

G. F. RUSS.
 ENVELOPE FILLING AND CLOSING MACHINE.
 APPLICATION FILED OCT. 20, 1920.

1,421,835.

Patented July 4, 1922.
 7 SHEETS—SHEET 1.

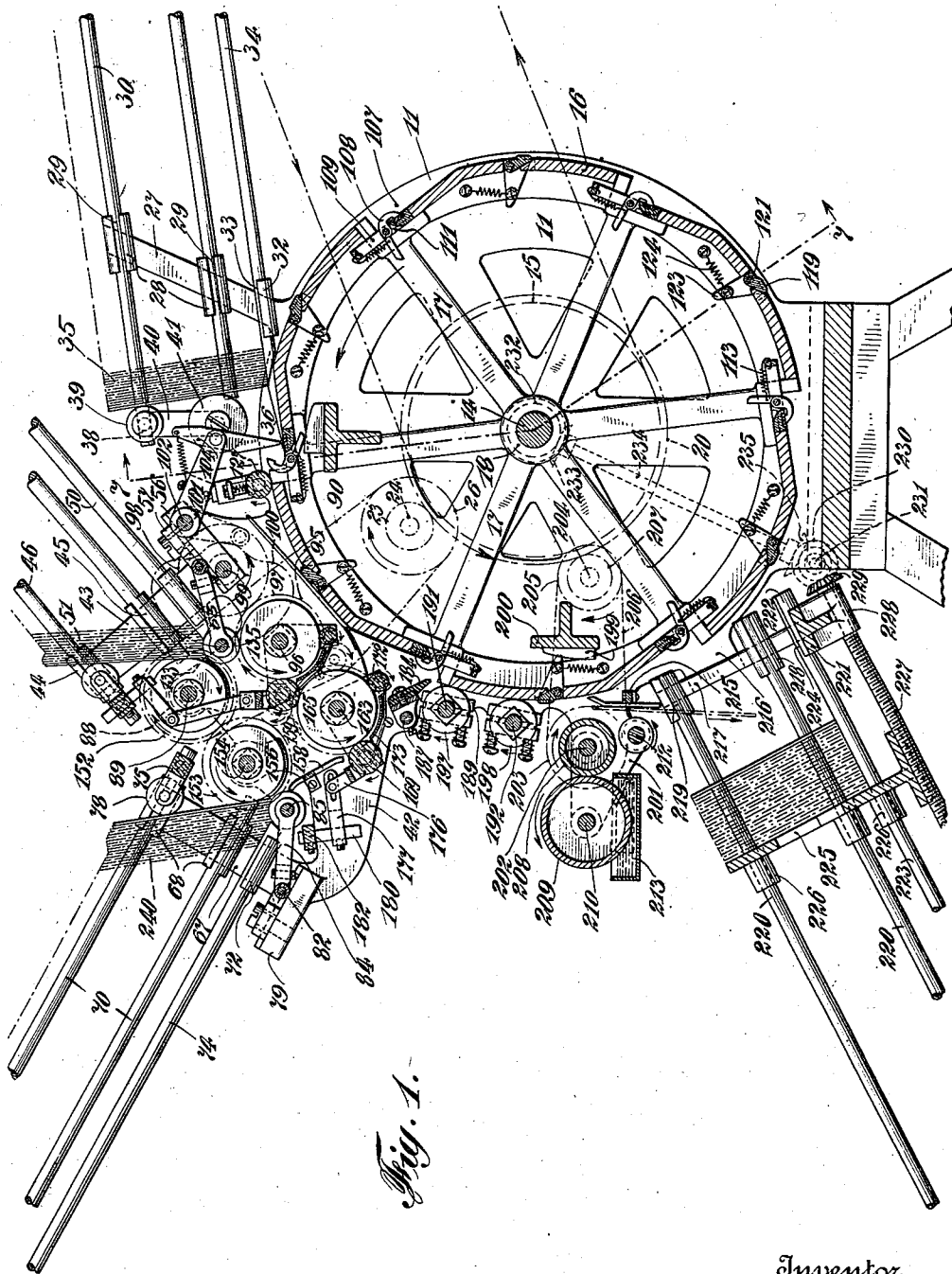


Fig. 1.

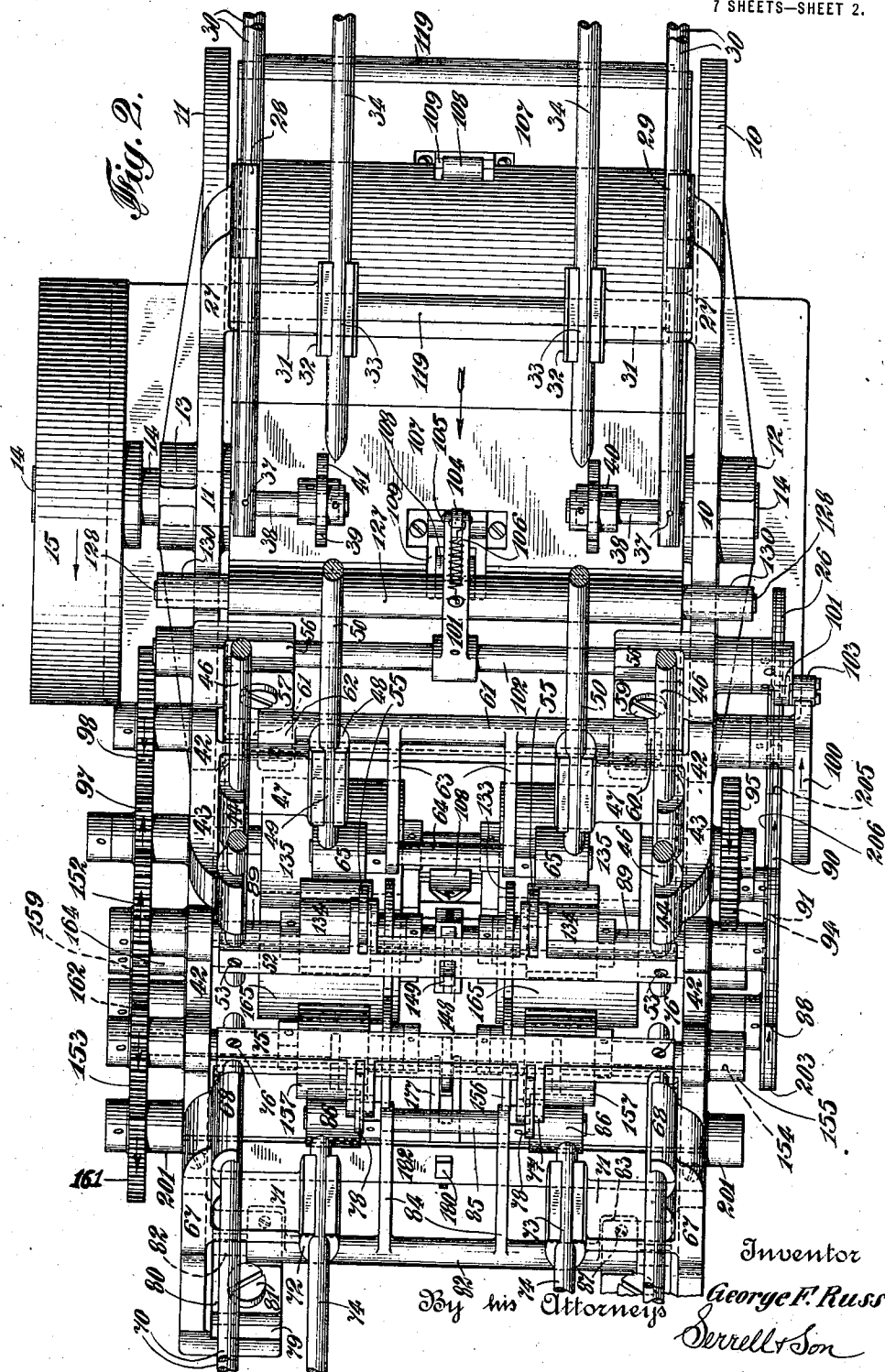
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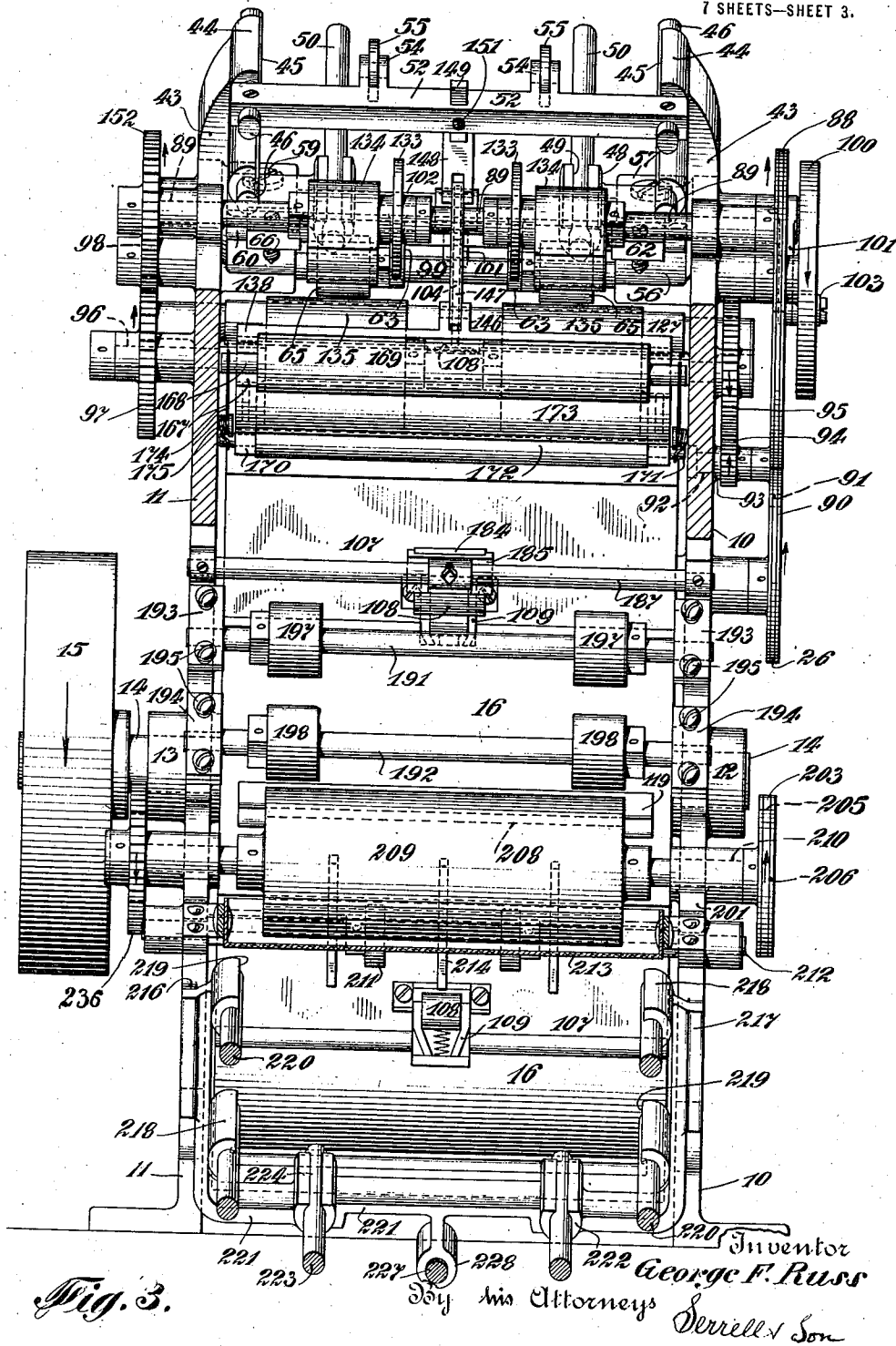


