H. H. DANIELS.

VENDING MACHINE.

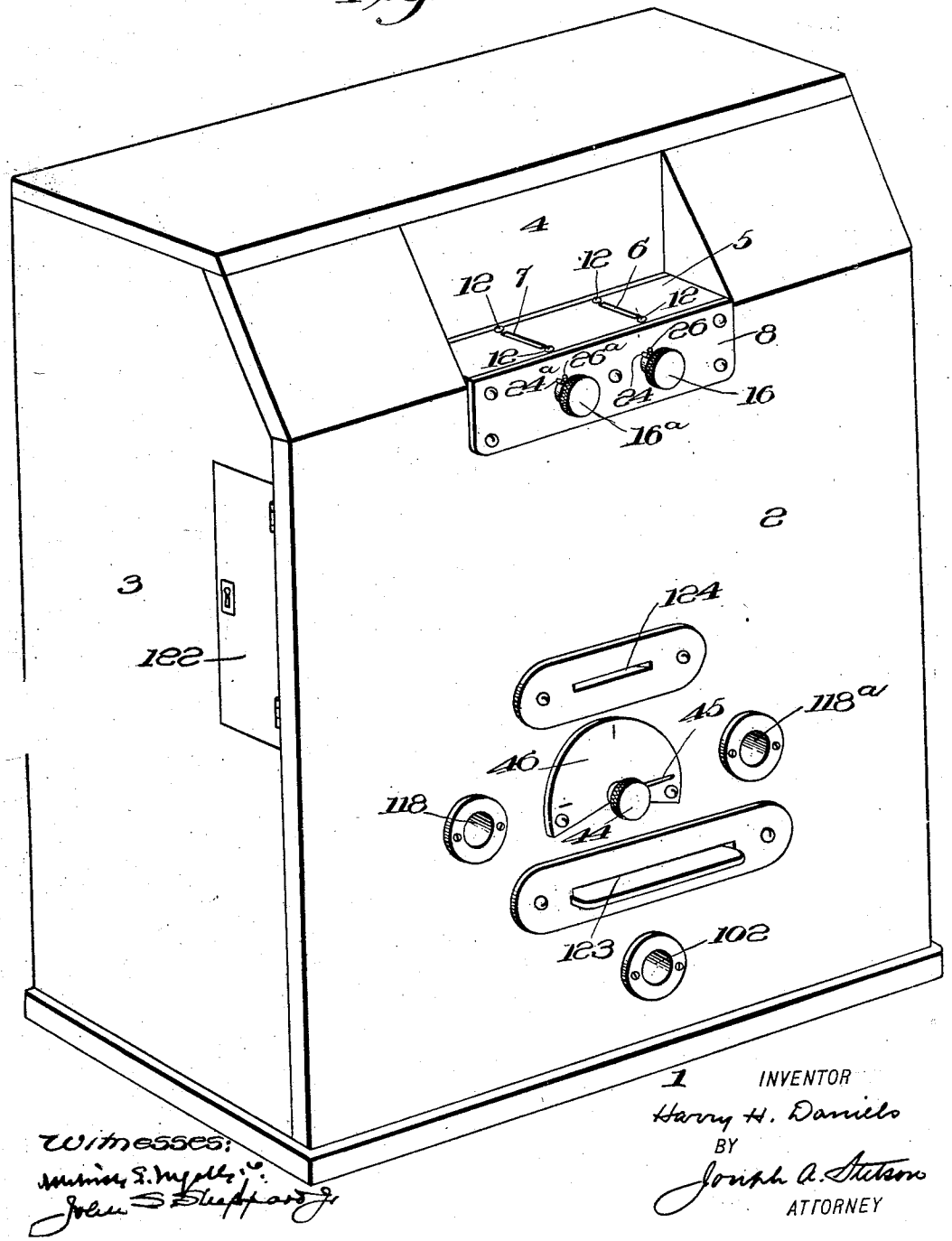
APPLICATION FILED FEB. 2, 1906.

919,543.

Patented Apr. 27, 1909.

5 SHEETS—SHEET 1.

Fig. 1.



