

W. F. COZZENS & W. H. WIGGIN.  
Machines for Bending Sheet-Metal.

No. 141,329.

Patented July 29, 1873.

Fig. 1.

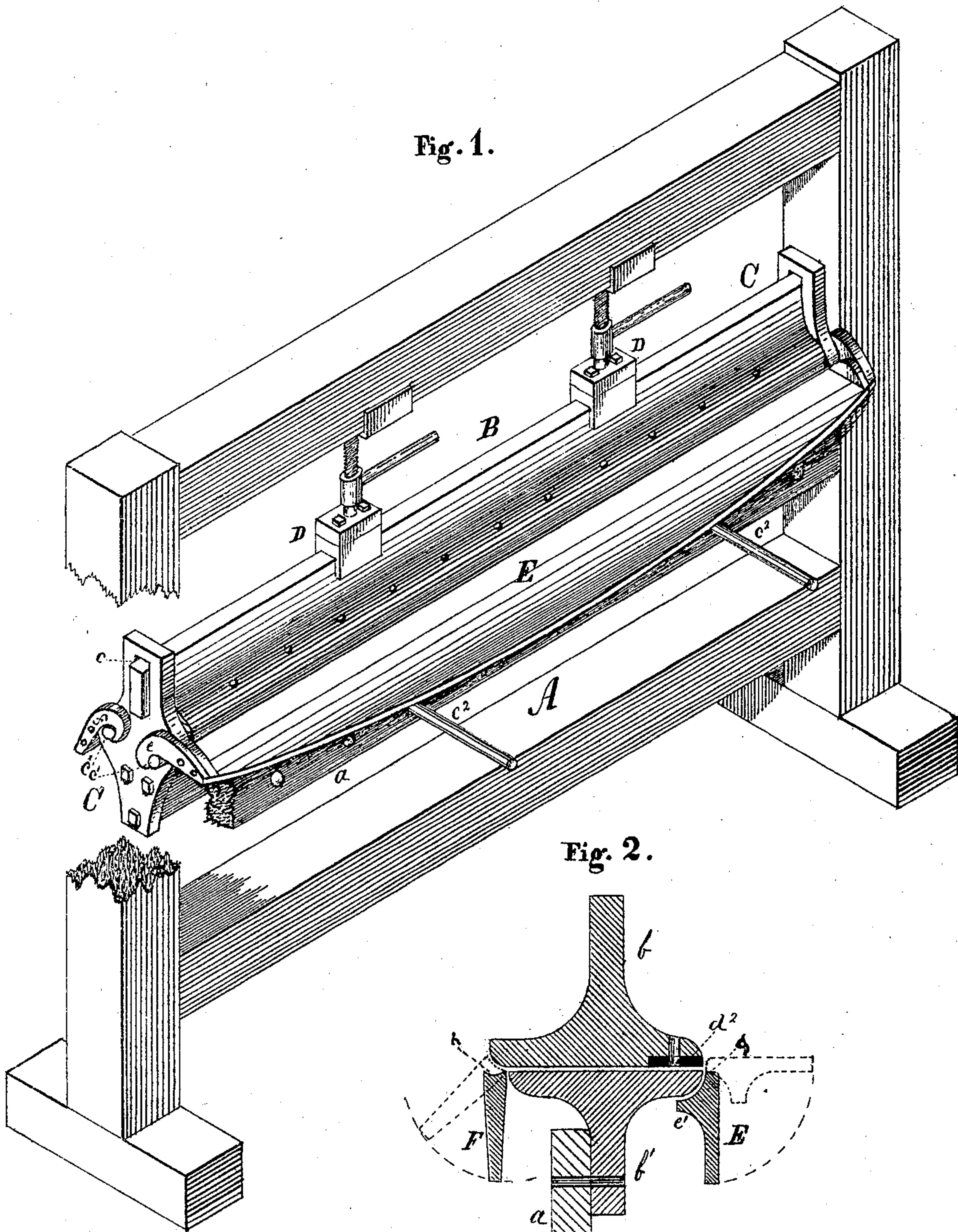
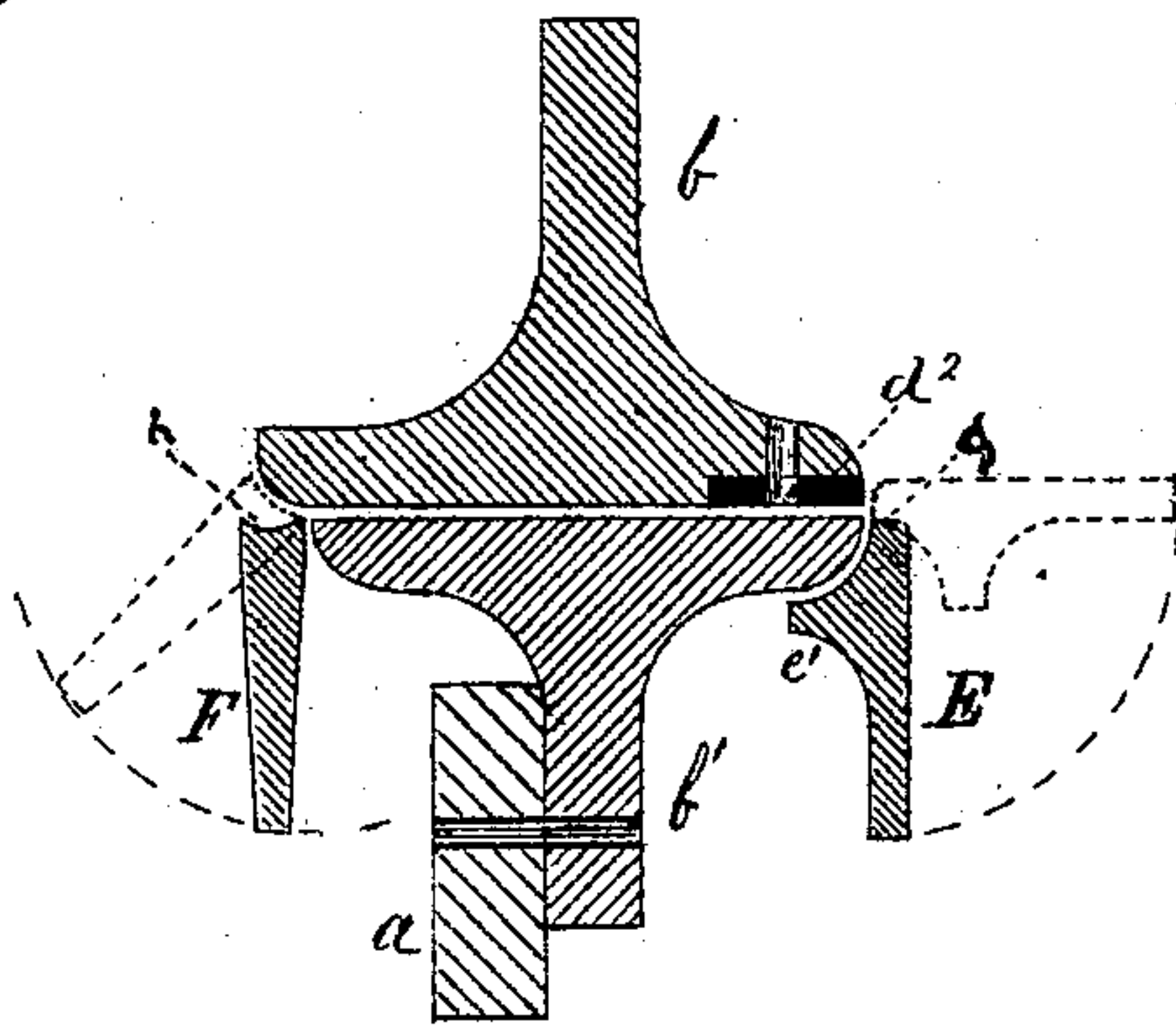


