

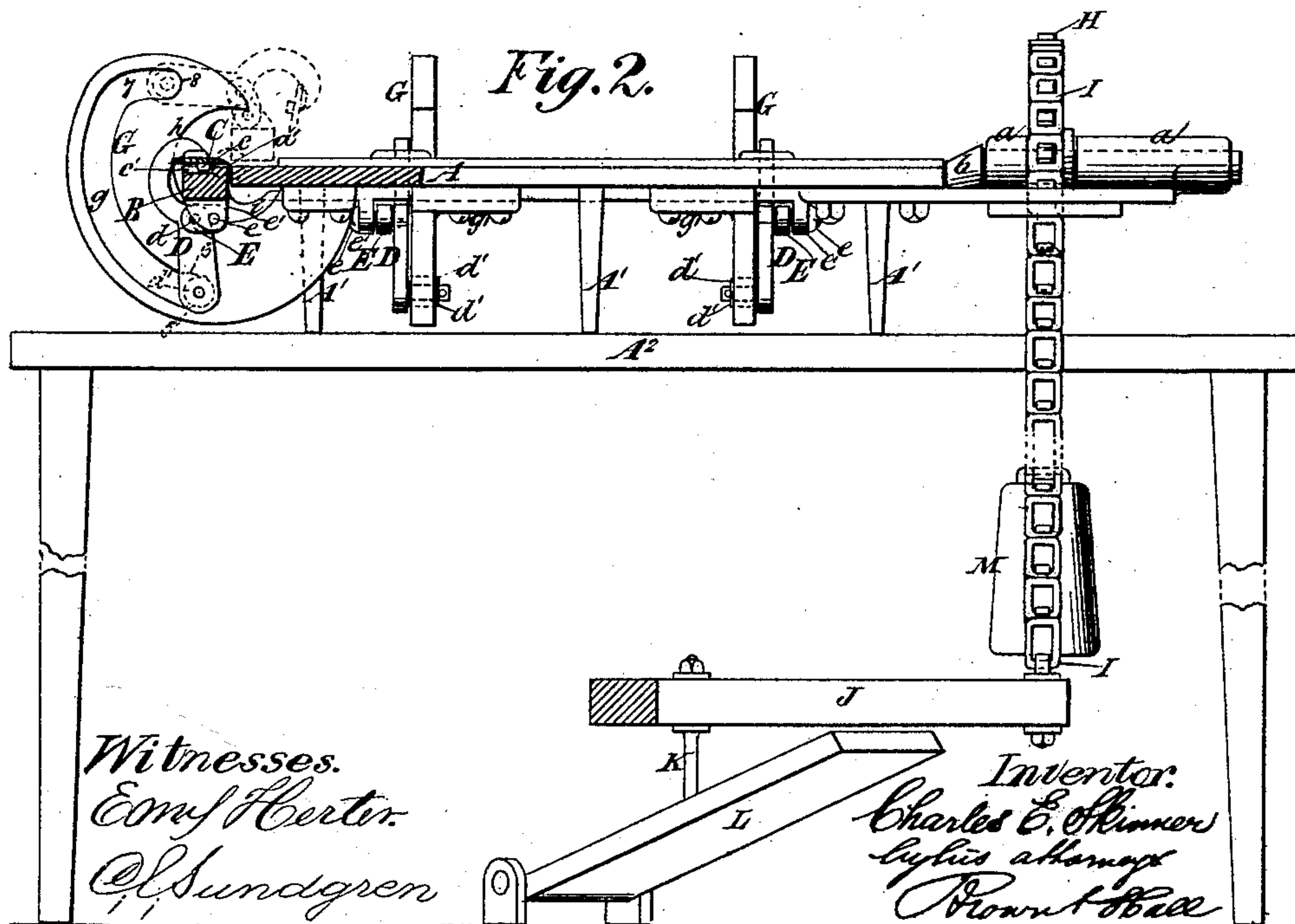
