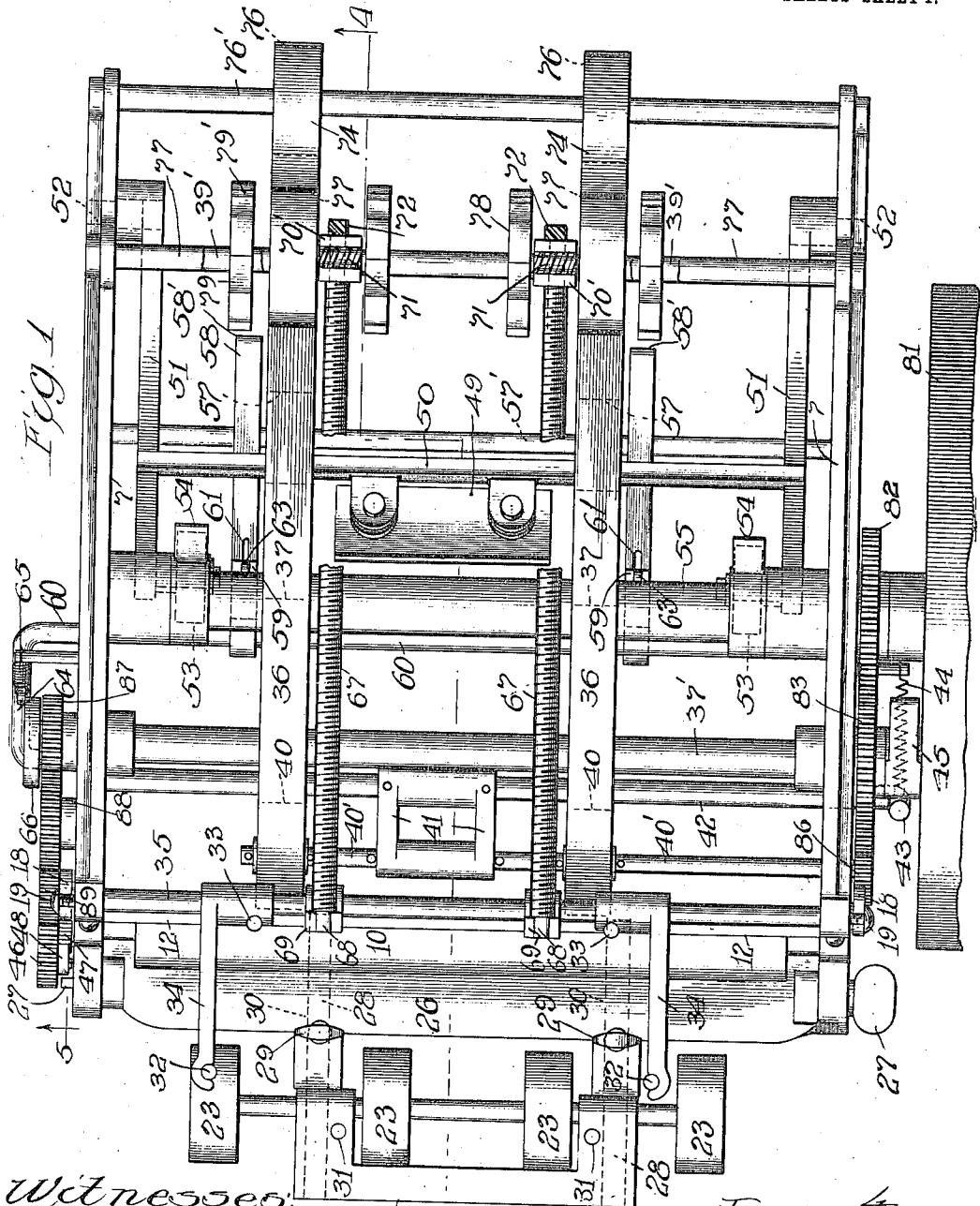


J. S. DUNCAN.
 ENVELOP FEEDING MECHANISM.
 APPLICATION FILED MAR. 1, 1909.

1,063,335.

Patented June 3, 1913.

