Aug. 16, 1927. 1,639,053

G. E. NORTHROP

MAILING MACHINE

Original Filed Dec. 31, 1925 4 Sheets-Sheet 1

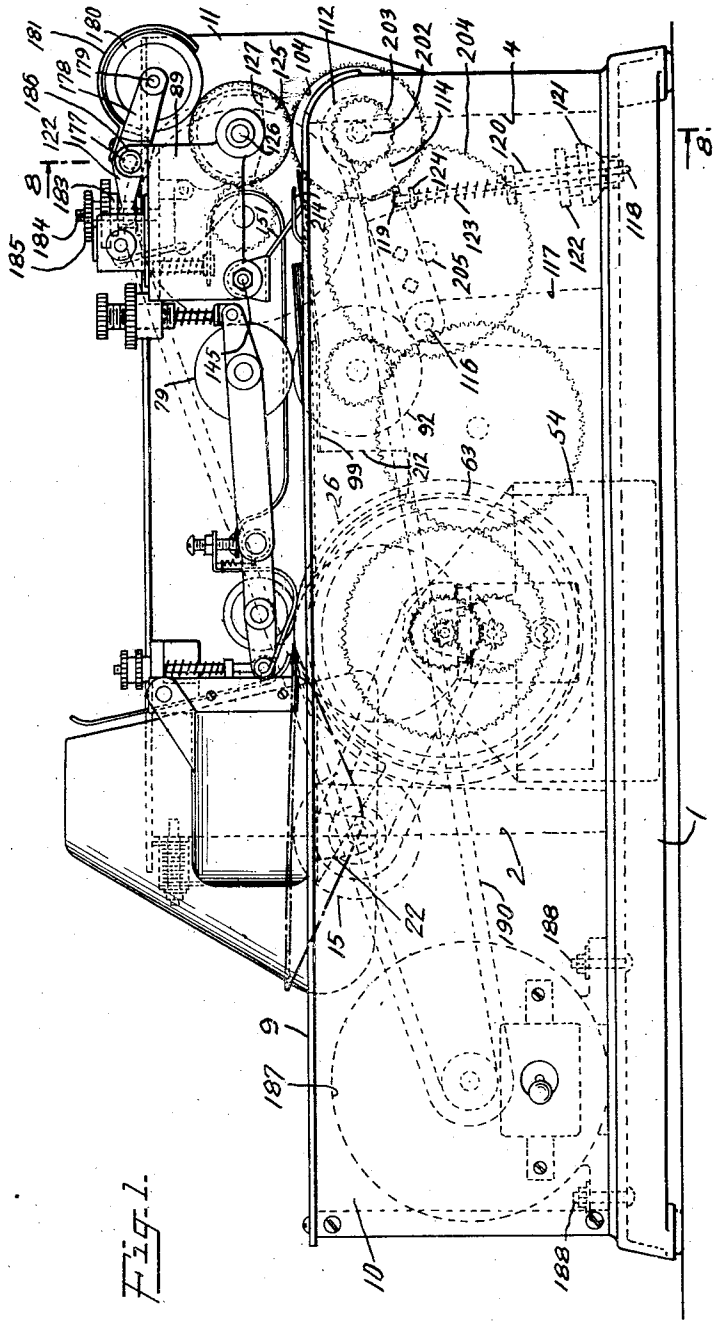


Fig. 1.

