No. 625,289.

Patented May 16, 1899.

J. CHRISTIE.

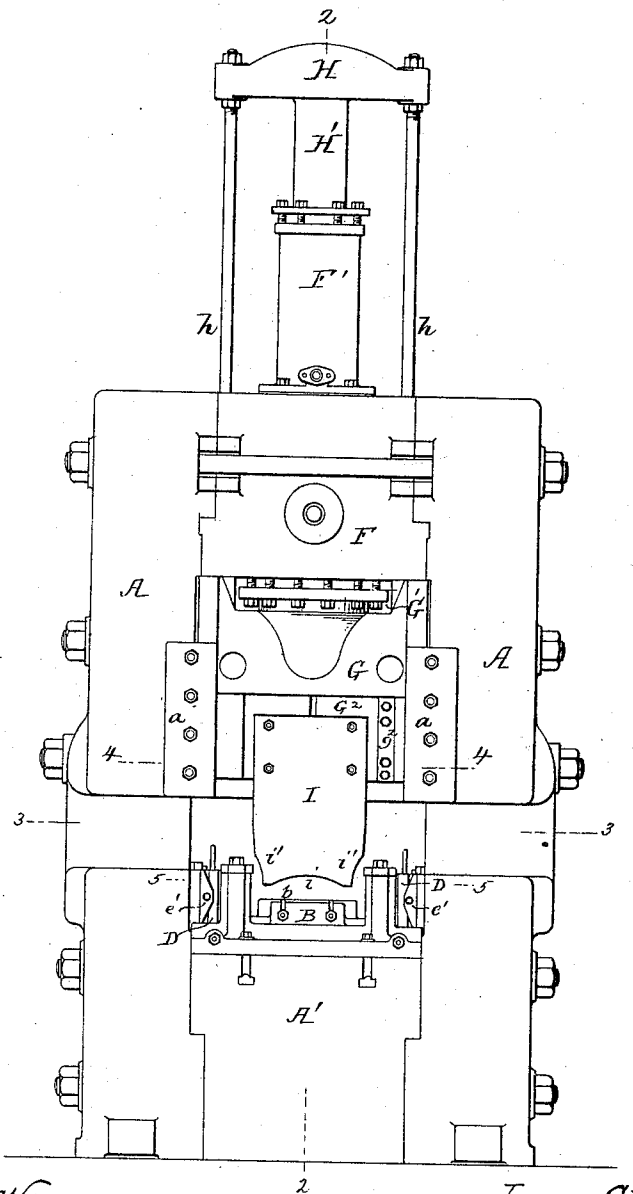
BEAM SHEARS.

(Application filed Dec. 3, 1897.)

(No Model.)

3 Sheets—Sheet 1.

FIG. 1.



Witnesses:
Charles De Cow
Murray & Boyce

Inventor
James Christie
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 3 Sheets—Sheet 2.

FIG. 3.

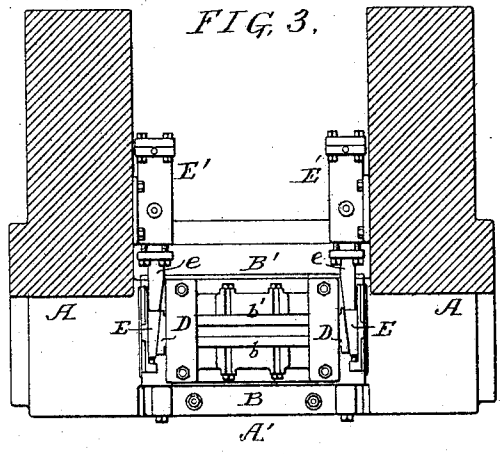


FIG. 1.

