

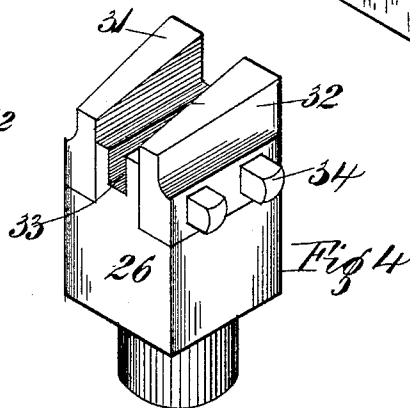
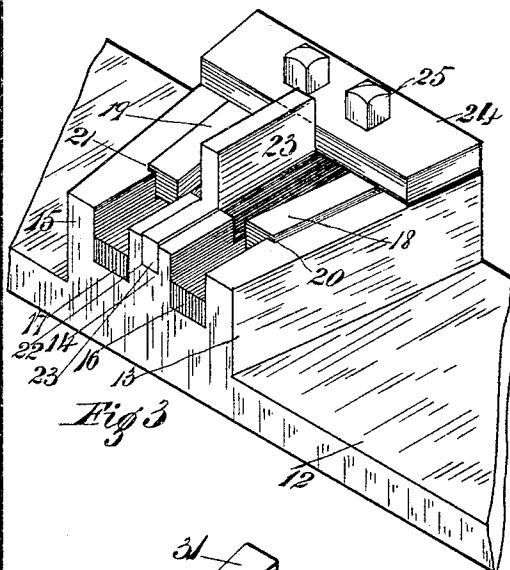
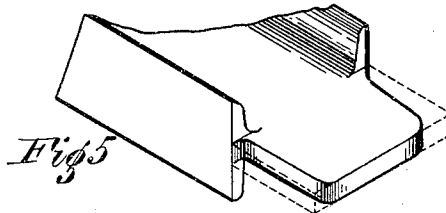
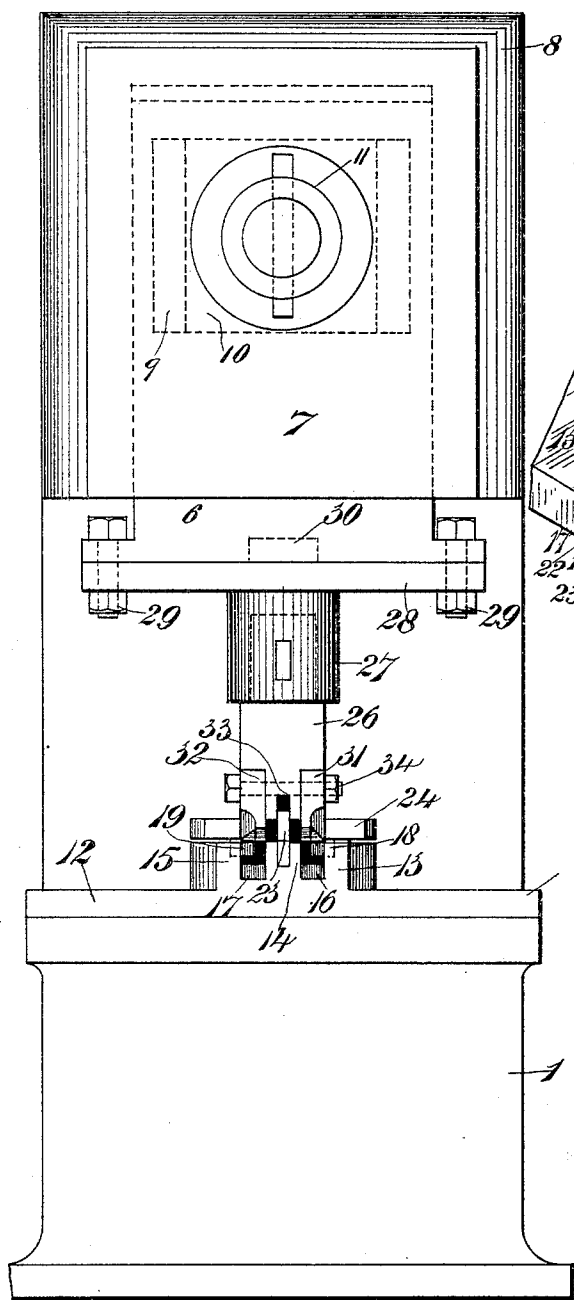
(No Model.)

