

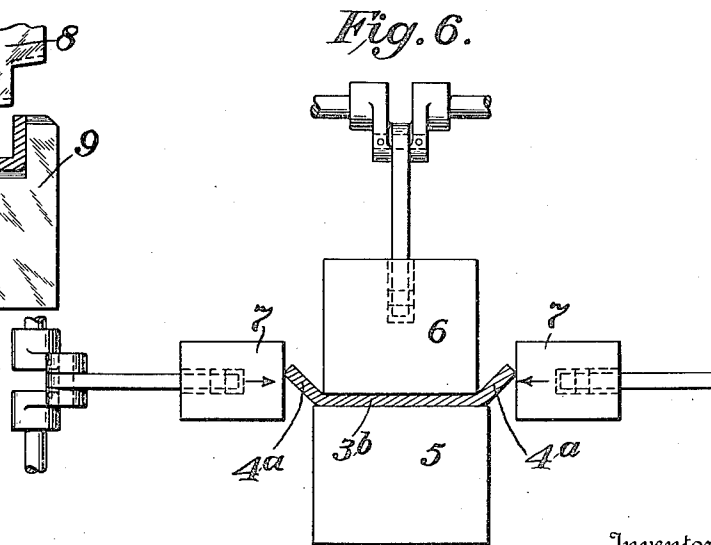
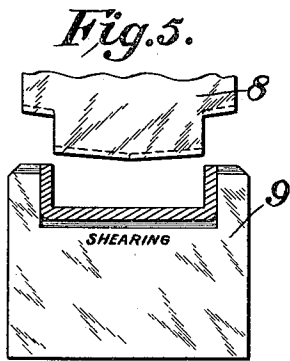
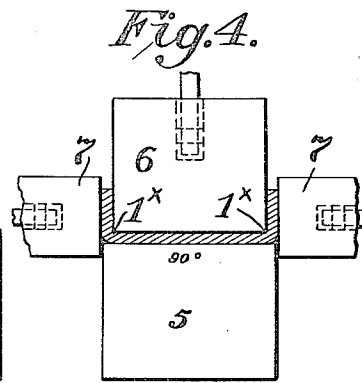
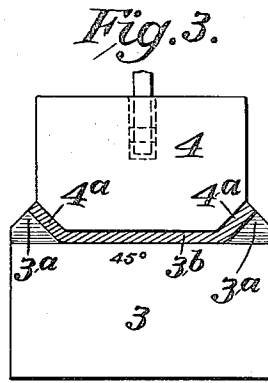
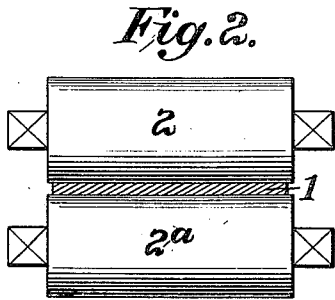
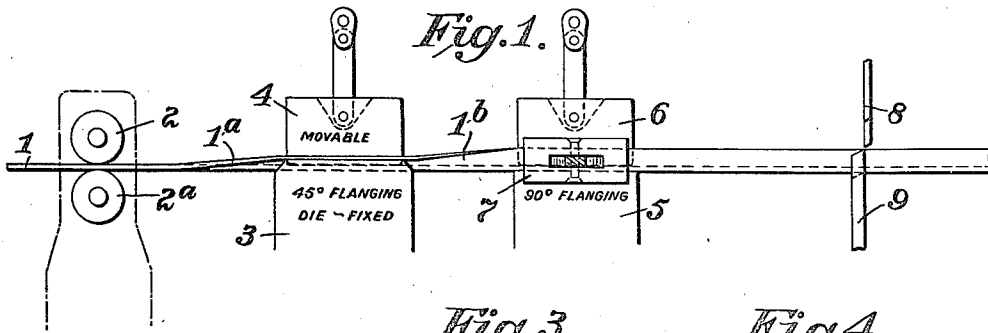
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1,503,884

L. E. CURTIS

METHOD OF PRODUCING CHANNEL IRONS

Filed May 25 1921



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UNITED STATES PATENT OFFICE.

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METHOD OF PRODUCING CHANNEL IRONS.

Application filed May 25, 1921. Serial No. 472,568.

To all whom may concern:

Be it known that I, LEWIS E. CURTIS, a citizen of the United States, and resident of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Methods of Producing Channel Irons, of which the following is a specification.

My present invention relates to an improved method of producing cold formed channel irons from flat sheets or plates. Heretofore, so far as I am aware, channel irons have been usually produced by rolling methods, but it has been practically impossible to produce in this manner channel irons having right angular corners, although this is desirable. In other words, in the rolling methods, the resulting corners are necessarily more or less rounded to an objectionable degree, due to the rapid wearing away of the rolls.

The present invention aims to provide a method by which plates or sheets of any desired length may be economically and efficiently converted into channel irons having right angular corners, and the invention includes the novel method or process hereinafter described and particularly defined by the appended claims.

In order that my method may be better understood, I have appended hereto a sheet of drawings showing diagrammatically apparatus which may be conveniently used to perform the method.

In these drawings:—

Figure 1 is a side elevation partly in section showing feed rolls, two sets of shaping dies, and cutter mechanism.

