

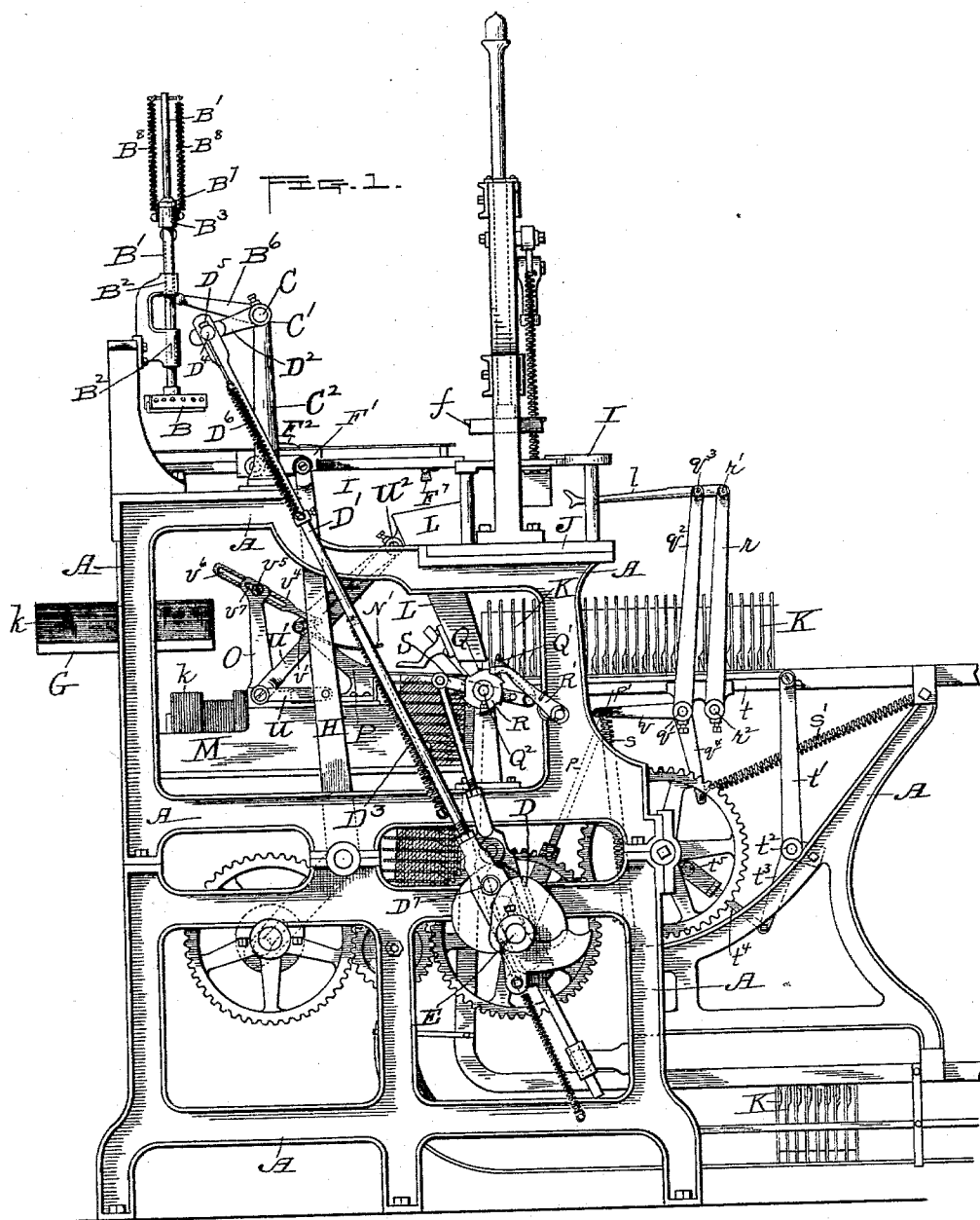
(No Model.)

5 Sheets—Sheet 1.

A. A. RHEUTAN.
ENVELOP MACHINE.

No. 584,064.

Patented June 8, 1897.



Witnesses;

Walter B. Nourse,
C. Forrest Pearson

Inventor;

Abram A. Rheutan.
By A. A. Barker. Atty.

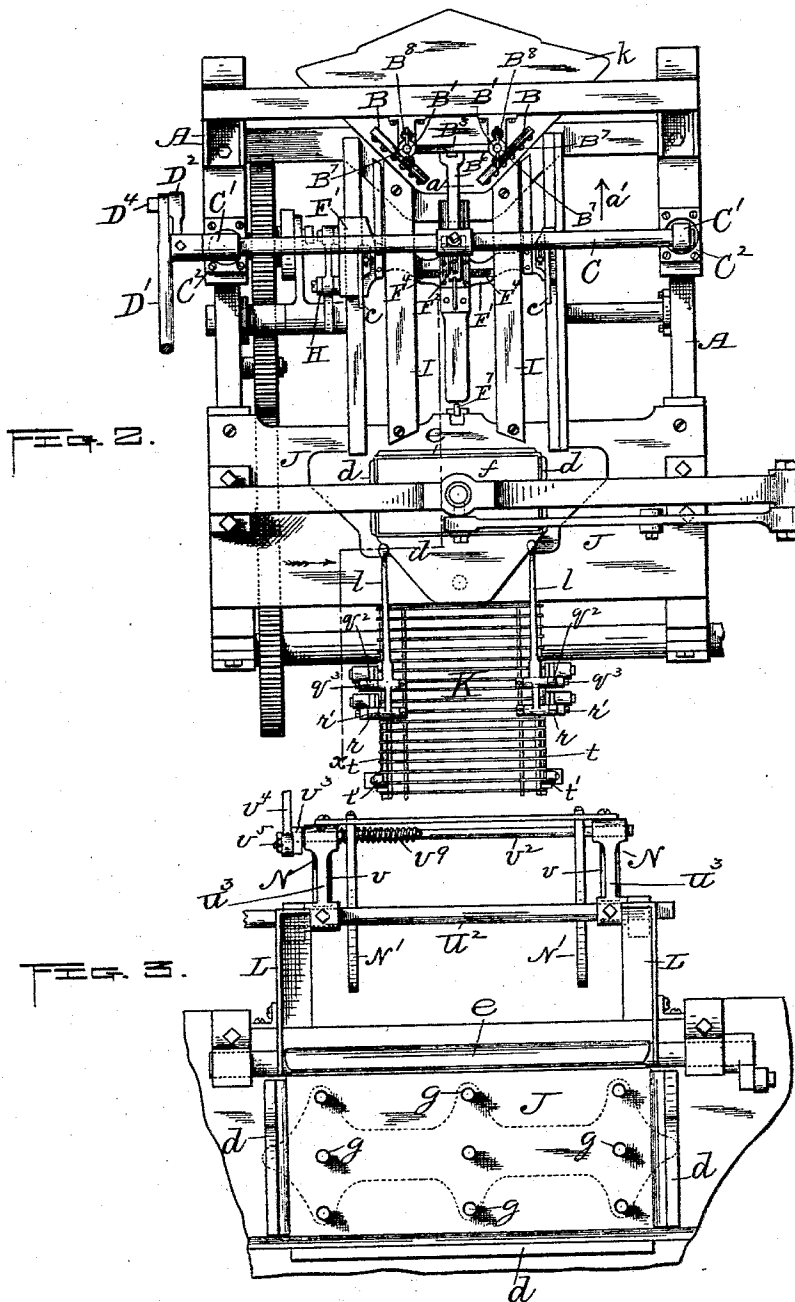
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WATERBURY

