

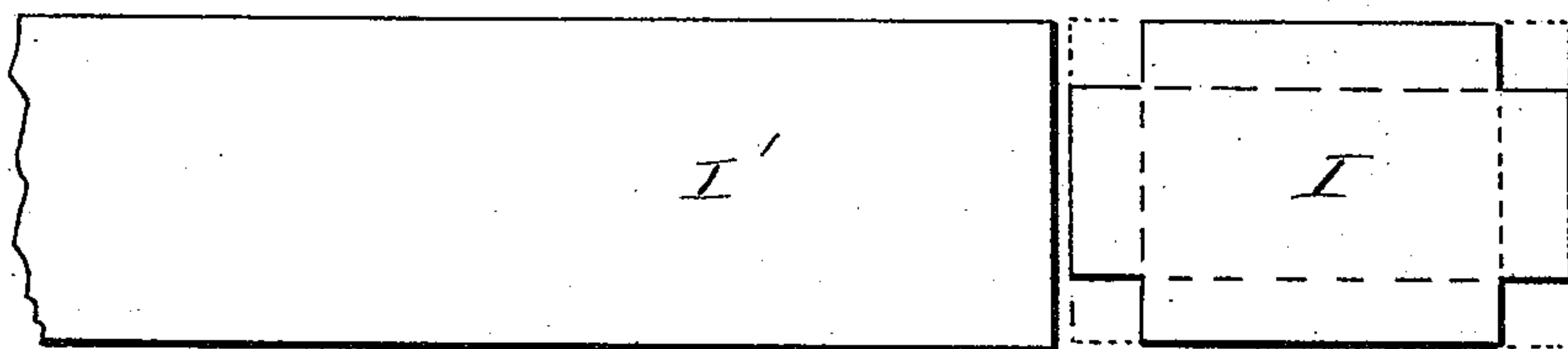
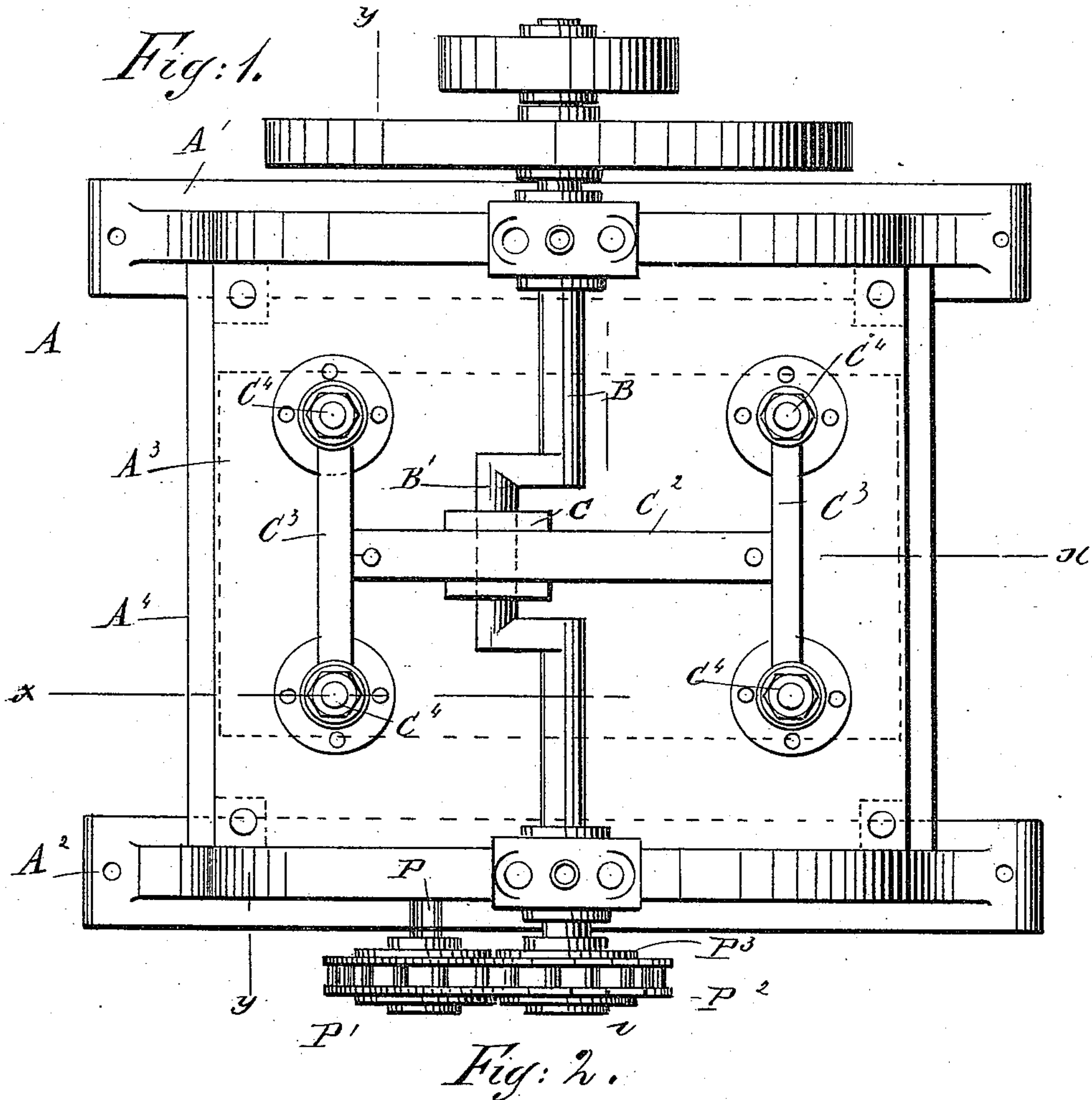
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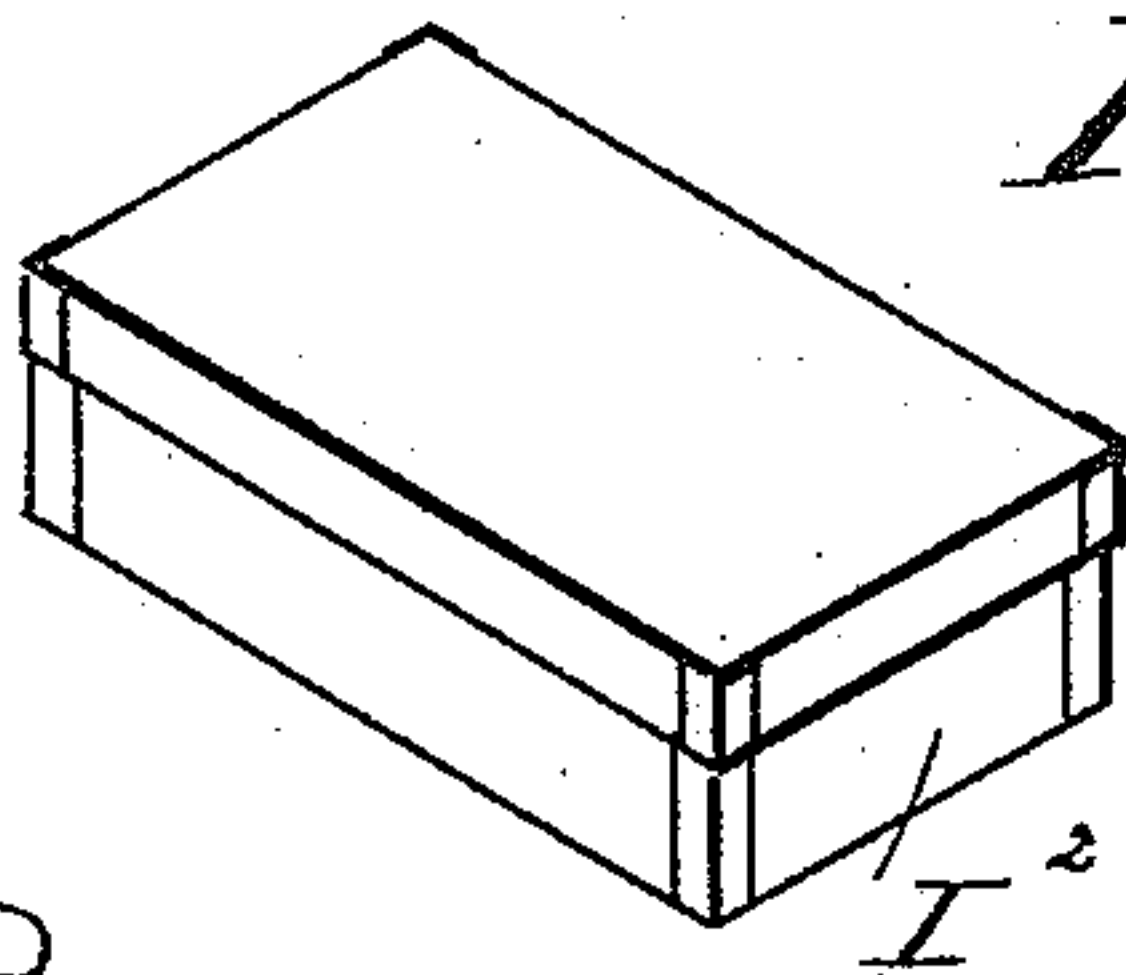
J. MOHS.  
BOX MAKING MACHINE.

