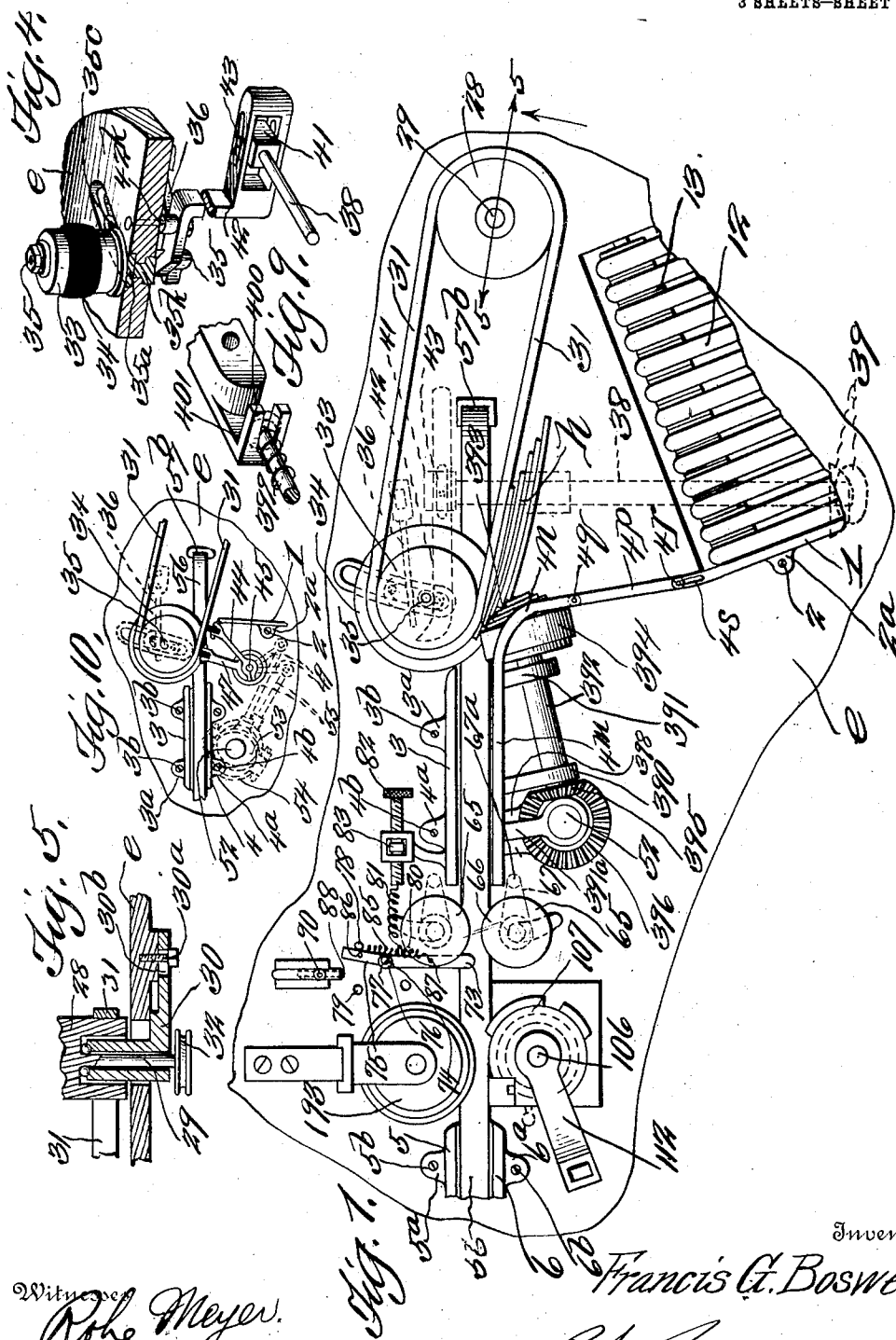


F. G. BOSWELL.
LETTER SEPARATING AND FEEDING DEVICE.
APPLICATION FILED APR. 29, 1912.

1,058,696.

Patented Apr. 8, 1913.

3 SHEETS—SHEET 1.



Witnesses
Rohr Meyer.
Edward S. Ford.