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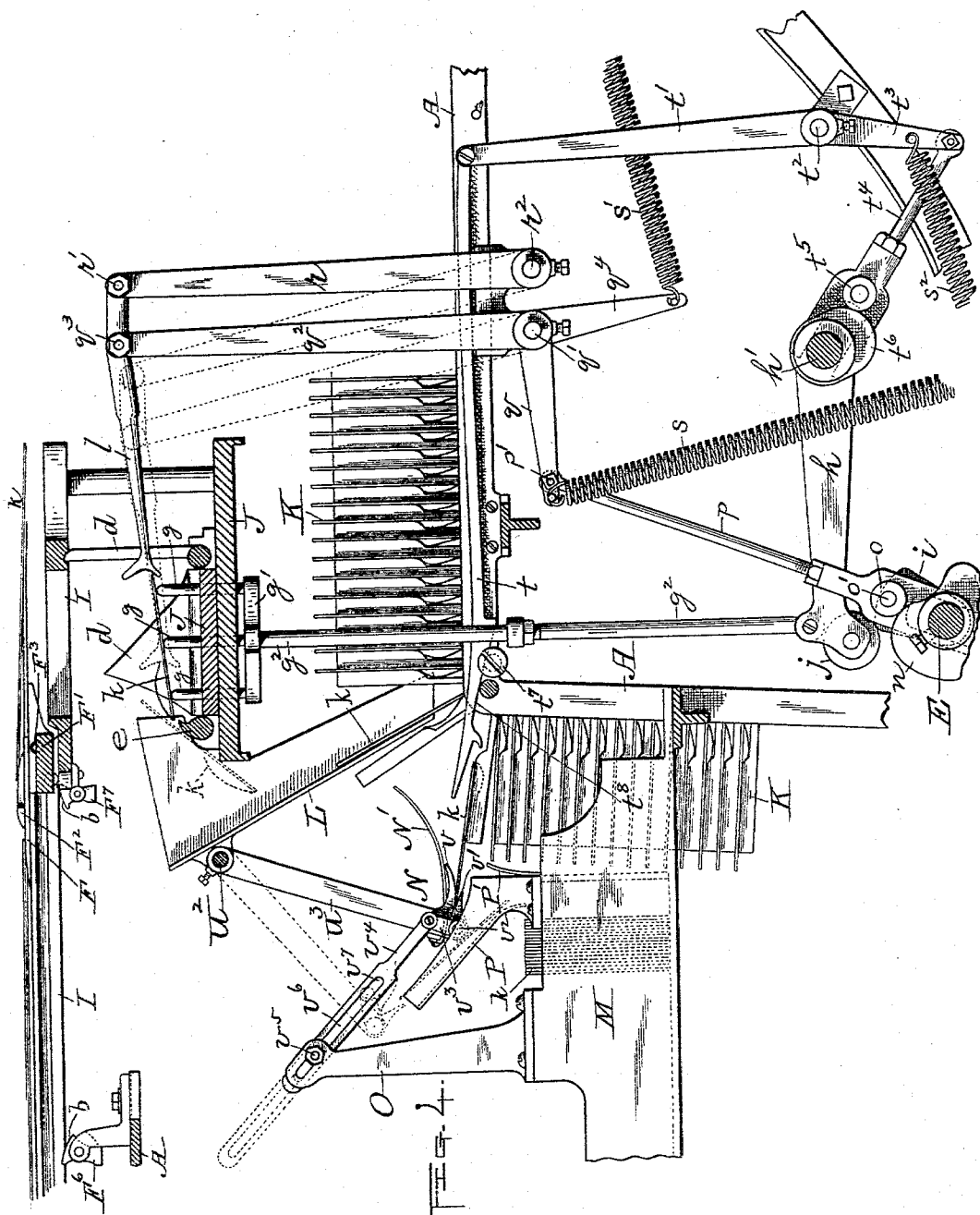
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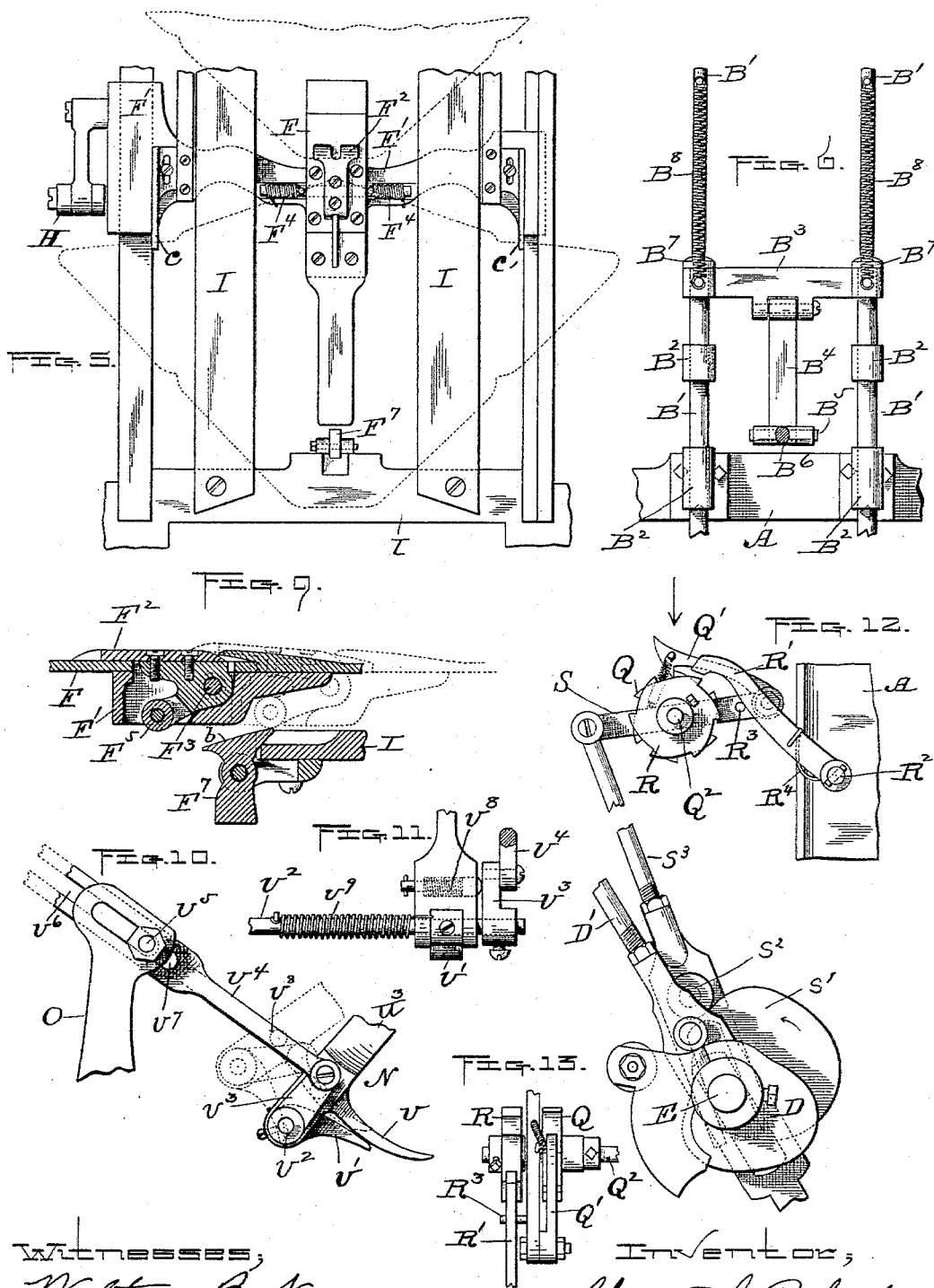
