

No. 611,070.

Patented Sept. 20, 1898.

M. J. LOCKE.  
FOLDING MACHINE.

(Application filed Dec. 30, 1897.)

(No Model.)

5 Sheets—Sheet 1.

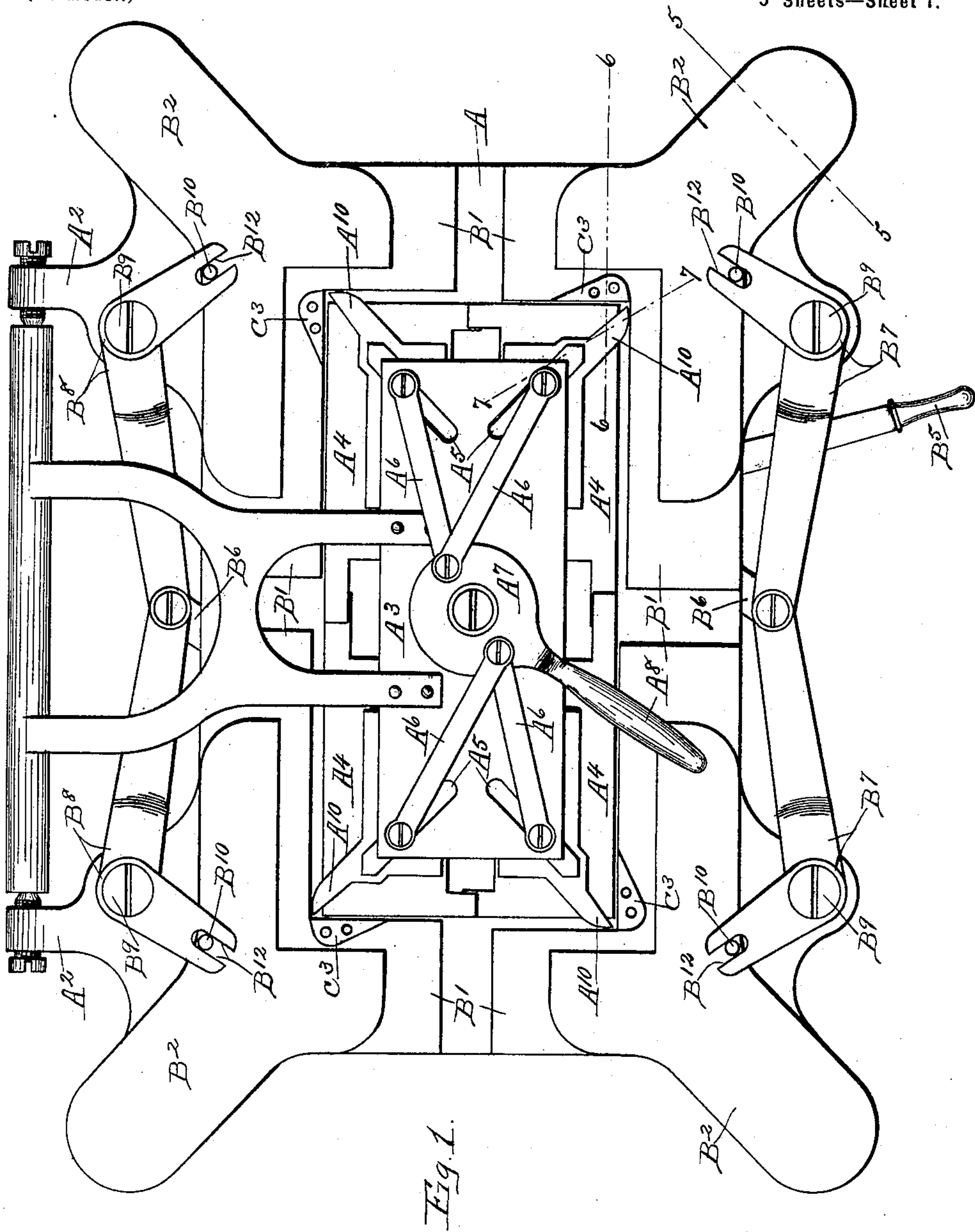


Fig. 1.

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G. L. Curtis.