No. 441,104.

Patented Nov. 18, 1890.



WITNESSES:  
*Chas. W. W. W.*  
*C. Sedgwick*



INVENTOR:  
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BY  
*Munn & Co.*  
ATTORNEYS.

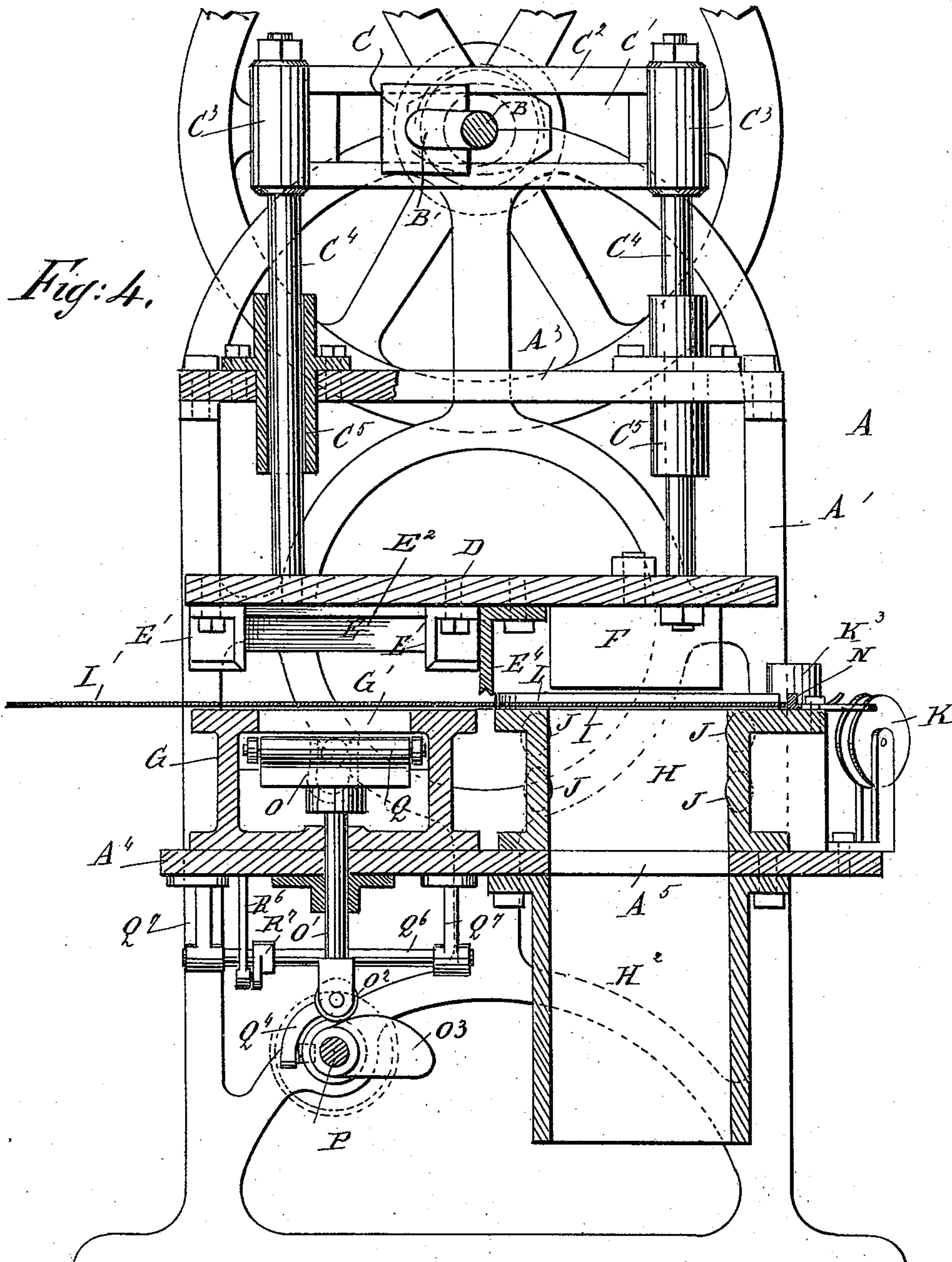
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**WITNESSES:**

