(No Model.) 2 Sheets—Sheet 1.

S. A. GRANT.

ENVELOPE MACHINE.

No. 306,741. Patented Oct. 21, 1884.

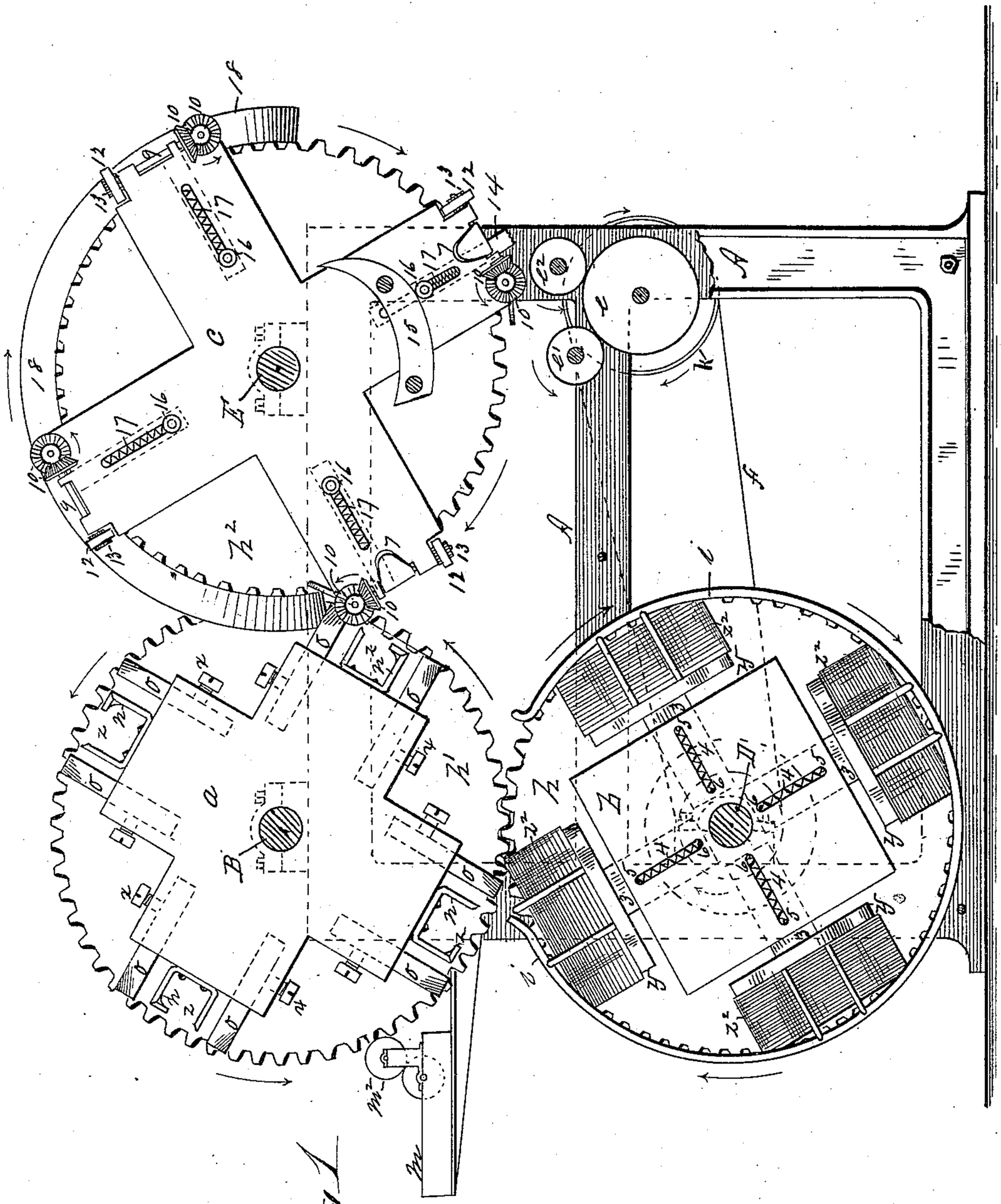

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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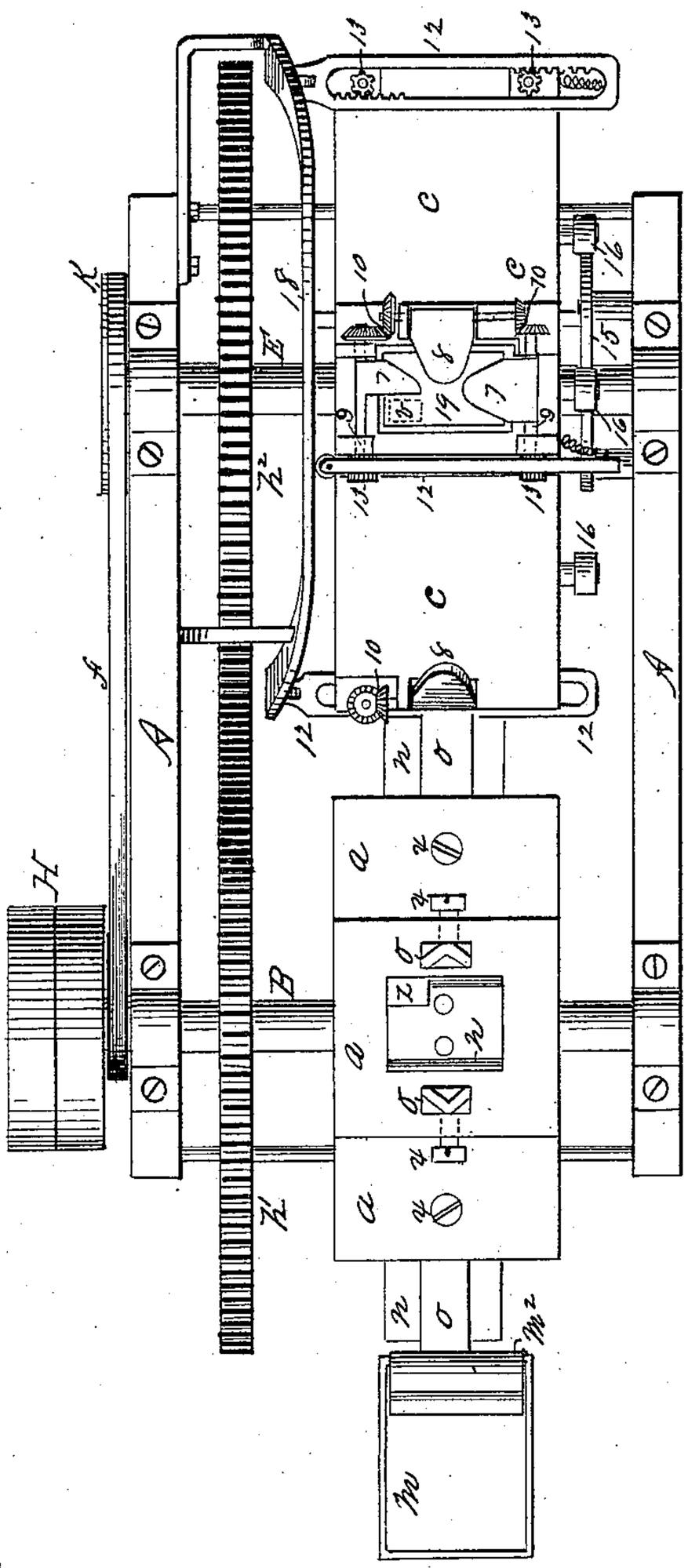
Fig 2



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ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,741, dated October 21, 1884.

Application filed August 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY A. GRANT, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Envelope-Machines, of which the following is a specification.

This invention relates to improvements in the construction and arrangement of envelope-machines, the object being to greatly simplify the construction of machines for this purpose, and at the same time to embody therein mechanism for holding and delivering envelope-blanks, and for gumming, picking up, folding, and printing the same much more rapidly than has heretofore been done, all as hereinafter set forth.

In the drawings forming part of this specification, Figure 1 is a side elevation, partly in section, and Fig. 2 is a plan view, of an envelope-machine embodying my improvements.

In the drawings, A indicates the frame of the machine, which supports in suitable bearings three principal shafts, B, E, and D, and three inking-rollers, e e' e^2. The said inking-rollers are run by a belt, f, running on a pulley on shaft D and on a pulley, K, on the shaft to roller e. Shaft D is the driving-shaft of the machine, and has on it the usual tight and loose pulleys, H. A gum-box, m, and a gumming-roller, m^2, of the usual description, are supported at one end of the machine.