Inventor:  
Martin J. Locke  
By Mosher & Curtis  
attys

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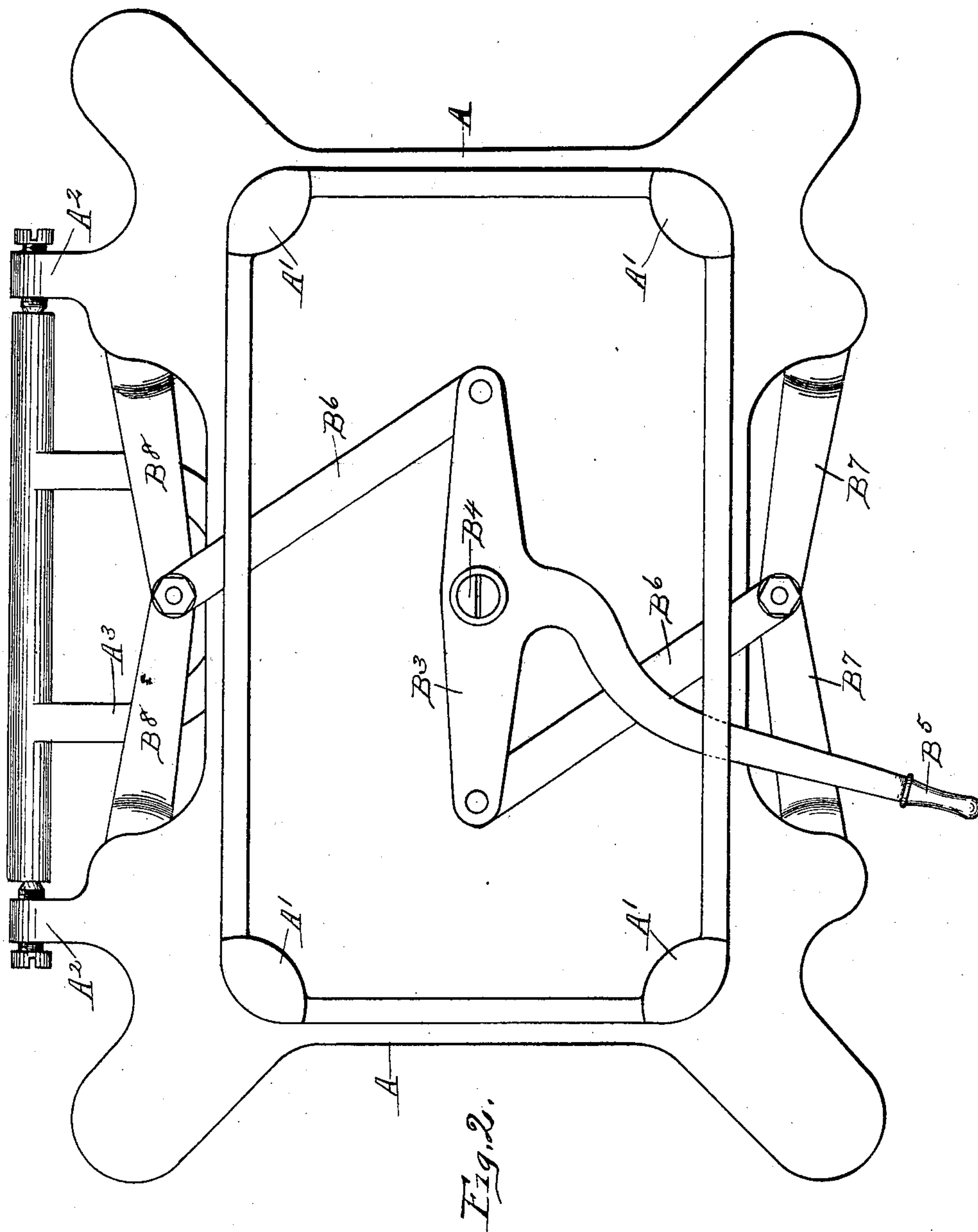
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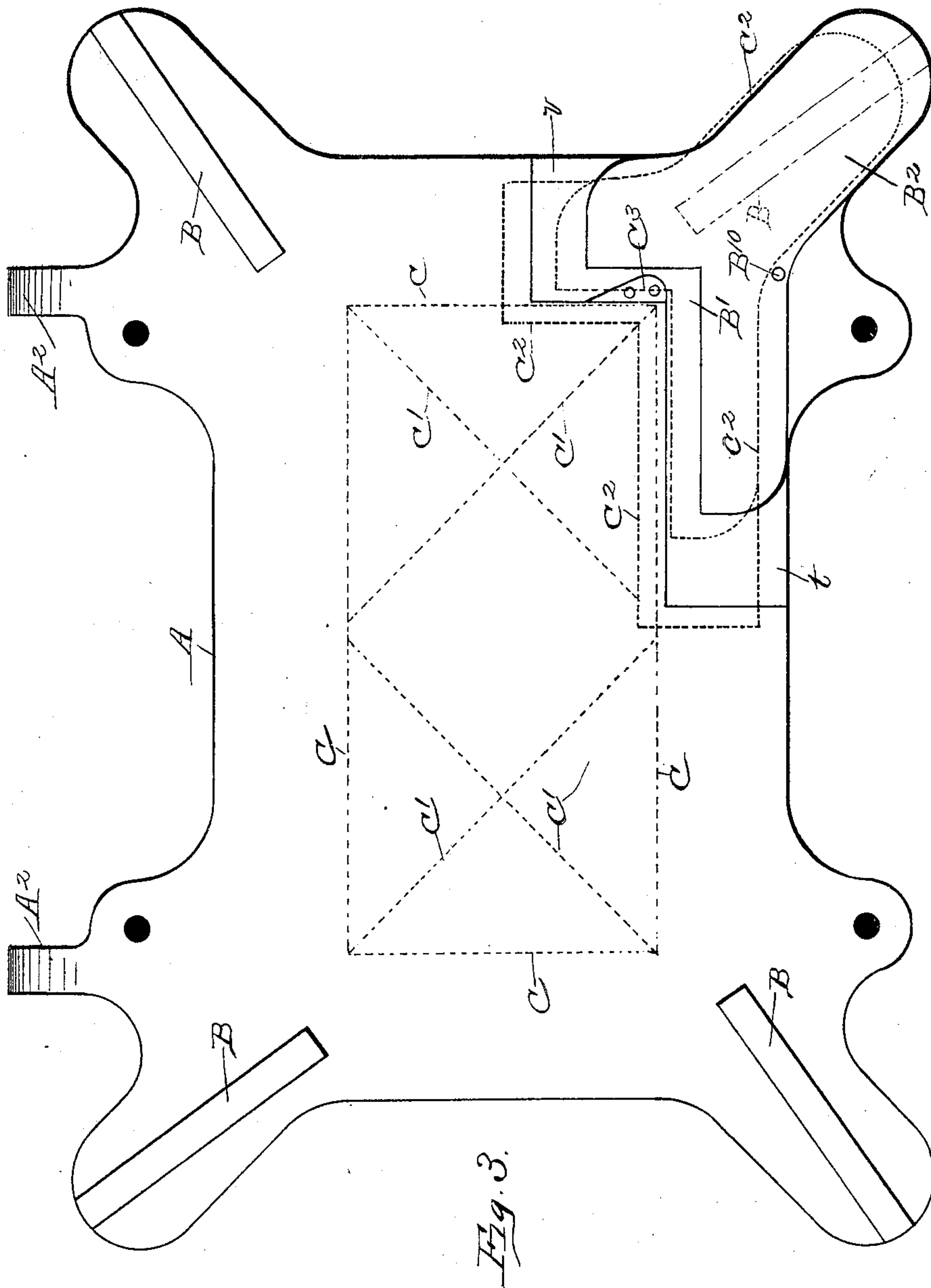


Fig. 3.

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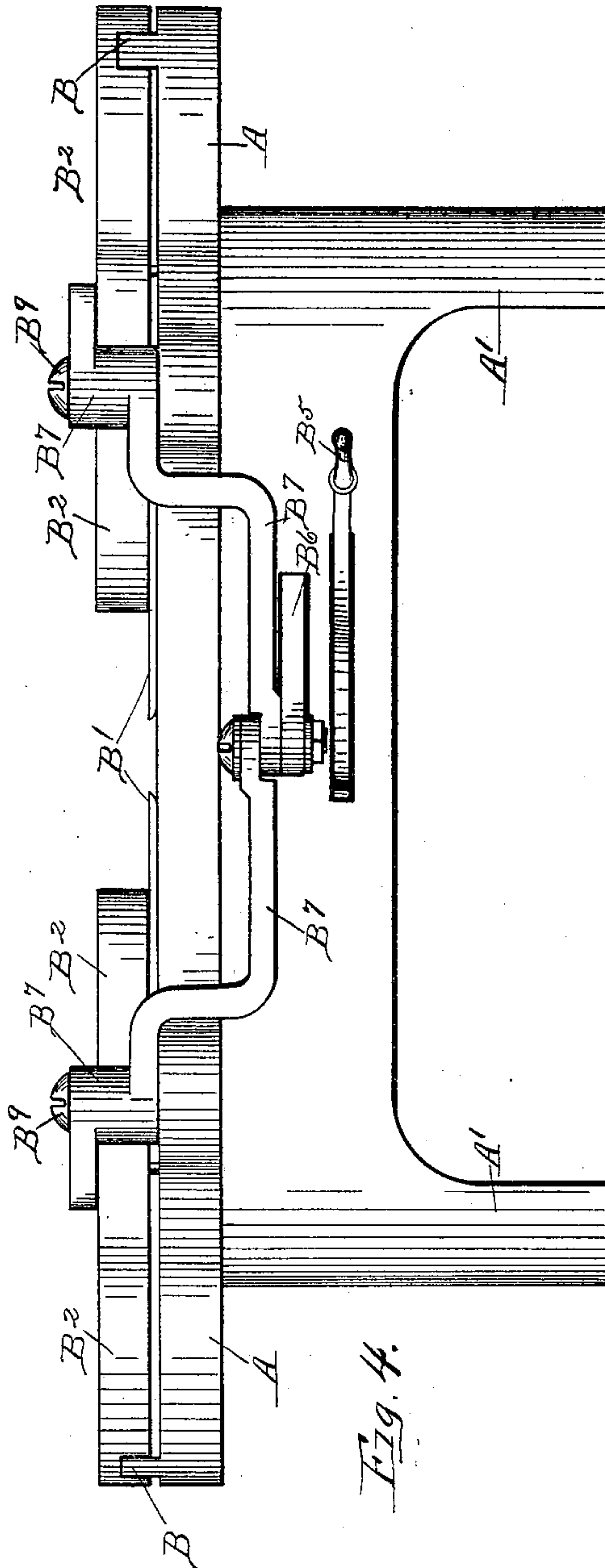