Witnesses:  
 Chas. Nida  
 C. Sedgwick

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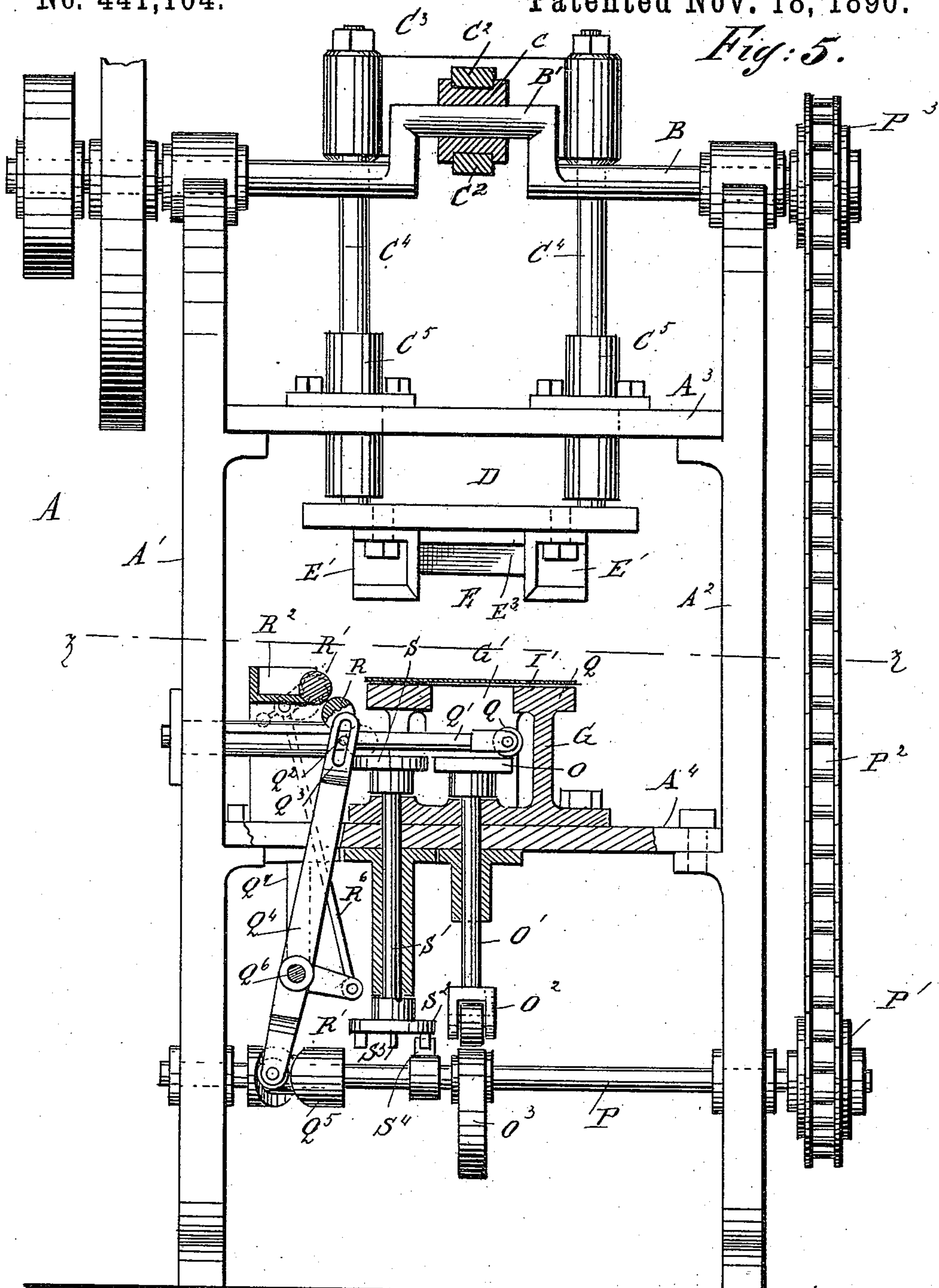
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*Fig. 5.*



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Fig. 6.

