

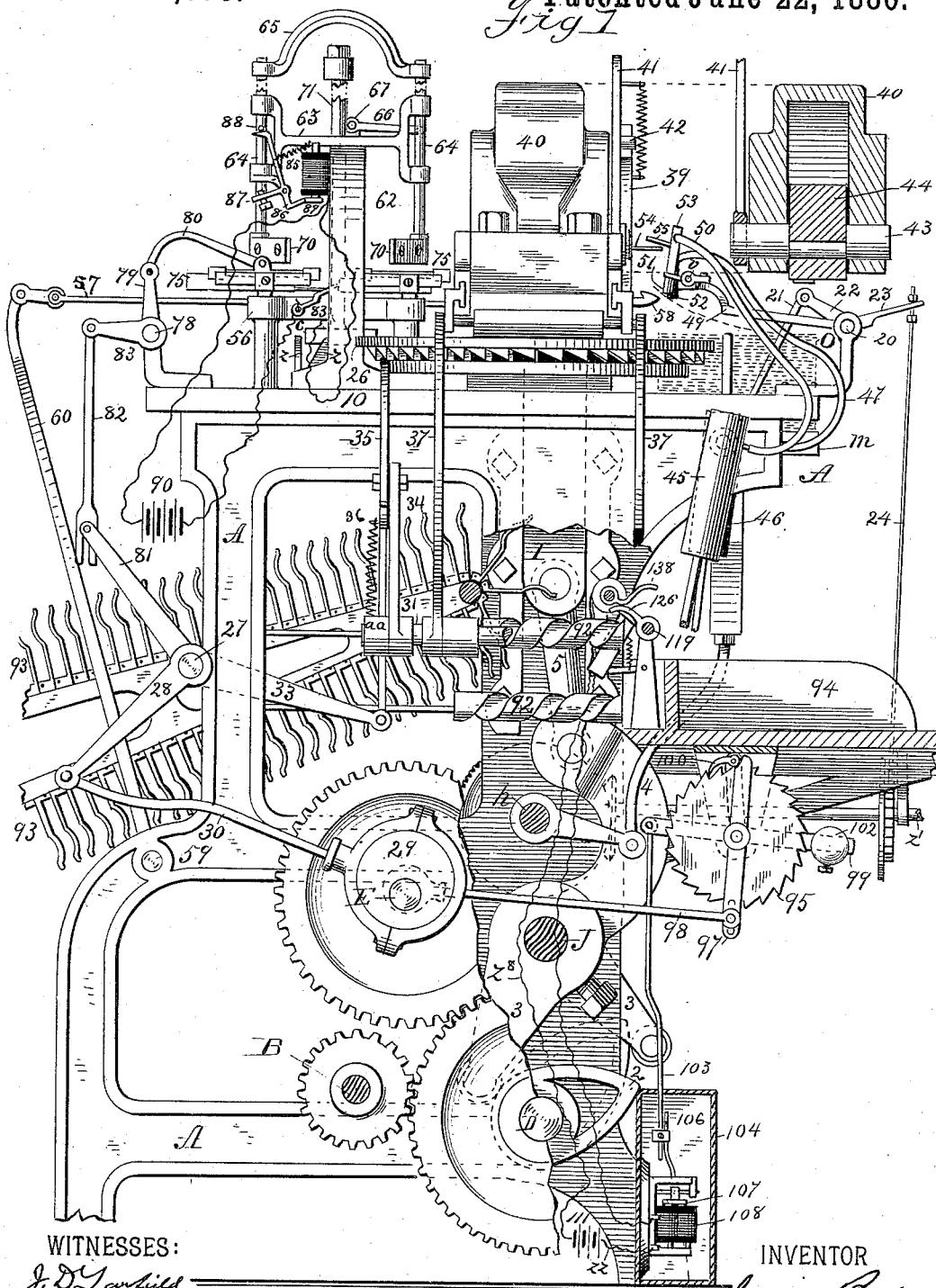
J. BALL.

ENVELOPE MACHINE.

No. 344,073.

Patented June 22, 1886.
Fig 1

2. Pater
Fig 1



WITNESSES:

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Wm. Chapin

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James Ball

BY

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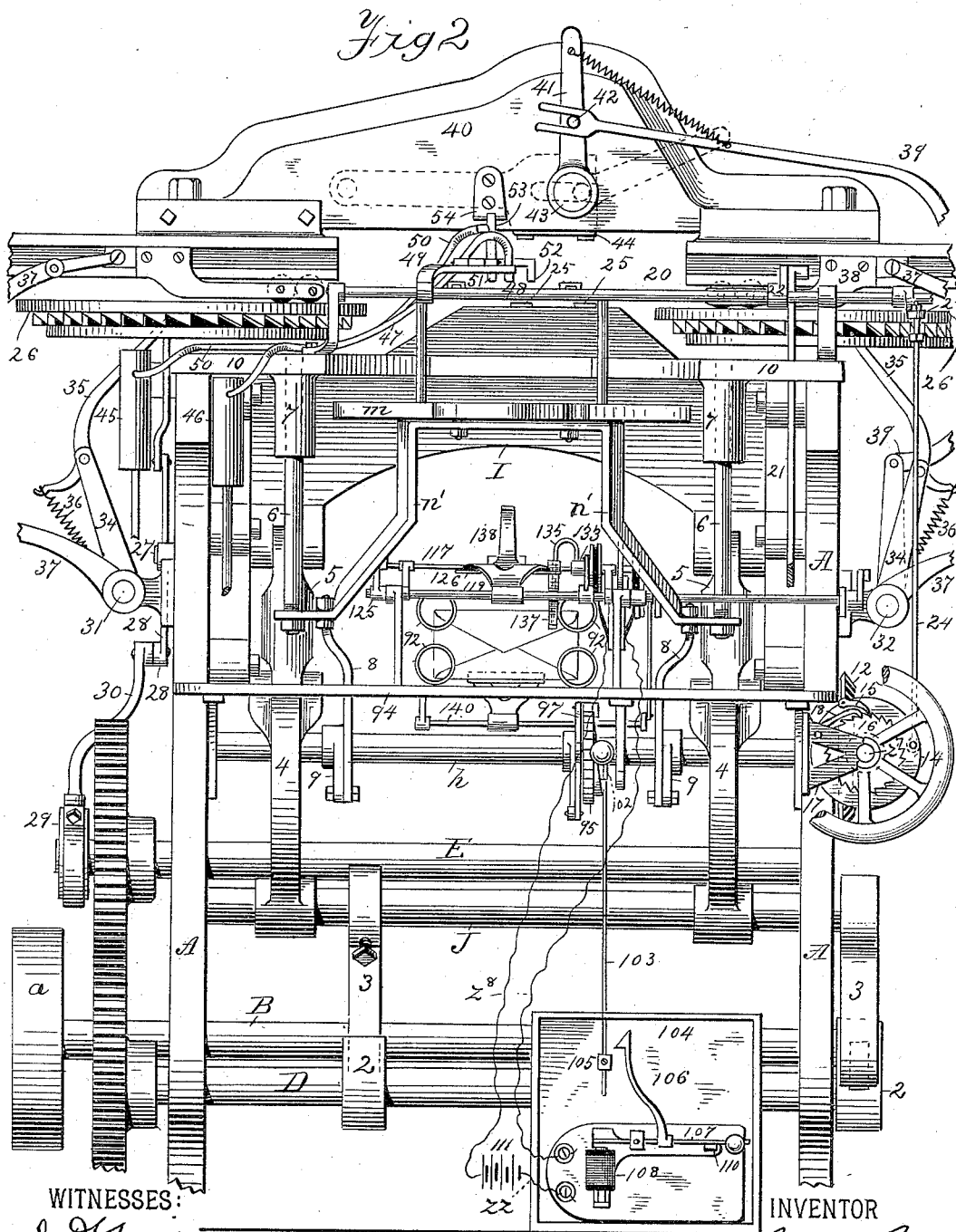
ATTORNEY