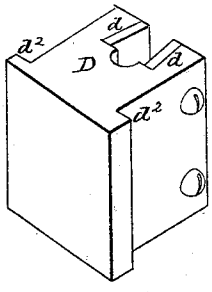
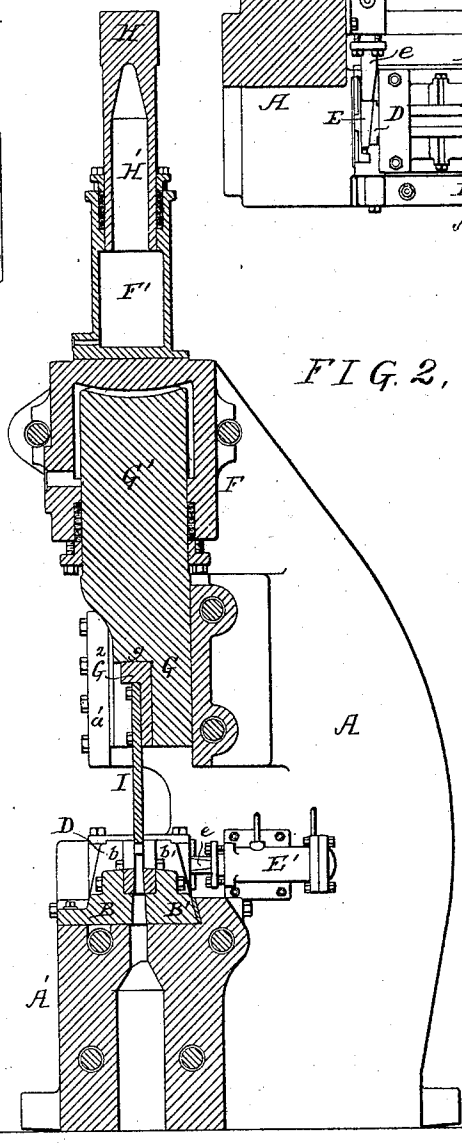


FIG. 2.



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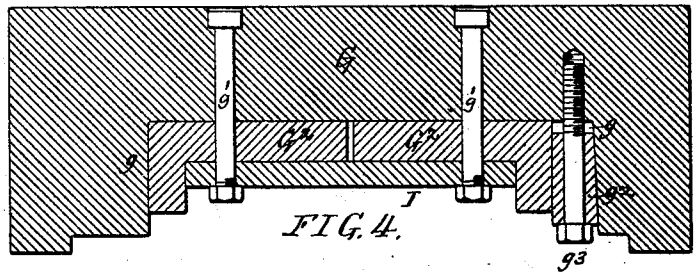


FIG. 4.

FIG. 5.

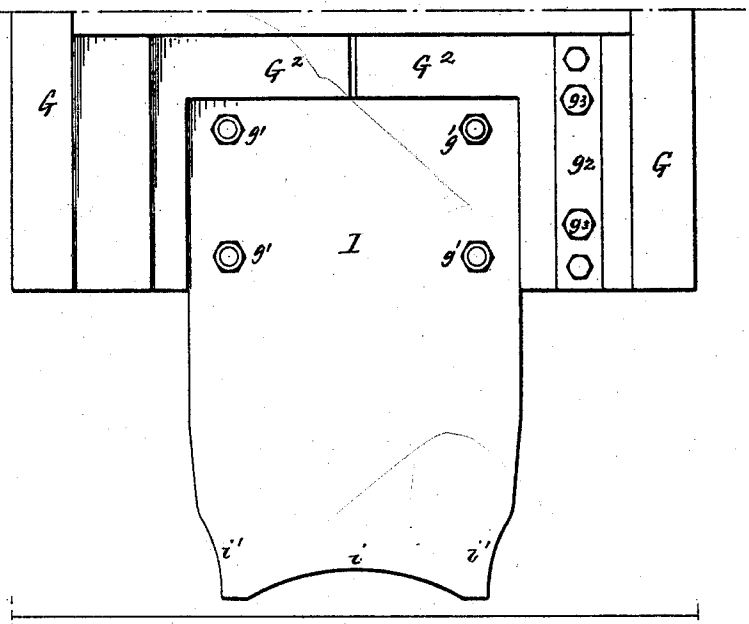
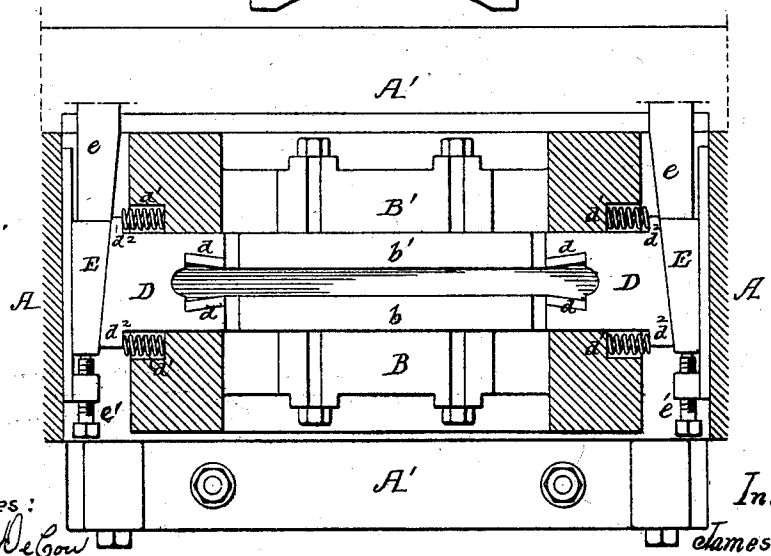