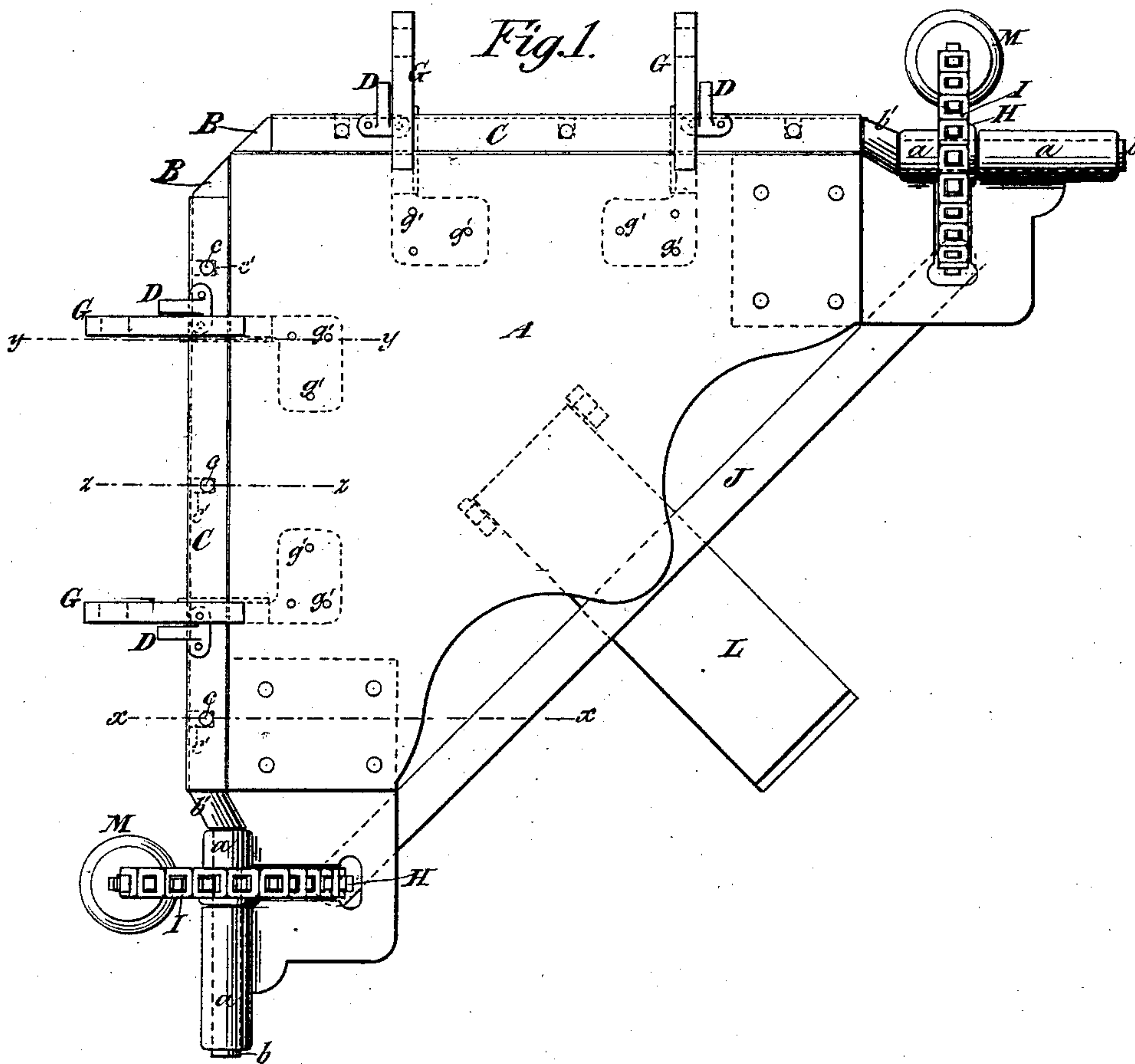
(No Model.)

