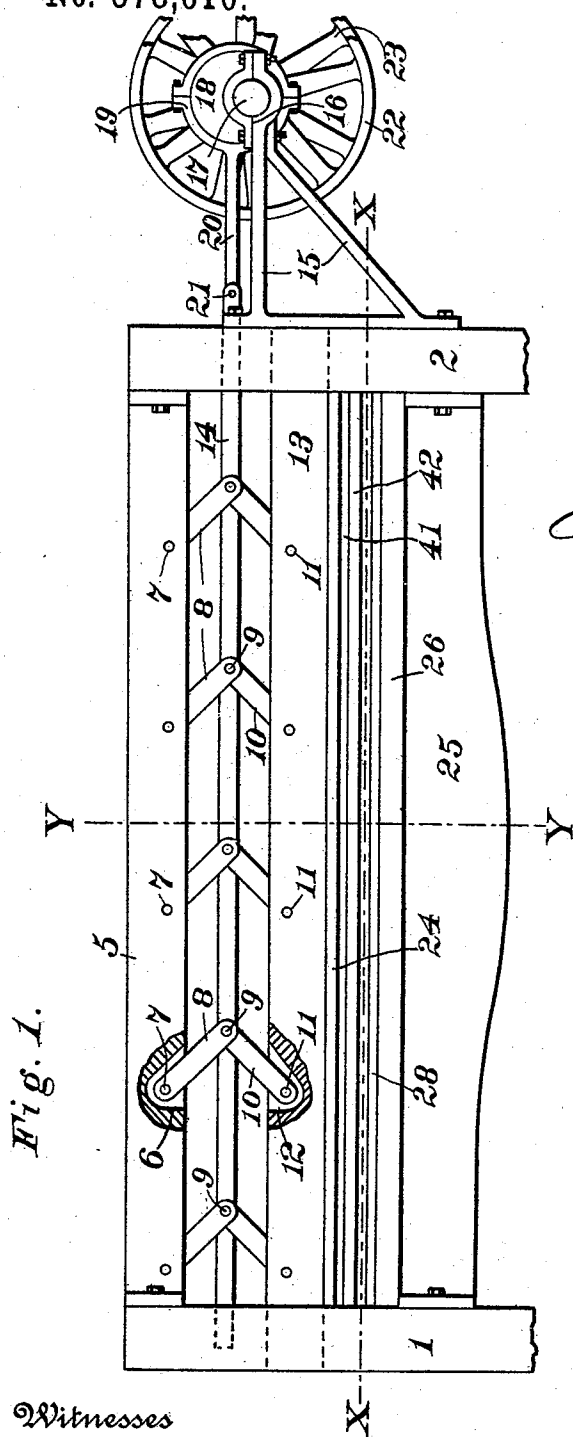


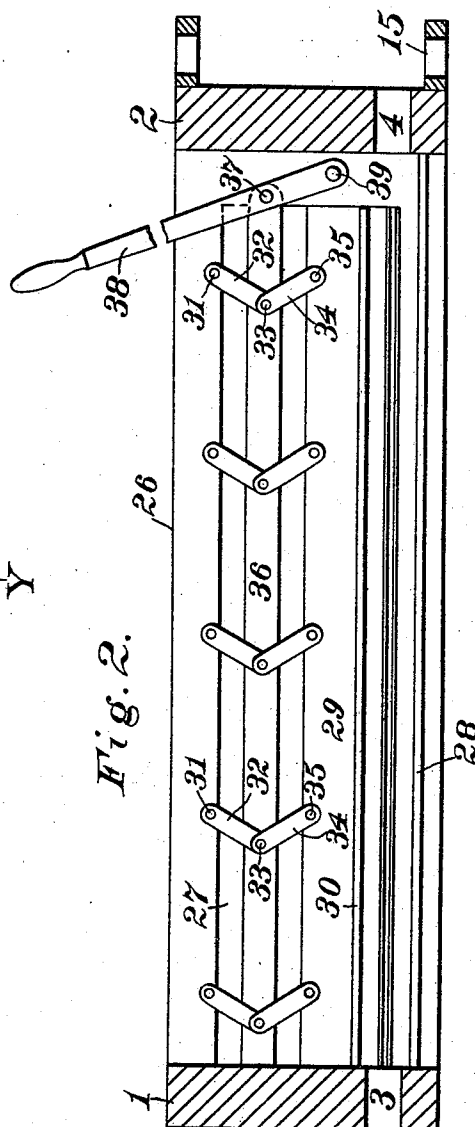
W. C. PENDLETON.
MACHINE FOR FORMING CORNER STRIPS.