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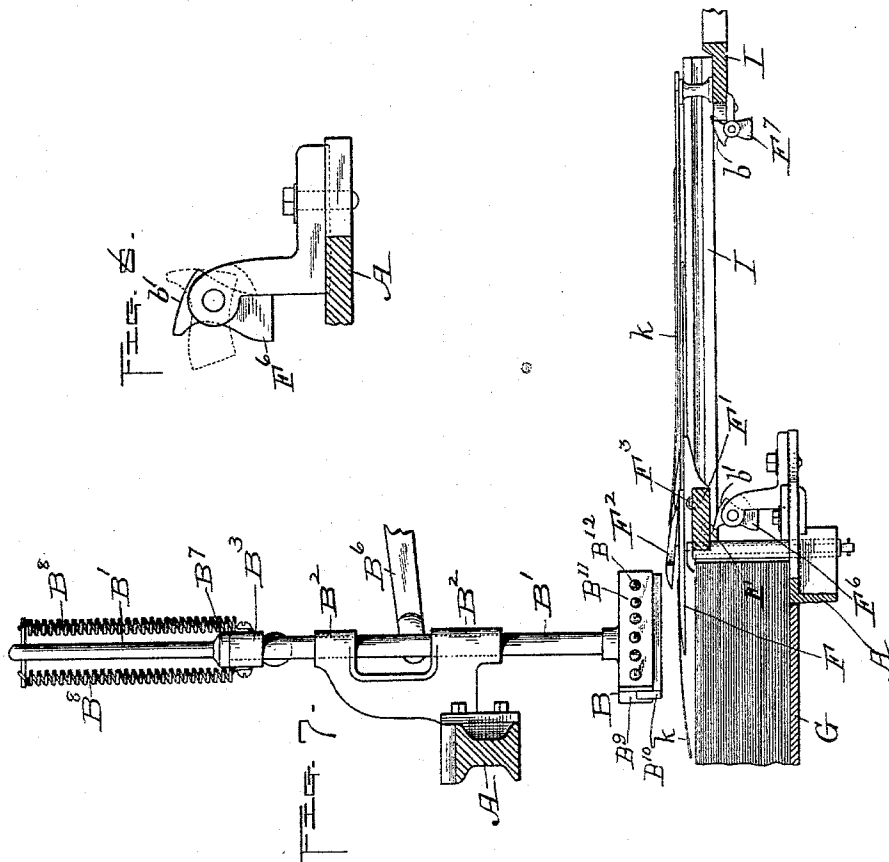
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WITNESSES,
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UNITED STATES PATENT OFFICE.

