2 Sheets—Sheet 1

D. M. LESTER.
Envelope-Machine.

No. 221,835. Patented Nov. 18, 1879.

Fig. 1.

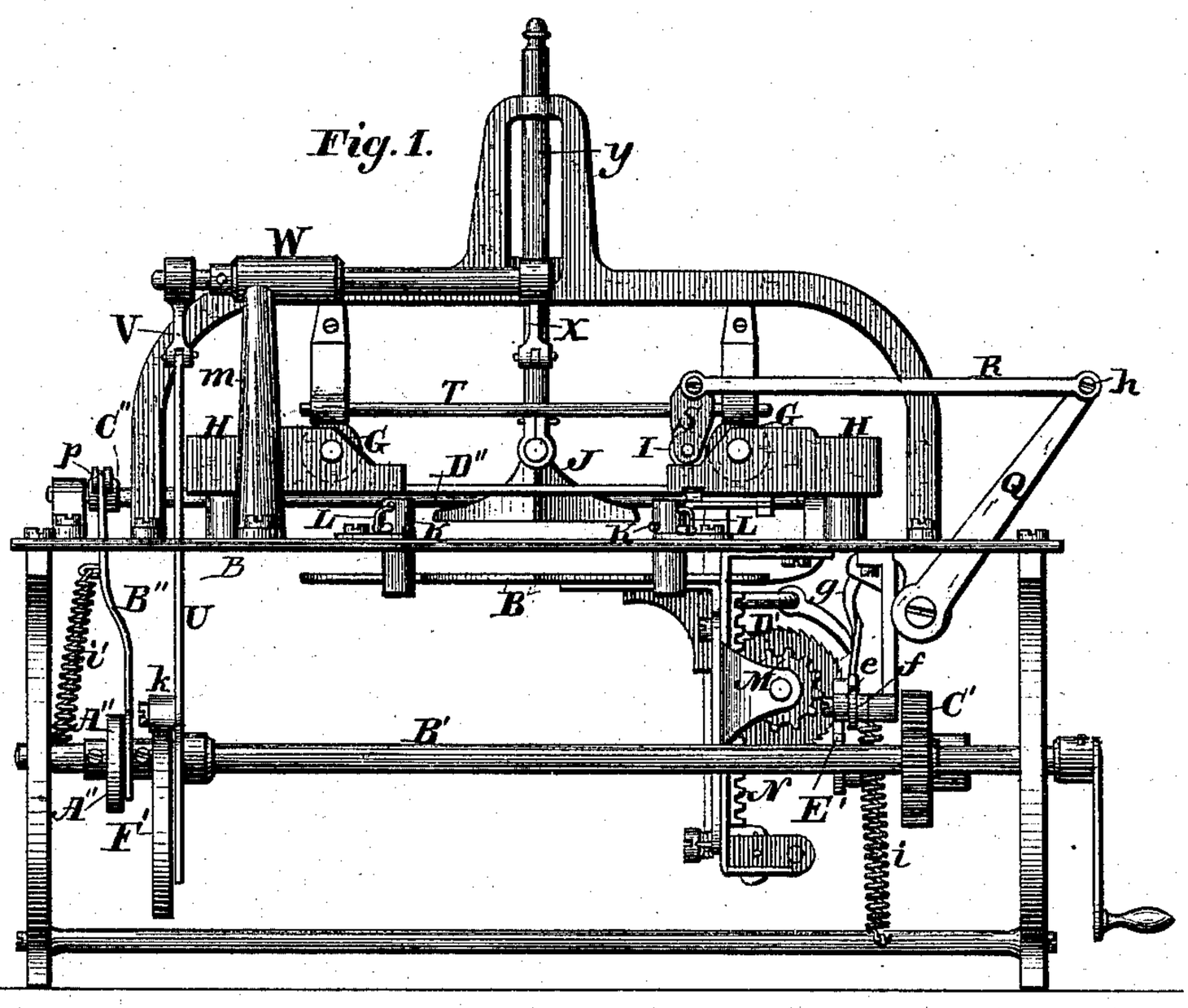
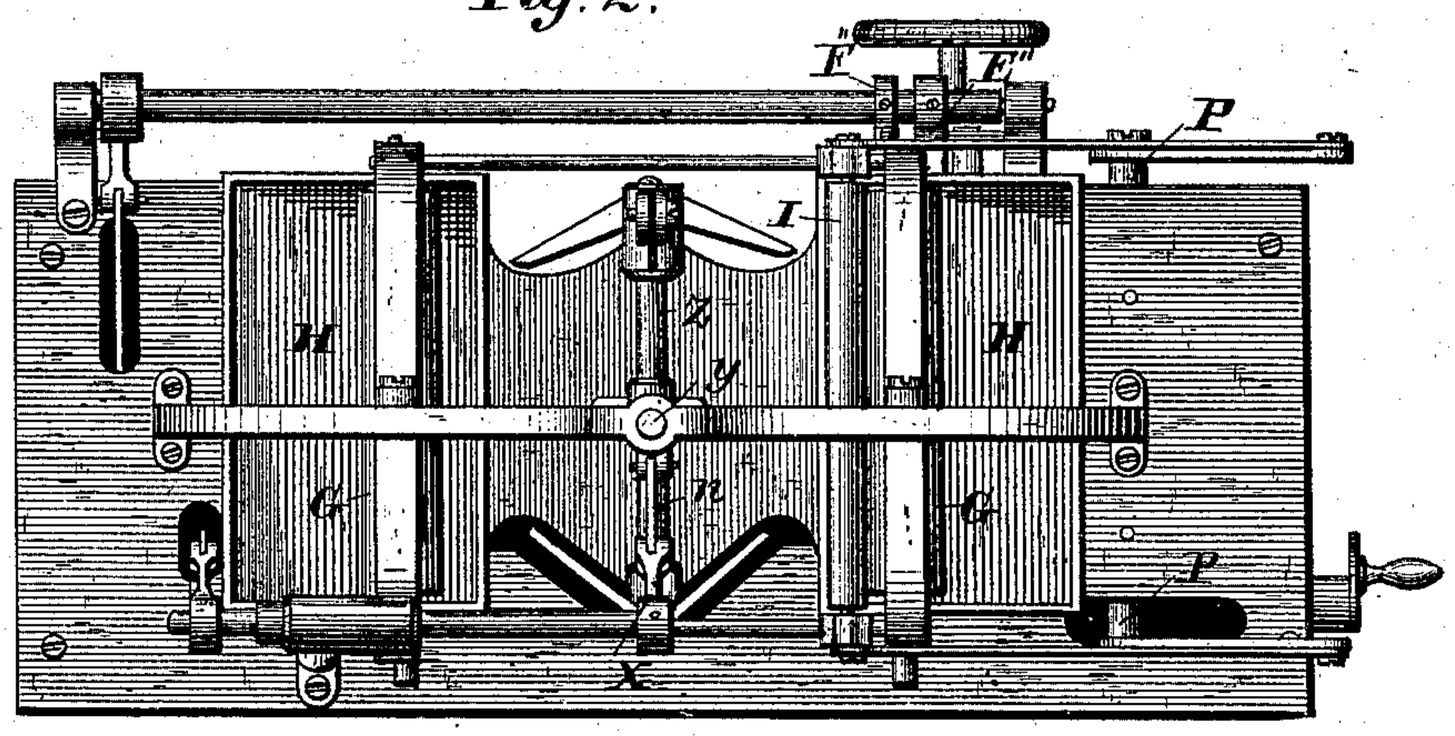