4 SHEETS—SHEET 1.



Witnessed:
 H. R. L. White
 M. A. Kiddie

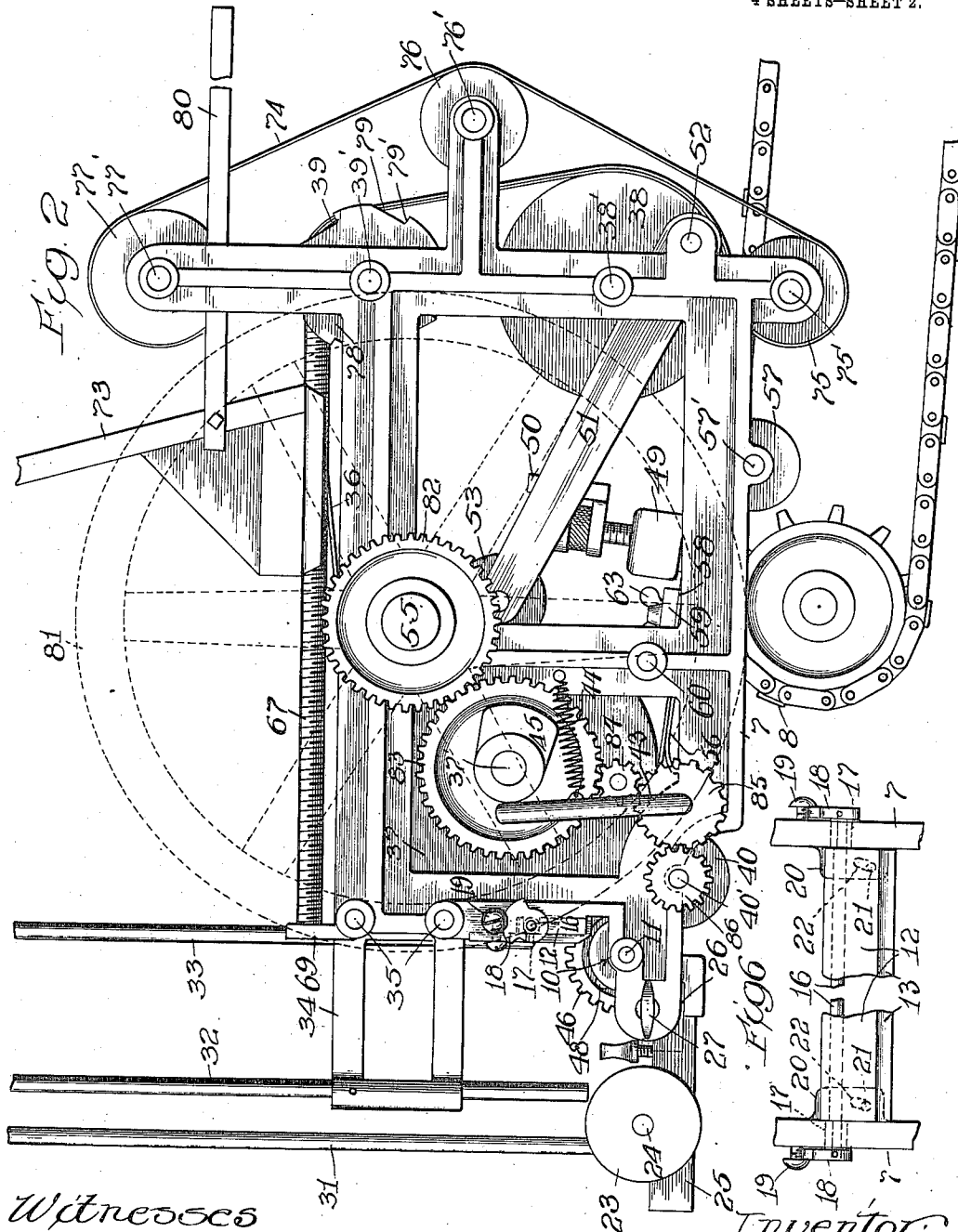
Inventor:
 Joseph S. Duncan
 By *[Signature]*
 Atty.

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4 SHEETS-SHEET 2.

