

(No Model.)

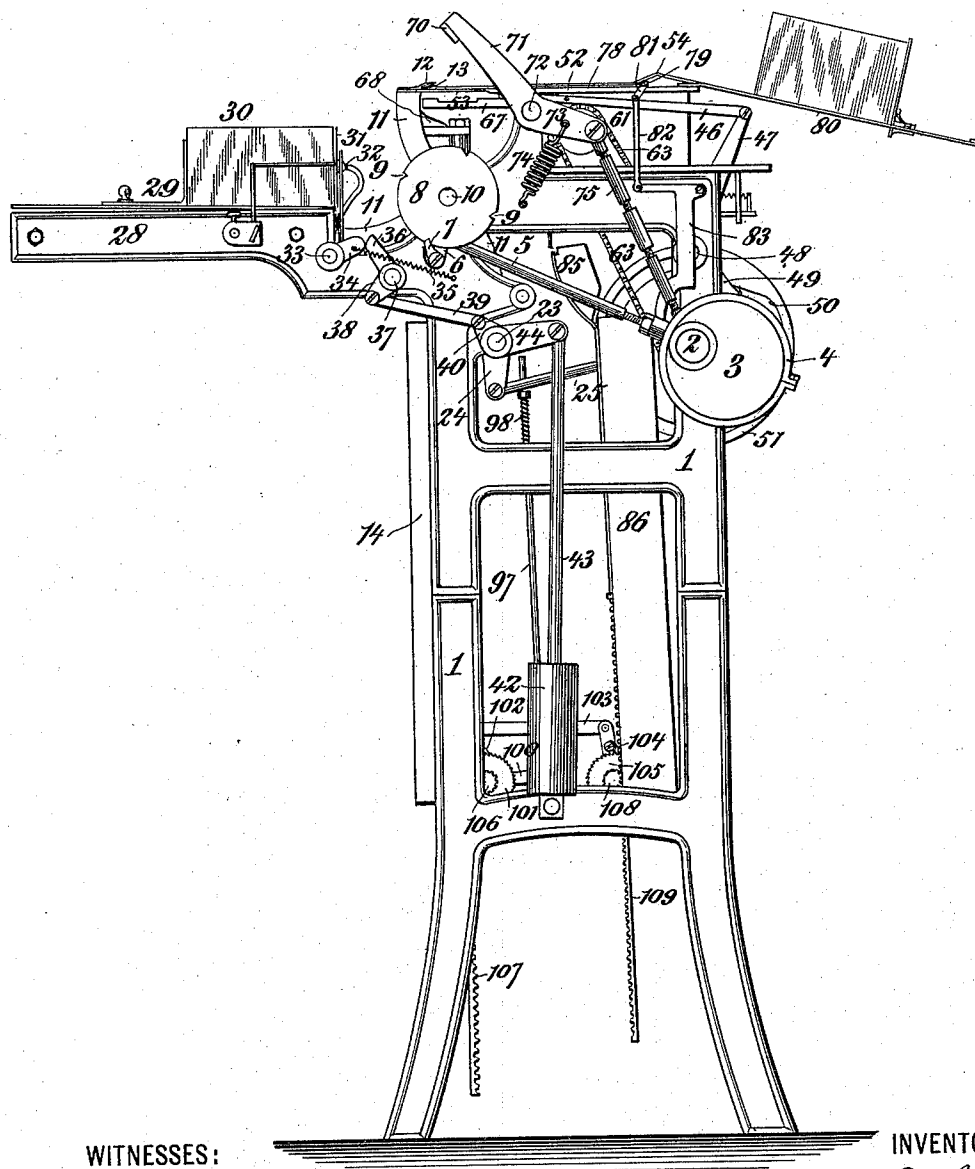
4 Sheets—Sheet 1.

F. D. BELKNAP.
ADDRESSING MACHINE.

No. 573,849.

Patented Dec. 29, 1896.

