

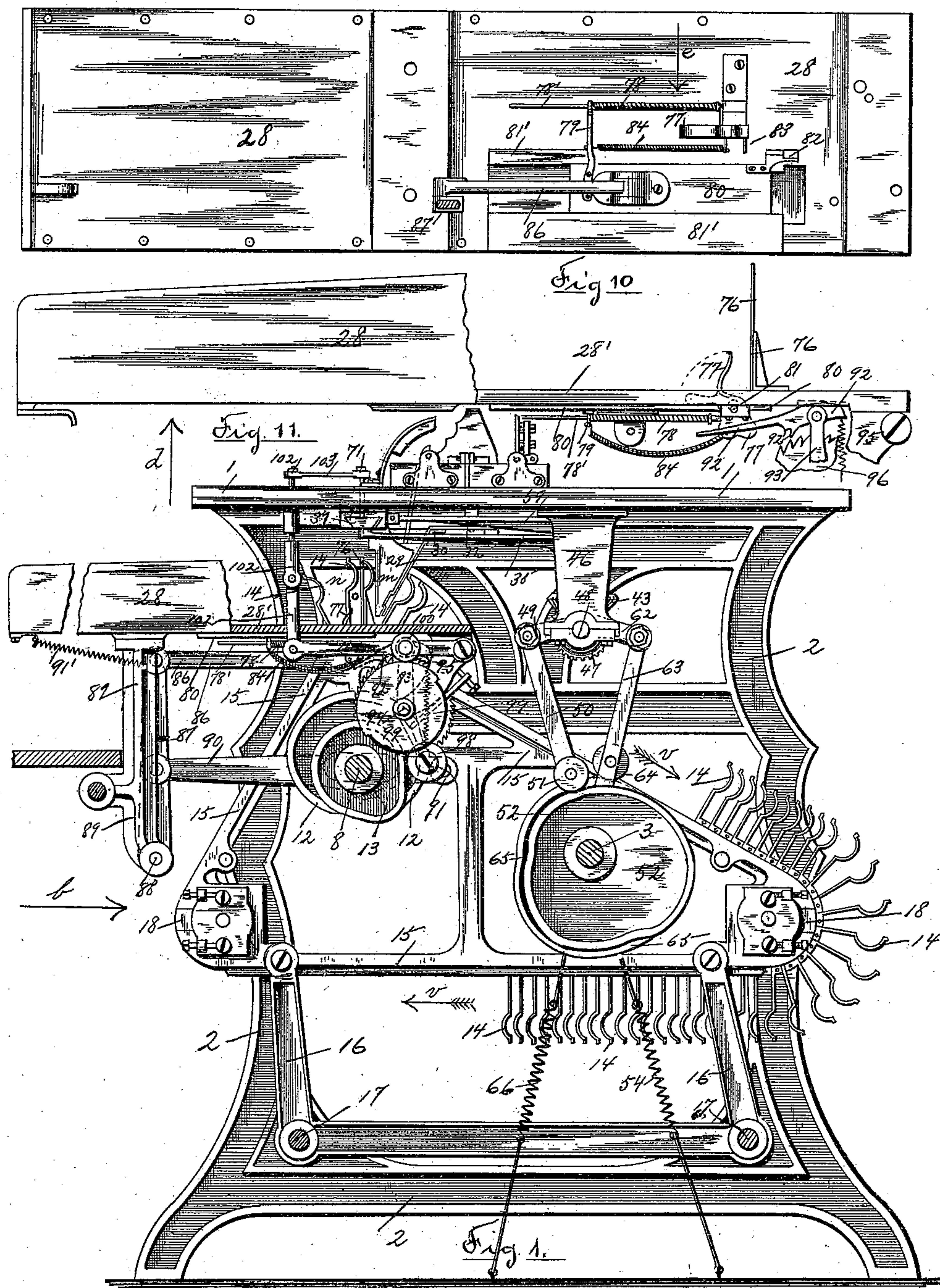
(No Model.)

4 Sheets—Sheet 1.

E. M. LOW.
ENVELOPE MACHINE.

No. 556,063.

Patented Mar. 10, 1896.



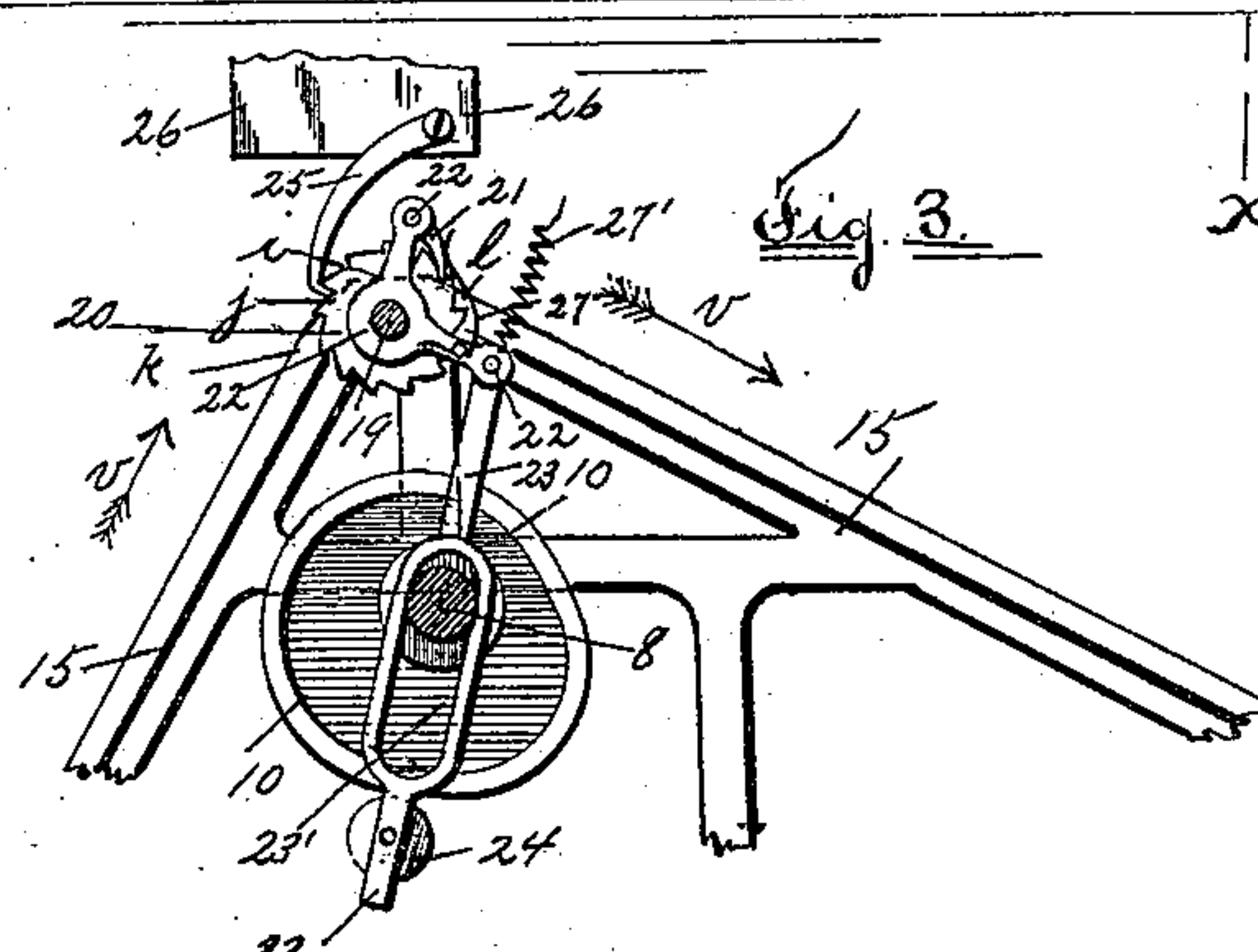
Witnesses
Walter S. Bowen
Chas. Short Jr.

Inventor
Everett M. Low
By his Attorney
John C. Dewey

4 Sheets—Sheet 2.

No. 556,063.