Fig. 2.



Attest:

William Courtenay

William L. Longdon.

Inventor:

Daniel M. Lester.

2 Sheets—Sheet 2.

D. M. LESTER.
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Fig. 3.

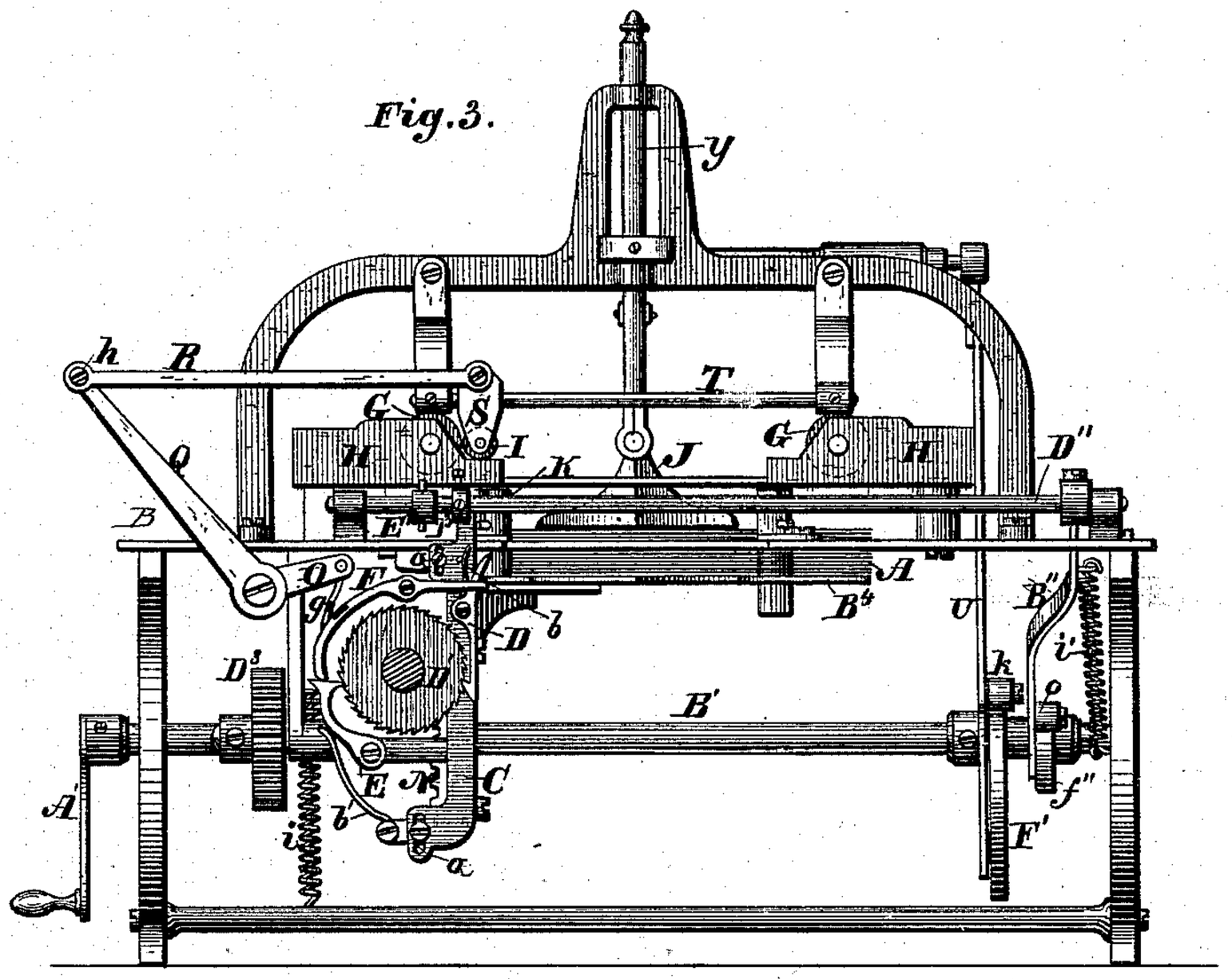

Fig. 4.