ABRAM A. RHEUTAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO THE W. H. HILL ENVELOPE COMPANY, OF SAME PLACE.

ENVELOP-MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,064, dated June 8, 1897.

Application filed February 3, 1896. Serial No 577,801. (No model.)

To all whom it may concern:

Be it known that I, ABRAM A. RHEUTAN, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Envelop-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a side view of so much of an envelop-machine as is necessary to illustrate my improvements. Fig. 2 is a top or plan view of the parts shown in Fig. 1. Fig. 3 represents, upon an enlarged scale, a plan of the folding-table and folders of the machine; also of part of the mechanism for guiding the envelops to the drying-chain and for gripping and conveying them from said chain to the counting-box. All the following figures are upon the same enlarged scale except figures 9 to 13, inclusive, which are upon a still larger scale. Fig. 4 is a vertical longitudinal section through part of the machine, taken at the point indicated by line *x*, Fig. 2, showing the mechanism for folding the envelops, for discharging the folded envelops from the folding-table and conveying the same to the drying-chain, and for discharging said envelops from said drying-chain and conveying and discharging them into the counting-box, said view also showing part of the mechanism for conveying the blanks to the folders, as will be hereinafter more fully specified. Fig. 5 is a plan of the guideways and carriage for supporting, guiding, and conveying the blanks to the folders. Fig. 6 represents a vertical section taken at the point indicated by line *a* in Fig. 2, looking in the direction of arrow *a'* and showing a side view of the upper part of the mechanism for elevating and lowering the gumming-heads shown in Figs. 1, 2 and 7. Fig. 7 is a vertical longitudinal section through part of the blank, supporting-table or carrier, and through the end frames of the blank-guideway between the gumming and folding mechanisms, with part of a pile of envelop-blanks on said table or carrier, said view also showing a side view of the parts shown in Fig. 6 and of the blank gripping and conveying mechanism arranged between

said gumming and folding mechanism. Fig. 8 is a detail view of one of the tilting levers of the blank gripping and conveying mechanism above referred to. Fig. 9 is a vertical longitudinal section through part of the guideway-frame, the blank-gripper, and the tilting lever at the opposite end of said conveying mechanism from the tilting lever shown in Fig. 8. Fig. 10 is a side view of part of the mechanism shown in Figs. 1 and 4 for gripping the finished envelops as they are pushed forward from the drying-chain and for conveying and discharging them into the guideway leading to the counting-box, as will be hereinafter described. Fig. 11 is a plan of part of said mechanism shown in Fig. 10. Fig. 12 is a side view of the mechanism for operating the drying-chain, a portion of the cams and levers for operating the gumming mechanism also being shown in this figure. Fig. 13 is a plan of part of said drying-chain shaft, its operating-levers, ratchet-wheel, pawl, and lock device, looking down, as indicated by the arrow in Fig. 12.

The object of my invention is to simplify the construction of an envelop-machine and to obtain as compact an arrangement of the parts as possible consistent with an easy and effective operation of said parts; and it consists of certain improvements in the construction and arrangement of those portions of said envelop-machine previously alluded to, and which will be hereinafter more fully set forth.

To enable those skilled in the art to which my invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

My invention relates more especially to improvements in the mechanism for elevating and lowering the gumming-heads, for gripping and conveying the envelop-blanks to the folding-table and folders, for discharging the folded envelops from said folding-table and folders and conveying the same to the drying-chain, and for discharging the finished envelops from said drying-chain and conveying them to the counting-box. The description will therefore be confined to said parts and so much of the old construction of an envelop-machine as will be necessary to make

clear my said improvements in connection therewith.

The gumming of the back flaps is performed by means of two separate gumming-heads B B, which are arranged diagonally to conform to the shape of the envelop, as is shown in Fig. 2, and mounted on the lower ends of vertical rods B' B', fitted to slide in suitable stationary bearings B² B². Said rods are connected near their upper ends by a cross-bar B³, to which is pivoted the outer end of a link B⁴, (see Fig. 6,) whose lower end is in turn pivoted by means of a transverse pin B⁵ to the outer end of a crank-lever B⁶, secured at its opposite end to a horizontal transverse shaft C, fitted to turn in stationary bearings C' C' in the upper ends of standards C² C², secured to main frame A. Said gumming-heads B B each consist of a holding-block B⁹, the rubber or other elastic strip B¹⁰, fitted in a groove in said block and projecting a little below the bottom thereof, and the holding-plate B¹¹, fitted against the side of the block and elastic strip and fastened by means of screws B¹² or otherwise to hold said elastic strip in place, as is shown in Fig. 7.

The vertical rods B' B' are provided with fixed collars B⁷ B⁷ above the ends of the cross-bar B³, which rest upon said cross-bar to support the rods and their gumming-heads. Said rods are also each provided with the usual springs B⁸ B⁸, secured at their upper ends to the upper ends of the rods and at their lower ends to the ends of the cross-bar for exerting a downward yielding pressure upon said rods.

The shaft C is rocked in its bearings to intermittently raise and lower the gumming-heads by a cam D on shaft E through the long connecting-rod D' and crank-lever D², the lower end of said connecting-lever D' being provided with a friction-roll D⁷, which engages with the periphery of said cam D. The upper end of rod D' is pivoted to the outer end of the crank-lever D², and said crank-lever is secured to the outer end of transverse shaft C. A longitudinal pressure is exerted upon the connecting-rod D' toward its operating-cam to keep its friction-roll in engagement with the periphery of the cam, as is shown in Figs. 1 and 12, by means of a spiral spring D³, secured at one end to said connecting-rod and at its opposite end to frame A, and a yielding power is also obtained between the crank-lever D² and the connecting-rod D' by providing the outer end of said crank-lever with a lateral stud D⁴, which fits in a suitable slot D⁵, formed in the end of the connecting-rod, to which stud one end of a spiral spring D⁶ is secured, while its other end is fastened to said connecting-rod, as is shown in Fig. 1 of the drawings. The object of said yielding power is to provide for any inequality in the pile of envelop-blanks which may exist, and thus remove any injury to the operating parts that might occur if the parts were all made rigid. The

adoption of two separate gumming-heads B B instead of making said two heads in one integral part, as is commonly the case, is of especial advantage, since it admits of their being more readily and accurately adjusted to any inequality in the height or level of the pile of envelop-blanks, each half being susceptible of adjustment independent of the other by thus mounting the same on separate and independently-operating supporting-rods, as previously described. When the back edge of each envelop-blank is lifted by said gumming-heads B B after the gumming operation, said edge is gripped between a plate F, secured to carriage F', and a gripping-jaw F², pivoted at F³ to said carriage F', and which passes in between said gumming-heads B B in operation. The normal position of said gripper is when it is down flat against the plate F or upon the edge of an envelop-blank between the two, and it is thus held by torsion-springs F⁴ F⁴, (see Figs. 5 and 9,) fitted over the pivot-spindle F³ of the gripping-jaw F² and adapted to exert a yielding rotary pressure thereon to hold said gripping-jaw down, as aforesaid, one end of each torsion-spring being fastened to said pivot-spindle F³ and their other ends being adapted to bear and hold against the carriage F', as is shown in Fig. 5. The gripper is opened at stated intervals to receive the edge of the envelop-blank and to release the same by the forward and back reciprocating movements of carriage F' between the gummers and the folders, said reciprocating movements causing a friction-roll F⁵, mounted on an arm extending down under the gripper, to engage with a balanced tilting lever F⁶, mounted on an arm extending up from a projection on the main frame A, and with a similar balanced tilting lever F⁷, mounted on a projection on table I at the opposite end from said tilting lever F⁶.