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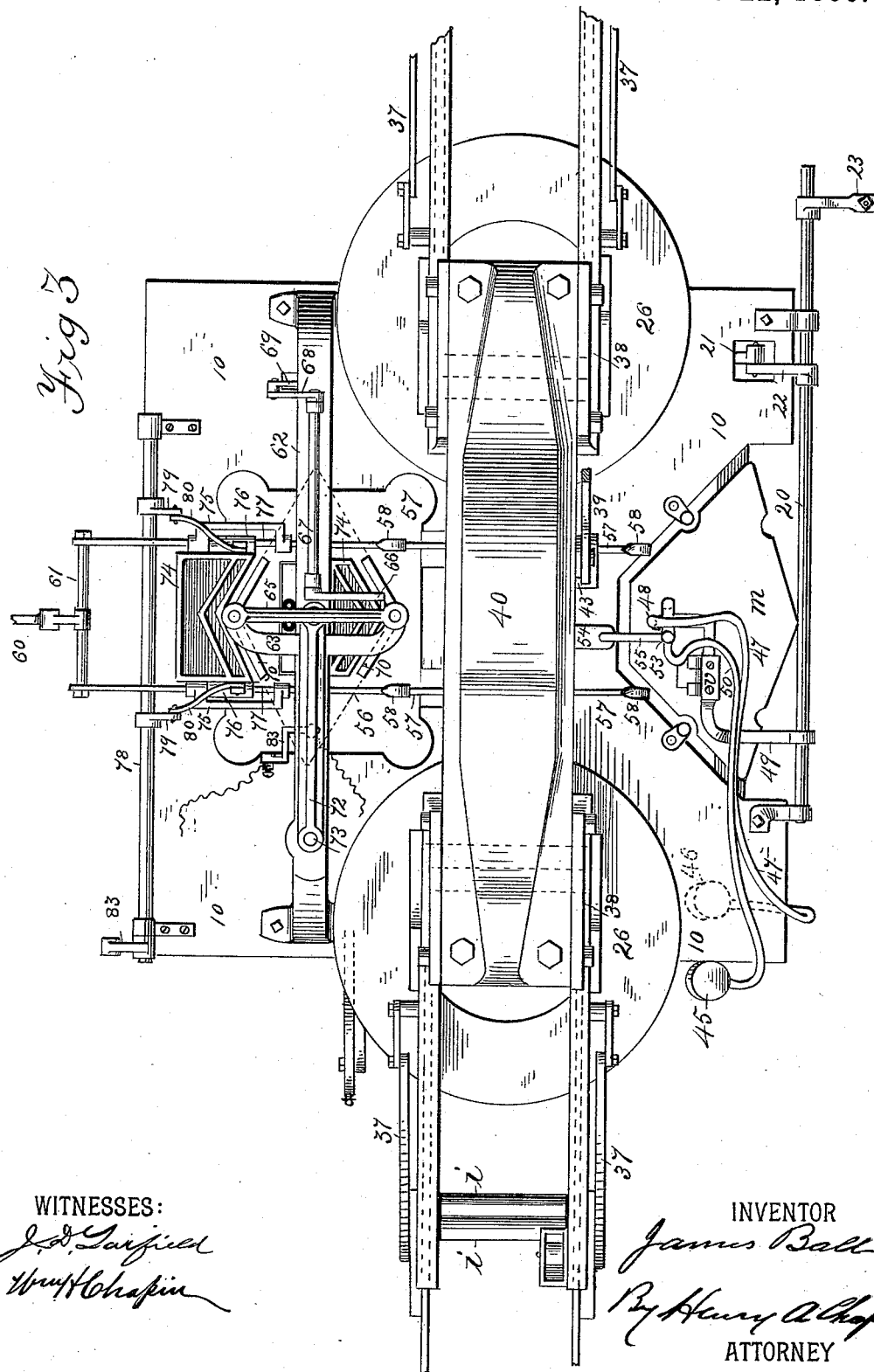
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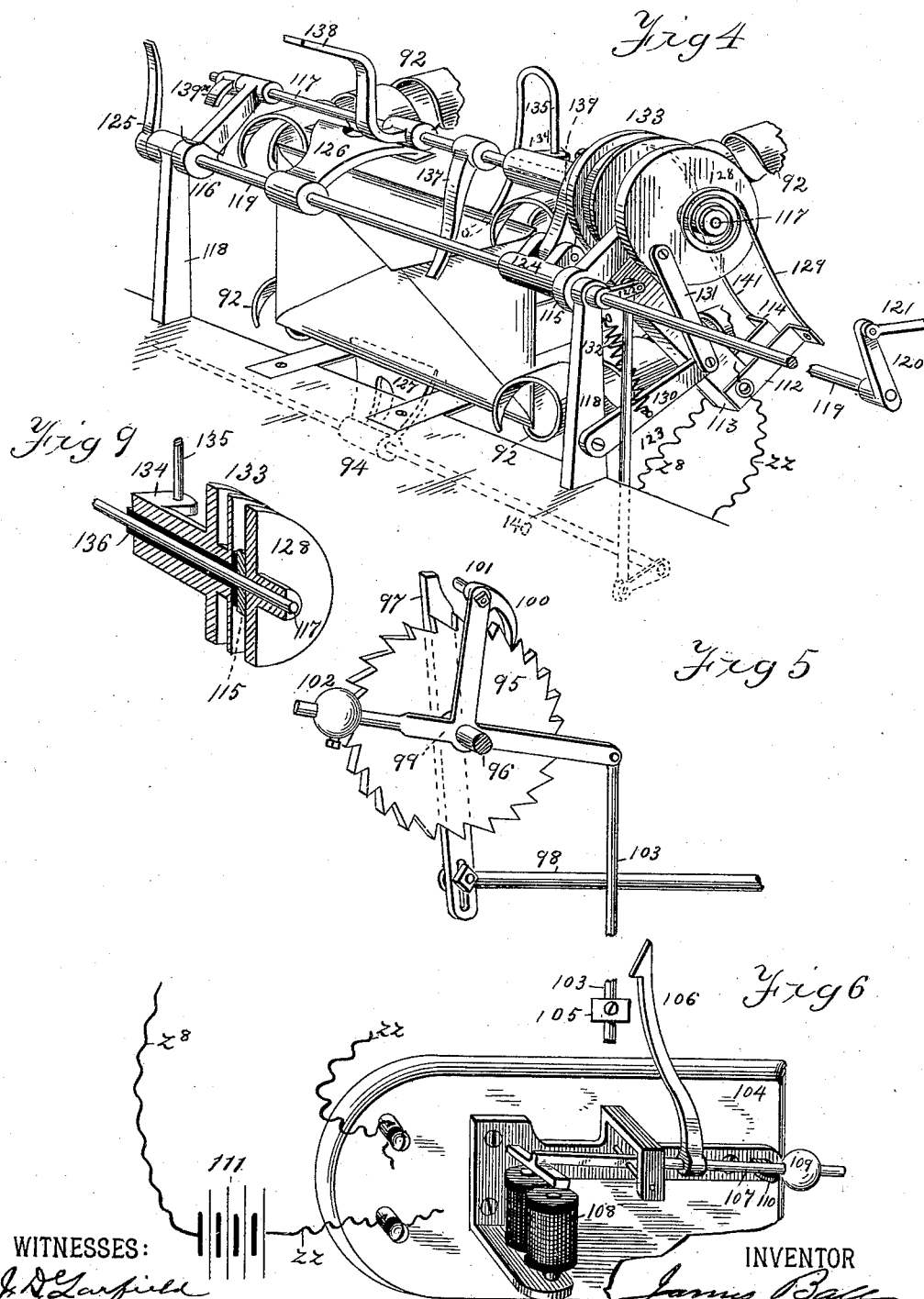


