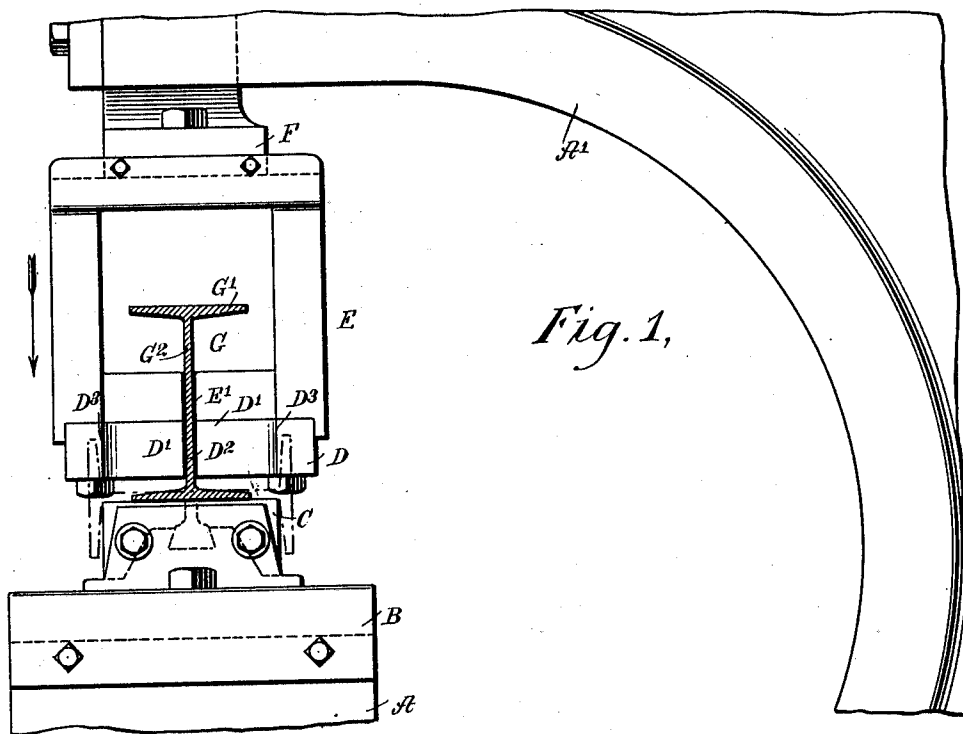


J. G. & H. L. BENSTER.  
COPING MACHINE.  
APPLICATION FILED JUNE 21, 1910.

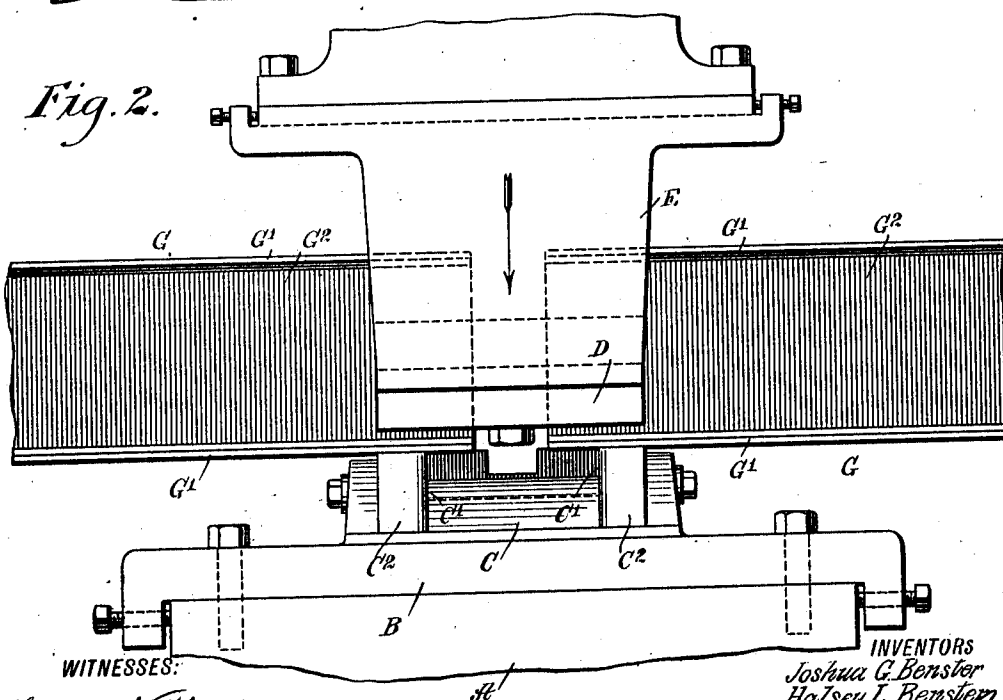
1,003,866.