The carriage, it will be understood, is moved forward and back continuously with reciprocating movements by the usual operating-lever H to convey the gummed envelop-blanks to the table I under the plunger *f*. Assuming that a blank has been conveyed under said plunger *f* by the carriage, its gripper, and fingers *c c* and said carriage is returning for the next blank with the gripper closed, as is shown in Fig. 9, when the friction-roll F⁵ comes in contact with the top inclined surface *b'* of the tilting lever F⁶ said gripper is opened and passes over the edge of the blank, as is shown in Fig. 7, and immediately on passing by said tilting lever (by the continued forward movement of the carriage) again closes and grips the edge of the envelop between the same and the plate F. The movement of the carriage now reversing, the blank is drawn forward toward the plunger *f* over the usual guideways on bed or table I, and when the friction-roll engages with the other tilting lever F⁷ said gripper is again opened and releases the blank. The carriage continuing to move forward carries the end of the grip-

per beyond the blank thus released, when it is closed again by the friction-roll F^5 passing over in contact with and beyond the highest point of the tilting lever F^7 . Said carriage then reversing causes the gripper to be passed under said blank, leaving the latter on the guideway, the lever F^7 tipping over to permit the free passage of the gripper and then swinging back into its original position, as in the former instance. The next gummed blank is then gripped, drawn forward into the same position and released, and at the same time that said blank is gripped the pusher-fingers $c\ c$ (one at each side of the carriage) engage with the edge of the blank previously conveyed forward, as is indicated in Fig. 5, and push it in advance of the following blank over onto the table I under the plunger f .

The gummed blanks having been forced down by the plunger f onto the folding-bed J and folded by the folders d, d, d , and e in the usual way, they are each successively, as fast as folded, pushed from said folding-bed J and conveyed to the drying-chain K by mechanism constructed and arranged to operate as follows:

The folding-bed J is provided with a series of vertical openings, nine in this instance, in which vertical pins g are fitted to work up and down, said pins being mounted in a head g' , fastened to the upper end of a vertical rod g^2 , which is pivoted at its bottom end to a horizontal lever h , in turn pivoted at the opposite end from rod g^2 to a horizontal transverse shaft h' or other stationary bearing. The free end of said lever h is raised by a cam i on the horizontal transverse rotary shaft E and drops, when the cam-pressure is released, by force of gravity. A roll j may be mounted upon the end of lever h for the cam to impinge against to reduce friction of the parts. The purpose of said vertical fingers g and their operating mechanism is to raise the envelopes k , after they have been folded, above the folding-bed J , as is illustrated in Fig. 4, to bring them in line with the forked pushers $l\ l$, so that the latter may push them forward edgewise over the front folder e far enough for them to tip over and slide down the guideway L into the drying-chain K , as is also indicated in Fig. 4.

The vertical rod g^2 , it will be understood, is operated with intermittent vertical movements to raise and lower the pins g in unison with the folding operation—that is, they are allowed to drop so that their upper ends will come at or below the level of the top of the folding-table, before the envelop-blank is deposited thereon, and moved up to raise the envelop, immediately after it is folded, preparatory to being pushed forward by the forked pushers $l\ l$, as previously described.

To facilitate the downward slide movements of the envelopes when pushed forward as aforesaid by the forked pushers $l\ l$, the tops of the pins g , upon which said envelopes rest, are preferably arranged at an incline to

the top of the folding-table by varying the lengths thereof to obtain a downward incline toward the front folder, as is shown in Fig. 70

4. Therefore, since said forked pushers are moved forward with quick movements, when they strike the back edges of the envelopes the latter are carried forward also with a quick movement, and the impetus imparted thereto causes them to be carried and tipped over from the front folder and folding-bed into the guideway L , down which they slide with the front flap underneath, or in a reversed position to that which they occupied when resting on the tops of the pins g . Said guideway consists of two angle-plates, one at each side of the envelopes, with a space between them, and they slant inward toward the center of the machine, so that their inner ends, where the envelopes pass therefrom into the drying-chain, come about under the center of the folding-table. By this arrangement it is obvious that I am enabled to greatly economize in space in the construction of the machine over the usual constructions adopted in other machines. I am also enabled to dispense with the close chute usually employed for guiding the envelopes to the drying-chain, in this instance only the angle-plates at each side of the envelopes being necessary to properly guide the envelopes to said drying-chain.

The forked pushers $l\ l$ are moved horizontally and longitudinally by a cam n on the same shaft E that the cam i is secured to and by the spiral springs $s\ s'$, said springs causing said forked pushers to be moved forward toward the envelopes to push them forward and the cam causing them to be moved back again preparatory to pushing the next envelop forward, connection between cam i and the forked pushers being made through the friction-roll o , connecting-rod p , pivot-pin p' , crank-lever q , horizontal transverse rock-shaft q' , and crank-levers $q^2\ q^2$. The roll o is mounted on a stud o' on the lower end of connecting-rod p , and the periphery of cam n engages therewith to impart the desired movements to the rod p and parts connected therewith. Spring s connects with the end of crank-lever q , and s' with crank-lever q^4 , also on shaft q' , the other ends of both springs being in practice secured to some stationary part of the machine. If desired, the crank-lever q^4 and its spring s' may be dispensed with.