Fig. 4.

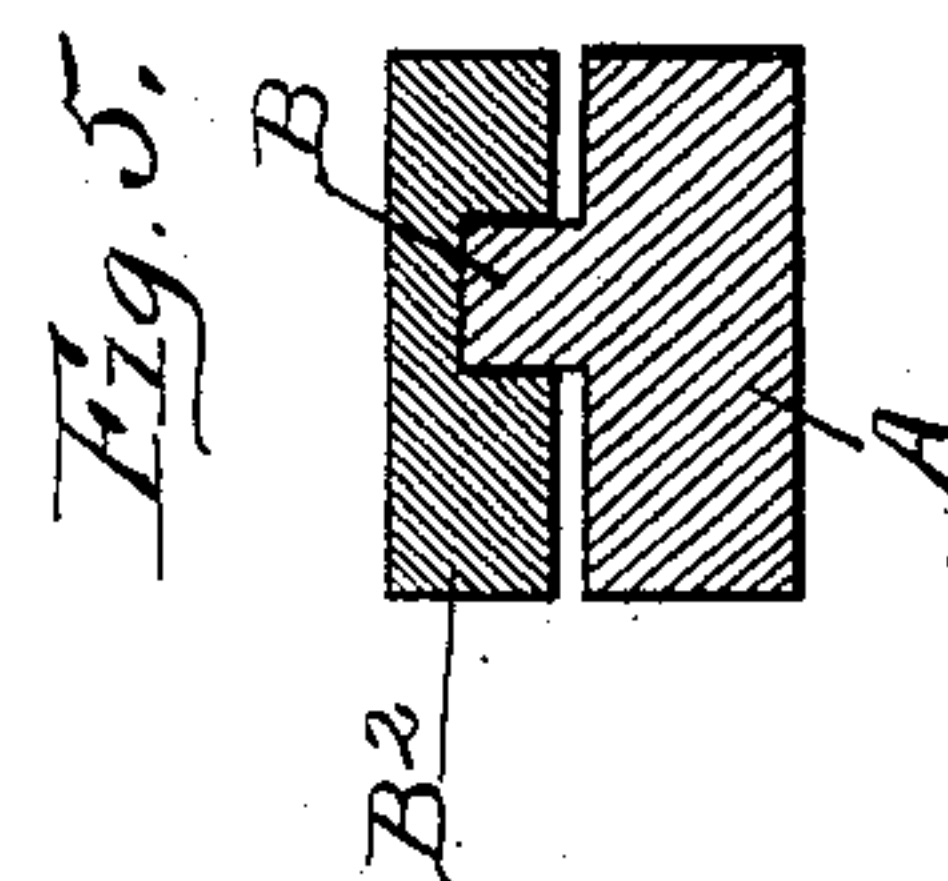


Fig. 5.

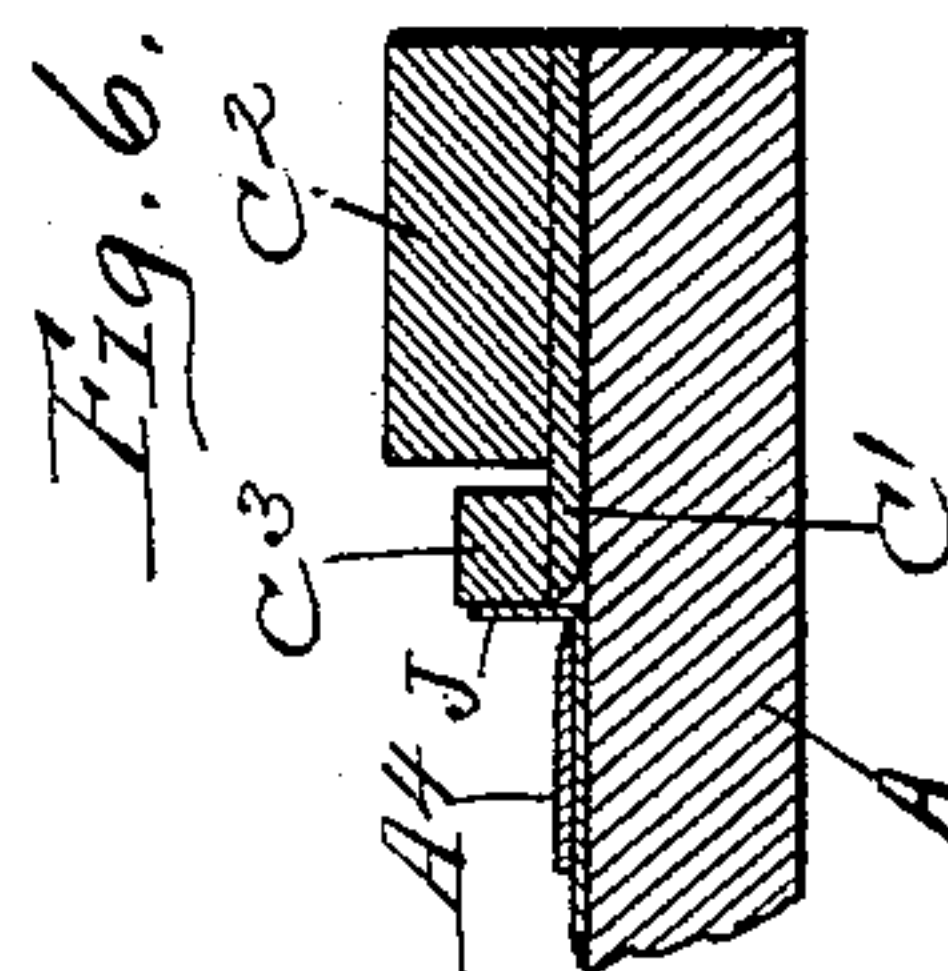


Fig. 6.

