(No Model.) 2 Sheets—Sheet 1.

L. P. BOUVIER.

ENVELOPE BLANK FEEDING MECHANISM.

No. 324,644. Patented Aug. 18, 1885.

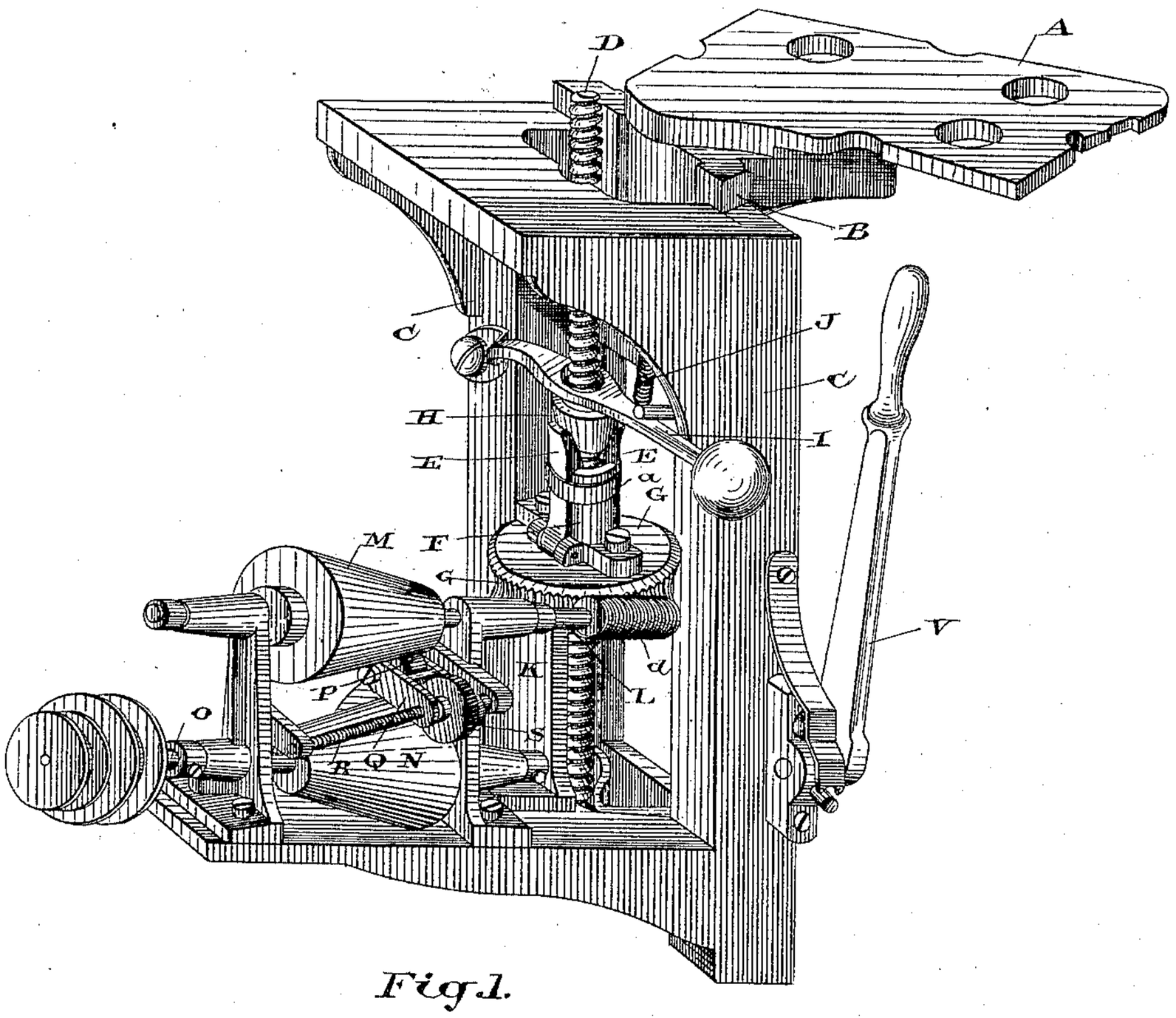

Fig. 1.