The rod p is pivoted to shaft E by its lower end being made fork-shaped and fitted over said shaft, as is indicated by dotted lines in Fig. 4, and at its upper end to the pin p' . The outer end of crank-lever q is pivoted to rod p and its inner end is secured to rock-shaft q' . The crank-levers $q^2\ q^2$ are likewise secured at their bottom ends to said rock-shaft q' and are pivoted at their upper ends to the forked pushers $l\ l$ at $q^3\ q^3$. In order that said forked pushers $l\ l$ shall be moved horizontally in line with the envelopes resting on the supporting-fingers g , they are double

pivoted at their base ends not only to the levers $q^2 q^2$ at $q^2 q^2$, but also at $r' r'$ to the levers $r r$. Said levers $r r$ are attached at their lower ends to a horizontal transverse shaft r^2 , each pair of levers q^2 and r being arranged substantially parallel to each other, as is shown in Fig. 4, when the parts are fitted for operation.

By the above construction and arrangement it is obvious that when the upper ends of levers $q^2 q^2$ are moved forward and back by the action of springs $s s'$ and cam n both sets of levers $q^2 q^2$ and $r r$ moving together cause the forked pressers to be moved forward and back always in the same horizontal line with the envelopes. Said envelopes after having been carried around in the drying-chain to be dried, as usual, are pushed from said drying-chain and conveyed to and discharged into the counting-box M in the following manner:

Two forked pushers $t t$, similar to but longer than the forked pushers $l l$, previously described, are pivoted at their base ends to the upper ends of the crank-levers $t' t'$, which are in turn secured at their lower ends to the horizontal transverse rock-shaft t^2 . To said shaft is also secured the upper end of a crank-lever t^3 , to whose lower end is pivoted one end of a connecting-rod t^4 , which is fork-shaped at its opposite end and pivoted to the same shaft h' that the lever h is pivoted to. Said connecting-rod t^4 is provided with a friction-roll t^5 , with which the periphery of a cam t^6 on shaft h' engages, similar to the rod, roll, and cam employed for operating the other forked pushers $l l$, previously described. The action of said cam t^6 is to move the forked pushers $t t$ forward. They are moved back again when said cam-pressure is released by a spring s^2 , attached to the crank-lever t^3 . The forward ends of the forked pushers $t t$ rest on horizontal transverse supporting-studs $t^7 t^7$, and said forked pushers are beveled on their under sides, as is indicated at t^8 in Fig. 4, so that when they are moved forward over said studs t^7 their forward ends will be gradually elevated slightly to conform to the inclination of the blade in the drying-chain coming at that point and with the incline at which the envelopes should be pushed forward for the grippers N N to grasp the same and draw them forward over the counting-box M.

The mechanism for gripping the envelopes, conveying them forward, as aforesaid, and depositing them in the counting-box is constructed and arranged to operate as follows: Said mechanism is operated from the same lever H that is connected with the carriage F' for conveying the envelop-blanks to the folders. To said lever H is pivoted one end of a link u , (see Fig. 1,) whose opposite end is pivoted to the bottom end of a crank-lever u' , secured at its upper end to a horizontal transverse rock-shaft u^2 , fitted to turn in suitable bearings on the guideway L. To said rock-shaft u^2 are also secured the upper ends

of crank-levers $u^3 u^3$, having the gripping devices N N mounted on their lower ends. Said devices are moved forward and back toward and from the drying-chain by the rocking movements of the shaft u^2 , which oscillating movements also cause the grippers to be opened and closed to grip and release the envelopes, being closed immediately after the edges of the envelopes are received therein and remaining closed until the envelop is conveyed to the proper point over the counting-box, when they are opened and allow the same to drop into said counting-box. The upper jaws $v v$ of said gripping devices are formed upon or rigidly secured to the levers $u^3 u^3$, while the bottom jaws $v' v'$ thereof are secured to a horizontal transverse shaft v^2 , fitted to rock in the lower ends of the levers $u^3 u^3$. To one end of said rock-shaft is secured one end of a crank-lever v^3 , (see Figs. 4 and 10,) to whose opposite end is pivoted the end of a lever v^4 , fitted to swing and also to move longitudinally on a pivot-stud v^5 at the opposite end thereof, mounted in a stationary standard O, said lever v^4 being slotted longitudinally, as is shown at v^6 in Figs. 4 and 10, to admit of the aforesaid longitudinal movements thereof. The opening v^7 in the upper end of the standard O to receive the pivot-stud v^5 is also made oblong in shape or slotted in alinement with the slot v^6 to admit of the lateral adjustment of said pivot-stud v^5 . By thus slotting the lever v^4 it is permitted to move the length of its slot with the levers $u^3 u^3$ without moving the crank-levers v^3 and the bottom jaws $v' v'$, but when said lever v^4 strikes at one end or the other of its slot v^6 against the stud v^5 said jaws are opened or closed, according to which end comes in contact with said stud, and remain thus opened or closed until the lever strikes the stud at the opposite end of its slot, when the action is reversed—as, for example, assuming that the jaws are closed and moving forward with an envelop to convey it over the counting-box, they are opened again upon arriving at the proper point to release said envelop to allow it to drop into said counting-box, as is indicated by dotted lines in Fig. 4, by the lever v^4 striking against the pivot-stud v^5 at the inner end v^7 of its slot v^6 , said operation causing the crank-lever v^3 to be swung around to rock the shaft v^2 and swing down the bottom jaws $v' v'$ by the continued forward movement of the main crank-levers $u^3 u^3$, in which position they are held by a small spring-spindle v^8 , fitted in a suitable transverse opening in the lower end of one of said crank-levers u^3 and adapted to bear endwise against the side of the small crank-lever v^3 , as shown in Fig. 11. When the crank-levers $u^3 u^3$ return toward the center of the machine to get another envelop and the lever v^4 comes against stud v^5 at the opposite or outer end of slot v^6 , the crank-lever v^3 is moved in the opposite direction and the bottom jaws thereby closed to grip the envelop, the parts being so adjusted as

to thus close the gripper just after the envelop has been pushed from the drying-chain in between the jaws of said gripper. The bottom jaws are held closed against the upper ones v with sufficient power to prevent the envelop from being withdrawn in conveying the same to the counting-box by a torsion or other suitable spring v^9 , adapted to exert said pressure, and yet insufficient to move the crank-lever v^3 against the holding spring-spindle v^8 . When said lever v^3 is swung in either direction to its extreme limit to open or close the gripper N, the spring-spindle v^8 occupies a position to one side or the other of said crank-lever, as is indicated by dotted lines in Fig. 10, with its head bearing against the upper or under edge of the lever to better hold the same from a swinging movement, except when forcibly swung around by contact of lever v^4 with the pivot-stud v^5 , as previously described. To facilitate the above operation, said head of the spring-spindle v^8 may be slightly rounded, as is shown in Fig. 11.