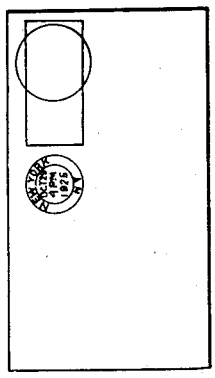


Fig. 18

INVENTOR

George E. Northrop

Dennis Davis Morris & Edmonds

ATTORNEYS

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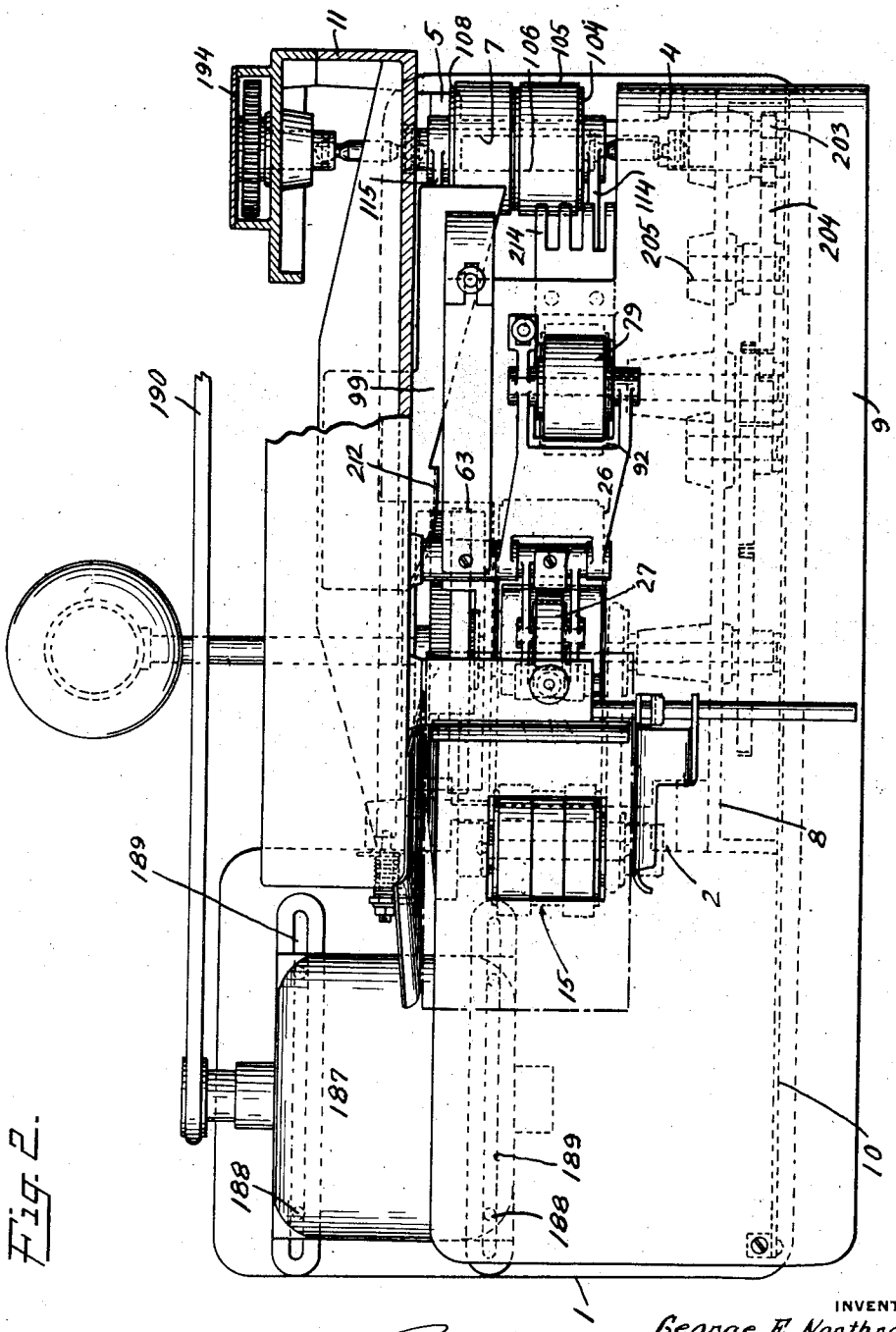


Fig. 2.

INVENTOR

George E. Northrop

Dennis Davis Morrison & Edmonds

ATTORNEYS

Aug. 16, 1927. 1,639,053

G. E. NORTHROP

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Fig. 3.