Fig. 2 is a front elevation of the feed rolls showing the sheet in section.

Fig. 3 is an elevation of the first set of dies and Fig. 4 is a similar view of the second set of dies.

Fig. 5 is a detail view in elevation of the cutter; and

Fig. 6 is a detail view in elevation showing the second set of dies in the position assumed at the commencement of the bending operation performed by the side presser members.

Referring by reference characters to these drawings, the numeral 1 designates a flat sheet or plate from which the channel iron is to be formed, and which sheet may be of any desired width according to the size of

channel iron to be produced, and of indefinite length. 2 and 2^a designate feed rolls which may be of any desired form, and provided with means not shown by which they may be intermittently driven. 3 designates a lower fixed die member and 4 an upper vertically movable die member situated at any desired distance in rear of the feed rolls to receive the sheet therefrom. The die member 3 has side portions 3^a which are inclined to the plane of the sheet at an angle preferably of 45°, the portion 3^b of the lower die 3 between these inclines being located in substantial alignment with the bight of the feed rolls. The upper or movable die 4 has side portions 4^a which are inclined to correspond to the inclination of the portions 3^a. The movable die may be operated by any suitable means, it being understood that its movements are timed so that it contacts with and operates upon the sheet during the period when the feed rolls are stationary, the feed rolls operating to feed the sheet during the period when the movable die is moving away from the sheet, and again moving towards it to re-engage it. During the time when the feed rolls are stationary, the movable die on its downward stroke engages the sheet and forces it down into the channel between the side wings 3^a of the stationary die, causing the portion which coincides with the die members to assume the shape shown in cross section in Fig. 3. This pressing operation causes the margins of the sheet lying between the feed rolls and the dies 3 and 4 to be deflected upwardly along the diagonal line, as indicated at 1^a.

Located in rear of the dies 3 and 4 is a second set of dies 5 and 6, the lower die 5 being a stationary die, having the width of the portion of the sheet lying between the bases of the inclined margins, and which portion corresponds to the bottom of the completed channel iron.

The upper die is arranged to move vertically, and operated by any suitable mechanism in a manner similar to the die 4, and it has a plain lower face and vertical side walls, the distance between which corresponds to the distance between the inner walls of the side wings or flanges of the completed channel iron. In other words, the upper die 6 is narrower than the lower die 5, by an amount equal to twice the thick-

ness of the metal sheet. The second set of dies are preferably of substantially the same length as the first set of dies, and the distance between the first and second sets is preferably equal to the length of the dies. A portion of the sheet having been acted upon by the first set of dies to bring the margins into the inclined position shown in Fig. 3, the intermittent movement carries the sheet forward, so that this portion bridges the space between the two sets of dies, as indicated at 1^b, during which time die 6 is raised, and a portion of the sheet having a cross section such as indicated in Fig. 3 will lie between the dies 5 and 6.

As the feed of the sheet is stopped, die member 6 clamps the sheet against the stationary die member 5, and the inclined side wings are then folded up against the sides of the die member 6 by horizontally moving die members or pressers 7. Fig. 6 shows the sheet clamped between the die members 5 and 6, and the die or presser members 7 in the position assumed at the commencement of the folding operation.

Fig. 4 shows the position and shape of the sheet at the completion of the inward movement of the members 7, where it will be seen that the margins have been folded against the sides of the die 6, causing the sheet to assume a true channel iron form, with the corners of sharp right angular formation, as indicated at 1^c. During the time that the said members 7 are folding the margins into vertical position, the marginal portions lying between the first and second set of dies will be bent or twisted from the angular position of Fig. 1 to the vertical position of Fig. 4, as indicated at 1^b in Fig. 1.

Any suitable cutting shears may be provided, as indicated at 8 and 9, Figs. 1 and 5, which may be operated in any suitable manner, and by which the completed channel iron may be severed into sections of the desired length.

Having thus described my invention, what I claim is:—

1. The herein described method of producing channel iron from a strip which consists in intermittently feeding the strip, successively subjecting definite opposed marginal portions of such strip to the action of dies operating perpendicular to the plane of the strip to simultaneously bend the said opposed marginal portions into inclined position, and subsequently and successively subjecting said marginal portions to the action of dies acting transversely in the plane of the strip to bend said marginal portions into planes perpendicular to the plane of the strip.

2. The herein described method of producing channel iron from a strip which consists in intermittently feeding the strip, successively subjecting definite opposed marginal portions of such strip to the action of dies operating perpendicular to the plane of the strip to bend the said opposed marginal portions of said strip into inclined position, and subsequently and successively clamping the unbent portions and subjecting said opposed marginal portions to the action of dies acting transversely in the plane of the strip to bend said opposed marginal portions into planes perpendicular to the plane of the strip.

3. The herein described method of producing channel irons from a metal strip, which consists in intermittently feeding said strip and between the feeds holding it at successive points between parallel clamping devices, simultaneously bending successive opposed marginal portions of said strip into inclined position, and simultaneously and successively bending said inclined portions into planes perpendicular to the strip, the clamping, partial bending and final bending being carried out on portions of the strip which are spaced from each other a distance substantially equal to the length of the marginal portions operated on in the bending action.

In testimony whereof, I affix my signature.

LEWIS E. CURTIS.