

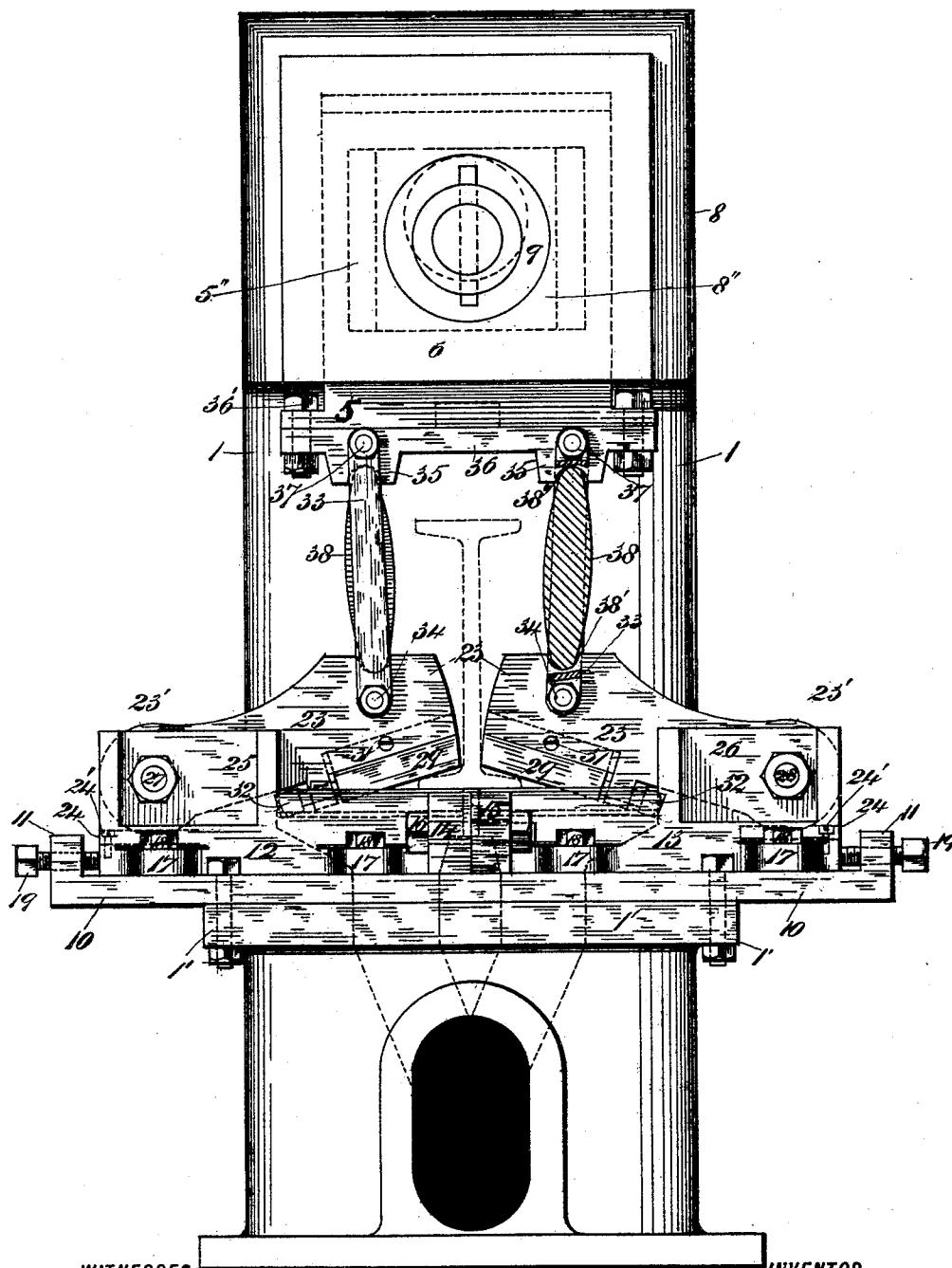
(No Model.)

3 Sheets—Sheet 1.

B. F. HAUGH.
COPING MACHINE.

No. 467,720.

Patented Jan. 26, 1892.



WITNESSES:

Ernst Hege
W. R. Thompson

Fig 1

INVENTOR

Benjamin F. Haugh

BY

Thompson & Bell

ATTORNEY.