On the driving-shaft D is secured a gear-wheel, h, and a blank-table frame, b. The blank-tables y, four of which are arranged on the several sides of the frame b, are of suitable size and form to hold piles of envelope-blanks z^2, and have projecting from their faces suitable pins, within which the blanks are piled, as shown. The blank-tables y are supported upon posts 3, which enter suitable perforations in the several sides of the frame b, and they are adapted to have a movement therein in a direction at right angles to shaft D. The movement of posts 3 and tables y outwardly from shaft D is effected by the springs 4, (or other suitable ones,) located in slots in the side of frame b, and attached at 6 by a pin to posts 3, and at 5 to frame b. If preferred, a spring may be inserted in the sockets in which posts 3 operate, beneath their ends. Pins 6, projecting through said slots in frame b, prevent posts 3 and tables y from turning. Two blank-holding rings, i, are secured to the frame A, under the series of blank-tables y. Each ring i is open at its upper side, and is adapted to spring against the piles of blanks z^2. Each ring i is composed of wire or a narrow band of metal, and is adapted to bear upon the blank-piles just within the folding-lines of the end flaps. The springs 4 operate to keep the tops of the piles of blanks against the inner faces of rings i, and to hold up the piles against the pickers, as hereinafter described. The shaft B has secured thereon a gear-wheel, h', which engages with gear h on shaft D, and also carries the picker and creaser-frame a, which is likewise secured to and rotates with it. The frame a has secured within each of its four sides, by the screws x, two gummers and pickers, o, and between each pair of the latter a creaser, n, adapted to be pressed against the blank upon the folding-lines of the back and seal flap of the blank, as hereinafter described. One lip of the creaser n is provided with a printing-platen, z, whose face is in the plane of the rotation of the face of the creaser, or of the edges thereof. The gum-roll m^2 is so set that the ends of the pickers o, when frame a is rotated, will be carried against its surface and be made to take therefrom the gum required for securing the flaps of the envelope, in the usual way. It will be seen that the ends of the pickers o project a little beyond the edges of the creaser n, and they may be adjusted to proper positions by the screws x. The pickers o are located and arranged on frame a in such manner that each time that a pile of blanks z^2 is brought around to the opening in spring i a pair of pickers is carried against the top blank, and they transfer to the latter the gum required to secure its flaps when they are folded. A gear, h^2, which engages with gear h', is secured on shaft E, and thereby the shafts B and E rotate with equal velocity and with the same speed as shaft D, since the gears h, h', and h^2 are of like diameter. Shaft E has secured thereon the frame c, which carries on its four sides and within the same four folding-boxes and four type-blocks, 14. The base of the folding-box is represented by 19, Fig. 2. The end-folding wings 7 7 and the back-flap-folding wing 8 are secured to the shafts 9, which

are made to rotate together by the bevel-gears 10 thereon. One of the ends of each of the shafts which carry the end wings, 7, has thereon a pinion, 13, which engage with the opposite sides of a double rack, 12. The said rack is caused to have an intermittent reciprocating motion when frame *c* is rotated by bringing one end thereof against the cam 18, which is secured to frame A near the side of frame *c*. A suitable spring moves rack 12 in the opposite direction from which cam 18 moves it, after it has been carried beyond the latter. Cam 18 operates the rack 12 to fold the wings 7 7 8 against the flaps and said spring to lift them from the envelope. It will be seen that one of wings 7 has one side of it cut away to expose a spot, *v*, on the base of the folding-box. (Shown in dotted lines in Fig. 2.) Said spot *v* indicates the position on said base of the end of the block 14 which bears the printing-types. Block 14 is adapted to have a movement in frame *c* at right angles to shaft E, and before the folding-box comes around opposite to the pickers and creaser to retire into frame *c*, bringing its type-face to the same plane of the base of the folding-box, or a trifle beyond. The said type-block has a spring, 17, around it within frame *c*, and a stud, 16, projects from its side through a slot in said frame. Spring 17 operates to retire the block within the frame. A cam, 15, is set on frame A near the side of frame *c* and opposite the inking-roller c^2, and when, in revolving, frame *c* brings the stud 16 in contact with the border of cam 15, the type-block is carried outward, as in Fig. 1, so that as its type-face passes over roller c^2 it will roll against the latter and become inked. As soon as stud 16 passes off from cam 15, spring 17 draws the type-block into frame *c*.