2 Sheets—Sheet 1.

B. F. HAUGH.
COPING MACHINE.

No. 467,861.

Patented Jan. 26, 1892.



Witnesses

C. F. R. Wappenhans,

W. M. DePue

Fig 1

Inventor

Benjamin F. Haugh

By his Attorney

Thompson & Bell

(No Model.)

2 Sheets—Sheet 2.

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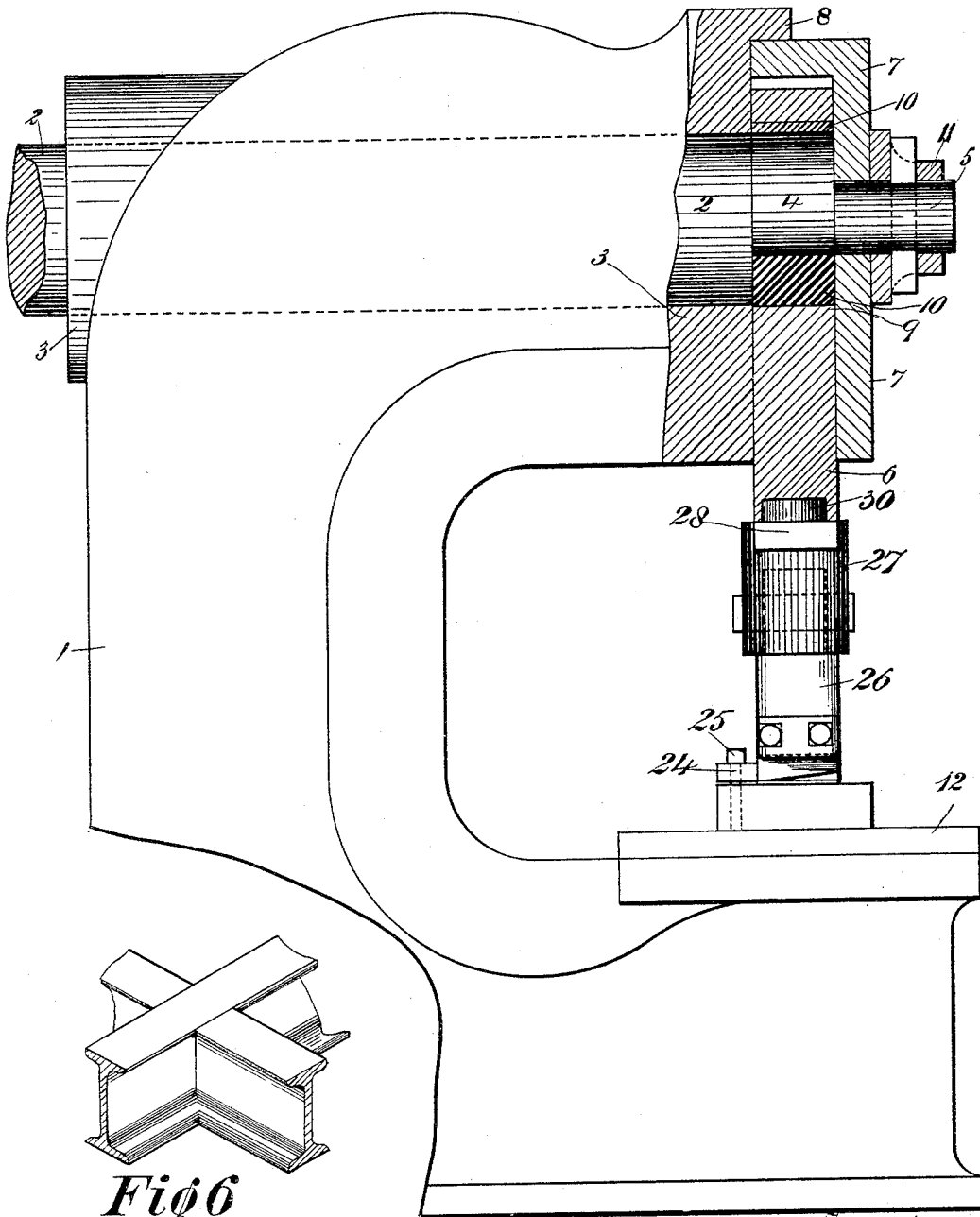