Patented Sept. 19, 1911.

3 SHEETS—SHEET 1.



*Fig. 1,*



*Fig. 2.*

WITNESSES:

*Edward Thorpe*  
*Prof. Hester*

INVENTORS  
*Joshua G. Benster*  
*Halsey L. Benster*  
BY *Mumford*

ATTORNEYS

J. G. & H. L. BENSTER.  
 COPING MACHINE.  
 APPLICATION FILED JUNE 21, 1910.

1,003,866.

Patented Sept. 19, 1911.

3 SHEETS—SHEET 2.

Fig. 3,

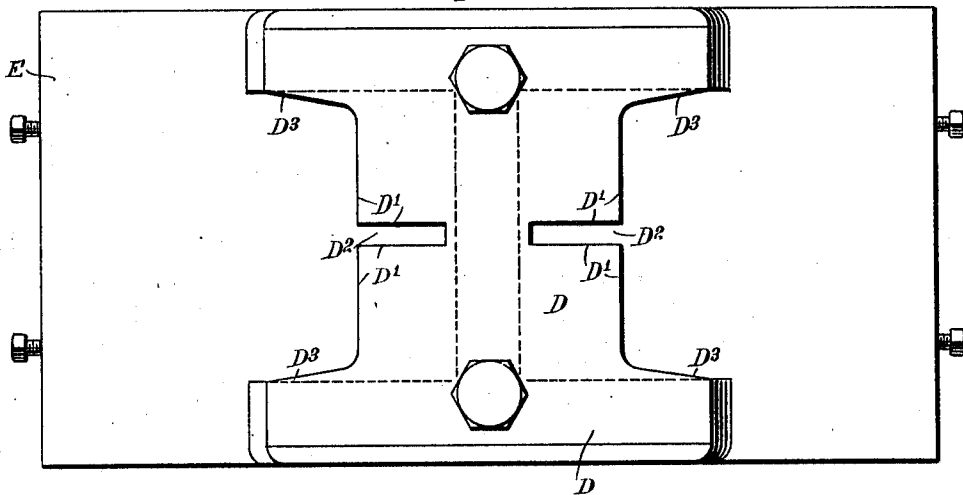


Fig. 4,