2 Sheets—Sheet 1.

C. E. SKINNER.
MACHINE FOR EDGING SHEET METAL.

No. 358,991.

Patented Mar. 8, 1887.



Witnesses.

Emil Herter.

O. Sundgren

Inventor.

Charles E. Skinner

By his attorney

Robert H. Ball

(No Model.)

2 Sheets—Sheet 2.

C. E. SKINNER.
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Fig. 3.

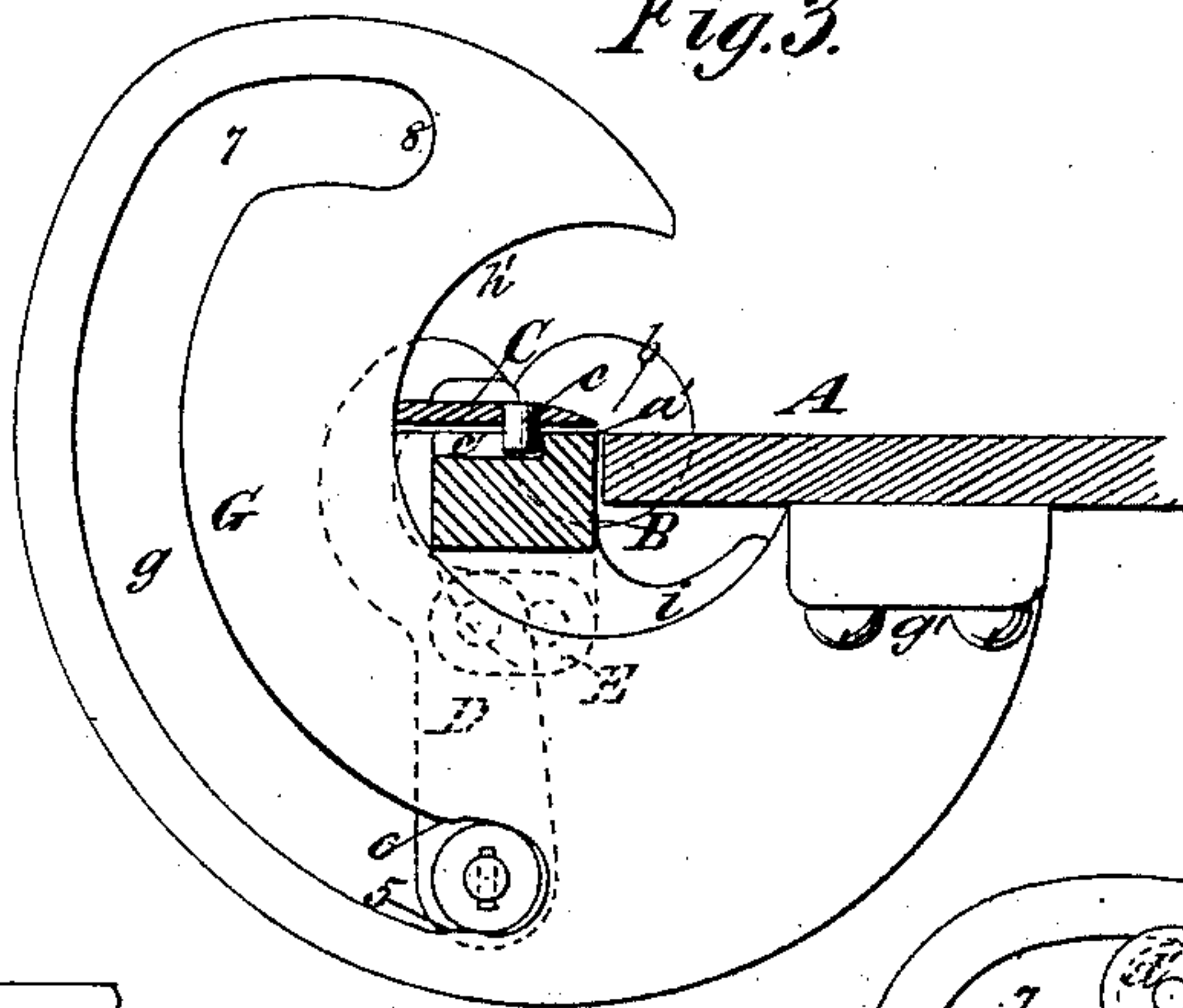


Fig. 5.