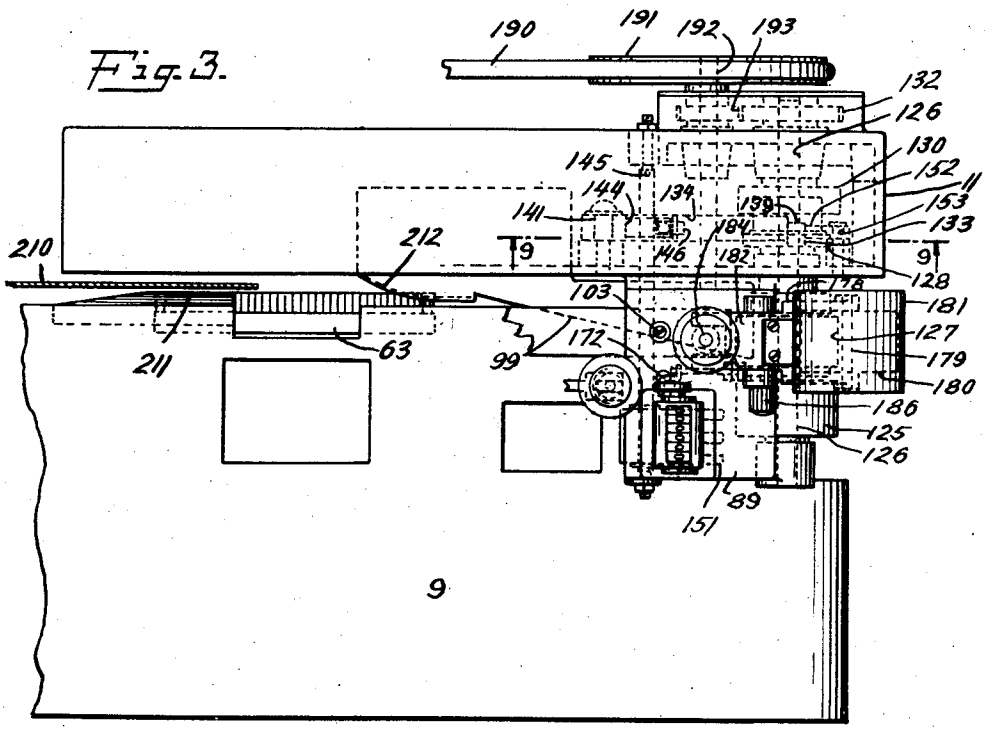


Fig. 6.

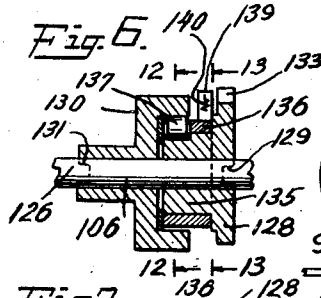


Fig. 7.

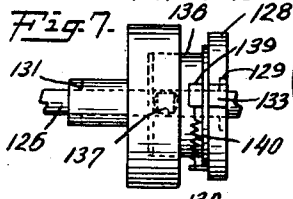


Fig. 8.

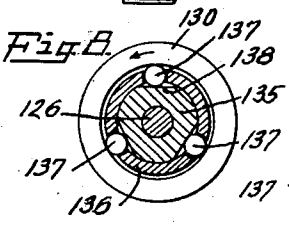


Fig. 5.

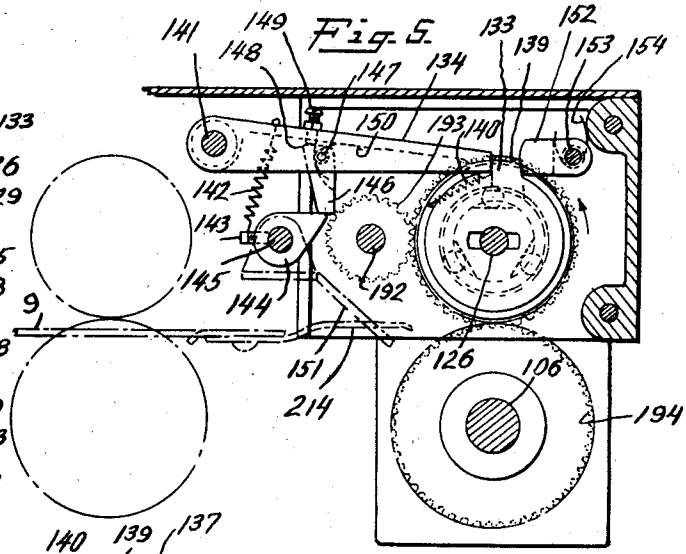
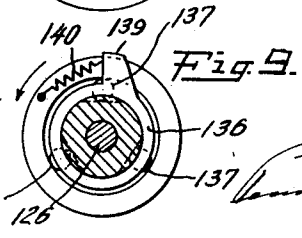


Fig. 9.



INVENTOR

George E. Northrop

Dennis Davis Morris & Edmonds

ATTORNEYS

Aug. 16, 1927. 1,639,053

G. E. NORTHROP

MAILING MACHINE

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Fig. 4.