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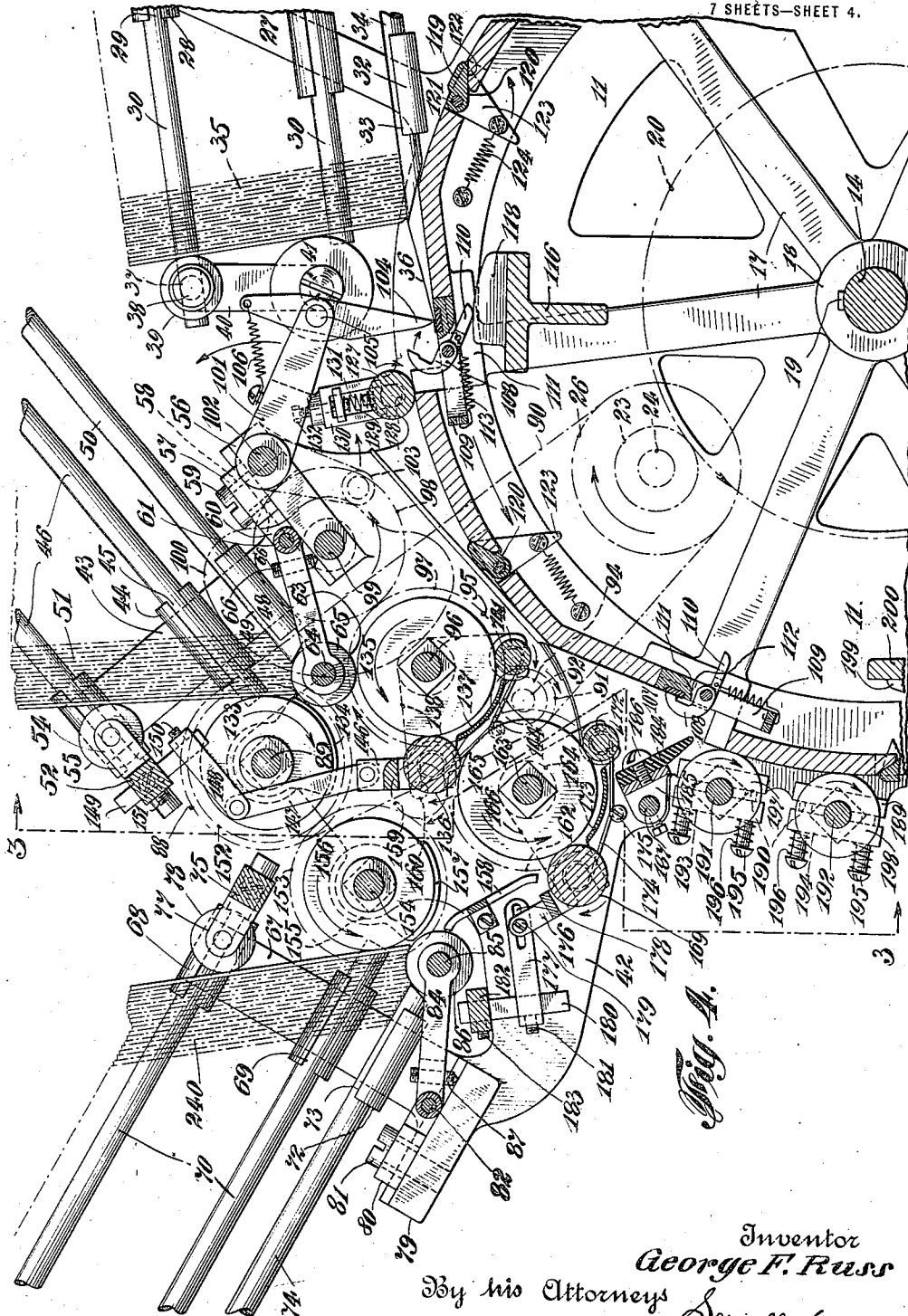


Fig. 4.

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7 SHEETS—SHEET 5.