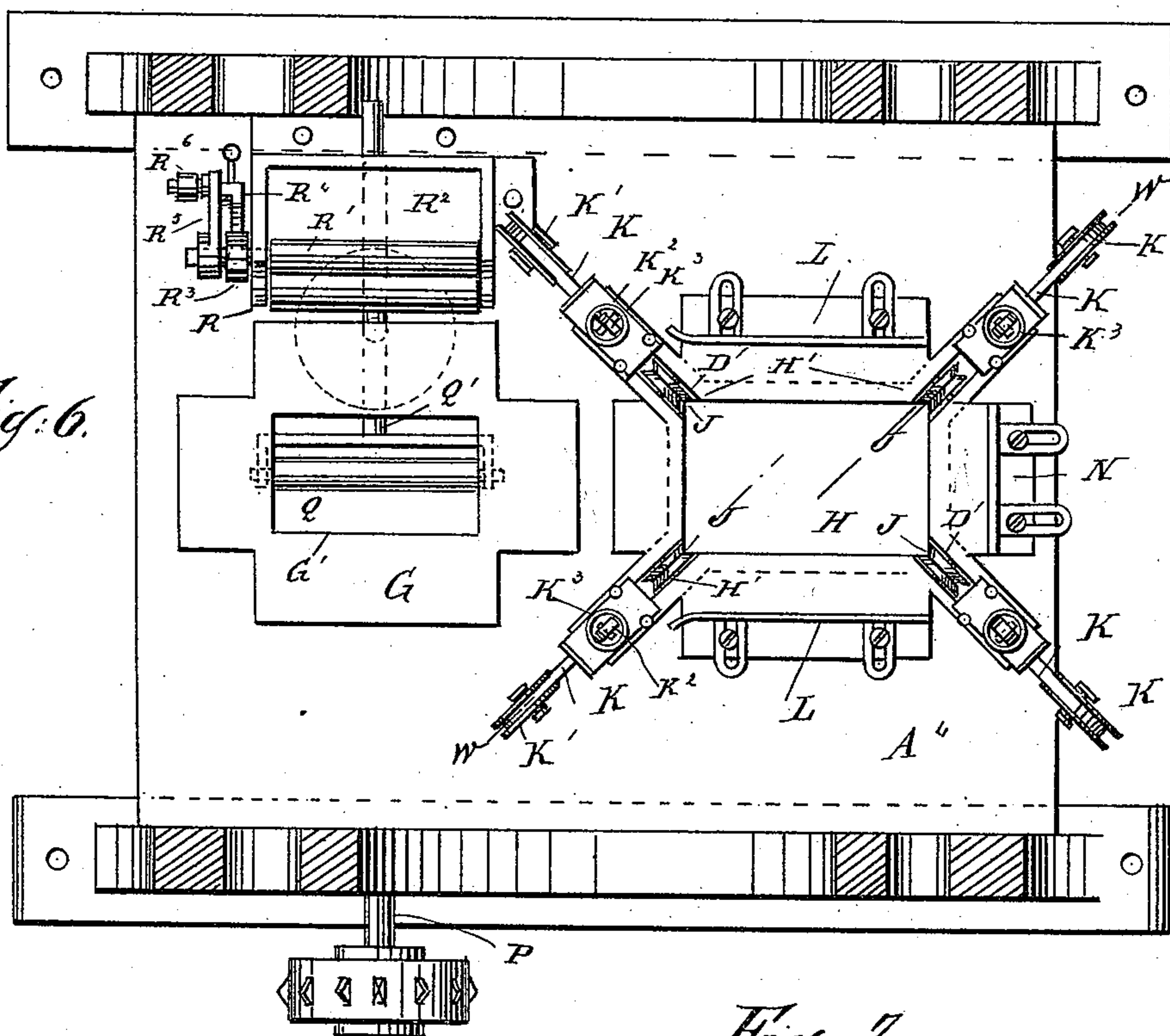


Fig. 7.