The operation of my improvements is as follows: Piles of blanks z^2 z^2 z^2 z^2 are placed on the tables *y* and the gum-box *m* is supplied with gum. The machine is started, and each set of pickers *o*, as they roll against roller *m*, take gum therefrom, and then are carried against the piles of blanks in rapid succession. The spring 4 carries the blank-table toward the pickers as fast as the pile is reduced in height, so that the top blank is within contact distance of the picker. As soon as the pile of blanks passes from under the rings *i* to the open space at the top of the latter the top blank is free to be removed, and each pair of pickers carries with it a blank from each pile with which it comes in contact, and at once carries the blank against the folding-box on frame *c*, forcing the blank against the creaser *n*, and the platen *z* on the creaser receives the pressure of the type-block on its face, the type-block coming against the blank at the spot *v* on the base 19.

The creasing and printing operation is somewhat similar to the printing of a sheet between two rotating cylinders. The moment that the blank is brought squarely against the folding-box the end of rack 12 strikes cam 18, causing the wings 7 7 to swing over onto the base 19 of the folding-box, inclosing and folding down the end flaps. The wing 8 is so geared as to move a little after the wings 7 7, so that the bottom flap will be folded above the end flaps. This can be accomplished by a slight difference in the teeth of the gears. As the wing 8 is driven from the gears which drive wings 7 7, a very little play or lost motion will permit this. As all the wings are elastic, this lost motion will be compensated for when all the wings are folded down on the envelope by the spring of the wings 7 7 of the envelope. The folding-wings 7 7 close upon the blank and transfer it to frame *c*. The seal-flap is left with the fold given to it by one border of the creaser, and is not carried down upon the other flaps, whereby it would be likely to adhere to them before the gum on it would have dried. After the blank has been folded as aforesaid, it is carried around in the direction of the arrow over the frame *c* until the end of rack 12 passes off from cam 18, when the wings 7 7 8 open and the blank is dropped from the box, or taken therefrom by any of the well-known devices employed for that purpose. Thus, by the employment of the three simultaneously-rotating frames *b*, *a*, and *c* and the above-described devices connected with each of them, together with the gum-roll m^2 and ink-roll e^2, four envelopes are gummed, folded, and printed at each revolution of said frames.

To adapt the within-described machine to some classes of envelope-work, the frames carrying the blank-piles, pickers, and creasers and folding mechanism may be constructed with a less number than four sets of said devices, or a part of them may be thrown out of action.

The type-block 14 may be made inoperative by removing the cam 15.

What I claim as my invention is—

1. In an envelope-machine, one or more blank-tables supported in a rotating frame, and adapted to have an outward movement in the direction of their plane of rotation, combined with a spring blank-holder open on one side and encircling said tables, and adapted to bear against the blanks thereon, substantially as set forth.

2. In an envelope-machine, a rotating frame carrying one or more sets of pickers and creasers, substantially as described, one or more envelope-blank tables to rotate in coincidence with said pickers, and suitable gumming mechanism, substantially as described, to supply gum to the pickers, combined and operating substantially as set forth.

3. In an envelope-machine, a rotating frame carrying on its periphery one or more folding-boxes provided with folding-wings which fold toward the center of said frame, and mechanism, substantially as described, for operating said wings during the rotary movement of said boxes, combined and operating substantially as set forth.

4. In an envelope-machine, a rotating frame carrying one or more folding-boxes provided with folding-wings, a type-block presenting a face in a plane with the base of each folding-box, an inking-roller, and mechanism, substantially as described, for operating said wings during the rotary movement of said folding-boxes, and for giving said type-block a reciprocating movement in the plane of its rotation when opposite said roller, combined and operating substantially as set forth.

5. In an envelope-machine, a rotating frame carrying one or more folding-boxes provided with folding-wings, mechanism, substantially as described, for operating said wings during the rotary movement of said boxes, and a series of pickers and creasers, substantially as described, adapted to rotate in coincidence with said folding-boxes and to carry envelope-blanks thereto, combined and operating substantially as set forth.

6. In an envelope-machine, a series of rotating blank-tables, substantially as described, a series of pickers and creasers, substantially as described, adapted to rotate in coincidence with said tables, a series of folding-boxes and wing-operating mechanism, substantially as described, adapted to rotate in coincidence with said pickers and creasers, and suitable gumming mechanism for supplying gum to said pickers, combined and operating substantially as set forth.

7. In an envelope-machine, a rotating frame carrying one or more folding-boxes provided with folding-wings, a type-block presenting a face in a plane with the base of each folding-box, and a series of creasers, substantially as described, each having a platen thereon adapted to rotate in coincidence with said type-blocks to bring said platens opposite the latter, combined and operating substantially as set forth.

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Witnesses:
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