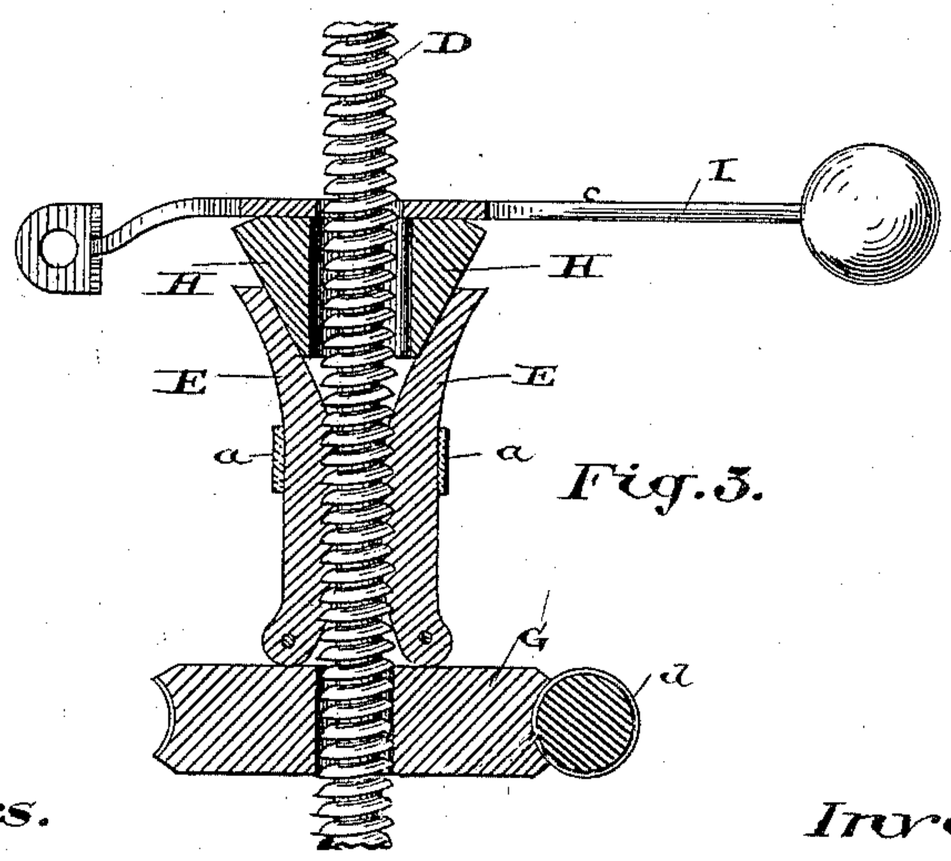

Fig. 3.

Witnesses.

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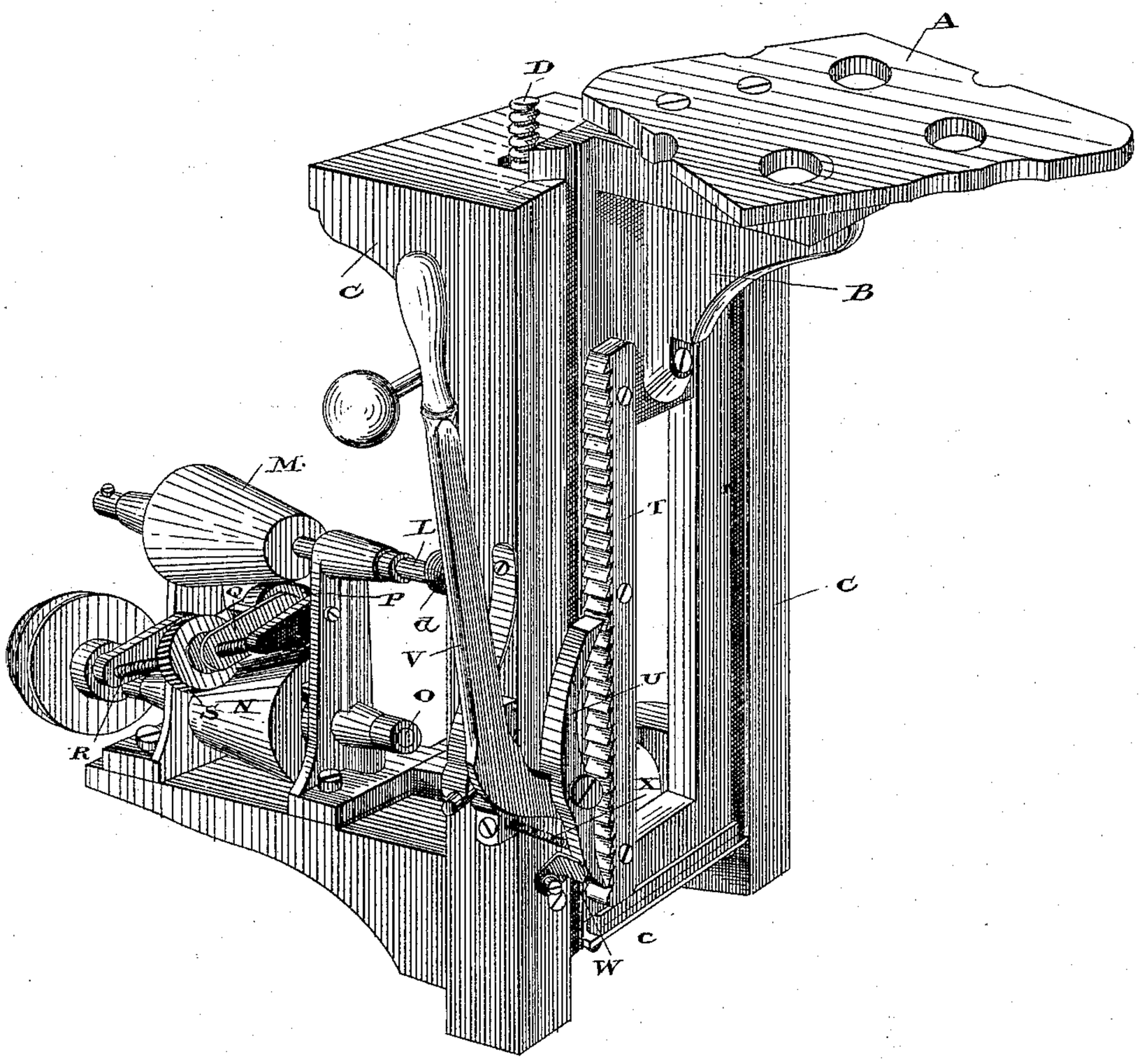

Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

LOUIS PETER BOUVIER, OF TORONTO, ONTARIO, CANADA, ASSIGNOR OF ONE-HALF TO JOHN FITZALLEN ELLIS, PHILIP THOMAS PERROTT, AND THOMAS JAMES CLARK, ALL OF TORONTO, CANADA.

ENVELOPE-BLANK-FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 324,644, dated August 18, 1885.

Application filed September 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, LOUIS PETER BOUVIER, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, machinist, have invented a new and Improved Feed for the Blank-Elevator of an Envelope-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same.

The object of the invention is to devise a continuous feed for the elevator of an envelope-machine, so arranged that the speed of the feed may be adjusted to a hair's-breadth in order to accommodate the various thicknesses of the blanks employed in different classes of envelopes. The feed is also arranged so that its speed may be increased or decreased without stopping the machine, and it is also arranged so that the elevator on which the blanks are carried may be raised or lowered independently of the feed mechanism; and it consists, essentially, in a vertical screw attached to the frame of the elevator and provided with a split nut connected to the worm-gear operated by a worm formed on the end of a spindle, having a friction-cone fastened to it driven by an adjustable friction-roller deriving its motion from a friction-cone fastened to a spindle driven from some convenient part of the machine, the two cones mentioned being made on the same taper and set on their respective spindles so that their sides shall be parallel with each other, in order that the friction-pulley which connects the two shall continue in contact with both cones, no matter at which end of the cone the friction-roller may be placed. Simple means for disengaging the split nut from the screw are provided, in order that the elevator may be dropped independently of the feeding mechanism, a simple rack-and-pawl movement being arranged to raise the blank-elevator independently of the feeding motion.

Figure 1 is a perspective view of the elevator, showing the feeding mechanism. Fig. 2 is a perspective view of the elevator at a different angle, in order to show the elevating rack and lever. Fig. 3 is a sectional detail of the spindle, split nut, and mechanism for operating the same.

As the invention relates only to the mechanism immediately connected with the blank-elevator of an envelope-machine, it is not necessary to exhibit any other part of the machine than that immediately connected with my invention. It is applicable to any envelope-machine in which the envelope-blanks are carried in a pile on top of a table arranged to be moved or fed upwardly as the thickness of the pile of blanks is reduced by the removal of the blanks on top of the pile as they are formed into envelopes by the action of the machine.

In the drawings, A represents the elevator plate or table on which the pile of blanks is placed. This table or plate is fastened to or forms part of the elevator-frame B, which is held in suitable guides formed in the elevator-bracket C, which is fastened to or forms part of the main frame of the envelope-machine. The guides which hold the elevator-frame B are fitted to the same so that the said elevator-frame shall have a free vertical movement.

D is the elevator-screw, rigidly fastened at its bottom end to the elevator-frame B.