Fig 6
Witnesses
C. R. Wapenhame
M. W. Deane

Fig 2
Inventor
Benjamin F. Haugh
By his Attorney
Thompson & Bell

UNITED STATES PATENT OFFICE.

BENJAMIN F. HAUGH, OF INDIANAPOLIS, INDIANA.

COPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,861, dated January 26, 1892.

Application filed December 4, 1891. Serial No. 414,051. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. HAUGH, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Coping-Machines, of which the following is a specification.

My invention relates to a new and improved machine for trimming or forming the ends of the webs of beam, channel, or T irons or other forms of beams preparatory to fitting or coping, as is usual in structural iron-work; and it consists in mechanism of novel construction hereinafter described and claimed.

Heretofore the ends of the webs of beams used particularly in structural iron-work were trimmed and formed by means of milling or other shaping machines, which operation is tedious, slow, and expensive, and very materially adds to the cost of "fitting up" structural iron-work.

The object of my invention is to provide a simple and cheap machine that will rapidly trim or "cope" the webs of the ends of rafters or other beams of any form which have had their flanges previously removed from the ends thereof, thus completely forming the ends of said beams to fit into the side of or to cope with other beams, as hereinafter more fully described. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of my machine. Fig. 2 is a side elevation of the same, showing the head thereof in section. Fig. 3 is a perspective view of the cutter-bed-plate of the web-trimming tool. Fig. 4 is a perspective view of the raising and lowering cutter-head. Fig. 5 is a perspective view of the end of an I-beam, showing the end of the web formed to cope or fit into the side of a similar I-beam; and Fig. 6 is a perspective view of an I-beam, showing a similarly-formed I-beam coped or let into the side thereof.

Similar numbers of reference designate like parts throughout the several views.

1 designates the main frame of my machine, formed somewhat similar to the frame of a double shearing machine or punch.

2 designates the main actuating-shaft, connected to any suitable driving-gear and journaled in the bearings 3, formed on the top or

head of the main frame 1, said shaft having the eccentric 4 and the concentric projecting end 5, of smaller diameter, formed on the end thereof and integral therewith.

6 designates the reciprocating head or plunger, adapted to slide upwardly and downwardly in the ways formed by the boxing 7 and the head 8 of the main frame 1. Integral with the plunger 6 is formed the yoke 9, adapted to receive the sliding block 10, and wherein the latter freely slides, said blocks adapted to receive the eccentric 4, whereby a reciprocating motion is imparted to the plunger 6 and the forming or trimming tool connected thereto. On the projecting end of the shaft 2 is secured the collar 11, which retains the boxing 7 in its fixed position.

12 designates the cutter-holder of the web-trimmer, having the A-formed or angled projections 13, 14, and 15 formed thereon and integral therewith. Between the latter projections are neatly fitted the liners 16 and 17, (preferably of steel,) on which the flanges of the bars or beams to be operated upon rest or bear, said liners made of various thicknesses to conform with the different widths of the flanges of the beam to be trimmed, and thereby permit the web to rest firmly or bear on either of the cutters 18 and 19 as required.

On the inner sides of the projections 13 and 15 are formed the recesses 20 and 21, into which are fitted the web-cutters 18 and 19, with their cutting-edges turned inwardly and flared or spread backwardly, and on the intermediate projection is formed the groove 22, into which is neatly fitted the cutter-head guide-plate 23, all being firmly held in their respective positions by the clamping-plate and the securing-bolts 25. (See particularly Fig. 3.)

