

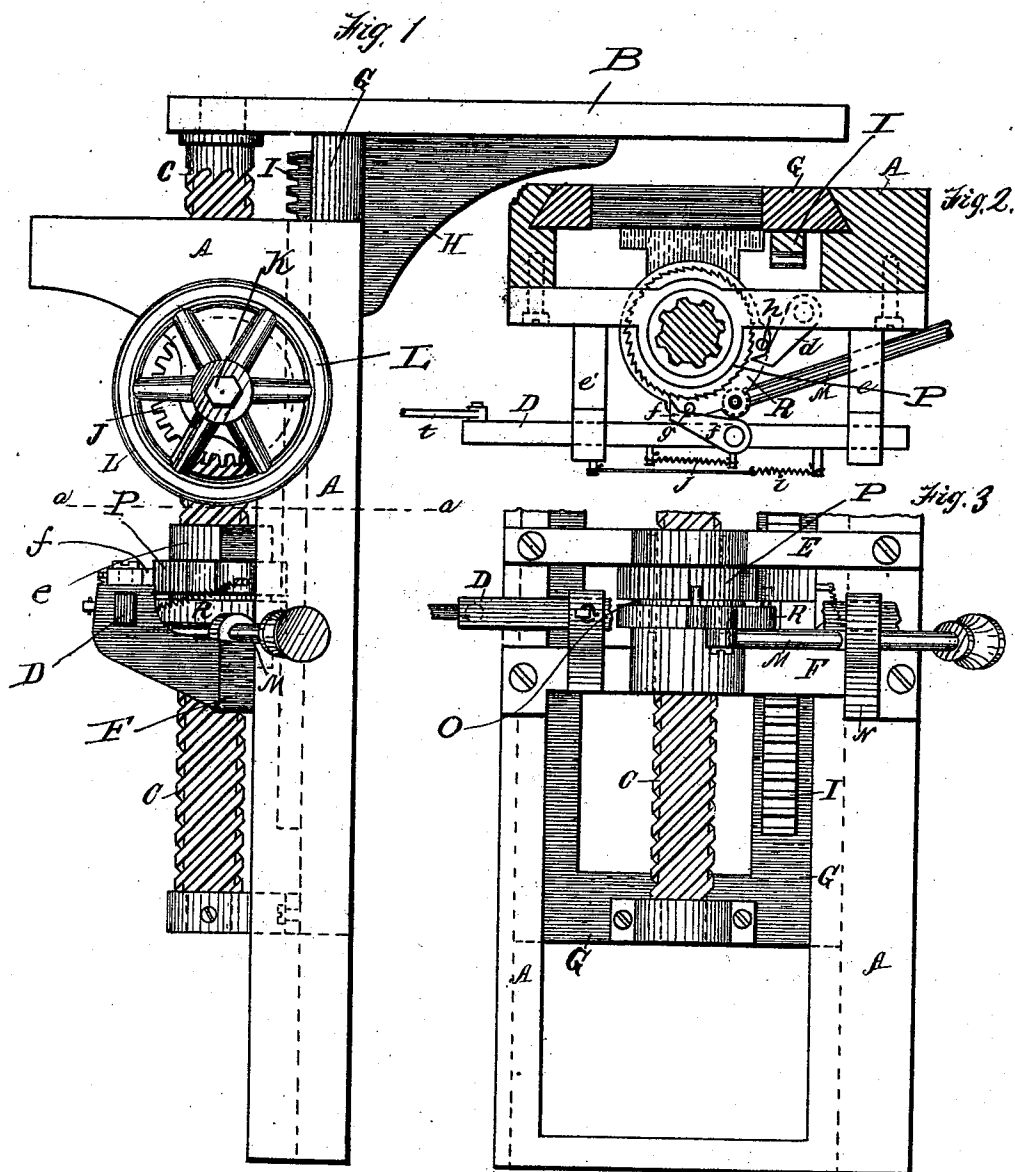
(No Model.)