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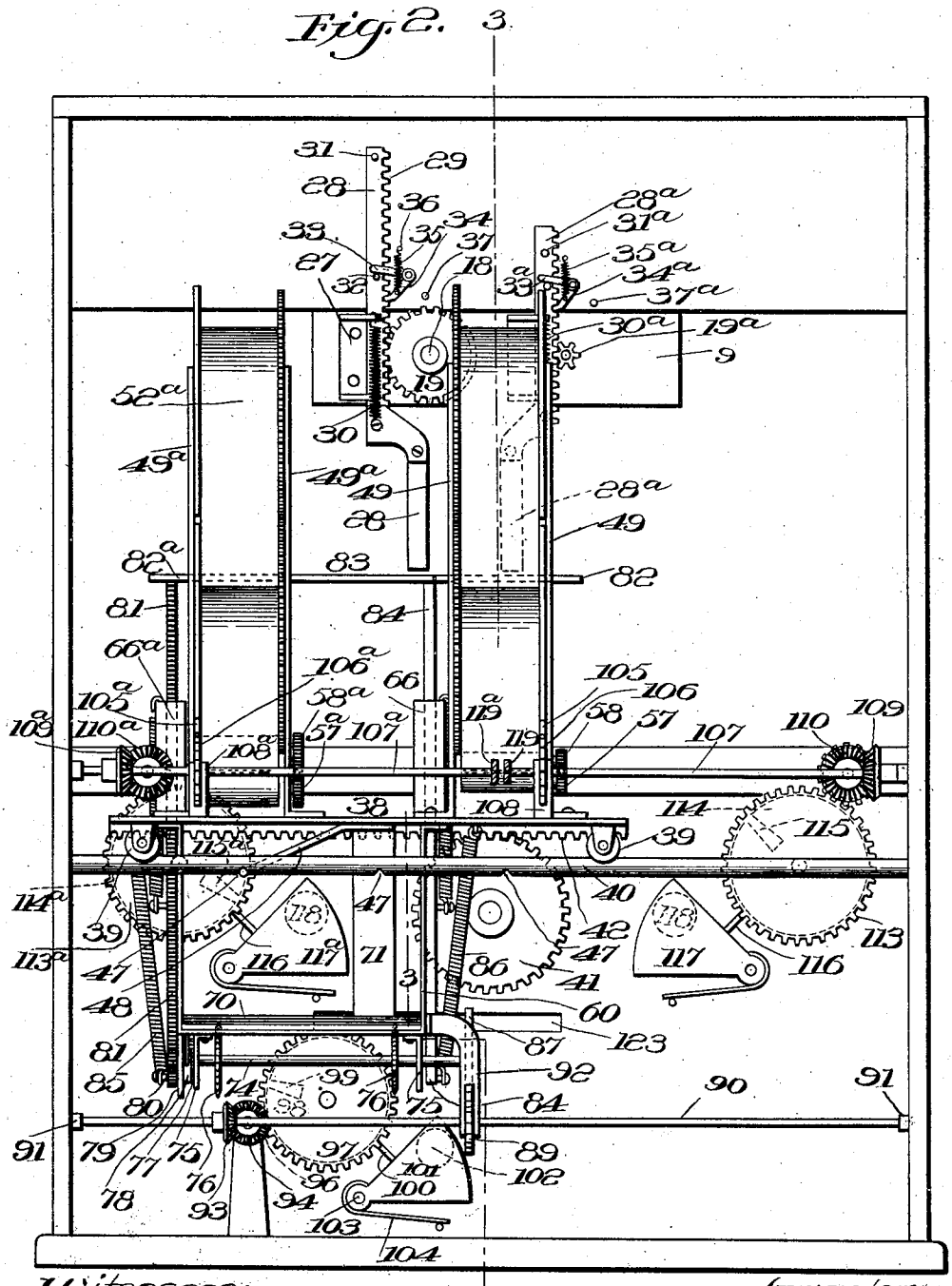
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5 SHEETS—SHEET 2.

Fig. 2.



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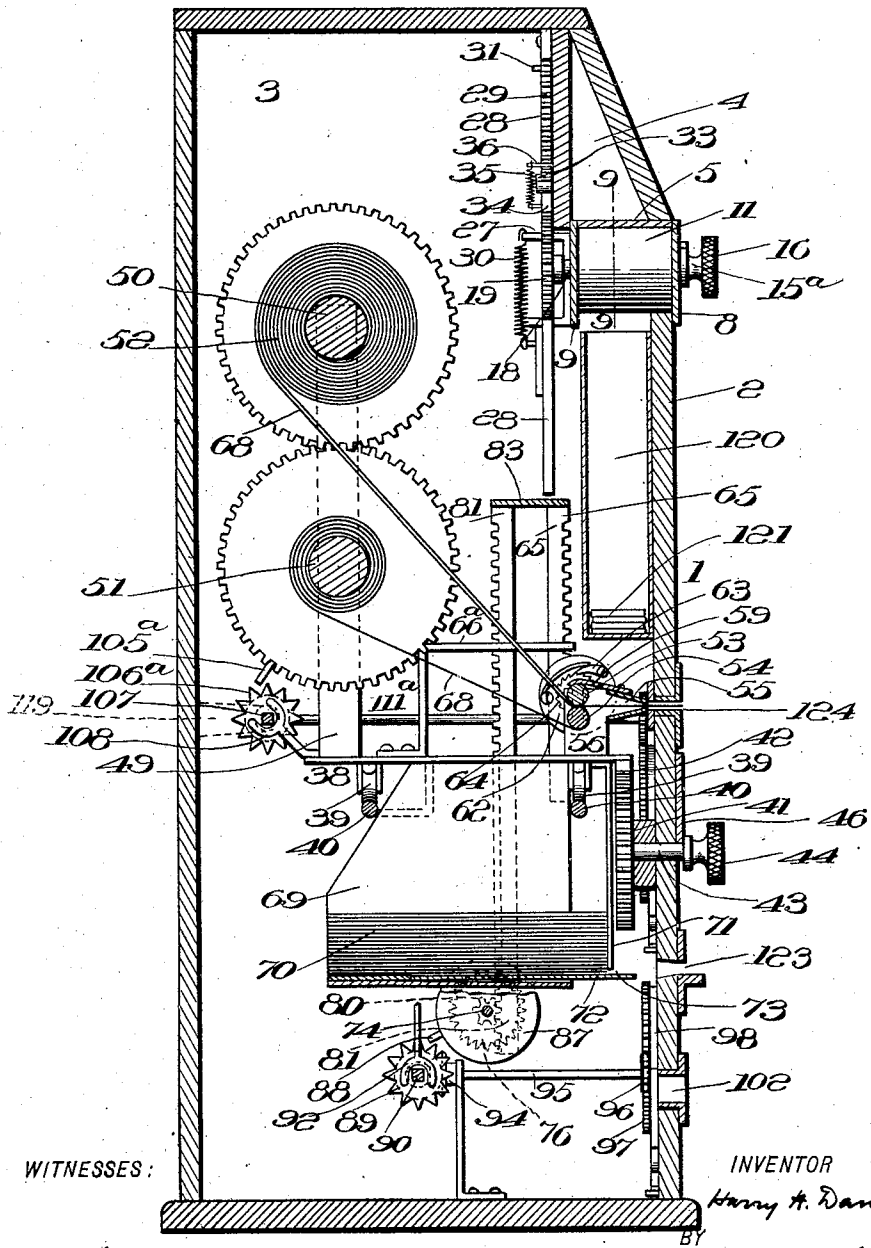
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5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

