(No Model.)

T. W. IRWIN.

MACHINE FOR SHAPING SHEET METAL.

No. 407,530. Patented July 23, 1889.

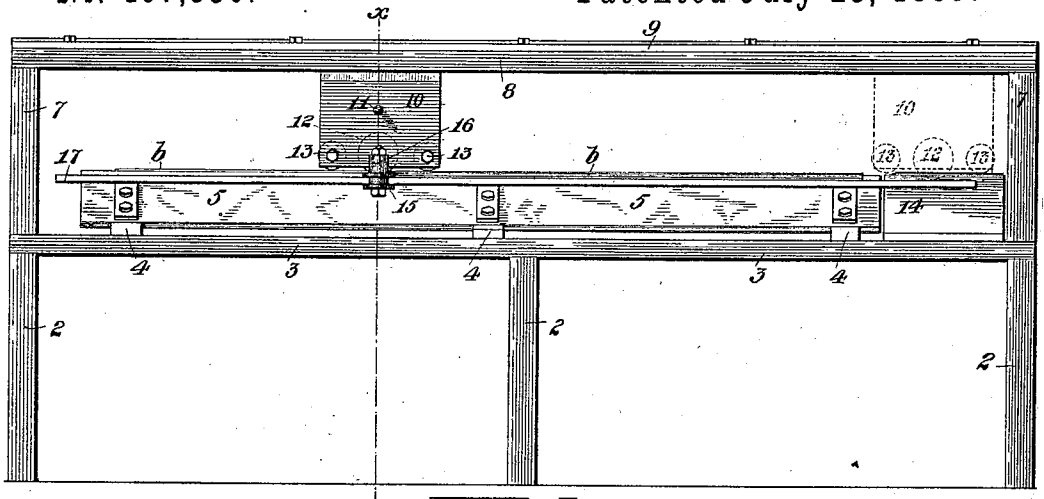


FIG. 1.

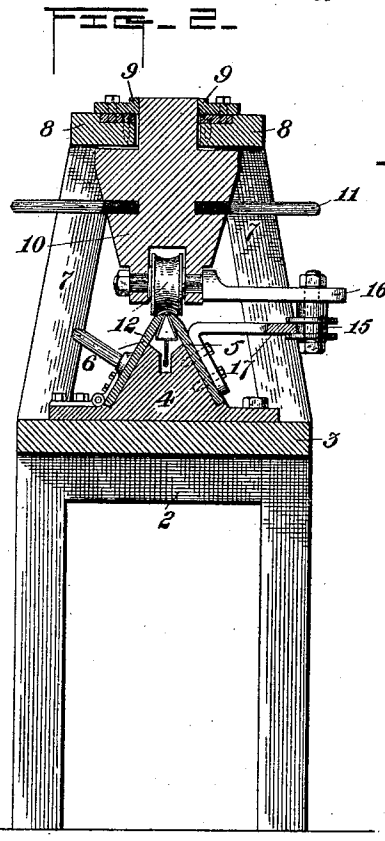


FIG. 2.

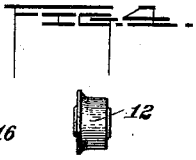


FIG. 4.

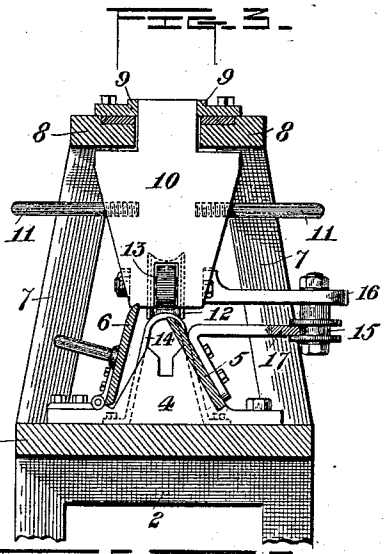


FIG. 3.

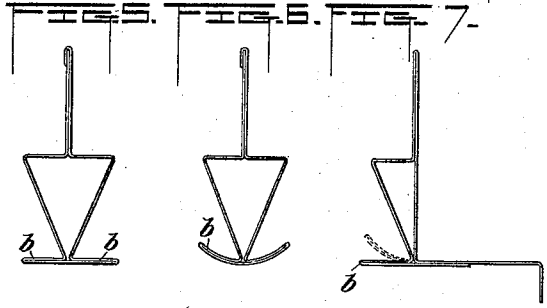


FIG. 5. FIG. 6. FIG. 7.

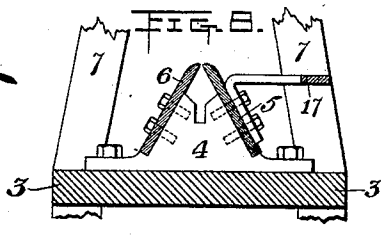


FIG. 8.

Witnesses
L. A. Conner Jr.
E. R. Conner.

Inventor
Thomas W. Irwin
by W. Baxendell & Son
his Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

THOMAS W. IRWIN, OF ALLEGHENY, PENNSYLVANIA.

MACHINE FOR SHAPING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 407,530, dated July 23, 1889.

Application filed December 6, 1888. Serial No. 292,833. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. IRWIN, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machines for Shaping Sheet Metal; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a vertical cross-section on the line *x x* of Fig. 1. Fig. 3 is a vertical cross-section on the same line, showing the bending-carriage in end view moved back to permit the insertion of a new piece of sheet metal into the machine. Fig. 4 is a detached view of a forming-wheel which I employ for bending a flange of the shape shown in Fig. 7. Fig. 5 is an end view illustrating the shape into which the skylight-bars are bent before they are placed in the machine for bending the gutter-flanges. Fig. 6 is an end view of one of the finished skylight-bars. Fig. 7 is an end view showing a modified form of the bar. Fig. 8 is a vertical cross-section on a line corresponding to the line *x x* of Fig. 1, showing a modified arrangement of the supporting-bed for the article to be shaped.