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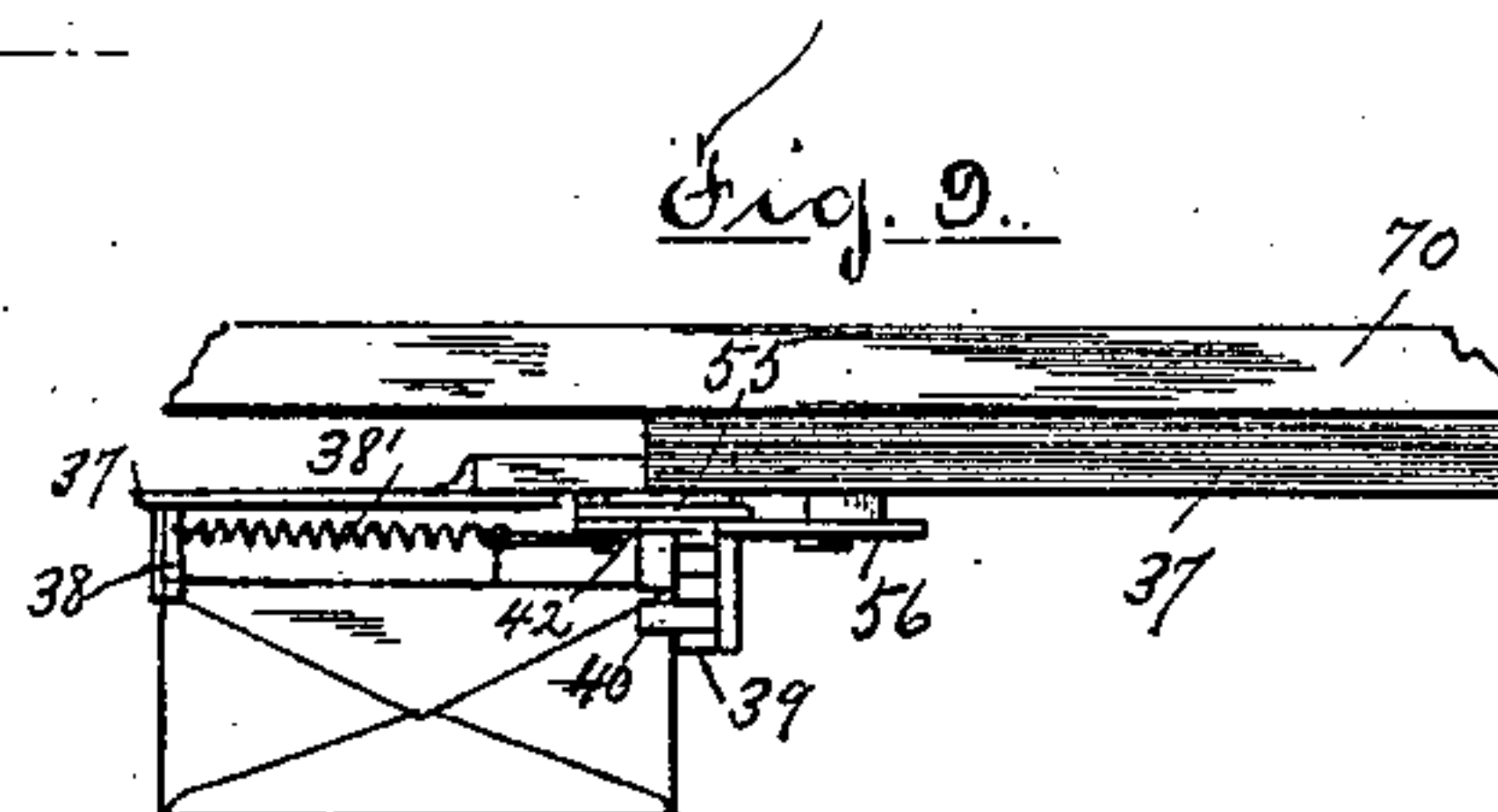