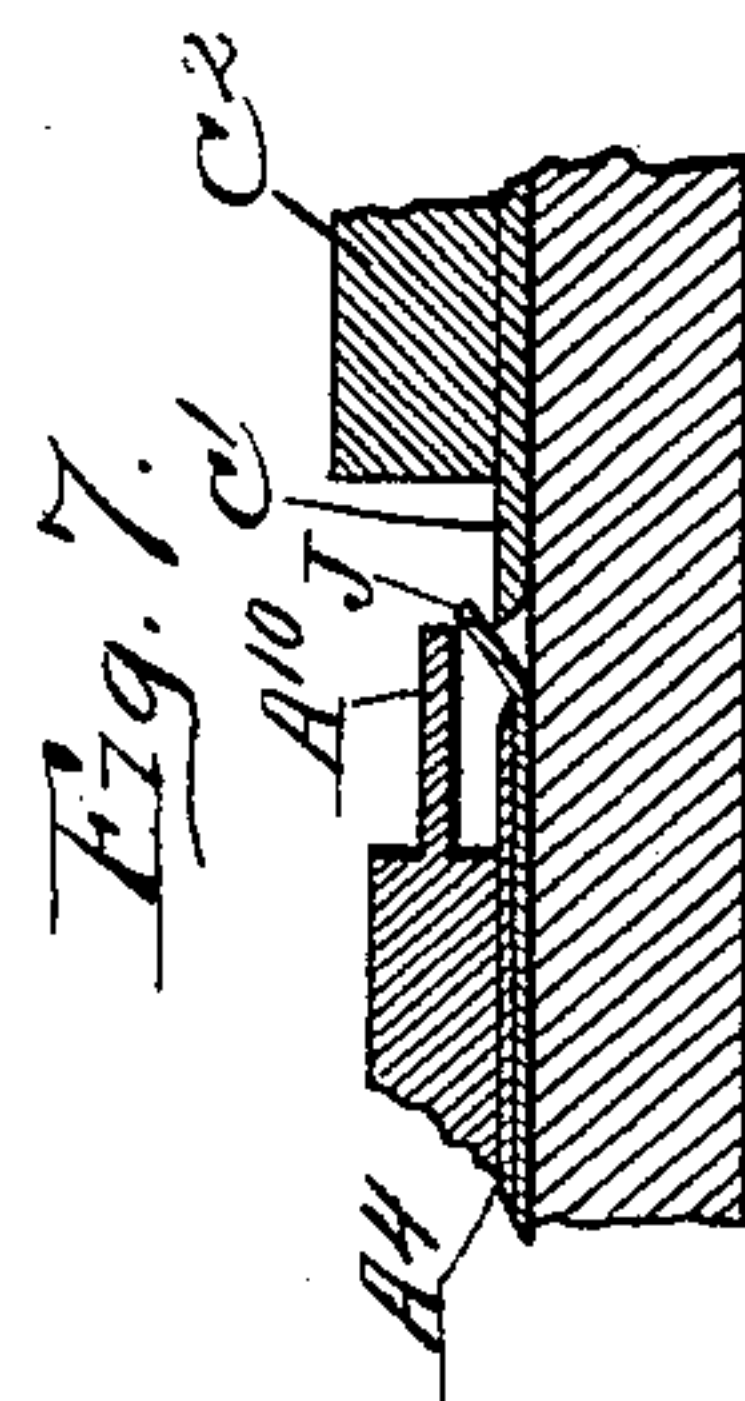


Fig. 7.

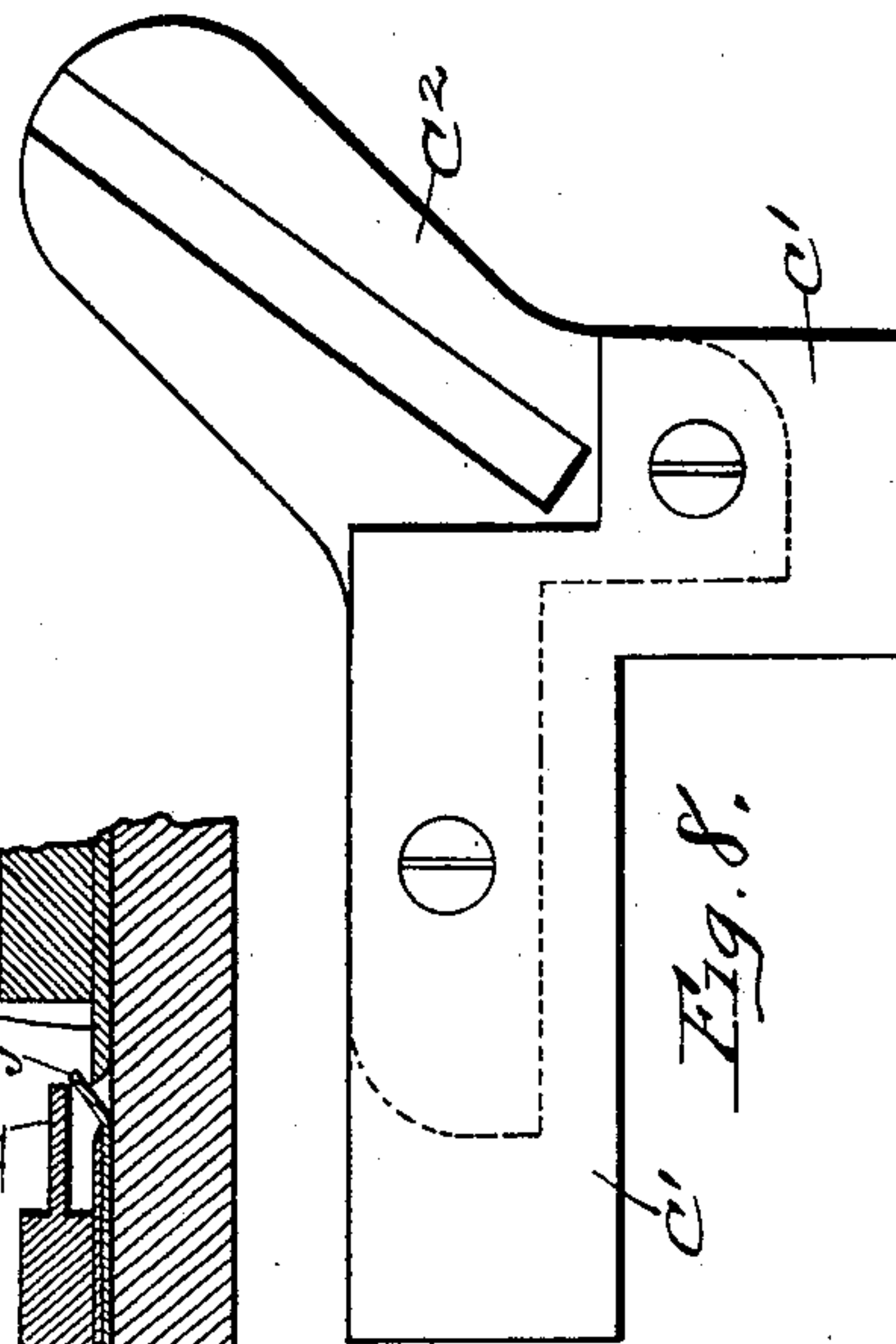


Fig. 8.