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ENVELOPE MACHINE.

No. 344,073.

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WITNESSES:

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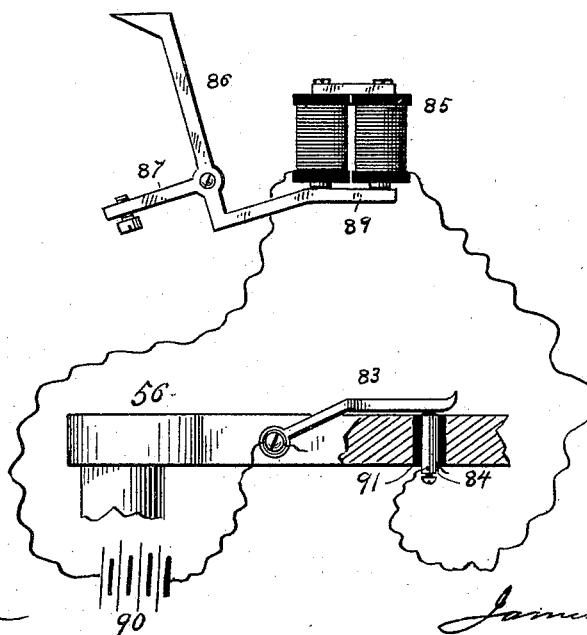
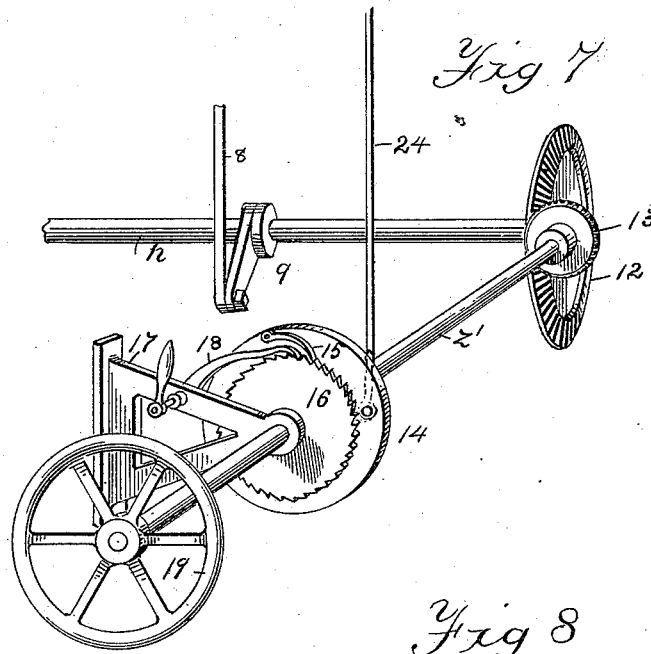
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J. BALL.

ENVELOPE MACHINE.

No. 344,073.

Patented June 22, 1886.



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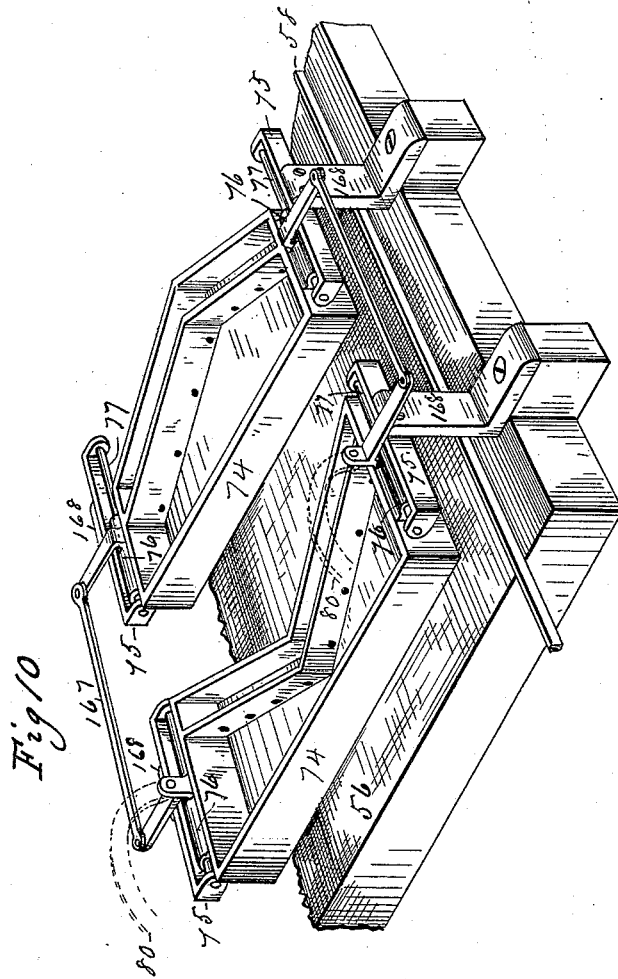
(No Model.)

