

(No Model.)

J. M. LONG.
BEAM COPING DIE.

No. 464,130.

Patented Dec. 1, 1891.

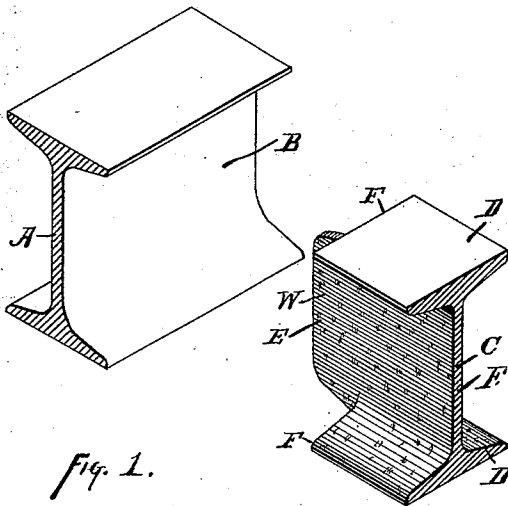


Fig. 1.

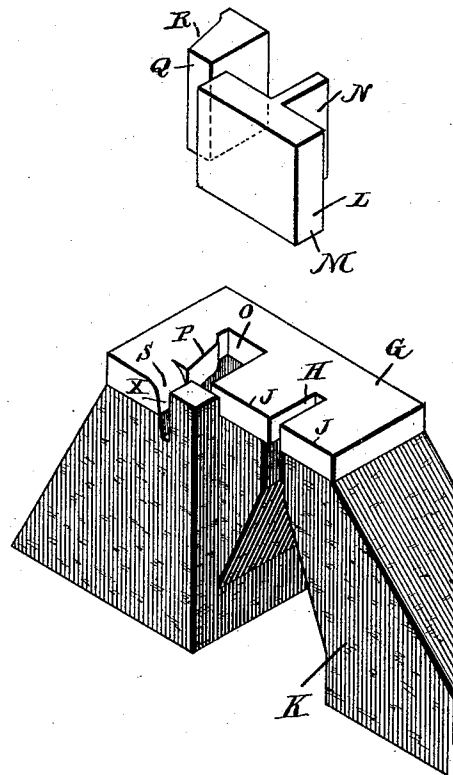


Fig. 2.

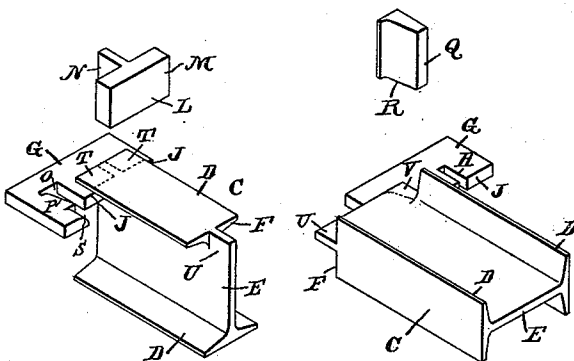


Fig. 3.

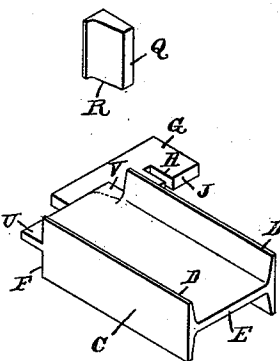


Fig. 4.

Witnesses:

M. S. Belden
P. P. Sheehan.

John M. Long
Inventor
by *James W. See*
Attorney

UNITED STATES PATENT OFFICE.

JOHN M. LONG, OF HAMILTON, OHIO.

BEAM-COPING DIE.

SPECIFICATION forming part of Letters Patent No. 464,130, dated December 1, 1891.

Application filed August 10, 1891. Serial No. 402,201. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. LONG, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Beam-Coping Dies, of which the following is a specification.

This invention pertains to improvements in shearing-dies for forming a coped joint between flanged beams—as, for instance, I-beams or channel-beams.

My invention will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a perspective view illustrating an I-beam fitted for coping connection with a second I-beam, the two pieces of beam being shown somewhat separated; Fig. 2, a perspective view of the improved dies; Fig. 3, a perspective view of a beam in position in the dies to have the first effect performed upon the beam, the upper contouring-die being omitted from this figure; and Fig. 4, a perspective view of the beam in position in the dies to have the final effect produced, the upper deflanging-die being omitted from this figure.

In the drawings, A indicates an I-beam to which it is desired to connect a second beam at right angles to it to form a coped joint—that is, a joint in which the end of the second beam shall fit into the side of the first beam; B, the channel in the side of this beam, the channel into which the end of the second beam is to fit; C, the second beam, whose end is to fit the first beam, this second beam being the one referred to by the term “beam” when that term is hereinafter used without qualification, the other beam to be referred to as the “receiving-beam;” D, the flanges of the beam; E, the web of the beam; F, the ends of the flanges after cutting, which will come against and make joints with the side edges of the flanges of the receiving-beam; G, a die adapted to be secured to any suitable punching or shearing machine; H, a slot in this die, open in front, and having width corresponding substantially with the thickness of the web of the beam, so that the end of the beam can be poked into this slot with the top flanges of the beam overlying the die, as indicated in Fig. 3, the two upper corners