26 designates the top cutter-head, firmly secured by a key or other securing device in the boss 27, formed on the yoke 28, said yoke firmly bolted to the plunger 6 by the bolts 29 and held in its central position by the dowel-pin 30.

31 and 32 designate the upper web-cutters, having their outer cutting-edges tapering or flaring backwardly parallel with and adapted to neatly fit and to move upwardly and downwardly in and between the cutters 18 and 19, said head held in its central position by the

guideway 33, neatly fitting the guide-plate 23, hereinbefore described, said cutters secured to the head 26 by their securing-bolts 34.

The operation of the machine is as follows:

- 5 When it is required to trim the ends of a beam to a taper or "rake" to cope into another beam—as, for example, an I-beam—coped into a similarly-formed beam, the ends of the flanges of the I-beam to be coped having
10 been trimmed off, and the web after this operation being rectangular in form, as shown in dotted lines, (see Fig. 5,) the beam is first placed on the cutter-head plate with its web resting first on the cutter 18 and with its under flange
15 resting on the liner 16. The head 26 is then caused to move downwardly by means of the driving mechanism attached to the plunger 6, and thus cause the cutters 31 and 32 to pass in and between the cutters 18 and 19, and thereby
20 trimming the web in the required form to accurately cope into the beam, as shown in Fig. 6. The opposite side of the end of the web is now placed on the cutter 19, and the under flange bearing on the liner 17, and the
25 head is again caused to move downwardly, as before, thus trimming both sides of the web to the required rake and completing the operation of forming the end of the beam preparatory to coping. The liners 16 and 17, being fitted comparatively loosely in the cutter-head, may be replaced by others of greater or lesser thickness to suit the different sizes of beams having variable sizes of flanges.

It is obvious that dies of different sizes and
35 forms could be used for forming the ends of the webs of beams; but such would be very expensive, as a different die would necessarily be required for each different size and form of beam to be trimmed. I therefore prefer to use the machine hereinbefore described,
40 on account of its easy adjustment and simplicity.

Having thus fully described the nature and construction of my invention, what I claim as
45 novel and useful, and desire to cover by Letters Patent of the United States therefor, is—

1. In a coping-machine, the combination,
50 with a cutter-frame having an angled and projecting cutter-holder formed thereon with inner recessed edges, of a fixed bottom cutter secured on said holder with its cutting-edge

turned inwardly and flaring backwardly, a suitable guide-plate opposite said cutter, a reciprocating cutter-head having a guideway
55 formed in the end thereof and adapted to receive and to work on said guide-plate, and a cutter on said head with its cutting-edge turned outwardly and inclined parallel with said fixed cutter, substantially as set forth.

2. In a coping-machine, the combination,
60 with the cutter-frame thereof having angled cutter-holders formed thereon with inner recessed edges, suitable inclined cutters secured in the inner recessed edges of said cutter-holders with their cutting-edges turned
65 inwardly and flaring backwardly, and a guide-plate intermediate between said cutters, of a reciprocating cutter-head having a guideway formed in the bottom end thereof and adapted to receive and to work on said guide-plate,
70 cutters on said head, having their cutting-edges turned outwardly and inclined parallel with said inclined cutter, and suitable means and connections for reciprocating said head, substantially as set forth.

3. In a coping-machine, the combination,
75 with the cutter-frame thereof, the angled and projecting cutter-holders thereof, the inclined cutters secured in the inner recessed edges of said cutter-holders with their cutting-edges
80 turned inwardly and flaring backwardly, a guide-plate and its support intermediate between said cutters and their holders, a clamping-plate for securing said cutters and guide-plate, and suitable flange-liners between said
85 guide-plate and cutter-holders, of a reciprocating cutter-head having a guideway formed in the bottom end thereof and adapted to receive and to work on said guide-plate, cutters
90 on said head, having their cutting-edges turned outwardly and inclined parallel with said inclined cutter, and suitable means and connections for reciprocating said cutter-head, substantially as set forth.

In testimony whereof I have hereunto set
95 my hand in the presence of two subscribing witnesses.

BENJAMIN F. HAUGH.

Witnesses:

THOMPSON R. BELL,
W. N. BOWMAN.