6 Sheets—Sheet 6.

J. BALL.
ENVELOPE MACHINE.

No. 344,073.

Patented June 22, 1886.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES BALL, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR TO THE HOLYOKE ENVELOPE COMPANY, OF SAME PLACE.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 344,073, dated June 22, 1886.

Application filed June 15, 1885. Serial No. 168,734. (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, the object being to provide improved devices in such machines for moving by hand and automatically the blank-table; for printing and embossing the envelope-blanks before gumming and folding them; for picking up and carrying the blanks from the table to the said printing devices, and from thence to the gumming and folding mechanism; for arresting by electrical action the movement of the gummers when no blank is under them; for receiving the folded envelopes from the drying-chain and conveying them toward the banding or receiving table; for electrically indicating the absence of one envelope or more from its place in the moving line thereof from the drying-chain toward the banding-table, by preventing any action of envelope-counting mechanism during or by reason of such absence of envelopes in regular successive distances, one from the other, as delivered from the folding-box and by the drying-chain to the above-named conveying devices.

In the drawings forming part of this specification, Figure 1 is a side elevation, with part of the frame broken away, of an envelope-machine embodying my improvements, said figure having included therein a transverse section of the bridge-piece of the frame, in which is located a portion of the embossing or printing mechanism. Fig. 2 is a front elevation showing a portion of the side connections, partly broken away, and the picker-frame and pickers removed. Fig. 3 is a plan view showing a portion of the extreme end of the carrying-track broken away. Fig. 4 is a perspective view of the devices for receiving the envelopes from the drying-chain and moving them toward the table, together with the electrical mechanism, which operates to cause the absence of an envelope from between the carriers to be indicated. Fig. 5 is a perspective view of the ratchet-wheel connected with the

electric envelope-indicating mechanism and its directly co-operating devices. Fig. 6 is a perspective view of that part of the electric devices which co-operate directly with the said ratchet-wheel and its pawl, and which are connected by electric conductors with those referred to in the description of Fig. 4. Fig. 7 is a perspective view of the devices for feeding upward the table on which the envelope-blanks are laid preparatory to printing, gumming, and folding. Fig. 8 is a perspective view of a section of the gumming and folding table, together with the electric gummer-stop mechanism. Fig. 9 is a sectional detail view of a portion of the devices referred to in the description of Fig. 4, as will be hereinafter fully explained. Fig. 10 is a perspective view of a portion of the table of the machine and of the gum-boxes thereon, showing the means by which they are connected together and supported on said table.

In the drawings, A indicates the frame of the machine, in which are located in suitable bearings the driving-shaft B, having a driving-pulley, *a*, thereon, and the usual auxiliary shafts, D E, on which are carried the requisite cams and gears for imparting suitable motions to the operative parts of the machine.

J is a rock-shaft actuated by cams 2 2 on shaft D, operating against arms 3 3 on shaft J, and on the latter are fixed the arms 4 4, (curved to clear the rock-shaft *h*, adjoining it,) and the latter are pivotally connected with the vertically-moving bed I by the bars 5 5, which, with said arms 4 4, constitute a toggle-joint for the purpose of actuating said bed.

The blank-table *m* is supported on a frame, *n'*, to which are bolted two posts, 6, which enter pending socket-supports therefor, which are attached to the bed 10 of the machine and give steadiness to the movements of said table. The frame *n'* is connected with the arms 9 9 on the rock-shaft *h* by the rods 8 8. A bevel-gear, 12, is fixed on the end of shaft *h*, (see Figs. 2 and 7,) with which a pinion, 13, on the shaft *z* engages. A disk, 14, is mounted to have a free reciprocally-rotating motion on shaft *z*. On the disk is hung a pawl, 15. A ratchet-wheel, 16, with which pawl 15 engages, is fixed on shaft *z* by the side of disk 14. Shaft *z* is partly supported in a bracket, 17,

secured to frame A, and on said bracket is hung a pawl-lifter, 18, to which is attached a suitable handle, as shown. A hand-wheel, 19, is fixed on the end of shaft *z*. A shaft, 20, running across the front of the machine, has a rocking motion imparted to it by its connection, through the rod 21 and arm 22, with a suitable cam on one of the shafts of the machine. An arm, 23, fixed on shaft, 20, is connected with the disk 14 on shaft *z* by the rod 24, whereby said disk is given a reciprocating rotary motion.

To drop the table *m*, in order to place upon it a pile of envelope-blanks, *o*, the pawl-lifter 18 is thrown up, disconnecting pawl 15 from the ratchet-wheel 16, then by turning shaft *z* by the hand-wheel 19 the table may be lowered or raised to bring the top of the pile of blanks to a proper starting position relative to the picking-up devices. The pawl 15 is then thrown into connection with the ratchet-wheel, and the latter is timed to be rotated at such a speed by disk 14 as will keep the top of the pile of blanks practically at the same elevation, so that the picking-up devices may always take up a blank at the proper time.

The printing and embossing devices of this machine consist of the above-mentioned bed, operating as described, and the following described mechanism acting in conjunction with said bed, on which are placed the plates or plate 25, whose impression is to be made on the envelope-blank. A circular ink-table, 26, located on opposite sides of the machine, is adapted to have a reciprocating rotary motion, as hereinafter set forth. A shaft, 27, is hung on the rear side of the machine, (see Fig. 1,) having an arm, 28, on it, which is connected with an eccentric, 29, on shaft E by the rod 30, whereby said shaft is given a rocking motion. Shafts 31 and 32 are located on opposite sides of the machine and supported in suitable bearings running at right angles to shaft 27. Each of said shafts 31 and 32 has an arm fixed thereon, (the sleeve to which the arm on shaft 31 is connected being shown at *a*, Fig. 1,) which arm is connected with an arm, 33, on shaft 27 by a suitable connecting-rod, whereby shafts 31 and 32 are given a rocking motion.