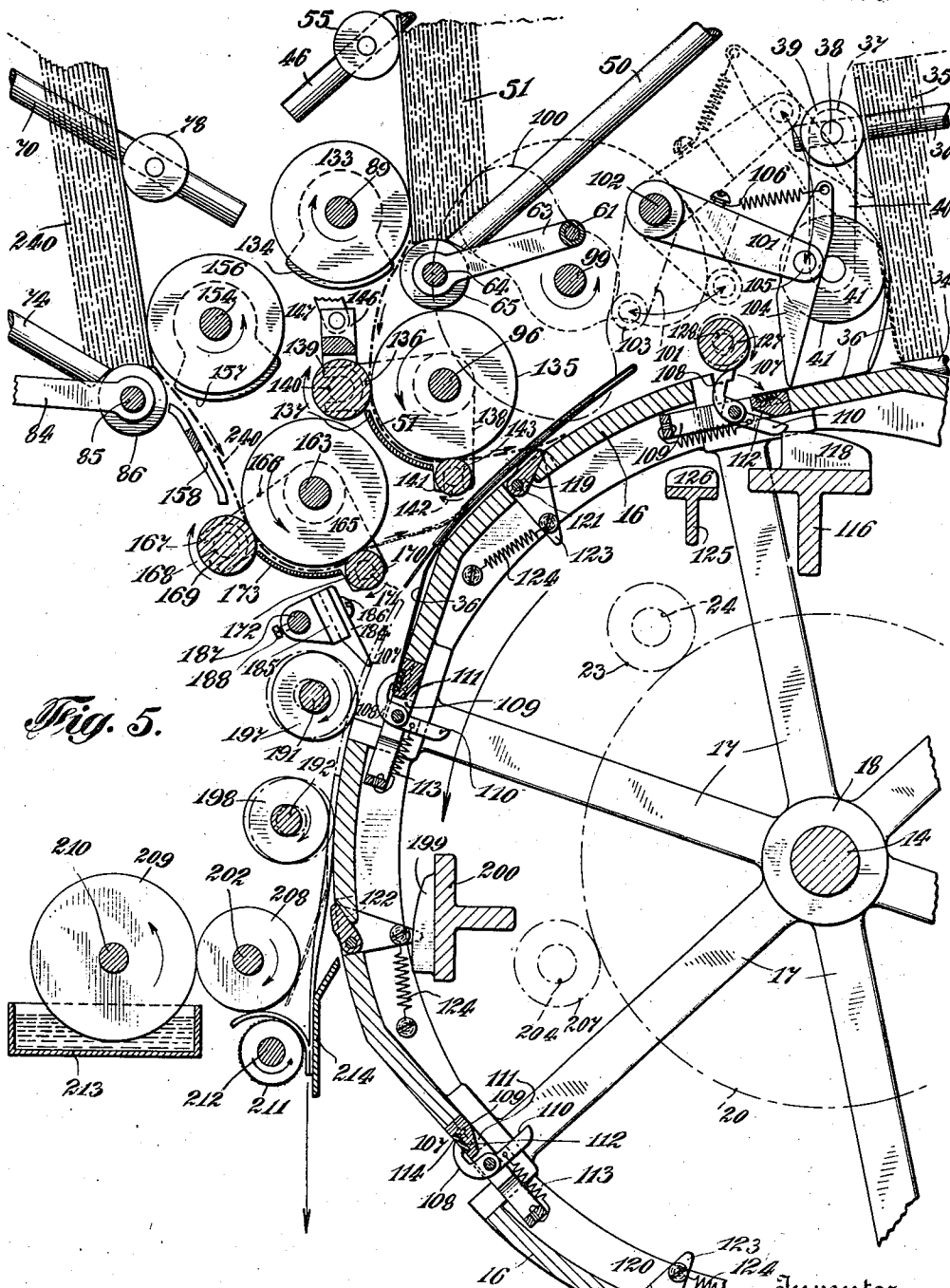


Fig. 5.

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7 SHEETS—SHEET 7.

Fig. 8.

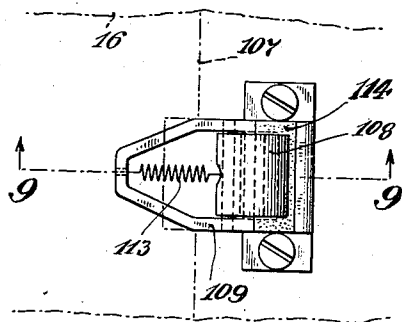


Fig. 9.

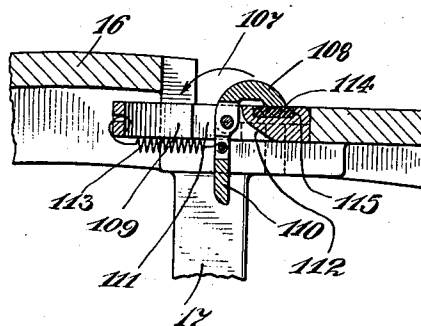


Fig. 10.

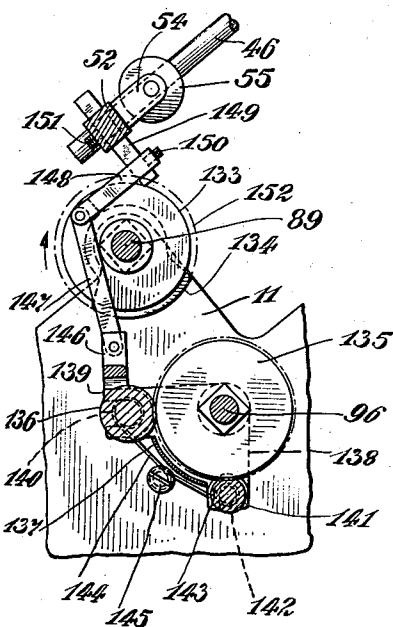
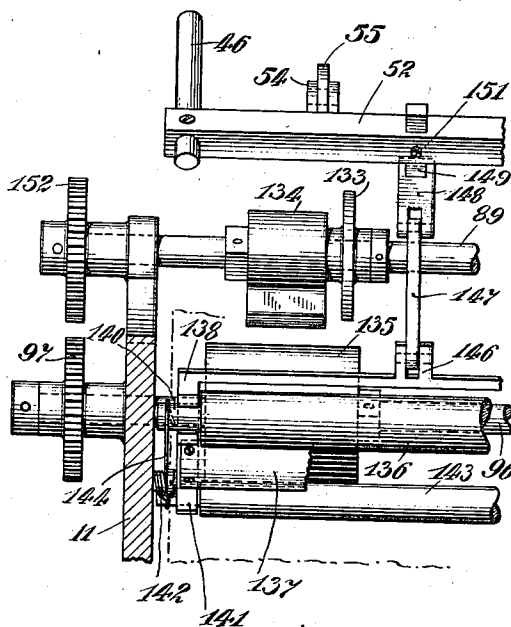


Fig. 11.



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UNITED STATES PATENT OFFICE.

GEORGE F. RUSS, OF JERSEY CITY, NEW JERSEY.

ENVELOPE FILLING AND CLOSING MACHINE.

1,421,835.

Specification of Letters Patent.

Patented July 4, 1922.

Application filed October 20, 1920. Serial No. 419,256.

To all whom it may concern:

Be it known that I, GEORGE F. RUSS, a citizen of the United States, residing at Jersey City, in the county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Envelope Filling and Closing Machines, of which the following is a specification.

My present invention relates to machines for inserting mail matter, such as circulars, letters, bills, notices, etc., into envelopes.

The principal objects of the invention are to provide means for inserting a plurality of circulars or the like into envelopes; to provide means for automatically advancing the envelopes one by one, and while so doing to turn the flap into substantially the same plane as the body of the envelope; to open the mouth of the envelope and hold the flap open during the insertion of such matter; to advance the envelope after the insertion of the mailable matter; to provide means whereby the contents of the envelope will be pushed further into the envelope if not sufficiently therein; to advance the envelope with its contents to a position where the flap of the envelope will be moved to closed position, and also sealed, when desired.

While I am aware that machines have heretofore been made for accomplishing similar objects, to the best of my knowledge and belief, the mechanism and mode of operation herein shown and described is new.

The details of construction and operation are hereinafter particularly described.

In the accompanying drawings:

Figure 1 is a central vertical section of my improved machine.

Fig. 2 is a plan of the same.

Fig. 3 is a front elevation, in section on the broken line 3—3 of Fig. 4.

Fig. 4 is a diagrammatic sectional view in enlarged size with some of the parts broken away.

Fig. 5 is a similar view with the cylinder in a more advanced position.

Fig. 6 is a detail view partly in section of the mechanism for opening the mouth of the envelope.

Fig. 7 is a vertical section on the broken line 7—7, Fig. 1.

Fig. 8 is a top view of one of the dogs and its frame.