The split nut E consists of two distinct parts, each part being pivoted at its bottom to a bracket, F, shaped substantially as shown, and attached to the top side of the worm-gear G. A clean hole is made both through the worm-gear G and the bracket F for the clear passage of the elevator-screw D, which is therefore only connected to the worm-gear G when the split nut E is held in gear.

As shown in the drawings, I employ a rubber band, *a*, arranged to fit over the cylindrical portion of the bracket F, and thereby grasp and hold the split nut E into gear with the elevator-screw D, passage-ways being cut out of the bracket F to allow the split nut E to come in contact with the screw D.

With the view of opening the nut, I fit loosely over the elevator-screw D an inverted-cone-shaped collar, H, the apex of the collar H fitting between the two parts of the split nut E. Consequently when the collar H is pressed downwardly the two halves of the nut E are pushed apart clear of the elevator-screw D, so as to break all connection between the worm-gear G and elevator-screw D.

In order to enable the operator of the machine to readily break the connection between the screw D and worm-gear G, I provide a hand-lever, I, one end of which is pivoted to the bracket C, while its other end projects beyond the bracket C, where it may readily be grasped by the operator. A hole is made at or about the center of the lever I to permit the screw D to pass through it and allow the lever I to come in contact with the inverted base of the cone-shaped collar H. Consequently a downward pressure on the free end of the lever I imparts a corresponding movement to the cone-shaped collar H, which, consequently, forces the two halves of the nut E apart, and thereby breaks the connection between the worm-gear G and elevator-screw D.

With the view of preventing the lever I from acting on the collar H when not required to do so, I provide a spring, J, arranged to support the free end of the lever I.

The worm-gear G is suitably journaled on the top of a bracket, K, attached to or forming part of the bracket C.

The horizontal spindle L has a worm, *d*, formed on its inner end and arranged to mesh with the worm-gear G. This horizontal spindle L is carried in suitable journals, as indicated, and has fastened to it a cone, M, made the same taper as the cone N, which is fastened to the spindle O, journaled below or next to the spindle L. These spindles are parallel to each other, and as the apex of one cone is set opposite to the base of the other cone the sides of the two cones will be parallel to each other, so that the connection between the two cones shall be formed by the friction-roller P, no matter at which end the said friction-roller may be placed. For the convenience of adjusting this friction roller P, I journal it at the end of the arm Q, the other end of which is loosely fitted onto the screw R, and is adjusted thereon by the thumb-screw S, by turning which thumb-screw the friction-roller P may be adjusted to a hair's-breadth in either direction. Consequently the speed of the spindle L may be increased or decreased at will by simply adjusting the friction-roller P toward either the apex or the base of the cone M, as the motion of the cone M is derived through the friction-roller P, and cone N from the motion of the spindle O, which is driven from any convenient part of the envelope-machine.

As the elevator A B, with the pile of envelope-blanks on top of A, is elevated by the action of the split-nut E on the screw D, any increase or decrease in the speed of the spindle L will cause a corresponding change in the speed at which the elevator A B and its blanks are fed upwardly. Consequently the mechanism herein described, which is of course caused to revolve in the proper direction, enables the speed at which the elevator A B is fed to be increased or decreased to suit the thickness of the envelope-blanks which may at the particular time be resting on the elevator-table A.

As it is important for the convenience of operating the machine that the elevator-table should be so connected to its feed that it may be raised or lowered independent of the feed, I provide a lever and rack, which I shall presently describe, as well as the split nut E, the action of which I have already fully explained.

The downward movement of the lever I moves the nut E from the screw D, which screw, when grasped by the nut, is the only support for the elevator-frame B. Consequently the removal of the nut E from the screw D will cause the elevator-frame B, with its table A, to fall by its own gravity, from which lowered position they may be raised, either by allowing the nut E to reform its connection with the revolving screw D; or, if the operator wishes to move the elevator A B upwardly more quickly than the action of the revolving screw D will do, the rack and lever elevating mechanism may be brought into requisition. This mechanism will be understood on reference to Fig. 2, where it will be seen that a ratchet-toothed rack, T, is fastened to the elevator-frame B, and that a pawl, U, is pivoted on the small arm of the lever V, which lever is pivoted, as indicated, to the bracket C.

The pawl U has a tail, *c*, which projects beyond the face of a small adjustable bracket, W, attached to the face of the frame B. This bracket W is so set against the tail *c* that the upper end of the pawl U is held clear of the ratchet-rack T as long as the lever V stands in its initial position, as shown in Fig. 2; but as soon as this lever is pressed down the rounded end of the tail *c* permits the spring X to pull the tail *c* back sufficiently far to throw the top end of the pawl U into mesh with the ratchet-rack T. By this arrangement the pawl U has no effect upon or cannot interfere with the free movement of the elevator-frame B, except when the lever V is pressed down, which need only be done when it is desired to raise the elevator independently of its ordinary feed.