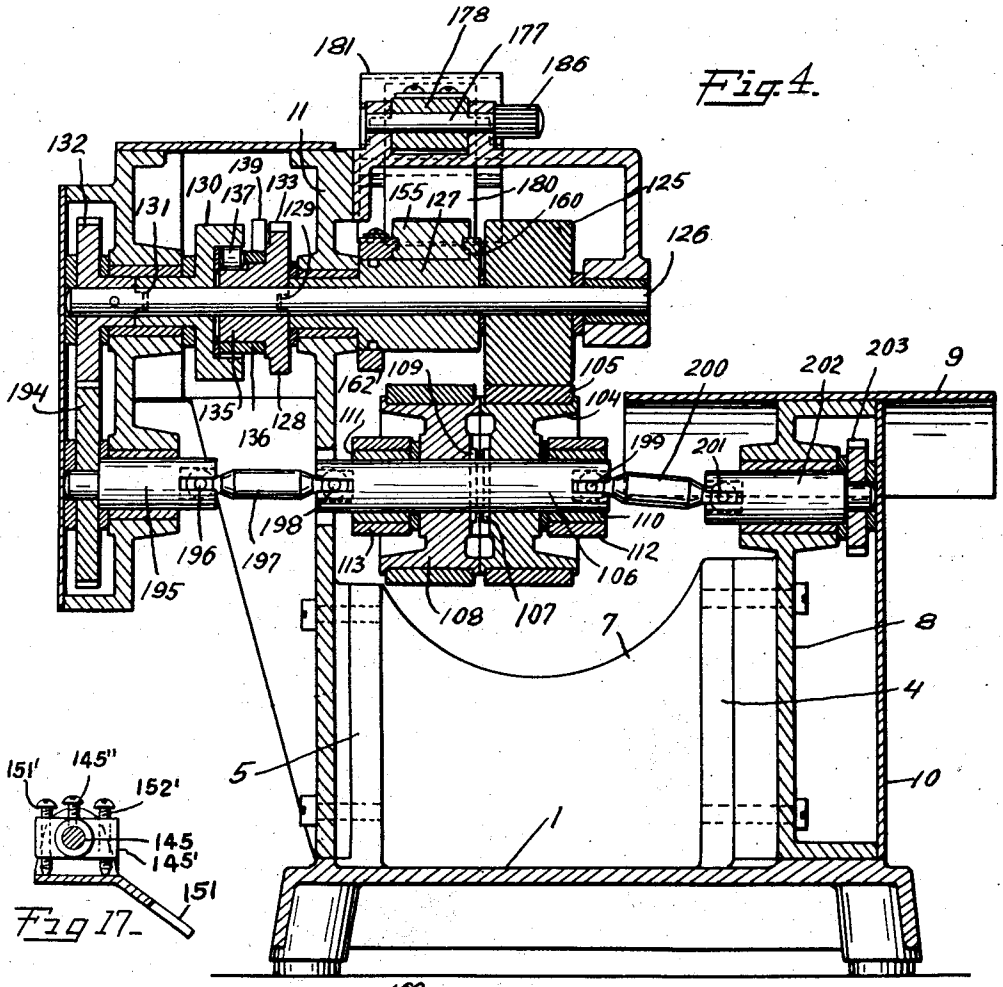


Fig 17.

Fig. 11.

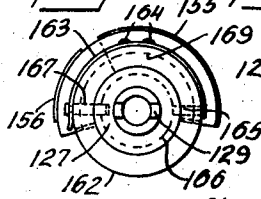


Fig. 10.

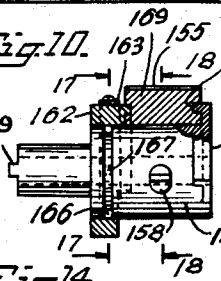


Fig. 12.

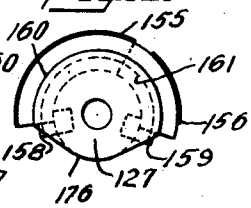


Fig. 15.

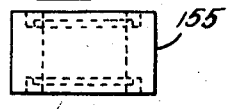


Fig. 16.

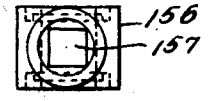


Fig. 13.

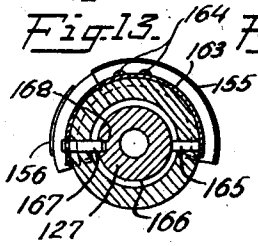
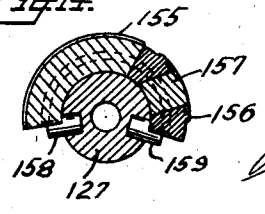


Fig. 14.



INVENTOR

George E. Northrop

Dennis Harris Morrison & Edmonds

ATTORNEYS

Patented Aug. 16, 1927. 1,639,053.

UNITED STATES PATENT OFFICE.