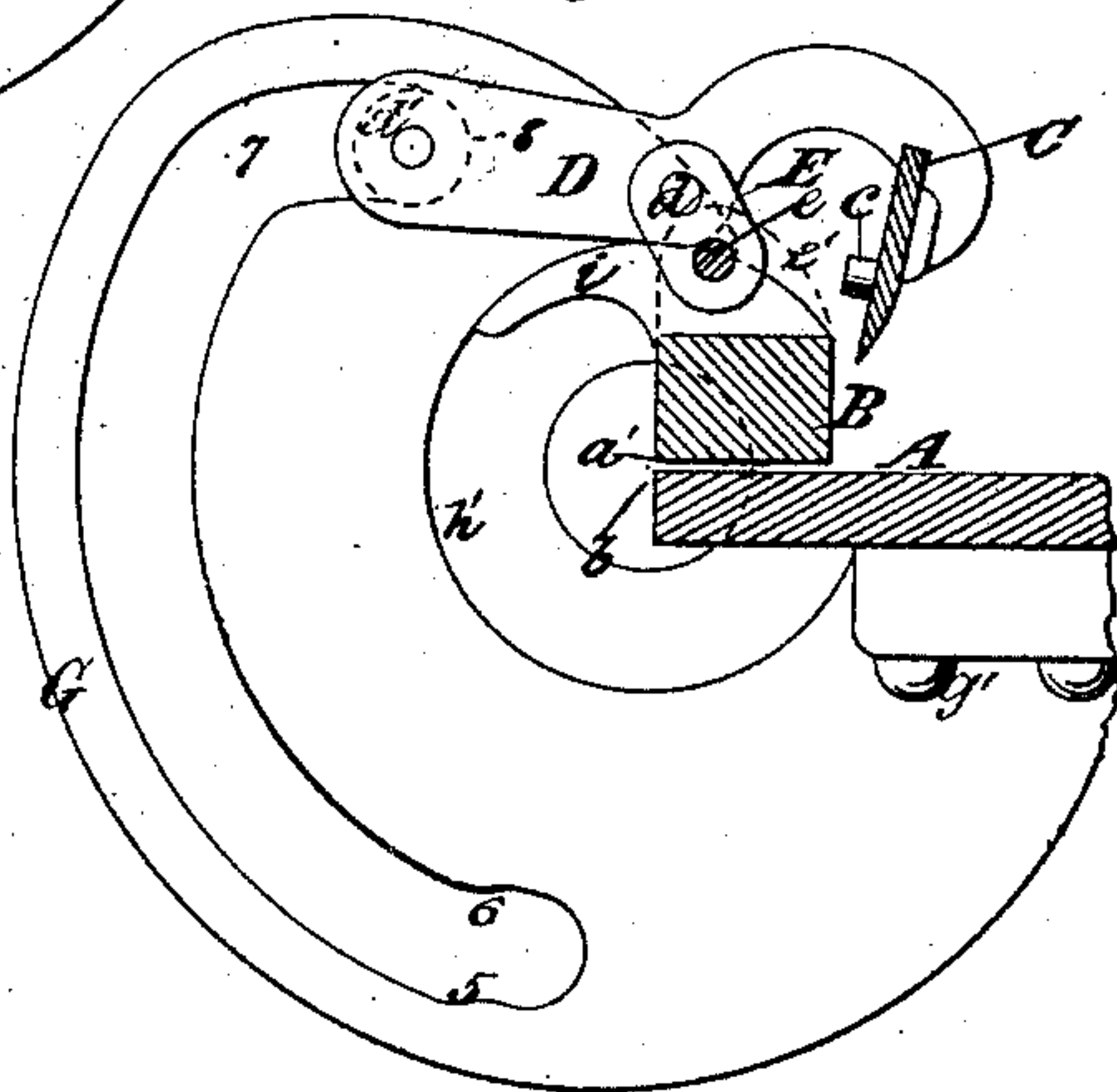


Fig. 4.