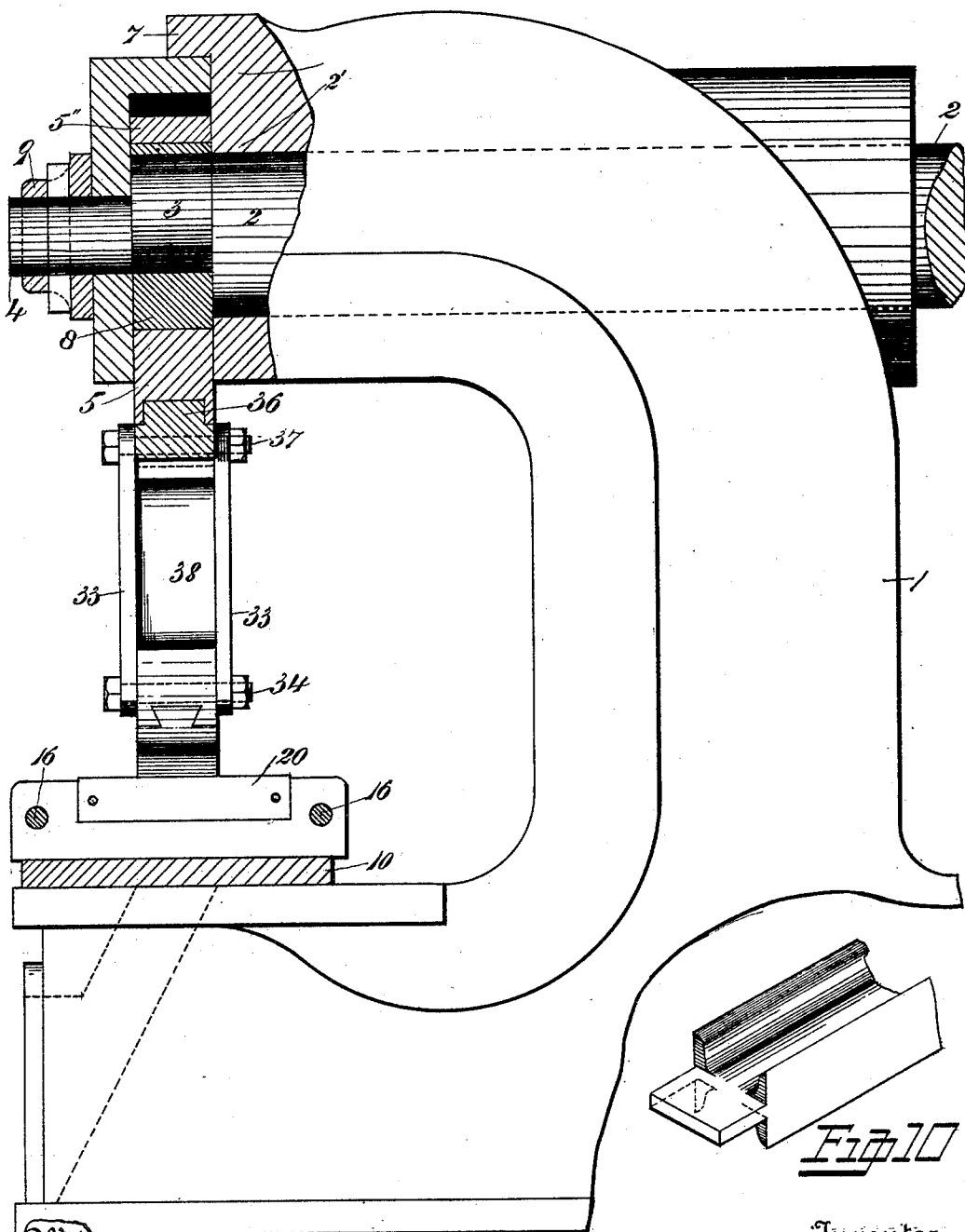
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3 Sheets—Sheet 2.

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Witnesses

Fig 2

Inventor

M. W. DeFree
J. H. Stem

Benjamin F. Haugh
By his Attorney
Thompson & Pell

(No Model.)