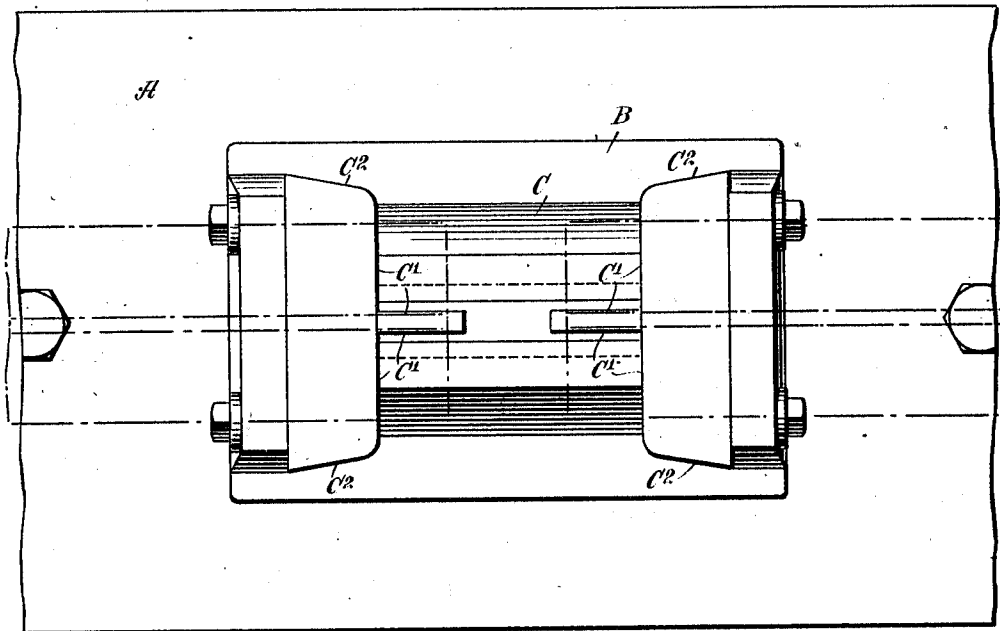


Fig. 5,

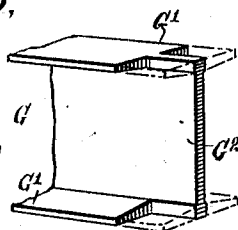
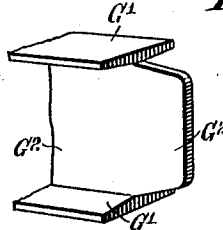


Fig. 6,



WITNESSES:  
*Edw. Thorpe.*  
*Wm. H. Hester.*

INVENTORS  
*Joshua G. Benster*  
*Halsey L. Benster*  
 BY *Munn & Co.*  
 ATTORNEYS

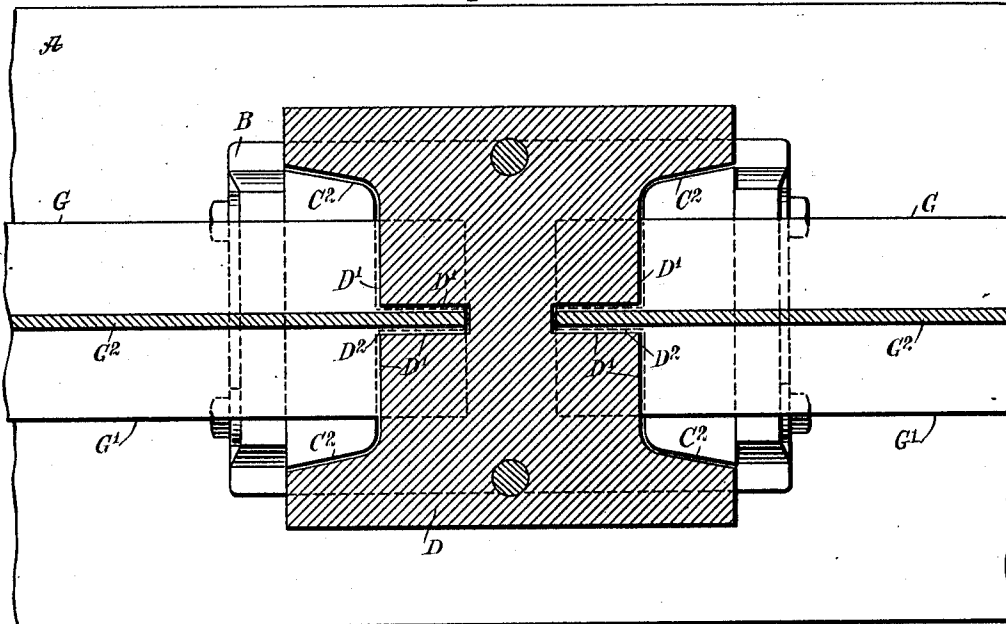
J. G. & H. L. BENSTER.  
COPING MACHINE.  
APPLICATION FILED JUNE 21, 1910.