Fig. 9 is a sectional view of the same taken on the line 9—9, Fig. 8.

Fig. 10 is a detail side view partly in section of the adjustable feed for the circulars, and

Fig. 11 is a front elevation of the same.

Similar reference characters denote like parts throughout the several views.

The main frame of the machine consists of two spaced vertical side plates 10 and 11 which may be bolted or otherwise secured to any suitable base or foundation.

Within aligned openings in the center of the frame plates 10 and 11, are fixed bearings 12 and 13 for the main shaft 14 to one end of which, projecting beyond the frame plate 11 is fixed a drive pulley 15.

A cylinder 16 is mounted upon the main shaft 14 between the frame plates 10 and 11, there being broad spokes 17 having an elongated hub 18 which extend inwardly from one side of the cylinder to near its center, said hub being keyed or otherwise fixed to the main shaft as at 19. The other half of the cylinder 16 is open or without spokes to permit clearance of the shafts and arms which extend into the cylinder while the same is rotating.

A gear wheel 20 is mounted on the main shaft 14 at a predetermined point within the open half of the cylinder, said wheel being provided with a hub 21 which is keyed or otherwise secured to said shaft as at 22.

This gear wheel 20 meshes with a pinion 23 fixed to the inner end of a transverse shaft 24 supported in a bearing 25 in the frame plate 10. A sprocket wheel 26 is secured to the other or outer end of the shaft 24 beyond the frame plate 10.

27 indicates two upright arms extending from the side plates with which they are preferably integral, or they may be secured at their lower ends to the side plates in any suitable manner; these arms are in alignment and are slightly inclined backwardly. Integral with or secured to each of these arms there are sleeves 28, inclined slightly downwardly in the reverse direction to the inclination of the arms, the inner or facing sides of the sleeves being cut away leaving a longitudinal slot 29. Rods 30 pass through and are supported by these sleeves, and consequently such rods are positioned at the same inclination with the sleeves, that is, they are inclined slightly down-

wardly towards the front of the machine. Brackets 31 extend from and between the two opposite upright arms 27 at a predetermined distance above the periphery of the cylinder 16, to which brackets are secured two spaced sleeves 32 having longitudinal slots 33 in their upper surface; rods 34 pass through and are supported by these sleeves 32, their forward ends coming closely adjacent the periphery of the cylinder, the under surface of these ends of said rods being beveled to clear the cylinder in its rotation. These rods 30 and 34 with their supports form the holder or magazine for the envelopes 35 which are placed vertically between the side rods 30 with the flap edges resting down upon the two lower rods 34, the flaps 36 pointing upward and facing forward.

It will be seen that the longitudinal slots in the respective sleeves prevent the envelope contacting with the sleeves as they move forward in the magazine, their ends passing freely between the smooth surfaces of the side rods and their under edges sliding easily over the smooth surfaces of the bottom rods. The envelopes are placed into the magazine in considerable quantity and will move down the inclined holder by gravity when the machine is in operation, but if desired a weight, or other pusher (not shown,) may be placed in the magazine to the rear of the stack.

The two top side rods 30 extend forward a predetermined distance beyond the forward ends of the bottom rods 34 and to each of these ends of the top side rods are secured a bearing 37 for a short horizontal shaft 38, which shafts extend toward each other within the magazine and have loosely mounted upon their free ends an anti-friction roller 39. A hanging link 40 is connected at one end to each of the shafts 38, and to the lower end of each of these links there is pivotally connected another anti-friction roller 41, which rollers are of somewhat larger diameter than the rollers 39. These rollers 39 and 41 bear against the forward envelope in the magazine to retain the stack of envelopes in proper position, but allow the envelopes to be withdrawn one at a time by the mechanism hereafter described.

42 denotes two vertical bracket extensions of the frame plates 10 and 11. These brackets are in alignment upon the opposite upper portions of the two frame plates at a predetermined distance to the left of the envelope magazine, and correspond with each other in shape.

Projecting upwardly from the top of each bracket 42 at the end nearest the envelope magazine, and at a forward inclination, is a post 43 provided with sleeves 44 having longitudinal slots 45 in their inner

or facing sides; these slotted sleeves have the same inclination as the posts 43. Rods 46 pass through and are supported by these sleeves. At a point below the rods 46 a cross bar 47 extends between the posts 43, to which its ends are secured, and to this cross bar there are secured two spaced sleeves 48 having longitudinal slots 49 in their top. Rods 50 pass through and are supported by the sleeves 48. The posts 43, rods 46 and 50 form a holder or magazine for the circulars 51 or other matter intended for insertion in the envelopes. This magazine is inclined in the same direction as the envelope magazine but at a greater degree.

The circulars 51 or other mailable matter are arranged vertically in the magazine, that is with one longitudinal edge resting crosswise upon the smooth upper surfaces of the rods 50 over which they will readily slide toward the front of the inclined magazine by gravity, but if desired, a weight or other pusher (not shown,) may be placed in the magazine at the rear of the stack.

A cross bar 52 is supported by the forward ends of the two top rods 46, the ends of the rods passing through holes in the bar adjacent its ends, and it is fixed in the desired position on such rods by means of screws 53 by which it may be adjusted nearer to or further from the ends of such rods. At equal distances from each end of the cross bar 52 on one side thereof, there are two spaced lugs 54 between each pair of which is pivoted an anti-friction roller 55 which rollers bear against the upper front of the stack of circulars or other contents of the magazine.

At that end of each vertical frame bracket 42 nearest the envelope magazine and on the facing sides of said frame brackets, there is an inwardly extending bracket 56 which is at an inclination corresponding with that of the magazine for the circulars, and upon each of these brackets 56 there is mounted a slidable block 57 provided with a longitudinal slot 58 through which passes a set-screw 59 by which the blocks 57 are clamped to the brackets 56. The forward ends of the blocks 57 are recessed on the inner side as at 60 and have transverse holes therein which provide bearings for a rock shaft 61 having integral lugs 62 adjacent such bearings. This shaft 61 is provided with two spaced arms 63 which project forwardly at right angles to the shaft.

The free ends of the arms 63 form bearings for a transverse shaft 64 upon each projecting end of which is fixed a rubber roller 65, the peripheries of which are adjacent the beveled under surface of the two bottom rods 50 of the magazine for the mailable matter, and in such position thereto that a number of the most forward circulars in the magazine rest upon the pe-

riperies of these rollers 65 (see Figs. 1, 4 and 5.) In the lugs 62 on the rock shaft 61 there are threaded vertical holes into which screws 66 are inserted, the lower ends of which bear upon the top of the brackets 56 and by means of which the shaft 61 may be rocked thereby raising or lowering the arms 63 and bringing the rollers 65 nearer to or further from the bottom of the magazine for the circulars, while by the manipulation of the screws 59 the rollers may be moved backward or forward when desired.

At a predetermined distance from and forward of the circular holding magazine 15 above described, and positioned somewhat lower, there is another magazine or holder for circulars or other matter for insertion into the envelopes, which second magazine is of like construction to the one already described, but inclined in the opposite direction, that is, the side posts 67 extend upwardly from the frame brackets 42 inclined towards the upper magazine. These side posts are provided with sleeves 68 cut away 25 on their inner or facing sides, leaving longitudinal slots 69. Rods 70 pass through and are supported by these sleeves. Brackets 71 extend from and between the two posts 67, and these brackets are provided 30 with two spaced sleeves cut away and leaving longitudinal slots 73 in their tops. Rods 74 pass through and are supported by these sleeves and form a rest for the circulars 240 or other mailable matter which are arranged 35 in this magazine in the same manner as in the upper or first described circular holder.

A cross bar 75 is supported by the forward ends of the two top rods 70, the ends of which pass through holes in the cross bar 40 adjacent its ends, and it is secured by screws 76 which allow of the adjustment of the bar on the rods.

As in the other circular holder, this cross bar 75 is provided with two pairs of spaced 45 lugs 77 between each pair of which is pivoted an anti-friction roller 78, which rollers bear against the upper front of the stack of circulars in this holder.