If desired, the grippers N N may be provided with curved guards N', curving upward and inward therefrom toward the guideway L to prevent the envelops from accidentally passing over the grippers when pushed forward from the drying-chain; but as said guards are not an essential feature I reserve the right to use the same or not, as preferred.

When the envelops are released from the grippers N N, they drop into and slide down the guideway P into the counting-box, being guided at the front side in passing down by the guide-plate P'. (Shown in Fig. 4.) As said counting-box does not constitute a part of my invention it will be unnecessary to describe the same in detail.

The mechanism for operating the drying-chain with the usual intermittent movements (illustrated by Fig. 12 of the drawings) consists of the rock-lever S, mounted on the drying-chain shaft Q^2 and operated by a cam S' , friction-roll S^2 , and connecting-rod S^3 . Upon said shaft Q^2 are also mounted and fitted to turn therewith the ratchet-wheels Q R, which engage, respectively, with the pawls Q' and R', the pawl Q' being pivoted to the outer end of the rock-lever S and the pawl R' to frame A at R². The pawl Q' and the operating mechanism connected therewith turn the ratchet-wheel Q and through the shaft Q^2 , the drying-chain with the usual intermittent movements, and the pawl R' serves by its engagement with ratchet-wheel R to lock said parts from any forward movement which might occur from the momentum imparted thereto by the pawl Q and other parts in turning the same. When the outer end of rock-lever S is elevated to carry forward pawl Q', so as to engage with one of the notches of its ratchet-wheel, a pin R³ on said lever strikes and raises the pawl R' above the notches of its ratchet-wheel and is not again lowered sufficiently to engage therewith until just prior to the pawl

Q leaving the notch in its ratchet-wheel. By said time the supporting-pin R³ has been lowered the proper distance to permit said pawl R' to drop down in front of one of the notches of ratchet-wheel R, and thereby holds the parts locked until the pin R³ forces the same up again in the operation of moving the pawl Q forward to engage with the next notch of its ratchet-wheel to again turn the drying-chain.

By the foregoing construction and arrangement of the various improved parts of an envelop-machine it will at once be apparent to those skilled in the art to which my invention appertains that great compactness is obtained in the disposition of the operating parts without affecting the utility thereof, and by the application of said invention to practice I am enabled to produce envelops of a superior quality and with great rapidity.

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

1. The crank-lever H, having means connected therewith for swinging the same forward and back, stationary bed or table I, and carriage F', fitted to slide on said bed or table, and to which the upper end of said lever H is pivoted, in combination with the gripping-jaw F², the pivot-spindle F³, mounted in carriage F'; friction roll or bearing F⁵ mounted on the hub of said gripping-jaw; torsion-springs F⁴ F⁴, fitted over pivot-spindle F³, with one end of each fastened to said pivot-spindle, and their other ends bearing against the carriage F', for exerting a downward, yielding pressure to close said jaw, and tilting levers F⁶ F⁷, pivoted respectively to frame A and bed or table I, and adapted to engage with said friction roll or bearing F⁵, when the carriage is moved forward and back with reciprocating movements, substantially as and for the purpose set forth.

2. The folding-bed J, provided with a series of vertical openings and the main frame A of the machine, in combination with the vertical rod g^2 , having means connected therewith for operating the same, up and down, also having the head g' , with a series of pins g projecting up vertically therefrom of unequal lengths, so that their tops will form an inclined plane, said pins being adapted to fit in the openings, of folding-bed J and to lift and hold the envelops upon a downward incline, pitching toward the guideway L, preparatory to the forked pushers $l l$ pushing the same into said guideway and the drying-chain and said guideway, forked pushers and drying-chain, substantially as and for the purpose set forth.

3. The main frame A, of an envelop-machine, and the horizontal, transverse shaft E in combination with the cam n , secured to connecting-rod p , provided with the friction-roll adapted to engage with said cam, crank-lever q , pivoted at its outer end to the upper end of rod p , and secured at its other end to the horizontal, transverse shaft q' , said shaft

q' fitted to rock in stationary bearings; means for imparting a constant, yielding power to force the rod p and lever q toward shaft E, crank-levers q^2, q^3 , also secured to shaft q' ; levers r, r' , mounted on shaft r^2 , substantially parallel to levers q^2, q^3 , said shaft r^2 in turn mounted in stationary bearings, and the forked pushers l, l' pivoted at their base ends to the upper ends of the parallel levers q^2, q^3 , r, r' , and made fork-shaped at their other ends, substantially as and for the purpose set forth.

4. The folding-bed J, provided with a series of vertical openings, the main frame A of the machine, and the horizontal, transverse driving-shaft E, in combination with rod g^2 , means for imparting longitudinal movements thereto, from said shaft E, the vertical pins g , secured in the head g' , mounted on the upper end of rod g^2 ; rod p , means for imparting longitudinal movements thereto from shaft E, crank-lever q pivoted at one end to rod p and secured at its other end to shaft q' ; said shaft q' fitted to rock in stationary bearings; means for imparting a yielding power to force lever q' , in the direction toward shaft E, crank-levers q^2, q^3 , also secured to shaft q' ; levers r, r' mounted on shaft r^2 substantially parallel to levers q^2, q^3 ; said shaft r^2 in turn mounted in stationary bearings, and the forked pushers l, l' pivoted at their base ends to the upper ends of the parallel levers q^2, q^3, r, r' , and made fork-shaped at their other ends, substantially as and for the purpose set forth.

5. The main frame, folding-bed and folders of an envelop-machine, in combination with the open guideways L, L, consisting of angle-plates arranged, one at each side of the drying-chain, and inclined from a point outside of the front end of the folding-bed, to a point beneath said folding-bed, whereby the envelops may be guided under the folding-bed before they are discharged into the drying-chain, substantially as and for the purpose set forth.