No. 578,610.

Patented Mar. 9, 1897.



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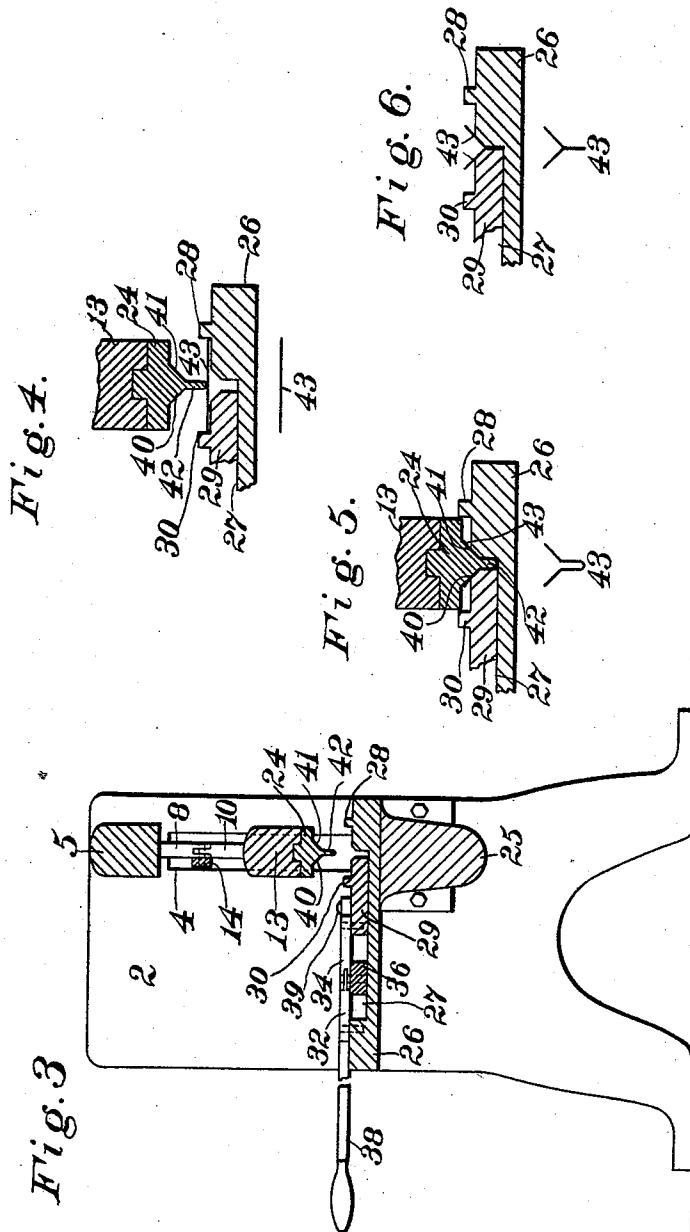


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UNITED STATES PATENT OFFICE.

WILLIAM C. PENDLETON, OF WARREN, OHIO, ASSIGNOR TO THE YOUNGSTOWN IRON AND STEEL ROOFING COMPANY, OF YOUNGSTOWN, OHIO.

MACHINE FOR FORMING CORNER-STRIPS.

SPECIFICATION forming part of Letters Patent No. 578,610, dated March 9, 1897.

Application filed January 4, 1897. Serial No. 617,891. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. PENDLETON, a citizen of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Machines for Forming Corner-Strips; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to machines for bending metal sheets, more particularly to machines for forming corner-strips, such strips being employed wherever the walls or partitions meet at an angle, to support plaster as commonly applied to interiors of buildings.

Corner strips or laths commonly consist of metal sheets, narrow in proportion to length, suitably perforated or punched to provide retaining-orifices and projections to engage plaster and having a longitudinal crease or fold following a line midway between the edges of the sheet. As finally formed the sheet or "corner-strip" possesses a fin or ridge having double the thickness of the sheet and lateral wings by which the strip may be nailed to studding; and the object of my invention is the production of a machine by means of which the forming or folding and bending of corner-strips may be completely carried out. This object I accomplish by constructing a supporting-frame, a vertically-acting die-carrier or gate and mechanism for operating the carrier, a male die attached to the carrier, a table upon which is borne a female die, consisting of one fixed and one laterally movable and adjustable abutment, and adequate means for actuating the movable abutment independently.

Each constituent element of my invention is described in detail, and its office, together with the mode of operation of the whole, fully explained hereinafter.

