

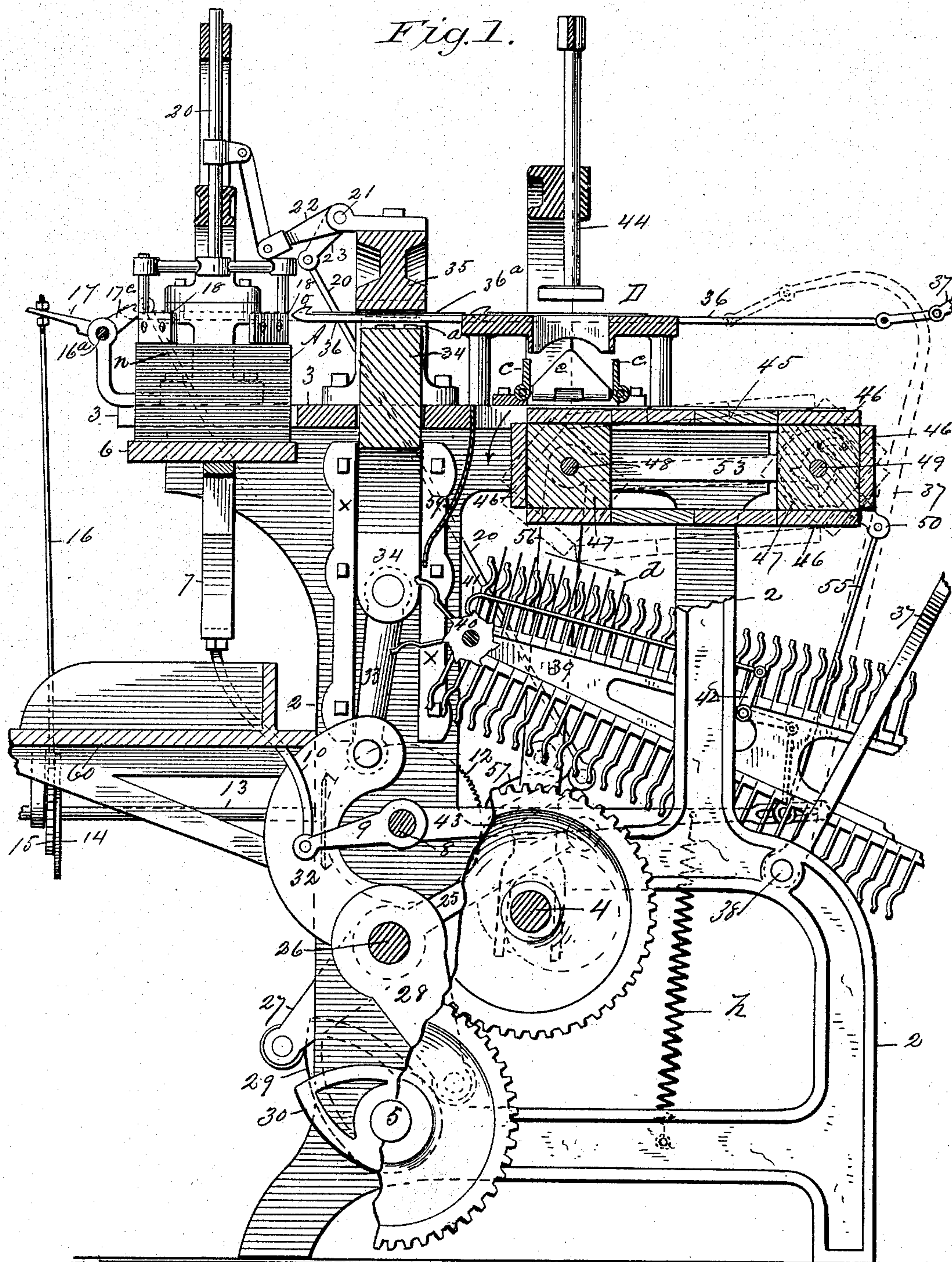
(No Model.)

3 Sheets—Sheet 1.

J. BALL.
ENVELOPE MACHINE.

No. 442,092.

Patented Dec. 9, 1890.



Witnesses:

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(No Model.)