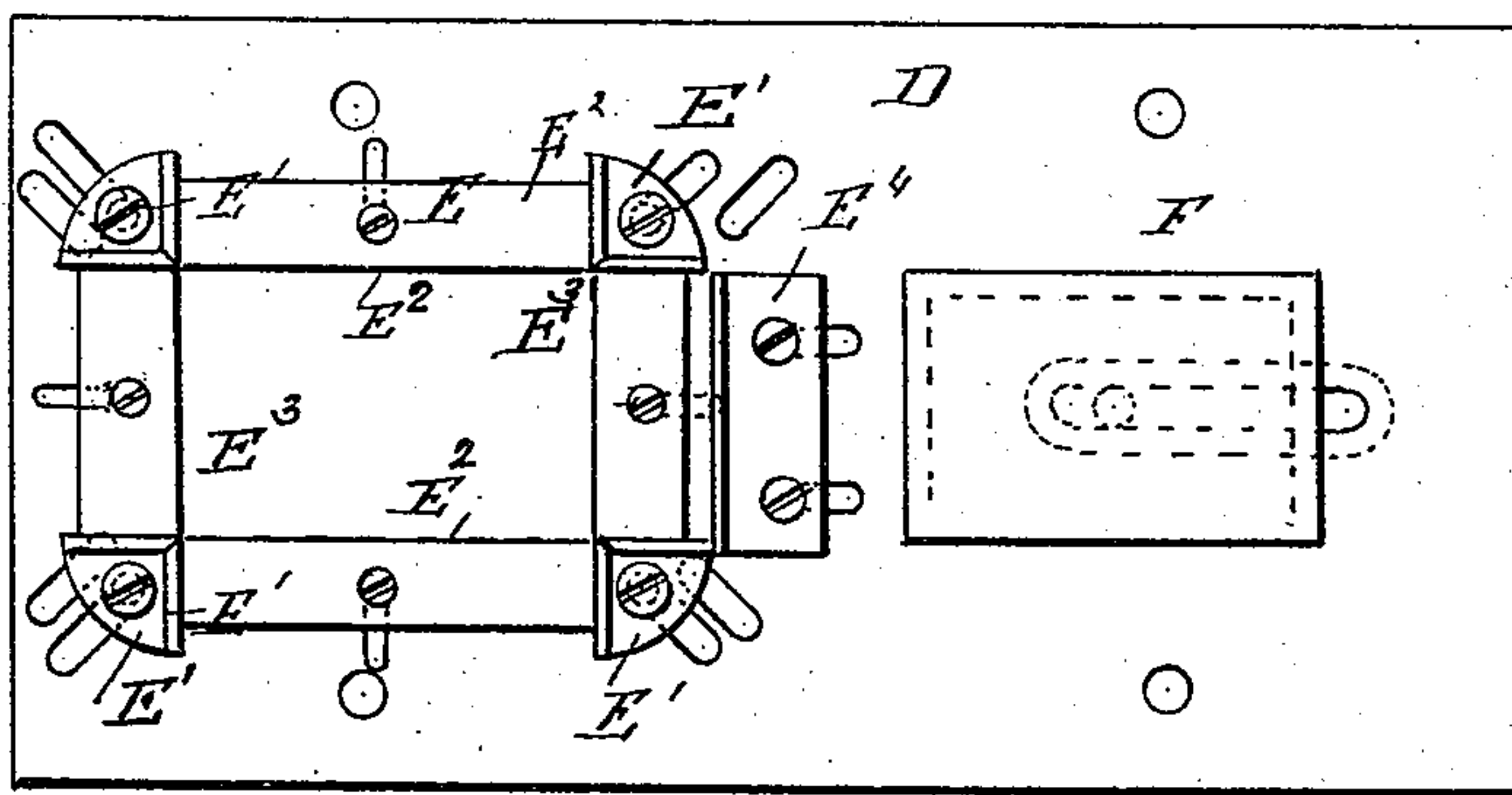
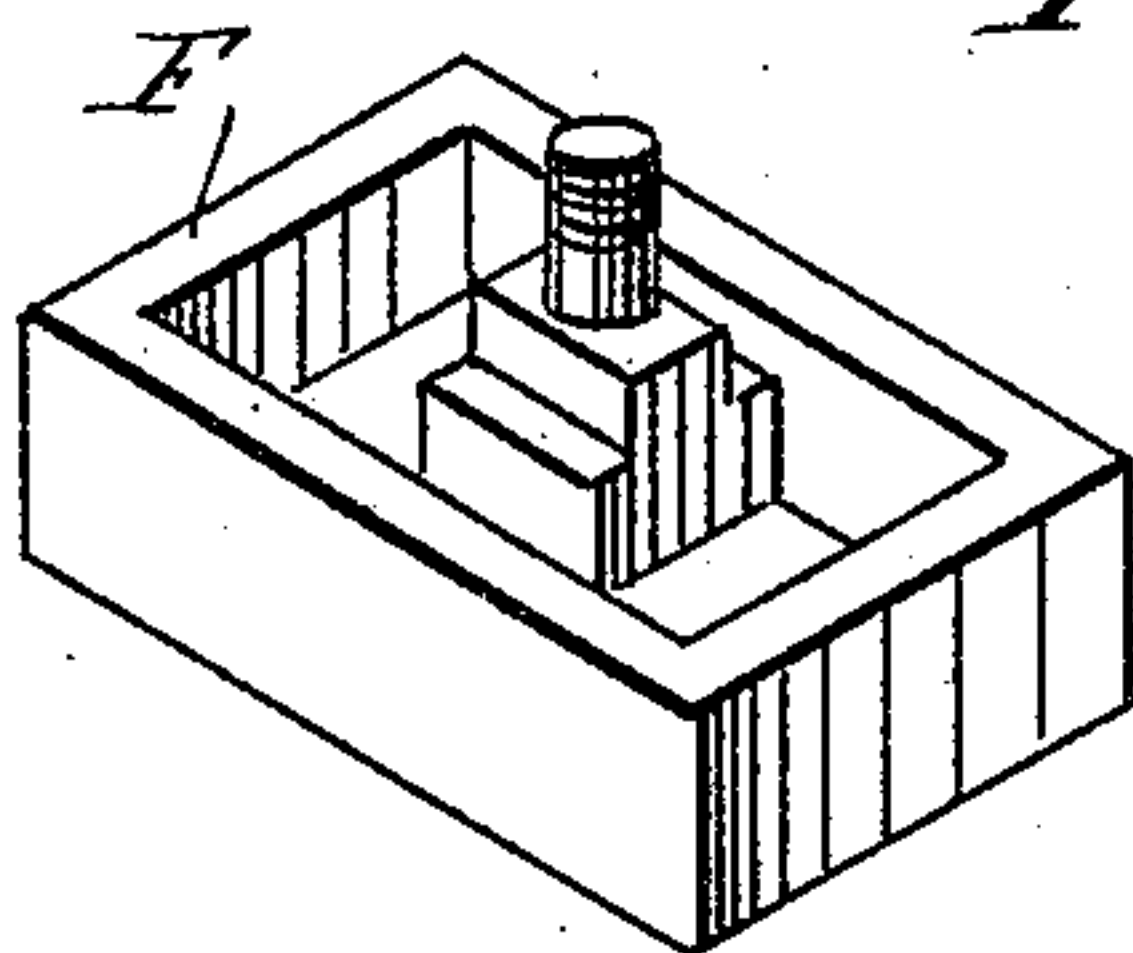