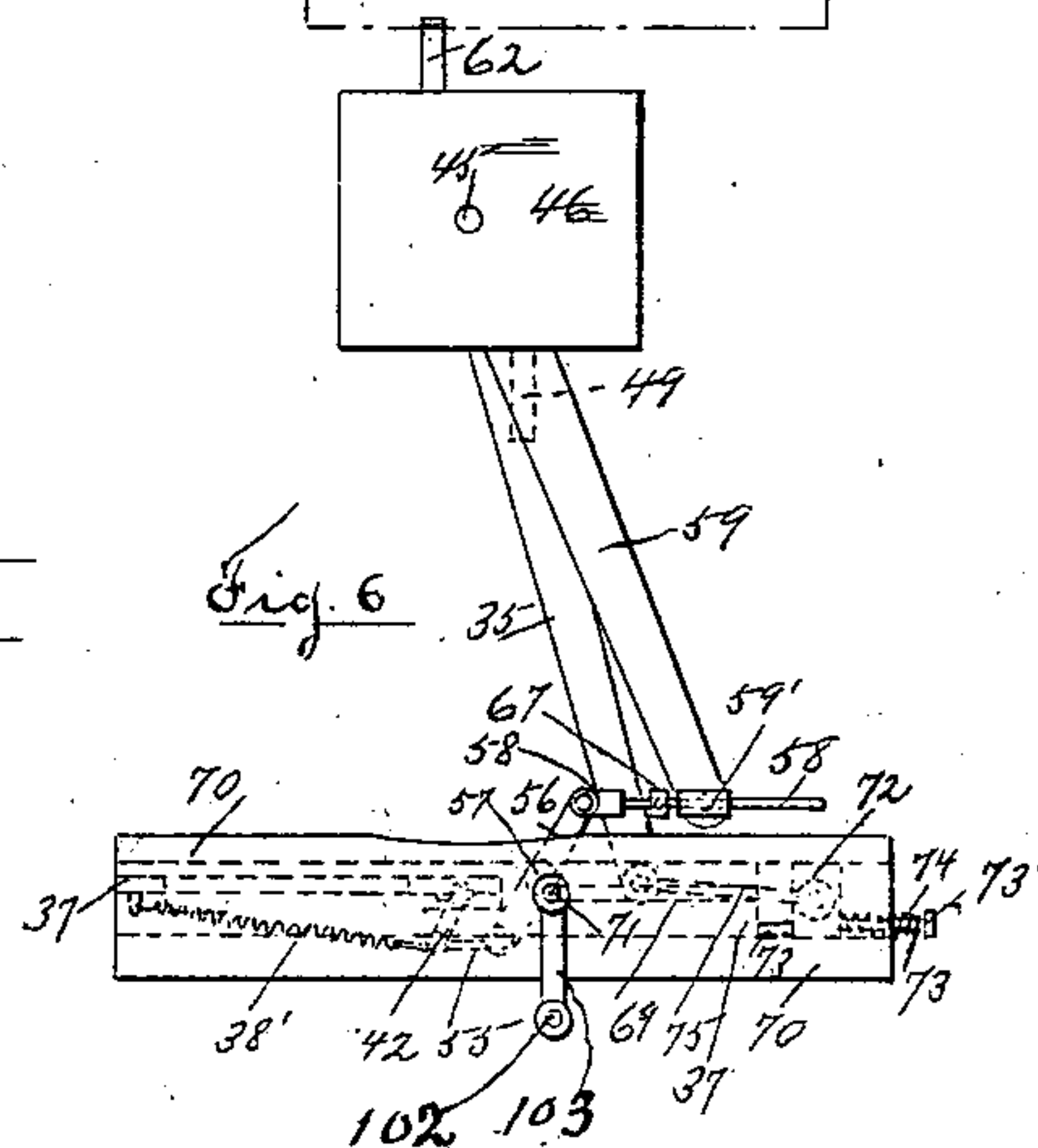
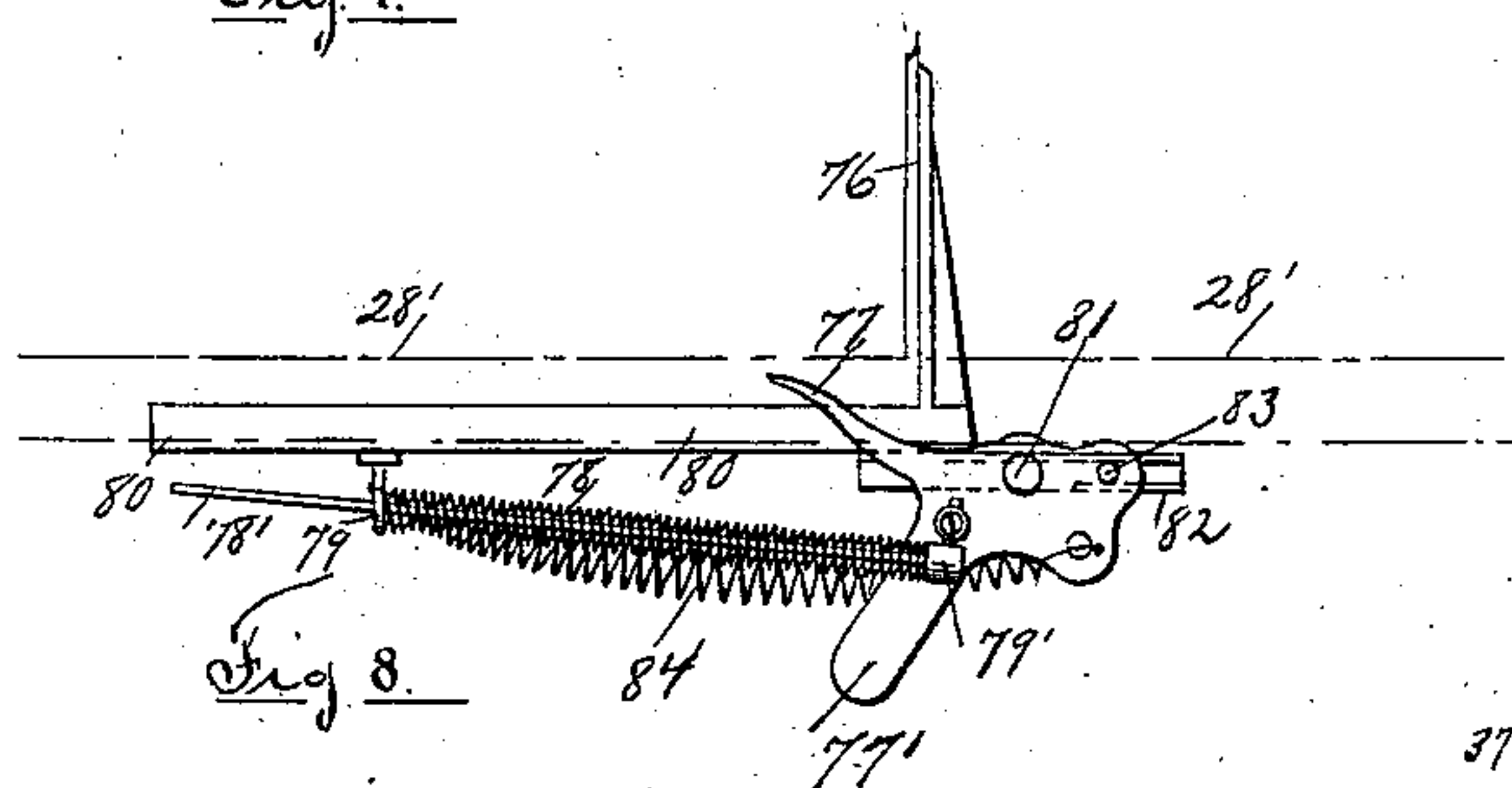
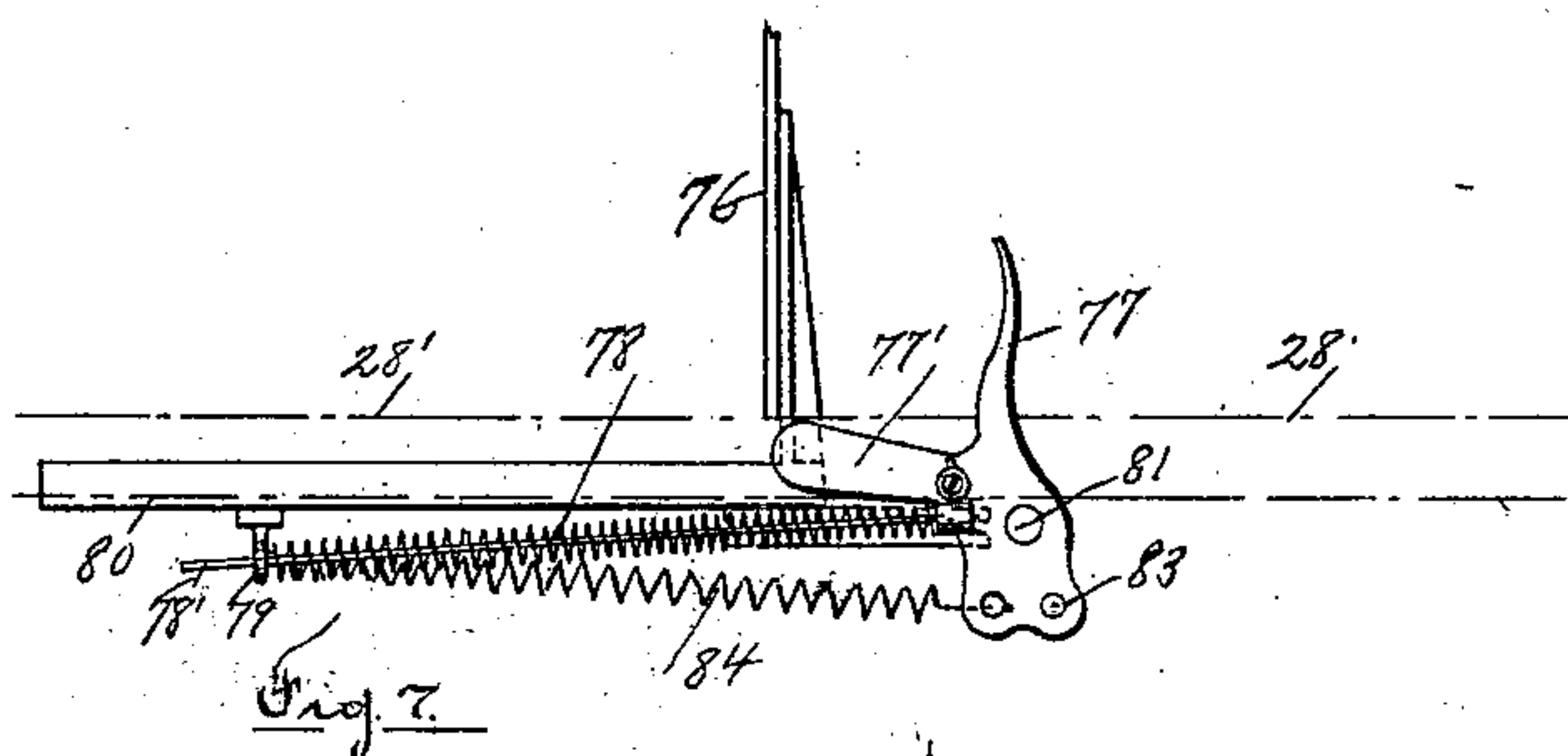