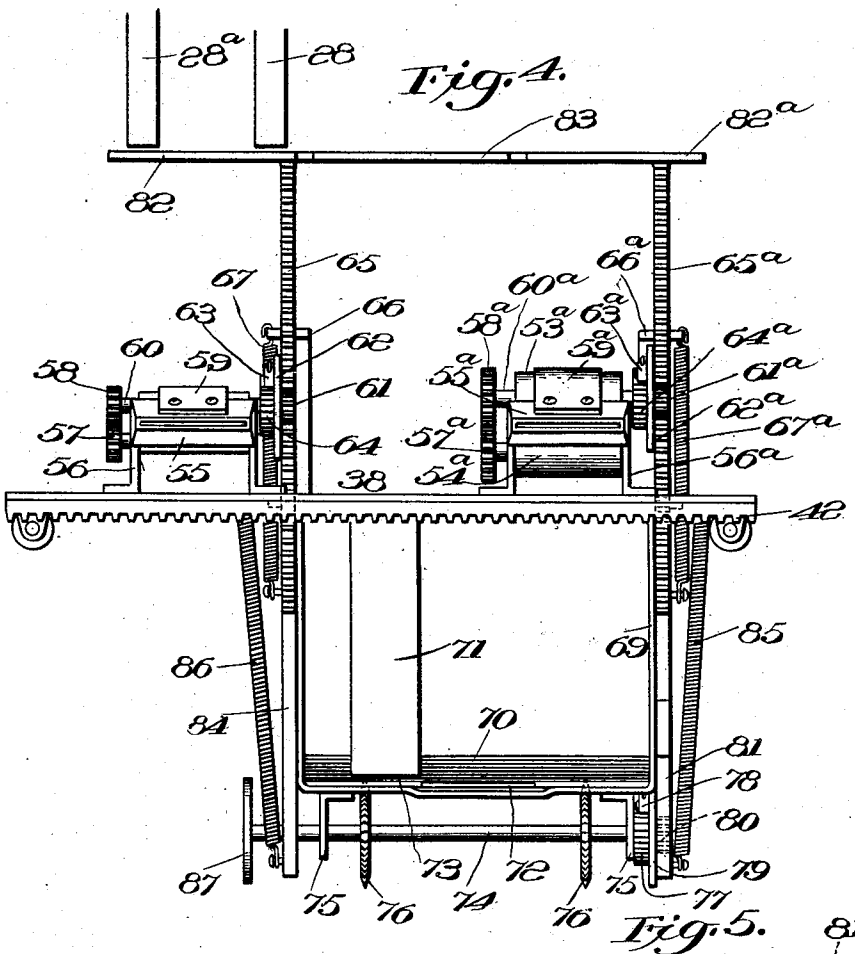


Fig. 4.

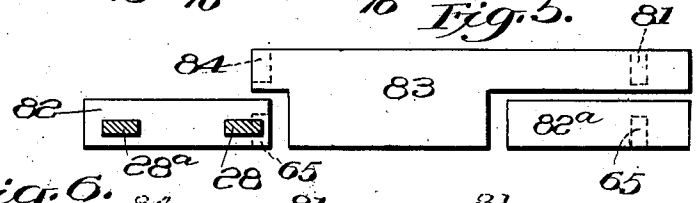


Fig. 5.

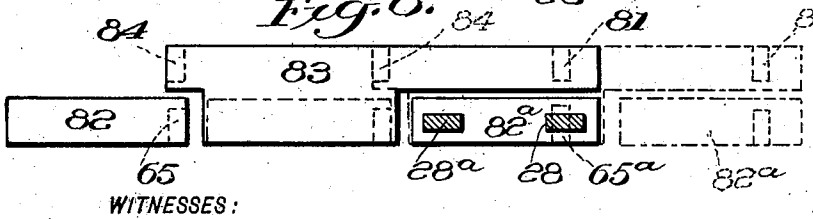


Fig. 6.