Each of the shafts 31 and 32 is provided with an arm, 34, to which is pivoted a pawl, 35, having a short arm thereon, to which is attached a retracting-spring, 36. The pawls 35 engage with the ratchet-teeth under the ink-tables 26, and give the latter intermittent rotary motions. The pawls swing on arms 34 when they draw back from engagement with said teeth, and upon their return movement the springs 36 hold their ends against the latter and cause a proper re-engagement therewith.

On each of the shafts 31 and 32 is an arm, 37, having connection, as shown in Fig. 2, with an inking-roller frame, 38, located over the ink-table 26, whereby said frames are given reciprocating motions to roll the inking-rollers they carry over the faces of said tables 26, to

properly distribute the printing-ink over the tables and on said rollers, and also to ink the plates 25 in the usual manner. An arm, 39, fixed on shaft 32, has a forked end extending to one side of the truss-bar 40 on the top of the machine. Said forked end of arm 39 engages with a stud, 42, on the side of the arm 41, the latter being fixed on the end of the eccentric-shaft 43. A retracting-spring connects the end of arm 41 with the arm 39, whereby the forked end of the latter is kept in engagement with said stud when arm 39 draws arm 41 in one direction, and a yielding connection is formed which prevents an abrupt motion of the movable platen 44, between which and the dies 25 the blank is placed to be printed or embossed, as hereinafter set forth. A pivoted movable platen, 44, (shown in dotted lines in Fig. 2, and in section in Fig. 1,) is pivoted within the truss-bar 40, and the eccentric-shaft 43 passes through said bed-piece, having its eccentric-bearings in the truss-bar 40. When shaft 32 rocks operating-arm 39, the shaft 43 is rotated and its motion is timed to coincide with the upward movement of the bed I, so that at a proper time the blank to be printed or embossed is pressed between the dies 25 on the bed and the projections on said bed-piece opposite said die-plates.

The movements of the inking-roller frames 38 are so timed that the ink-rollers are passed over the die-plates 25 after each blank has been printed. When only embossing is done, without colors, frames 38 are disconnected.

The envelope-blanks are taken from the pile thereof on table *m*, by devices hereinafter described, and carried between the bed I and the pivoted platen or impression-plate 44, where their movement is arrested for an instant, in order that they may receive the printing or stamping impression, and then they move on to the gummers, the blank remaining in the carrier while being printed; hence it is desirable that the bed I and the platen 44 shall both move toward the blank and meet, or stop opposite each other substantially in the plane of the blank, and then retire from the latter and let it pass on to the gummers. To that end, the said platen and bed are caused to operate as above described. The said inking-rollers take their ink from the two rollers *i i*, hung in the ways on which the carriage 38 moves, as shown in Fig. 3, such rollers being placed on both sides of the machine.

In this machine the order of the operations upon the blanks is as follows, after they are placed upon the table *m*: first, picking up one edge of the top one; second, seizing the blank and carrying it between the printing devices, as aforesaid, and thence to the gummers; third, gumming; fourth, folding to form the envelope.

The picking-up devices by which one edge of the blank is raised so that the carrier can pass under and engage with it, are constructed as follows, and a side, front, and top view thereof are shown in Figs. 1, 2, and 3. Two

air-pumps, 45 and 46, are employed, which are suitably connected with the machine to cause the latter to draw the air through its flexible pipe 47, a little in advance of the same action of the former. Said pipe 47 is connected with a suitable nozzle, 48, which is attached to the end of the arm 49, which is fixed on the rock-shaft 20, whereby said nozzle is carried down against the top blank of the pile and then upward, having attached to it by the action of said pump 46 the blank, as shown in dotted lines in Fig. 1. The second air-pump, 45, is adapted to draw air through its flexible pipe 50, operating after pump 46, and through a nozzle having two mouths, 51 and 52, which nozzle is hinged on said arm 49 at *v*, which supports the nozzle 48. The connection of pipe 50 with its two-mouthed nozzle is through the upright pipe 53. A clip, 54, is secured on the side of the truss-bar 40, which an arm, 55, on said pipe 50 strikes when arm 49 swings down to carry nozzle 48 against the pile of blanks, and thereby holding back the nozzle-mouths 51 and 52 (owing to their said hinged connection with arm 49) and preventing them from striking said pile with nozzle 48; but when arm 49 rises, the blank adheres to the last-named nozzle and is lifted against the nozzles 51 and 52, and pump 45 then acts, bringing all three of said suction-nozzles into joint action upon the blank to hold it unfailingly while the blank-carrier passes under and engages with it, as hereinafter set forth.

A gumming-table, 56, (see Figs. 1 and 3,) is set on posts on the bed 10. Two blank-carrying rods, 57, having suitable hooks, 58, thereon to engage with and hold the envelope-blank, have a reciprocating movement in a plane with and across the top of said table 56, actuated by their connection with a rock-shaft, 59, (which receives its motion by suitable connection with the driving-shaft B,) through the arm 60, which is fixed on shaft 59, and has its upper end connected to a cross-bar, 61, which unites the ends of said rods 57. A suitable cam is arranged to act upon an arm fixed on said shaft 59, whereby it is given an intermittent rocking motion, and a suitable retracting-spring holds said arm against the cam, whereby the said reciprocating motion is imparted to the carrying-rods 57. After the top blank of the pile is raised, as above described, and as shown in dotted lines in Fig. 1, the ends of said rods 57 pass under said lifted blank, carrying the hooks 58 thereon beyond the farther edge of said blank. The action of the pumps 45 and 46 then ceases, the blank falls upon said rods, and the latter immediately move away from over the blank-pile, carrying the engaged blank between the printing devices, as aforesaid, resting there an instant, then moving on and carrying the blank over the table 56 to the position shown by dotted lines in Fig. 3, where it is next acted on by the gummers, which attack it immediately, and meanwhile the carrier-rods move again toward the blank-pile for another blank.