6. The main frame, the folding-bed, provided with a series of vertical openings, the folders and drying-chain, in combination with the vertical, envelop-supporting pins g , adapted to work up and down in said openings, means for operating said pins up and down; the forked, envelop-pushers l, l' , means for supporting and operating the same, forward and back, longitudinally, and the guideways L, L, consisting of angle-plates, arranged, one at each side of the drying-chain, upon an incline, so as to direct the envelops as they pass over the front folder e , down, underneath the folding-bed, before they are discharged into the drying-chain, substantially as and for the purpose set forth.

7. The main frame, the studs t^1, t^2 , and shaft h' , having the cam t^3 secured thereon, in combination with connecting-rod t^4 , provided with the friction-roll t^5 ; crank-lever t^6 , pivoted to rod t^4 , and secured to transverse

shaft t^2 ; said shaft fitted to turn in stationary bearings; crank-levers t^1, t^2 , also secured to shaft t^2 , and pivoted to the outer ends of pushers t, t' , said pushers t, t' , arranged, one at each side of the drying-chain, provided with the bevels t^8, t^9 , on the under sides of their forward or inner ends, and also provided with fork-shaped front ends adapted to engage with the back edges of the envelops, and means for forcing the pushers back when the cam-pressure is released, substantially as and for the purpose set forth.

8. The combination of the main frame A, and studs t^1, t^2 , with the longitudinally-reciprocating, forked pushers t, t' , provided with the inclined or beveled under sides t^8, t^9 , adapted to slide on said supports, and means for operating said pushers to push the envelops radially from the drying-chain, substantially as and for the purpose set forth.

9. The combination of guideways L, L, and radially-reciprocating or rocking crank-lever H, with link u , pivoted to crank-lever H, and to crank-lever u' ; said crank-lever u' , secured to rock-shaft u^2 , said rock-shaft u^2 , mounted in stationary bearing; crank-levers u^3, u^4 , also secured to rock-shaft u^2 , and provided, at their free ends, with the rigid, upper jaws, v, v' , transverse rock-shaft u^5 , mounted in the lower ends of crank-levers u^3, u^4 ; crank-lever v^3 , secured to the end of rock-shaft u^2 , slotted lever v^4 , pivoted to crank-lever v^3 , and also pivoted and fitted to slide on pivot-stud v^5 in the upper, slotted end of stationary stand O, said stand O, spring-spindle v^8 , in the lower end of one of the crank-levers u^3, u^4 , movable bottom jaws v', v'' , secured to rock-shaft v^2 , and spring v^9 , substantially as and for the purpose set forth.

10. The combination of stationary stand O, and crank-levers u^3, u^4 , having the upper, rigid jaws v, v' on their lower ends, with slotted lever v^4 pivoted to crank-lever v^3 , also pivoted and fitted to slide longitudinally on stud v^5 in the upper, slotted end of the stand O, said crank-lever v^3 , secured to transverse rock-shaft v^2 , said rock-shaft v^2 , mounted in the lower ends of crank-levers u^3, u^4 , the bottom jaws v', v'' , secured to rock-shaft v^2 , and means for exerting a yielding pressure to close the bottom jaws against the upper ones, substantially as and for the purpose set forth.

11. The combination of stationary stand O and crank-levers u^3, u^4 , having the upper, rigid jaws v, v' , at their lower ends, with slotted lever v^4 , pivoted to crank-lever v^3 , also pivoted and fitted to slide longitudinally on stud v^5 in the upper, slotted end of the stand O; said crank-lever v^3 , secured to transverse rock-shaft v^2 ; said rock-shaft v^2 mounted in the lower ends of crank-levers u^3, u^4 ; the bottom jaws v', v'' secured to rock-shaft v^2 , spring-spindle v^8 , mounted in the lower end of one of the crank-levers u^3, u^4 , and adapted to bear endwise against the crank-lever v^3 , and means for exerting a yielding pressure

to close the bottom jaws against the upper ones, substantially as and for the purpose set forth.

12. The combination of mechanism for pushing the envelops radially from the drying-chain, consisting of longitudinally, reciprocating pushers t, t , adapted to engage with the back edges of the envelops, with mechanism for gripping and conveying said envelops (after being thus pushed forward) to the counting-box M, and depositing the same therein, consisting of the oscillating crank-levers u^3, u^3 , having the upper, rigid jaws v, v on their lower ends; the transverse, rock-shaft v^2 mounted in the lower ends of said crank-levers u^3, u^3 , crank-lever v^3 secured to said rock-shaft v^2 , slotted lever v^4 pivoted to crank-lever v^3 also pivoted and fitted to slide on stud v^5 in the upper slotted end of stand O, the bottom jaws $v' v'$ secured to rock-shaft v^2 , spring-spindle v^8 , mounted in the lower end of one of the crank-levers u^3 , and adapted to bear endwise against the crank-lever v^3 , and means for exerting a yielding pressure to close the bottom jaws against the upper ones, substantially as and for the purpose set forth.

13. The gripping device N, consisting of the upper, rigid jaws v, v on the bottoms of the oscillating crank-levers u^3, u^3 , and the bottom, movable jaws $v' v'$, secured to transverse shaft v^2 , mounted in the bottom ends of said crank-levers u^3, u^3 , and means for operating said bottom jaws, in combination with the guide-fingers or guards N', rigidly

secured in position above the level of the jaws $v v, v' v'$, for guiding the envelops in between said jaws when they are pushed forward from the drying-chain by the pushers $t t$, and the gripping device is moved toward said envelops to grip them, and said drying-chain and pushers substantially as and for the purpose set forth.

14. The combination of the folding-bed J and mechanism for supporting and elevating the envelops from said folding-bed, consisting of the vertical rod q^2 having a suitable envelop-supporting frame mounted on its upper end, and means for imparting intermittent, longitudinal movements thereto, with mechanism for pushing the envelops from said supporting-frame, consisting of the vertical, parallel, swinging levers $q^2, q^2, r r$, means for supporting and imparting intermittent swinging movements thereto, and the horizontal pushers $l l$ mounted upon and pivoted to the upper ends of said parallel levers, substantially as and for the purpose set forth.

15. The combination of frame A and means for imparting intermittent swinging movements to the vertical parallel levers $q^2, q^2, r r$, with said levers and the horizontal pushers $l l$, mounted upon and pivoted to the upper ends thereof, substantially as and for the purpose set forth.

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Witnesses:

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