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5 SHEETS—SHEET 5.

Fig. 7.

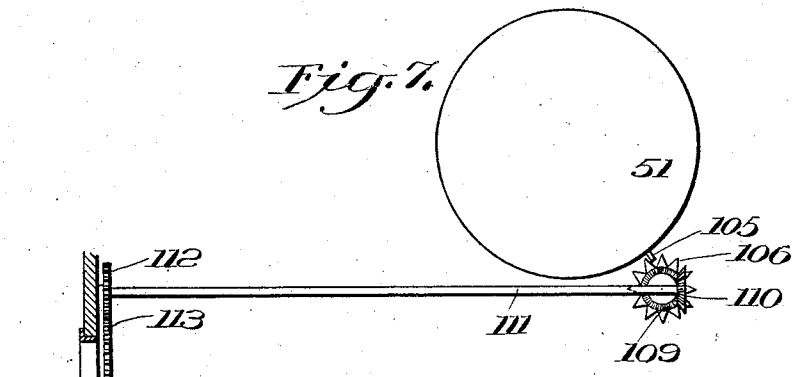


Fig. 8.

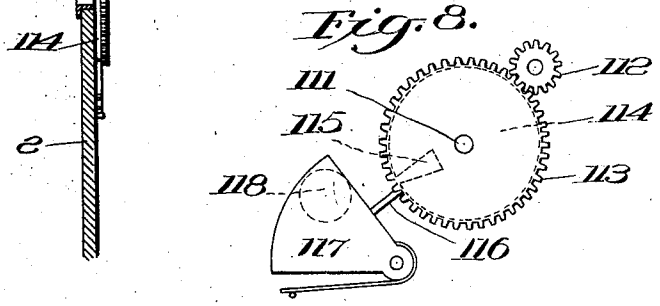


Fig. 9.

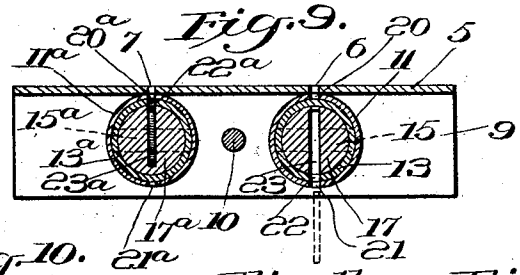


Fig. 10.

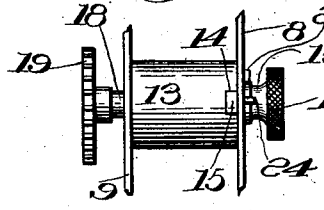


Fig. 11.

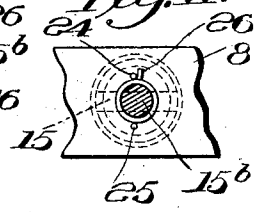
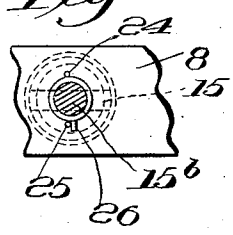


Fig. 12.



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UNITED STATES PATENT OFFICE.

HARRY H. DANIELS, OF WINTHROP, MASSACHUSETTS, ASSIGNOR TO AGNES STEVENSON CAMPBELL, OF TEANECK, NEW JERSEY.

VENDING-MACHINE.

No. 919,543. Specification of Letters Patent. Patented April 27, 1909.

Application filed February 2, 1906. Serial No. 299,129.

To all whom it may concern:

Be it known that I, HARRY H. DANIELS, a citizen of the United States, residing at Winthrop, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Vending-Machines, of which the following is a specification.

My invention relates to that class of vending machines wherein articles are delivered from a storage place within the machine to an operator upon the insertion of a coin of selected value.

The purpose of my invention is to provide apparatus adapted to receive coins of different values, the amount of delivery of the merchandise being controlled according to the denomination of the coin inserted.

The particular embodiment of my invention shown in the drawings and herein described is an apparatus for containing and delivering postage stamps and postal cards in quantities varying in accordance with the denomination of the coin inserted within the coin-receiving aperture.

Figure 1 of the drawing is a perspective view of the front of the casing containing the mechanism of my vending machine. Fig. 2 is a rear view of the mechanism, the rear of the casing being removed. Fig. 3 is a vertical section on the line 3—3 of Fig. 2. Fig. 4 is a front view of the delivery mechanism, the front of the casing being removed. Fig. 5 is a plan view of the plates adapted to receive the downward impact of the plungers driven by the operator when the machine has received the proper coin, one position of said plates in reference to the plungers being indicated, namely, that adapted to the delivery of two-cent stamps. Fig. 6 is also a view of the same plates showing in solid lines a second position of the same in relation to the plungers (for the delivery of one-cent stamps), and in dotted lines a third position (for the delivery of postal cards). Fig. 7 is a detail side view of the device actuating the signals which show the exhaustion of the supply of stamps. Fig. 8 is a detail view of the signal and gear adjacent thereto. Fig. 9 is a sectional view of the coin-receiving device on the line 9—9 of Fig. 3. Fig. 10 is a top view of the coin-receiving device, the parts being shown in the position assumed when the operator has half completed the delivery movement. Fig. 11 is a front view partly in section illustrating the pins which terminate the movement of the coin-receiving device. Fig. 12 is a similar view of the same, the parts being in a position opposite to that of Fig. 11.