The gummers and folding-plunger are supported on a curved bar, 62, which is bolted to the bed 10 of the machine. (See Figs. 1 and 3.) A gummer-support, 63, is secured in a transverse position across the bar 62, and has two bearings on each end, in which the gummer-shafts 64 have their usual reciprocating movements. The upper ends of said gummer-shafts are united by a curved connection, 65, and to give them a reciprocating motion they are connected to the arm 66 on the rock-shaft 67, located on the bar 62, and an arm, 68, is connected by a bar, 69, extending through bed 10, with a suitable cam whereby shaft 67 is given the requisite reciprocating rotary motion, and in turn the two gummers 70 are given a reciprocating vertical motion, to act on the envelope-blank on table 56 in the usual way. The folding-plunger 71, having the usual foot, *c*, thereon, is supported on the bar 62, and is given the usual reciprocating vertical motion by the connection therewith of the arm 72, (see Fig. 3,) which extends in a line with bar 62 and has one end connected to a vertical post, 73, which passes down through the bed 10 and is acted on by a suitable cam to give it a vertical reciprocating motion. The foot *c* of the folding-plunger 71 operates in conjunction with the common folding-box in the usual manner, two of the wings, *z*, of which are partly shown in Fig. 1 beneath the table 56.

Two gum-boxes, 74, are supported in the holders 75, (one only of the latter being shown in Fig. 3, but all being shown in Fig. 10,) each holder 75 being supported on a standard, 168, which is attached to table 56, the space between said supports near the opposite edges of said table being sufficient to allow the envelope-blank to be carried under the gum-boxes to the center of said table. The connection of the gum-boxes 74 with the holders 75 is by perforated projections 76 on the sides of the boxes, through which pass short rods 77, fixed in the holders. Projecting laterally from each side of said gum-boxes is an arm, as shown in Fig. 10, the ends of which arms are connected by rods 167. Said gum-boxes are given a reciprocating motion on the rods 77, to move them under and away from the gummer 70 by the shaft 78, having arms 79 thereon, which are connected with the gum-box 74 by the rods 80. Shaft 78 is given a rocking motion by the connection therewith of shaft 27 through the arm 81 on the latter and the rod 82 connecting arm 81 with arm 83 on shaft 78. Rod 82 has a bifurcated end, as shown, and, to cause the gum-box to move toward the end of the machine, a suitable retracting-spring is attached thereto. By this means, if any obstruction to the rearward movement of the gum-box occurs, the breaking of any parts is obviated and lever 81 can swing in the forked end of rod 82.

The gum-box is shown in plan view in Fig. 3, the diagonally-partitioned space therein providing for a sponge or similar substance,

which absorbs mucilage from the bottom of the box and conveys it to the gummer by wiping against it when the box moves under the latter, as above described.

5 To prevent the gummers 70 from acting when for any reason no blank is brought from the pile, as above described, and deposited on the table 56, and thereby obviate the inconvenience of having the table soiled
10 with gum from the gummers, the below-described devices are provided. A metallic latch, 83, is pivoted on table 56, and suitably insulated, (see Figs. 1 and 8,) having its free end lying on said table, but not in contact
15 therewith; but said latch, when free to do so, as hereinafter set forth, rests on the end of a metallic pin or binding-post, 84, which is fixed in table 56 and surrounded with insulating material 91, and to its lower end is secured an electrical connecting-wire leading to
20 the electro-magnet 85. The end of pin 84 projects a little above the face of table 56, as shown. A conducting-wire connects the latch 83 with a battery, 90, and the latter is connected directly with said magnet by a suitable
25 wire, as shown. A three-armed catch-lever, 86, is pivoted on the gummer-support 63, having an arm, 87, thereon, provided with a set-screw, which has contact with said support, whereby the vibratory motion of lever 86 is
30 regulated, and said lever has its lower arm, 89, extending under the magnet 85, and constituting an armature, and its upper arm extends upward by the side of one of the gummer-shafts, 64, in which is a pin, 88, with which
35 said lever engages. A suitable retracting-spring connects lever 86 and the support 63, to swing the end of said lever from under pin 88 when the circuit between the battery and
40 the magnet is broken.

The operation of the above-described devices, in connection with the blanks which are brought onto the table 56, to be gummed, is as follows: Each blank that is brought
45 under the gummers 70 has one end of it drawn between the lever 83 and the end of the pin 84, (see Fig. 3,) thereby interrupting the electrical circuit from the battery through latch 83, pin 84, and the magnet, and allowing
50 lever 86, by said retracting-spring, to be drawn out of the path of the pin 88 on the gummer-shaft 64, so that the gummer can act regularly; but if no blank is brought onto the table while the gummer is up, as usual, the
55 latch 83 rests on the pin 84, completing said circuit and causing the end of lever 86, which constitutes the armature, to be drawn against the magnet, thus throwing the upper end of the lever forward under pin 88, and holding
60 the gummers in an upward position until another blank is carried under latch 83.

The folded envelopes are dropped from the above-mentioned folding-box into a drying-chain, 93, substantially such as is shown in my
65 patent of August 26, 1884, and are by said chain conveyed in the usual manner to a series of spiral carriers, 92, (see Figs. 1, 2, and 4,)

which are arranged and operate substantially as described in my said patent, to engage with and convey each envelope from the drying-chain, holding it in the vertical position shown
70 in Figs. 2 and 4 while so conveying it to the usual banding-table, 94.

The envelope-counting devices of this machine operate normally continuously with the machine, as hereinafter described, except
75 when such operation is interrupted by the absence of an envelope from the line thereof between the spiral carriers as they move toward table 94, and said counting and interruption thereof is effected by the following means: For indicating one revolution of a
80 counting ratchet-wheel of twenty-five teeth, the "grouping-guides" *rr*, (mentioned in said patent,) and substantially the mechanism there described for operating them, or other suitable
85 means, are employed, whereby the operator is informed automatically when twenty-five envelopes are counted and grouped on the banding-table. The said ratchet-wheel 95 of this
90 machine is hung loosely on the shaft 96 near shaft *h* or other convenient one under the table 94, and the vibrating bar 97 is also loosely hung on said shaft by the side of the ratchet-wheel, and by connecting bar 97 by the rod
95 98 with one of the shafts of the machine, substantially as shown in said patent, said bar is given a continuously-vibrating movement. On the opposite side of the ratchet-wheel from
100 bar 97 on shaft 96 is hung the three-armed lever 99, at the end of one of whose arms is pivoted the pawl 100 (see Figs. 5 and 6) on a pin, 101, which projects over the periphery of the wheel and into the path of movement
105 of the end of lever 97. On another of the arms of lever 99 is a counterbalancing-weight, 102, which is adjustable on its arm, and to the third arm of said lever is connected the rod 103, whose lower end passes through and is
110 supported in a pendent position by the side of a magnet-box, 104, (see Fig. 2,) and the rod has thereon within box 104 a catch-block, 105. The weight 102 on lever 99 is adjusted to swing the end of its arm, which bears the
115 pawl, as aforesaid, toward the end of bar 97, so that at each movement of the latter toward pin 101 the latter is struck, and the pawl is made to engage with a tooth of wheel 95, and give it an intermittent rotary motion. When
120 lever 99 is rocked by the combined action of weight 102 and bar 97, rod 103 is given a vertically-reciprocating motion, moving the catch-block 105 up and down by the side of the hook 106. Said hook is attached to a
125 pivoted armature-lever, 107, (see Fig. 6,) having an armature at one end, as shown, which is subject to the attractive influence of the electro-magnet 108. A counterbalancing-weight, 109, is attached to lever 107, to throw
130 hook 106 away from catch-block 105, a stop, 110, retaining the lever in the position shown in Fig. 6 when no electric current acts on magnet 108. By the devices hereinafter described, the absence of an envelope from its proper