3 Sheets—Sheet 3.

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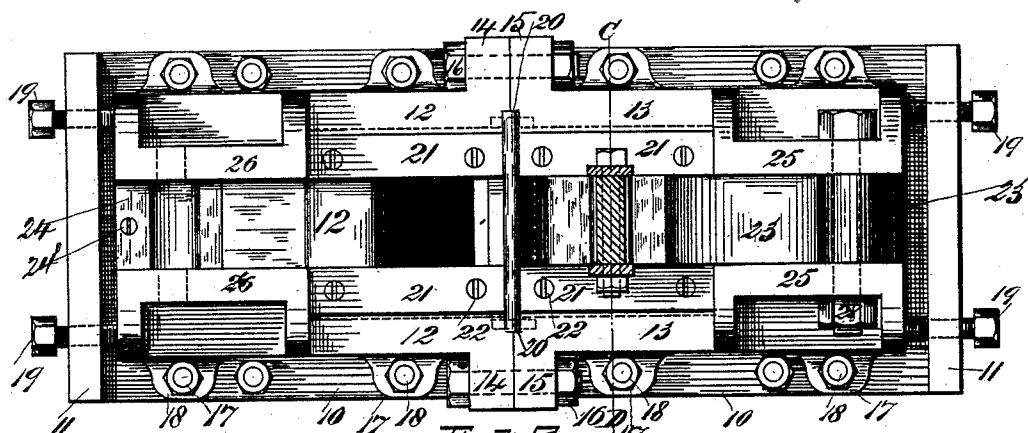


Fig. 3

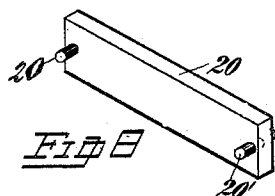


Fig. 8

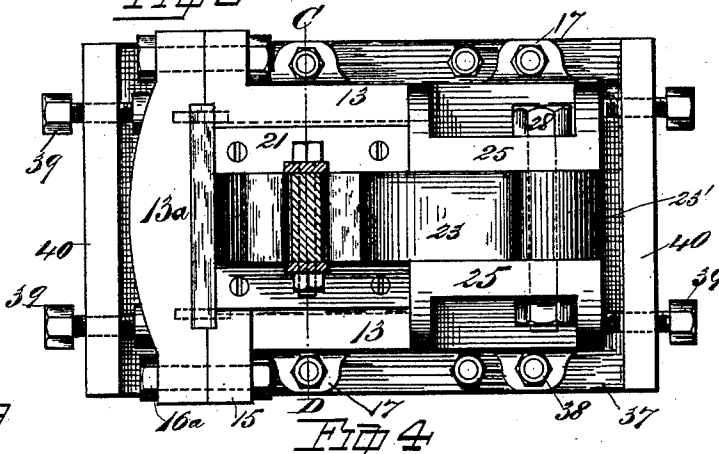


Fig. 4

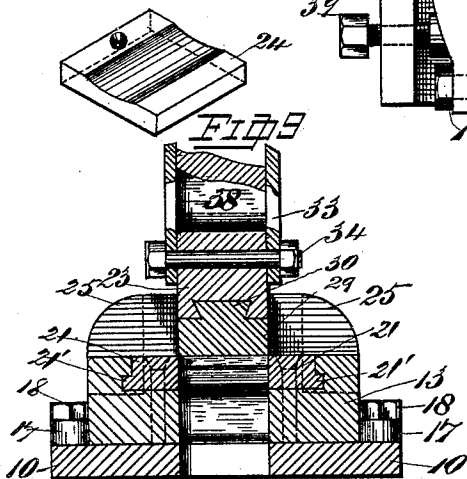


Fig. 5

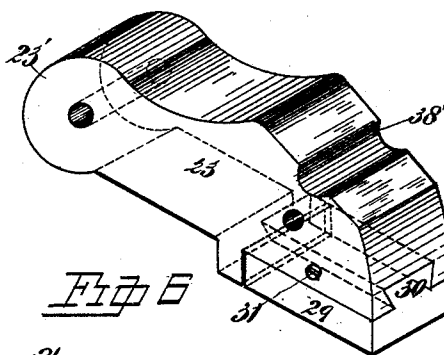


Fig. 6

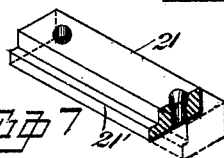


Fig. 7

WITNESSES:

Ernest Hage

E. F. R. Thompson

INVENTOR

Benjamin Haugh

BY

Thompson & Co.

ATTORNEY.

UNITED STATES PATENT OFFICE.

BENJAMIN F. HAUGH, OF INDIANAPOLIS, INDIANA.

COPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,720, dated January 26, 1892.