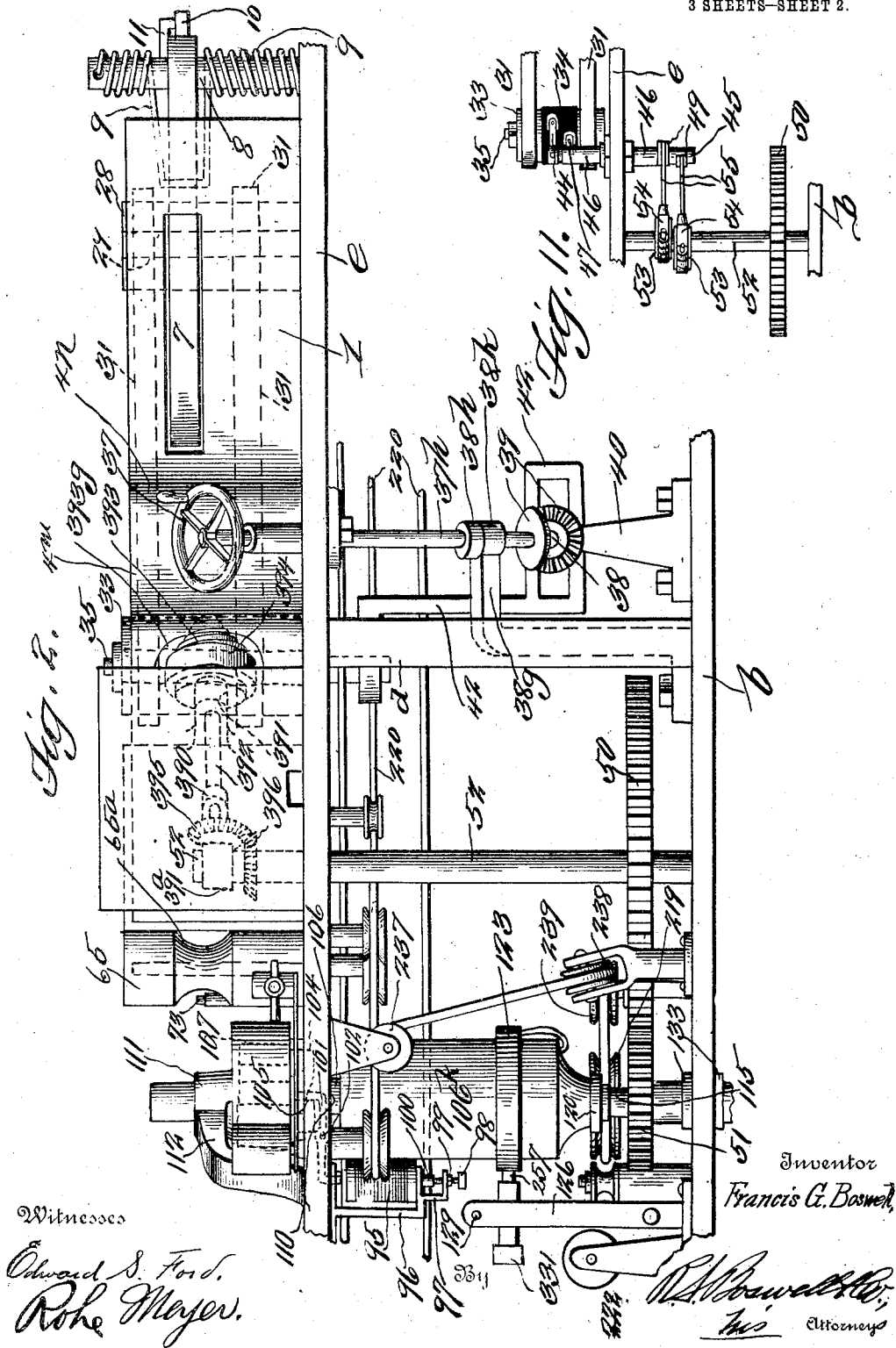
Inventor
Francis G. Boswell,