FIG. 6.



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UNITED STATES PATENT OFFICE.

JAMES CHRISTIE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE A. & P. ROBERTS COMPANY, OF SAME PLACE.

BEAM-SHEARS.

SPECIFICATION forming part of Letters Patent No. 625,289, dated May 16, 1899.

Application filed December 3, 1897. Serial No. 660,653. (No model.)

To all whom it may concern:

Be it known that I, JAMES CHRISTIE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Beam-Shears, of which the following is a specification.

My invention relates particularly to certain improvements in machines for shearing I-beams, channels, &c.; and the main object of my invention is to so construct the machine as to positively shear the beam in one operation, to clamp the beam during the shearing process, and to secure the upper blade rigidly to its plunger or slide. These objects I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved machine. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 1. Fig. 4 is an enlarged section on the line 4 4, Fig. 1. Fig. 5 is an enlarged view of the upper blade. Fig. 6 is a sectional plan view showing the lower blades, and Fig. 7 is a perspective view of one of the side blocks.

A is the frame of the machine, having the base A′, on which rest the two blocks B B′, carrying the two lower blades *b b′*. The upper face of each block is slightly rounded toward the edge of the blade, so that the beam will rest on the cutting edges of the lower blades.

D D are sliding side blocks extending above the upper face of the blocks B B′ and are adapted to clamp the beam laterally when placed in position in the machine. Mechanism is provided to adjust these blocks so as to firmly clamp the beam during the cutting process. In the present instance the rear edge of each block is beveled, and between each block and a projection on the frame are inserted wedges E E. Each wedge is connected to a piston-rod *e* of a fluid-pressure cylinder E′, so that when fluid is admitted to both cylinders both wedges are forced forward, moving the blocks D D laterally against the I-beam.

e′ are adjustable stops on the slide-plate to limit the forward movement of the wedges, so that if one wedge should move faster than the other it will be stopped when it reaches a certain point and the other will move until it reaches its stop, so that the two side blocks will confine the beam centrally in the machine.

Each block D is notched at the forward end, and in the notch are placed cutting-knives *d d*, arranged on a bevel, so as to free the upper blade when it passes through the flanges of the beam. In order to release the beam after it is sheared, I provide springs *d′*, which rest in pockets in the side portions of the frame and bear against lugs d^2 on the blocks, so that when the blocks are relieved from the pressure of the wedges they will open automatically and release the beam, which can then be removed. All the lower knives are detachably secured by means of bolts, so that when worn they can be removed or resharpened.

The frame carries at its upper end a fluid-pressure cylinder F, to which the plunger G′ of the slide G is adapted. The slide G is mounted in suitable ways *a′ a′* on the frame A and has a recess *g*, in which rests a two-part frame G^2. This frame is secured in any suitable manner to the slide, and its inner edges are planed off true, so as to receive the head of the upper blade I, which is made, preferably, in the form shown in Fig. 1. The blade is secured to the frame and slide in the present instance by bolts *g′*, which pass through the plate, block, and plunger.