3 Sheets—Sheet 2.

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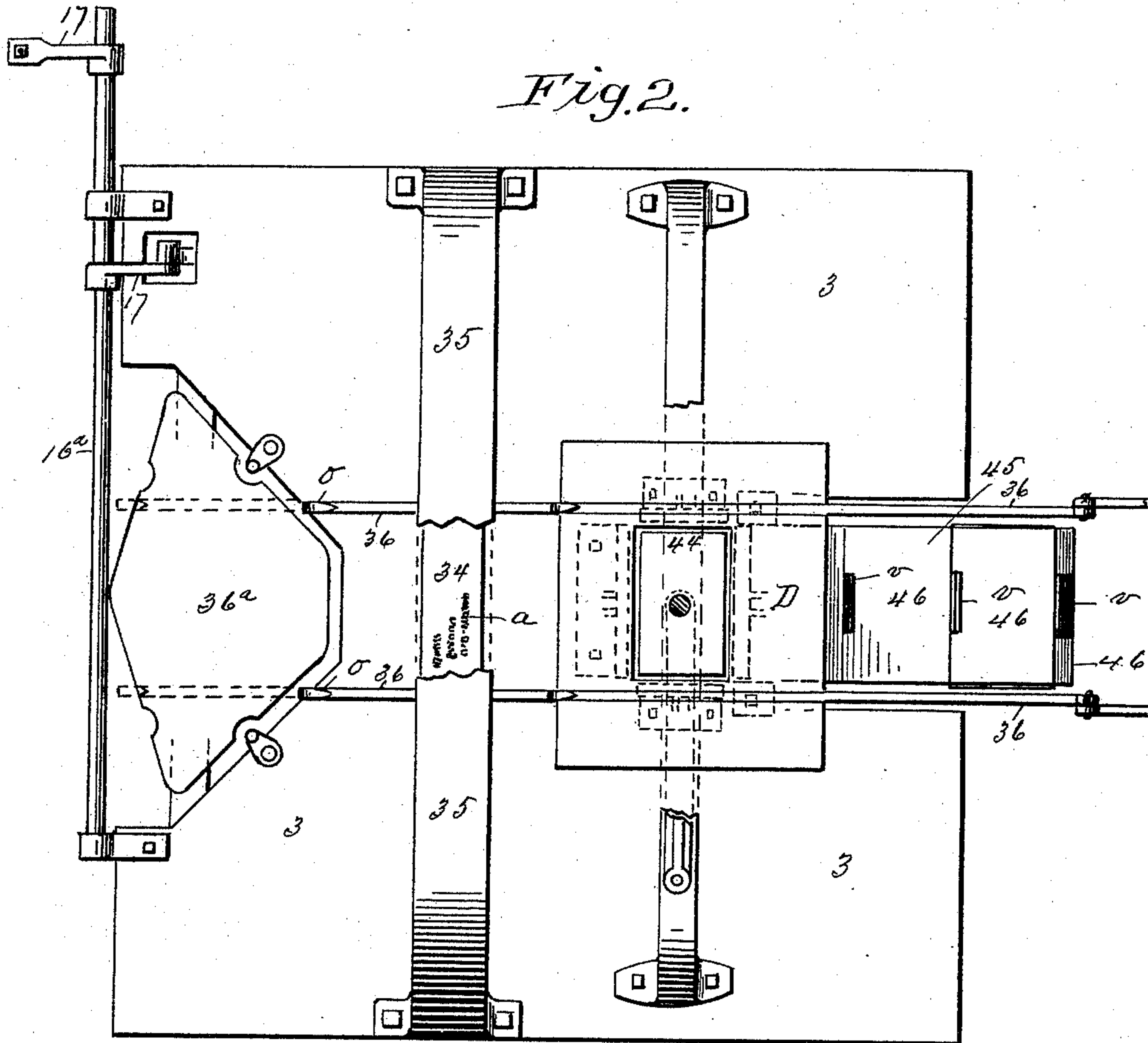
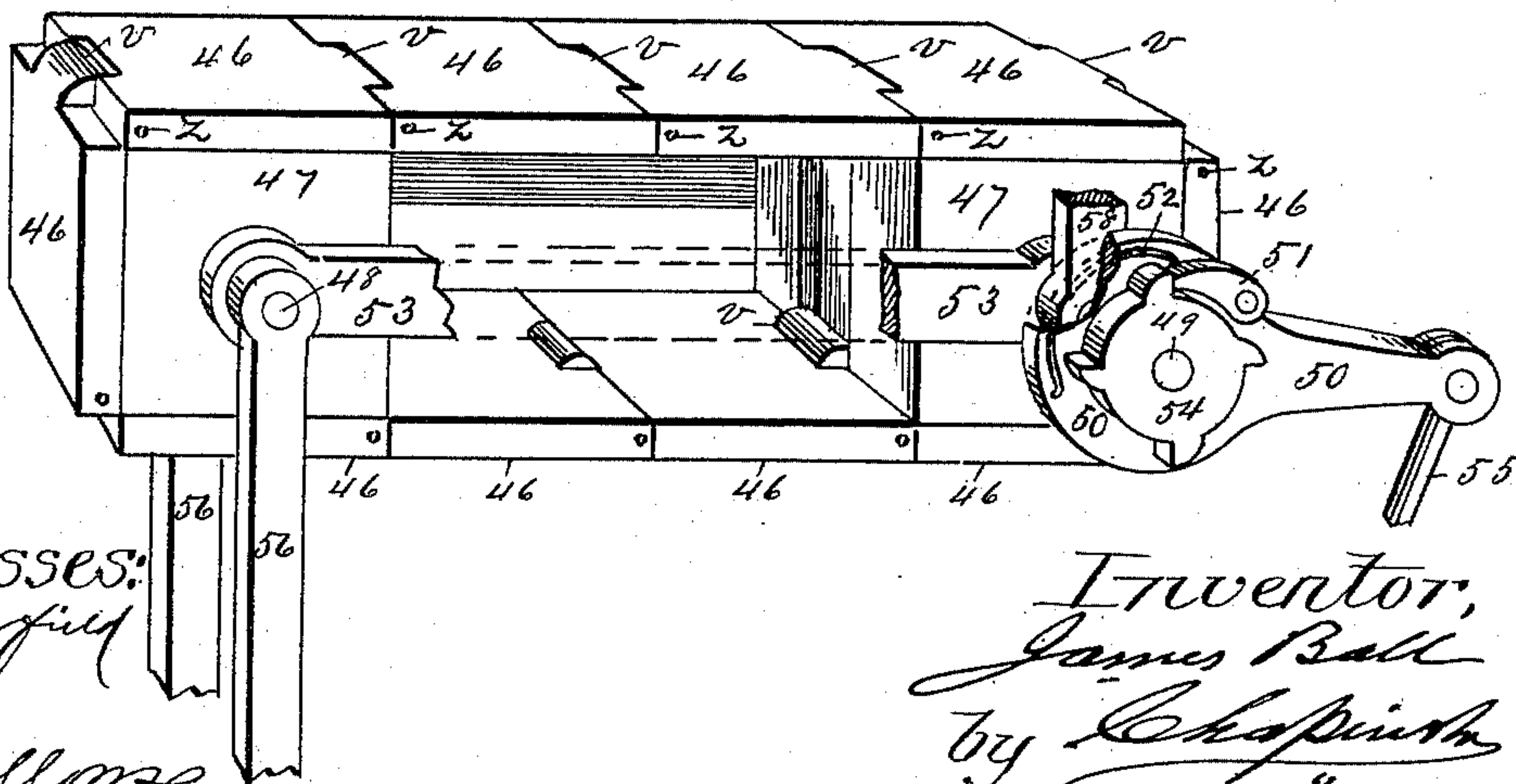