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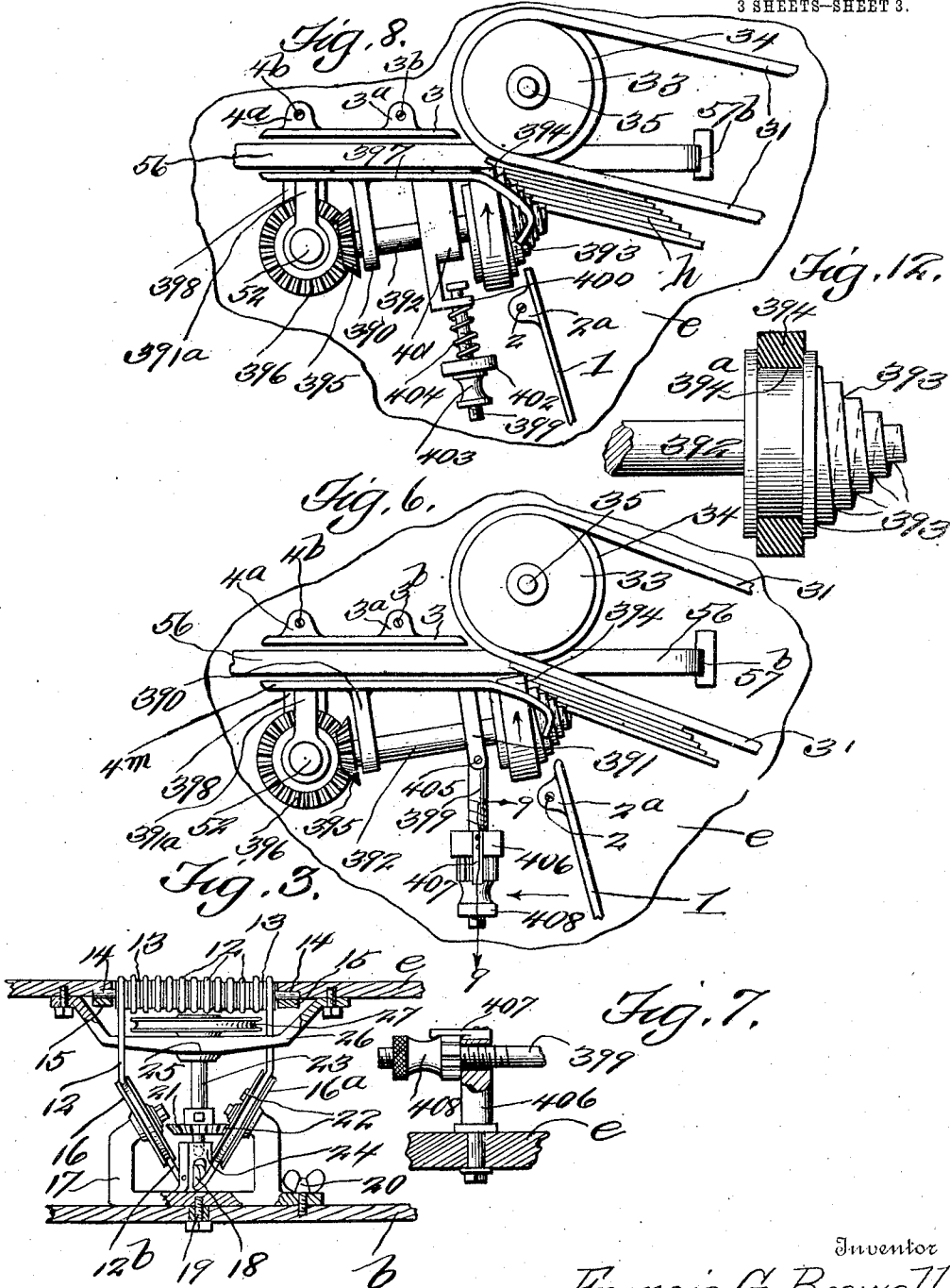