There is also provided at this forward 50 end of the side frame brackets two aligned brackets 79 similar to the brackets 56 inclined at the same angle as the magazine at this end of the machine, and slidable blocks 80 similar to the blocks 57 are provided with 55 set screws 81 and rock shaft 82 provided with lugs 83. This shaft is also provided with two spaced arms 84, the free ends of which form bearings for a transverse shaft 85 carrying on each end a fixed rubber 60 roller 86, the peripheries of which rollers are adjacent the beveled under surface of the two bottom rods 74 of the magazine, and as in the other instance are in such relative position to the magazine that a number 65 of the most forward circulars in this maga-

zine rest upon the peripheries of these rollers 86, (see Figs. 1, 4 and 5.) Screws 87 similar to the screws 66, and for the same purpose, pass through threaded holes in the lugs 83.

The cylinder 16 revolves in a direction indicated by the arrow. The gear wheel 20 on the main shaft 14 meshing with the pinion 23 on the shaft 24 turns the sprocket wheel 26 in the direction indicated by the arrow. 75 88 denotes another sprocket wheel fixed to a transverse shaft 89 supported in bearings in the frame brackets. A sprocket chain 90 passes over the two wheels 26 and 88. 91 denotes a spur wheel intermediate the 80 sprocket wheels 26 and 88, and is fixed to the end of a shaft 92 supported in a bearing 93 in the side frame 10. This spur wheel also engages with the sprocket chain 90. A gear wheel 94 fixed to the shaft 92 meshes with 85 the gear wheel 95 fixed to the transverse shaft 96 supported in suitable bearings in the side frames. To this shaft 96 is fixed a gear wheel 97 which in turn meshes with the gear wheel 98 fixed to a shaft 99. Upon this shaft 99 there is also fixed a cam 100. 101 indicates a bell crank lever fixed to a shaft 102 supported in bearings in the side brackets. To one end of this lever 101 there is pivoted a roller 103. The other end of the lever is 95 bifurcated and a picker finger 104 inserted therein and secured by a pivot pin 105. A spiral spring 106 is connected at one end to the upper end of the finger 104 and at its other end to the lever. The cam 100 con- 100 tacts with the roller 103 on the lever 101.

The shaft 99 carrying the cam rotates in the direction indicated by the arrow, consequently in rotation the bell crank lever 101 and the picker finger 104 will be moved by 105 the action of the cam upon the roller 103 from the position shown in Figs. 1 and 4 to that indicated by dotted lines in Fig. 5, and it will be noted that in this position the end or point of the finger is in contact with the 110 front of the stack of envelopes in the magazine, being held in said position by the contraction of the spring 106, at a point above the upturned flap of the first envelope. It will also be apparent that this spring will 115 insure the finger continuing to bear against the body of the first envelope during the downward movement of the bell crank lever 101 whereby the finger will pass between the body of the first envelope and its upturned 120 flap so that the flap will be carried outward from the body of the envelope and pressed down upon the periphery of the rotating cylinder 16 as shown in Figs. 1, 4 and 5. The spring 106 permits the point of the 125 finger to continue to press the flap in contact with the moving cylinder until the cam 100 again begins to act upon the roller 103.

Upon the periphery of the cylinder 16 at equal distances apart there are inclined de- 130

pressions 107 and it is upon these inclined portions that the flaps of the envelopes are laid by the finger 104 above described, the movements being so timed that one of these inclined portions of the cylinder reaches the forward end of the envelope magazine at the same time that the finger opens the flap of an envelope.

A gripper or dog 108 journaled in a frame 109 is secured to the cylinder 16 in the forward end of each depressed inclination 107. Each of these dogs has an integral stem 110 which projects through slots 111 in the cylinder, the under part of each slot being inclined as at 112 at one side of such stems.

One end of a spiral spring 113 is connected to the stem of each dog, the other ends of such springs being secured to the frames 109. Pads 114 of rubber or other suitable material are inserted into recesses 115 in the dog frames with which the jaws of the dogs contact when in their normal positions; these dogs and their frame are shown in detail in Figs. 8 and 9 of the drawings.

An arm or bracket 116 secured to the side frame 10 by bolts 117 or other suitable means extends to the vertical center of the cylinder 16 within the same, upon the free end of which arm there is a stationary cam 118 directly in the path of the dogs 108.

When in the rotation of the cylinder 16 the stem 110 of a dog 108 contacts with the stationary cam 118, it rides over the top of the cam opening the jaw of the dog as shown in Figs. 1 and 4. The movements are so timed that this occurs at the time the flap of an envelope has been opened and pressed into one of the inclined depressions 107 as before described and as shown in Figs. 1 and 4. When the stem of the dog passes off the cam 118 a spring 113 contracts thereby closing the jaw of the dog upon the forward end of the open flap of the envelope, gripping the flap and drawing the envelope out of the magazine and along with the rotating cylinder, the flap of the envelope being in the inclined depression while the body of the envelope rests upon the higher surface of the cylinder, thus the flap is bent downward leaving the mouth of the envelope unobstructed.

119 denotes a plurality of pawls, located within transverse slots 120 in the cylinder between the dogs 108 but out of alignment therewith. One end of each pawl is fixed to a shaft 121 while the under surface of its free end normally rests upon an inclined portion 122 of the slot. A lug 123 at one side of each pawl and fixed to the shaft 121 extends into the cylinder. A spiral spring 124 is connected at one end to the lower part of each lug 123, their other ends being fastened to the cylinder.

An arm or rod 125 fixed to the side frame 10 extends to a point in line with the path

of the lugs 123 and is provided at its end with a stationary cam 126 with which these lugs contact during the rotation of the cylinder 16. As the points of the lugs 123 ride over the top of the cam 126 the shafts 121 are rocked thereby raising the free ends of the pawls (see Fig. 6), and when the lugs pass off said cam the pawls are drawn back to normal position by the contraction of the spiral springs 124. The cam 126 is in such position that it operates one of the pawls 119 at the moment that one of the envelopes has been drawn by one of the dogs 108 to the position shown in Fig. 6 so that when the free end of the pawl is raised it presses upon the under surface of the body of the envelope at or about the center thereof.

127 indicates a presser roll mounted on a shaft 128 supported in a vertical slot 129 in the bearing frame 130. A spiral spring 131 is located in the slot 129 above the shaft 128 which spring may be contracted or expanded by the manipulation of the screw 132, thus varying the pressure of the roll.

As an envelope is drawn from the magazine by one of the dogs 108 it passes under this roll 127 which revolves in the direction of the arrow, this not only holds the body of the envelope down upon the periphery of the cylinder 16 but also acts in conjunction with the pawls 119 to open the mouth of the envelope as shown in Fig. 6.

Two spaced apart anti-friction rolls 133 are mounted upon the shaft 89 which rolls lightly contact with the front of the stack of circulars 51 in the upper circular magazine and in conjunction with the rolls 55 serve to retain the circulars in this magazine, but allow them to be withdrawn one at a time by the means next described.

Two spaced cams 134, preferably of rubber, are fixed to the shaft 89 and extend slightly beyond the peripheries of the rolls 133. These cams rotate in the direction of the arrows and in their movement periodically contact with the forward circular in the magazine, carrying it down into contact with the periphery of the rollers 65 which direct the circular downwardly (as indicated by the arrow and broken line in Fig. 5,) when it is received between rollers 135, preferably of rubber, mounted on a transverse shaft 96 and a roller 136 revolving in opposite direction which continue the downward movement of the circular which passes off the roll 136 upon a guide 137 curved to conform to the periphery of the rollers 135. The guide 137 is fixed to a bracket 138 loosely mounted on the shaft 96 which bracket also supports a slotted bearing 139 for the shaft 140 upon which the roller 136 is mounted. Upon this bracket 138 adjacent the lower end of the guide 137 there is another slotted bearing 141 for a shaft 142 upon which is mounted a roller

143, the periphery of which is closely adjacent the peripheries of the rollers 135 and as the circular leaves the guide 137 it passes between the rollers 135 and 143 and is carried toward the rotating cylinder 16. The movements are so timed that at this moment one of the dogs 108 has drawn an envelope with its opened mouth directly in front of the circular which is by the action of the rollers 135 and 143 pushed into the envelope as it advances (see Fig. 6).

Wire springs 144 coiled at their centers around screws 145 which project from the side frames 10 and 11 bear with their free ends against the ends of the shafts 140 and 142 mounted in the slotted bearings 139 and 141 which gives the rollers 136 and 143 a resilient bearing upon the circulars as they pass between these rolls and the roller 135.