Fig. 3.



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Fig. 4.

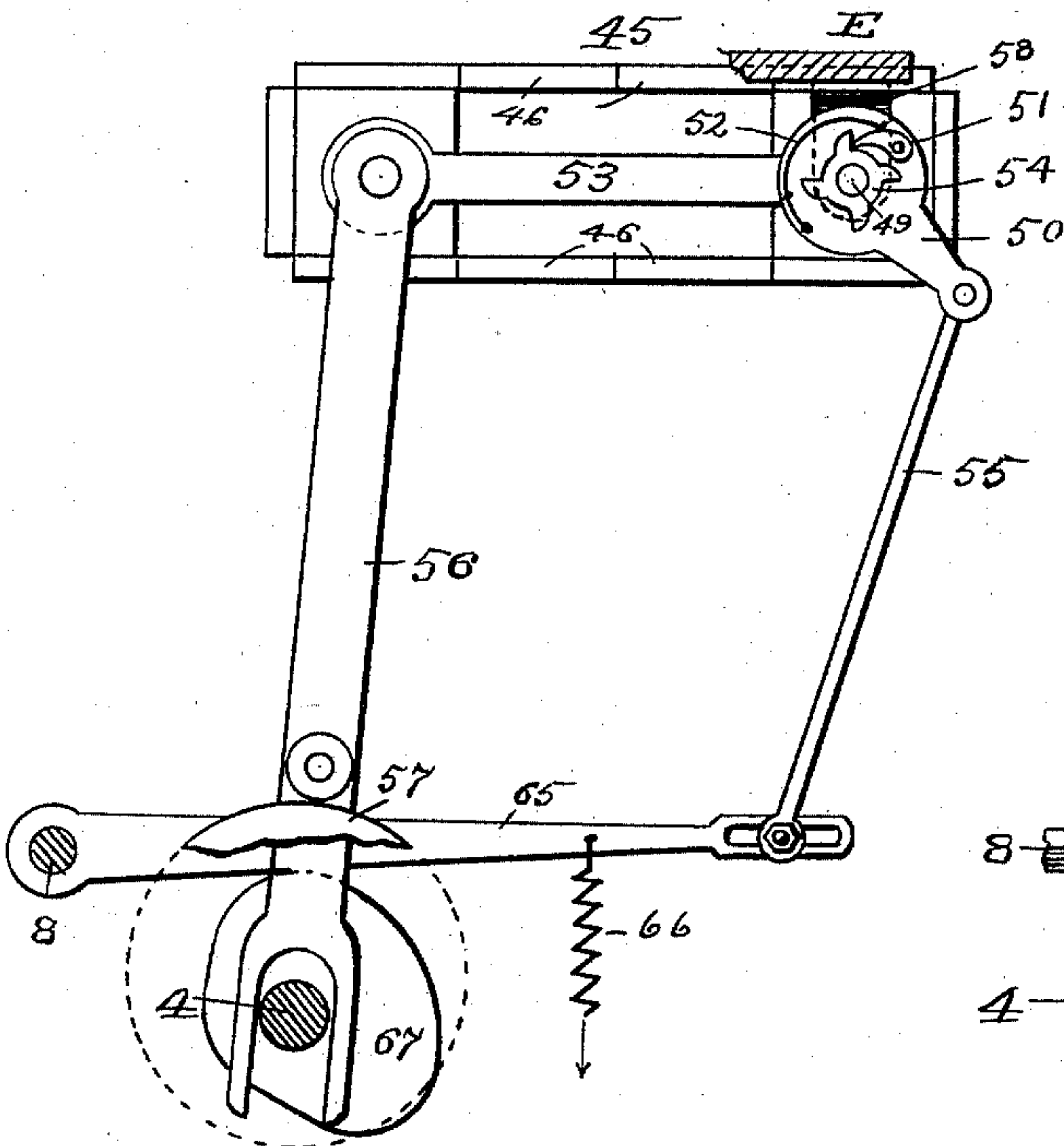
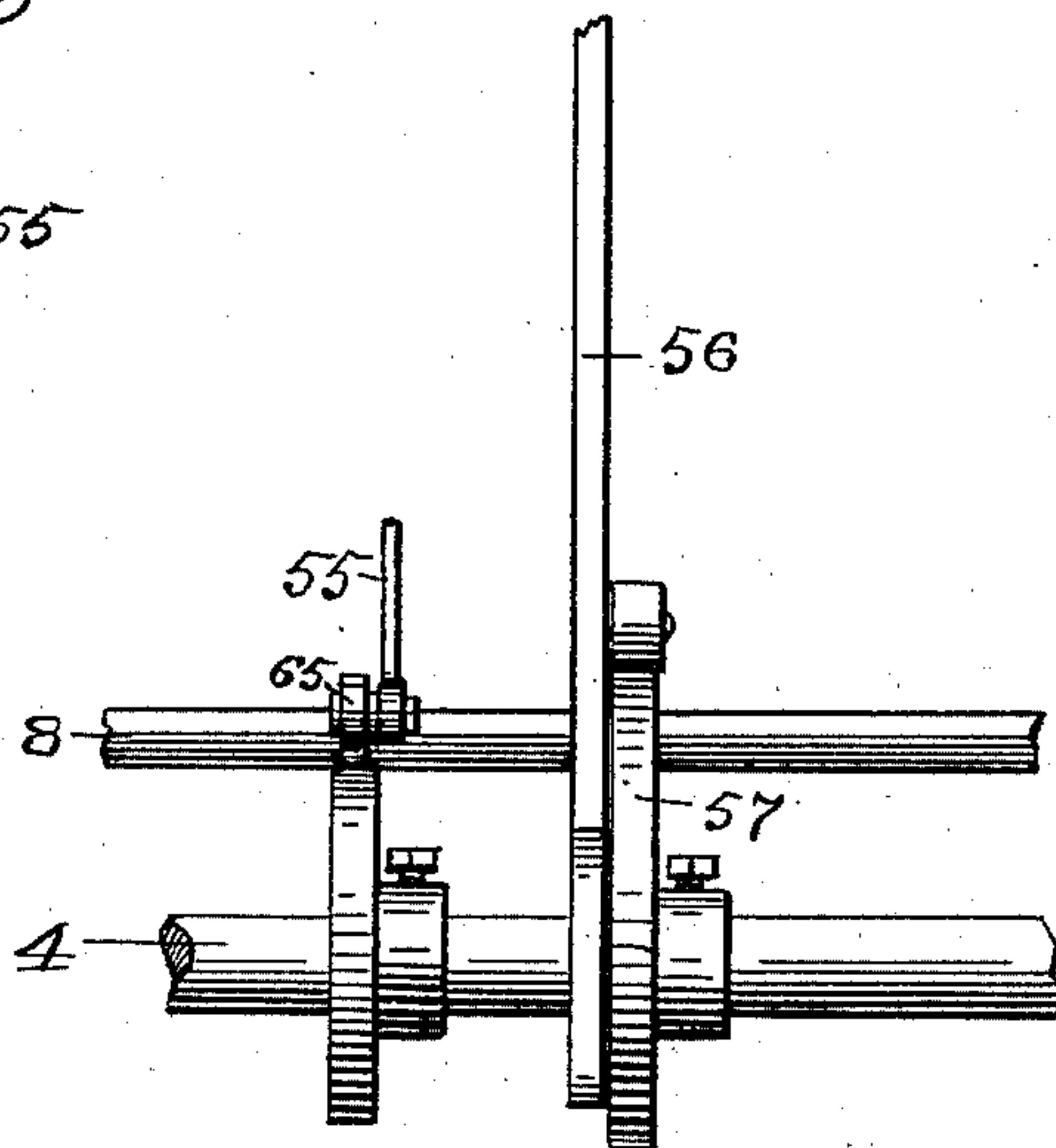