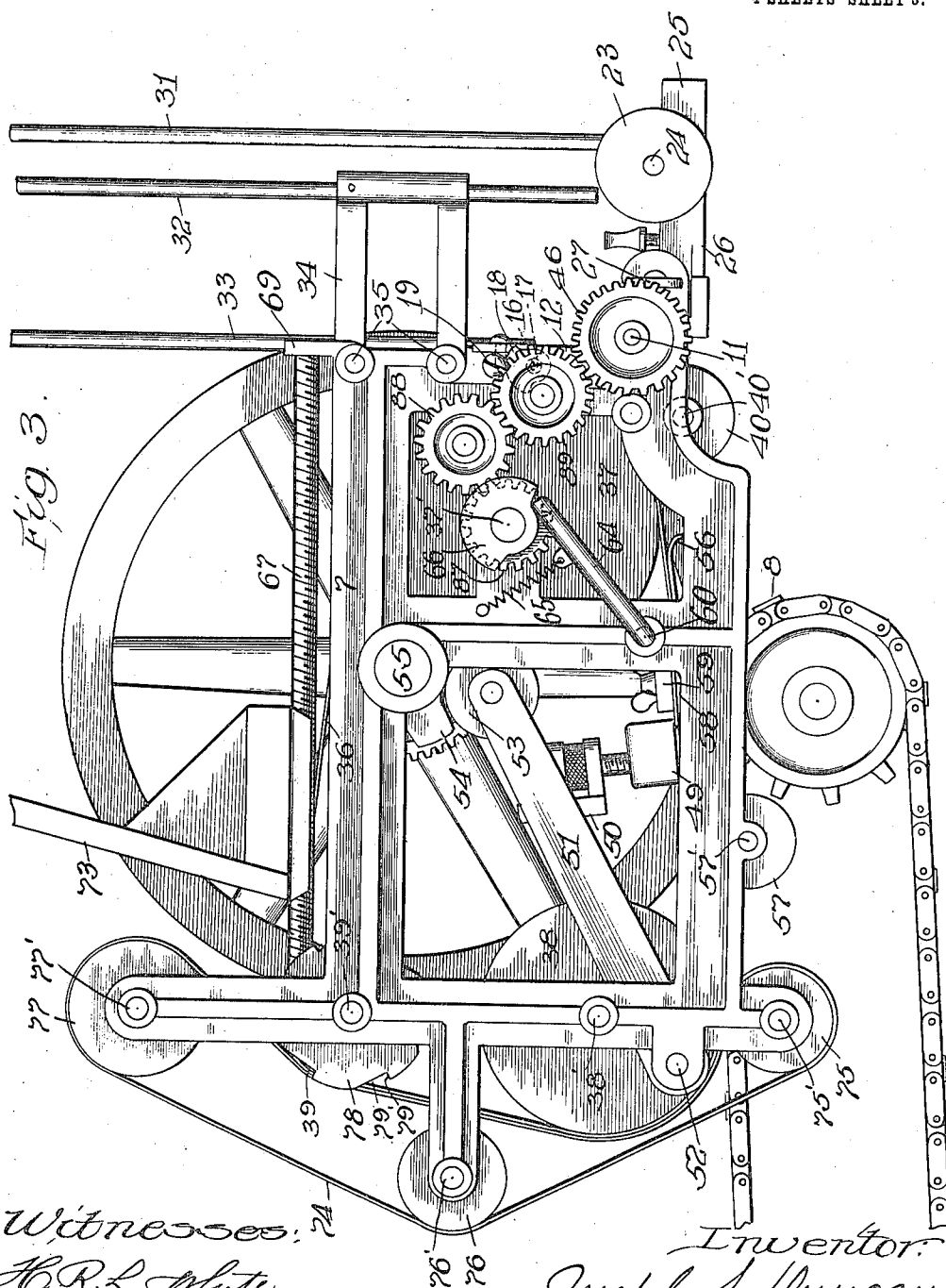


Witnesses
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Inventor:
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 By Wm. H. Bell, Atty.

1,063,335.