Integral with the bracket 138 and extending vertically therefrom at its longitudinal center is a bifurcated lug 146 into which is pivotally connected one end of a link 147, to the other end of which is pivotally connected a shorter link 148. Adjacent the free end of the link 148 there is a square sided opening into which is inserted one end of a square sided bar 149 which is adjustable therein, and retained in position by a set screw 150 passing through a hole in the end of the bar. The other end of this bar 149 passes through a square sided opening in the cross bar 52 in which it is adjustable and retained in a fixed position by a set screw 151. The guide 137 is spaced a sufficient distance from the rollers 135 to permit the free passage of the thickest material made use of for mailing, and the feed of different thicknesses of material is provided for by the adjustability of the links 147, 148, and bar 149, together with the resilient bearing of the rollers 136 and 143.

A gear wheel 152 is fixed to the end of the transverse shaft 89 at the end opposite to that upon which the sprocket wheel 88 is fixed, and this gear wheel 152 meshes with another gear wheel 153 upon a shaft 154 mounted in bearings 155 in the side frames 10 and 11.

Two spaced apart anti-friction rollers 156 are mounted upon the shaft 154, which rollers lightly contact with the front of the stack of circulars in the lower or second magazine for the mailable matter and in conjunction with the rolls 78 serve to retain the mailable matter in this magazine but allow them to be withdrawn one at a time by the means next described.

Two spaced cams 157 preferably of rubber, are fixed to the shaft 154 and extend slightly beyond the peripheries of the rollers 156. These cams rotate in the direction of the arrows and in their rotation periodically contact with the forward circular in this magazine carrying the circular down

into contact with the periphery of the revolving roll 86 which directs the circular upon the slightly inwardly inclined guide members 158 supported by the side frame brackets.

An idler gear 159 mounted on a pin 160 fixed to the side frame 11 meshes with the gear wheel 153 and also with a gear wheel 162 on a shaft 163 supported in bearings 164 in the side frame 11. Fixed to the shaft 163 are two spaced rollers 165, preferably of rubber, which revolve in the direction of the arrows. A bracket 166 is loosely mounted on the shaft 163 and is provided with slotted bearings 167 for a transverse shaft 168 upon which is mounted an elongated roll 169. This bracket is also provided with slotted bearings 170 for a transverse shaft 171 upon which is mounted a roll 172 and between these rolls 169 and 172 the bracket 166 carries a curved guide 173. Wire springs 174 are coiled at their center around screws 175 upon the side frame brackets with their ends bearing upon the shafts 168 and 171. Integral with the bracket 166 and extending upwardly at a slight inclination at the longitudinal center thereof is a bifurcated lug 176. A link 177 having a longitudinal slot 178 in one end is inserted in the lug 176 and a screw or rivet 179 passes through the said slot giving the link a pivotal and adjustable connection with the lug. In the free end of the link 177 there is a square sided opening into which passes one end of a square sided bar 180. This bar is adjustably retained in said opening by a set screw 181 which passes through a threaded hole in the end of the link. The other end of the bar passes through a square sided opening in a cross bar 182 supported between the side frame bracket extensions. The upper end of the bar 180 is adjustably retained in the opening in the cross bar by means of a set screw 183, which extends through a threaded hole in one side of the cross bar. The guide 173 is spaced a sufficient distance from the rollers 165 to permit the free passage of the thickest material made use of for mailing, and the feed of different thicknesses of material is provided for by the adjustability of the link 177, and bar 180, together with the resilient bearing of the rollers 169 and 172.

As the circulars pass off the lower ends of the guide members 158 they are gripped between the rollers 165 and roll 169 and are thereby carried onto the curved guide 173 over which they are carried by the rollers 165 and then between the rollers 165 and roll 172 by which they are directed towards the advancing envelope into which a circular from the upper magazine has previously been inserted in the manner before described. The circular 240 from the second magazine passes into the envelope un-

derneath the first circular which projects slightly from the envelope, and this second circular tends to push the first circular fully within the envelope. In case the contents of the envelope are not pushed far enough into the same after passing the feed mechanism of the second circular magazine, I provide a pusher finger 184 which is arranged in the path of the envelopes at a distance from the cylinder to clear the flaps of the envelope as they pass, but near enough so that any matter projecting from the mouth of the envelope will contact with said finger and be pushed thereby fully into the envelope. This pusher finger is fitted in a slotted bearing 185 and adjustably retained therein by a set screw 186 which bearing is loosely fitted on a cross shaft 187 supported between the side frame brackets, and adjustably secured on said shaft by a set screw 188. This arrangement permits the finger being fixed nearer to or further from the periphery of the cylinder 16 or adjusted at different inclinations thereto.

189 denotes two aligned brackets upon the side frames 10 and 11, each bracket having two parallel lateral projections 190 provided with concave grooves in their outer surfaces forming one half of the bearings for the two transverse shafts 191 and 192, the ends of which are inserted in said grooves. Blocks 193 and 194 provided with similar concave grooves form the other half of the bearings for said shafts. The blocks 193 are adjustably connected with the projections 190 by means of screws 195 which pass through openings in the blocks of slightly larger diameter than the screws, while the threaded ends of the screws engage threaded openings in said projections. Spiral springs 196 surround the screws between their heads and the blocks 193. Rollers 197 and 198 are fixed to the shafts 191, 192, the peripheries of which rollers have a resilient bearing against the periphery of the cylinder 16.

These rollers 197, 198 are at a point below the pusher finger 184 and so positioned that when an envelope is passing, the flap of the envelope is still held by one of the dogs 108 in an inclined depression 107 of the cylinder, and so that the flap does not contact with such rollers, but as the body of the envelope with its contents passes the pusher finger it is drawn between the periphery of the cylinder and the rollers 197 and 198, which rollers have a resilient bearing on the envelope retaining it upon the cylinder and also guiding its forward movement.

At a point slightly below the rollers 198 and directly in the path of the dogs 108 there is a stationary cam 199 supported upon a bracket arm 200 extending from the side frame. As the stem of the dog gripping the flap of an envelope rides over this cam 199 the jaw of the dog is opened releas-

ing its grip on the flap of the envelope. This causes the flap to spring out of the inclined depression and outward from the periphery of the cylinder, the body of the envelope with its contents being still between the rollers 198 and the periphery of the cylinder.

Two aligned brackets 201 extend forwardly from the side frames 10 and 11 in which are bearings for a transverse shaft 202. Upon one end of this shaft is fixed a sprocket wheel 203. 204 is another transverse shaft having its bearings in the side frames 10 and 11. Upon one end of this shaft 204 is fixed a sprocket wheel 205. A sprocket chain 206 passes over the wheels 203 and 205. A gear wheel 207 fixed on the shaft 204 meshes with the large gear wheel 20 on the drive shaft 14. A roller 208 is fixed to the shaft 202, the periphery of which roller contacts lightly with the periphery of a larger roller 209 mounted on a transverse shaft 210 supported in bearings in the brackets 201, and closely approaches the peripheries of two smaller rollers 211, preferably of rubber, mounted on a transverse shaft 212 also supported in bearings in the brackets 201. The peripheries of these two rollers 211 are preferably knurled. A gear wheel 161 fixed to the shaft 202 meshes with a gear wheel 236 fixed to the shaft 210, by means of which the roller 209 is rotated.

A trough 213 is supported by and between the forward ends of the brackets 201 below the shaft 210 so that a portion of the roller 209 is within such trough.

Vertically disposed spaced guide strips 214 are fixed to a cross piece 215 supported by and between the side frames. These guide strips are positioned between the cylinder 16 and rollers 208 and 211 and the upper ends of the guide strips are bent inwardly towards the cylinder. When the flap of an envelope is released from the grip of one of the dogs, as above described, it strikes against the roller 208 and as the body of the envelope with its contents is carried downward by the action of the rollers 198 its flap is directed in between the rollers 208 and 211 whereby during the continued downward movement of the envelope with its contents the flap is turned upward and drawn out from between the rollers 208 and 211 and will thereby assume its normal position in relation to the body of the envelope when the body of the envelope and its contents pass out from between the cylinder 16 and the rollers 198. In case the contents of the envelope are such that it is desired to seal the envelope, water is placed into the trough 213 whereby the roller 209 revolving therein will transmit moisture to the periphery of the roller 208 which in turn will apply it to the gummed flaps of the envelopes as they pass between such

roller and the rollers 211. Both the rollers 208 and 209 are preferably of metal so that no surplus moisture will reach the flap of an envelope.