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES BALL, OF HOLYOKE, MASSACHUSETTS.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 442,092, dated December 9, 1890.

Application filed January 21, 1890. Serial No. 337,570. (No model.)

To all whom it may concern:

Be it known that I, JAMES BALL, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Envelope-Machines, of which the following is a specification.

This invention relates to improvements in envelope-machines, and more particularly to an improved construction of the base or bottom of the folding-box of such machines, and means for operating the same, all as herein-after fully described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of an envelope-machine, showing the essential parts thereof so far as is necessary to an understanding of the operation of the improvements herein described. Fig. 2 is a plan view of Fig. 1, but showing the gumming and picker devices removed, in order to make more clear the operation of parts thereunder. Fig. 3 is a perspective view of the base or bottom of the envelope-folding box of the machine, showing certain directly-connected parts, all of which are fully described below. Figs. 4 and 5 are views of detail parts of the machine hereinafter described.

As above stated, the subject-matter of this application relates more particularly to improvements in the construction of the base or bottom of the envelope-folding box of envelope-machines, which improvements are adapted to be usefully employed in any envelope-machine, but are of particular advantage in machines which embody mechanism for printing or embossing the envelopes in addition to the usual mechanism for gumming, picking up, carrying, and folding the blanks to complete the envelope.

The envelope-making mechanism herein shown and described comprises those parts of the machine which operate to gum and pick up an envelope-blank from a pile, to seize and carry said blank from the pickers between printing or embossing devices and a suitable platen, and thence to the folding-box, and the essential parts of the mechanism for operating said devices, together with said improved folding-box base and means

for operating the same, the adaptation of the said improvements to an envelope-machine construction being made clear to any person skilled in the art of constructing and operating envelope-machines by reference to the drawings and the following description of the construction therein shown.

The essential object of the within-described improved folding-box base is to avoid the inconvenience (when folding printed envelope-blanks or those embossed in colors) pertaining to the ordinary hinged base which constantly presents the same face for the reception thereagainst of every envelope which is folded, thereby rendering it exceedingly difficult to print and then fold a number of envelopes in succession against the face of said base without causing the address side of the envelope to become more or less defaced by the ink upon said base which the previously-folded envelopes shall have deposited there; and said inconvenience pertaining to the hinged folding-box base is obviated by constructing, as herein described and shown, a base having an intermittent movement under the folding-box, whereby another part of the face of said base is presented under the folding-box than that upon which the preceding envelope was folded, and whereby several envelopes are folded before any two thereof shall have been folded against any one portion of the surface of said base, thereby allowing more or less time for any ink that may have been deposited on said base from a printed or embossed envelope to become sufficiently dried before that part of the base shall be again brought under the folding-box to prevent any defacement of an envelope, as above stated.