4 SHEETS—SHEET 3.



Witnesses: ²⁴
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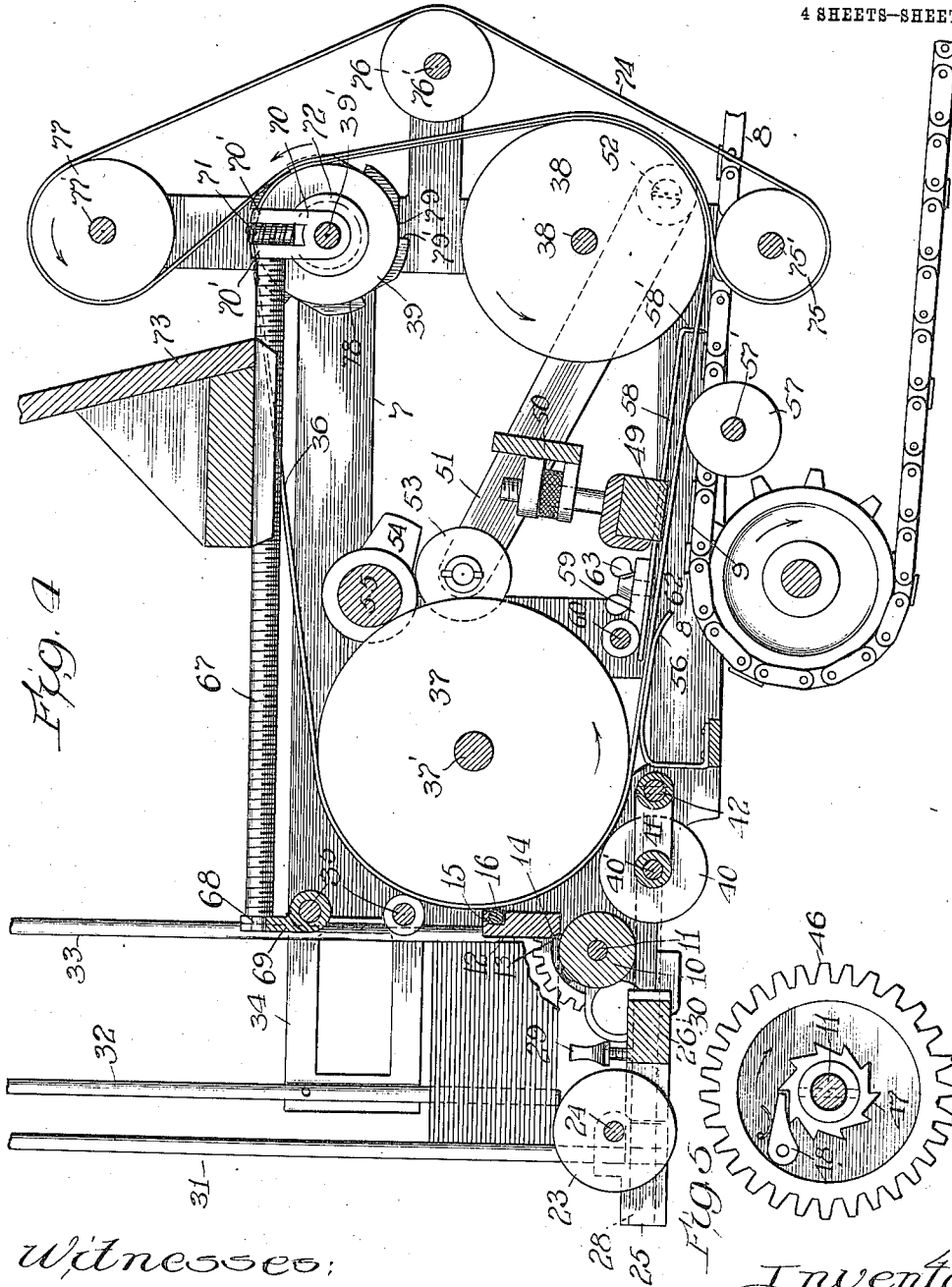
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4 SHEETS—SHEET 4.



Witnesses:
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Inventor:
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 By Wm. H. Delaney

UNITED STATES PATENT OFFICE.

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OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ENVELOP-FEEDING MECHANISM.

1,063,235.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed March 1, 1903. Serial No. 420,598.

To all whom it may concern:

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Envelop-Feeding Mechanism, of which the following is a specification.

The object of this invention is, primarily, to provide means of simple character for automatically and regularly feeding envelopes from a supply to an addressing machine where they are provided with addresses or other inscription and then to deliver said envelopes after they are addressed in regular order.

Further objects of the invention are to insure the feeding of the envelopes singly and at regular intervals; to operate the roll which draws the envelop from the supply at comparatively low speed to facilitate this part of the operation and then to accelerate the movement of the envelop to provide a mechanism of large capacity; to automatically and temporarily stop the envelop in printing position; and to quickly deliver the envelop after it is printed on to a discharge table.

The invention has other objects in view which will be fully pointed out hereafter in the detail description of the embodiment of the invention illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view without the support 73. Fig. 2 is an elevation of one side of the mechanism. Fig. 3 is an elevation of the other side of the mechanism. Fig. 4 is a sectional view on the line 4—4 of Fig. 1. Fig. 5 is a detail view showing the ratchet on the drawing roll gear. Fig. 6 is a detail view showing the adjusting devices for the throat plate.

Referring to the drawings, 7 designates the main frame of the mechanism which may be of any suitable character to carry the various parts thereof. This frame is supported in any suitable manner on or in proper relation to an addressing machine which comprises a carrier 8 operating intermittently to carry printing devices 9 one at a time into printing position.

A drawing roll 10 made of rubber, or other suitable material, is mounted on a shaft 11 supported in bearings in the frame and a plate 12 is arranged above the roll and supported in adjusted position rela-

tive thereto to form a throat 13 through which the envelopes are fed from the supply. This throat plate is supported with its lower edge in front of the vertical center of the drawing roll and adjacent to the perimeter thereof, the edge of the throat plate adjacent to the drawing roll being beveled at 14, all for the purposes hereafter described.