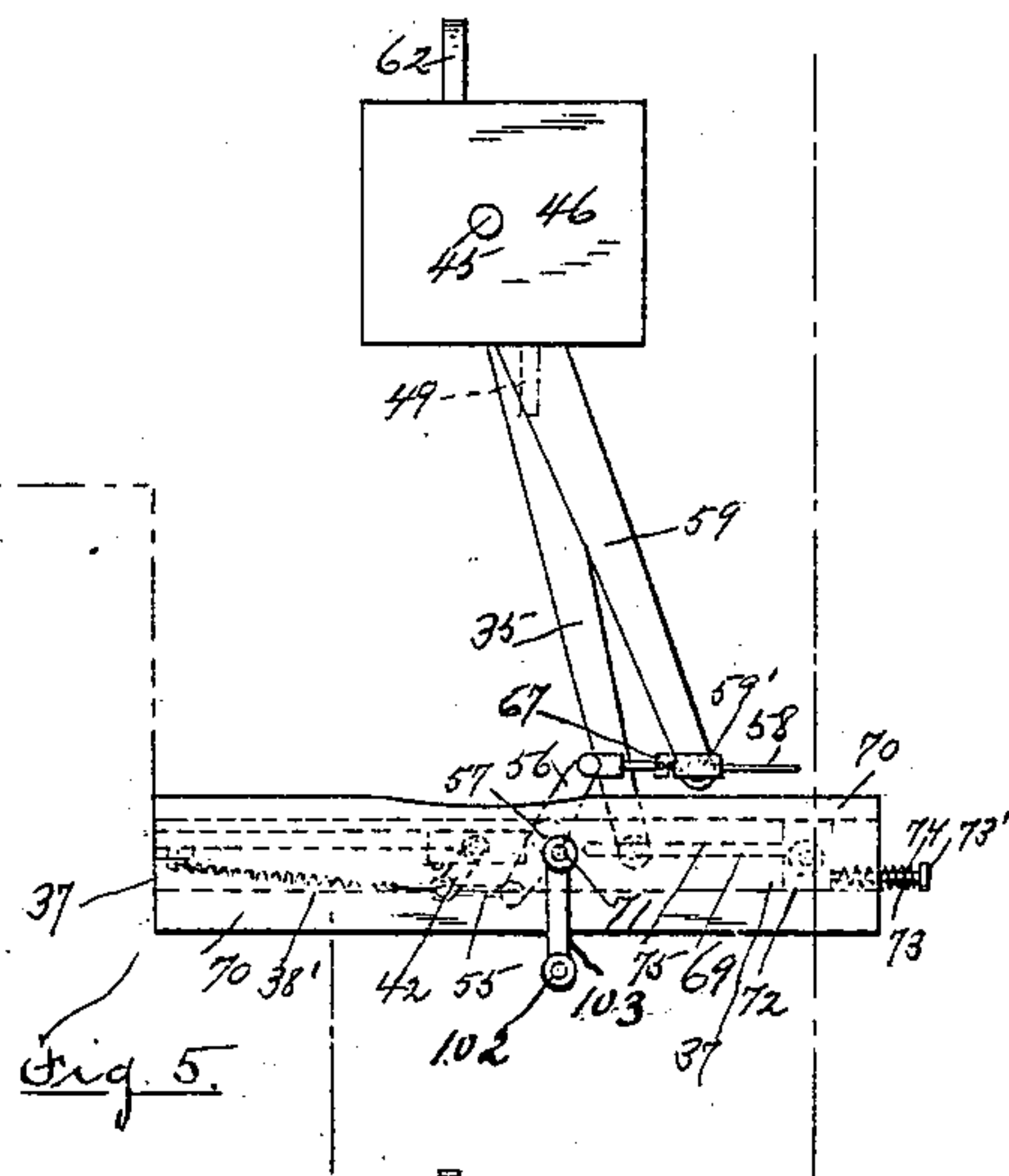
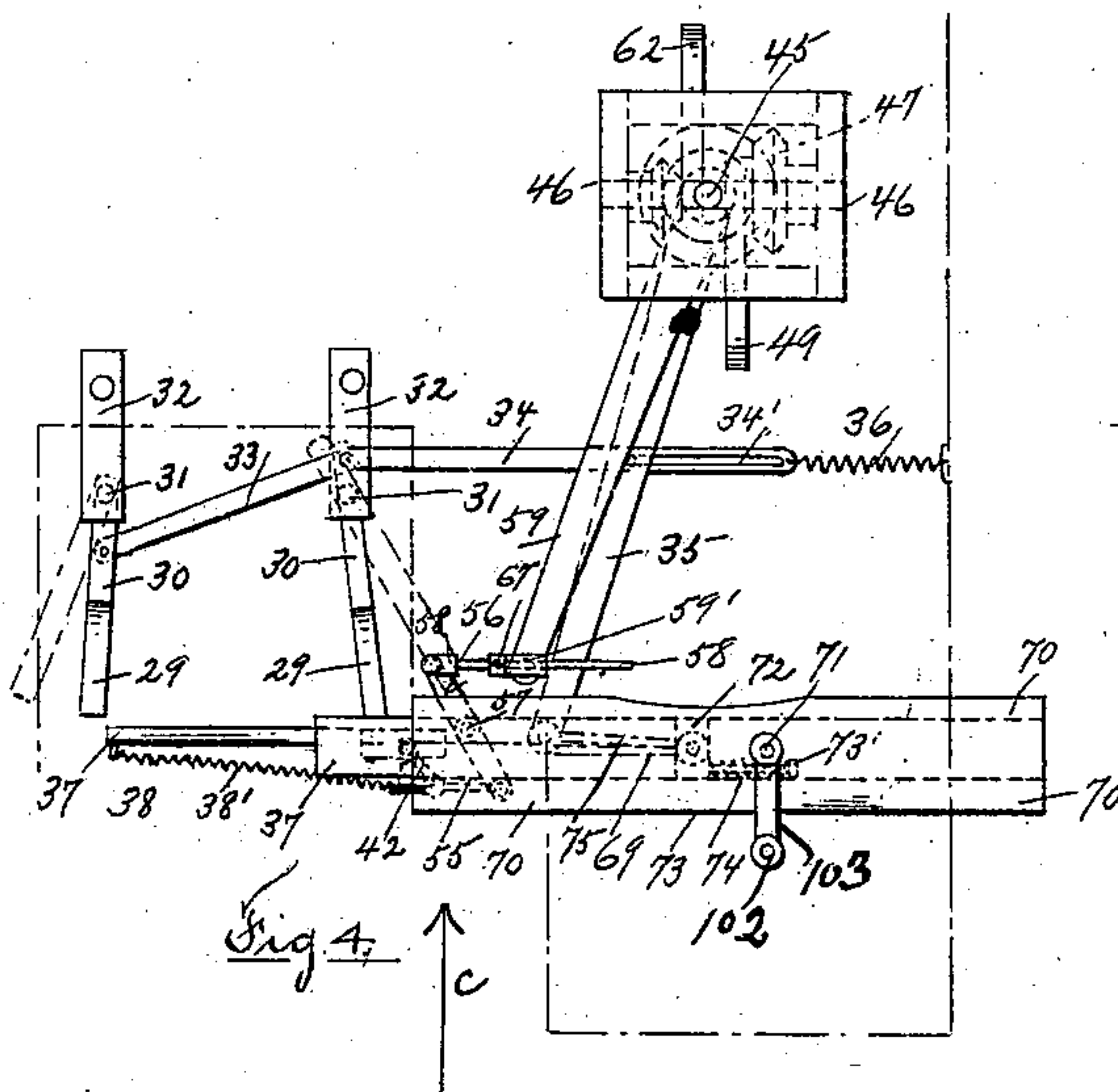
(No Model.)