The within-described improved folding-box bottom is usefully employed in an envelope-machine not provided with printing or embossing devices, for by the said movement thereof under the folding-box the envelopes are, after being folded thereon, carried from under the said box to the drying-chain and dropped into the latter, no knocking off or other similar mechanism being required, as is common in folding-boxes with ordinary bottoms for pushing the folded envelopes into said chain.

In the drawings, 2 indicates the frame of

the machine, and 3 the table thereof. A driving-shaft 4 is provided with suitable bearings in the frame, and has a geared connection with an auxiliary shaft 5. A blank-table 6 (shown in vertical section in Fig. 1) is supported on a suitable frame 7, and carries thereon a pile A of the usual envelope-blanks. The mechanism herein shown for supporting and giving an upward movement to said table 6 is substantially that shown and described in my patent No. 344,073, of June 22, 1886, to which reference may be had, where said mechanism is shown more in detail. Two pending curved rods 10 are in practice attached to the lower end of said frame 7, and each of said rods is pivotally attached by its lower end to an arm 9, fixed on a rock-shaft 8, on the end of which, outside of frame 2, is a bevel-gear 12. A shaft 13, having an intermittently-rotating motion, has a bevel-geared connection with said gear 12, as shown by dotted lines in Fig. 1, and near the outer end of said shaft 13 is placed a freely-rotating disk 14, having a pawl thereon, (not shown,) which engages with a ratchet-wheel 15, which is fixed on the shaft 13. A rod 16 has its lower end pivotally connected with said disk 14 at one side of its axis, and the upper end of said rod 16 is attached to the end of an arm 17, Figs. 1 and 2, which is fixed on a rock-shaft 16^a, supported at the edge of the table 3 of the machine in suitable bearings. A second arm 17^c is fixed on said shaft 16^a, to which is attached the upper end of a connecting-rod *n*, the lower end thereof having an engagement with a suitable cam (not shown) on one of the shafts of the machine, whereby it is given an endwise reciprocating motion. The vibratory motion of said arm 17, through the rod 16, disk 14, and the ratchet-wheel 15, imparts said intermittent rotary motion to the shaft 13 and its gear thereon, and the engagement of the latter with said gear 12 on shaft 8 causes the latter to turn intermittently, thereby gradually swinging the end of arm 9 upward and lifting the blank-table to maintain the uppermost side of the blank-pile A at as near a uniform height as is practicable while the blanks are being removed one by one by the pickers 18.

The pickers 18, which operate in the usual way to apply gum to each blank 36^a of the pile A in succession and lift it up from those under it, are mounted on a vertical shaft 20, which is supported in a suitable frame above the table 3, as shown. A vertically-reciprocating motion is given to said pickers by means of a vibratory arm 22, fixed on a rock-shaft 21, the free end of which arm is connected to said shaft, as shown, and motion is imparted to said rock-shaft by means of a cam-lever 25, having a vibratory motion on said shaft 8, by means of a cam on the shaft 4, (said cam being shown in dotted lines in Fig. 1,) said lever 25 being connected with an arm 23 on shaft 21 by a rod 20.

The embossing or printing block 34 (see

Fig. 1) is supported in suitable guideways *xx*, under the table 3, and extends above the latter, as shown, under a fixed platen-bar on said table 3, and bears embossing or printing devices or letters *a* on its upper end or face. Said block 34 is given a properly-timed vertically-reciprocating motion by means of two pivotally-connected toggle-arms 32 and 33, the first of which is connected to said block 34, and the latter one 32 is fixed by its lower end on the rock-shaft 26. Said shaft 26 is given its rocking motion by the engagement of two arms 27 and 28 fixed thereon, with the cams 29 and 30 fixed on the said shaft 5.

The blank-carrier 36 is of ordinary construction, Figs. 1 and 2, having hooks *o* thereon for engagement with the picked up envelope-blanks 36^a, and is suitably supported in a horizontal position in a line under said platen 35, over the folding-bed and under the pickers 18, when the latter are, with a blank adhering thereto, lifted up. The said carrier is given a horizontally-reciprocating motion by means of two levers 37, hung on a rock-shaft 38, whereby said levers are given a vibratory motion and the upper ends of the latter (one only being shown in the drawings) have link-connections with said carrier, as shown.