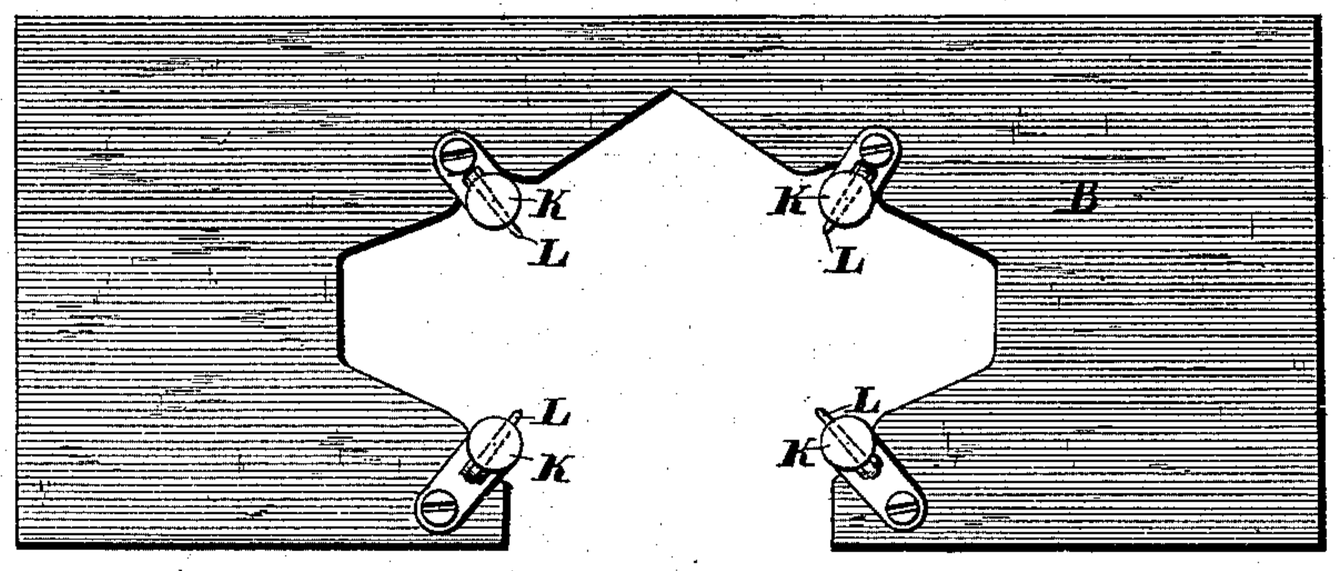

Fig. 5

Fig. 6.

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William Courtlan

William S. Longdon

Inventor:

Daniel M. Lester

UNITED STATES PATENT OFFICE.

DANIEL M. LESTER, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN ENVELOPE-MACHINES.

Specification forming part of Letters Patent No. **221,835**, dated November 18, 1879; application filed September 15, 1879.

To all whom it may concern:

Be it known that I, DANIEL M. LESTER, of Norwich, in the county of New London and State of Connecticut, have invented new and useful Improvements in Envelope-Machines, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

My invention relates to that class of envelope-machines in which the envelope-blanks are placed upon a platform underneath a gummer, which picks up a blank at the same time that it gums its sealed flap, and, after holding it up long enough to allow the proper removing mechanism to pass under it, delivers it to said removing mechanism; and my said invention consists, first, in a novel arrangement of the gum-boxes, from which the gum is carried automatically by a moving roller to the gummer; and, second, in a new and improved construction of the pressure-fingers, which rest upon the file of blanks and prevent more than one being picked up at each upward movement of the gummer; finally and lastly, my invention consists in an automatic upward feed motion of the elevator or bed upon which the blanks rest, so that the gummer not only has to pass always through the same space downward to meet the blanks, but also presses downwardly through the blanks upon the elevator itself.

In the accompanying drawings, which form a part of this specification, and in which like letters designate like parts, Figure 1 is a side vertical view. Fig. 2 is a plan view, looking down upon the machine from above. Fig. 3 is a vertical view from the opposite side from Fig. 1. Fig. 4 is the platform or upper frame of the machine proper, with the opening through which the envelope-blank elevator or bed rises and falls, and showing the pressure-fingers. Fig. 5 is a side exterior view of the post and pressure-finger; and Fig. 6 is a sectional view of the finger and post.

A represents the pile of envelope-blanks to be gummed upon their "seal-flaps," so called. B, the upper platform of the machine; C, an upright frame or bar moving automatically in slots *a a*, through mechanism to be hereinafter described, and carrying the pawl D, which at each upward movement of the bar rotates the rack-wheel D′. E is a pawl, which prevents any backward movement of rack-wheel D′ while the motor-pawl D goes downward to take a new bite. F is a lever by which the pawl E is released and the elevator or bed B^4 allowed to drop to receive a fresh pile of blanks. *b* is the spring to keep pawl D engaged with a rack-wheel, E; *b′*, the spring which keeps pawl E in engagement with said wheel E. G G are the rollers, journaled upon the gum-boxes H H, which serve to convey gum to the roller I, which reciprocates and touches first the one and then the other, and during its passage passes under the edges of the gummer J, leaving upon it a supply of gum for gumming and lifting the blank. K K K K are the four posts which confine and guide the upper part of the pile of blanks, and in each one works in a slot the fingers L, which, by gravity, hold down the upper blank until the gummer picks it up. M is the gear-wheel, which is upon the same rotating shaft as and operated by the rack-wheel D′. N is a vertical rack attached to the blank elevator or bed, and operated by the gear-wheel M. A′ is a crank, and used merely to represent any proper power applied at that point to the shaft B′, running lengthwise of the machine.