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UNITED STATES PATENT OFFICE.

FRANCIS G. BOSWELL, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO
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LETTER SEPARATING AND FEEDING DEVICE.

1,058,696.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Original application filed February 13, 1909, Serial No. 477,522. Divided and this application filed April 29, 1912. Serial No. 693,962.

To all whom it may concern:

Be it known that FRANCIS G. BOSWELL, a citizen of the United States of America, residing at Washington, in the District of Columbia, has invented a new and useful Letter Separating and Feeding Device, of which the following is a specification.

This invention is a separating and feeding device for use in conjunction with stamp canceling machines. It is designed with the object of providing a simple and durable apparatus of this kind, which will do its work efficiently and with a minimum liability to derangement.

This invention is a divisional application of the application, Serial No. 477,522, filed Feb. 13, 1909, which has matured into Patent No. 1,024,552, April 30, 1912.

An ideal separator and feeder would be one which would so arrange a stack of faced letters that the first letter of the stack would be separated from the rest and delivered to the printing members of the machine, the next letter following in quick succession, and so on, until all the letters are canceled.

Heretofore all separators and feeders have been open to the inherent objection of allowing more than one letter at a time to pass through the machine, resulting in what is known as "skips" and defective postmarks.

With the invention at hand, this trouble is obviated by providing a suitable feed roller and a novel separator to work in conjunction therewith. The feed roller serves to deliver the initial letter of a stack of mail to the die, the separator, the while, retarding the rest of the stack, and aiding the feed roller to the extent of allowing only one letter to pass at a time.

The drawings illustrate and the specification describes a specific structure to which the invention is in no way restricted. The inventor reserves the right to make any changes or alterations which practice may demand, provided that by so doing, he does not deviate from the spirit of the appended claims.

Referring to the drawings which accompany this specification and form a part thereof:

Figure 1 is a top plan view of a portion

of a canceling machine, showing the upper bed plate and parts of the machine mounted thereon.

Figure 2 is a front elevation of a portion of a canceling machine, parts being broken away so as to display the driving mechanism for the machine.

Figure 3 is a detail view showing the upper and lower bed plates in section, clearly illustrating the auxiliary feed belt, and the tightening means therefor.

Figure 4 is a detail perspective view showing the feed roll 33, and the manner in which the same is movably mounted in the bed plate, and the means for adjusting said feed roll.

Figure 5 is a detail sectional view of a portion of the upper bed plate, showing the carrier belt and the rolls therefor.

Figure 6 is a fragmentary detail view showing a modification of the separating means that is shown in Figure 1; in this figure the separating means proper is adjustable by means of the thumb nut.

Figure 7 is a sectional view on line 9-9 of Figure 6, showing the parts upon an enlarged scale, and illustrating the manner in which the thumb nut is held from rotating when once adjusted.

Figure 8 shows a further modification of the separating means, showing modified means for holding the separating means or cone in adjusted positions.

Figure 9 is a detail view of a portion of the structure that is shown in Figure 8.

Figure 10 is a view showing a modification of separating means, which comprises fingers.

Figure 11 is a fragmentary view, showing in side elevation the structure that is shown in Figure 10.

Figure 12 is a detail view partly in section of the helical separating cone.

Reverting to Figure 1 and designating the parts by numerals, so that a clearer understanding may be had:

Number 1 is the auxiliary feed belt fence, secured to the bed plate *e*, by cap screws 2, which pass through the projections 2^a. Numbers 3, 4^m, 5 and 6 are the carrier belt fences, also fastened to bed plate *e* in the same manner as fence 1, projections 3^a, 4^a,

5^a and 6^a being clamped down by the cap screws 3^b, 4^b, 5^b and 6^b.

Number 7 is the assisting arm mounted loosely on the stud 8, and thrown normally backward, by the spring 9, the length of throw being limited by the lug 10 on the arm, coming in contact with the projection 11 on the stud. The assisting arm swings over the auxiliary feed belt 12 and in rear of the mail (which is placed upon the feed belt 12) in order to assist in feeding the mail to the separating mechanism. The mail when placed upon the belt is positioned in front of the arm 7. This belt also runs over a belt tightener, composed of sheaves 16 and 16^a, mounted on frame 17, which also carries the boxed pulley 18. This whole frame swivels on the lower bed plate, being connected thereto by the screw stud 10. A wing screw 20 serves to hold the frame 17 stationary, when it has been moved to tighten the belt 12. This belt is driven from one of the tightener pulleys, by the bevel gear 21, meshing with a bevel gear 22 on the face of the pulley 16^a, the bevel gear 21 receiving motion from the shaft 23, on which it is fastened. The shaft 23 has a thrust bearing in the top of the box 24, and a steadying bearing 25 set in bracket 26, which straddles the auxiliary belt and is secured to the bottom of the upper bed plate by suitable cap screws. The sheave 27 is also fastened to the shaft 23, and is the medium through which the shaft receives motion.