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN MACHINES FOR BENDING SHEET METAL.

Specification forming part of Letters Patent No. **141,329**, dated July 29, 1873; application filed October 18, 1872.

*To all whom it may concern:*

Be it known that we, WILLIAM F. COZZENS and WILLIAM H. WIGGIN, of St. Louis, in the county of St. Louis and State of Missouri, have invented a new and useful Improvement in Machines for Forming Metal Cornices; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Figure 1 shows the invention in perspective; part of the frame is broken away to show the arrangement for hinging the leaves. Fig. 2 is a transverse central section of the jaws and leaves; the dotted lines show the position of the leaves when turned up.

Like letters of like kind refer to like parts.

The invention relates to improvements in machinery for forming metal cornices; and it consists in certain combinations of parts, as will be fully described hereinafter.

In the accompanying drawing, A represents an upright frame of ordinary construction, in which is suitably fastened the vise and other parts which constitute the machine. B represents a vise, consisting of two jaws, an upper movable one, *b*, and a lower stationary one, *b'*. The vise is arranged in a horizontal direction, extending across the frame. The lower jaw *b'* is fastened to a cross-piece, *a*. C C represent guide-pieces that are fastened to the ends of the lower jaw. They are provided at their upper ends with slots *c c* for the ends of the upper jaw to move in. D D represent two tightening-screws, by which the upper jaw is operated and held down upon the lower jaw. They are arranged on the upper side of the upper jaw, between it and the upper bar of the frame A, and, respectively, about one-fourth of the length of the jaw in from the ends of the jaw. The general shape of the jaws in cross-section is that of a T. Both edges of the face of the lower jaw are made sharp. The edge of the face of the upper jaw on the side of the machine on which angles are formed is also sharp, and coincides with the edge of the lower jaw. The opposite edge of the face of the upper jaw is convex. In width the faces of the jaws are equal, the convexity of the edge of the upper jaw above described extending beyond the line of the face