Referring to the drawings, 1 is the casing for the device, having the front 2, sides 3 and an upper recess 4 where is located the plate 5 having the aperture 6 adapted to receiving a five-cent piece or nickel, and the aperture 7 adapted to receiving a one-cent piece. Adjacent to the plate 5 is the plate 8 secured to the front of the casing. Parallel to the plate 8 is the plate 9 (Fig. 3), the two plates being held together in position by the stud 10 which is located midway between the two coin-receiving shells (Fig. 9). The outer shell 11 (Fig. 9) of the coin-receiving device is fixed in position between plates 8 and 9 by the screws 12 (Fig. 1). Within the outer shell 11 is located the inner shell 13, having opposite notches 14 (Fig. 10), in its outer edge adapted to be engaged by the opposite ends of a cross-piece 15 fast upon the stud 15^b which carries the thumb-wheel 16. Within the inner shell 13 is the cylinder 17 (Fig. 9) fast upon the shaft 18 carrying gear wheel 19 (Fig. 10). The fixed outer shell 11 is provided with top and bottom slots 20 and 21, the top slot 20 being directly under the corresponding slot in plate 5. The inner shell 12 is provided with a single slot 22. The cylinder 17 has a slot-like recess 23 extending almost across its diameter, but closed at one side. The plate 5 carries upper pins 24 and lower pins 25 adapted to stop the rotation of thumb-wheel 16 by the impact of pin 26, as best indicated in Figs. 11 and 12.

Secured to the plate 9 is the bracket 27 (Figs. 2 and 3), having upper and lower slots in which the rack 28 is moved vertically upon the rotation of gear wheel 19 which meshes with teeth 29 on said rack. The spring 30, whose lower end is connected to rack 28 while its upper end is attached to bracket 27, tends to hold said rack in its upper position except when driven downward by the operator as he rotates thumb-wheel 16. The rack 28 carries upper and lower pins 31 and 32 (Fig. 2), adapted to strike against the arm 33 of the pawl 34 to which is secured the spring 35 whose other end is fastened to pin 36 projecting from the casing. The pin 37, also

projecting from the casing, serves to limit the movement of pawl 34 upon the impact of pin 31 upon arm 33 of said pawl.

The carriage 38, provided with rollers 39 adapted to run upon tracks 40 which extend across the casing, is shifted by the rotation of gearwheel 41 which meshes with an under-rack 42 secured to said carriage. The gear-wheel 41 is secured on a shaft 43 rotated by the operator by means of thumb-wheel 44 which carries the pointer 45 (Fig. 1) indicating upon a dial 46 the position of the carriage 38. Three notches 47 in the rear rail of track 40 are adapted to be engaged by the spring-bent rod 48 to retain the carriage in one of three positions, although the engagement of spring-rod 48 with either notch 47 is such as to permit the shifting of the carriage upon the rotation by the operator of thumb-wheel 44.

The standards 49 (Figs. 2 and 3) are mounted on the carriage 38 in two sets, each set having bearings for the shafts of two spools 50 and 51, mounted one above the other, one of the flanges of each spool being provided with gear teeth which mesh together, as best indicated in Fig. 3. Each of the upper spools 50 carries a roll or coil 52 of stamps and waxed paper in strips, which are led between feed rollers 53 and 54 (Fig. 3), the strip of stamps running into the slotted hood or guide 55 mounted on standards 56 on carriage 38, best shown in Figs. 3 and 4. Upon the shaft of the lower roller 54 is fixed the gear wheel 57 (Fig. 4) which meshes with gear wheel 58 upon the shaft of the upper roller 53. Secured to the top of the guide 55 is the spring 59, which bears down upon the top of upper roller 53. Upon the shaft 60 of upper roller 53 is loosely mounted the small gear wheel 61 (Fig. 4) with the disk 62 affixed thereto. The disk 62 carries the spring-pressed pawl 63 (Fig. 3) adapted to engage or ride over the teeth of ratchet wheel 64, which is fast upon the shaft 60 of the upper roller 53 at the end opposite the gear wheel 58. The gear wheel 61 meshes with the teeth of the vertical rack 65, which is guided by an aperture in the carriage 38 and an aperture immediately above in the bracket 66 mounted upon said carriage. The spring 67 extends between the lower end of rack 65 and bracket 66, tending to hold the rack in its upper position. A strip 68 of waxed paper is coiled with the strip of stamps around upper spool 50, the paper being on the outside. The strip of paper accompanies the strip of stamps between rollers 53 and 54, but instead of being led therefrom through guide 55 (Fig. 3), it is led beneath lower roller 54 to the spool 51 around which it is adapted to be wound as the spools 50 and 51 rotate.