Numeral 28 is the feed belt tightener pulley, secured to the shaft 29, which is carried by the bracket bearing 30 designed to slide in a recessed portion of the upper bed plate, being capable of enough longitudinal adjustment to take up all slack in the feed belts 31; this adjustment being maintained by the cap screw 30^a which, passing through the slotted portion 30^b of the bracket, holds it to the bed plate.

The shaft 29 carries at its lower end a sheave 32 from which the feed belts 31 are driven. These feed belts in turn drive the feed roller 33 which carries on its periphery, midway between the two belts, the feed rubber 34. The feed roller is loosely mounted on the stud 35 set in and projecting through a slide (composed of the parts 35^a and 35^b united by the screws 35^c) which moves in a slotted portion of the bed plate, this slot being cut on the arc of a circle, the center of which is the shaft 29. This method gives flexibility to the feed roller without affecting the tension of the feed belts. The flat spring 36 holds the stud 35 normally against the front of the slot, but this stud is adjustable backward by means of the hand wheel 37 and rod 37^a which connects with the rod 38 through the bevel gears 39. This rod 38 passes through bracketed bearings 40, and threads into the box nut 41 which slides in a

recessed portion of the crank 42 and at the same time is capable of a swiveling motion on the pins 43.

On the fence 4^m brackets 390 and 391 are mounted, being made integral with the fence. The brackets 390 and 391 carry bearings in which the separator cone shaft 392 is journaled, while the bracket 391^a acts as a steadying bearing for the separator gear shaft 52. On the shaft 392 the separator cone is mounted, its surface being provided with the spirally formed steps 393, while that portion of the frustrum near the base carries the separator rubber 394. A bevel gear 395 is fastened on the shaft 392 at the end remote from the cone and meshes with the bevel gear 396 carried by the shaft 52. The cone is then driven in a clockwise direction (when viewed from the apex) by the gear 50 which, meshing with the drive gear 51, receives motion and transmits it by the shaft 52 to the bevel gear 396.

A modified form of separator may be used, as shown in Figures 5, 7, 8, and 9, in which case a swinging fence 397 is used in place of the fence 4, while the steadying bearing of shaft 52 is transferred to the bed plate *e.* A hinge 398, integral with the fence 397 sets over the shaft 52 on that portion which extends through the bed plate on which it has a thrust, and the hinge is so formed as to straddle the feed gear 396. With the separator on this swinging fence, it is unnecessary to have the feed roll 33 adjustable, for the swinging property of the fence makes possible the adjustment of the separator cone. This adjustment is accomplished in the form shown in Figures 8 and 9 by the adjustment screw 399, the head of which rests behind the bifurcated extension 400 of the projection 401, this projection being a part of the fence 397.

The other end of the screw passes through the lug 402 (stationary on the bed plate) and enters the knurled nut 403, while the spiral spring 404, which is under compression between the lug 402 and the bifurcated part 400, tends to force the fence 397, together with the separator cone, towards the feed roller. By turning the nut 403, the position of the cone with respect to the feed roller can be varied.

Another form of adjustment screw is shown in Figures 6 and 7, in which form the screw is hinged to the separator fence at the point 405, where it is capable of a swiveling movement. Passing through the lug 406, to the top of which the flat spring 407 is secured, it threads into the nut 408, provided on its periphery with grooves for the reception of the spring. With this form of adjustment screw, any movement of the separator fence must necessarily cause a movement of the screw, but the spring 407 being long enough to remain in contact with

the nut 408 for the extreme movement of the screw, any predetermined adjustment of the nut 408 is not upset.