Like symbols of reference indicate like parts in each.

In the drawings, 2 represents the frame of the machine, on the bed 3 of which blocks 4 are set, having inclined sides, to one side of which is bolted a plate 5, and at the base of the other side of the blocks is hinged a plate 6, which is movable on its hinge up against the side of the blocks. Both plates 5 and 6 may be hinged, or, if it be desired, one or both of them may be removably bolted to the blocks 4 instead of being hinged thereto. I illustrate this construction in Fig. 8. These plates are curved at the top, and they thus constitute a curved shaping or forming die bed, the parts of which are separated by an intervening slot or space. The plates are of a suitable length, as shown in Fig. 1, corresponding to the length of the metal pieces which are to be shaped by the machine. Above the bed of the machine is a frame 7, having parallel top rails 8, to which are bolted adjustable metal slide-pieces 9, between which slide-pieces is set the shank of a traveling carriage 10, which is movable by the operator through handles 11 back and forth over the bed of the machine. At the bottom of the carriage is a forming-wheel 12, having a grooved periphery which is adapted to work upon and conform to the surface of the curved bed afforded by the tops of the forming-plates 5 and 6. The carriage is steadied in its movements and prevented from tipping forward or backward by means of guide-wheels 13, journaled at both sides of the forming-wheel 12. The carriage is guided laterally by means of a guide-roller 15, fixed to a projecting arm 16 of the carriage and bearing on a guide-rail 17, which is parallel with the course of the carriage.

The operation of the machine is as follows: A piece of sheet metal of the proper length and width is taken and bent into a blank, the form in cross-section of which is shown in Fig. 5. Then, in order to place it in the machine for the purpose of reducing it to the form of Fig. 6, I move the carriage back from over the forming-plates 5 and 6 upon a block or rest 14 at the end of the machine, as shown by dotted lines in Fig. 1, and I then move back the plate 6 on its hinge into the position shown in Fig. 3. The blank of Fig. 5 is then placed in the machine in the manner illustrated in Fig. 2, with its horizontal flanges *b b* resting on top of the forming-plates. Then, having closed the plate 6 into the position of Fig. 2, the workman seizes the handle 11 and draws or pushes the carriage along the machine. The carriage being made heavy, preferably of cast-iron, acting on the flanges *b b* through the curved forming-wheel 12, bends the flanges down upon the plates 5 and 6, thus reducing them to the finished form, which I show in Fig. 6. The work is introduced into a machine—such as shown in Fig. 8—by endwise insertion. The work is performed in this way by one passage of the carriage. It is done quickly and with little labor and cost, whereas the old method of curving these flanges by mallet-work was tedious and laborious and caused a very considerable cost to the manufacturer.

The construction of the bed-die may be modified in form to suit the necessities of particular cases. In the form which I have shown the sides are inclined to correspond

with the inclination of the shank of the article. They thus exercise a formative effect on the article, and if there are any irregularities in it they are corrected when the sides are brought together.

The machine which I have described is designed for bending both flanges of the bars simultaneously. When it is desired to bend only one flange, as shown by dotted lines in Fig. 7, I employ the form of roller shown in Fig. 4, which instead of being grooved in its periphery and having two operative forming-flanges is provided with but one. The rolls may be otherwise modified in form to suit the peculiar shape intended to be given to the flanges.

I have devised my machine especially for the work of bending the gutter-flanges of skylight-bars, and have so described it; but I do not desire to limit its use thereto, since with suitable modifications it may be employed for the purpose of bending similar sheet-metal shapes.

I claim as my invention—

1. An improvement in machines for bending sheet metal, which consists in the combination of a die-bed for supporting the article to be formed and of corresponding shape with the formed article, and a traveling weighted forming-roller arranged loosely in guides above the die-bed and supported by the die-bed and freely movable thereon by hand, substantially as described.

2. A machine for bending sheet metal, comprising a die-bed shaped correspondingly to the formed article, combined with a roller similarly shaped, a weighted carriage in which the roller is supported, and guideways which direct the carriage laterally, substantially as described.

3. The combination of a die-bed shaped substantially like the article to be formed, a forming-roller of complemental peripheral outline, a carriage in which the roller is supported, the die-bed directly receiving the carriage and roller and supporting their weight, and ways arranged over the die-bed and parallel therewith and by which the carriage is guided and adapted to be traversed along the same to act upon and shape the article upon the die-bed, substantially as and for the purposes described.

4. A machine for bending sheet-metal blanks, having flanges and a part forming the shank, which consists in a die-bed constituted of side pieces, between which the shank is placed and on which the flanges rest, and a hand-moved weighted forming-roller, of complemental peripheral outline, which travels on the said flanges and shapes them on the said die-bed, substantially as and for the purposes described.

5. An improvement in machines for bending sheet-metal articles, which consists in the combination of a die-bed for supporting the article to be formed and of corresponding shape with the formed article and constituted of side pieces, at least one of which is separable from the others to permit the introduction of the article to be shaped, and a traveling weighted forming-roller arranged loosely in guides above the die-bed and supported by the die-bed and freely movable thereon by hand, substantially as described.

6. In machines for bending sheet metal, having flanges and a part forming the shank, a die-bed consisting of side pieces, at least one of which is hinged to admit the shank, and on which side pieces the flanges rest, a forming-roller, and a reciprocating carriage in which the roller is arranged and which causes the roller to travel on said flanges and shape the flanges upon the die-bed, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 23d day of November, A. D. 1888.

THOMAS W. IRWIN.

Witnesses:
W. B. CORWIN,
JNO. K. SMITH.