4 Sheets—Sheet 3.

E. M. LOW.
ENVELOPE MACHINE.

No. 556,063.

Patented Mar. 10, 1896.



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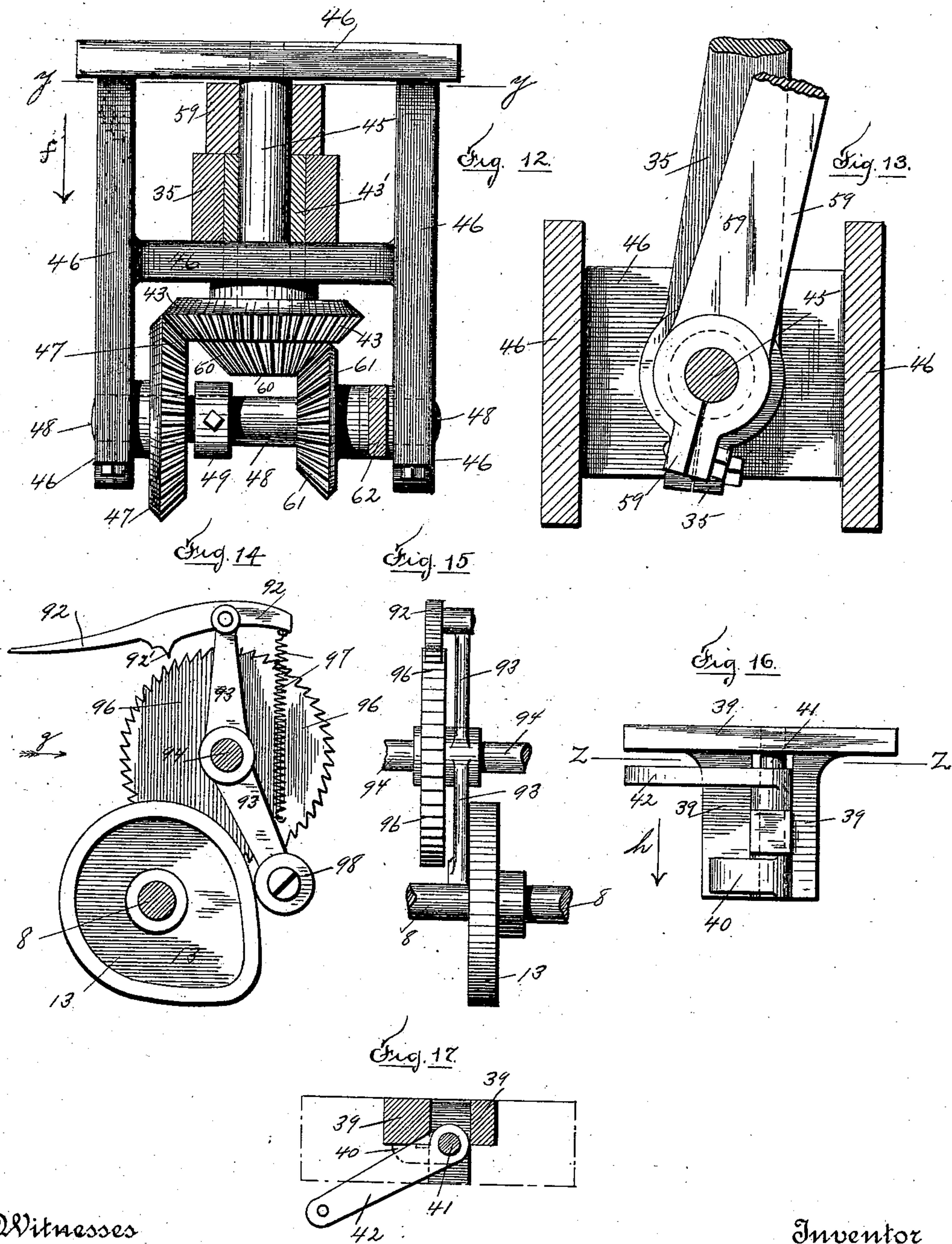
(No Model.)

4 Sheets—Sheet 4.

E. M. LOW.
ENVELOPE MACHINE.

No. 556,063.

Patented Mar. 10, 1896.



Witnesses

Walter S. Brown
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UNITED STATES PATENT OFFICE.

EVERETT M. LOW, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WORCESTER ENVELOPE COMPANY, OF SAME PLACE.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,063, dated March 10, 1896.

Application filed March 6, 1891. Serial No. 383,993. (No model.)

To all whom it may concern:

Be it known that I, EVERETT M. LOW, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Envelope-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to envelope-machines, and more particularly to the drying-chain or endless carrier in which the envelopes are held while the gum upon the seal-flap of the folded envelope is drying, and to the mechanism for removing the envelopes from the drying-chain to the receiving-box, and also to the mechanism for counting and bunching the envelopes into any desired number ready to be banded by the operator.

My invention consists in certain novel features of construction and operation of the parts of an envelope-machine above referred to, as will be hereinafter fully described.

I have shown in the drawings only such parts of an envelope-machine with my improvements applied thereto as will be sufficient to clearly illustrate the construction and operation of my improvements.

Referring to the drawings, Figure 1 is a sectional side elevation of an envelope-machine with my improvements applied thereto taken on line *xx*, Fig. 2, looking in the direction of arrow *a*, same figure. Some of the parts of the machine are left off for a more clear illustration. Fig. 2 is a front elevation of an envelope-machine, looking in the direction of arrow *b*, Fig. 1. Fig. 3 is a detail of the actuating mechanism of the drying-chain or endless carrier. Fig. 4 is a detail plan of the mechanism for directing the envelope into the drying-chain and of the mechanism for seizing and removing the envelope from the drying-chain into the receiving-box, said mechanism shown at the point of removing the envelope from the drying-chain. Fig. 5 corresponds to Fig. 4, showing the envelope-removing mechanism in the opposite position from

that shown in Fig. 4. Fig. 6 corresponds to Fig. 5, showing the mechanism for bunching the envelopes in a different position from that shown in Fig. 5. Fig. 7 is a side detail of the pusher-slide in the receiving-box and the counting-finger and its operating-springs. Fig. 8 corresponds to Fig. 7, showing the pusher-slide in the act of passing over and depressing the counting-finger. Fig. 9 is a front detail of the mechanism which seizes the envelope to remove it from the drying-chain, looking in the direction of arrow *c*, Fig. 4. Fig. 10 is a view of the bottom of the receiving-box and pusher-slide, looking in the direction of arrow *d*, Fig. 11. Fig. 11 is a side view of the parts shown in Fig. 10, looking in the direction of arrow *e*, same figure, showing also a portion of the counting mechanism. Fig. 12 is a detail of the gearing mechanism which operates the levers of the mechanism which seizes and removes the envelope from the drying-chain. Fig. 13 is a section on line *yy*, Fig. 12, looking in the direction of arrow *f*, same figure. Fig. 14 is a detail of the operating mechanism of the counting mechanism. Fig. 15 is an end view looking in the direction of arrow *g*, Fig. 14. Fig. 16 is a detail of the nipping mechanism which nips one end of the envelope to remove it from the drying-chain; and Fig. 17 is a section on line *zz*, Fig. 16, looking in the direction of arrow *h*, same figure. Figs. 4 to 17, inclusive, are shown on an enlarged scale.

In the accompanying drawings, 1 is the top or table of the machine, and 2 the frame of the machine. Upon the top 1 and the frame 2 are supported the several operating parts of the machine. 3 is the main driving-shaft supported in bearings upon the frame 2, having on one end the driving-pulley 4, driven by a belt 5 in the ordinary way. On the opposite end of the driving-shaft 3 is fast a gear 6, meshing with and driving a gear 7 fast on a shaft 8, having a hand-wheel 9 on the opposite end thereof. Said shaft 8 has a cam 10 fast thereon for operating the mechanism which causes the drying-chain 11 to revolve, and also a cam 12 fast thereon (see Fig. 1) which operates, through intervening mechanism to be hereinafter described, the pusher-

slide and pusher-plate in the envelope-receiving box. A cam 13 is also fast on the shaft 8, and operates, through intervening mechanism to be hereinafter described, the counting 5 and bunching mechanism.

I will now describe the construction and operation of the drying-chain 11 into which the envelopes are dropped from the folding-box and carried around in the direction of the arrow, Fig. 1, for the purpose of drying the gum 10 on the seal-flap, as is customary in envelope-machines.

The drying-chain 11 is made up of a number of metal fingers 14 (only a portion of 15 which are shown in the drawings) constructed and linked together in the ordinary way by wires passing through overlapping sections. The drying-chain 11 is supported and moved around on the triangular frame 15, which is 20 rigidly supported within the frame of the machine, in this instance, upon the upright stands 16, which are supported at their lower ends on the cross-tie rods 17. (See Figs. 1 and 2.) The frame 15 is provided with movable sections 18 at its lower ends of any ordinary construction and operation for regulating the tension on the drying-chain.

The drying-chain frame 15 at its upper end has a flat surface *i* (see Fig. 3) parallel with 30 the bottom of the frame and equal in length to the distance between the centers of three of the wires of the drying-chain. There is also a flat surface *j* between the flat surface *i* and the surface *k* of the frame, equal to the 35 distance between two of the wires of the drying-chain, or one-half the length of the flat surface *i*, and at an equal angle with the surfaces *i* and *k*.