GEORGE E. NORTHROP, OF STAMFORD, CONNECTICUT, ASSIGNOR TO RED STAR APPLIANCES, INC., OF STAMFORD, CONNECTICUT, A CORPORATION OF DELAWARE.

MAILING MACHINE.

Original application filed December 31, 1925, Serial No. 78,524. Divided and this application filed April 24, 1926. Serial No. 104,300.

The present invention relates to machines for sealing envelopes, and for printing with ink on the face of the envelope, as for instance, to cancel a Government stamp that previously has been affixed on the envelope and to place adjacent to the cancelled stamp the name of the post office, the date and hour of cancellation, and the permit number of the user. The machine is also of service for counting envelopes, cards, and other flat objects, and can be used for printing small inscriptions thereon simultaneously with the counting.

This application is a division of my copending application, Serial No. 78,524, filed December 31, 1925.

Although the machine is capable of a wide variety of uses, it is intended particularly for sealing stamped envelopes, and then cancelling the Government stamp and counting the number of stamps so cancelled.

Envelopes to be used in this way may be of the character now furnished by the United States Government, and having the postage stamp formed directly in the paper of the envelope, or equally well, may be plain envelopes to which adhesive Government stamps have been affixed.

When the sealed envelopes come from the machine with the stamps cancelled, and with the name of the post office and the date printed thereon, they can be delivered in bulk to the post office and there can be distributed directly into the outgoing pouches without the delays and labor incident to first placing them face up on the sorting table and then passing them through the stamp cancelling device now commonly used by the Government employees. In other words, by the use of this machine, much of the labor now done at the post office is done before the mail reaches the post office, with a consequent saving in time in placing the mail in transit to its destination.

The machine is preferably constructed to moisten and seal the envelope flap and then to forward the envelope to a position at which it trips a printing mechanism which, by a rolling movement over the travelling envelope, cancels the postage stamp and prints adjacent thereto other data, such as the name of the post office, the date and hour of cancellation, and the like. Counting mechanism operatively connected with the printing mechanism records the number of printed imprints, and consequently the number of envelopes, cards, or the like, that have been passed through the printing mechanism.

The printing drum is driven through a clutch mechanism, a trip means being arranged for engagement by an approaching envelope to operate the clutch and to cause a single rotation of the printing drum as the envelope passes thereunder. The present invention deals more particularly with the clutch mechanism, together with the arrangement of parts provided for controlling the operation of the clutch and the printing drum.

Other objects, advantages and characteristic features of the present invention will become apparent as the description thereof progresses.

In describing the invention in detail, reference will be made to the accompanying drawings, in which:

Fig. 1 is a side elevation of the complete machine;

Fig. 2 is a plan view of the same with the printing and discharge end removed;

Fig. 3 is a plan view of the printing and discharge end of the machine;

Fig. 4 is a sectional elevation on the line 8—8 of Fig. 1;

Fig. 5 is a detail of the trip end and clutch mechanism which controls the printing device;

Figs. 6 to 9, inclusive, are details of the clutch shown in Fig. 9;

Figs. 10 to 16, inclusive, are details of the die holder and of the dies used for printing;

Fig. 17 is a detail of the trip adjusting device, and

Fig. 18 is a diagrammatic representation of an envelope after it has been passed through the machine.

Frame-work and envelope sealing and feeding mechanism (Figs. 1, 2 and 3).

The frame-work of the machine comprises a cast metal base 1, integral with which are pairs of suitable supporting members, shown at 2, 4 and 5, preferably connected by transverse stiffening webs such as the web 7 shown in Fig. 4. These supporting members serve to support suitable mechanism enclosing casings and plates including the

member 8, the horizontal plate 9, the side plate 10 and the channel 11.

The receiving platform for the envelopes is at the left hand end of the machine as viewed in Fig. 1, and includes a suitable power driven drum 15 which engages the lowermost of a stack of envelopes and forwards it to the moistening and sealing apparatus. The weight of a stack of envelopes is relied upon to give a good frictional engagement between the lowest envelope in said stack and the drum 15.

The envelope is advanced by the drum 15 to a point where it is gripped between a large rotating feed roll 26 and a small cylindrical baffle 27. The gummed flap of the envelope extends at right angles therefrom, and is moistened as it passes between the roll 26 and the baffle 27 by engagement with a brush on the edge of a rotary moistening drum 63, the lower edge of this brush being immersed in water carried in a suitable container 54. The envelope then passes between suitable rotary transfer rolls 79 and 92, which serve to finally press the moistened gummed flap against the body of the envelope, thus sealing the same. In this manner, the envelope is moistened, sealed and forwarded to the printing mechanism, where a suitable printing operation is performed thereon as hereinafter described.