The blank-folding devices are of the usual description, consisting of the usual series of folding-wings *c* and a plunger and shaft 44 to strike the blank 36^a while held by the carrier 36 and carry it downward into the folding-box between said wings. It has not been deemed necessary to show any mechanism for actuating said plunger and shaft 44, since they and their actuating mechanism are old and well-known constructions. The base or bottom 45 of said folding-box is shown in operative position under said box in Fig. 1.

The operation of the above-described parts in gumming, picking up, embossing or printing, and folding an envelope-blank is as follows: The pickers 18 have their under edges gummed by well-known means while they are in an elevated position, after which they are dropped against the top blank of the pile A, applying the gum thereon to said blank. The pickers then rise, picking up said blank and separating it from the others beneath it. The carrier 36 then passes under said picked-up blank, its hooks *o o* engaging with the outer edge of the blank, and the carrier immediately moves back with said blank, carrying the latter over the die-block 34, where it rests an instant, said block meanwhile rising up and causing an impression to be made or printed on the face or downward side of the said blank, said block immediately moving downward again. The embossing or printing having been accomplished, the said carrier again moves rearwardly, carrying the said embossed blank over the folding-box D, where it comes to a stop, and the plunger and shaft 44 then descend, thereby carrying the blank into the box and between the wings *c*

and against the base 45, when the said wings swing inwardly, as usual, thus folding the flaps of the envelope and completing the same. The said folding-box base or bottom 5 45 consists of a series of rectangular-shaped flat metallic sections 46, hinged to each other, as shown, and forming, in effect, a flat sectional metal band, each section of which is of about the same superficial area as the space 10 in the folding-box which is surrounded by the folding-wings thereof, it being preferable that each of said sections shall successively constitute the part of said base on which each envelope is folded, as indicated in Fig. 1, where a section of said base is shown 15 as covering the space surrounded by the wings *c* of the folding-box, in order that there shall be an unbroken plane or surface upon which each envelope shall be folded. 20 The said sectional band forming the folding-box bottom, made preferably of metal, as stated, may consist of as many of the hinged sections as may be desired or be found requisite for accomplishing one of the above-stated 25 objects of its construction, but is represented in the drawings as having ten sections. Said sections 46 of the base or bottom 45, as shown in the drawings, have each in one edge a socket or recess, and on the opposite edge is 30 a hinge projection *v*, the latter entering the said recess of the adjoining section and being secured therein by a pin *z*, passed from edge to edge through the section and through said projection, thereby hinging the sections 35 together, as shown. The above-described manner of hinging said sections together is one way of connecting them to form said sectional band. Any other suitable manner of 40 hinging the sections may be adopted, if preferred. Said sectional base or bottom is mounted upon two rectangular-shaped blocks or supports 47, (preferably of metal,) through each of which passes a shaft 48 and 49, which shafts are preferably fixed therein, and the 45 projecting ends thereof enter or pass through suitable supports in which said shafts turn when the blocks 47 are rotated, as below described. Two horizontal bars 53 (only one of which is shown in the drawings) connect the 50 said rectangular blocks 47 by engaging the projecting ends of said shafts 48 and 49 at the ends of said blocks and serve to hold the latter in proper separated positions, whereby the said sectional band is suitably held under 55 the folding-box D. The said sectional band, constituting a continuous movable bottom for the folding-box of an envelope-machine, together with its said co-operating parts, is supported under said folding-box as follows, 60 or in any other suitable manner: Two posts 56 have the ends of the shaft 48 passing through their upper ends, as shown, their lower ends being bifurcated and resting on a shaft 4 of the machine, as indicated in Fig. 1. 65 Said shaft has fixed thereon at the side of said posts a cam 57, (see Figs. 1, 4, and 5,) and whose periphery engages under a fric-

tion-roller, as shown, on the side of said posts, whereby, after the envelope is folded as aforesaid, the end of the bottom 45 under the fold- 70 ing-box is dropped down or separated from the folding-box to facilitate the delivery of the envelope therefrom into the drying-chain 39, said envelope moving in the direction indicated by the arrow at the end of said bottom 75 in Fig. 1, and being directed into said chain more or less by the pending curved guide 59 opposite the folding-box bottom, as shown. The rear end of said bottom 45 may be supported in any suitable manner by proper posts 80 or hangers engaging with the ends of the said shaft 49, one of said means being indicated in Fig. 3, wherein is shown a portion of a suspension-bar 58, engaging with one end of said shaft 49, and a like bar is engaged with the 85 opposite end of said shaft, and the upper ends of said bars may be secured to any suitable fixed part of the machine on or above the table thereof, whereby the rear end of said bottom may be maintained in substantially the 90 position shown in Fig. 1, and permitted to have its opposite end swing vertically, as aforesaid. The said intermittent movement of the sectional band bottom is produced, preferably, by the below-described appli- 95 ances, but may be otherwise provided for in any suitable way.