Still another form of separator is shown in Figures 10 and 11 which comprises fingers. The finger 44 is mounted on the solid spindle 45, which drops through the hollow spindle 46. This spindle 46 carries at its upper end and directly below the finger 44, the finger 47. These two spindles connect, below the upper bed plate, with the reciprocating arms 49. The hollow shaft 46 is provided with suitable bearing features in the upper bed plate. The gear 50 serves to drive the separating fingers, by meshing with the drive gear 51. The gear 50 is mounted on the shaft 52, which carries the eccentrics 53. Suitable eccentric straps 54 and connecting rods 55 unite the eccentrics with the reciprocating arms.

The carrier belt 56, running over the pulley 57^b and adapted to run over another pulley (not shown), is driven by any suitable means (not shown), such as disclosed in the aforesaid patent.

Numerals 65 and 66 are the switch idler rollers. Grooves 65^a are cut in their circumferences to provide clearance for the switch tongue 73, there being only one of said grooves shown, in Figure 2. Each of these rollers is carried on its shaft (which is integral with the roller) in suitable L-shaped bearings 67, swiveling from the upper bed plate on screw studs 67^a, with the legs of the L-shaped bearings movable through slots cut in the bed plate. The rollers are further provided with sheaves 68 from which each receives motion.

The switch is composed of the tongue 73 swiveled on the stud 74 directly above the pawl 75. A shoulder on the stud keeps the tongue and pawl from dropping to the bottom of the stud and a suitable washer 76 and screw 77 prevent them from rising off the top. The pawl is capable of movement between the studs 78 and 79, while the tongue is normally held back against the pillar 80 by the spring 81, the tension of which spring is governed by the screw 82 and the knurled nut 83 set in the box 84. The spring 81 is of greater strength than the spiral spring 85, which is connected between the pin 86 on the pawl and pin 87 on the tongue and serves to hold the pawl against the stud 78, when the tongue is against the pillar 80; the spring 85 then contracting on that side of the stud 74 nearest the stud 78. When the tongue 73 is away from the pillar 80 whither it is thrown by the approaching letter, the spring 85 contracts on the opposite side of the stud 74 and draws the pawl 75 over against the stud 79; during which operation the pawl 75 passes and makes contact with the contact block 88, thus closing the circuit on the de-

tent magnet 95. The exact way in which this is accomplished is brought out in the description of the generator circuits in the said patent No. 1,024,552.

The contact block is made up of a block 88 set on a pivot bearing 90. The operation of this contact block is also disclosed in the foresaid patent. The detent magnet 95 is set in the frame 96 bolted to the upper bed plate *e*, which frame is provided with the arm 97. A knurled screw 98 and lock nut 99 constitute means for adjusting the plunger core 100 vertically through the center of the magnet. This plunger is designed to disengage the detent 101 from the notch 105 of the detent plate 104, by hitting the tail of the detent, thus drawing the nose down.

The die hub shaft 106 has a suitable bearing 110 in the upper bed plate *e*. A steady- ing bearing 111, set in the bracket 112, suffices to relieve all transverse strains due to operation. Directly below the upper bed plate, the die hub shaft 106 connects with and is driven by a driver similar to that shown, set forth and claimed in the pending Patent No. 1,024,552, issued April 30, 1912.

In practice, the operation of the machine is as follows:—

When the shaft 115 is started by any suitable means, its motion is transmitted, through the gear 51, to the gear 50, which revolves the separator cone. When the driver is operated, the shaft 115 rotates with it, said driver being fed by the insulated brush 257, and current travels over the wires (not shown, but as shown in the above said patent), to the brush holder stud 126. From this it passes to the slip ring 123, and enters the winding (not shown) of the driver, from the grounded end of which it returns to the ground brush (not shown) of a generator (not shown). However, all of this structure is illustrated in the aforesaid patent.

When letters are placed on the auxiliary feed belt 12, they are forced against the feed belt 31, by the movement of the latter belt 12, and the aid of the assisting arm 7. The separator cone then acts on the letters and tends to force back all except the one which is in intimate contact with the feed belt 31 and feed rubber 34. This letter, by virtue of the superior contacting surface of the feed roller and belts, is forced into the carrier belt 56 and transferred to the switch idlers 65 and 66, where it hits the switch tongue 73, and throws the pawl 75 into contact with the block 88, thereby operating the die-cylinder, in the manner set forth in the said pending application.