The cylindrical baffle 27 and the upper transfer roll 79 are supported by suitable resilient and adjustable means, and suitable guide plates are provided for guiding the envelopes and folding their moistened flaps against the bodies thereof before they encounter the transfer rolls, but as these means form no part of the present invention, they will not be described herein.

The printing mechanism (Figs. 1 through 18).

The lower roller of the printing mechanism comprises a drum 104 (Fig. 4) with a rubber face 105. This drum is mounted to turn with shaft 106, to which it is operatively connected by a transverse pin 107 housed within a slot in the hub of the drum. A similar drum 108 is operatively secured to shaft 106 by a transverse pin 109. Shaft 106 is supported in anti-friction wood sleeves 110 and 111 mounted respectively in hubs 112 and 113 carried by arms 114 and 115 (Fig. 1). These arms are mounted to swing on a shaft 116 carried by a standard 117 which is cast integral with base 1. This arrangement permits easy assembly of the lower roller.

To furnish an upward thrust on the lower roller, there is provided an upwardly extending bar 118 (Fig. 1), the upper end of which fits in a rounded socket 119 formed in arms 114 and 115, and the lower end of which slides freely in a sleeve 120 which is threaded through a stop 121, the lower rounded surface of which contacts with base 1. A lock nut 122 is threaded on sleeve 120 and fits against stop 121. A compression spring 123 encircles bar 118 and is confined between sleeve 120 and a collar 124.

Above drum 104 is a rubber roller 125 (Fig. 4) mounted to turn with shaft 126. Freely mounted on shaft 126 is a printing drum 127 on which the printing dies are mounted as hereinafter described. Also mounted to turn on shaft 126 is a clutch element 128, this element having a driving relation to printing drum 127 because of a tongue and groove connection 129. The other clutch element 130 is mounted on shaft 126 and though not directly keyed thereto has a tongue and groove connection 131 with the hub of a gear 132 which is pinned to shaft 126.

The clutching and unclutching of the printing mechanism is effected by elements shown in Figs. 4–9, inclusive. Clutching element 128 carries a lug 133 which can swing against the end of a locking arm 134. Element 128 also has a hub 135 encircled by a cage 136. Three rollers 137 are loosely mounted in this cage, but can be forced outwardly by cam faces 138 on the hub and thereby can be brought into gripping engagement with the inner surface of cylindrical hub 130. This cage 136 also has a lug 139 in position to strike against arm 134 at the same time that lug 133 strikes against that arm. A coiled spring 140 tends to shift the cage 136 on hub 135 thereby forcing rollers 137 outward into gripping relation with the inner face of clutch member 130. It is through this mechanism that clutch member 130 can be used to drive clutch member 128 and through tongue and groove connection 129 can drive printing drum 127. That driving, however, can occur only when coiled spring 140 is contracted. The mechanism for controlling the contraction or expansion of spring 140 includes the locking arm 134 pivoted on stub shaft 141 and urged downward by a tension spring 142 anchored to a pin 143 which also has the function of securing a cam 144 to a rock shaft 145. The working nose of cam 144 engages a latch 146 carried by a pivot 147 on arm 134. The heel 148 of latch 146 engages the adjustable stop 149 and a spring 150 coiled about and secured to pivot 147 urges latch 146 against stop 149.

Also secured to shaft 145 are a plurality of tripping fingers 151 in position to be engaged by a passing envelope. As shown in Fig. 17, the tripping fingers 151 can be adjusted about shaft 145 by means of set screws 151′ and 152′, engaged with a block 145′ which is clamped to shaft 145 by a screw 145″. The envelope lifts the finger thereby rocking shaft 145 and its attached

cam 144 to thrust upwardly on latch 146 and thereby lift arm 134 out of engagement with lugs 133 and 139. As soon as arm 134 has lifted, spring 140 contracts to establish the desired driving connection between clutch elements 130 and 128, and the printing drum rotates one revolution to impress the desired imprint on the envelope. Before that revolution is complete, cam 144 will have wiped entirely across the lower end of latch 146, and into a position behind that latch. This permits arm 134 to drop back under the action of spring 142 into position to act again as a stop for lugs 133 and 139 when they have completed their revolution. When in stopped position, the trailing edges of these lugs are engaged by a latch 152 pivoted on a stub shaft 153. The free end of this latch is urged downward by a spring 154 positioned as shown in Fig. 5. This latch prevents any back lash and keeps the drum in position ready for the next unlatching.