4 Sheets—Sheet 1.

C. H. HEYWOOD.
ELEVATOR FOR ENVELOPE MACHINES.

No. 516,812.

Patented Mar. 20, 1894.



Witnesses
Robt. Riddell
Geo. D. Dutton.

Inventor
Charles H. Heywood.

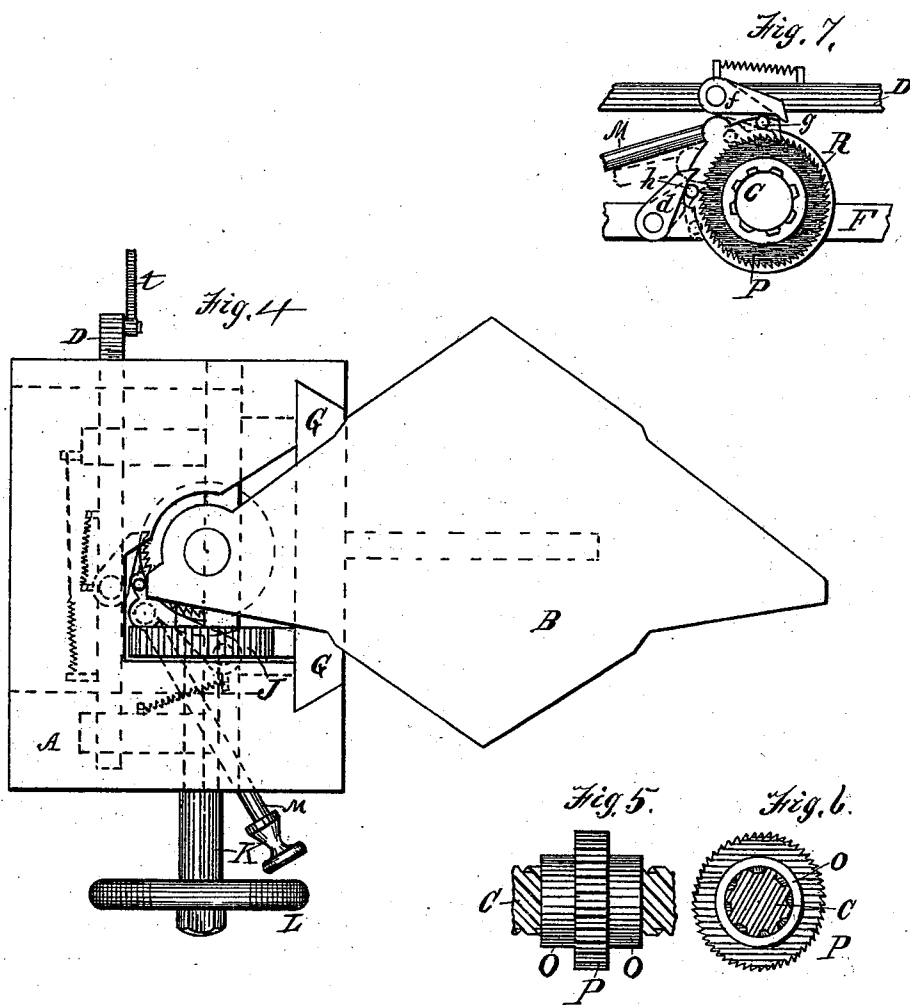
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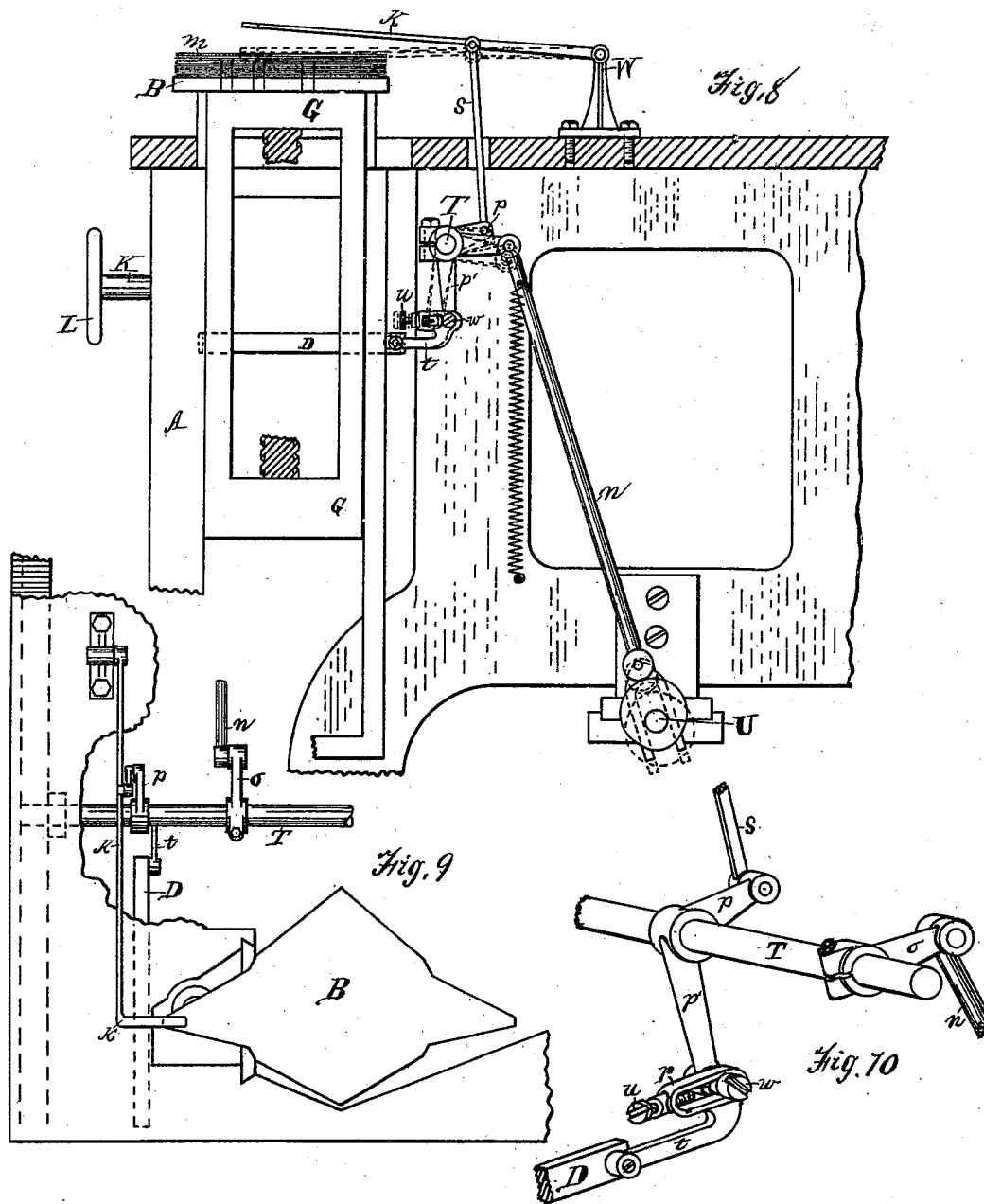