As the drying-chain revolves in the direction of arrow *v*, and the wires passing through 40 the overlapping sections of the holding-fingers, as above described, pass over the corners of the angle from the surface *k* to the surface *j*, and over the angle from the surface *j* to the 45 surface *i*, and over the angle from the surface *i* to the surface *l* of the frame of the drying-chain, the top of the holding-fingers 14 are spread apart and caused to stand in the position shown in Fig. 1, when the envelope 50 is held between the two upright fingers and the adjacent fingers on both sides are thrown apart, as shown in said figure. When the drying-chain comes to rest in the position shown in Fig. 1, the envelope is removed from 55 between the two upright or vertical holding-fingers 14, while another envelope drops from the folding-box into the space *m* between the two next forward fingers. The space *n* between the two next rear fingers is of no special 60 use; but said space is a necessary consequence of the shape of the drying-chain frame above described and of the position of the other fingers.

The drying-chain 11 is driven intermittently by means of two sprockets (not shown) 65 in the ordinary way, within the drying-chain 11, at its upper end, and fast on the shaft 19,

within the upper end of said frame. (See Fig. 2.) The sprockets engage the wires which connect the links of the chain, as is common 70 in said mechanism.

The shaft 19 has a ratchet 20 fast thereon, operated by a pawl 21, carried on an angle-lever 22, loose on the shaft 19 and operated by a lever 23, having a slot 23' therein, through 75 which the shaft 8 extends, and carrying a roll 24 at its lower end, which is operated by a cam 10 on said shaft 8. (See Figs. 2 and 3.) A holdfast-pawl 25 is pivoted on a stand 26 on the under side of the top of the table, and is 80 adapted to catch into the teeth of the ratchet-wheel 20 to prevent any backward motion of said ratchet-wheel. A spring 27 may be used to hold the pawl 21 in contact with the teeth of the ratchet 20, (see Fig. 3,) and the spiral 85 spring 27', (see Figs. 2 and 3,) connected at its lower end to the upper end of the cam-lever 23, serves to keep the cam-roll 24 in contact with its cam 10.

As the drying-chain 11 is revolved intermittently by the mechanism above described 90 in the direction of the arrow *v*, Fig. 1, the envelopes drop from the folding-box into the space *m* in the drying-chain, and move around in the drying-chain in the direction of the 95 arrow *v*, Fig. 1, until they reach the space *o* at the top of the drying-chain frame, where the holding-fingers 14 are in their upright position, as shown in Fig. 1, when the envelopes are removed to the receiving-box 28, arranged 100 on the right side of the drying-chain, by the mechanism to be hereinafter described.

In order to prevent the envelopes as they fall from the folding-box into the drying-chain from lodging in the curved portions of 105 the holding-fingers 14, I may employ two inclined guide-strips 29 to direct the envelopes, so that they will drop between the holding-fingers in the proper manner. The inclined strips 29 extend, one at each side of the drying-chain, (see Fig. 4,) just outside of the hold- 110 ing-fingers 14 and in line with them, (see Fig. 1,) so that the ends of the envelopes which project beyond the holding-fingers 14 will slide down on the strips 29 between the hold- 115 ing-fingers. The inclined strips 29 are supported at their upper ends and operated in such a manner that they swing out to each side of the drying-chain far enough to allow the envelopes to pass as the drying-chain 120 moves around. The inclined strips 29 are secured, in this instance, at their upper ends to angle-pieces 30, (see Figs. 1 and 4,) and said angle-pieces 30, carrying the guiding-strips 29, are moved on the studs or pins 31, supported in arms 32 on the frame of the machine. 125 The angle-pieces 30 are operated to cause the guiding-strips 29 to come together and spread apart, as shown by full and dotted lines, Fig. 4, by means of the lever 33, connecting said 130 angle-pieces, and the lever 34, which is connected with and operated by the swinging arm 35, which operates the removing-slide to be hereinafter described.

The lever 34 has a slot 34' therein to reduce the movement thereof, and is moved in one direction by the swinging arm 35 to move from each other the guiding-strips 29, as shown by dotted lines, Fig. 4, and is moved in the opposite direction to move toward each other the guiding-strips 29, as shown by full lines, Fig. 4, by a spring 36 attached to the end of said lever 34 and to the frame of the machine.

I will now describe the mechanism which removes the envelopes from the drying-chain after the same have been once carried around therein to the receiving-box preparatory to counting and bunching.

A slide 37 is supported and adapted to move back and forth in ways 70 upon the under side of the table 1 over the upper part of the drying-chain in a direction at right angles to the axis of revolution of said chain. At the outer end of the slide 37 is a downwardly-projecting lug 38, the lower end of which is adapted to extend below and over the upper corner of the envelope, as shown in Fig. 9. Attached to the slide 37, at the other end of the envelope from the projecting lug 38, is a nipping mechanism, which seizes and holds said envelope as it is removed from the drying-chain into the receiving-box. The nipping mechanism (shown on an enlarged scale in Figs. 16 and 17) consists of the stationary part or jaw 39, extending down from and forming a part of the slide 37, and the movable jaw 40, which is fast on and moves with a pin 41 revolving and having its bearing on the downward extension or stationary jaw 39 of the slide 37. The movable jaw 40 is operated by a crank-arm 42, fast on the pin 41, and connections thereto to be hereinafter described.

The slide 37 moves out over the drying-chain into the position shown in Figs. 4 and 9. Then said chain moves the distance of one space of the holding-fingers 14, bringing the envelope against the downward-projecting part or stationary jaw 39 and the downwardly-projecting lug 38 on the slide 37. The movable jaw 40 then closes down on the envelope, operated by a spring 38', attached to the lug 38 and the outer end of the crank-arm 42, thus binding the envelope between the stationary jaw 39 and the movable jaw 40 by the contraction of said spring, which is not enough to mark the envelope. The movable jaw 40 is opened at the proper time to release the envelope by mechanism to be hereinafter described.

After the envelope has been seized by the nipping mechanism, as above described, the slide 37 moves back over the receiving-box, carrying the envelope. The movable jaw 40 is now opened to release the envelope and allow the same to drop into the receiving-box, and the slide 37 moves forward over the drying-chain preparatory to removing another envelope, and the operation is repeated.

I will now describe the mechanism for operating the slide 37 to cause the same to have

a reciprocating motion back and forth over the drying-chain, and also for operating the movable jaw 40 to cause the same to be opened at the proper time to release the envelope.

The slide 37 is operated by the swinging arm 35, connected at its outer end with said slide in the manner to be hereinafter described and fast at its inner end on the hub 43' of the bevel-gear 43. The hub of said bevel-gear is supported and turns loosely on the vertical shaft 45, (see Fig. 12,) supported in the frame 46, secured on the underside of the top 1 of the envelope-machine. A bevel-gear 47 meshes with and drives the bevel-gear 43. Said bevel-gear 47 is fast on a rocking shaft 48 turning in bearings at the lower end of the frame 46. A rocking arm 49 is fast at its inner end upon said rocking shaft 48, and at its outer end is connected with the cam-lever 50, having a slot therein, through which the driving-shaft 3 extends, and a cam-roll 51 thereon, which is operated by the cam 52, fast on the driving-shaft 3. (See Fig. 1.) A spring 54 is secured to the lower end of the cam-lever 50 to keep the cam-roll 51 in contact with its operating-cam 52. It will thus be seen that the slide 37 is operated to have a positive reciprocating motion over and away from the drying-chain by the cam 52, cam-lever 50, rocking arm 49, rocking shaft 48, bevel-gear 47, bevel-gear 43, and swinging arm 35.

The movable jaw 40 is operated to open and release the envelope at the proper time by means of a crank-arm 42, fast on the vertical pin 41, (see Figs. 16 and 17,) on which said jaw 40 is secured, connector 55, lever 56, pivoted at a central portion 57 on the slide 37, connector 58, attached at one end to said lever 56 and at its other end to the swinging arm 59, arranged over the swinging arm 35 and secured at its inner end on the vertical shaft 45, supported in the frame 46, before referred to. (See Figs. 12 and 13.) On the lower end of said shaft 45 is fast a bevel-gear 60, which meshes with the bevel-gear 61 loose on the rocking shaft 48, before referred to. A rocking arm 62 is fast to the hub of the beveled gear 61 and loosely supported on the rocking shaft 48, and extends out in the opposite direction from the rocking arm 49, above referred to. (See Fig. 1.)