Fig. 1,



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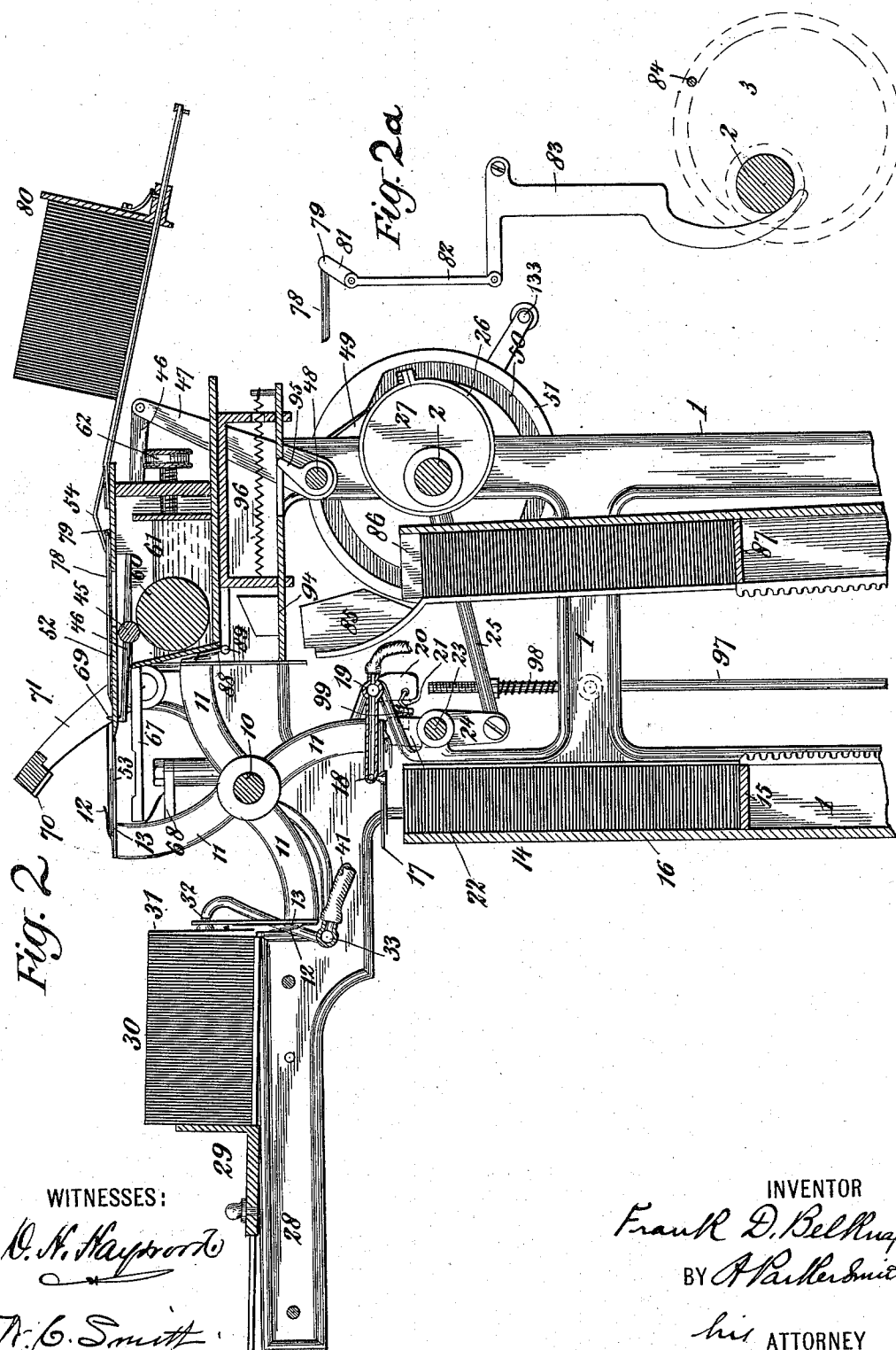
(No Model.)

4 Sheets—Sheet 2.

F. D. BELKNAP.
ADDRESSING MACHINE.

No. 573,849.

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(No Model.)