place between the spiral carriers 92, as hereinbefore set forth, causes the electric action of magnet 108, whereby the armature on lever 107 is drawn thereto, swinging said lever and throwing hook 106 forward, so that it engages with the catch-block 105, thereby holding lever 99 so that it cannot swing its pawl-arm toward bar 97, and thus stopping the action of the pawl and the wheel 95 and causing the counting to be interrupted for the instant or until the envelopes again come along in regular order between said carriers.

The magnet-box is provided with the usual binding-posts with which the wires of the electro-magnet 108 are connected in the usual manner, and from said posts lead two conducting-wires, as shown, one to a battery, 111, and one to a binding-screw, by which it is secured to a metallic plate, 112, (see Fig. 4,) which screw also secures the latter to an insulating-block, 113, of wood or other suitable material, which is attached to a fixed arm, 115, and supports parts of the electric connections of the machine. A second metallic plate, 114, is secured in like manner to the block 113, and to it is connected a circuit-wire running directly back to battery 111. The non-conducting arms 115 and 116 are attached to two standards, 118, on the banding-table 94, and serve as supports, having bearings at their ends, in which the shaft 117 operates, having a rocking motion, as hereinafter more fully set forth. A shaft, 119, having bearings in said standards 118, is given a rocking motion by suitable connection with a moving part of the machine through the arm 120 and the connecting-rod 121, and has fixed on it an arm, 122, connected by the rod 123 with an arm on the shaft 140, (shown in Fig. 2,) the arms 124 and 125, and the vibratory envelope-pusher 126. A second vibratory pusher, 127, is fixed on said shaft 140 under table 94, said two pushers acting in conjunction to strike an envelope from behind, and effect its quick and positive delivery from the ends of the spiral carriers 92 onto the table 94. A metallic disk, 128, is secured on the end of shaft 117, with which electrical connection is made from the bar 112 by the flexible metallic strip 129, and thence by the shaft 117. Two bars, 130 and 131, of non-conducting material, are pivoted one to the other and to the disk 128 and standard 118, as shown in Fig. 4, and a retracting-spring connects said bars and standards. The purpose of said pivoted bars and spring is to give to shaft 117 a quick rotation in both directions in excess of the incipient rotary motion which is imparted to it, as hereinafter set forth, whereby the pivot-point of the connection of bar 131 with disk 128 is carried a little to one side of a vertical line drawn from the center of shaft 117 downward. Adjoining the disk 128 on shaft 117, but the other side of arm 115, is placed the metallic double disk-piece 133, having a long hub on which is a laterally-projecting arm, 134, and in the latter is supported the electrical

contact-finger 135. To insulate the disk-piece 133 and its hub from shaft 117, a flanged non-conducting-bushing, 136, is interposed between said piece and the shaft. The disk-piece 133 is connected with arm 124 on shaft 119 by the bar 139, whereby the disk-piece is given a rocking motion. Electrical connection between the battery 111 and the finger 135 is made by the flexible metallic strip 141, (which is connected with said battery through bar 114,) whose free end lies between the two disks of said piece 133, as shown in dotted lines in Fig. 4. A metallic arm, 137, is fixed on shaft 117, and vibrates opposite the end of the finger 135, and by its contact with the end of the latter an electric circuit is established through the magnet 108 to battery by the wire z , and to battery direct by the wire z' . An arm, 138, is fixed on shaft 117, and is acted on by the pusher 126, as it swings upward, to swing arm 137 away from the envelope when the latter reaches the ends of the spiral carriers 92. Either arm 138 or the pusher 126 is suitably insulated on its shaft, to prevent any electrical action between the shafts 117 and 119 when they are brought in contact. A short arm, 139*, is fixed on shaft 117 and insulated therefrom, on which arm 125 acts to rock said shaft and swing arm 137 toward the end of finger 135.

By reference to Fig. 1 it is seen that the above-described mechanism, which acts in the absence of an envelope from between the spiral carriers to cause the stoppage of the counting-wheel 95, is located near the delivery end of said carriers.

The vibratory motion of the finger 135 is so timed that the end of said finger swings back and upward and descends against the rear side of each envelope as the latter approaches the ends of the spiral carriers, following and somewhat aiding the forward movement of the envelope, and the vibratory movements of the arm 137 are timed to accord with those of said finger, the latter being made to swing against the side of the envelope opposite the end of the finger, and then to recede with the movement of the latter and the envelope until the latter reaches the ends of the spirals, when arm 137 swings up out of the way, and, while an envelope is always in proper position to come between said finger and arm, no electric contact takes place between them, and nothing prevents the continuous regular action of the counting-wheel 95; but if, through lack of proper blank-feeding or other interruption of the order of operations of the machine from the feeding to the drying chain, now and then an envelope is absent from the place it ought to occupy between the spiral carriers, the operations, as aforesaid, of the finger 125 and arm 137 continue and swing into direct contact with each other, instead of coming to a position opposite each other with the envelope between them, and thereby the electric circuit above mentioned is closed, whereby hook 106

operates, as aforesaid, to stop the ratchet or counting wheel 95 and prevent its counting in the absence of an envelope.