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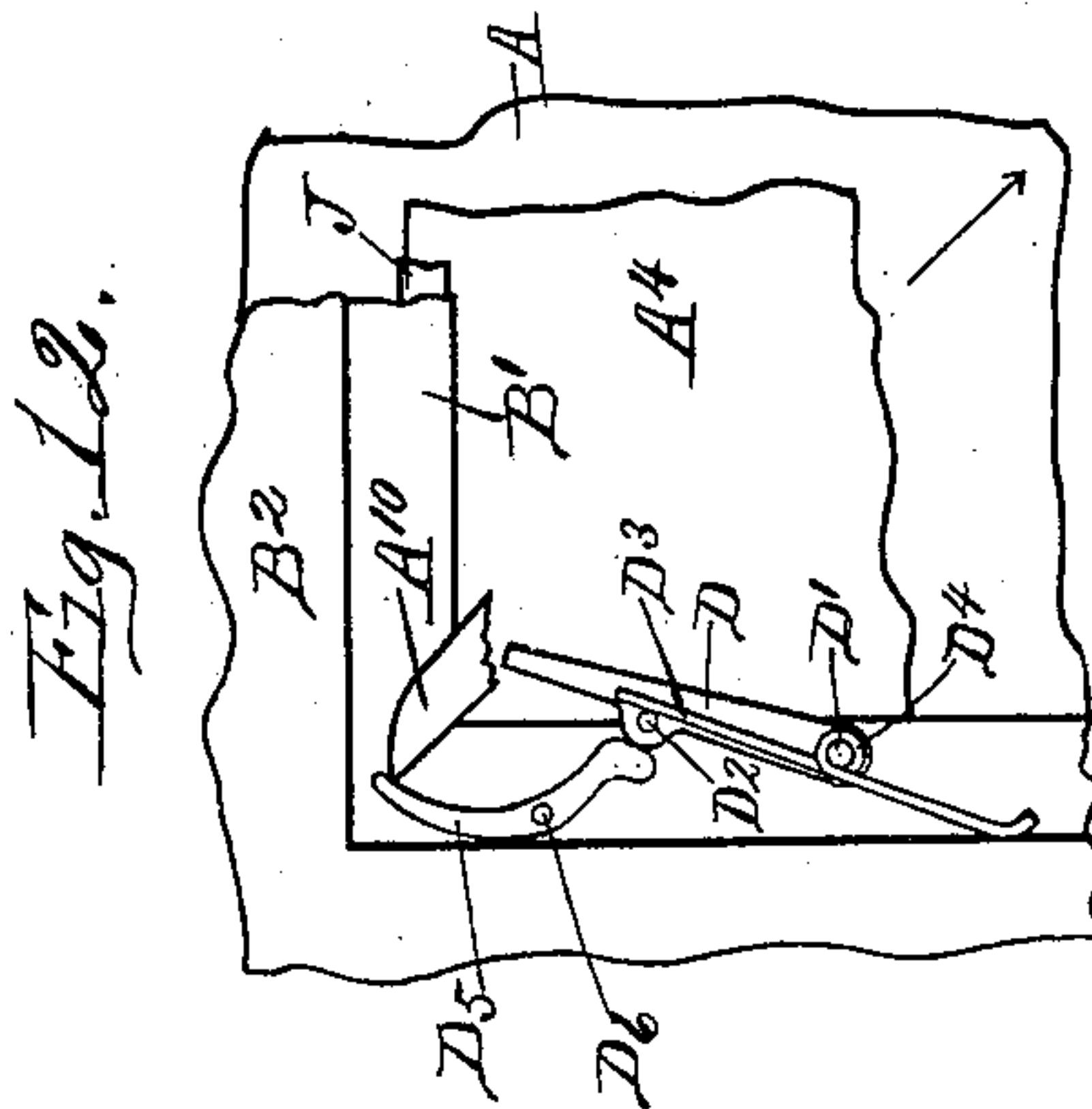
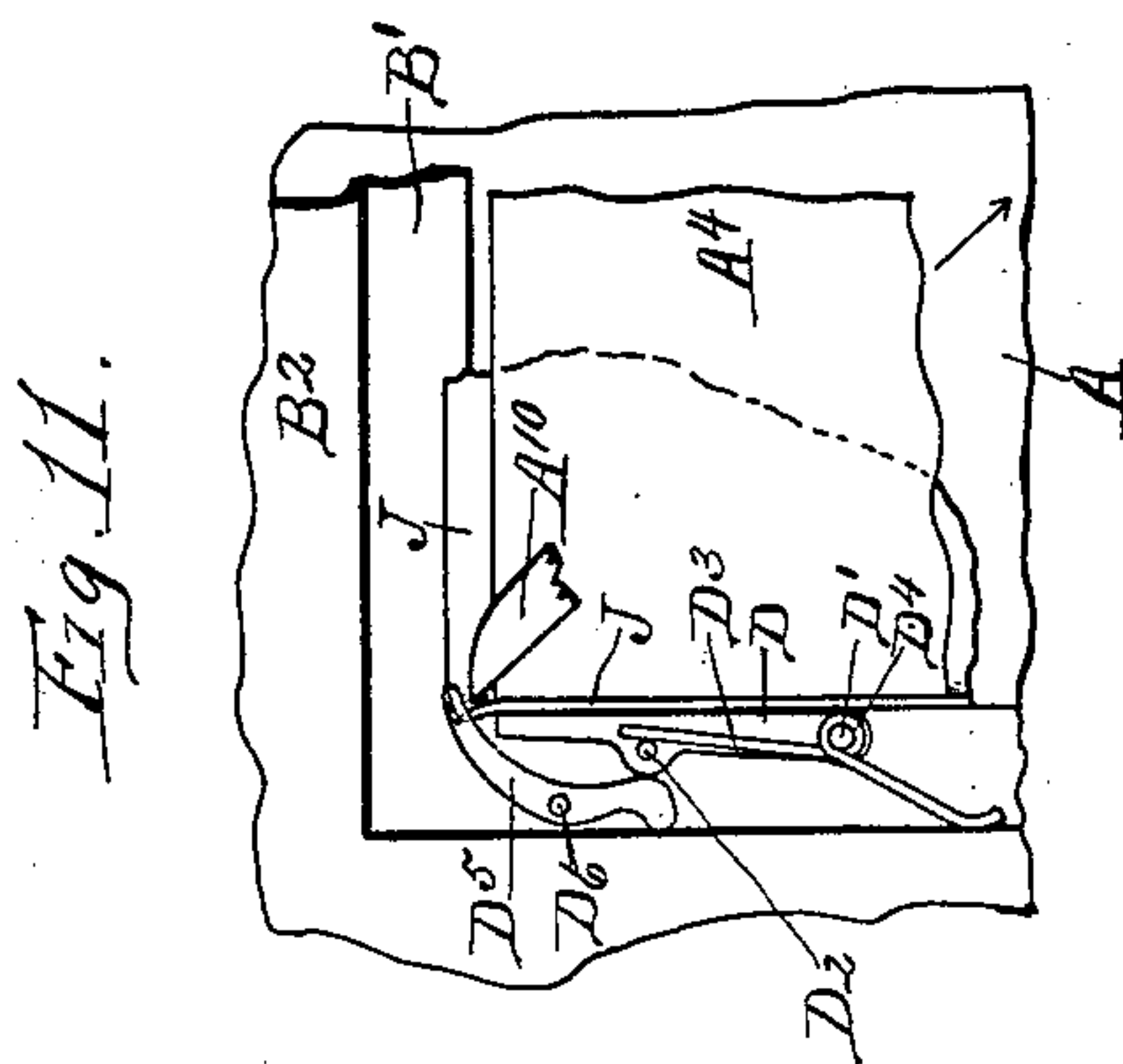
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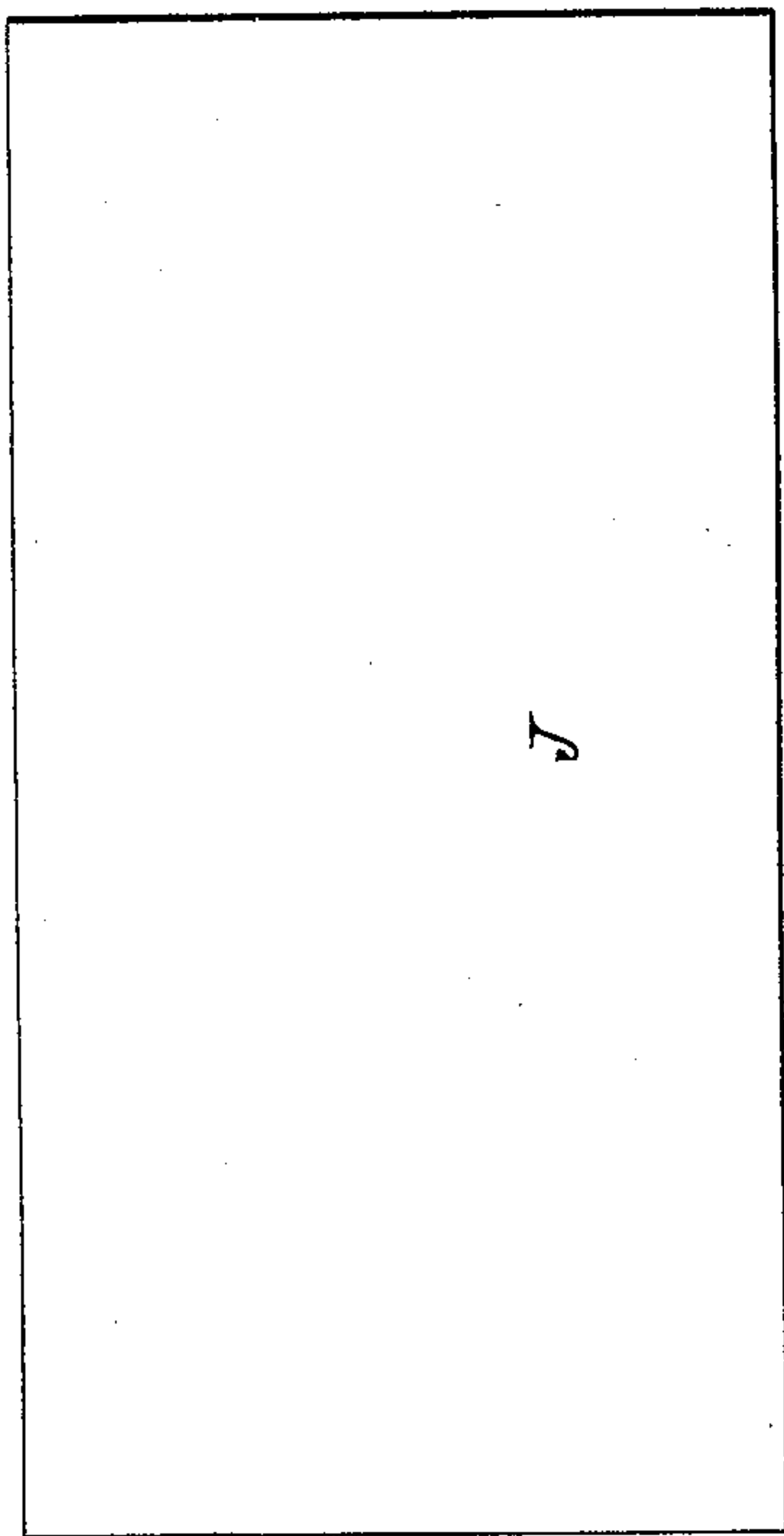
(Application filed Dec. 30, 1897.)