Application filed April 24, 1891. Serial No. 390,302. (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 the flanges of beam, channel, angle, and T irons and 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 flanges of beams used particularly in structural iron-work were trimmed and formed by means of milling or shaping machines, which was a slow, tedious, and expensive process and very materially added to the expense 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 flanges of rafters or other beams of any form. 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, showing the double knife-cutters in position to cut the flange of a beam, as shown in dotted lines. Fig. 2 is a side elevation of the same, partly in section. Fig. 3 is a plan view of the knife or cutter frame, showing one of the cutter-heads removed. Fig. 4 is a plan of the single cutter-frame holder. Fig. 5 is a section of the cutter-frame, cutter-head, and bed-plate, through the lines C D. (See Figs. 3 and 4.) Fig. 6 is a detail perspective view of the cutter-head. Fig. 7 is a detail perspective view of the side bottom flange-cutter. Fig. 8 is a perspective view of the web-cutter. Fig. 9 is a perspective view of the bearing of the pivotal end of the cutter-heads; and Fig. 10 is a perspective view of the end of a beam, showing the end portion of its flanges trimmed off.

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.

2 designates the main actuating-shaft con-

nected to any suitable driving-gear and journaled in the bearings 2', formed on the top or head of the main frame 1; and having the eccentric 3 and the concentric projecting ends 4, of small diameter, formed on the end of said shaft and integral therewith.

5 designates the reciprocating head or plunger, adapted to slide upwardly and downwardly in the ways formed by the boxing 6 and the head 7 of the main frame 1. Integral with the plunger 5 is formed the yoke 5', adapted to receive the sliding block 8 and wherein the latter freely slides, said block adapted to receive the eccentric 3, whereby a reciprocating motion is imparted to the plunger 5 and the mechanism connected thereto.

On the projecting end of the shaft 2 is secured the collar 9, which retains the boxing 6 in its fixed position.

10 designates the bed-plate of the cutter-frame, firmly secured by bolts or other suitable fastenings to the table 1', formed integral with the frame 1, and having the lugs 11 formed on the ends thereof, for the purpose hereinafter set forth.

12 and 13 designate the frames of the bottom flange-cutters abutting and having the lugs 14 and 15 formed on their inner ends, and through which the securing-bolts 16 pass and whereby the said frames are firmly secured together.

On the sides of the cutter-frames 12 and 13 are formed the oblong slotted lugs 17, whereby said frames are adjustably secured to the plate 10 by the bolts 18, and adjusted and centered endwise by the set-screws 19, screwed into the end lugs 11 of said plate.

20 designates the web-cutter, (of steel,) placed intermediate between the cutter-frames 12 and 13, let into the rectangular recess formed in the sides of the latter frames and held in its relative position by the set pins or dowels 20', said cutters of various thicknesses to correspond with the thickness of the web of the beam to be trimmed or coped, as hereinafter more fully described. Any suitable liner or distance-piece may be introduced between said cutter-frames and beneath the web-cutter when a beam of a thickness requiring a web-cutter of a corresponding thickness will cause a gap between the ends of said cutter-frames.

21 designates the side flange-cutter, (of steel,) bedded firmly and fitted into the recesses formed in the frames 12 and 13, and secured therein by the "countersunk-headed" bolts 22, screwed into said frames. I also provide the tongue 21', formed on the outer bottom edges of the cutter 21, and fitted into the correspondingly-formed grooves formed in the sides of the recesses of the cutter-frames 12 and 13, for the purpose of preventing said cutters from springing or twisting when sustaining the strain of shearing. (See particularly Fig. 5.)

23 designates the swinging cutter-heads having their cylindrically-formed pivotal ends 23' journaled in the removable bearings 24, fitted into recesses formed in the frames 12 and 13, wherein they are firmly secured by the screws 24', said heads 23 held in their pivotal positions between the jaws 25 and 26 by the bolts 27 and 28, whereby the said cutter-heads are guided and effectually prevented from twisting or "creeling."

29 designates the flange-cutters having the longitudinal dovetail 30 formed on the top surface thereof and neatly fitting into the similarly-formed grooves formed in the under faces of the heads 23, said cutters held in position by the set-screws 31 and adjusted by the adjusting-screws 32, screwed into the lugs 23', formed integral with said cutter-head. The outer ends of the cutters 29 being subjected to excessive wear due to the cutting of the web-flanges throughout its entire width necessitates frequent dressing and sharpening, thus requiring provision to be made for adjusting, as described.

33 designates the lifting-links of the cutter-heads, pivoted to said heads at points near their swinging ends intermediate between and above the cutters 29 by the bolts 34 at their bottom ends and at their top ends to the lugs 35 of the piston-link yoke 36 by the bolts 37.