While a great variety of envelopes may be fed without any adjustment of the throat plate it is preferred to provide an adjustment thereof so that the throat can be regulated for feeding envelopes or other things which vary in thickness to a marked degree. To this end the throat plate may be provided with a recess 15 extending lengthwise thereof to receive an adjusting rod 16 which has eccentric bearings 17 at its ends in the main frame. The ends of the rod extend through the main frame and segmental plates 18 are rigidly mounted thereon to operate said rod. These plates are secured rigidly in adjusted position by screws 19 on the main frame, the heads of which overlap the segmental edge of said plates. An operating plate may answer the purpose but it is preferred to have one at each end of the rod. The throat plate may be supported on ears 20 on the frame by screws 21 which pass through slots 22 in said ears and enter said plate. By tightening the screws the throat plate can be rigidly secured in its adjusted position. These slots 22 are parallel and may be inclined, as shown, so that the position of the throat plate relative to the drawing roll may always be maintained throughout its length in any adjustment of the plate.

The envelopes are piled flat one upon another and supported on the drawing roll 10 and a plurality of supporting rolls 23. These supporting rolls are carried by a shaft 24 which is mounted in one part 25 of a two-part frame, the other part 26 of which is pivotally supported by set screws 27 in the main frame. Rods 28 are fastened to one part, as the part 25, and are rigidly secured in adjusted position by set screws 29 in openings 30 in the other part. This construction provides for an adjustment of the supporting rolls 23 relative to the drawing roll 10 to accommodate envelopes of different sizes. The envelopes are held in place on the rolls by back rods 31 which are mounted in sockets in the part 25 and by end rods 32 and front rods 33 mounted in arms 34 which are ad-

justably mounted on the cross rods 35 supported on the main frame. With these various adjustments of the parts which constitute the envelop supply holder provision can be readily made for receiving and holding
 5 envelopes of many different sizes and varieties. If desired, the rods 31 can be removed and the two part frame 25, 26, tilted upwardly to hold the envelops in an angular
 10 position. The rods 31 may also be removed to enable this two part frame to be swung upward to a vertical position adjacent to the drawing roll and beneath the arms 34, if desired, to make the mechanism more compact
 15 for shipment. A weight of any suitable kind is placed upon the supply of envelops to hold them in compact form.

It has been found that the best results are obtained if the drawing roll is operated at
 20 comparatively low speed. This drawing roll is employed to partly feed the lowest envelop from the supply and then the envelop passes into other parts of the feeding mechanism which are operated at relatively
 25 high speed to increase the capacity of the machine. Tapes 36 are trained over feed rolls 37, 38 and 39 carried by shafts 37', 38' and 39', respectively, mounted in the main
 30 frame. The rolls 37 are about four times the diameter of the drawing roll 10 and are located just behind the throat plate. Presser rolls 40 are mounted in brackets 41 on a rock shaft 42 supported in the main frame
 35 and carrying a rocker arm 43. The free end of this arm is held by a spring 44 in position to be operated by a cam 45 on the shaft 37'. The parts are timed so that when the envelop is fed by the drawing roll through the
 40 throat 13 the presser rolls 40 are moved away from the tapes 36 and the feed rolls 37 to leave an opening therebetween for the approaching envelop. When the envelop is fed by the drawing roll between the presser
 45 rolls 40 and the tapes 36, the presser rolls are automatically moved up by the cam 45 operating the rocker arm 43 and the rock shaft 42 to press the envelop against the tapes which thereupon feed the envelop
 50 along at greatly increased speed by reason of the difference in size of the drawing roll 10 and the feed rolls 37. When the tapes take hold of the envelop as just described the latter has not yet been entirely fed
 55 through the throat 13 and is still in contact with the drawing roll 10. The envelop may and generally will revolve the drawing roll at an increase over its ordinary speed. To
 60 allow for this I mount the driving gear 46 loosely on the drawing roll shaft 11 and secure a ratchet wheel 47 rigidly to said shaft (Fig. 5). A spring-pressed pawl 48 carried
 65 by the gear wheel engages the ratchet and thereby communicates the movement of the gear wheel to the drawing roll. The pawl and ratchet, however, allow the drawing roll

to revolve at a greater rate of speed than the gear wheel which takes place, as just described, when the envelop is caught by the tapes and the presser rolls 40 and fed forward thereby.