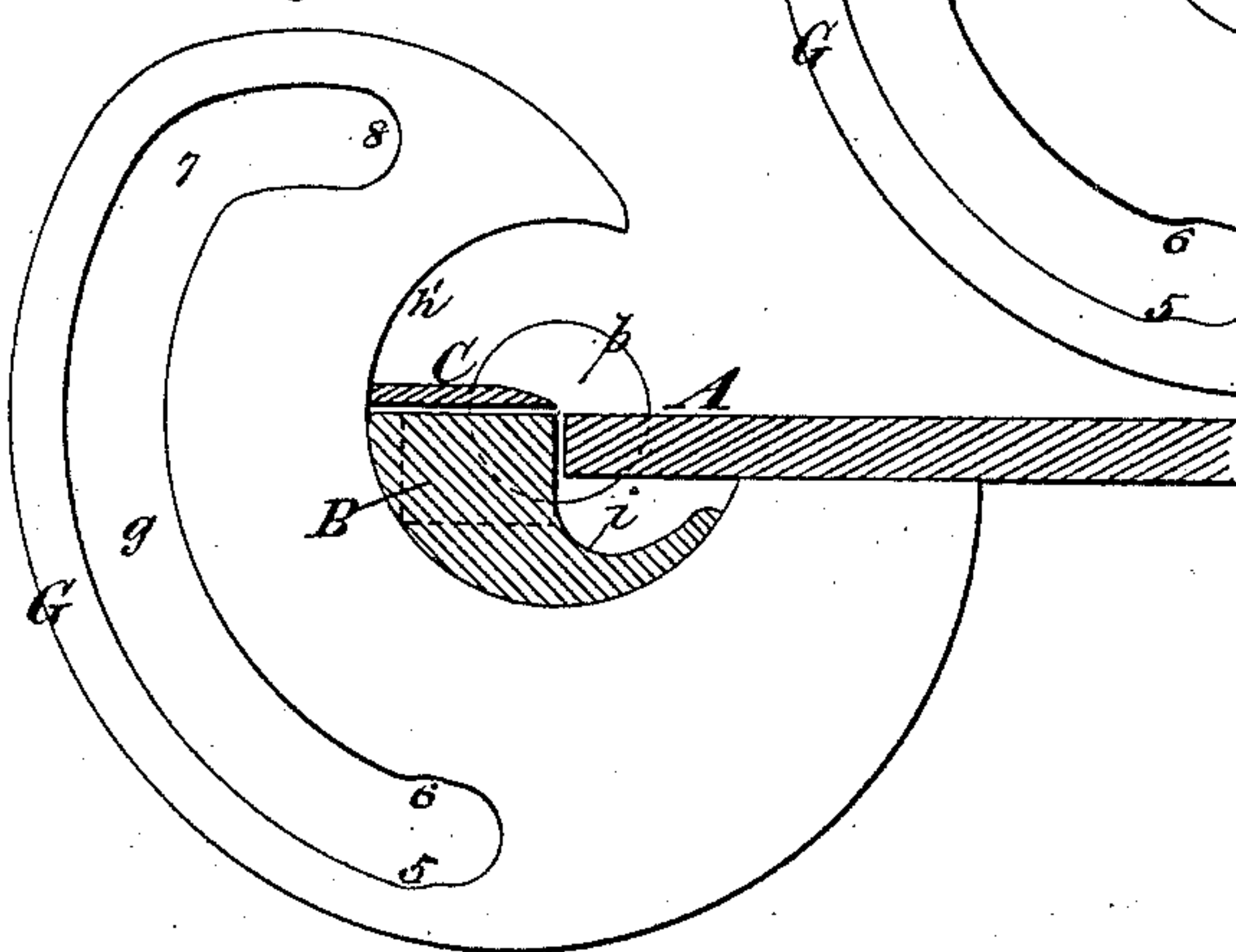
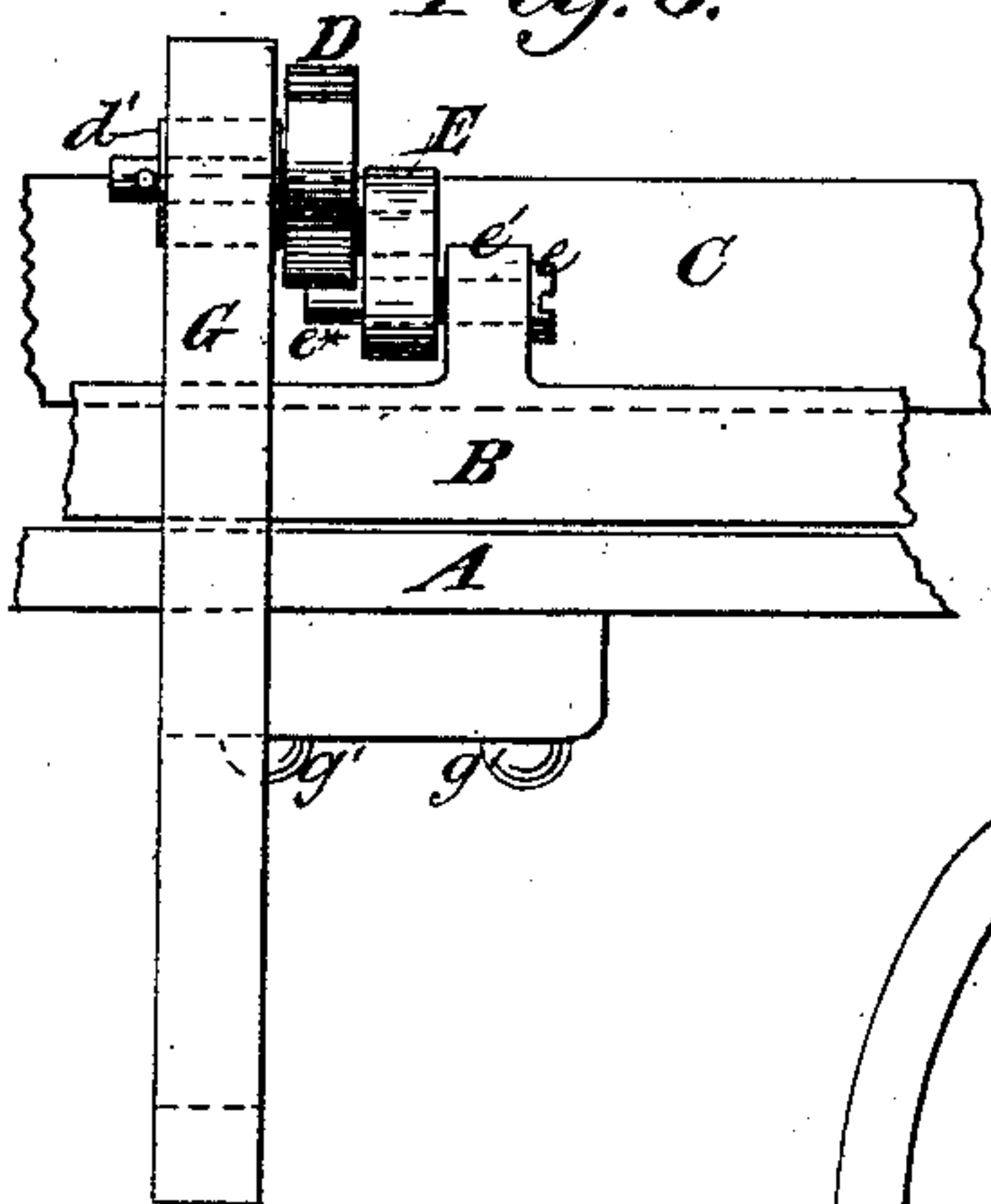