After the envelope has cleared fingers 151 those fingers swing downward under the action of spring 142, and cam 144 is restored to its initial position, latch 146 being pivoted at 147 to permit that restoration of cam 144.

Mounted on the printing drum 127 (Fig. 14) is a cancellation die 155 for cancelling the postage stamp on the envelope and for printing the user's permit number or other identifying data. Also mounted on this drum is a die 156 carrying the name of the post office, and within this die is a type element 157 bearing date and hour of cancellation. Rugged pins 158 and 159 permanently mounted in drum 127 keep these printing dies from slipping around on the shaft. To keep them from sliding off the drum endwise, a special expedient is resorted to, to wit: the right hand end of the drum 127 as viewed in Fig. 10 has a protruding flange 160 extending over something more than half a circle, as shown in Fig. 12. The right hand edge of the dies engage under this flange with a tongue and groove connection at 161. At the other end of drum 127 is a ring 162 on which is a leaf spring 163 anchored by screws 164 (Fig. 13). At one end of this spring is a pin 165 engaging in an annular groove 166 cut in the cylindrical face of drum 127. This pin bears on the bottom of that groove at all times. At the other end of groove 166 is a pin 167 which passes beyond the bottom of groove 166 into a recess 168. On the right hand edge of ring 162 as viewed in Fig. 10, there is a tongue and groove connection 169 with the dies.

When a die is to be removed, the operator pulls outwardly on pin 167 to free it from its socket, and he then turns ring 162 with respect to drum 127 through a part of a revolution or until that part of ring 162 which does not have a protruding flange lies alongside the end of the die to be removed. Under these circumstances there is enough clearance between the ring and the end of the die to permit the die to be shifted axially of the cylinder far enough to disengage the tongue and groove connection at 161. Then the die can be lifted directly away from the cylinder. Although the dies are rigidly held in working position they can be released and replaced very quickly and without the use of any special tools.

The inking roll (Figs. 1, 3 and 4).

In the upper right hand corner of the machine as viewed in Fig. 1 is a pin 177 on which is pivotally mounted a bell crank having a bifurcated outer arm 178 for carrying a transverse shaft 179 on which is mounted a felt inking roller 180. A sheet metal guard 181 covers the roller. The other arm 182 of the bell crank lever is likewise bifurcated and engages in the groove of a knurled collar 183 threaded to a steel post 184. A lock nut 185 holds this collar in adjusted position. With this arrangement, the collar 183 may be moved up or down on its post to control the pressure with which the felt inking roll 180 bears against the type of the printing drum. To remove the inking roller for cleaning and repairing, there is provided on pin 177 a knurled handle 186 (Fig. 4) by which the pin can be pulled out to release the bell crank and its supported inking drum so that they can be lifted upward out of the machine. Pin 177 is normally held in working position by friction.

The drive (Figs. 1 to 5 inclusive).

The source of power is an electric motor 187 secured to base 1 by bolts 188 which slide in slots 189 (Fig. 2) to permit adjustment of the main driving belt 190 with which the machine is equipped. This belt passes over pulley 191 (Fig. 3) secured to a shaft 192 which drives a pinion 193 meshing with pinion 132 on shaft 126. Gear 132 meshes with a lower gear 194 (Fig. 4) secured on a stub shaft 195 and this stub shaft is connected through a universal joint 196 with a coupling shaft 197 and through a universal joint 198 with shaft 106. The other end of shaft 106 is connected through a universal joint 199, a coupling shaft 200, and a universal joint 201, to a stub shaft 202 on which is secured a pinion 203. The latter meshes with the gear 204 (Fig. 2) on stub shaft 205. The gear 204 serves to drive the transfer rolls and the feeding and moistening mechanism through suitable gears and pinions.

The operation.

Envelopes are stacked on the platform

one above another in substantially horizontal position with their flaps hanging downward in shingled relation at the side of the table. Envelopes are picked off one by one from the bottom of the stack by the driven roller 15, and are dragged forward by the feeding drum and slide across the lower face of the relatively stationary cylindrical baffle 27 while at the same time the damp bristles of the moistening drum 63 wipe the gummed flaps.

When the flap of an envelope is passing out of contact with the damp bristles, it encounters the curved edge 212 (Fig. 2) of a horizontal plate 99 and is thereby urged inward toward its final position against the bottom face of the envelope.