Fig. 8.

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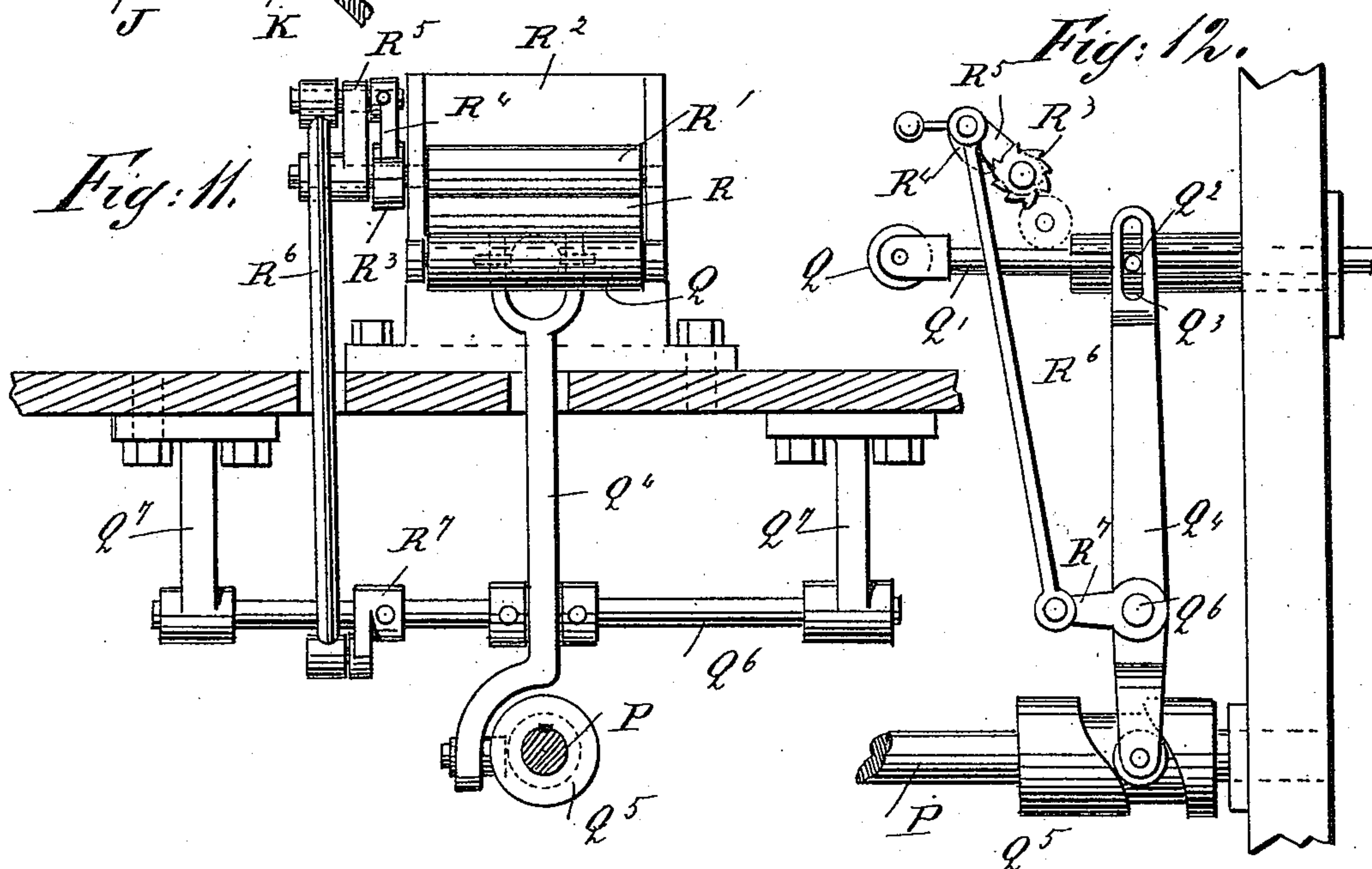
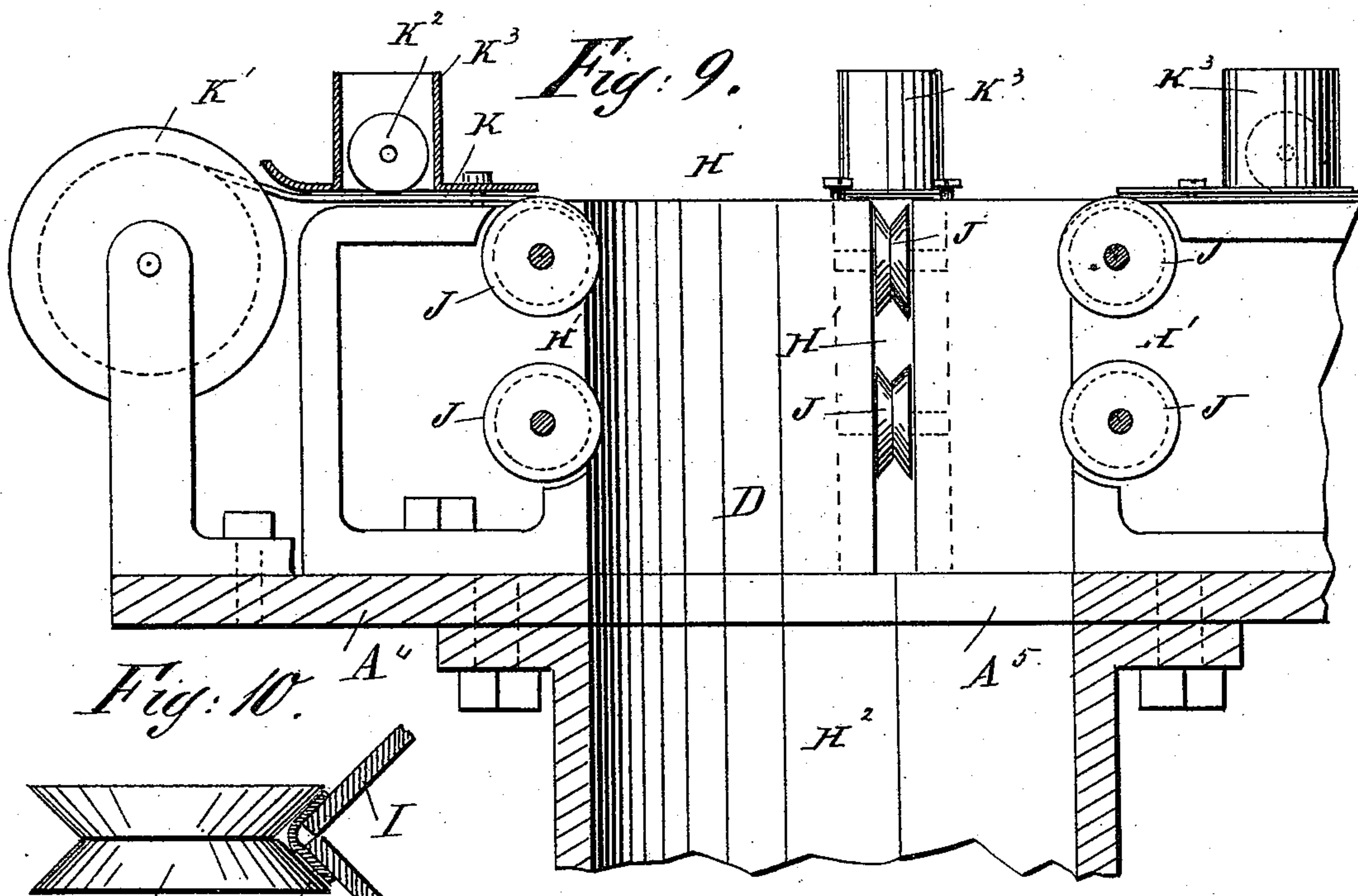
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Patented Nov. 18, 1890.



WITNESSES:

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

JULIUS MOHS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO MAX  
ESCHENBEK, OF SAME PLACE.

## BOX-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 441,104, dated November 18, 1890.

Application filed January 19, 1889. Serial No. 296,931. (No model.) Patented in France January 25, 1889, No. 195,624, and  
in Germany October 4, 1889, No. 48,960.

*To all whom it may concern:*

Be it known that I, JULIUS MOHS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Box-Making Machines, (for which patents have been granted me in Germany October 4, 1889, No. 48,960, and in France January 25, 1889, No. 195,624,) of which the following is a specification.

My invention relates to the making of boxes from paper, card-board, or analogous material; and it relates more specially to the apparatus for making boxes from blanks having the corners cut out so as to form flaps which form the sides of the box or lid when stamped or bent into shape.

My invention consists in an apparatus wherein the corners of the boxes are secured by means such as grooved rollers within a mold, such rollers acting to press adhesive strips to the corners of the box while the same is being depressed by a plunger which acts to bend up the sides of the box; and my invention consists in such further features and details of construction as will be set forth in the specification, and covered in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is a plan view of the strip and one of the blanks for forming the box. Fig. 3 is a perspective view of a finished box. Fig. 4 is a sectional side elevation of the improved machine on the line *xx* of Fig. 1. Fig. 5 is a transverse section of the same on the line *yy* of Fig. 1. Fig. 6 is a sectional plan view of the improvement on the line *zz* of Fig. 5. Fig. 7 is an inverted plan view of the plunger-plate, cutters, and plunger. Fig. 8 is a perspective view of the plunger. Fig. 9 is an enlarged sectional side elevation of parts of the machine on the line *ww* of Fig. 6. Fig. 10 is an enlarged sectional plan view of one corner of the box and a wheel for fastening the strip. Fig. 11 is an enlarged side elevation, with parts in section, of the inking device; and Fig. 12 is an end view of the same.

The improved box-making machine is mounted on a suitably-constructed frame A, comprising two standards A' and A<sup>2</sup>, connected with each other by transverse plates A<sup>3</sup> and A<sup>4</sup>. In the upper ends of the standards A' and A<sup>2</sup> is mounted to turn in suitable bearings the main driving-shaft B, carrying the usual fly-wheel and pulley, of which the latter is connected with suitable machinery for imparting a rotary motion to the main driving-shaft B.