A platen 49 is adjustably supported on a
 70 cross bar 50 which is connected at its ends to arms 51 pivoted at 52 in the main frame. The cross bar and arms are preferably made in one casting as shown. These arms carry
 75 rolls 53 which are engaged by cams 54 on the drive shaft 55 and the parts are timed to operate the platen when a printing device and an envelop are in proper position one
 80 below the other and both below the platen. The envelop is supported in printing position on spring arms 56 fastened to the main frame and on idle rollers 57 carried by a
 85 shaft 57' mounted in the main frame. The spring arms are located back of printing position and the idle rollers 57 are located in front of printing position so that the envelop
 90 when supported thereon can be pressed by the platen into engagement with the printing device. The envelop is carried forward by the tapes from the presser rolls 40
 95 over the spring arms 56 and to the idle rollers 57 and these parts are all arranged in such relation to each other that envelops of many different sizes may be run through the feeding mechanism without requiring any
 adjustment of its parts.

The printing operation takes place at
 100 some distance in front of the drawing roll and after the envelop has left said roll and been carried forward by the other parts of the feeding mechanism. Means are provided to stop the forward movement of the
 105 envelop during the printing operation and for this purpose I provide two or more fingers 58 which have hooked ends 58' to engage the forward edge of the envelop. These fingers are supported in adjusted position
 110 on brackets 59 which are rigidly secured on a rock shaft 60. The fingers are provided with slots 61 (Fig. 1) to receive screws 62 which pass through said slots and the brackets 59 and are provided with cap
 115 nuts 63. The rock shaft 60 carries a rocker arm 64 at one end and the free end of this arm is held by a spring 65 in position to be operated by a cam 66 on the shaft 37'. The
 120 construction is such that the hooked ends of the fingers 58 will be also in position to engage the front edge of the envelop as it is fed forward by the tapes 36 and stop said
 125 envelop temporarily in position for the printing operation. At the proper time the fingers are swung upward out of the path of the envelop so that it can be fed forward after the printing operation.

The discharge table comprises a plurality
 130 of parallel screw-threaded rods 67 which are supported in horizontal position at the top of the mechanism. These rods turn

freely at one end in sockets 68 in brackets 69 mounted on the upper cross rod 35. At the other end each rod is supported in a bifurcated bracket 70 which is mounted on the shaft 39'. A worm gear 71 is rigidly mounted on each screw rod 67 between the arms 70' of the bracket 70 and this gear meshes with a worm 72 on the shaft 39'. The brackets 70 are loose and the worms 72 are tight on the shaft 39' and the screw rods 67 are held against endwise movement by the engagement of the worm gears with the worms. Other means for preventing endwise movement of the screw rods may be provided if desired. A support 73 of any suitable character is placed upon the screw rods 67 and as these rods are turned the threads thereon will move the support from the geared end of the rods backward to accommodate the increasing pile of envelops as the mechanism is operated. This support is preferably removable from the rods so that its position can be readily changed whenever necessary. The screw rods and the support constitute the discharge table.

After the envelops are printed they are moved forward from printing position by the tapes 36 and are elevated to the discharge table by said tapes in cooperation with elevating tapes 74 which travel on rolls 75, 76 and 77 mounted respectively on shafts 75', 76' and 77'. The rolls 75 are preferably located below the rolls 38 so that the printed envelop will be received between said tapes after it is moved forward from printing position by the feeding tapes 36 in cooperation with the rolls 57.

On the shaft 39' a plurality of disks 78 are rigidly mounted and these disks are provided with peripheral notches 79. The notches 79 are angularly disposed in the periphery of the disks and the shoulders 79' at the rear end of said notches are adapted to engage the lower edge of the envelop as it is fed forward by the tapes 36 and 74 and throw the envelop with a quick movement over the adjacent ends of the screw rods and the worm gears thereon against the support 73 or the envelops resting against said support. These disks constitute the means for delivering the envelops from the tapes to the discharge table on which they are supported in an inclined position against the support 73. The screw rods not only feed the support backward but also the envelops resting on said rods and they have a tendency to feed the envelops endwise. I therefore provide a side gage 80 which may be arranged on the support, as shown, or attached to the main frame or other part of the mechanism in a convenient manner. The screw rods will feed the envelops against said gage and thereby arrange the envelops on the discharge table in an even and regular pile. The drive shaft 55 may carry a crank

handle to be turned by hand or a pulley 81 to be driven by power applied in any suitable manner. This power shaft also carries a gear 82 which drives a gear 83 on shaft 37'. Gear 83 drives a gear 84 which drives an idle gear 85 loosely mounted on the end of the shaft 42 which in turn drives a gear 86 on the shaft 40' carrying the presser rolls 40 (Fig. 2). A gear 87 on shaft 37' drives an idle gear 88 which drives another idle gear 89 and the latter drives the gear 46 on the drawing roll shaft 11 (Fig. 3). The rolls 38 and 39 are operated by the tapes 36 which are driven by the rolls 37 and the elevating tapes 74 are driven by the feeding tapes 36 with which they contact through a part of their travel. The printing device carrier 8 may be driven in any suitable manner.