of this slot forming cutters; J, the front of the die at right angles to the slot and forming cutters to the right and left of the slot of a length equal at least to the projection of the flanges of the beam from the web; K, an exemplifying support for the die, which support may be the bed of the machine in which the dies are employed, or a die-holder applied to the machine to support the die, this support requiring, of course, to be open in front and give room below the die for the proper presentation of the beam to the die; L, a top die adapted to be attached in any usual manner to the ram of the punching or shearing machine in which the dies are used, this die being virtually a punch of a form suited to co-operate with the cutting-edges of the lower die—namely, the edges J and the sides of the slot—this upper die therefore having the form of a T, this upper die being hereinafter referred to as the “deflanging-punch,” such being a convenient term, M, the front of this punch, being a mere plate adapted to have a shearing action down past the edges J of the die, N, a rearward projection from the front of this punch, being a mere plate adapted to pass into the slot in the die and act as a punch or shear in connection with the sides of the slot, this back portion of the deflanging-punch being formed either integral or separable, as desired, with reference to the front of the punch; O, a die-hole in the die to one side of the slot, this die-hole also, like the slot, being open in front; P, the cutting-edge of this die-hole at one side thereof having a contour corresponding with the inner contour of the flange of the beam, this cutting-edge being the only portion of the die-hole which has a cutting office; Q, an upper die or punch carried alongside the upper deflanging-punch and adapted to enter the die-hole in the die; R, the cutting-edge of this punch, corresponding with the cutting-edge P of the die-hole, the punch Q and the cutting-edge P constituting the contour-dies to perform a second operation on the beam, the punch Q being hereinafter referred to as the “contour-punch,” and the die-hole as the “contour-die;” S, a projection of the contour-die forward of the cutting-edge P and adapted to fit the fillet of the beam; T in Fig. 3 the portions to be removed from the flange of the

beam by the operation of the deflanging-dies; U, the result of the removal of these portions, leaving the web of the beam projecting beyond the flanges a distance equal to the depth of the channel in the receiving-beam; V in Fig. 4 the portion to be removed from the projecting web by the action of the contour-dies; W in Fig. 1 the projecting end of the beam after the completion of the operation, this projecting end being adapted to fit the channel of the receiving-beam, and X a notch formed in the front portion of the contour-die to receive and sustain the lower flange of the beam during the contour-cutting operation, this notch having the form of the flange of the beam, so that when the beam is laid with its projecting web upon the contour-die, as seen in Fig. 4, the lower flange of the beam will lie in the notch and have its lower edge supported on the floor of the notch.

In using these dies the beam is first poked into the slot, with its upper flanges resting on the die, as is seen in Fig. 3. The punch then comes down and pushes the beam down, thus removing the portions T from the flange and leaving the beam in the condition shown at U on the nearer end of the beam in Fig. 3. The beam is then turned over and a similar operation performed upon the other flanges, thus leaving the beam with its web projecting beyond the flanges a distance equal to the depth of the channel in the receiving-beam, the further end of the beam in Fig. 4 showing the result of the deflanging process. During this portion of the process the contour-dies have done no work and they need not have been present. The deflanged beam is now ready to have the end projecting portion of its web contoured to fit the channel of the receiving-beam. It is now poked into the die-hole, with the end of the lower flange resting in the notch X and with the projecting portion of the web resting on the die, with a corner projecting over the die-hole or a portion of the die-hole. The contour-punch now descends and removes the portion, (V indicated in Fig. 4,) thus producing at one side of the projecting portion of the web a contour to suit the channel of the receiving-beam. The beam

is now turned over and the other corner of the web subjected to the action of the contour-dies, thus leaving the beam in the condition indicated in Fig. 1, fitting it to intermember and form a coped joint with the receiving-beam. During the operation of the contour-dies the deflanging-dies have done no work and need not have been present. The finished result is seen to be due to the conjoint operation of the two sets of dies operating dissimultaneously. The unification of the two sets of dies in the manner indicated will be found practically advantageous.

I claim as my invention—

1. In beam-coping dies, the combination, substantially as set forth, of a deflanging-die having frontal cutting-edges and an open-fronted slot at right angles thereto and provided with cutting-edges upon its two sides, a deflanging-punch having cutting-edges to co-operate with the cutting-edges of said die, a contour-die having a die-hole open in front and provided at one of its sides with a contour-cutting edge, and a contour-punch having a cutting-edge adapted to co-operate with the cutting-edge of said contour-die.

2. In beam-coping dies, the combination, substantially as set forth, of a deflanging-die having frontal cutting-edges and an open-fronted slot at right angles thereto provided with cutting-edges upon its two sides, and a deflanging-punch having cutting-edges adapted to co-operate with the cutting-edges of said die.

3. In beam-coping dies, the combination, substantially as set forth, of a contour-die having an open-fronted die-hole provided upon one of its sides with a contour-cutting edge, a contour-punch having a cutting-edge adapted to co-operate with the cutting-edge of said die, and a projection from said die in front of its cutting-edge and adapted to support the lower flange of the beam being operated upon.

JOHN M. LONG.

Witnesses:

J. W. SEE,
JAS. FITTON.