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES E. SKINNER, OF YONKERS, NEW YORK.

MACHINE FOR EDGING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 358,991, dated March 8, 1887.

Application filed January 20, 1887. Serial No. 224,839. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SKINNER, of Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Machines for Edging Tin-Plate and other Sheet Metal, of which the following is a specification, reference being had to the accompanying drawings, forming part of this specification.

The machine or tool commonly employed by tinsmiths and sheet-metal workers for what is called "edging"—that is to say, turning in the edges of sheets—consists, simply, of a bench and a semi-rotary bar containing a narrow groove to receive the edge of the plate. This bar, after it has been turned over to edge the plate, requires to be turned nearly all the way back, and the body of the plate has to be thrown over before the plate can be released; and, moreover, by such a machine or tool only one edge of a plate can be edged at a time.

The object of my invention is to facilitate the edging operation, to avoid the necessity of turning the plate for removing it from the machine, and to provide for edging two sides of a plate simultaneously.

The invention consists, essentially, in the combination, with a plate or support, of a pair of clamping-jaws, one of which is pivoted to the said plate or support and the other of which is attached to the first one, but automatically movable relatively thereto, whereby the sheet to be edged may first have its edge clamped between the jaws, and while so clamped may have its edge partly turned over or folded, and afterward one jaw may be moved out of the way of the other by the action of the latter, while the turning over or folding is completed by the latter in such manner as to provide for the easy removal of the sheet.

The invention also consists in certain combinations of details hereinafter described and claimed; and it further consists in the combination of two such pairs of jaws and gearing, as hereinafter described and claimed, whereby two edges of a sheet may be edged at the same time.

In the accompanying drawings, Figure 1 is a plan view of an edging-machine embodying my invention in a form to perform the edging

of two edges of a sheet simultaneously. Fig. 2 represents a vertical section of the same in the line $x x$ of Fig. 1. Fig. 3 is a transverse sectional view, on a larger scale, of the clamping-jaws and their operating mechanism and part of the table or support in the line $z z$, Fig. 1, showing the jaws in position to receive a sheet to be edged. Fig. 4 is a transverse sectional view of a part of the table and one of the clamping-jaws in the line $y y$, Fig. 1. Fig. 5 is a transverse sectional view showing the position of the clamping and folding jaws after folding, and Fig. 6 is a rear view corresponding with Fig. 5.