The envelope passes forward through transfer rolls 79 and 92 and is sealed thereby. After passing the transfer rolls, the folding operation is completed and the envelope passes under the tripping fingers 151 and over cooperating fingers 214 (Fig. 1) and then passes under the printing roll where it receives an appropriate imprint.

The envelope is then ready for delivery at the post office and can be sent on its way without the delays incident to sorting and stamp cancellation by Government officials.

Changes may be made in details of the machine without departing from the spirit of my invention as defined by the appended claims.

I claim:

1. In a machine of the character described, the combination of a printing drum, a power driven lower roll cooperating therewith, a driving connection between said roll and said drum, and including a disengageable clutch, a single means initially holding said printing drum against rotation and holding said clutch out of engagement, and a release for said holding means, said release being positioned for actuation by an approaching envelope on which a printed imprint is desired.

2. In a machine of the character described, the combination of a printing drum, a power driven lower roll cooperating therewith, a pivoted arm initially holding said printing drum against rotation, a latch pivoted on said arm, a cam operative through said latch to lift said arm, and tripping fingers operatively connected to said cam and positioned for actuation by an approaching envelope on which a printed imprint is desired.

3. In a device of the character described, the combination of a driving shaft, a roller mounted to turn therewith and adapted to engage a passing envelope, a clutch element driven by said shaft, an opposed clutch element having cam surfaces with rollers engaging therewith and held in a rotative cage, a spring for shifting said rollers on the cam surfaces to engage the opposite clutch element, stop mechanism for governing the contraction of said spring, and a printing drum operatively connected for rotation when said clutch elements are in driving connection with one another.

4. In a device of the character described, the combination of tripping mechanism in position to be engaged by a passing envelope, a stop controlled by said tripping mechanism, a clutch element initially held against rotation by said stop and bearing a spring pressed cage with gripping rollers thereon, an opposed clutch element with which said rollers can frictionally engage when said cage is released, a printing drum operatively connected with one clutch element, a shaft operatively connected with the other clutch element, and a roller mounted on said shaft in position to advance an envelope beyond said printing drum after rotation of the printing drum has been checked by disengagement of the clutch elements from one another.

5. In a machine of the character described, the combination of a rotary printing drum, a power driven lower roll cooperating therewith, a driving connection between said roll and said drum including a disengageable clutch, a stop lug and a clutch operating lug rotating with said drum, and a single arm for simultaneously engaging said lugs whereby said clutch is disengaged and said printing drum is stopped in a pre-determined position.

6. In a device of the character described the combination of a driving shaft, a clutch element driven by said shaft, an opposed clutch element having cam surfaces with rollers engaged therewith and held in a rotative cage, a spring for shifting said rollers on the cam surfaces to engage the opposite clutch element, stop mechanism for governing the contraction of said spring, a clutch operating lug on said rotative cage, a stop lug on said opposed clutch element, a printing drum freely mounted on said shaft and connected to said opposed clutch element, and an arm for simultaneously engaging said stop lug and said clutch operating lug whereby said clutch is disengaged and said drum is stopped in a pre-determined position.

7. In a device of the character described, the combination of a printing drum, a power driven lower roll cooperating therewith, a driving connection between said roll and said drum including a disengageable clutch, a stop lug and a clutch operating lug rotating with said drum, an arm for simultaneously engaging said lugs whereby said clutch is disengaged and said printing drum is stopped, and means for moving said arm out of engagement with said lugs upon the approach of an envelope.

8. In a device of the character described, the combination of a printing drum, a shaft on which said drum is freely mounted, a clutch element fixed to said shaft, an opposed clutch element freely mounted on said shaft and operatively connected to said printing drum, clutch means for operatively connecting said clutch members and disposed there between, an operating lug extending radially from said clutch means, a stop lug on said opposed clutch member and an arm for simultaneously engaging said clutch operating lug and said stop lug for disengaging said clutch and stopping said drum in a predetermined position.

9. In a device of the character described, the combination of a printing drum, a shaft on which said drum is freely mounted, a clutch element fixed to said shaft, an opposed clutch element freely mounted on said shaft and operatively connected to said printing drum, clutch means for operatively connecting said clutch members and disposed there between, an operating lug extending radially from said clutch means, a stop lug on said opposed clutch member, an arm for simultaneously engaging said clutch operating lug and said stop lug for disengaging said clutch and stopping said drum in a predetermined position, and means for moving said arm out of engagement with said lugs on the approach of an envelope.

In testimony whereof I affix my signature.

GEORGE E. NORTHROP.