To the outer end of the rocking arm 62 is secured the upper end of the cam-lever 63, which has a slot therein through which extends the driving-shaft 3. The shaft 48 may be fast in its bearings, and both the beveled gears 47 and 61 and the arms 49 and 62, connected with said gears, may be supported loosely on shaft 48, if desired. The cam-lever 63 has a cam-roll 64 thereon which engages with and is operated by a cam 65 fast on the driving-shaft 3. (See Figs. 1 and 2.) To the lower end of the cam-lever 63 is secured a spring 66 to hold the cam-roll 64 in contact with its operating-cam 65. It will thus be seen that the movable jaw 40 is opened at the proper time by means of the

crank-arm 42, connector 55, lever 56, connector 58, swinging arm 59, vertical shaft 45, bevel-gear 60, bevel-gear 61, rocking shaft 48, rocking arm 62, cam-lever 63, cam-roll 64, and
5 cam 65.

The cams 52 and 65 for operating the slide 37 and movable jaw 40, as above described, are so formed and so timed relative to each other that the swinging arms 35 and 59 move
10 together, except at the end of the movement of slide 37, and swinging arm 35 in each direction, when an additional movement of cam 65 opens the movable jaw 40 at the end of the movement toward the receiving-box
15 and allows the spring 38' to close it at the end of the movement toward the drying-chain.

The swinging arms 35 and 59 always have the same amount of travel, and the connector 58, which is attached to the outer end of the
20 swinging arm 59, is preferably composed of a rod 58, sliding loosely in a block 59' on the end of the swinging arm 59 and having a collar 67 fast thereon. The movable jaw 40 is opened by the swinging arm 59, moving
25 the block 59' against the collar 67, fast on connector 58, as shown in Fig. 4, and said jaw 40 is closed by the spring 38', the block 59' moving away from collar 67, as shown in Fig. 5.

30 The envelopes are separated into bunches of any desired number, usually twenty-five, in the receiving-box by varying the amount of travel of the slide 37, every alternate bunch being carried about one-half an inch beyond
35 the preceding one.

I will now describe the mechanism for varying and controlling the amount of travel of the slide 37 to regulate the bunching of the envelopes.

40 The slide 37 has a longitudinal groove 69 in its upper side, cut about half-way through at its outer end. (See dotted lines, Fig. 5.) Through the top 1 and the ways 70 of the slide 37 extends a pin 71, placed over the groove 69
45 in said slide, with its lower end adapted to extend into said groove. Said pin 71 has a vertical movement equal to the depth of the groove 69, and is operated to be moved into or out of said groove 69 to regulate the move-
50 ment of the slide 37 by the mechanism to be hereinafter described. The outer end of the slide 37 has connected therewith a block 72 about one-half an inch long. Said block moves in the ways of the slide 37 and is con-
55 nected to the slide 37 by a pin 73, extending loosely through the block 72, with its inner end fast in the end of the slide 37. (See Fig. 6.) The block 72 is free to slide on the pin 73, but is pushed and held against the end of the
60 slide 37 by a spiral spring 74 on the outer end of the pin 73, and interposed between said block 72 and the head 73' of said pin 73.

The outer end of the swinging arm 35 is attached to one end of the connector 75, and the
65 other end of said connector is attached to the block 72, so that when the vertical moving pin 71 drops into the groove 69 in the upper sur-

face of the slide 37 to limit the motion of the slide 37 to form one bunch of envelopes the slide 37 can only move until the end of the
70 groove 69 strikes the pin 71, as shown in Fig. 6, and the additional movement of the swinging arm 35, connected to the slide 37 through connector 75, block 72, and pin 73, as above de-
75 scribed, is taken up by the block 72, moving away from the end of the slide 37, and compressing the spring 74 on the pin 73, as shown in Fig. 6. When the vertical pin 71 is raised
80 up out of the groove 69, the slide 37 is free to move out over the receiving-box to the far-
85 thest extent of its travel. The spring 74 holds the block 72 against the end of the slide 37, as shown in Fig. 5.

The pin 71 is operated by the counting mechanism to be hereinafter described, and
85 is down in engagement with the groove 69 in the slide 37 while one bunch of envelopes is being removed to the receiving-box and up while the next is being removed, thus allow-
90 ing the bunches to be placed in the receiving-box in a zigzag line to separate the same.

When the pin 71 is down, so that its lower end engages the groove 69 in the slide 37, as shown in Fig. 6, and said slide stops at its
95 shortest travel, the block 59' on the swinging arm 59 moves away from the collar 67, and the swinging arm 59 must have movement enough to move the distance of the space to open the movable jaw 40.

I will now describe the mechanism for push-
100 ing the envelopes along in the receiving-box and for counting the same.

After the envelope has been removed from the drying-chain to the receiving-box by the slide 37, and the nipping mechanism carried
105 by said slide above described, the movable jaw 40 opens, releasing the envelope, which then stands in the receiving-box in front of the pusher-plate 76. (See Fig. 11.) As the movable jaw 40 opens, the pusher-plate 76
110 moves forward, (operated by mechanism to be hereinafter described,) pushing the envelope against the counter-finger 77, which is pivoted on the lower side of the receiving-
115 box 28, (see Figs. 10 and 11,) and pushing said finger through a slot in the bottom of the receiving-box below the surface of the bottom 28' of said receiving-box, as shown in Fig. 8, where it is held by the tension of the spring
120 78, which is supported on a rod 78' and attached at one end to an arm 79, secured on the slide 80, which carries the pusher-plate 76, and at the other end to the counter-finger 77 at such a point, as 79', that when the envelope
125 pushes the counter-finger 77 downward to pass over it, as shown in Fig. 8, the point where the spring 78 is attached to said counter-finger is brought below the center 81, on which the counter-finger is pivoted. The counter-
130 finger is moved down the remainder of its travel by the expansion of the spring 78, and is held down by said spring until a lip 82 on the slide 80, which carries the pusher-plate 76, passes under a pin 83 on the counter-fin-

ger, which prevents it being drawn up by the spring 84, which exerts a tension in the opposite direction from spring 78, and is attached at one end to the arm 79 on the slide 80 and at the other end to the counter-finger 77 below the center on which the counter-finger turns.

When the slide 80 and pusher-plate 76 thereon are only moved far enough to press the envelope against the counter-finger and move it down far enough for the spring 78 to act on it, the spring 84 is loose and exerts no tension, as shown in Fig. 8; but as the slide 80 moves forward still farther, carrying the pusher-plate beyond the counter-finger, the spring 78 loses its tension, and the spring 84 gains its tension; but it cannot raise the counter-finger until the slide 80 has traveled nearly to its full extent, when the lip 82, on the lower side of the slide at the rear thereof, passes beyond the pin 83 on the counter-finger 77. Then the spring 84 acts to pull the counter-finger up, as shown in Fig. 7. After the envelope has been pushed forward, the slide 80, carrying the pusher-plate 76, returns to its first position, the counter-finger passing through a slot 85 (see Fig. 2) in said pusher-plate. When no envelope is pushed forward by the pusher-plate 76 carried on the slide 80, the counter-finger 77 passes through the slot 85 in the pusher-plate and is not pushed downward to operate the counting mechanism to be hereinafter described, and therefore no count is made.

I will now describe the mechanism for operating the slide 80 and the pusher-plate 76 carried thereon, said slide moving in ways 81' on the bottom of the receiving-box, as shown in Fig. 10.

A connector 86 is pivoted at one end to the lower surface of said slide 80, and is pivoted at its other end to the upright lever 87, pivoted at its lower end at 88 on a bracket or arm 89, secured on the under side of the receiving-box. To the lever 87 is pivoted one end of a cam-lever 90, having a slot therein, through which the shaft 8 extends, (see Fig. 1,) and a cam-roll 91 thereon, which engages with and is operated by a cam 12, fast on the shaft 8. A spring 91', (see Fig. 1,) attached to the upper end of the lever 87 and to the receiving-box, serves to keep the cam-roll 91 in contact with its operating-cam 12. The revolution of the cam 12, through cam-roll 91, cam-lever 90, lever 87, and connector 86, causes the slide 80, carrying the pusher-plate 76, to have a reciprocating motion back and forth. The extent of said motion is controlled by the shape of the cam 12.

I will now describe the mechanism for counting the envelopes, which is operated by the counter-finger 77.