(No Model.)

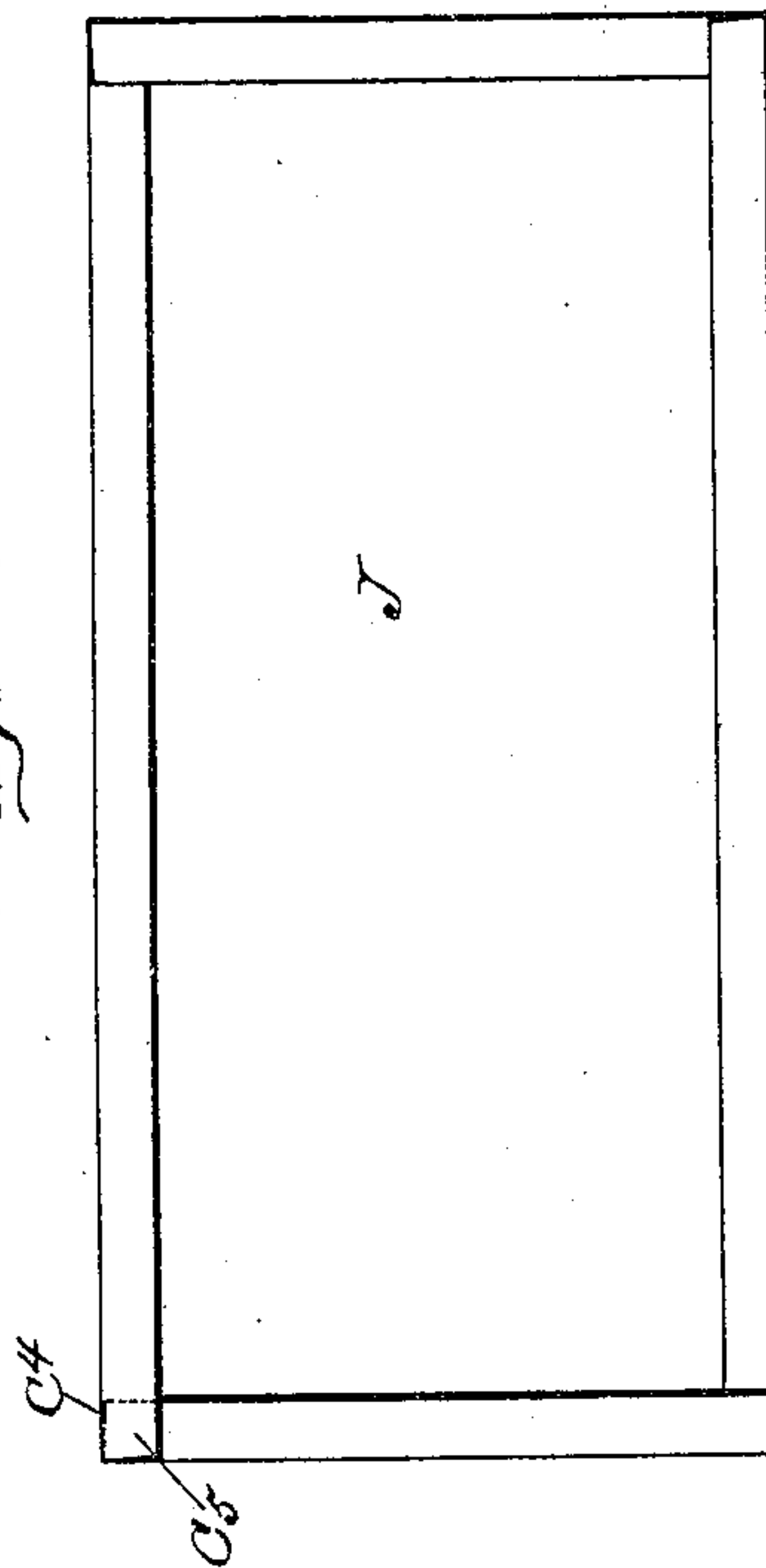
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*Fig. 9.*