Between one part of the frame and the slide is a wedge g^2. The wall of the recess in the slide is slightly tapered, and bolts g^3 are used to force the wedge into the recess, thus forcing the frame firmly against the blade, after which the securing-bolts *g′* are tightened. Thus the blade is rigidly secured to the slide. The holes in the blade and frame are somewhat larger than the bolts, so as to allow for the adjustment.

The lower cutting edge *i* of the blade I is curved, as shown, so that it will commence to cut at the edges of the web of the beam before cutting the center, and while it is cutting the center the inclined cutting edges *i′* will cut the upper flanges of the beam, and as the blade continues its movement the web will be entirely severed and the cutting of the lower

flanges will be completed, the beam being held rigidly during the cutting by the side blocks D D.

The plunger is connected by rods *h h* to a cross-head H of a plunger H′, adapted to a cylinder F′, so that on turning suitable valves the plunger will be returned by the fluid in the small cylinder. This form of apparatus for returning the plunger forms no part of the invention.

To cut I-beams of different heights, the lower side knife-carrying blocks are removed and others inserted of the proper size and the upper blade is also replaced.

When channel-beams are to be cut, plain lower blades are inserted, extending from one side block to the other.

I claim as my invention—

1. The combination in a shearing-machine, of an upper blade, side blocks, blades thereon, wedges back of each side block, and mechanism for moving the wedges in unison to clamp the article to be sheared, substantially as described.

2. The combination in a machine for shearing beams, of an upper blade, side blocks, blades thereon, wedges back of each side block, hydraulic cylinders, pistons therefor connected to the wedges, substantially as described.

3. The combination in a machine for shearing beams, of a base, blades thereon, adjustable side blocks having beveled backs, blades carried by said blocks, slide-plates, wedges resting between the beveled backs of the blocks and the slide-plates, an upper blade, and means for operating said blade to cut the beam clamped between the side blocks, substantially as described.

4. The combination in a machine for shearing beams, of a frame, two blades thereon arranged side by side, two adjustable side blocks, each block notched at its forward end and beveled at the back, blades on each block at each side of the notch, wedges for moving said blocks to clamp the beams, cylinders on the frame, piston and piston-rods adapted to said cylinders and connected to the wedges, and an upper blade adapted to the space between the two sets of lower blades so that the upper blade in cutting will remove a narrow strip from the beam, substantially as described.

5. The combination in a shearing-machine, of a recessed slide, a two-part frame adapted to the recess in the slide and also recessed, a knife-blade adapted to said recess and secured to the two-part frame and slide, and means for laterally forcing the frame against the blade, substantially as described.

6. The combination in a shearing-machine, of a slide having a recess therein, a recessed frame adapted to the recess in the slide, a blade adapted to the recess in the frame, a wedge between one side of the frame and the slide and adapted to force the frame against the blade, substantially as specified.

7. The combination in a shearing-machine, of a slide having a recess therein, a two-part recessed frame adapted to the recess in the slide, a blade mounted in the recess in the frame, a wedge mounted between the one side of the frame and the slide, bolts securing the wedge to the slide and bolts securing the blade and frame to the slide, substantially as described.

8. The combination in a machine for shearing beams, of the lower blades, blocks carrying the lower blades, sliding side blocks carrying side blades, wedges back of the said blocks, means for moving said wedges, springs resting in pockets in the frame bearing against the said blocks so as to force the blocks away from the beam after it is cut when the wedges are released, substantially as described.

9. The combination in a machine for shearing beams, of blocks carring the lower blades, sliding side blocks carrying the side blades, the said blocks being beveled, wedges adapted to force the side blocks forward to clamp the beam, and means for moving the said wedges and stops to limit the movement, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES CHRISTIE.

Witnesses:

WILL. A. BARR,

JOS. H. KLEIN.