When the counter-finger 77 is moved down by a passing envelope, pushed along by the pusher-plate 76, as above described, the projecting portion 77' strikes the end of the pawl 92, pivoted on the upper end of the angle-

lever 93. (See Figs. 1, 11, and 14.) The angle-lever 93 is loosely supported on a shaft 94, which has its bearing in the lower end of arms or hangers 95, secured on the under side of the receiving-box. (See Fig. 1.) A ratchet 96 is fast on the shaft 94, and its teeth are adapted to be engaged by the projecting point 92' of the pawl 92 when the same is pressed down by the counter-finger 77.

A spring 97 is attached to the pawl 92 and to the angle-lever 93 to hold said pawl out of engagement with the ratchet 96 when said pawl is not operated by the counter-finger 77. Upon the lower end of the angle-lever 93, opposite from the pawl 92, is a cam-roll 98, adapted to engage with and be operated by the cam 13, fast on the shaft 8. When the pawl 92 is moved down by the action of the counter-finger 77 into engagement with the ratchet 96, said pawl is moved, through angle-lever 93 and cam 13, far enough to move the ratchet 96 a distance of one tooth. The ratchet 96 will have fifty teeth for counting bunches of twenty-five, or twenty-four teeth for counting bunches of twelve, and said ratchet will be moved one tooth every revolution of the cam 13, provided the pawl 92 is operated by the counter-finger 77 to engage said ratchet 96. The spring 97 holds the pawl 92 out of contact with the ratchet 96 to prevent the revolution of said ratchet and the count of an envelope when the counter-finger 77 is not moved down by the non-passing of an envelope, as above stated.

On the shaft 94, carrying the ratchet 96, at the outer end of said shaft, is fast a cam 99, which has one half of its circumference cut down lower than the other half. Working on said cam and operated thereby is a roll 100, supported on the lever 101, pivoted at one end on the arm or hanger 95, and having pivoted to its other end the vertical moving rod 102, provided at its upper end with the horizontal arm 103, carrying at its outer end the vertical moving pin 71, the lower end of which is adapted to extend into the groove 69 in the slide 37, as above described, to regulate the movement of said slide and the bunching of the envelopes in the receiving-box, as before described.

The cam 99, fast on the shaft 94, is revolved a distance equal to one tooth of the ratchet 96, every time a count is made, by an envelope pushing down the counter-finger 77 and moving the pawl 92 into engagement with the teeth of the ratchet 96.

The operation of the counting mechanism above described is as follows: Supposing that the ratchet 96 has fifty teeth therein for the counting of twenty-five envelopes in a bunch, as each envelope is pushed forward by the pusher-plate 76, as above described, the pawl 92, through the operating mechanism above described, moves the ratchet 96 the distance of one tooth. When twenty-five envelopes have been pushed forward, the cam 99, fast on the shaft 94 of the ratchet 96, has moved one-half

a revolution, and the roll 100 would be raised from the lowest part of the cam 99 onto its highest part, as shown in Fig. 1, or vice versa, and through the lever 101, rod 102, and arm 103 the pin 71 would be lowered, so as to extend into the groove 69 in the slide 37 to limit the movement of said slide to form one bunch of envelopes, or raised out of said groove 69 in the slide 37 when roll 100 is on the lowest part of the cam 99 to allow said slide to have its greatest movement to form one bunch of envelopes, said pin 71 regulating the bunching of the envelopes, as before described.

In case no envelope is pushed forward by the pusher-plate for any reason the counting mechanism does not operate; neither does the pin 71, regulating the bunching mechanism, operate.

From the above description, in connection with the drawings, the operation of my improved mechanisms for directing the envelope in a proper manner into the drying-chain for seizing and removing the envelope from the drying-chain to the receiving-box, and for pushing the envelope along in the receiving-box, and for counting the envelopes, and for separating the same into bunches preparatory to the removal of the same from the box, and the banding thereof by the attendant will be readily understood by those skilled in the art.

It will be understood that I do not limit myself to the details of construction of the several parts of my improvements shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an envelope-machine, the combination with the drying-chain, of the drying-chain frame, having a flat surface on its top end, and straight inclined surfaces leading from said flat surface to form angles, for the purpose stated, substantially as set forth.

2. In an envelope-machine, the combination with the drying-chain, of two inclined guide-strips, to direct the envelopes, so that they will drop between the holding-fingers in the proper manner, and means for operating said guide-strips, substantially as set forth.

3. In an envelope-machine, the combination with the holding-fingers of the drying-chain, of two inclined guide-strips, to direct the envelopes between said holding-fingers in the proper manner, and means for moving said guide-strips apart by a positive motion, to allow the envelopes to pass, and moving them toward each other by a spring-actuated motion, substantially as set forth.

4. In an envelope-machine, the mechanism for removing the envelopes from the drying-chain to the receiving-box, consisting of a slide, having a downward projection at its outer end, adapted to extend over the outer upper corner of the envelope, and provided with a nipping mechanism, to nip and hold the opposite corner of the envelope, and means

for operating said slide, and said nipping mechanism, for the purpose stated, substantially as set forth.

5. In the mechanism for removing the envelopes from the drying-chain to the receiving-box, the combination with a slide provided with a downward projection at its outer end, to extend over the outer upper corner of the envelope, and means for operating said slide, of a nipping mechanism supported on, and moving with said slide, and means for operating said nipping mechanism, to open the same and release the envelopes by a positive motion, and to close and nip the envelopes by a spring-actuated motion, substantially as set forth.

6. In an envelope-machine, the mechanism for removing the envelopes from the drying-chain to the receiving-box, consisting of a slide having a reciprocating motion back and forth over the drying-chain, and carrying a nipping mechanism to seize one corner of the envelope, to remove the same, and to release the envelope, after the same is removed, and means for operating said slide, consisting of a swinging arm, and connections between said arm and slide, and means for operating said swinging arm, consisting of two beveled gears, a shaft, rocking arm, cam-lever, and cam, substantially as set forth.

7. In an envelope-machine, the nipping mechanism carried on a reciprocating slide, which removes the envelopes from the drying-chain to the receiving-box, said nipping mechanism consisting of a stationary jaw, and a movable jaw, in combination with means for opening said movable jaw, consisting of a swinging arm, and connections from said swinging arm to said movable jaw, and means for operating said swinging arm, consisting of a shaft, two beveled gears, a shaft, a rocking arm, a cam-lever, and cam, substantially as set forth.

8. In an envelope-machine, the combination with the slide, to remove the envelopes from the drying-chain to the receiving-box, of means for varying the amount of travel of said slide, to separate the envelopes into bunches, said means consisting of a vertical moving pin, with its lower end adapted to extend into a longitudinal groove in said slide, to limit the travel thereof, and means for operating said pin, to cause the same to engage with, or be disengaged from said groove for the purpose stated, substantially as set forth.

9. In an envelope-machine, the combination with a slide, to remove the envelopes from the drying-chain to the receiving-box, of means for regulating the amount of travel of said slide, to separate the envelopes into bunches, consisting of a vertical moving pin, to extend into a longitudinal groove in said slide, to limit the movement thereof, and to be moved into, or out of engagement with said groove by a cam, a cam-lever, and intervening connections to said pin, substantially as set forth.

10. In an envelope-machine, the combination with the receiving-box, and a pusher-slide to move back and forth therein, of a counter-finger operated by the envelopes as
5 they are moved forward by the pusher-slide, a pawl made independently of, and not attached to said counter-finger, and operated by said counter-finger to engage the teeth of a ratchet-wheel, and said ratchet-wheel
10 and means for operating said pawl, to cause said ratchet-wheel to revolve and operate the counting mechanism, substantially as set forth.

11. In an envelope-machine, the combination with the receiving-box, a pusher-slide
15 to move back and forth therein, and means

for operating said pusher-slide, of a counter-finger, to be moved down by a passing envelope, a spring connected with said counter-finger, for continuing the downward motion
20 thereof, and a pin on said counter-finger engaged by a lip on said slide, to hold said counter-finger in its downward position, and a second spring for returning said counter-finger to its upright position when said pin
25 is disengaged from said lip, substantially as set forth.

EVERETT M. LOW.

Witnesses:

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CHAS. S. SHORT, Jr.