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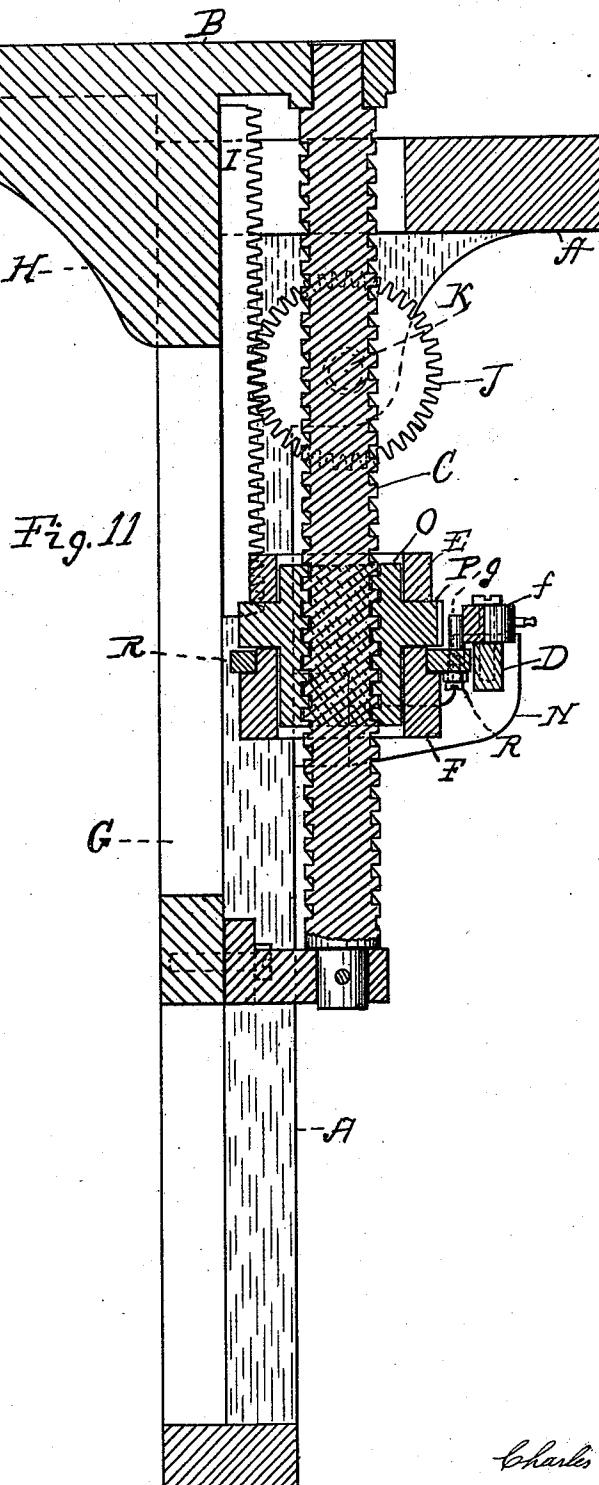
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UNITED STATES PATENT OFFICE.