Secured to the under side of carriage 38 is the box 69 adapted to contain postal cards 70. The rear of the box 69 is open, while the front is partially closed by the plate 71 secured to the under side of carriage 38, as best shown in Figs. 3 and 4. The strip 72 affixed on the bottom of box 69 is so adjusted as to permit just sufficient space at the point 73 for the ejection of a single postcard. Upon a shaft 74, carried in bearings 75, are fixed the sharp-toothed feed wheels 76 which project through slots in the bottom of box 69. Fast upon shaft 74 is the ratchet wheel 77 engaged in one direction by the spring-pressed pawl 78, carried upon the disk 79, secured to the gear wheel 80 which is loosely hung upon the outer end of shaft 74. Gear wheel 80 meshes with the teeth of the vertical rack 81, which extends upward through guiding apertures in carriage 38 and bracket 66[a]. Affixed across the top of rack 65 is the plate 82 which, when in its uppermost position, occupies a recess in the plate 83, which is affixed across the top of rack 81 and extends to the top of the vertical rod 84 guided in apertures in the carriage 38 and the bracket 66. A spring 85 is secured to the lower end of rack 81 and to the carriage 38, tending to retain said rack in its uppermost position. A corresponding spring 86 is similarly secured between the lower end of the rod 84 and carriage 38.

Upon the disk 87 affixed to shaft 74 is the projecting pin 88 adapted to engage at each revolution one of the star teeth upon the wheel 89, which is loosely mounted upon a square shaft 90, journaled in bearings 91 in the sides of the casing so that the square shaft 90 is rotated by the wheel 89 which, however, may be carried lengthwise upon the shaft 90 by means of the bracket or yoke 92 when the carriage 38 is shifted. Bevel gear 93 upon shaft 90 meshes with bevel gear 94 upon shaft 95, whose outer end is provided with a gear wheel 96, which meshes with gear wheel 97 (Fig. 3) adapted to rotate about a pin projecting from the front 2 of the casing. Secured to the front face of gear wheel 97 is the disk 98, provided with an aperture 99, adapted to receive the pin 100, projecting from the sector 101, located behind the round window 102 in front 2 of the casing. The sector 101 is pivoted upon the pin 103 projecting from the front casing. Spring 104 holds the pin 100 against the periphery of disk 98, as said disk rotates with gear wheel 97, until the aperture 99 reaches the pin 100, which is then projected into the aperture to lock the device and shift sector 101 upward, so that the lower part of its face is brought opposite window 102.

The free flange of lower spool 51 is provided with a pin 105, adapted to engage at each revolution one of the star teeth upon the wheel 106, which is loosely mounted upon a square shaft 107, so that said shaft may be rotated by wheel 106 which, however, may be carried lengthwise thereof by means of the

yoke or bracket 108, projecting from carriage 38 when said carriage is shifted. At the outer end of shaft 107 is bevel gear 109 which meshes with bevel gear 110 upon shaft 111 (Fig. 7) provided with gear wheel 112 (Fig. 8), meshing with gear wheel 113, secured to disk 114, with an aperture 115 (like aperture 99 already described) adapted to be entered by the pin 116 upon a sector signal 117 behind the round window 118. The square shaft 107 terminates at the middle of the machine (Fig. 2) where it is journaled in bearings supported by a bracket 119 secured to the rear casing. The second set of spools operates a second signal similar to that just described. The three signals, two of which have been described, operate in a similar manner. Figs. 7 and 8 illustrate their construction. As to the two coin-receiving devices and adjacent devices, it seems unnecessary to number and describe each separately, inasmuch as the only differences are in the proportions of the gear. Where corresponding parts of both are numbered similarly, the parts operated upon the insertion of a one-cent coin are distinguished by the letter *a*, while the five-cent connections have the bare numerals. A similar system of numerals distinguishes the delivery device for two-cent stamps from that for one-cent stamps, which show the letter *a* after the numerals. Beneath the two coin-receiving devices secured to the front casing is a coin-receiving box 120, adapted to receive the coins 121 as they are released from the cylinders above. The side 3 of the casing is provided with a small door 122, giving access to the box 120.

The operation of my device is as follows: It will be seen that the carriage 38 is provided with a receptacle for storing postal cards, and also two sets of spools for carrying one and two-cent stamps. Receiving and operating devices are also provided for coins of two different denominations,—one and five-cents. An operator, therefore, may first choose whether he wishes postal cards or stamps delivered, and, if the latter, which denomination of stamps. He may then choose as to the amount of delivery, dependent upon the denomination of the coin inserted by him. If now the operator wishes to procure for a five-cent piece postal cards, he rotates the hand screw 44 until the pointer 45 is in a perpendicular position pointing to the mark properly lettered to indicate postal cards, although such lettering is not shown on the drawing. The spring rod 48 will then enter the middle notch 47 upon the track 40 to retain and steady the carriage which has been shifted by gear wheel 41 engaging rack 42 to a central position in which the postal card box 69 is directly opposite the proper aperture 120 for the ejection of postal cards. The plates 82, 82[a] and 83 will then be in the dotted position of Fig. 6 in relation to the lower ends of racks 28 and 28[a]. Having shifted the carriage to its proper position, the operator inserts through slot 6 a five-cent piece, which assumes a position in the slot 23, so that the coin projects upward into the slot 22 in the shell 13. The left-hand half of Fig. 9, (which, however, shows the one-cent mechanism) illustrates the initial position of the coin. The operator then turns to the right thumb-wheel 16, rotating its shaft 15[b], and by means of cross piece 15 the inner shell 13. The coin serves to lock together shell 13 and cylinder 17 so that the cylinder rotates therewith to the right, revolving gear wheel 19 to lower rack 28 against the resiliency of spring 30. The lower arm of rack 28 then bears upon plate 83 to force downward rack 81 to rotate gear wheel 80 and disk 79 so that the spring-pressed pawl 78 engages ratchet wheel 77 to rotate the shaft 74 and feed wheels 76, the teeth of which engage the surface of the lowermost postal card in the receptacle 69 to drive the same forward through aperture 73 to the delivery opening 123 in the front of the casing. The rotation of the feed wheels 76 continues after the first postal card has passed partially out of the delivery opening and has become clear of the feed wheels, so that they engage and propel forward a second postal card, and the operation is continued until five (5) postal cards are delivered, corresponding to the denomination of the coin inserted.