Similar letters of reference designate corresponding parts in all the figures.

A designates the horizontal plate or support on which the sheet to be edged is to be placed, having two straight edges at a right angle to each other, and being provided with feet A' , to stand on a work-bench, A'' . Close to each of the two straight edges of the said plate there is arranged one of the two pairs of clamping and folding jaws B C, by which two of the edges of a sheet may be folded or edged simultaneously, the main jaw B of each pair being pivoted directly to the plate A by means of a long journal, b , provided on the said jaw, and fitted to a journal-box, a , secured to the plate. The said jaw B is straight, and may be square, as shown; but two of its sides should present a right or nearly right angle. It extends the whole length of the corresponding side of the plate A; but it is cranked at b' relatively to its journals b , in order that its rectangular edge a' may be slightly eccentric to the axis of the journal a , the eccentricity being equal to or slightly greater than the thickness of the metal to be bent. The axis of the said jaw is so arranged relatively to the corresponding edge of the plate A as to occupy a position slightly above the face of said plate, so that when the jaw is thrown open, as shown in Figs. 2 and 3 in bold outline, its edge a' will be nearly close to the edge of the plate and its upper face will be flush with the face of the plate.

The second jaw, C, of each pair consists of a light flat bar, and is carried by duplicate levers D, the fulcrums d of which are in dupli-

cate links E, which are pivoted by pins *e* to lugs *e'*, provided on the back of the main jaw B, the jaw being attached to one end of each of the levers, and the other ends of the levers being furnished with rollers *d'*, which run in the curved slots *g* of duplicate stationary cams G, which are bolted at *g'* to the plate or support A. The said jaw C has furnished in its inner face stops *c* in the form of short studs, to serve as a gage to the edge of the sheet inserted between the jaws B C to be folded, and grooves *c'* are provided in the face of the main jaw B to receive the ends of these studs. The greater portion of the length of the slots of these cams G is concentric with the axis of the main jaw B; but near the bottom of said slot there is a slight rise, as shown at 5 6 in Figs. 2 and 3, and the extreme upper part of the said groove has an inclination forward or toward the axis of the jaw, as shown at 7 8 in Figs. 2, 3, 4, and 5.

As it would be impracticable in a machine with two pairs of clamping-jaws to have a journal like *b* at each end of the main jaw B, because the ends of the jaws require to come close or nearly close together, as shown in Fig. 1, I provide a bearing or bearings for each jaw B by making the interior one or both of its cams G of circular form, as shown at *h'* in Figs. 2, 3, 4, and 5, and providing on the back of the bar at proper intervals in its length one or more concentric projections, *i*, which fit the said bearings in such manner as to constitute or be equivalent to supplemental journals. In order to avoid making the said jaw B unreasonably heavy, such a projection or journal *i* and bearing *h'* may be provided within each cam.

The power to perform the edging might be applied to the journals of the jaws B in any suitable manner; but I have represented it as applied through sprocket-wheels H, one on the journal of each jaw, and chains I, connecting the said sprocket-wheels with a yoke, J, which is connected by a rod, K, with a treadle, L, which is so arranged that the operator, standing in a position with his hands free to place a sheet of metal within the two pairs of jaws, may by his foot depress the said treadle, and thereby work both pairs of jaws simultaneously. The chains are represented as having weights M suspended from the opposite ends to those connected with the yoke J, for the purpose of turning back and opening the jaws after the edging of the sheet has been performed.

It need only be stated, briefly, that if a machine were needed for edging one side of a sheet only, a single pair of clamping and folding jaws only would be necessary, and in that case the main jaw B might have a journal like *a* at each end.

I will now describe the operation of the machine, which, when at rest, has its jaws in the position represented in bold outline in Figs. 2 and 3 of the drawings—that is to say, the main jaws B are thrown back entirely outside

of the plate A and the second jaws, C, which then have their faces parallel with and directly over those of B, are raised just high enough above B to permit the introduction between them of the sheet to be folded, the second jaw C being so held up by reason of the roller at the lower end of its carrying-lever being in the raised lower parts, 5 6, of the cam-slots *g*. The machine being in this position, the sheet to be edged is laid on the plate A, and two of its edges, which form an angle with each other, are inserted between the two pairs of jaws as far as permitted by the pins *c*. The treadle is then depressed, and the jaws B C are thereby thrown upward and over the table by the action of the chains on the sprocket-wheel on the journals of the main jaws.