Referring to the accompanying drawings, wherein like figures are used to designate like parts throughout the several views, Figure 1 represents a side view of my invention. Fig.

2 represents a top plan view of the table, the vertically-acting die-carrier, its supports and operating mechanism being removed above the plane indicated by line X X in the first figure in order that the movable abutment and relating parts may appear clearly. Fig. 3 represents a vertical cross-section of my invention on the plane indicated by line Y Y of Fig. 1. Figs. 4, 5, and 6 represent detached vertical sectional views of dies, table, and a corner-strip, showing the succeeding stages in the forming operation.

Considering Fig. 1, numerals 1 and 2 mark the right and left end or leg frames, of any convenient size and shape, having the vertical slots 3 4. (See Fig. 2.) The upper stay-beam or bridge-piece, having flanged ends bolted to frames 1 and 2, as shown, is numbered 5, and it is provided at intervals with mortises, one of which appears in the first figure, (designated by numeral 6.) In each of the mortises pins 7 7 pivotally retain the upper levers 8 8 of a series of toggle-joints in connection with beam 5. Levers 8 8 are pivotally attached by pins 9 9 to lower levers 10 10, that are in their turn pivotally held by pins 11 11 within mortises 12 12, extending from the upper surface of a bar or die carrier 13. At each end the die-carrier is suitably constructed to enter the vertical slots 3 4 in end frames 1 2, and it may be reciprocated vertically in and guided by those slots, as more fully discussed later herein. Pins 9 9 project beyond the levers and engage orifices in a connecting-rod 14, thus attaching the rod pivotally to each toggle-joint, all of which may therefore be simultaneously actuated in the ordinary manner. One end of rod 14 passes through slot 4 and will be again mentioned.

Upon the outer surface of end frame 2 are fixed twin brackets, one only being shown (see Fig. 1) and marked 15. Each bracket supports a bearing 16, wherein rotates a horizontal shaft 17. Upon the shaft is an eccentric 18, having the customary strap 19 and rod 20, the last named and numbered part being coupled by pin 21 with the outermost end of rod 14, above referred to. A fixed and a free pulley 22 23 are also borne by shaft 17, and it will be readily understood that upon

the application of a power-operated belt, rod 14 will be moved back and forth and die-carrier 13 raised and lowered correspondingly.

The shape of the male die 24 is shown in Fig. 3, where it appears secured to the lower face of the die-carrier.

In Figs. 1 and 3 will be seen the lower stay-beam or bridge-piece 25, and formed integrally with the beam or fastened upon it is a table 26. In Figs. 2 and 3 is shown the longitudinal groove 27 in the table, the right-hand wall of the groove constituting one side of the female die. The right edge of groove 27 is usually beveled, and a bead or ridge 28 is formed longitudinally upon the upper surface of the table near that edge of the groove. Movable laterally within the groove is the plate 29, the right-hand side of which completes the female die. It will be observed that the right upper edge of plate 29 is beveled in correspondence with the edge of groove 27 and that a bead or ridge 30 is situated upon the upper surface of the plate 29 at the same distance from its right side as intervenes between bead 28 and the edge of groove 27.

Considering Fig. 2, the screws or pins 31 pivotally connect the outer members 32 of a series of toggle-joints with table 26, and pins 33 couple the inner members 34 and outer members 32. A third series of pins 35 pivotally combine the plate 29 and the toggle-joints. Pins 33, as my invention is usually constructed, project below the members of the toggle-joints and engage orifices in a connecting-rod 36, which reciprocates in groove 27. One end of rod 36 is pivotally attached by pin 37 to a lever 38, and a fulcrum 39 is provided for the lever upon the table or upon the end frame, as may be deemed expedient in different machines.

From the foregoing description, taken in connection with Fig. 2, it is believed to be clear that plate 29 may be moved sidewise outwardly and inwardly, approaching or receding from the right side of groove 27, and that it may be brought into contact with that side.

The operation of my invention may be explained as follows: Male die 24 possesses two converging surfaces 40 41, (see Fig. 3,) longitudinally placed, and from their line of intersection there projects a blade or fin 42. As previously stated, the male die is suitably secured to the reciprocative die-carrier, and the parts are assembled and the mechanism so proportioned that the blade of the die may be brought downward into groove 27 in proximity to the right side of the groove. Plate 29 being moved toward the right until a predetermined interval remains between the side of the plate and the side of groove 27 a female die, corresponding in shape to the male die in a degree, is provided. Let a strip of sheet metal 43 be introduced between beads 28 and 30, which are intended to prevent the displacement of a sheet once laid in position, as set out in Fig. 4. Upon lowering the die

24 the sheet metal is bent throughout its length upon a middle line, and its edges rise under the pressure until they come into contact with the converging surfaces 40 41 of the male die. (See Fig. 5.) It will be understood that upon raising die 24 some space remains in the fold from which the blade was withdrawn, and to close this open space completely by compressing the bend is the office of the laterally-movable plate 29. (See Fig. 6.) Manifestly any effective means for actuating the plate could be substituted for the handle shown and specified herein, and I do not confine myself to that particular construction.