On the shaft B, between the standards A' and A<sup>2</sup>, is formed a crank-arm B', fitted into a sliding box C, mounted to slide in a longitudinally-extending slot C', formed in the yoke C<sup>2</sup>, secured at its ends in the cross pieces C<sup>3</sup>, supporting vertically and downwardly extending rods C<sup>4</sup>, mounted to slide in suitable bearings C<sup>5</sup>, secured on the upper cross-plate A<sup>3</sup> of the frame A.

On the lower ends of the rods C<sup>4</sup> is secured the head D, carrying on its under side the cutters E and the plunger F. Opposite the cutters E and the plunger F are located the cutter-bed G and the mold H, both held on the top of the lower transverse plate A<sup>4</sup> of the main frame A. When the shaft B is rotated, its crank-arm B' and the box C impart an up-and-down sliding motion to the yoke C<sup>2</sup>, so that the head D, with its cutters E and the plunger F, is reciprocated to and from the cutter-bed G and the mold H, respectively. The tops of the cutter-bed G and the mold H are in line with each other, so that the material I' of which the box is to be formed can be fed across the top of the cutter-bed G and there formed into the blank I by means of the cutters, and the said blank I is pushed across the mold H by the operator handling the material I'.

The cutters E comprise outside corner or angle cutters E', serving to cut out the waste or surplus portion of the blank I, as is plainly illustrated in Fig. 2. In connection with the cutters E, I provide longitudinally and transversely arranged scorers or creasers E<sup>2</sup> E<sup>2</sup> E<sup>3</sup>, the base members of which are adjustably held on the lower face of the head D, while the cutting-edges thereof are in the same plane with the cutting-edges of the angle-cutters E',



as is plainly shown in Fig. 7. The cutting-edges of the angle-cutters  $E'$  extend below the cutting-edges of the creasers  $E^2 E^3$ , as the latter only cut part way into the material  $I'$ .

- 5 Next to the inner transverse cutter  $E^2$  is arranged a cutter  $E^4$ , extending below the angular cutters  $E'$  and serving to sever the blank  $I$  from the material  $I'$  before the said blank is operated on by the plunger  $F$ .
- 10 As the shape of the box to be made is varied, differently-configured plungers  $F$ , molds  $H$ , cutters  $E$ , and cutter-bed  $G$  are used. For this purpose the said parts can be removed and replaced by other similar ones.
- 15 In the corners of the mold  $H$  are formed slots  $H'$ , through which project grooved rollers  $J$ , mounted to turn in suitable bearings in the said mold  $H$ . Over the grooved rollers  $J$  pass the corner borders or strips  $K$ , wound on
- 20 rollers  $K'$ , mounted to turn in suitable bearings held on the lower transverse plate  $A^4$ . The borders or strips  $K$  may be of paper, muslin, or other suitable material, or be either suitably prepared with the size, glue, or paste,
- 25 or such adhesive material may be placed thereon as the strips are fed to the boxes. In the latter case a suitably-mounted paste-roller  $K^2$  is held in a paste-box  $K^3$ , resting on top of the strips  $K$ , so that when the latter pass from
- 30 the roller  $K'$  to the pasting-rollers  $J$  the adhesive material is placed on the top of the said strip. If the strip is already prepared with an adhesive material, the roller  $K^2$  is a wet-sponge roller in contact with the adhesive
- 35 side of the strip for moistening the same.
- The mold  $H$  is held over an opening  $A^5$  in the lower transverse plate  $A^4$ , and from the bottom of the latter extends downward an extension-mold  $H^2$ , corresponding with the upper mold  $H$ . On the top of the mold  $H$  and at its sides are held the transversely-adjustable guide-plates  $L L$ , serving to engage the side edges of the blank  $I$ , so as to hold the latter in place. An adjustable stop-plate
- 40  $N$  is also held on the outer end of the mold  $H$  and serves to limit the forward movement of the blank  $I$  when pushed into position over the mold  $H$  by the operator handling the material  $I'$ .
- 45 If it is desired to emboss or print the bottom of the box, the type or embossing plunger  $O$  is held to slide vertically in the recess  $G'$  in the hollow cutter-bed  $G$ . The plunger  $O$  is secured on the upper end of a rod  $O'$ ,
- 50 mounted to slide in suitable bearings formed on the transverse plate  $A^4$ , and carrying on its lower end a roller  $O^2$ , operated on by a cam  $O^3$ , secured on a transversely-extending shaft  $P$ , mounted to turn in suitable bearings in the
- 55 lower parts of the standards  $A'$  and  $A^2$ . On one outer end of the shaft  $P$  is secured a sprocket-wheel  $P'$ , over which passes a sprocket-chain  $P^2$ , also passing over a sprocket-wheel  $P^3$ , secured on one outer end of the
- 60 main driving-shaft  $B$ . When the latter is rotated, said sprocket wheels and chain impart a rotary motion to the shaft  $P$ , and the

latter, by its cam  $O^3$ , raises and lowers the type or embossing plunger  $O'$ , so that the top surface of the latter is moved in contact with the underside of the material  $I'$ , held directly over the opening  $G'$  in the cutter-bed  $G$ .

When the plunger  $O$  is a type-carrying plunger, a suitable sliding inking-roller  $Q$  is arranged to pass over the said plunger to supply the necessary ink. The inking-roller  $Q$  is mounted to turn in the end of a rod  $Q'$ , held to slide transversely in suitable bearings on the standard  $A$ . A pin  $Q^2$  projects from the said rod  $Q'$  and engages a slot  $Q^3$ , formed in the upper end of a lever  $Q^4$ , operated on at its lower end by a cam  $Q^5$ , secured to the shaft  $P$ . The lever  $Q^4$  has for its fulcrum a shaft  $Q^6$ , mounted to turn in suitable bearings formed in the brackets  $Q^7$ , secured to the under side of the transverse plate  $A^4$ .

The inking-roller  $Q$ , when in its rearward position, comes in contact with a distributing-roller  $R$  in contact with a fountain-roller  $R'$ , held in the fountain  $R^2$ , supported on a transverse plate  $A^4$ , and of the usual construction. On the shaft of the fountain-roller  $R'$  is held a ratchet-wheel  $R^3$ , engaged by a pawl  $R^4$ , secured on an arm  $R^5$ , loosely fulcrumed on the shaft of the said fountain-roller  $R'$  and pivotally connected by a link  $R^6$ , with an arm  $R^7$ , secured on the shaft  $Q^6$ . When the latter is rocked by the action of the cam  $Q^5$  and the lever  $Q^4$ , said fountain-roller  $R'$  is turned by the ratchet mechanism, and the distributing-roller  $R$  is supplied with ink.