As the two pairs of jaws operate precisely alike, the description of their operation will be simplified by limiting it to the operation of a single pair, which is as follows: As the jaw B begins to come upward and over, it carries with it the jaw C, while the rollers *d'* of the levers D, passing the parts 6 of their cam-grooves *g*, are drawn downward, and thereby caused to pull down the jaw C and make it clamp the edge of the sheet firmly. The two jaws are caused to retain this hold on the edge of the sheet by the rollers *d* working in those parts of the cam-grooves *g* which are concentric with the axis of the main jaw until the edge of the sheet has been bent a little beyond a right angle to its body, which remains lying on the plate A, and then the rollers, coming along the upper inwardly-turned portions, 7, of the cam-grooves, cause the second jaw, C, to move directly away from the main jaw and liberate the sheet, after which the rollers stop against the upper ends, 8, of the cam-grooves, and during the continued movement of the main jaw the links E have a toggle-like action, by which the jaw C is lifted clear out of the way of the main jaw, while the movement of the latter is continued to the position in which it is shown in Fig. 5 and in dotted outline in Figs. 2 and 3, and in coming to which position it brings down the turned-in edge of the sheet parallel with the body thereof, thereby completing the edging operation. The levers D now rest upon their respective pins *e*, which are prolonged beyond the links E to support them, as shown at *e'* in Fig. 6. In the movement which has been just described the jaw C first moves directly toward the face of the main jaw to clamp the sheet, and then, after moving with the main jaw to effect the partial folding, moves not only away from the said face to liberate the turned edge thereof, but moves entirely across the said face, so as to completely uncover it, and, finally, moves upward or backward, so that its front edge, under which the sheet was clamped, stands well in rear of said face, as shown in Fig. 5. The pressure being removed from the treadle, the weights on the chains at once throw back the main jaw and liberate the sheet, which can then be withdrawn without meeting any ob-

stacle. At the commencement of movement of the main jaw B, the levers D of the second jaw, C, are at first supported by the pins e, and the said jaw C is held up long enough to permit the sheet to be withdrawn. As the backward movement of B continues, the rollers d' of the levers D, passing along the cam-slots g, bring back the jaw C to the position relatively to the jaw B shown in Fig. 3 and in Fig. 2 in bold outlines, to prepare for the reception of a new sheet.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a plate or support, of a pair of clamping and folding jaws, one of which is pivoted to said plate or support and the second of which is attached to the first, and means whereby the second jaw is moved relatively to the first by the act of moving the latter, for the purpose of taking it out of the way of the folded part of the sheet during the completion of the folding, substantially as herein described.

2. The combination, with a plate or support, of a pair of clamping and folding jaws, one of which is pivoted to said plate or support and the second of which is attached to the first one, but movable to and from the clamping-face thereof, and also entirely across the said face and to a position in rear of the said face, substantially as and for the purpose herein set forth.

3. The combination, with a plate or support, of a pair of clamping and folding jaws, the first one of which is pivoted to said plate or support and the second one of which has a pivotal connection with the first one, and a

cam for producing movements of the second jaw relatively to the first one while the first one is in motion, substantially as herein described.

4. The combination of a fixed plate or support, a jaw pivoted thereto, a second jaw and levers for carrying the same, link-connections between said levers and the first jaw, and stationary cams for operating on said levers during their movement with the first jaw for the purpose of producing the movement of the second jaw relatively to the first one, substantially as herein described.

5. The combination of the fixed plate or support A, a jaw, B, pivoted thereto, levers D, link-connections E, connecting said jaw and levers between the ends of the latter, a jaw, C, attached to the said levers at one end thereof, and stationary cams G, engaging with the said levers at the other ends thereof, substantially as herein described.

6. The combination, with the plate or support A, and the clamping-jaws B C, journaled thereto, of the projections or supplemental journals i, provided on the back of the said bar, and bearings h', secured to the said plate or support opposite said journals, substantially as herein described.

7. The combination, with the main jaw B, the second jaw, C, the levers D, and links E, of the pivots e, prolonged to support the levers, substantially as and for the purpose herein described.

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Witnesses:

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