4 Sheets—Sheet 3.

F. D. BELKNAP.
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Fig. 3,

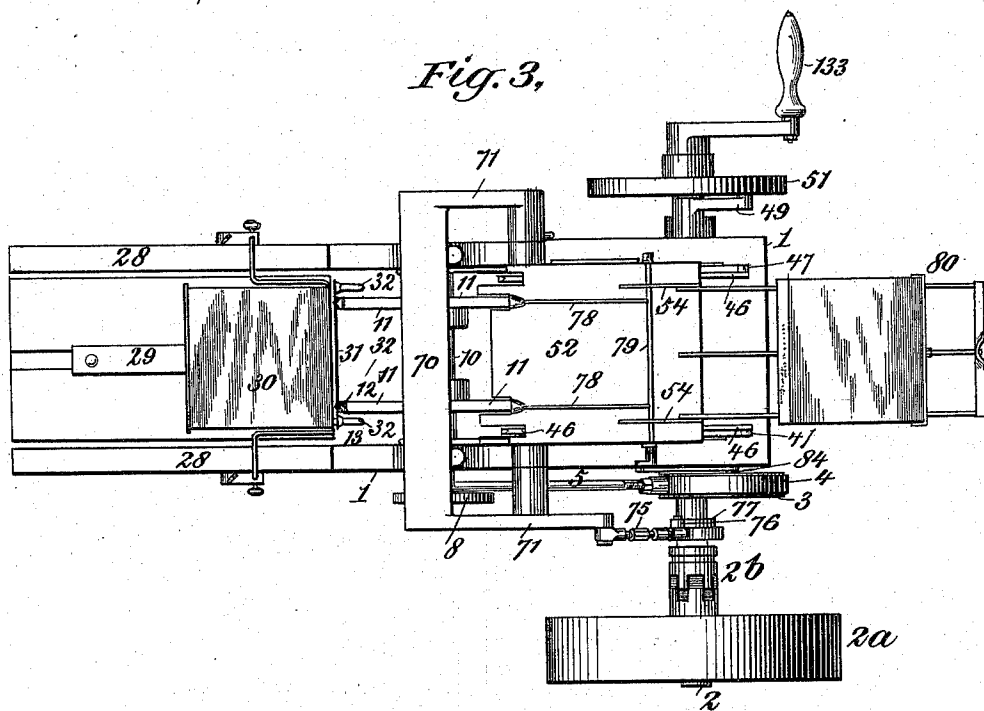
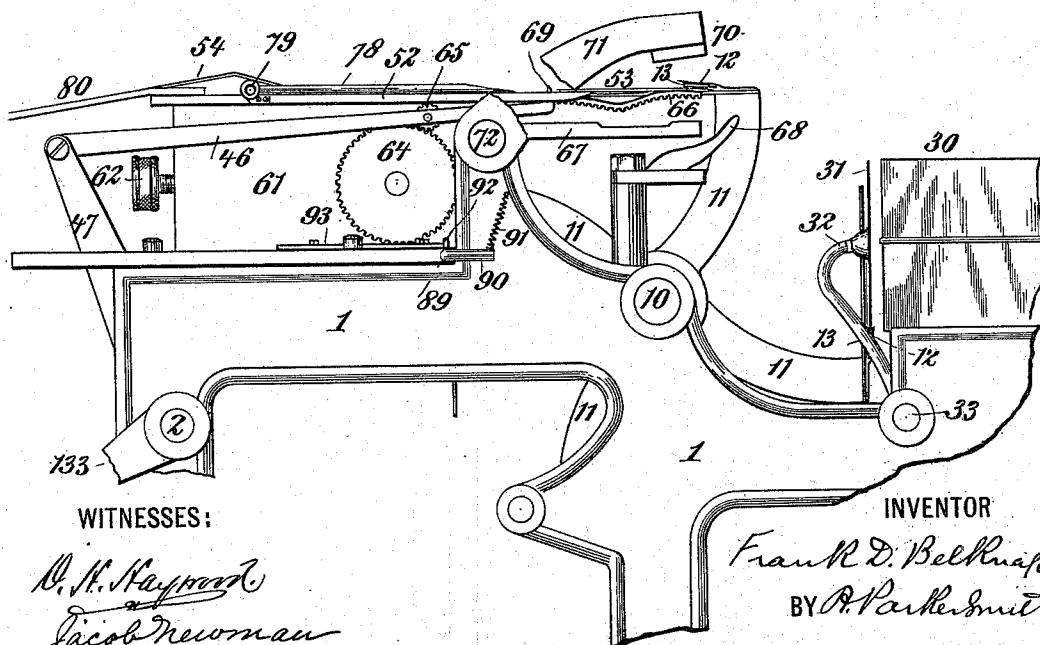