*Fig. 10.*



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# UNITED STATES PATENT OFFICE.

MARTIN J. LOCKE, OF TROY, NEW YORK.

## FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 611,070, dated September 20, 1898.

Application filed December 30, 1897. Serial No. 664,696. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN J. LOCKE, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings and the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a top plan view of my improved folding-machine with the templet or former expanded and resting upon the bed-plate with the folders distended or open. Fig. 2 is a bottom plan view of the same. Fig. 3 is a top plan view of the bed-plate with the former and three of the folder-plates detached. Fig. 4 is a front elevation of the machine with the former removed from the bed-plate. Fig. 5 is a vertical cross-section taken on the broken line 5 5 in Fig. 1. Fig. 6 is a vertical section taken on the broken line 6 6 in Fig. 1. Fig. 7 is a vertical section taken on the broken line 7 7 in Fig. 1. Fig. 8 is a bottom plan view of one of the folders. Figs. 9 and 10 are plan views, respectively, of a blank before and after its edges have been folded by my improved machine. Fig. 11 is a top plan view showing the corners of a movable folder-plate and former-plate with the guide-finger in position for folding the corner of a cuff-blank shown interposed between the plate-corners and resting on the bed-plate or the machine, both the former and folder plates being in an open or distended position. Fig. 12 shows the relative position of the parts after the folder-plates of the machine have been closed or moved over the former-plates.

My invention relates to that class of machines in which a collapsible shaper or former movable to and from a blank-supporting bed is superposed upon a bed-supported collar or cuff blank, while inwardly and outwardly movable folder-plates are moved inwardly to

fold the edges of the blank over the edges of the former.

The object of my invention is to provide collar and cuff blanks with uniformly-disposed corner-folds which are interlockable the folds of one blank with those of another, as will be hereinafter more fully explained.

My invention consists of mechanism for regulating the laying of the corner-folds of a collar or cuff blank, whereby a certain predetermined one of the two sides forming a corner of the blank is first folded over and its corner-fold laid upon the former or shaper and the other side afterward folded and its corner-fold laid upon the corner-fold of the first-turned side.

In the manufacture of collars and cuffs two blanks, one or both with one or more interlining plies, are separately folded by turning in the edges. The two folded blanks are then superposed one upon the other, with the folded-in edges concealed between the superposed plies, after which the plies are all secured together by a line of stitching through the folded-in edges. It is quite important, therefore, that the corner-folds should be formed systematically, not only to secure the least number of superposed thicknesses, but to produce a uniform fold that will always permit the corner-fold of each folded blank to interlock with the corresponding corner-fold of every other blank, whereby the finished collars or cuffs composed of any two separately-folded blanks will present neatly-folded corners of uniform thickness and form.

Fig. 9 of the drawings shows an unfolded blank, and Fig. 10 a blank folded by my improved machine.

Referring to the drawings of the machine, A is the bed-plate, provided with supporting-legs A' and ears A<sup>2</sup>, containing the cone-bearings of the former A<sup>3</sup>, which former may be of any known class. I have shown a former collapsible on four sides by moving the corner-plates A<sup>4</sup> inwardly. These corner-plates are secured to the central head by studs projecting up through slideways A<sup>5</sup> and connected by links A<sup>6</sup> with a lever A<sup>7</sup>, having a handle A<sup>8</sup>, adapted to operate the lever to slide the corner-plates and to swing the former to and from the bed upon the cone-bearings. Projecting from and fixed to each corner of



the former-head is a finger-guide A<sup>10</sup>, herein-  
after more particularly referred to. The bed  
is also provided at or near each corner with a  
flange or rib B, raised above the upper sur-  
face of the bed and forming a slideway for a  
corner-folding plate B'. The corner-folding  
plates comprise two comparatively long and  
short arms disposed at right angles to each  
other.

I have shown a machine adapted to fold a  
four-cornered cuff, and there are four corner-  
folding plates and slideways. As usual in  
this class of folding-machines, the plates  
proper are made of sheet metal and fixed upon  
thicker castings B<sup>2</sup>, each having a channel on  
the lower side adapted to receive the slide-  
way-rib on the bed.

As a means for sliding the folder-plates to  
and fro I provide a lever B<sup>3</sup>, fulcrumed at B<sup>4</sup>  
upon the under side of the bed and provided  
with an operating-handle B<sup>5</sup>, which projects  
out through an opening in the front portion  
of the bed-frame. The lever B<sup>3</sup> is connected  
at each end by links B<sup>6</sup> with a pair of levers  
outside the bed-frame, one end with the le-  
vers B<sup>7</sup> in front and the other end with the  
levers B<sup>8</sup> in rear. Each of the levers B<sup>7</sup> and B<sup>8</sup>  
is fulcrumed intermediately of its ends upon  
the bed-frame, as by screw B<sup>9</sup>. The short  
end of each lever is connected with a corner-  
folder, so as to slide the same, as by pin B<sup>10</sup>,  
projecting from the corner-plates and loosely  
fitting the open slot B<sup>12</sup> in the several levers.

The dotted lines C in Fig. 3 represent the  
shape and size of that part of the machine  
called the "former," which is also the shape  
and approximately the size of a finished cuff  
folded on the machine. I have also placed  
on this Fig. 3 broken lines C', drawn to bisect  
the respective corner-angles formed by the  
dotted lines C.