The roller  $Q$  in its forward and backward motion passes over a distributing-plate  $S$ , secured on the upper end of a shaft  $S'$ , mounted to turn in suitable bearings formed on the transverse plate  $A^4$ . On the lower end of the shaft  $S'$  is secured a disk  $S^2$ , provided on its lower face with pins  $S^3$ , adapted to be alternately engaged by a cam  $S^4$ , secured on the shaft  $P$ . When the latter is rotated, said cam  $S^4$  turns the disk  $S^2$ , and consequently the shaft  $S'$ , so that the distributing-plate  $S$  is turned and a new surface is presented to the inking-roller  $Q$ , so that a given amount of ink passes onto the inking-roller  $Q$ , whereby the latter can fully and evenly ink the type on the plunger  $O$ .

The operation is as follows: The operative parts of the machine being suitably timed and power applied to the main driving-shaft  $B$  to actuate the same, the strip or length of card-board, leather, or other suitable material  $I'$  is pushed or fed by the operator over the cutter-bed  $G$  and rests thereon until the first cut or descent of the cutters  $E$  cut out the forward corner-pieces of the blank and cut through the material  $I'$  at places corresponding to the rear corners, and the material is partly cut through by the longitudinal and transverse creasers. At the same time the inking or embossing plunger  $O$  is moved up through the opening  $G'$  in the cutter-bed to make an impression on the under side of the material, after which it moves downward into its low-



ermost position (shown in Fig. 5) and the ink-  
ing-roller Q is moved over the same to ink the  
type. Meanwhile the head D, with the cut-  
ters E and the plunger F, ascends, and dur-  
ing such ascent the material I', with the par-  
tially-cut blank I, is fed forward until such  
blank finds its position over the top of the  
mold H, the outer end of the blank resting  
against the stop-plate N to limit the forward  
feed of the blank. Lateral movement of the  
blank is prevented by the guide-plates L. On  
the next descent of the head D the partially-  
formed blank I is first cut from the board by  
the transverse cutter E<sup>4</sup>, which also cuts off  
the rear corner-pieces, so that the blank is  
then fully formed before the plunger F meets  
the said blank. As soon as the plunger F  
contacts with the blank it is forced into the  
mold H, and the sides and ends of the blank  
strike the upper edges of the mold and are  
by the same bent or turned up against the  
sides and ends of the plunger, so as to form  
a box, which descends with the plunger into  
the mold H. As the slit or cut corners of the  
box travel down the mold in contact with the  
rollers J, the latter revolve by the friction be-  
tween them and the corners of the box, so as  
to feed the border or strip K to and press the  
same against or upon the corners of the box  
to bind the corners together. That part of  
the strips K adhering to the corners is then  
cut off by the operator with scissors or other  
suitable tool. Meanwhile the cutters E have  
descended upon the material I', resting on the  
cutter-bed G, to partially cut a succeeding  
blank, which is printed or embossed, as above  
described. When the cutters and plunger  
ascend, the plunger withdraws from the box,  
formed as above described, to get into posi-  
tion for the next blank. The box remains in  
position in the mold, owing to a slight friction  
between it and the sides of the mold, and is  
fed through the same by the succeeding boxes  
as they are formed or shaped. When the  
plunger O is an embossing-plunger, the ink-  
ing attachment may be dispensed with.

With the above-described machine the box  
or its lid is fully formed and printed or em-  
bossed as desired, the boxes or bodies thereof  
being made at one time and the lids at an-  
other time.

In making round, three or six sided, octago-  
nal, or other configured boxes the cutters are  
changed to correspond to the form or shape of  
blank required, as are also the plunger F and  
mold H.

The cutters E are held adjustable on the  
head D, so as to permit of accurately setting  
the angle-cutters E' and the scorers or creas-  
ers E<sup>2</sup> and E<sup>3</sup>.

Having thus fully described my invention,  
I claim as new and desire to secure by Let-  
ters Patent—

1. In a box-making machine, the combina-  
tion, with a plunger, of a mold adapted to re-  
ceive said plunger and feeding devices, held

in the corners of said mold and adapted to  
carry the borders or strips to the corners of  
the box pressed into the mold by said plun-  
ger, substantially as described.

2. In a box-making machine, the combina-  
tion, with a plunger, of a mold adapted to re-  
ceive said plunger and feeding-roller, held in  
the corners of said mold and adapted to carry  
the adhesive strips or borders to the corners  
of the box pressed into the mold by said plun-  
ger, substantially as described.

3. In a box-making machine, the combina-  
tion, with a cutter-bed and a mold held along-  
side the said cutter-bed, of a head held to re-  
ciprocate over the said bed and mold, cutters  
secured to the said head and operating over  
the said bed to form the blank, a plunger  
held on the said head and adapted to pass  
into the said mold to form the box, and a  
corner-strip feeding and pressing device, sub-  
stantially as described, for fastening adhesive  
strips to the corners of the box pressed into  
the mold by the said plunger, substantially  
as set forth.

4. In a box-making machine, the combina-  
tion, with a cutter-bed and a mold held along-  
side the said cutter-bed, of a head held to re-  
ciprocate over the said bed and mold, cutters  
secured to the said head and operating over  
the said bed to form the blank, a plunger  
held on the said head and adapted to pass  
into the said mold to form the box, side guide-  
plates held on the sides of the said mold, and  
a stop-plate held on the outer end of the mold,  
substantially as set forth.

5. In a box-making machine, the combina-  
tion, with a plunger, of a mold adapted to re-  
ceive the said plunger, and grooved rollers  
held in the corners of the said mold and  
adapted to carry the borders or strips to the  
corners of the box pressed into the mold by  
the said plunger, substantially as shown and  
described.

6. In a box-making machine, the combina-  
tion, with a plunger, of a mold adapted to re-  
ceive the said plunger, grooved rollers held  
in the corners of the said mold and adapted  
to carry the borders or strips to the corners  
of the box pressed into the mold by the said  
plunger, and reels carrying the borders or  
strips, substantially as shown and described.

7. In a box-making machine, the combina-  
tion, with a plunger, of a mold adapted to re-  
ceive the said plunger, grooved rollers held  
in the corners of the said mold and adapted  
to carry the borders or strips to the corners  
of the box pressed into the mold by the said  
plunger, and a device for moistening or ap-  
plying adhesive material to the borders or  
strips, substantially as shown and described.

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

JULIUS MOHS.

Witnesses:

GEORGE CORBION, Jr.,  
S. J. VAN STAVOREN.