Fig. 4,



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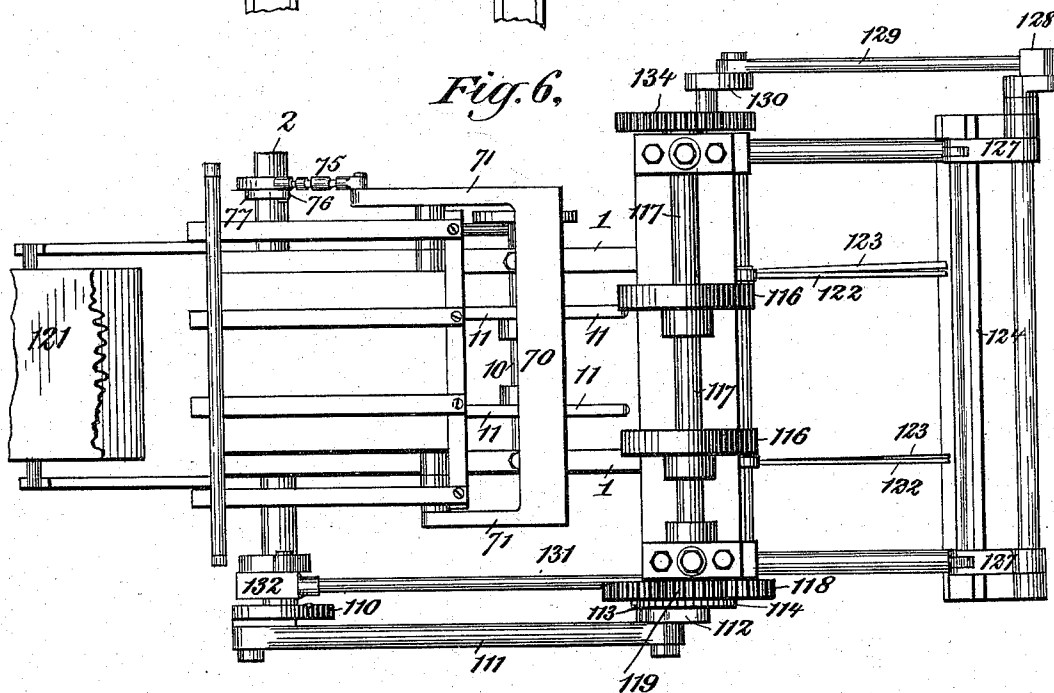
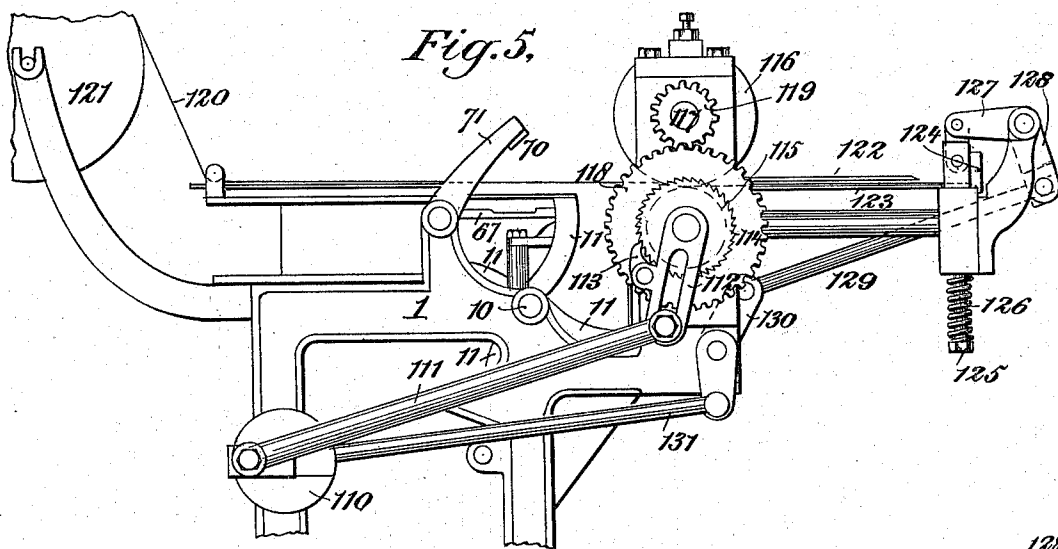
(No Model.)

4 Sheets—Sheet 4.

F. D. BELKNAP.
ADDRESSING MACHINE.

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UNITED STATES PATENT OFFICE.

FRANK D. BELKNAP, OF NEW YORK, N. Y.

ADDRESSING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,849, dated December 29, 1896.

Application filed December 19, 1895. Serial No. 572,643. (No model.)

To all whom it may concern:

Be it known that I, FRANK DRAYTON BELKNAP, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Addressing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for automatically printing a series of addresses, numbers, or like marks upon a series of envelopes, cards, or other objects. It is more specifically designed to produce a machine of the above general type which shall operate by means of a series of independent stencils on which the addresses, numbers, or other marks have been cut or perforated.

My especial object is to produce a machine operating by these means which shall have the smallest number of parts, the most positive action, and be operated with the expenditure of the least amount of power. To secure these advantages, I have designed and invented the type of machine herein to be described, the preferred form of which is illustrated in the accompanying four sheets of drawings, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical section thereof. Fig. 2^a is a detail view of the oscillating bell-crank 83. Fig. 3 is a plan view of the machine. Fig. 4 is an enlarged detail view showing the printing mechanism and a portion of the feed mechanism, the view being taken from the opposite side of the machine shown in Fig. 1. Fig. 5 is a detail view of the printing mechanism in part with an attachment for feeding a continuous roll of paper and cutting portions thereof off for newspaper-wrappers. Fig. 6 is a plan view of Fig. 5.

Throughout the drawings like reference-figures refer to like parts.

1 is the main frame of the machine.