When the operator has revolved thumb-wheel 16 until the pin 26 strikes pin 25 (Fig. 12), the coin drops through the slot 21 in fixed shell 11 (Fig. 9) to the box 120. At the same instant the pin 31 has engaged the arm 33 on pawl 34, shifting said pawl against the pull of spring 35 until said spring pulls the pawl past a central position to snap it against pin 37 and retain it there. The rack 28, being released by the fall of the coin and the shifting of pawl 34, is returned to its original and upper position by spring 30,—the pin 32 engaging arm 33 to snap the pawl 34 back into engagement with the teeth 29 of rack 28 is shown in Fig. 2. The raising of the rack 28 permits springs 85 and 86 to raise plate 83 and rack 81. As rack 81 returns to its upper position, the pawl 78 slides over the teeth of ratchet wheel 77 without rotating the same. As rack 28 rises it rotates gear wheel 19 and cylinder 17 to their initial positions with recess 23 directly under slot 6. For the next delivery the operator should rotate thumb-wheel 16 from right to left until pin 26 strikes pin 24, when slot 22 will again permit the insertion of the coin. If the operator desires but a single postal card, he inserts in slot 7 a one-cent piece. The operation of the mechanism is similar to the operation just described, ex-

cept that gear wheel 19[a] is smaller than gear wheel 19, so that rotation thereof drives rack 28[a] downward one-fifth of the distance traversed by rack 28 in the operation just described. Therefore, when the lower arm of rack 28[a] operates feed wheels 76 by means of the intermediate mechanism already described, these feed wheels will be driven only a sufficient distance to feed and deliver a single postal card. The disk 87 affixed to the shaft 74, which drives feed wheel 76, rotates with said feed wheels so that at every revolution thereof the pin 88 engages one of the star points upon wheel 89 to rotate the shaft 90 slightly and, by means of the gear already described, wheel 97 and disk 98. When the supply of postal cards in box 69 has become exhausted, the aperture 99 in disk 98 will reach pin 100, which then enters said aperture to allow the signal sector 101 to spring upward to display at window 102 a signal printed on the lower part of said sector, showing, for instance, the word "Empty."

If the operator desires a two-cent stamp, he should rotate thumb-wheel 44 from left to right until the pointer 45 assumes the position shown in Fig. 1, thus revolving gear wheel 41 to shift the carriage 38 to the position illustrated in Fig. 2 with the guide 55 directly behind the stamp aperture 124. The plate 82 will then be directly beneath the lower ends of racks 28 and 28[a] in the position illustrated in Fig. 5. The operator then inserts a one-cent coin in the slot 7. The coin assumes the position illustrated at the left-hand side of Fig. 9. The operator next rotates thumb-wheel 16[a] from left to right to depress rack 28[a] illustrated on the right-hand side of Fig. 2. The operation is precisely the same as that heretofore described for depressing the rack 28, except that gear wheel 19[a] is so much smaller than gear wheel 19 that the rotation of gear wheel 19[a], which terminates when the pin 26 comes in contact with the pin 25 (Fig. 12), serves to lower rack 28[a] only one-fifth the distance traversed by rack 28. The lower end of rack 28[a] then contacts with plate 82 to depress the same with rack 65 upon which it is mounted. The teeth of rack 65 engage gear wheel 61 to rotate it and disk 62 so that the pawl 63 engages ratchet wheel 64 (Fig. 3) to rotate the two feed wheels 53 and 54 in a direction to pull forward the strips of stamps and waxed paper. The upper feed wheel 53 is held in close contact with the lower feed wheel by the spring 59 and both feed wheels are covered by emery paper to assist the feeding. The circumference of each feed wheel 53 and 54 equals one-half the length of one of the stamps in the strip and the proportions of the downward movement of rack 65 and the diameter of gear wheel 61 are such that a single revolution is imparted to the feed wheels 53 and 54 so as to eject the strip of stamps at the aperture 124 a distance equal to one-half the length of a single stamp. The pull of feed wheels 53 and 54 upon the two strips of stamps and waxed paper serves to unwind the strips slightly from the upper spool 50 and rotate the same. By means of gear teeth on one of the flanges of spool 50 and upon one of the flanges of lower spool 51 the latter spool is rotated in the reverse direction to wind the strip of waxed paper in a roll or coil around said spool 51, the waxed paper strip being led beneath the lower feed roller 54 to the lower spool 51. The diameter of the roll of stamps and waxed paper carried by upper spool 50 will be, when the upper spool is loaded, greater than the diameter of the shaft of the lower spool 51 so that the winding of the waxed paper upon lower spool 51 will exert but a slight pull upon the waxed paper strip which will lie loosely upon the lower spool and hang somewhat loosely between said spool and lower feed roll 54. But as further deliveries of stamps are had, the diameter of the coil or roll upon the upper spool will be diminished, while the diameter of the coil of waxed paper upon the lower spool will increase, serving to take up the slack and tighten the coil upon the lower spool. When the operator has rotated the thumb-wheel 16[a] until the pin 26 contacts with the pin 25, the coin will be released from cylinder 17[a] and dropped downward through slots 22[a] and 21[a] into the receptacle 120 and at the same time rack 28[a] will be returned to its upper position by spring 30[a], permitting spring 67 to raise rack 65. On the reverse rotation of gear wheel 61 and disk 62, the pawl 63 rides over the teeth of ratchet wheel 64 without rotating the feed wheels 53 and 54. To complete the delivery of the two-cent stamp, a second one-cent coin must be employed and the operation just described repeated.