1,003,866.

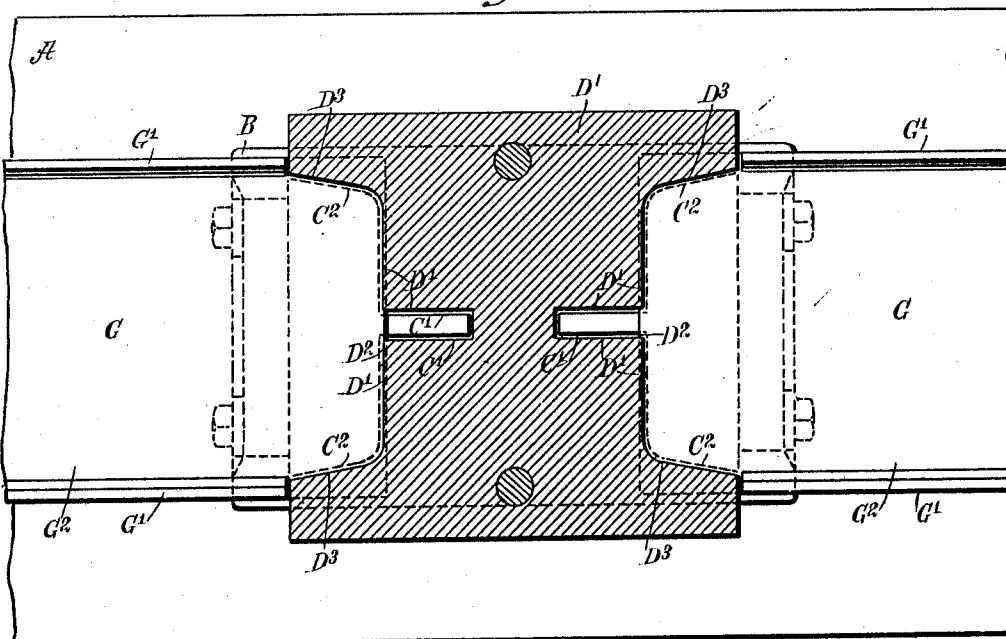
Patented Sept. 19, 1911.

3 SHEETS—SHEET 3.

*Fig. 7.*



*Fig. 8.*



WITNESSES:

*Edward Thorpe*  
*Herby Hunter*

INVENTORS  
*Joshua G. Benster*  
*Halsey L. Benster*  
BY *Munn Co*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

JOSHUA G. BENSTER AND HALSEY L. BENSTER, OF MOLINE, ILLINOIS.

COPING-MACHINE.

1,003,866.

Specification of Letters Patent.

Patented Sept. 19, 1911.

Application filed June 21, 1910. Serial No. 568,079.

*To all whom it may concern:*

Be it known that we, JOSHUA G. BENSTER and HALSEY L. BENSTER, citizens of the United States, and residents of Moline, in the county of Rock Island and State of Illinois, have invented a new and Improved Coping-Machine, of which the following is a full, clear, and exact description.

The invention relates to cutting and punching sheets and bars, and its object is to provide a new and improved coping machine more especially designed for shaping the ends of I-beams, channel beams and other beams used in structural steel work, to insure close fitting of adjacent members at an angle of 90° or less, as the case may be.

For the purpose mentioned, use is made of coacting dies, having specially arranged cutting edges, for first cutting off the end portions of the flanges of the beam and subsequently trimming the web of the beam.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the coping machine and showing a channel beam in position thereon; Fig. 2 is a front elevation of the same; Fig. 3 is an enlarged inverted plan view of the movable die; Fig. 4 is an enlarged plan view of the anvil die; Fig. 5 is a perspective view of a channel beam having the end portions of the flanges cut off; Fig. 6 is a like view of the finished end of a channel beam; Fig. 7 is a horizontal section of the upper die showing the cutting of the flanges, and Fig. 8 is a similar view showing the cutting of the web of the beam.

