent or turned to the desired shape.

The frame 1 comprises a pair of substantially C-shaped side walls 5 and 6 which are spaced apart and secured preferably by welding, near their upper extremities to a tube 7. The tube serves a dual function in that it not only acts as a spacing means for the side walls but also

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as a journal for the head of an elongated screw as will be more fully explained later. A plurality of gussets 8 extend between the tube 7 and the inner surfaces of side walls 5 and 6 and serve to form a rigid and unitary structure at the upper end of the frame. The frame is further strengthened by reinforcing members 9 disposed adjacent the inner edge of the C-shaped side walls 5 and 6. A cross-brace 10 extends between the side walls and is secured thereto to provide additional strength and rigidity.

The lower ends of the side walls are spaced apart and have secured thereto, preferably by welding, a pair of vertical cross-braces 11 and a pair of horizontal cross-braces 12. The upper of the latter pair is threaded for the reception of a suitable bolt to anchor the metal bending tool to a support or the like.

Work tables or supports 13 and 14 are horizontally disposed at either side of the device and are secured to the skeleton-like framework by a plurality of strengthening ribs or gussets and are strengthened by angularly shaped ribs disposed underneath the same. The supports extend outwardly for a relatively short distance beyond the base of the device and serve to hold the sheet metal stock upon which an edge or flange is to be turned. A suitable die 15 is generally disposed on the metal stock to give the desired curvature between the main body of the sheet metal and the flange as the latter is bent or formed along the edge of the sheet.

Suitable means are disposed above the members 13 and 14 to aid in removably securing the metal stock while it is being operated upon. In the embodiment of the invention herein disclosed, this means is a horizontally disposed bar 16 having a plurality of vertical threaded apertures extending therethrough. The bar 16 extends through depending portions of the frame of the device as best seen in Figs. 4 and 5, and is secured to the latter preferably by welding. The above referred to vertically disposed apertures are so spaced in relation to the framework of the device that easy access may be had to the heads of threaded bolts 17 which extend downwardly through the apertures and bear on blocks 18 disposed between the lower end of the bolts and the die 15.

The pull bracket 2 comprises a pair of spaced side walls 19 and 20 which are substantially triangularly shaped. As best seen in Fig. 6, the lowermost portions of the side walls project horizontally to form supports 21 and 22 to which is secured, preferably by welding, a horizontally dis-

posed plate 23. This plate 23 is provided with slots 24 which extend substantially from the outer surfaces of the supports 21 and 22 to the opposite outer edges of the plate 23.

At the end of the pull bracket 2 and opposite the slotted plate 23, the side walls of the bracket are provided with aligned apertures 25 extending therethrough to receive the oppositely disposed trunnions of the slider 3 to be presently described.

The slider 3 comprises a body member 26 which is provided with an aperture 27 extending therethrough from end to end. Trunnions 28 and 29 extend outwardly from the outer surfaces of body 26. The trunnions are disposed within the aperture 25 in the side walls of the pull bracket prior to assembly of the latter. After the slider has been assembled between the side walls of the pull bracket the unit may be formed into a unitary structure by welding the slotted plate 23 to the supports 21 and 22. The welding of these members is carried out so that all welds are disposed under the lower surface of the slotted plate in order that the welds will not occasion any interference with other structure to be later described.

The structure provided for causing pivotal movement of the pull bracket 2 around the trunnions and which in turn provides for turning of the edge of the sheet metal stock comprises an elongated threaded screw shaft 30 having a transversely apertured head 31 disposed at the upper end thereof and freely journaled on the tube 7. The screw shaft 30 is of somewhat lesser diameter than the aperture 27 of the slider so that the shaft may be disposed therein to slide freely.

An elongated interiorly threaded hollow tube 32 having the hand wheel 4 fixed at the outer end thereof functions in conjunction with the screw shaft 30 to move the slider along the latter as the threaded tube 32 is screwed along the shaft by virtue of rotation of the hand wheel. To effect this feed the opposite or open end of the tube 32 is provided with a shoulder 33 which abuts a washer 34 engaging the lower end of the slider.

A notched clamping fixture 35 of suitable configuration is removably secured to the supports 21 and 22 of the pull bracket by inserting elongated bolts in either side of slotted plate 23 to removably secure the clamping fixture to the latter. One edge of the clamping fixture is notched or provided with a cut out portion 36 for receiving the edge of the metal stock which is to be turned or flanged. Immediately below the notch 36 the lower portion of the fixture is provided with threaded apertures for receiving bolts 37 or the like, the inner ends of which bear against a block

38 to removably yet securely anchor the edge of the sheet which is to be turned.

After the work is securely clamped in the fixture, the tube 32 is rotated by the hand wheel 4 and its threads co-operating with the threads of the shaft 30 cause the slider 3 to move along the screw shaft. The slider being trunnioned to the side walls of the pull bracket 2, pivotal movement of the latter about the trunnions 28 and 29 takes place and one edge of the metal stock which is clamped in the fixture 35, is turned or flanged in response to the upward movement and inward rotation of the pull bracket, as shown in Fig. 2.

The above description of a preferred embodiment of the invention provides a metal bending tool comprised of a relatively few component parts, a structure which is of a sturdy construction and a metal bending tool that is capable of being operated with great rapidity.

Various embodiments of the invention may be employed within the scope of the accompanying claim.

#### I claim:

A tool for bending the edge of sheet metal which comprises a frame having a pair of spaced substantially C-shaped members joined at the upper portions thereof by a horizontally extending brace, an elongated exteriorly threaded shaft pivoted at one end to said brace and threaded at the other end into a tube adapted to be rotated thereon, clamping means carried by said C-shaped members to clamp the body portion of the sheet metal with the free edge to be bent extending within the entrance of the C-shaped member, a second clamping means disposed inside the C-shaped members and free to rotate therein, said second clamping means having a pair of jaws adapted to receive and hold the edge of the sheet to be bent, a hollow slider pivoted to the second clamping means and freely encircling said shaft ahead of the tube, and means to rotate the tube and thread the shaft into the same to push the slider forward and pivot the second clamping means around the first clamping means for shaping the edge of the sheet.

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