My improved feeding mechanism will feed envelops one at a time from a pile and discharge them after being printed in regular order and neatly arranged on the discharge table. While the drawing roll is operated at a comparatively low rate of speed to obtain the best results and insure the feeding of the envelops singly the other parts of the feeding mechanism are operated at a high rate of speed to enable the work to be done with greater rapidity. The difference between the rate of speed of operation of the drawing roll and the tapes corresponds substantially to the time consumed in the printing operation so that there is a continuous stream of envelops from the supply pile and to the discharge table. The drawing roll operates on the lowest envelop in the pile and draws the forward edge of the envelop downward into the throat between said roll and the throat plate and forward, in a downward direction, to the throat between the presser rolls 40 and the tapes 36. As the lowest envelop is thus fed from the pile the next envelop, and perhaps the next two or three envelops, will be moved forward against the beveled edge 14 of the throat plate. The beveled edge will stop the forward movement of the envelops above the lowest envelop and prevent more than one envelop being fed at a time, but the drawing action of the drawing roll is sufficient to feed the lowest envelop, the forward edge of said envelop sliding down on the beveled edge of the throat plate.

I have found that the construction and arrangement of parts herein shown and described and particularly the positioning of the beveled edge of the throat plate relative to the drawing roll will insure the feeding of a single envelop one at a time and I have also found that envelops of different sizes and shapes, within considerable limits of thickness, will be fed in this manner without necessitating a readjustment of the throat plate.

I have described my invention in connection with feeding envelopes for this is believed to be the most important use thereof, but obviously it may be used for feeding cards and many other things and I do not intend to limit or restrict the invention to feeding envelopes only and desire it to be so understood.

The invention is particularly useful in connection with an addressing machine for printing addresses on envelopes, but it will also be understood that it can be used in connection with any other kind of printing machine or with any other machine for which it is adapted.

The several parts are made adjustable to accommodate envelopes of different sizes, shapes and thicknesses and the stop fingers are also adjustable to locate the address properly thereon.

What I claim and desire to secure by Letters Patent is:

1. In a feeding mechanism of the class described, the combination of a drawing roll, a throat plate mounted in front of the vertical center of said roll to permit the forward end of a stack of envelopes to be supported by said roll, the lower edge of said throat plate being disposed below the top of said roll and beveled to flex the forward end of the lowermost envelop over the roll to thereby permit withdrawal of said envelop, and means for adjusting the throat plate vertically to accommodate envelopes of various thicknesses.

2. In a feeding mechanism of the character described, the combination of a frame, a drawing roll, a supporting roll movable in an arc on said frame and adjustably mounted so that the distance between said rolls may be varied, a throat plate having a beveled lower edge mounted in a vertical plane in front of the vertical center of the drawing roll, and means for adjusting said plate relatively to the roll.

3. In a feeding mechanism of the class described, the combination of a main frame, a drawing roll mounted in said frame, a two-part frame mounted to swing on said main frame, one of said parts being adjustable relative to the other and toward and away from the drawing roll, and a supporting roll carried by said adjustable part.

4. In a feeding mechanism of the class described, the combination of a main frame, a drawing roll mounted in said frame, a two-part frame comprising one part pivotally mounted in the main frame and another part adjustably supported on said pivoted part, and a supporting roll carried by said adjustable part behind the drawing roll.

5. In a feeding mechanism of the class described, the combination of a main frame, a drawing roll mounted in said frame, a

two-part frame comprising one part pivotally mounted in the main frame and another part adjustably supported on said pivoted part, said pivotal part having transverse openings therein and said adjustable part having rods adjustable in said openings, means for securing the rods in adjusted position in the openings, and a supporting roll carried by said adjustable part.

6. In a feeding mechanism of the class described, a supply holder comprising a drawing roll and a supporting roll behind said drawing roll forming therewith a support for a supply of material to be fed, a pivotally mounted slidable frame in which said supporting roll is secured, said frame being adapted to permit the adjustment of the supporting roll about the pivot center and also in a right line toward and from said drawing roll, and means disposed above said rolls for holding the supply in proper position thereon.

7. In a feeding mechanism of the class described, the combination of a main frame, a drawing roll mounted in said frame, a supporting roll behind said drawing roll, a frame carrying said supporting roll and adjustable relative to the main frame, vertical rods carried by said supporting roll frame, cross rods on the main frame, arms adjustable on said cross rods, and vertical rods carried by said arms.