The fence 4^m and the helical separating cone 394 with its shaft 392 are also adjustable on the shaft 52 which acts as a pivot. The fence 4^m terminates in a curve 4ⁿ, the extremity of which is pivoted at 4^a to the

section of fence 4^p. Through one end of the section 4^p a pin 4^r extends, which pin is mounted in a slot 4^s in one end of the fence 1. In this manner the fence 4^m when adjusted flexes through the connections 4^a and slot and pin connection.

The invention having been set forth, what is claimed as new and useful is:—

1. In a mail marking machine; mail advancing means; a pivoted letter guide member; a cone member having spiral threads acting co-ordinately to feed one letter at a time and mounted in bearings of the pivoted letter guide; and means for adjusting the

2. In a mail separating mechanism; a feed belt; a pivoted letter guide; a cone member having spiral threads acting co-ordinately to feed one letter at a time between the belt and the cone; and means for adjusting the guide.

3. In a mail separating mechanism; a feed belt; a pivoted letter guide; a cone member having spiral threads acting co-ordinately to feed one letter at a time between the belt and the cone; and means for adjusting the guide; and means for adjusting the feed belt.

4. In a mail separating mechanism; a feed belt; a letter guide pivoted in a position adjacent the feed belt, a revoluble member mounted in bearing of the guide and provided at one end with a cone having spiral threads acting co-ordinately and with the feed belt to feed one letter at a time between the cone and the belt, and operated gear connections at the pivot of the guide for operating the cone.

5. In a mail separating mechanism; a feed belt; a letter guide pivoted in a position adjacent the feed belt, a revoluble member mounted in bearing of the guide and provided at one end with a cone having spiral threads acting co-ordinately and with the feed belt to feed one letter at a time between the cone and the belt, and operated gear connections at the pivot of the guide for operating the cone; and means for adjusting the guide and with it the revoluble member and its cone.

6. In a mail separating mechanism; a feed belt; a letter guide pivoted in a position adjacent the feed belt, a revoluble member mounted in bearing of the guide and provided at one end with a cone having spiral threads acting co-ordinately and with the feed belt to feed one letter at a time between the cone and the belt, and operated gear connections at the pivot of the guide for operating the cone; and means for adjusting the guide and with it the revoluble member and its cone; and means for adjusting the feed belt.

7. In a mail separating mechanism; a feed belt; a mail advancing means; a pair of let-

ter guides one upon either side of the mail advancing means; a revoluble shaft acting as a pivot and upon which one of the guides is pivoted; a revoluble spindle mounted in bearings of one of the guides and provided with a cone having spiral threads acting co-ordinately and with the feed belt to feed one letter at a time between the cone and the belt; gear connections between the revoluble shaft and the spindle; and means for adjusting one of the guides and with it the spindle and the cone.

8. In a mail separating mechanism; a feed belt; a mail advancing means; a pair of letter guides one upon either side of the mail advancing means; a revoluble shaft acting as a pivot and upon which one of the guides is pivoted; a revoluble spindle mounted in bearings of one of the guides and provided with a cone having spiral threads acting co-ordinately and with the feed belt to feed one letter at a time between the cone and the belt; gear connections between the revoluble shaft and the spindle; and means for adjusting one of the guides and with it the spindle and the cone; and means for adjusting the feed belt relative to the cone.

9. In a mail marking machine having means for supporting the letters; means for feeding the letters forward; a revoluble member having a volute helix thread adapted to arrange and hold a series of letters in stepped relation with one another.

10. In a mail marking machine having means for supporting the letters and provided with means for feeding the letters forward; a revoluble member adapted to rotate downwardly towards the mail, and provided with a volute helix thread adapted to arrange each piece of mail matter of a series of letters in stepped relation to each proceeding piece of mail.

11. In a mail marking machine having means for supporting the letters and provided with means for feeding the letters forward; a revoluble member having a volute helix thread adapted to arrange a plurality of letters in stepped relation to one another; and means for adjusting the member in a lateral direction to and from the mail.