38 designates the thrust-links of the cutter-heads interposed between the links 33 and having their ends rounded to freely oscillate in the bearings 38', formed on the top of the cutter-heads 23 and having their top ends similarly fitted in the bearings 38'', formed in the bottom faces of the lugs 35 of the link-yoke 36. The yoke 36 is firmly secured to the bottom end of the piston or reciprocating head 4 by the bolts 36' and held in its central position by the dowel-pins 36'', formed thereon and integral therewith.

When it is desirable to trim the channel, angle, or I beams, or other forms of beams having a single flange, I use either of the cutter-frames 12 or 13, on the end of which is securely bolted the head 13^a by the securing-bolts 16^a, said cutter-frame adjustably secured on the bed-plate 37 by the bolts 39 and adjusted endwise by the screws 39', screwed into the end lugs 40, formed on the end of said plate and integral therewith. I prefer to place the latter head and its cutter-frame on the table 1' in a position transverse to that of the

double cutter-frame to permit the flanges of the angle or T's to be pushed longitudinally under the front edge of the cutter 29, and thereby facilitate the operation of trimming.

The operation of the machine is as follows: When it is required to cope or trim the ends of the flanges of beams—as, for example, an I-beam—the beam is first placed endwise on the double cutter-frames 12 and 13 between the cutter-heads 23, as shown in dotted lines. (See Fig. 1.) The head of the plunger 5 is then caused to reciprocate by means of the driving mechanism, (not shown,) and consequently the heads 23 and their cutters 29 are caused to move downwardly past the cutters 21 and the web-cutters 20, thereby effectually shearing off the flange the amount of which to be removed can be readily regulated by moving the beam along and between the cutter the requisite amount. The web of the beam, which is now rectangular in form at its trimmed end, as shown in dotted lines, Fig. 10, has now to be trimmed to a taper or "rake" corresponding with the inclination of the flanges of the beam into which it is coped. This operation is performed by a special machine designed for that purpose and which will form the subject-matter of another application.

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

1. In a coping-machine, the combination, with a cutter-frame, an end cutter, and opposite interior cutters abutting said end cutter to form a rectilinear cutting-edge, of a suitable cutter-head adapted to move upwardly and downwardly in and between said cutters, and an adjustable cutter on the bottom swing end of said cutter-head having its rectilinear cutting-edges turned outwardly and coinciding with the cutting-edges of said end and side abutting cutters, substantially as and for the purpose set forth.

2. In a coping-machine, the combination, with the cutter-frame thereof, an intermediate web-cutter, and interior opposite and parallel cutters abutting said intermediate cutter to form rectilinear cutting-edges, of suitable pivotal swinging and opposite cutter-heads having their pivotal ends turned outwardly, and a suitable adjustable cutter on the bottom swing face of said head having its rectilinear cutting-edges adapted to coincide with the cutting-edges of said end and side abutting cutters, substantially as set forth.

3. In a coping-machine, the combination, with a cutter-frame, an intermediate cutter, and opposite interior parallel cutters abutting said intermediate cutter to form a rectilinear cutting-edge, of suitable swinging and opposite cutter-heads having their pivotal heads turned outwardly, a suitable adjustable cutter on the bottom face of said swinging head having its rectilinear cutting-edges

adapted to coincide with the cutting-edges of said intermediate and interior and opposite abutting cutters, and means whereby said cutter-heads are simultaneously moved upwardly and downwardly, substantially as set forth.

4. In a coping-machine, the combination of a cutter-frame, jaws formed on the outer ends of said frame, a pivotal cutter-head pivoted in said jaws, an end cutter, and interior parallel cutters abutting said end cutter, a reciprocating piston above said cutter-head, and suitable piston and cutter connecting and thrust links, all arranged to operate substantially as set forth.

5. In a coping-machine, the combination of a suitable cutter-frame, suitable end jaws

formed thereon, opposite swinging cutter-heads pivoted in said jaws with their swinging ends turned outwardly, an intermediate cutter, and interior opposite and parallel cutters abutting said intermediate cutters, a reciprocating piston above said cutter-heads, suitable piston and cutter-head connecting and thrust links, and means for reciprocating the same, substantially as set forth.

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

BENJAMIN F. HAUGH.

Witnesses:

THOMPSON R. BELL,
GEO. P. ANDERSON.