2 is the main driving-shaft, which receives motion from a belt by means of the pulley-wheel 2^a and the clutch 2^b. 3 is an eccentric on said drive-shaft, which by means of the eccentric-strap 4, the eccentric-rod 5, the crank 6, and pawl 7 conveys intermittent mo-

tion to the notched disk 8, which is keyed upon the shaft 10 and has several (preferably four) notches 9 in its circumference.

On the shaft 10 is mounted the rotating frame 11, which may be of any proper construction, but which I prefer to make in the shape of a four-armed star-wheel, as shown. This rotating frame has spring-clips 12 and 13 or other suitable means for grasping envelopes and cards placed at equal distances around its circumference. The distance between any two sets of these clips should be equal to the circumference of travel of the rotating frame at each impulse of the pawl 7. In the construction shown the clips would be placed at a distance of one-fourth of the circumference of the rotating frame, and consequently would be located in the extremities of the arms 11, as shown.

14 is a magazine of stencils arranged at a convenient point in the circumference of the rotating frame and preferably radial thereto. The magazine has a sliding follower 15 in the bottom thereof which will force the stencils upward toward the mouth of the magazine. A series of such stencils 16 is shown in the magazine. Just prior to each intermittent action of the rotating frame 11 the outermost stencil 17 is picked up by the suction-fingers 18 and lifted into line with the course or line of travel of the spring-clip 13. The suction-fingers may be operated in any proper manner, but in the apparatus shown they are mounted on a shaft 19, which has the cam-lug 20, and the fingers are normally retained in their upper position by the spring 21, attached to said cam-lug 20. The wiper 22 on the shaft 23 strikes the cam-lug 20 when the shaft is vibrated by means of the crank 24, connecting-rod 25, eccentric-strap 26, and eccentric 27, mounted on the drive-shaft 2. The result of such action is to force the suction-fingers down into the magazine and pick up the first stencil.

It is understood, of course, that the rotating frame is made double, that is, it is composed of two star-wheels, each provided on its extremity with the clips 12 and 13, and that these two wheels pass on either side of the suction-fingers 18 and other apparently interfering mechanism.

28 is an extension of the main frame, which, with the coöperation of the adjustable slide

29, serves as a magazine for a series of envelopes or other articles 30 to be addressed. The outermost envelop 31 is picked up by the suction-fingers 32, operated from the shaft 33, and drawn into line with the travel of the spring-clip 12, so that at each intermittent action of the machine said outermost envelop 31 is carried away by a pair of said clips 12. The suction-fingers 32 are operated by means of the cam-lug 34 on the shaft 33. The spring 35 normally holds the suction-fingers in the position shown in the drawings until it is overpowered by the action of the wiper 36, mounted on the shaft 37 and operated by means of the crank 38, connecting-rod 39, and crank 40 on the shaft 23.

The partial vacuum necessary in the suction-fingers 18 and 32 can be created in any well-known way by any of the familiar forms of mechanism. I have shown a portion of the rubber tubing 41 extending from the hollow shaft 33. Similar tubing extends from the hollow shaft 19 to one or more air-pumps 42, whose piston-rods 43 are operated by the cranks 44 on the shaft 23. Other convenient portions of the mechanism could be employed to operate the suction apparatus, if desired. In mentioning the suction-fingers hereinafter I desire to be understood as including under said term the necessary apparatus for producing a partial vacuum therein, however said apparatus may be arranged.

45 is an inking-roller mounted in a vibrating frame 46, which is moved back and forth by the crank 47 on the shaft 48. This shaft 48 is vibrated by the crank-arm 49, which has a roller (not shown) engaging with the cam-groove 50 in the cam-plate 51 on the driving-shaft 2.

52 is a delivery-table placed over the inking-roller and in line with the projection 53 on the end of the star-wheel 11. 54 is a light frame extending from said delivery-table to the envelop-receptacle 80 and covering the shaft 79 of the delivery-fingers 78.

60 is the roller of an ink-fount 61, which ink-fount is adjustable by means of the set-screw 62.

63 is a sprocket-chain extending from the drive-shaft 2 and keeping the ink-roller 60 in continuous rotation.

64 is a gear-wheel on the other end of the ink-roller, (shown in Fig. 4,) and 65 is a pinion on the vibrating roller 45, which gears therewith. 66 is a toothed rack arranged along the line of travel of the roller 65 at its outermost portion, and 67 and 68 are guides for said roller. The rack 66 is given a curved form (shown in Fig. 4) to carry the roller free from other parts of the mechanism until it arrives directly under the stencil-card. 69 represents a pair of delivery-hooks on the outer end of the vibrating frame 46.

The pinion 65 and coacting gearing are so proportioned that when the roller 45 is in contact with the fount-roller 60 it rotates therewith, and while the said roller 45 is in its

outermost portion of travel, that is, while passing under the stencil and envelop carried by the rotating frame, the rack 66 meshes with the pinion 65 and gives the roller 45 a velocity of rotation just equal to its motion of translation, so that it rolls over the card but does not slide thereon.