It will be observed that each one of the  
slideways B is inclined to the line which bi-  
sects the neighboring corner-angle and that  
all the slideways are similarly inclined with  
relation to their respective corners. The re-  
sult of this inclination is that each corner-  
plate, when moved along its slideway toward  
the blank, travels faster toward one of the  
edges forming the neighboring corner of the  
blank than toward the other edge—that is, if  
the corner-plate shown in Fig. 3 is moved  
from the position shown by solid lines to that  
indicated by the dotted lines C<sup>2</sup> the long arm  
of the corner-forming plate will have trav-  
eled farther than the short arm *v*. It is also  
apparent that the short arm will cross the  
dotted line C in advance of the long arm.  
The short arm would therefore be the first to  
lap the former-plate and fold over upon it the  
corresponding edge of a cuff-blank interposed  
between the bed and former with its edges  
resting upon the folder-plates. The long arm  
afterward laps the other side of the corner  
and folds the corresponding edge of the blank  
over onto the former.

Starting from the corner-plate shown in  
Fig. 3 and passing around the bed-plate to  
the left, the next corner-plate has its slideway  
so inclined that its long arm will be nearer  
the edge of the former, and therefore will be  
the arm which has the comparatively slow  
movement, while on the next corner the short  
arm moves more slowly, like the one shown  
in Fig. 3, and on the fourth corner the long  
arm has the comparatively slow movement,  
the alternating arms, without reference to  
their lengths, having similar movements.  
All the slideways being similarly inclined  
with relation to their respective corners, as  
before stated and shown, the respective arms  
of the corner-folders all travel in unison and  
produce like results, whereby each of the  
four edge folds of a folded cuff has one end of  
its fold underfolded and the other end over-  
folded with relation to the respective edge  
folds of the neighboring edges of the cuff, as  
shown in Fig. 10, the object of such an ar-  
rangement being to lay the corner-folds, as  
shown in Fig. 10. I am able to facilitate uni-  
formity of action by providing the short or  
slowly-moving arm of the corner-folder with  
a riser C<sup>3</sup>, which forms an upright or abut-  
ment in the same vertical plane with the face  
edge of the plate which holds the neighbor-  
ing edge of the blank in a vertical position  
when the former is swung down onto the  
blank J previously deposited upon the bed  
and edges of the folder-plates, as seen in Fig.  
6. Then as the folder laps the former the  
riser tends to keep the engaged edge of the  
blank smooth and under control until the  
folder-plate passes over it.

The operation may be still further facili-  
tated by means of the finger-guide A<sup>10</sup>, which  
holds back, as seen in Fig. 7, the extreme  
edge of the blank opposite the long arm of  
the folder as long as possible until the corner-  
fold (represented by the dotted line C<sup>4</sup> in  
Fig. 10) has been partially formed and laid  
upon the former, after which that edge is  
folded over and its corner-fold C<sup>5</sup> laid over  
upon the edge of the blank folded over by  
the short arm.

In Figs. 11 and 12 I have shown a modified  
form of riser, which consists of a lever D, ful-  
crumed at one end by pin D' to the folder-  
plate and provided with an upright pin D<sup>2</sup>,  
adapted to be engaged by one end of the con-  
trolling-spring D<sup>3</sup>, which has its coils D<sup>4</sup>  
slipped onto pin D' and its other end bearing  
against the casting of the folder. Another  
lever D<sup>5</sup> is fulcrumed at D<sup>6</sup> upon the folder-  
plate with one end in engagement with the  
lever D, as shown, and the other end engage-  
able with the guide-finger A<sup>10</sup>, projecting from  
the former. As the folder-plate travels along  
its slideway toward the blank and former  
from the position shown in Fig. 11 the lever  
D<sup>5</sup> engages the guide-finger at once and forces  
the riser-lever over the edge of the former in  
advance of the short arm of the folder-plate,



so that the parts occupy the position shown in Fig. 12 at the end of the folding movement of the folder-plate.

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

1. In a machine for folding the edges of collar and cuff blanks, the combination with a bed for receiving and supporting the blank; and a former movable to and from the bed; of corner-folding plates movable inwardly and outwardly along the upper surface of the bed; slideways for the folder-plates severally and similarly inclined to the straight lines bisecting the corner-angles, respectively, whereby one arm of a corner-folding plate is movable to and from the blank more rapidly than the other; means for operating the former; and means for moving the corner-folding plates inwardly and outwardly along the respective inclined slideways, substantially as described.

2. In a machine for folding the edges of collar and cuff blanks; the combination with a bed for receiving and supporting the blank; and a former movable to and from the bed; of corner-folding plates movable inwardly and outwardly along the upper surface of the bed; slideways for the folder-plates severally and similarly inclined to the straight lines bisecting the corner-angles respectively, whereby one arm of a corner-folder plate is movable to and from the blank more rapidly than the other; a blank-engaging riser on the more slowly movable arm of the several folding-plates; means for operating the former; and means for moving the corner-folding plates inwardly and outwardly along the respective inclined slideways, substantially as described.

3. In a machine for folding the edges of collar and cuff blanks, the combination with a bed for receiving and supporting the blank; and a former movable to and from the bed; of corner-folding plates movable inwardly and outwardly along the upper surface of the bed; slideways for the folder-plates severally and similarly inclined to the straight lines bisecting the corner-angles respectively, whereby one arm of a corner-folding plate is movable to and from the blank more rapidly than the other; blank-engaging detaining-fingers,

severally projecting from the several corners of the former, whereby each finger projects, when the former rests upon a blank horizontally, over one edge of the blank and over the more rapidly moving arm of a corner-folding plate; means for operating the former; and means for moving the corner-folding plates inwardly and outwardly along the respective inclined slideways, substantially as described.

4. In a machine for folding the edges of collar and cuff blanks having a bed, a collapsible former, and corner-folding plates, the combination with the folding-plates, of a riser on one arm of the folding-plates engageable with an edge of the blank forming one side of a blank corner, and a detaining-finger on the former engageable with the edge of the blank forming the other side of such blank corner, and means for operating the former and folding plates, substantially as described.

5. In a machine for folding the edges of collar and cuff blanks, having a bed, a collapsible former, and corner-folding plates, the combination with the folding-plates, of a movable riser pivoted upon one arm of the several folding-plates engageable with an edge of the blank, a riser-operating lever pivoted on the several folder-plates, and a detaining-finger on the several former corners engageable with an edge of the blank and with the riser-operating lever, whereby an inward movement of the angle-plate will cause the movable riser to move more rapidly than either arm of the plate, and means for operating the former and folding plates, substantially as described.

6. In a folding-machine, the combination with a two-armed corner-folder, and means for moving one arm more rapidly than the other, of a movable riser on the more slowly moving arm, and means for advancing the riser beyond the arm, substantially as described.

In testimony whereof I have hereunto set my hand this 15th day of September, 1897.

MARTIN J. LOCKE.

Witnesses:

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INESIME BELHUMER.