5 The inclined upper ends of the guide strips 214 direct the flaps of the envelope between the rollers 208 and 211 in case the flap does not of itself spring out from the cylinder sufficiently far to strike the roller 208.

10 As the flap of the envelope is withdrawn from between the rollers 208 and 211 at the same moment that the body of the envelope with its contents passes from between the cylinder 16 and the rollers 198, the envelope will fall by gravity, guided by the strips 214 which direct them into a receptacle which may be of any suitable character, but I prefer the construction shown and next described.

20 Two aligned lugs 216, one on either side project forwardly from the side frames 10 and 11, each of which lugs supports a forwardly inclined post 217 which posts are provided with sleeves 218 cut away forming longitudinal slots 219 in one side. Rods 220 pass into and are supported by these sleeves. Brackets 221 extend from each post 217 on their inner side provided with slotted sleeves 222 similar to the sleeves 218. Rods 223 pass into and are supported by these sleeves 222, which rods form the bottom of the receptacle, while the rods 220 form the sides thereof. A slidable support 225 for the filled envelopes is provided, which support carries sleeve 226 through which the rods 220 and 223 pass. The lower end of the support 225 extends below the bottom rod 223 and has a threaded concave portion which engages with a screw-shaft 227 journaled at one end in a bearing 228 in one of the brackets 221. A bevel gear 229 is fixed to the end of the screw-shaft which extends slightly beyond its bearing 228. This bevel gear meshes with another bevel gear 230 fixed to a transverse shaft 231 supported in bearings in the side frames of the machine. A bevel gear 232 fixed to the main shaft 14 meshes with another bevel gear 233 upon one end of a rod 234 upon the other end of which rod is another bevel gear 235 which meshes with the gear 230. This gearing moves the support 225 gradually along the inclined rods 220 and 223 while the machine is in operation, the pitch of the thread on the screw-shaft 227 being such that the support 225 moves continuously a distance equal to the thickness of a filled envelope.

60 It is to be understood that the word "circulars" as used herein is to be broadly construed as meaning any type of mailing matter capable of being inserted into envelopes by the mechanism described.

65 I do not wish to be limited to the precise construction and arrangement shown and

described, because it will be apparent that various modifications might be made without departing from the spirit and scope of my invention.

I claim as my invention:

1. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping such flap and drawing the envelopes from the holder, and means for inserting articles into the envelopes as it is drawn along.

2. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping such flap and drawing the envelope from the holder, means for opening the mouth of the envelope, and means for inserting articles into the envelope.

3. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, means attached to the cylinder for gripping the flap and drawing the envelope from the holder, and means for inserting articles into the envelope.

4. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, means attached to the cylinder for gripping the flap and drawing the envelope from the holder, means for opening the mouth of the envelope, and means for inserting articles into the envelope.

5. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, a plurality of dogs attached to the cylinder in spaced alignment, means for opening the jaw of a dog and closing it upon the flap of the envelope, and means for inserting articles into the envelope.

6. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap

upon the periphery of the rotating cylinder, means for operating the picker finger, a plurality of dogs attached to the cylinder in spaced alignment, means for opening the jaw
5 of a dog and closing it upon the flap of the envelope, means for inserting articles into the envelope, and means for releasing the grip of the dog.

7. In a machine of the character described, the combination of a cylinder, means
10 for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping the flap
15 of the envelope, a holder for circulars supported by the frame of the machine forward of the envelope holder, means for drawing the circulars one at a time from said holder, means for feeding the circular towards and
20 into the advancing envelope, and means for releasing said gripping means.

8. In a machine of the character described, the combination of a cylinder, means
25 for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping
30 the flap and drawing the envelope from the holder, means for opening the mouth of the envelope, a holder for circulars, a cam for drawing the circulars from the holder one at a time, means for operating said cam, and
35 means for feeding the circular towards and into the open mouth of the envelope.

9. In a machine of the character described, the combination of a cylinder, means
40 for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping the flap
45 of the envelope, means for opening the mouth of the envelope, a holder for circulars, a cam for drawing the circulars from the holder one at a time, means for operating said cam, adjustable means for feeding the
50 circular towards and into the mouth of the envelope as it advances, and means for releasing said gripping means.

10. In a machine of the character described, the combination of a cylinder, means
55 for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, a plurality of dogs attached to the cylinder in
60 spaced alignment, means for opening the jaw of a dog and closing it upon the flap of the envelope, means for opening the mouth of the envelope, a holder for circulars, means for drawing the circulars from the holder
65 one at a time, means for feeding the circular

towards and into the open mouth of the advancing envelope, and means for releasing the grip of the dog.

11. In a machine of the character described, the combination of a cylinder, means
70 for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping the flap
75 of the envelope and drawing it from the holder, means for opening the mouth of the envelope, a holder for circulars, a cam for drawing the circulars from the holder one at a time, means for operating the cam, means
80 for feeding the circular towards and into the envelope, another holder for circulars forward of the first holder, means for withdrawing the circulars one at a time from the said second holder, means for feeding the
85 circular towards and into the advancing envelope, and means for releasing said gripping means.

12. In a machine of the character described, the combination of a cylinder, means
90 for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping
95 the flap and drawing the envelope from the holder, means for opening the mouth of the envelope, a holder for circulars, a cam for drawing circulars from the holder one at a time, means for operating said cam, adjustable
100 means for feeding the circular towards and into the envelope, another holder for circulars, a cam for drawing circulars from said second holder one at a time, means for operating the cam, adjustable means for feeding
105 the circular towards and into the envelope containing the circular from the first holder, an adjustable pusher finger supported in the path of the advancing envelope and by which said circulars will be pushed further
110 into the envelope if projecting therefrom, and means for releasing said gripping means.

13. In a machine of the character described, the combination of a cylinder, provided with spaced inclined depressions in
115 its periphery, means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the rotating cylinder within one of said inclined depressions, means for operating the picker finger,
120 a plurality of spaced aligned dogs journaled in frames attached to the cylinder in the forward end of each depression and provided with stems passing through slots in the cylinder, a stationary cam supported
125 within the cylinder in the path of the dogs with which the stems of the dogs periodically contact to open the jaws of the
130

dogs, a spring connected with the stem of each dog for closing the jaw of the dog upon the flap of the envelope when the stem of the dog passes off said cam, and means for

5 inserting articles into the envelope.

14. In a machine of the character described, the combination of a cylinder provided with spaced inclined depressions in its periphery, a picker finger for opening the
10 flaps of the envelopes one at a time and laying the flap upon the rotating cylinder within one of said inclined depressions, means for operating the picker finger, a plurality of spaced aligned dogs journaled
15 in frames attached to the cylinder in the forward end of each depression and provided with stems passing through slots in the cylinder, a stationary cam supported within the cylinder in the path of the dogs with which
20 the stems of the dogs periodically contact to open the jaws of the dogs, a spiral spring connected with the stem of each dog for closing the jaw of the dog upon the flap of the envelope, means for opening the mouth
25 of the envelope, and means for inserting articles into the envelope.

15. In a machine of the character described, the combination of a cylinder provided with spaced inclined depressions in
30 its periphery, means for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the rotating cylinder, a plurality of spaced aligned dogs journaled
35 in frames attached to the cylinder in the forward end of each depression and provided with stems passing through slots in the cylinder, a stationary cam supported within the cylinder in the path of the dogs
40 with which the stems of the dogs periodically contact to open the jaws of the dogs, a spiral spring connected with the stem of each dog for closing the jaw of the dog upon the flap of the envelope, a holder for
45 circulars, means for drawing the circulars one at a time from said holder, adjustable means for feeding the circulars toward and into the advancing envelope, and means for releasing the grip of the dog.