70 is a swinging platen supported by the arms 71 from the shaft 72, which presses down upon the envelop as the ink-roller passes under the stencil. The proper motion is given to the shaft 72 by means of the crank-arm 73, spring 74, connecting-rod 75, cam-roller 76, and cam 77 on the main driving-shaft 2, Figs. 1 and 3.

The proper motion of the delivery-fingers 78 is given by the crank 81 on the shaft 79, the connecting-rod 82, the oscillating bell-crank 83, and the pin 84 on the eccentric 3, which strikes the crescent-shaped lower extremity of said bell-crank 83.

85 is a chute arranged under the line of travel of the clips 12 and 13 on the rotating frame at a point where said clips open downward. The stencil held in the clip 13 will tend to drop out of the clip when the rotating frame stops with said clips over the chute 85, and it will be conducted to the receptacle for stencils 86. This receptacle has a sliding follower 87, which is drawn down as the stencils accumulate, so that the level of the column of the stencils in the receptacle is maintained at or near the mouth thereof.

I find that the dropping of the stencil-card by its own weight into the chute 85 cannot be depended upon always to occur at just the right moment. Accordingly I control the same positively by means of the ejector-fingers 88, Fig. 2, which are mounted on the shaft 89, Fig. 4. This shaft has a crank 90 and spring 91, which tends to hold said ejector-fingers in the upward position shown in Fig. 2. The lug 92 on the shaft 89 is struck by the slide 93, Fig. 4, which has been forced forward by the crank 47 at the extremity of the forward motion of the crank 47, and the fingers 88 are consequently turned downward, so as to positively eject the stencil-card. To prevent the premature ejection of said card, I employ a reciprocating stop or slide 94, which normally projects into the path of the stencil-card and withholds the same until it is withdrawn by means of the toe 95 on the shaft 48 just after the action of the ejector-fingers. The spring 96 tends to keep the slide or stop 94 in its normal position.

The mechanism for causing the follower of the stencil-magazine to rise as each card is removed and the follower of the stencil-receptacle to descend as each new card is added after its discharge from the printing mechanism may be of various types. I have illustrated a construction in which the plunger 97 is forced down by the wiper 22 on the shaft 23 against the resistance of the spring 98. This wiper 22 has an adjustable face 99 for co-action with said plunger 97. The plunger 97

vibrates the crank-arm 100, which drives the ratchet-wheel 101 by means of the pawl 102. The link 103 connects the pawl 102 with the corresponding pawl 104, which drives the ratchet-wheel 105. At each motion of the plunger 97 these ratchet-wheels 101 and 105 are moved one tooth. They turn the pinions 106 and 108 a corresponding amount, and these lift the follower 15 through the medium of the rack 107 and depress the follower 87 through the medium of the rack 109 each a distance equal to the thickness of one stencil-card 17.

A special attachment by which my invention may be employed in the printing of newspaper-wrappers is shown in Figs. 5 and 6. 110 is a crank-disk on the main driving-shaft, which by means of the connecting-rod 111, the slotted crank 112, and pawl 113 and the ratchet-wheel 114 gives an intermittent motion to the gear-wheel 118, which is rigidly connected to the ratchet-wheel. The gear 118 meshes with gear 119 on shaft 117. The feed-wheels 116 are keyed to this shaft. Their coacting feed-wheels 115 are driven in unison with them by gear 134 on the other end of shaft 117 and a coacting gear (not shown) which is rigidly connected to the feed-wheels 115. These feed-wheels draw the continuous web of paper 120 on the roll 121 through the printing mechanism, which is the same as in the other form of my machine employing stencil-cards to print the addresses on the web of paper at regularly-spaced intervals. This interval is determined by the position of the connecting-rod 111 in the adjustable slotted crank 112. After leaving the feed-rollers the paper is forced out between the guides 122 and 123 under the knife 124, which is normally drawn down by the plungers 125 and on which the springs 126 operate. At the moment of feeding the paper forward said knife is lifted by the bell-crank 127. When the forward motion of the paper stops, the knife falls and cuts off a length sufficient to form a wrapper and on which an address has been printed. The mechanism by which the bell-crank lever is lifted consists of the crank 128, connecting-rod 129, bell-crank 130, connecting-rod 131, and cam mechanism 132, operated by the drive-shaft.