of the lower jaw. E represents a forming-leaf arranged on the angle-forming side, and F represents a forming-leaf on the curve-forming side of the machine. They are at their ends provided with hooks *e* and *f*, respectively, which engage with and turn upon studs *c<sup>1</sup> c<sup>1</sup>*, with which the guides at their outer faces are provided. The studs or journals *c<sup>1</sup> c<sup>1</sup>* are arranged so that their axes coincide, respectively, with the lower inner corners of the inner edges of the leaves E and F. The inner edge *g* of the leaf E or angle-forming leaf is flat. This leaf is strengthened horizontally by widening it toward its center, as shown in Fig. 1. It is strengthened vertically by the rib *e'*. The lower inner corner of the inner edge of the leaf E coincides as closely as is practicable with the angle-side corner of the face of the lower jaw, reference in this respect being had to the thickness of the sheet and the character of the metal being operated on. When the leaf E is turned down its inner edge *g* is flush with the face of the lower jaw. The inner edge *f* of the leaf F is made concave. Its inner corner coincides as closely as is practicable with the curve-side edge of the face of the lower jaw. The concavity of the edge *h* corresponds with the convexity of the curve-side edge of the face of the upper jaw, above described. When the leaf F is turned down its inner edge is flush with the face of the lower jaw. The upper jaw is furnished with a steel plate, *d'*, at the angle-side corner.

To operate the invention in forming square turns or angles, the leaf E being turned down and the upper jaw being raised sufficiently, the sheet of metal is introduced the desired distance between the jaws from the angle side. The upper jaw is then screwed firmly down, and the leaf E, by means of the handles *c<sup>2</sup> c<sup>2</sup>*, turned up. In forming a right angle the leaf assumes the position shown by the dotted lines in Fig. 2. In forming obtuse angles it is turned up the proportionate distance. To form curves the same operation in general is performed on the curve side of the machine.

When a curve of the shape of the convexity of the edge of the upper jaw is made the leaf F is turned up closely against the convex edge above. To form curves of greater radius the leaf is turned up but the proportion-



ate distance. The more moderate the curve, the less the distance, and the more the times the leaf is raised. In forming the curves last described the sheet with every raising of the leaf is drawn out from the side a distance corresponding to the curve. The distance to which the leaf should be raised to form the proper curve can be determined by a gage; but in practice the operator soon becomes sufficiently skilled to dispense with it. In forming the last-described curves it is not essential that the edge *h* of the leaf should be concave, as shown, with both its upper and lower corners projecting the same distance. It is, however, necessary that the upper or outer corner should project further than all that part of the edge that lies between the upper and lower corners.

From the above-described construction several important advantages accrue. By arranging the edges of the jaws on the angle side, the axes upon which the forming-leaf turns, and the inner edge of the leaf, as set forth, it will readily be seen that a strong leverage is obtained. A similar result is obtained on the opposite side of the machine. In the arrangement of the tightening-screws, as specified, there is such a distribution of the clamping agency as to prevent the giving way of the jaw, from its springing, when required to sustain a heavy pressure.

It is essential in forming an angle to avoid the shearing of the metal, as is apt to take place if during the operation the jaw bends, and with it a portion of the sheet; also, if the jaw yields or the forming-leaf, it is impracticable to form a sharp angle.

As the forming-leaf in its motion has to sustain a resistance in both directions it is im-

portant it should be strengthened in the manner set forth. In connecting the leaves to their support by means of hooks it is easy to detach and replace them. In giving the inverted T shape to the upper jaw space is afforded for the projecting parts of the cornice to fall into as the operation proceeds.

From the construction and arrangement of the parts on the curve side of the machine not only shapes of any desired curvature can be formed readily, but the operator is able without withdrawing the work from the vise to change the degree of the curve; and in forming that class of curves termed ogee he can easily cause the two parts of the curve to gradually and gracefully blend without the need, as has heretofore been the custom, of withdrawing the work and hammering it at a bench, thus saving in expense and improving in quality.

Finally, in combining in one machine both an angle and a curve forming construction, arranged as set forth, all the parts of a cornice can be made readily and economically.

What we claim, and desire to be secured by Letters Patent, is—

1. The leaf *F* provided with the concavity *h*, in combination with the jaws *b b'*, as described, for the purpose set forth.

2. The leaves *E F* having hooks *e f*, in combination with the studs *c<sup>1</sup> c<sup>1</sup>* upon the iron *C*, as described, for the purpose set forth.

This specification signed and witnessed this 8th day of October, 1872.

WM. F. COZZENS.

WILLIAM H. WIGGIN.

Witnesses:

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