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ELEVATOR FOR ENVELOPE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 516,812, dated March 20, 1894.

Application filed December 26, 1891. Renewed December 6, 1893. Serial No. 492,945. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HEYWOOD, a citizen of the United States of America, residing in Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Elevators for Envelope and other Like Machines, of which the following is a specification, reference being had to the accompanying drawings and letters of reference marked thereon.

In the drawings like letters of reference indicate like parts.

Figure 1 is a front elevation of the elevator complete. Fig. 2 is a plan view in section below line *a a*. Fig. 3 is a side elevation of the same. Fig. 4 is a plan view of the complete elevator. Fig. 5 is a side view of the nut showing a section of the screw therein. Fig. 6 is an end view of the same. Fig. 7 is a plan view of a portion of the apparatus detached, illustrating the detail of the construction and relation of the means by which the nut is rotated. Fig. 8 is a side view of a portion of an envelope machine with the elevator attached thereto. Fig. 9 is a plan view, and Fig. 10 is a perspective view on an enlarged scale of the rock shaft and parts immediately connected therewith. Fig. 11 is a central vertical section taken through the frames and the elevator screw, and looking toward the right in Fig. 3.

In detail A indicates a frame adapted to support the platform and operative mechanism.

B indicates the platen.

C indicates the screw, D the feeding-pawl-bar, E and F cross bars secured to frame or standard A, G a movable frame, H a bracket employed to strengthen and maintain the platen in fixed position upon the movable frame, I a rack mounted on the movable frame, J a gear mounted on a shaft K in the fixed frame and meshing with the rack on the movable frame, L a hand wheel mounted on shaft K, M a push rod to move the dogs out of engagement with the ratchet wheel, N a stud or bracket mounted on frame A in which the push rod has bearing, O the elevator nut, P a ratchet wheel mounted upon said nut, R a collar arranged adjacent to the ratchet wheel, T rock-shaft, U driving shaft. *d* retaining-

dog, *f* feed-dog, *g* and *h* pins to prevent engagement of the dogs with the ratchet-wheel, *k* feeler, *p* bell-crank-lever and *r* link.

A detailed description of the construction and operation is as follows:

The frame of the machine to which my device may be attached may be of any convenient form of construction, and in Fig. 8 I illustrate on a reduced scale a frame of an envelope machine having my device attached thereto in operative position, the screw being broken away and the intermediate parts omitted.

The main or supporting frame A of the elevator is secured in a vertical position to the machine frame, and is provided with ways to receive a frame G which moves vertically therein, the edges of which frame are preferably shaped as shown, in Fig. 2, and the ways in the frame A are shaped to receive said wedge shaped edges upon the movable frame. A screw, having a rapid thread, is mounted in a vertical position in the movable frame, and a nut O is arranged thereon. Extending from side to side of the fixed frame A are the cross pieces E, F provided with recessed portions or openings of sufficient size to receive the ends of the nut O, so that while the nut is free to be revolved no vertical motion is allowed. Upon the nut O I mount a ratchet wheel P having a suitable number of teeth upon its periphery, and immediately below the ratchet wheel I provide a collar R, the same having a limited rotary movement and being provided with pins, to force the dogs out of engagement with the ratchet wheel as hereinafter pointed out.

Suitably mounted upon a pivotal support above the cross-bar F I arrange a dog *d*, the office of which is to engage the teeth upon the ratchet wheel and prevent return movement of the same. A feed-bar D is arranged to slide in suitable supports or ways *e* and *e'*, motion being communicated to it as hereinafter pointed out. I pivotally mount upon the feed-bar D a dog *f*, the office of which is to engage the teeth upon the ratchet-wheel and cause it and the nut connected therewith to revolve and thereby raise the screw and with it the movable frame and parts connected therewith.

A collar R is provided with two pins *g* and *h* which project therefrom and when desired will engage the dogs *d* and *f* and throw them out of engagement with the ratchet-wheel, thus permitting the nut to revolve freely in either direction. A push-rod M is arranged to engage the collar R and cause it to rotate until the pins are in the desired position. A spring *i* is arranged to draw the feed-bar D in one direction and the cam hereinafter described operates to force it in the opposite direction. A spring *j* is arranged to throw the dog *f* toward the ratchet wheel. It will now be seen that as the screw is mounted in the movable frame and revolution of the same is prevented and the nut being mounted in the fixed frame and caused to revolve that each movement of the nut will cause the longitudinal movement of the screw, and thus the movable frame to which the screw is attached will be moved as required.