The operation of my invention is clear from the above description. The operator can move the machine by hand through the handle 133, if desired. Usually the clutch 2^b is in engagement and the machine driven continuously by power. The rotating frame 11 is given an intermittent motion equal to a quarter of a revolution with each revolution of the main driving-shaft. Prior to such revolution the suction-fingers 18 have lifted a stencil-card into line with the spring-clip 13 on the lower arm of the star-wheel, the suction-fingers 32 have lifted an envelop 31 into line with the clip 12 on the left-hand arm of the star-wheel, as looked at in Figs. 1 and 2; the printing mechanism has forced

ink through the stencil-card up against the envelop held by the upper arm of the star-wheel, and the ejector-fingers 88 have forced out the stencil-card from the clips on the right-hand arm of the star-wheel and shot it down into the receptacle 86. Prior to such motion also the ejecting-hooks 69 have pulled the printed envelop, after it has been printed and the swinging platen has lifted, out of the clips 12 on the upper arm of the star-wheel and left it on the delivery-table 52. From here it is thrown over by the discharge-fingers 78 into the envelop-receptacle 80.

The envelops being longer than the stencil-cards the suction-fingers 32 are outside of the star-wheel and draw the envelop back against the stencil-card which has been picked up at a prior operation of the machine. During all this time the ink-roller 60 is revolving and picking up ink from the ink-fount 61 and distributing the same at intervals over the inking-roller 45. As the discharge-hooks 69 haul the envelop onto the delivery-table the inking-roller is brought in contact with the fount-roller. As the hooks go out ready to grasp another printed envelop the inking-roller runs out along the guide 67-68 and is caused to roll over the stencil-card by means of the rack 66. During this operation of the machine the air-pumps 42 are working to give the suction-fingers their necessary action and the plunger 97 is operating to feed up the stencils in the magazine 14 and feed them down in the receptacle 86. The ejector-fingers and co-operating-stop 94 have their motion so timed as to force the stencil-card out into the chute 85 just after the rotating frame has come to rest at the completion of one of its quarter-turns.

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

1. In an addressing-machine the combination of the main frame and driving-shaft, the rotating frame provided at equally-spaced distances with means for grasping the stencils and envelops, means for feeding the stencils and envelops to the rotating frame at different points in its circumferential travel, and an inking apparatus which runs over the stencil at a point in the circumferential travel of the frame beyond that at which both stencil and envelop have been placed thereon, together with the mechanism which transmits motion from the main shaft to the rotating frame and inking apparatus, substantially as described.

2. In an addressing-machine the combination of the main frame and driving-shaft, the rotating frame, the spring-clips at equally-spaced distances around the circumference of the rotating frame and opening in the direction of rotation, the magazine of stencils and the magazine of envelops arranged at different points around the circumference of said rotating frame, means for lifting the out-

ermost stencil and the outermost envelop from each magazine into the line of travel of the spring-clips, whereby they are picked up by said clips and carried around together by the rotating frame, and the mechanism which transmits motion from the main shaft to the rotating frame, substantially as described.

3. In an addressing-machine, the combination of the main frame and driving-shaft, the rotating frame, the spring-clips at equally-spaced distances around the circumference of the rotating frame and opening in the direction of rotation, the magazine of stencils and the magazine of envelops arranged at different points around the circumference of said rotating frame, suction-fingers and mechanism operated from the main shaft which projects said fingers into the respective magazines and withdraws them into the line of travel of the spring-clips, just prior to the passage thereof, together with mechanism which transmits motion from the main shaft to the rotating frame, substantially as described.

4. In an addressing-machine the combination of the main frame and the driving-shaft, the rotating frame driven intermittently therefrom, means for holding a stencil and superposed envelop thereon, the ink-fount and the ink-roller mounted on reciprocating mechanism, driven from the main driving-shaft, which brings said roller alternately into contact with the ink-fount and with the stencil under the envelop, substantially as described.

5. In an addressing-machine, the combination of the main frame and the driving-shaft, the rotating frame driven intermittently therefrom, means for holding a stencil and superposed envelop thereon, the ink-fount and the ink-roller mounted on reciprocating mechanism driven from the main driving-shaft, which brings said roller alternately into contact with the ink-fount and the stencil under the envelop together with the swinging platen oscillated by mechanism from the driving-shaft, which presses down upon the envelop as the ink-roller runs under the stencil, substantially as described.

6. In an addressing-machine, the combination of the main frame and the driving-shaft, the rotating frame driven intermittently therefrom, means for holding a stencil and superposed envelop thereon, the ink-fount and the ink-roller mounted on reciprocating mechanism driven from the main driving-shaft, which brings said roller alternately into contact with the ink-fount and the stencil under the envelop together with the swinging platen oscillated by mechanism from the driving-shaft, which presses down upon the envelop as the ink-roller runs under the stencil, and the discharging-hooks, which draw the envelop from the rotating frame after the swinging platen has been lifted again, substantially as described.