50 16. In a machine of the character described, the combination of a cylinder provided with spaced inclined depressions in its periphery, means for rotating the same, an envelope holder, a picker finger for opening
55 the flaps of the envelopes one at a time and laying the flap upon the rotating cylinder within one of said inclined depressions, means for operating the picker finger, a plurality of spaced aligned dogs journaled
60 in the frames attached to the cylinder in the forward end of each depression and provided with stems passing through slots in the cylinder, a stationary cam supported within the cylinder in the path of the dogs with
65 which the stems of the dogs periodically

contact to open the jaws of the dogs, a spiral spring connected with the stem of each dog for closing the jaw of the dog upon the flap of the envelope, means for opening the mouth of the envelope, a holder for circulars, 70
a friction cam for drawing the circulars from the holder one at a time, means for operating the cam, adjustable means for feeding the circular towards and into the envelope, another holder for circulars forward of the first holder, a friction cam for
75 drawing the circulars one at a time from said second holder, means for operating the cam, adjustable means for feeding the circular towards and into the advancing envelope containing the circular from the first holder, and means for releasing the grip of the dog.

17. In a machine of the character described, the combination of a cylinder, 85
means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker
90 finger, means attached to the cylinder for gripping the flap of the envelope, a roller bearing resiliently upon the upper surface of the envelope as it is drawn forward, a plurality of spaced aligned pawls, located in
95 slots in the cylinder, means for raising the pawls against the under surfaces of the envelopes as they pass under said roller, whereby the mouth of the envelope is opened, and means for inserting articles
100 into the envelope.

18. In a machine of the character described, the combination of a cylinder provided with spaced inclined depressions in its periphery, means for rotating the same, an
105 envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the rotating cylinder within one of said depressions, means for operating the picker finger, a plurality of
110 spaced aligned dogs journaled in frames attached to the cylinder in the forward end of each depression and provided with stems passing through slots in the cylinder, a stationary cam supported within the cylinder
115 in the path of the dogs with which the stems of the dogs periodically contact to open the jaws of the dogs, a spring connected with the stem of each dog for closing the jaw of the dog upon the flap of the envelope
120 when the stem of the dog passes off said cam, means for opening the mouth of the envelope, a holder for circulars, means for drawing the circulars one at a time from said holder, adjustable means for feeding
125 the circular toward and into the advancing envelope, an adjustable pusher finger supported in the path of the envelope and by which the circulars will be pushed further into the envelope if projecting therefrom, 130

- rollers having a resilient bearing upon the periphery of the cylinder which rollers bear upon the filled envelope as it passes below said pusher finger, a stationary cam supported within the cylinder with which the stems of the dogs contact to release their grip upon the flap of the envelope, and means for turning the flap of the envelope back against the filled body.
19. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, means attached to the cylinder for gripping the flap of the envelope, a roller bearing resiliently upon the upper surface of the envelope as it is drawn forward, a plurality of spaced aligned pawls located in slots in the cylinder, means for raising the pawls against the under surfaces of the envelopes as they pass under said roller to open the mouth of the envelope, a holder for circulars, means for drawing the circulars one at a time from said holder, adjustable means for conveying the circular towards and into the mouth of the advancing envelope, a second holder for circulars, means for withdrawing the circulars therefrom one at a time, adjustable means for conveying said circulars towards and into the envelope containing the first circular, an adjustable pusher finger by which the circulars are pushed further into the envelope if projecting therefrom, rollers having a resilient bearing upon the periphery of the cylinder which rollers bear upon the filled envelope as it passes below said pusher finger, means for releasing the grip of the dogs upon the flap of the envelope, rollers between which the released flap is received and turned back against the body of the envelope as it is fed along, a guide for directing the filled envelope downwardly in a vertical position as it is released from contact with the cylinder and said flap turning rollers, and a receptacle into which such envelope falls by gravity.
20. In a machine of the character described, the combination of a cylinder provided with spaced inclined depressions in its periphery, means for rotating the same, an envelope holder, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the rotating cylinder within one of said inclined depressions, means for operating the picker finger, a plurality of spaced aligned dogs journaled in frames attached to the cylinder in the forward end of each depression and provided with stems passing through slots in the cylinder, a stationary cam supported within the cylinder with which the stems of the dogs periodically contact to open the jaws of the dogs, a spring connected with the stem of each dog for closing the jaw of the dog upon the flap of the envelope when the stem of the dog passes off said cam, a roller bearing resiliently upon the upper surface of the envelope as it is drawn forward, a plurality of spaced aligned pawls located in slots in the cylinder, means for raising the pawls against the under surface of an envelope as it passes under said roller to open the mouth of the envelope, a holder for circulars, means for drawing the circulars one at a time from said holder, adjustable means for conveying the circular towards and into the mouth of the advancing envelope, a second holder for circulars, means for withdrawing the circulars therefrom one at a time, adjustable means for conveying said circulars towards and into the envelope containing the first circular, an adjustable pusher finger by which the circulars are pushed further into the envelope if projecting therefrom, rollers having a resilient bearing upon the periphery of the cylinder which rollers bear upon the filled envelope as it passes below said pusher finger, means for releasing the grip of the dogs upon the flap of the envelope, rollers between which the released flap is received and turned back against the body of the envelope as it is fed along, a guide for directing the filled envelope downwardly in a vertical position as it is released from contact with the cylinder and said flap turning rollers, and a receptacle into which such envelope falls by gravity.
21. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping the flap of the envelope, means for opening the mouth of the envelope, a holder for circulars, means for drawing the circulars therefrom one at a time, adjustable means for conveying the circular towards and into the mouth of the advancing envelope, a second holder for circulars, means for withdrawing the circulars therefrom one at a time, adjustable means for conveying said circular towards and into the envelope containing the first circular, an adjustable pusher finger by which the circulars are pushed further into the envelope if projecting therefrom, rollers having a resilient bearing upon the periphery of the cylinder and bearing upon the filled envelope as it passes below said pusher finger, means for releasing the flap from said gripping means, rollers between which the end of the released flap is received and turned back against the body of the envelope as it is fed

along, a receptacle for the filled envelopes, a guide for directing the envelopes into said receptacle in a vertical position, said receptacle being provided with a slidable support for the envelopes, and means for continuously moving said support within the receptacle while the machine is in operation.

22. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, means for limiting the forward movement of the envelopes therein, means for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means attached to the cylinder for gripping the flap and drawing the envelope from the holder, means for opening the mouth of the envelope, and means for inserting articles into the envelope.

23. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, rollers bearing against the front of the stack of envelopes therein, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, means attached to the cylinder for gripping the flap and drawing the envelope from the holder, and means for inserting articles into the envelope.

24. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, rollers bearing against the stack of envelopes therein, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, means attached to the cylinder for gripping the flap and drawing the envelope from the holder, a holder for circulars, rollers bearing against the stack of circulars therein, means for drawing the circulars from the holder one at a time, adjustable means for conveying the circular towards and into the envelope, an adjustable pusher finger for pushing the circular into the envelope if it projects therefrom, rollers having a resilient

bearing upon the filled envelope as it passes below the pusher finger, means for releasing the flap from said gripping means, rollers between which the end of the released flap is received and turned back against the body of the envelope, a water trough, a roller therein, and means for rotating the roller to apply moisture to one of said flap turning rollers.

25. In a machine of the character described, the combination of a cylinder, means for rotating the same, an envelope holder, rollers bearing against the stack of envelopes therein, a picker finger for opening the flaps of the envelopes one at a time and laying the flap upon the periphery of the rotating cylinder, means for operating the picker finger, means attached to the cylinder for gripping the flap and drawing the envelope from the holder, a holder for circulars, rollers bearing against the stack of circulars therein, means for drawing the circulars one at a time from the holder, adjustable means for conveying the circular towards and into the envelope, a second holder for circulars, rollers bearing against the stack of circulars therein, means for drawing the circulars from the holder one at a time, adjustable means for conveying the circulars towards and into the envelope containing the circular from the first holder, an adjustable pusher finger by which the circulars are pushed further into the envelope if projecting therefrom, rollers having a resilient bearing upon the filled envelope as it passes below the pusher finger, means for releasing the flap from said gripping means, rollers between which the end of the released flap is received and turned back against the body of the envelope, a water trough, a roller therein, means for rotating such roller to apply moisture to one of said flap turning rollers, a receptacle for the filled envelopes, and a guide for directing the envelopes into said receptacle as they fall by gravity.

Signed by me this 15th day of October 1920.

GEORGE F. RUSS.