C′, Fig. 1, is a small gear-wheel carried by shaft B′, and this meshes into a wheel, D^3, upon a short shaft parallel to B′. D^3 only appears in Fig. 3, where it shuts off entirely the view of C′.

In Fig. 1 C′ only is shown, D^3 being located immediately in its rear. It carries, by its short shaft, a cam, E′, which strikes against a roller, *e*, upon a short horizontally-lying arm, one end only of which is seen at *f*. This arm *f*, through a curved link, *g*, (shown in Fig. 1, and also Fig. 3,) moves another short arm, O, Fig. 3, which rocks a shaft, P P. (Shown in Fig. 2.) The shaft P P carries at either end an arm, Q—one shown in Fig. 1, and one in Fig. 3. The arms Q Q carry each a horizontal arm, R, pivoted thereto at *h*. The outer extremities of each horizontal arm R carry a guide-block, S, which passes backward and forward upon guide-rods T T. At lower ends of guide-blocks S, and journaled therein, is the gummer-roller I, mentioned above.

i is a spring to keep the short arm *f* and its

roller *e* upon the surface of its operating-cam E′. The parts thus far are those used to reciprocate the gummer-roller.

The before-mentioned shaft B′, at its end opposite the movements just above described, carries a cam, F′, upon which rides a friction-roll, K, on connecting-rod U, which crank is slotted at the bottom end for passage of shaft B′ and to allow the necessary vertical motion.

The crank U is pivoted to a short arm, V, attached to a rock-shaft, W, journaled in an upright, M. At the opposite end of shaft W is also a rocking arm, X, pivoted to a short arm or connecting-link, *n*, (seen in Fig. 2,) which connects it with the upright post Y of the gummer. The link *n* is seen only in Fig. 2 of drawings.

The upright Y of the gummer is rigidly attached to a cross-bar, Z, which carries the angular gummer J, before mentioned.

This second part of the description of the figures relates merely to the mechanism for imparting an up-and-down motion to the gummer.

On the horizontal shaft B′ is a second motor-cam, A″, which works against a roller, *o*, Fig. 3, on an arm, B″, which is held downward by a coil-spring, *i*′. This arm B″ is pivoted at *p*, Fig. 1, to a short rocking arm, C″, attached to a rock-shaft, D″, which rock-shaft carries another short rigidly-attached arm, E″, Fig. 2, which lifts the plate C, and thereby rotates the rack-wheel D′. Another short arm, F″, Fig. 2, located on shaft B′, near said arm E″, forces down the said plate C, with its pawl D, to take a new bite on the rack-wheel D′.

The pawl E, as hereinbefore set forth, holds the rack-wheel from slipping backward while pawl D is passing down over the teeth. The wheel M, meshing in rack N at every movement upward of pawl D, feeds upward the elevator or blank bed.

The above describes the figures illustrating the mechanism for automatically feeding upward the elevator-bed.

Figs. 5 and 6 show a rigid finger bent on itself approximately at right angles. It is pivoted in the rear of the post K, and its upper or horizontal portion moves freely in a slot, G^2.

The mode of operation of this gummer is readily understood from the above.

It is to be understood that the three improvements mentioned above can be applied and used in any of the well-known envelope-machines.

Inasmuch as my said improvements do not at all relate to or modify the usual endless aprons to carry off each blank after the "seal-flap," so called, is gummed, these parts and the driers and various other parts are not shown in the drawings. They are left out so as to give clearer illustrations of my improvements than could be well done if the figures were crowded with all the other and well-known parts of any well-known machine to which it could be applied.

In regard to my first improvement, it will be seen that I have two gum-boxes, one each side of the gummer, and that while the gummer is elevated the roller passes under and supplies it with gum from one of the boxes. On the return of this gummer-roller I it also carries gum from the second box of gum, located upon the opposite side of the gummer from the first-mentioned box. By this means I can reduce the speed of the gumming-roller while moving the other parts of the machine at full speed. I thus give it more time to sweep across face of the gummers, and reduce the chances of throwing and wasting the gum.