While the toggle-joints and connecting-rods are advantageously utilized in connection with the die-carrier and plate of my invention, equal pressures being thereby applied throughout the length of those parts, other equivalent and well-known mechanical derivatives of the crank, cam, or eccentric could be substituted, and I do not, therefore, limit myself to the toggle-joints.

I am aware that presses have been constructed for corrugating sheet metal in which vertically-acting die-carriers are raised and lowered practically as set out in this application, but I have no knowledge of a machine combining the vertically and horizontally movable components with cooperating details, as specified hereinabove.

Having thus described my invention, what I claim, and desire to protect by Letters Patent of the United States, is—

1. In a machine for forming corner-strips, the combination of a frame, a die-carrier, a male die secured to said carrier, mechanism arranged to reciprocate said carrier and die, suitable guides for said carrier, a table, a female die supported by the table and consisting of a fixed portion and a movable portion, and devices adapted to actuate the movable portion of said female die, substantially as described.

2. In a machine for forming corner-strips, the combination of a frame, a die-carrier, a male die secured to said carrier, a series of toggle-joints pivotally attached to said frame and die-carrier, a connecting-rod pivotally secured to each of said toggle-joints, mechanism arranged to reciprocate said rod, suitable guides for said carrier, a table, a female die supported by the table and consisting of a fixed portion and a movable portion, and devices adapted to actuate the movable portion of said female die, substantially as described.

3. In a machine for forming corner-strips, the combination of a frame, a die-carrier, a male die secured to said carrier, mechanism arranged to reciprocate said carrier and die, suitable guides for said carrier, a table, a female die supported by the table and consisting of a fixed portion and a movable portion, a series of toggle-joints pivotally attached to said table and to the movable portion of said female die, a connecting-rod pivotally secured

to each of said toggle-joints, and devices adapted to reciprocate said rod, substantially as described.

4. In a machine for forming corner-strips, 5 the combination of a frame, a die-carrier, a male die secured to said carrier, a series of toggle-joints pivotally attached to said frame and die-carrier, a connecting-rod pivotally 10 secured to each of said toggle-joints, mechanism arranged to reciprocate said rod, suitable guides for said carrier, a table, a female die supported by the table and consisting of a fixed portion and a movable portion, a series of toggle-joints pivotally attached to said 15 table and to the movable portion of said female die, a connecting-rod pivotally secured to each of said last-mentioned series of toggle-joints, and devices adapted to reciprocate said rod, substantially as described.

20 5. In a machine for forming corner-strips, the combination of a frame, a die-carrier, a male die secured to said carrier, mechanism arranged to reciprocate said carrier and die, suitable guides for said carrier, a table hav- 25 ing a longitudinal groove, one side of said groove constructed to constitute the fixed portion of a female die, a plate movable laterally within said groove and constructed to constitute the complementary portion of said female 30 die, a series of toggle-joints pivotally attached to said table and to said movable plate, a connecting-rod pivotally secured to each of said

toggle-joints, and devices adapted to reciprocate said rod, substantially as described.

6. In a machine for forming corner-strips, 35 the combination of a frame, a die-carrier, a male die secured to said carrier, said male die having two inclined converging surfaces and a projecting blade, a series of toggle-joints pivotally attached to said frame and die-car- 40 rier, a connecting-rod pivotally secured to each of said toggle-joints, mechanism arranged to reciprocate said rod, suitable guides for said carrier, a table having a longitudinal groove, one side of said groove constructed to 45 constitute the fixed portion of a female die corresponding to said male die, said table provided with a bead upon its upper surface, a plate movable laterally within said groove and constructed to constitute the comple- 50 mental portion of said female die, said plate provided with a bead upon its upper surface, a series of toggle-joints pivotally attached to said table and to said movable plate, a connect- 55 ing-rod pivotally secured to each of said last-mentioned series of toggle-joints, and devices adapted to reciprocate said rod, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM C. PENDLETON.

Witnesses:

FRANK S. CHRYST,
W. H. JOHNSTON.