Upon the movable frame G is mounted a rack I and rotatably mounted within the fixed frame A is a shaft K, upon which shaft is mounted a gear J, the teeth of which mesh with the teeth of the rack I, and upon the projecting end of the shaft is mounted a hand-wheel L or other suitable contrivance for conveniently grasping by the hand to revolve the shaft. Thus when the dogs are disengaged from the ratchet wheel and the nut rendered thereby free to rotate in either direction, the movable frame and parts connected therewith, may be raised or lowered by rotating the shaft. When, however, the machine is in operation and the platen requires to be moved a predetermined distance with great accuracy, then the dogs are allowed to engage the teeth of the ratchet wheel and motion being communicated to the feed dog *f* through the medium of the feed bar D, the ratchet wheel will be moved at each movement of the feed-bar and the platen raised as desired. Motion is communicated to the feed-bar D from the shaft U (see Fig. 8) through the medium of the rod *n*, which lever is connected at one end with the arm *o* mounted on rock shaft T, and upon this shaft is mounted a bell-crank-lever *p*, the free end of the arm *p'* of which is arranged to engage the link *r*, which link is attached to the end of the feed-bar D. The arm *p* of the bell-crank-lever is pivotally connected with a rod *s* and the opposite end of this rod is attached to the feeler *k*, which feeler is mounted at one end upon a support W, and at its opposite end is arranged to overhang and bear upon the blanks *m*. The lower end of the rod *n* which receives motion from the shaft U is slotted and a cam arranged to throw the rod *n* upwardly while springs are relied upon to return it to its first position, and as the upward motion of this rod operates to cause the nut to rotate when the dogs are in engagement with the ratchet teeth, motion will be imparted to the movable frame G, and if no provision were made to regulate the feed, the motion

would be such as to cause the platen to be constantly elevated. To avoid this and to regulate the elevation by the position of the blanks and thus maintain the top of the pile of blanks in correct position to be fed therefrom, the bell-crank-lever is arranged upon the rock-shaft T in the manner before described, and the movable frame is elevated to a position approximating the desired location, and whenever the feeler *k* is free to move downwardly such distance as to permit return movement of the feeder bar sufficiently to enable the feed dog to engage another tooth in the ratchet-wheel, then the next motion of the rod *n* will cause the nut to revolve as before stated and the elevator platen to be raised. If, however, the pile of blanks are already at sufficient elevation then the feeler will in its downward movement rest upon the top of the blanks and prevent the springs operating to return the feeder bar a sufficient distance to enable the feed-dog to engage another tooth, and thus prevent further feeding or elevating of the platen until the blanks have been fed off sufficiently to allow the feeler to descend the requisite distance to enable the feed-dog to again engage another tooth in the ratchet wheel. And to prevent unnecessary motion of the feed-bar I arrange the arm of the bell-crank-lever which engages the feed-bar in such manner that it traverses within the link or slotted portion *r*, and all waste motion is expended therein without moving the feed-bar. The screw *u* arranged at the end of and projecting within the link is adapted for the purpose of adjustment, and to more readily bring the feeler to its approximate position with reference to the blanks upon the platen, and by the employment of this screw a very much more accurate adjustment of the feed may be had than if it were omitted, and if it be desired to feed more rapidly, then the lost motion or traverse of the free end of the bell-crank-lever in the link is reduced by setting the set screw *u* further into the slot or opening, thus causing the feeder-bar to receive more motion from the bell-crank-lever, and thus the feed-dog will be caused to engage a greater number of teeth and the feed be correspondingly increased in rapidity.

The pitch of the elevator screw, as herein illustrated, is two inches to each revolution and as the number of teeth on the ratchet wheel, as herein shown, is one hundred and twenty-eight, the elevation caused by a rotary movement of the nut equivalent to the distance of each tooth on the ratchet wheel will be one sixty-fourth of an inch or about the thickness of three or four ordinary sheets of paper as employed in the manufacture of envelopes.

It will be readily seen that if a more accurate or finer adjustment be desired, that the same may be accomplished by the employment of a ratchet wheel having a greater number of teeth upon its periphery, and also that the

teeth may be arranged to project from the ratchet wheel from either face as well as to be arranged upon its periphery. It will also be seen that a similar result may be accomplished if a screw be substituted having less gain to each revolution than the one herein shown. One object of a rapid thread, however, is to cause the screw and parts operating therewith to move downward by their own weight when free to do so, this being permitted by forcing the push rod M inwardly and causing the collar R to rotate, bringing the pins mounted thereon into engagement with the ratchet teeth, thus leaving the nut free to rotate in either direction. The end of the bell-crank-lever which gives motion to the feed-bar D is connected with the link *r* by the employment of a screw *w* which passes through the link and into the lever *t'*. The link is preferably mounted upon and made integral with an arm *t*, as shown in Fig. 10, and the arm *t* is pivotally connected to the feed-rod D.