What I claim as my invention is—

- 5 1. The shafts *h* and *z*, connected together, the former having arms thereon connected with the blank-table, and means for intermittently rotating the latter shaft, consisting of a ratchet-wheel fixed thereon, a pawl-disk having a pawl thereon to engage with said wheel
10 10 hung on the shaft by the side of the latter, and means, substantially as described, for rocking said disk, combined and operating substantially as set forth.
- 15 2. In a machine for operating upon envelope-blanks to produce therefrom printed, gummed, and folded envelopes, which operations follow in the order stated, the combination, with the bed I, having a reciprocating
20 vertical motion, of suitable inking devices, substantially as described, the pivoted bed-piece 44, having a vibratory motion above the platen, the blank-carrying rods 57, having a movement transversely across the machine
25 from the blank-table between said printing devices, the gummers 70, and suitable folding devices, substantially as set forth.
3. The combination, with the blank-table and envelope-transferring mechanism, of the
30 vertically-reciprocating bed I, the vibratory bed-piece 44, pivoted above the platen, the eccentric-shaft 43, and means, substantially as described, for giving said shaft a rocking motion, combined and operating substantially
35 as set forth.
4. In combination with the lifting-table *m* and the pneumatic blank-picking-up devices for envelope-machines, the two air-pumps 45
40 and 46, having successive air-drawing action, each connected by a flexible tube with a suitable nozzle, and a vibrating arm, substantially as described, attached to said nozzles, whereby the latter are carried against and from the
45 pile of blanks, combined and operating substantially as set forth.
5. In combination with the lifting-table *m* and the pneumatic blank-picking-up devices for envelope-machines, the two air-pumps 45
50 and 46, having successive air-drawing action, the former being connected by a flexible tube with a nozzle having two mouths, and the latter pump having connection by a flexible tube with a single-mouthed nozzle, combined with
55 the vibratory arm 49, and operating substantially as set forth.
6. In combination with the lifting-table *m* of an envelope-machine, the air-pump 45, the vibratory arm 49, the two-mouthed nozzle connected with said air-pump by a flexible
60 tube, and having a hinge-connection with said vibratory arm, and provided with an arm, 55, to strike a fixed portion of the machine and arrest its motion when arm 49 swings downward, substantially as set forth.
- 65 7. In combination with the lifting-table *m* of an envelope-machine and the driving mechanism thereof, the two air-pumps 45 and 46, having successive air-drawing action, the vibratory arm 49, having the single-mouthed
70 nozzle 48, rigidly connected therewith, and the nozzle having the two mouths 51 and 52, hinged to said arm, and flexible tube-connections between said pumps and nozzles, substantially as set forth.

8. The two vertically-reciprocating gummers having coinciding movements, the folding-plunger operating between said gummers, and the two gum-boxes 74, having horizontal reciprocating movements under said gummers, combined and operating substantially as set forth.

9. In an envelope-machine, as means for preventing the descent of the gummers when no blank lies on the table thereunder, an electrically-connected contact-post fixed in
85 said table, an electrically-connected latch hung on the latter capable of falling on said post, and of being separated therefrom by the interposition of a part of a blank between them, an electro-magnet connected with said post
90 and with a battery and a pivoted catch-lever, substantially as described, subject to the action of said magnet, whereby it is engaged with the gummers when said latch and post
95 are in contact, combined and operating substantially as set forth.

10. In combination with the table 56 and with the gummers 70, the latch 83, the post 84, the electro-magnet 85, the catch-lever 86, having arm 87 thereon provided with an adjusting-screw, and the battery 90, connected
100 with the magnet directly and through said latch and post, substantially as set forth.

11. In combination, an electrically-connected latch and contact-post located on the
105 table of an envelope-machine on which the blank is gummed, an electro-magnet connected in the same circuit with said latch and post, and an electrically-actuated gummer-stop, substantially as described, capable of
110 being engaged with the gummers by the action of said magnet, substantially as set forth.

12. In a machine for making envelopes, a counting ratchet-wheel having normally an intermittent rotary movement continuous
115 with that of the driving mechanism of the machine, an oscillating pawl-lever, substantially as described, having a pawl engaging with said wheel, an electrically-actuated hook to engage with said pawl-lever and stop its
120 movements, combined with a circuit-closing vibrating arm and finger, substantially as described, between which each envelope passes on its way to the banding-table, and which
125 are electrically connected with said hook, substantially as set forth.

13. In an envelope-machine, a counting ratchet-wheel having normally an intermittent rotary movement continuous with that of the driving mechanism of the machine, an oscillating
130 pawl-lever, substantially as described, having a pawl engaging with said wheel and

having a pending rod provided with a catch-block attached thereto, combined with an electrically-actuated vibrating hook to engage with said catch-block, substantially as described.

14. In an envelope-machine, the counting ratchet-wheel thereof hung on a suitable shaft to rotate freely, a pawl-lever and pawl, substantially as described, having a free oscillatory movement on said shaft, a continuously-vibrating bar hung on the latter by the side of said ratchet-wheel and engaging intermittently with said pawl-lever, a pending rod attached to the latter having a catch-block thereon, combined with an electrically-actuated vibrating hook to engage with said catch-block, substantially as set forth.

15. In an envelope-machine, the counting ratchet-wheel thereof hung on a suitable shaft to rotate freely, a pawl-lever and pawl, substantially as described, having a free oscillatory movement on said shaft, the adjustable weight 102, attached thereto, a continuously-vibrating bar hung on said shaft by the side of said ratchet-wheel and engaging intermittently with said pawl-lever, a pending rod attached to the latter having a catch-block thereon, the vibratory armature-lever 107, provided with a hook to engage with said catch-block, and the electro-magnet 108, having suitable connections with a battery, combined and operating substantially as set forth.

16. In an envelope-machine, envelope-carrying mechanism, substantially as described, for conveying envelopes from the drying-chain to the banding-table, an electrically-connected intermittently-rotating shaft having an arm thereon vibrating in the line of

movement of the envelopes, an electrically-connected contact-finger having a vibratory movement toward and from said arm, supported upon said shaft on a sleeve having an independent reciprocating rotary motion thereon but insulated therefrom, combined with a suitable battery whose circuit is closed by the contact of said arm and finger, substantially as described.

17. In combination, the rock-shafts 119 and 140, having the arms 124 and 125, and the envelope-pushers 126 and 127 thereon, the shaft 117, having the disk 128 and the arms 138 and 139 thereon, the double disk-piece 133, connected with shaft 119, the pivoted bars 130 and 131, and spring 132, substantially as set forth.

18. The shaft 117, having the disk 128, and the arms 137, 138, and 139 thereon, the shaft 119, having arm 125 and the pusher 126 thereon, the pivoted bars 130 and 131, the spring 132, and means, substantially as described, for imparting a reciprocating rotary motion to shaft 119, combined and operating substantially as set forth.

19. The combination, with shaft 117, having the arm 137 thereon, of the electrically-connected flexible metallic strip 129, the metallic disk 128, the double disk-piece 133, having the finger 135 thereon, the flexible metallic strip 141, and suitable battery-connections with said flexible metallic strips, substantially as set forth.

JAMES BALL.

Witnesses:

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