On the body A of the coping machine is secured an anvil B, carrying an anvil die C, operating in conjunction with an oppositely-disposed movable die D, attached to the under side of a cross head E, secured to a plunger or a ram F, moving up and down in suitable bearings arranged in the overhanging arm A' forming part of the body A, suitable mechanism being provided for imparting an up and down reciprocating motion to the plunger F, the said mechanism being similar to the one generally employed in punches and shears of any approved construction, as now constructed.

The anvil die C is provided with two sets of L-shaped cutting edges C', operating in conjunction with similar L-shaped cutting

edges D', formed on the removable die D, as plainly indicated in Figs. 3 and 4, each set of cutting edges D' being spaced apart by a longitudinally-extending slot D<sup>2</sup>, and the outer ends of the cutting edges C', D' terminate in angular trimming edges C<sup>2</sup>, D<sup>3</sup>.

In using the machine, two beams G are placed in position on the anvil die C, from opposite sides of the machine, so that the adjacent ends of the said beams are acted on simultaneously, with a view to first cut off the end portions of the flanges G' and to subsequently trim the webs G<sup>2</sup>, as indicated in Figs. 5 and 6.

By reference to Figs. 1 and 2 it will be noticed that the cross head E is provided with slots E', in register with the slots D<sup>2</sup> for the passage of the web G<sup>2</sup> of the beam G, and the said cross head E is made hollow, to accommodate the flange G' uppermost at the time, as indicated in Figs. 1 and 2. Now when the beams G are in position on the machine as described and the plunger F moves downwardly, then the cutting edges D', C' coact to cut off the end portions of the lowermost flanges G' of the two beams, and when this has been done the beams are placed upside down, and the above described operation is repeated, to cut off the end portions of the other flanges, as plainly indicated in Fig. 5. After this has been done, the beams G are laid down flat on the anvil die C, as indicated in dotted lines in Fig. 1, and then the plunger F is moved downward to cause the cutting edges C<sup>2</sup>, D<sup>3</sup> to trim off the corners of the projecting ends of the webs G<sup>2</sup>, as plainly indicated in Fig. 6.

Thus, from the foregoing, it will be seen that by the arrangement described, the ends of the beams can be readily shaped, to insure close fitting of the beams placed at an angle of 90° or less one relative to the other.

As shown in Figs. 3 and 4, the cutting edges of the dies are arranged to cut the flanges at right angles relative to the web, but in case it is desired to cut the flanges at 60°, 45° or any other number of degrees less than 90°, then the cutting edges C', D' are shaped correspondingly to cut the flanges at the desired angle. In case the angle of the coping is more acute, so that the flange of a beam interferes with one corner of the upper die, then the shape of the die is slightly altered by removing the opposite web trimming and cutting edges,

and turning the beam end for end, in order to obtain the angle, and turning the beam twice on its side to trim both sides of the web.

5 Having thus described our invention, we claim as new and desire to secure by Letters Patent:

10 1. A coping machine, comprising an anvil, a hollow cross head reciprocating toward and from said anvil and provided with longitudinal slots for receiving and permitting the passage of the web of the beam to be coped, an anvil head secured on the said anvil, and a head secured on the cross head,  
15 the said heads each having at opposite sides thereof a pair of oppositely arranged L-shaped cutting edges, each pair being separated by a slot, each of the L-shaped cutting edges terminating in an outwardly extending trimming edge for the purpose specified.  
20

2. A coping machine, comprising an anvil, a cross head reciprocating toward and from the said anvil and having longitudinal openings for permitting the passage of the web of the beam to be coped, an anvil head 25 on the anvil, a head on the cross head, the said heads each having at opposite sides thereof a pair of oppositely arranged L-shaped cutting edges, each pair being separated by an opening, each of the said cutting edges terminating in a lateral trimming edge. 30

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOSHUA G. BENSTER.  
HALSEY L. BENSTER.

Witnesses:

FRANK MIDDELKAMP,  
LOGAN NICHOLSON.

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