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

1. The combination of a fixed frame having vertical ways in its side supports a rotatable nut mounted in the fixed frame and held against vertical displacement, a vertically movable frame having its edges adapted to fit and slide in the ways of the fixed frame, a screw fixed and mounted in the movable frame and projected through the rotatable nut, a ratchet on the rotatable nut, a pawl to engage the ratchet, and a movable collar on the rotatable nut provided with a pin to engage and hold the pawl out of engagement, substantially as and for the purposes specified.

2. The combination of a fixed frame a nut rotatably mounted in said frame and arranged in such manner that vertical movement of the nut is prevented, a vertically sliding frame arranged within the fixed frame a fixed screw mounted therein, and projected through the nut in the fixed frame, a ratchet wheel mounted upon the nut, a horizontally reciprocating feed-bar provided with a dog arranged to engage the teeth of the ratchet wheel, a retaining dog arranged to engage the teeth of the ratchet wheel and prevent return movement thereof a collar on the nut having pins to engage and throw the dogs out of engagement with the ratchet wheel and means to impart intermittent motion to the feed-bars substantially as and for the purposes stated.

3. The combination of a fixed frame A provided with cross pieces E and F, a movable frame G mounted in ways in the fixed frame, a screw C mounted within the movable frame and fixed therein, a rotatable nut arranged between the cross pieces E and F upon the fixed frame, a ratchet wheel mounted upon the nut, a feed dog and a retaining dog arranged to engage the teeth of the ratchet wheel, means to cause

the feed-dog to rotate the ratchet wheel, means to disengage the dogs from the ratchet wheel teeth and a platen arranged upon the movable frame substantially as and for the purposes stated.

4. The combination with an envelope or other similar machine of a fixed frame A secured thereto and provided with a rotatable nut arranged in such manner that vertical movement thereof is prevented, a movable frame arranged in ways in the fixed frame and provided with a platen B, a screw C arranged in the movable frame and fixed in position, a ratchet wheel mounted upon the nut, a feed bar provided with a feed dog, a retaining dog arranged to prevent return movement of the ratchet wheel, a bell-crank-lever arranged to communicate motion to the feed bar, means to throw the feed dogs out of engagement with the ratchet teeth, a feeler arranged to bear upon the blanks upon the platen and connecting mechanism extending from the feeler to the bell-crank-lever, whereby the height of the platen may be regulated substantially as and for the purposes stated.

5. The combination of a fixed frame A having a rotatable nut mounted therein, a ratchet wheel fixed to the nut, a collar R mounted upon the nut and provided with pins *h* and *g*, a dog *f* pivotally mounted upon the feed-bar D and arranged to engage the teeth upon the ratchet wheel, a dog *d* arranged upon the fixed frame and adapted to engage said ratchet wheel, a push rod M pivotally attached at one end to the collar R and projecting through a suitable bearing in the fixed frame to a convenient position for manipulation, a movable frame mounted in ways in the fixed frame and having a screw C vertically arranged and fixed therein in suitable supports in such manner as to pass through the nut, and a platen mounted upon the movable frame substantially as and for the purposes stated.

6. The combination in an elevator for envelope and other like machines of a fixed frame provided with a nut free to rotate in either direction and retained from vertical movement, and having a rapid thread, means to prevent rotation of said nut in one direction, means to communicate motion to the nut to cause it to intermittently rotate in the opposite direction, a movable frame mounted in ways within the fixed frame and provided with a screw fixed therein and arranged to pass through said nut and provided with a thread of rapid gain whereby the weight of the movable frame will cause it to descend by gravity, and rotate the nut when free substantially as and for the purposes stated.

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Witnesses:

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