Of course, with usual speed of gumming-rollers I could greatly increase the speed of the machine generally, for the gumming-roller has to pass only once across the bed of blanks, instead of twice, as in all other machines with which I am acquainted.

The rollers G G distribute the gum upon the gumming-roller proper, I. The usual scraper, or "doctor," as it is called, is not shown, as it is of usual form and application.

After each envelope is gummed and picked up on the angular gummer J it is deposited in any of the usual ways upon any well-known form of carrier to be removed for folding and drying. When the inner point of the finger L is raised by a blank as the gummer J picks it up, it is carried inward and upward to the inner edge of the post, moving in a rectangular slot, G^2. As the blank passes this finger-point just at the face of the post, the said finger is in readiness to fall upon and secure the next blank, should it chance to be escaping.

In most of the machines with which I, as a manufacturer of envelope-machines, am acquainted the finger is carried up perpendicularly until there is room enough for the blank to wrinkle and pass from under said fingers. In such cases, owing to the unequal thickness of the paper or of the gum, it frequently happens that the fingers, on account of the weight, pull blanks off the gummer and lose or skip a blank that ought to have been picked up. This at times, and with certain kinds of paper, is very troublesome.

I overcome these well-known objections, as my fingers fall back and let the blank pass without wrinkling. At the same time my said fingers are in a position to fall upon and hold back any blank which may have started underneath the gummed one.

By my automatically upward-fed elevator or bed B^4, the gummer J, in its descent to the pile, does not have to make half the distance as in the ordinary machines. The gummer, therefore, can be given a much steadier and easier movement, and at the same time the speed of the machine can be greatly increased.

I am well aware that a vibrating blade has been arranged to constitute a divider for the envelopes and a resistance-plate for the gummer, said dividing-blade lifting up to the gummer a few blanks and taking the pressure of the gummer. This, however, in practice I find

not so reliable and convenient as to have the entire elevator or bed carry up the blanks at each revolution of the machine. This is simpler, easier, and more reliable. Much less complication of parts is necessary, and the same liability to skip blanks does not occur. At any rate, my automatically-elevated bed proper is substantially different from the vibrating dividing-arm alluded to, which I hereby fully disclaim. For my substantially different device I have a clearly-defined purpose of utility, as above set forth.

I am well aware that double paste boxes and rollers are not, broadly, new in machines, nor do I claim such. I am, however, the first to combine double gum boxes and rollers with the vertically-reciprocating gummer of an envelope-machine, and the horizontally-moving roller, its arms, and guide-rods, and can thus, other things being equal, get greater speed, with less throwing of gum.

It will be thus seen from the above that at each revolution of the main shaft the elevator-bed, through intermediate mechanism, is fed upward to take the whole pressure of the gummer and lessen materially the distance through which it must pass; a single horizontal movement, and not two, gums the gummer properly; and that, with the greatly-increased speed which these two devices give me, I secure a more sure delivery of the blanks without skipping any.

I am well aware, also, that it is not, broadly, new to feed up paper by a reciprocating bed or table so that the sheets may be picked up, and I disclaim such a device, it being shown in a patent already granted for feeding paper to printing-presses. I am not aware, however, that any one has utilized and adapted this old automatically-fed-up table for use with gummers which not only pick up but gum the envelopes at one and the same operation, nor has the bed been regularly and positively elevated by a rack and gear-wheel, as in my machine.

What I therefore claim as new and of my invention is—

1. In combination with the vertically-reciprocating gummer of an envelope-machine and its gumming-roller passing backward and forward over its face upon guides, the duplicate gum-boxes and supply-rollers, whereby a single movement of the gumming-roller in either direction gathers a supply from either box alternately and places it upon the gummer, substantially as and for the purposes described.

2. In a machine picking up and gumming envelopes, the combination of the bed or elevator, automatically fed up, with its entire pile of blanks, by the pendent rack and meshing gear-wheel at each revolution of the machine, with the vertically-reciprocating gummer, which picks up and gums the envelope at one operation, all as and for the purposes set forth.

3. In combination with the corner guide-posts for the pile of blanks, the fingers pivoted to the rear of said posts and bent at about right angles to pass through a slot in said posts and rest with their front ends upon the blanks, all as and for the purposes set forth.

DANIEL M. LESTER.

Witnesses:

ALLEN TENNY,

A. H. HARRIS.