12. In a mail marking machine having means for supporting the letters and provided with means for feeding the mail forward; a revoluble member adapted to rotate downwardly towards the mail, and provided with a volute helix thread adapted to arrange a plurality of letters in stepped relation to one another; and means for adjusting the member in a lateral direction towards and from the mail.

13. In a mail marking machine having means for supporting the letter, and provided with means for feeding the mail for-

ward; a revoluble cone member having a volute helix thread adapted to arrange a series of letters in stepped relation to each other.

14. In a mail marking machine; a revoluble cone member having a volute helix thread adapted to arrange each letter of a series of letters in stepped relation to each other, and a separator feed belt with which the mail matter contacts.

15. In a mail marking machine; a revoluble cone member having a volute helix thread adapted to arrange each letter of a series of letters in stepped relation to each other; and a separator feed belt with which the mail matter contacts; and means for adjusting one end of the separator feed belt.

16. In a mail marking machine having means for supporting the letters, and provided with means for feeding the mail forward; a revoluble cone member adapted to rotate downwardly and towards the mail matter, and provided with a volute helix thread, the scrolls of which being adapted to arrange each letter of the series of letters in stepped relation to each other.

17. In a mail marking machine having means for supporting the letters, and provided with means for feeding the mail forward; a revoluble cone member adapted to rotate downwardly and towards the mail matter, and provided with a volute helix thread, the scrolls of which are adapted to arrange each letter of a series of letters in stepped relation to each other; and means for adjusting the cone member in a lateral direction towards and from the mail matter.

18. In a mail marking machine; a revoluble cone member adapted to rotate downwardly and towards the mail matter, and provided with a volute helix thread, the scrolls of which are adapted to arrange each letter of the series of letters in stepped relation to each other; and means for adjusting the cone member in a lateral direction towards and from the mail matter; a separator feed belt with which the mail matter contacts; and means for adjusting one end of the separator feed belt.

19. In a mail marking machine; separating means for the mail comprising a feed belt, a cone member having a volute helix thread, the scrolls of which are arranged in stepped relations and operating downwardly and towards the mail to arrange each letter of a series of letters in stepped relation to each other and against the feed belt.

20. In a mail marking machine; separating means for the mail comprising a feed

belt; a cone member having a single volute helix thread, the volute scrolls of which acting to arrange each letter of a stack of letters, in stepped relation to each other, so that each letter will be fed by the belt between the cone and the belt; and means for adjusting the cone relative to the feed belt.

21. In a mail marking machine; separating means for the mail comprising a feed belt; a cone member having helix threads acting to arrange each letter of a stack of letters in stepped relation to each other, so that each letter will be fed by the belt one at a time between the cone and the belt; means for adjusting the cone member relatively to the feed belt; and means for adjusting one end of the feed belt relative to the cone member.

22. In combination with a bed plate; a separator mail feeding means thereon; a mail separating member comprising a conical body having means constructed thereon adapted to force each piece of mail matter to the rear of the preceding piece, so that only one piece of mail at a time is admitted between the feeding means and the conical body, the conical body adapted to rotate downwardly and towards the mail to cause the same to hug the bed plate of the feeding means.

23. In combination with a bed plate; a separator mail feeding means thereon; a mail separating member comprising a substantially abrupt conical body having means constructed thereon adapted to push each piece of mail matter to the rear of the preceding piece, so that only one piece of mail at a time is admitted between the feeding means and the conical body, the conical body adapted to rotate downwardly and towards the mail to cause the same to hug the bed plate of the feeding means; and means for rotating the conical body.

24. In a mail marking machine; a bed plate; a revoluble member mounted in bearings of the bed plate and provided with a volute helix thread adapted to arrange a series of letters in stepped relation to each other; said member adapted to rotate downwardly toward the series of letters and toward the bed plate to hug the letters to the bed plate.

In witness whereof, the applicant's signature is hereunto affixed in the presence of two witnesses.

FRANCIS G. BOSWELL.

Witnesses:

ROBERT A. BOSWELL,
ROHE MEYER.