7. In an addressing-machine the combination of the rotating frame which carries the

stencil and envelop, the printing mechanism in the line of circumferential travel of said rotating frame, the delivery-table and the reciprocating hooks, which pull the envelop from the rotating frame to the delivery-table, substantially as described.

8. In an addressing-machine the combination of the rotating frame which carries the stencil and envelop, the printing mechanism in the line of circumferential travel of said rotating frame, the delivery-table, and the reciprocating hooks, which pull the envelop from the rotating frame to the delivery-table, together with the envelop-receptacle and the vibrating fingers which throw the envelop into the receptacle, substantially as described.

9. In an addressing-machine an inking mechanism which is composed of the following parts in combination; an ink-fount, a roller mounted therein, gearing from the driving-shaft of the machine which continuously rotates the roller, a vibrating frame with an inking-roller mounted therein, a spur-wheel on said roller, a gear-wheel on the roller in the fount, a rack along the line of the outermost travel of the vibrating roller, whereby the vibrating roller is caused positively to rotate with the roller in the ink-fount while in contact therewith, and to revolve at a circumferential speed equal to its motion of translation during the outermost portion of its travel, substantially as described.

10. In an addressing-machine an inking mechanism which is composed of the following parts in combination; an ink-fount, a roller mounted therein, gearing from the driving-shaft of the machine which continuously rotates the roller, a vibrating frame with an inking-roller mounted therein, a spur-wheel on said roller, a gear-wheel on the roller in the fount, a rack along the line of the outermost travel of the vibrating roller, whereby the vibrating roller is caused positively to rotate with the roller in the ink-fount while in contact therewith, and to revolve at a circumferential speed equal to its motion of translation during the outermost portion of its travel, together with the discharge-hooks on the vibrating frame, and the clamping apparatus by which the article to be printed is held and from which it is withdrawn by the discharge-hooks, substantially as described.

11. In an addressing-machine, the combination of the main frame and driving-shaft, the intermittently-rotating frame provided with clips which carry the stencil-cards, the stencil-receptacle and the chute leading from the receptacle to a point beneath the clips at the point in the circumferential travel of the rotating frame such that the opening of said clips points downward, substantially as described.

12. In an addressing-machine, the combination of the main frame and driving-shaft, the intermittently-rotating frame provided with clips which carry the stencil-cards the stencil-receptacle and the chute leading from

the receptacle to a point beneath the clips at the point in the circumferential travel of the rotating frame such that the opening of said clips points downward, together with the vibrating ejector-fingers which positively eject the stencils from the clips and force them to drop down into the chute, substantially as described.

13. In an addressing-machine, the combination of the main frame and driving-shaft, the intermittently-rotating frame provided with clips which carry the stencil-cards the stencil-receptacle and the chute leading from the receptacle to a point beneath the clips at the point in the circumferential travel of the rotating frame such that the opening of said clips points downward, together with the vibrating ejector-fingers which positively eject the stencils from the clips and force them to drop down into the chute, and the reciprocating stop which normally withholds the stencil from falling into the chute, but is withdrawn simultaneously with the downward thrust of the ejector-fingers, substantially as described.

14. In an addressing-machine the combination of the stencil-magazine and stencil-receptacle, the sliding followers therein, gearing which connects said followers and causes one to descend as the other ascends, the driving-shaft, the mechanism operated therefrom to give intermittent motion to the gearing which actuates the followers, said gearing consisting of a rack attached to each follower a pinion meshing therewith and two sets of pawls and ratchet mechanism, connected by an intervening link which drive said pinions, substantially as described.

15. In an addressing-machine the combination of the main frame and driving-shaft,

the rotating frame, provided at equally-spaced distances with means for grasping the stencil, means for feeding the stencils to the rotating frame and means for feeding the articles to be addressed to the rotating frame in coaction with said stencils, and an inking apparatus which runs over the stencil at a point in the circumferential travel of the rotating frame at or beyond that at which the article to be addressed has been superposed upon the stencil, together with the mechanism which transmits motion from the main shaft to the rotating frame and inking apparatus substantially as described.

16. In an addressing-machine the combination of the main frame and driving-shaft, the rotating frame provided at equally-spaced distances with means for grasping the stencil, means for feeding the stencils to the rotating frame and means for feeding the articles to be addressed to the rotating frame in coaction with said stencil, and an inking apparatus which runs over the stencil at a point in the circumferential travel of the rotating frame at a point at or beyond that at which the article to be addressed has been superposed upon the stencil, together with the mechanism which transmits motion from the main shaft to the rotating frame and inking apparatus, and a knife arranged along the line of travel of said articles to be addressed with mechanism transmitting motion from the driving-shaft to said knife, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK D. BELKNAP.

Witnesses:

A. PARKER SMITH,
E. D. BELKNAP.