8. In a feeding mechanism of the class described, the combination of a drawing roll, a throat plate supported adjacent to the drawing roll, said throat plate having a recess extending lengthwise therein, an eccentric rod operating in said recess to adjust the throat plate relative to the drawing roll, said rod having a bearing at each end of the plate whereby the plate is adjusted equally throughout its length and means for fastening said rod in adjusted position.

9. In a feeding mechanism of the class described, the combination of a main frame, a drawing roll mounted in the frame, a throat plate supported on the frame adjacent to said drawing roll and having a recess extending lengthwise therein, a rod arranged in said recess and having eccentric bearings in the frame at each end of the plate whereby the plate may be adjusted uniformly throughout its length, and means at the end of said rod for locking it in adjusted position.

10. In a feeding mechanism of the class described, the combination of a main frame, a drawing roll mounted in the frame, a throat plate supported on the frame adjacent to said drawing roll and having a recess extending lengthwise therein, a rod arranged in said recess and having eccentric bearings in the frame, a segmental plate on one end of said rod, and a screw operating in the frame and having its head arranged

to overlap and lock said plate to hold the rod in adjusted position.

11. In a feeding mechanism of the class described, the combination of a drawing roll positioned to support one end of a stack of envelopes and mounted to rotate in one direction only, means including a train of gears and a pawl and ratchet connection for positively actuating said roll to feed the bottom envelop from the stack, means for holding back the other envelopes in the stack while the bottom one is being withdrawn, said means being beveled at its lower edge to flex the lowermost envelop in the stack and permit its withdrawal, and means operated at a greater linear speed than the peripheral speed of the drawing roll for feeding said bottom envelop from the supply after it has been drawn forward a predetermined distance by said drawing roll, said pawl and ratchet connection between the drawing roll and its actuating mechanism being adapted to permit said roll to rotate freely in one direction, under the influence of the envelop being withdrawn, at a peripheral speed equal to the speed of said envelop.

12. The combination with a printing device and a platen, of a drawing roll for feeding envelopes, or the like, one at a time from a supply, means for conveying the envelopes from the drawing roll to printing position between the printing device and platen, a spring and a roller disposed, respectively, on opposite sides of the platen for supporting said envelopes during the printing operation, a rock-shaft, a finger mounted thereon and adapted to hold the envelopes against movement by said feeding means during the printing operation, means whereby the position of said finger may be adjusted along the path of travel of the envelop, and means to rock said shaft whereby the finger is lifted out of engagement with the envelop after the envelop has been printed.

13. In a feeding mechanism of the class described, the combination of a drawing roll, means to rotate said roll to feed envelopes or the like one at a time from a supply, feed rolls, means to actuate said feed rolls at a speed greater than the peripheral speed of said drawing roll, endless tapes trained over said feed rolls and adapted to carry the envelopes along at a greater speed than the normal speed of the drawing roll, and presser rolls mounted to be intermit-

tently engaged with the surface of said feed rolls to assist in withdrawing the envelopes from said drawing roll.

14. The combination with a printing device and a platen, of a drawing roll for feeding envelopes or the like one at a time from a supply, tapes for feeding the envelop from the drawing roll to printing-position between said printing device and platen, yielding and rotary means on opposite sides respectively of the printing device to hold the envelop in engagement with the tapes, and means for holding the envelop against the action of the tapes during the printing operation.

15. The combination with a printing device and a platen, of a drawing roll for feeding envelopes or the like one at a time from a supply, means for feeding the envelop from the drawing roll to printing position between said printing device and platen, spring arms on one side of the printing device and rollers on the other side thereof to sustain the envelop during the printing operation, and means for stopping the forward movement of the envelop during the printing operation.

16. In a feeding mechanism of the class described, the combination of a drawing roll, a throat plate mounted in front of the vertical center of said roll to permit the forward end of a stack of envelopes to be supported by said roll, the lower edge of said throat plate being disposed below the top of said roll and beveled to flex the forward edge of the lowermost envelop from the plane of the stack of envelopes to facilitate its withdrawal from the stack, and means for adjusting said throat plate to accommodate envelopes of various thicknesses.

17. In a feeding mechanism of the class described, the combination of a drawing roll, and a throat plate mounted in front of the vertical center of said roll to permit the forward edge of a stack of envelopes to be supported by said roll, the lower edge of said throat plate being disposed beneath the plane of the lowermost envelop in the stack and beveled to flex the forward edge of said lowermost envelop so that said envelop may be withdrawn from the stack between the roll and the throat plate.

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