I should here mention that in order to permit the elevator to be raised by the lever V without throwing the nut E out of mesh with the screw D, I make the said screw D what is termed a "bastard thread"—that is to say, a thread beveled on one side, which in this case is made on the top side, so that when the nut E meshes with the screw D it supports the said screw and the elevator A B attached to it, but offers no resistance to the free upward movement of the elevator A B when acted upon by the lever V, as described.

What I claim as my invention is—

1. In an envelope-machine, the elevator-frame B, carried in suitable guides formed in the bracket C, and supporting the elevator plate or table A, in combination with mechanism, substantially as described, arranged to impart a continuous upward movement to the table during the operation of the machine, and an adjustable friction-roller, as P, oper-

ating on the cones M and N, as described, and varying the speed of the feeding mechanism, as and for the purposes specified.

2. In an envelope-machine, the plate or table A, carrying the envelope-blanks, and attached to or forming part of the frame B, held in suitable guides within the bracket C, a screw, D, fastened to said frame, and split nut E, arranged to grasp the screw D, and pivoted to the worm-gear G, through which the screw D passes, in combination with a horizontal spindle, L, having a worm on it to mesh with the worm-gear G, and deriving motion from adjustable mechanism, substantially as described, by which the speed of the spindle L may be increased or decreased without stopping the machine, substantially as and for the purpose specified.

3. In an envelope-machine, the plate or table A, attached to or forming part of the frame B, held in suitable guides within the bracket C, a screw, D, fastened to said frame, and a pivoted split nut, E, made to grasp the screw D, in combination with a cone-shaped collar, H, arranged to open the split nut E, substantially as and for the purpose specified.

4. In an envelope-machine, the plate or table A, attached to or forming part of the frame B, held in suitable guides within the bracket C, a screw, D, fastened to said frame, and a pivoted split nut, E, made to grasp the screw D, in combination with a cone-shaped collar, H, the apex of which extends between the ends of the split nut E, and the pivoted lever I, supported by the spring J, substantially as and for the purpose specified.

5. In an envelope-machine, the plate or table A, attached to or forming part of the frame B, held in suitable guides within the bracket C, a screw, D, fastened to said frame, and a pivoted split nut, E, made to grasp the screw D, in combination with a cone-shaped collar, H, arranged to open the split nut E, which is held against the screw D by a rubber band or spring, *a*, substantially as and for the purpose specified.

6. In an envelope-machine, the elevator-frame B, carried in suitable guides formed in the bracket C, and supporting the elevator plate or table A, and a screw, D, arranged to support the frame B, when grasped by a nut secured to the worm-gear G, supported by bracket, K, in combination with the spindle L, provided with a worm to mesh with the worm-gear G, and a cone, M, connected by the adjustable friction-roller P to the cone N, which is attached to the spindle O, deriving motion from some convenient moving part of the envelope-machine, substantially as and for the purpose specified.

7. In an envelope-machine, the elevator-frame B, carried in suitable guides formed in the bracket C and supporting the elevator plate or table A, a screw, D, fastened to the frame B, having a bastard thread cut upon it, with a nut, E, arranged to grasp the said thread, in combination with mechanism, arranged substantially as described, to impart a revolving motion to the nut, in order to convey a continuous upward movement to the elevator-frame B, and means, as the rack T, pawl U, and lever V, for raising said frame independently of the regular feed, as set forth.

8. In an envelope-machine, the vertically-adjustable elevator-table supporting the envelope-blanks, the spindle L, connected to the elevating mechanism, and having attached to it a cone, M, and a spindle, O, running parallel with the spindle L, and having attached to it a cone, N, the apex of the cone N being opposite to the base of the cone M, the two cones being similarly tapered, in combination with a friction-roller, P, arranged to form a connection between the two cones, and carried in a bracket capable of being adjusted toward either end of the cone, substantially as and for the purpose specified.

9. In an envelope-machine, a table carrying the envelope-blanks and attached to a frame carried in guides, so as to be vertically adjustable in them, and a ratchet-rack, T, formed upon or attached to the elevator-frame, in combination with the pawl U, pivoted on the end of the lever V, and having a rounded tail, *c*, arranged to extend beyond the adjustable bracket W, substantially as and for the purpose specified.

Toronto, September 4, 1884.

L. P. BOUVIER.

In presence of—

CHARLES CLINTON BALDWIN,

F. BARNARD FETHERSTONHAUGH.