On the end of shaft 49 is loosely placed a vibratory pawl-carrying arm 50, having pivoted thereon a pawl 51, a spring 52 bearing 100 on said pawl. A ratchet-wheel 54 is fixed on the shaft 49, with which said pawl engages, the teeth on said wheel being preferably so spaced as to cause the block 47, in which shaft 49 is fixed, to rotate a quarter of a revolution 105 at each action of said pawl-arm on said ratchet-wheel. Said pawl-arm has a connecting-rod 55 engaging with its free end, the lower end of said rod being connected to the free end of a lever 65, (see Fig. 4,) whose opposite 110 end is hung freely on shaft 8. A vibratory motion is imparted to lever 65 by a cam 67 on shaft 4, on which lever 65 lies, a spring 66 drawing the said free end of lever 65 downward and against said cam, thereby impart- 115 ing properly-timed vibratory movements to the lever 50, whereby the ratchet-wheel and block 47 are turned one-quarter round after each envelope is folded. The said intermittent rotation of the block 47, to whose shaft 120 49 the ratchet-wheel 54 is fixed, causes the hinged sections 46 of the bottom 45 to be carried proportionately along under the folding-box and around the blocks 47, bringing different parts of the surface of the bottom suc- 125 cessively under the folding-box, as aforesaid, and for the purpose described. The said inclined position taken by the bottom 45, after each envelope is folded, to deliver the same to the drying-chain, is substantially that indicated by dotted lines in Fig. 1. 130

The drying-chain 39 is of the ordinary construction, and has the usual intermittent motion given to it by means of a ratchet-wheel

40, fixed on the shaft at one end of the chain, said ratchet-wheel being rotated by a pawl-rod 41, having one end connected to one arm of an elbow-lever 42, the second arm of said lever being connected with the free end of a lever 43, whose opposite end is hung freely on shaft 8. A vibratory motion is imparted to lever 43 by a cam on shaft 4 (not shown in the drawings) and a spring *h* to draw the free end of said lever downward. The folded envelopes *d* drop from said bottom 45 into said chain and take the positions shown in Fig. 1, and are carried around in the usual manner, and are taken therefrom onto the table 60 and banded and packed as usual.

What I claim as my invention is—

1. A bottom for the folding-box of an envelope-machine, having a movement thereunder, whereby different portions of said bottom are brought successively under the folding-box, and a movement from the folding devices of the machine, whereby the said bottom and said folding devices are separated when the folded envelope is to be delivered therefrom, and mechanism for effecting said movements, combined and operating substantially as set forth.

2. In an envelope-machine, the combination, with printing or embossing devices, substantially as described, of a folding-box to receive and fold a printed or embossed envelope-blank and a bottom for said folding-box, consisting of a series of sections hinged to each other and forming an endless band, two supports upon which said band is mounted, hung to rotate on shafts, and mechanism for imparting an intermittent rotary motion to

one of said supports, whereby different portions of the surface of said bottom are brought successively under the folding-box, combined and operating substantially as set forth.

3. A bottom for the folding-box of an envelope-machine, consisting of a series of sections hinged to each other and forming an endless band, two supports upon which said band is mounted, hung to rotate on shafts, and mechanism for imparting an intermittent rotary motion to one of said supports, whereby different portions of the surface of said bottom are brought successively under the folding-box, combined and operating substantially as set forth.

4. A bottom for the folding-box of an envelope-machine, consisting of a series of sections hinged to each other and forming an endless band, two supports upon which said band is mounted, hung to rotate on shafts, mechanism for imparting an intermittent rotary motion to one of said supports, whereby different portions of the surface of said bottom are brought successively under the folding-box, supporting posts and hangers for said bottom, substantially as described, and mechanism operating in conjunction with said posts to impart thereto and to one end of said bottom a vertically-reciprocating motion from and toward the folding-box of the machine, combined and operating substantially as set forth.

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Witnesses

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