If the operator desires to procure a one-cent stamp, he proceeds as follows: The hand-wheel 44 should be rotated from right to left until the pointer 45 assumes the left-hand position, when the carriage 38 will be shifted to the extreme left-hand position, as regarded from the front. This brings the feeding devices for the delivery of one-cent stamps into operative position behind aperture 124 so that the plate 82[a] is beneath the lower ends of plungers 28 and 28[a] as shown in solid lines in Fig. 6. The feed rollers 53[a] and 54[a] for the one-cent stamps have circumferences just equal to the length of a single stamp, so that a single revolution thereof will feed the strip a distance equal to one stamp.

When a five-cent coin is employed and the carriage 38 is in its left-hand position for delivering one-cent stamps, the depression of rack 28 and rack 65[a], being five times the amount of the movement when the one-cent

device is operated, will deliver five stamps instead of one to the operator. If the carriage is shifted to the position for delivery of two-cent stamps and a five-cent coin is inserted in the proper aperture 6, the operation of the machine will feed the strip of two-cent stamps a distance corresponding to the length of two and one-half stamps. The insertion of a one-cent coin in the proper aperture 7 and the further operation of the machine will then propel forward the strip of two-cent stamps a distance corresponding to one-half the length of a stamp, thus completing the delivery of three stamps in return for the six cents, which has been received by the machine.

In placing the strips of stamps between the feed rollers when the machine is filled ready for operation, the adjustment should be such that stamps which are delivered as above explained through aperture 124, are not completely ejected but the perforated tearing line is withheld a slight distance behind the slot 124, enabling the operator to tear off the stamp but preventing the withdrawal of stamps in the rear. The rear of the casing is provided with upper and lower doors (not shown) allowing an attendant to have access to the mechanism for the purpose of providing new supplies of stamps and postal cards. The same attendant may withdraw the coins from the box 120 in which they are received. For each denomination of stamps a signal is provided operating similarly to the signal for postal cards and serving to indicate to the operator when the supply is exhausted.

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

1. In a vending machine, a movable carriage having storage facilities for different articles to be vended, means for shifting the carriage into position for the delivery of a selected article, feeding devices for each store of articles mounted on the carriage, and a plurality of operating devices mounted on the case of the machine, each adapted to effect a different amount of delivery by the feeding devices on said carriage.

2. In a vending machine, a carriage for holding stores of different articles, means to shift the carriage, separate feeding devices upon said carriage for each different store of articles, a toothed rack engaging each feeding device, and an operating member adapted to coöperate with one of the toothed racks to feed an article from a selected store.

3. In a vending machine, a movable carriage carrying stores of different articles, feeding means for each article mounted on said carriage, a plurality of operating devices having different limits of movement mounted in the case of the machine, means to shift said carriage into position for the delivery of a selected article and so that the feeding means for such article will be positioned ready for engagement by any selected operating device.

4. In a vending machine, a movable carriage, a plurality of spools for stamps of different values mounted thereon, means to shift said carriage into position for the delivery of a stamp of selected value through an aperture, a separate feeding device for each spool mounted on the carriage, each feeding device having a different rate of feed in inverse ratio to the value of its respective denomination of stamps, and means for actuating the feeding device mounted on the case of the machine.

5. In a vending machine, a movable carriage bearing a plurality of stores of different articles, means to shift said carriage into position for the delivery of a selected article, separate feeding devices for each store of articles mounted on said carriage, each feeding device being so proportioned in respect to the others that the more expensive articles are fed slower and the cheaper articles more rapidly in inverse ratio to their values, and means for actuating the feeding devices mounted on the case of the machine.

6. In a vending machine, a carriage bearing a plurality of stores of different articles, means to shift said carriage into position for the delivery of a selected article, a separate feeding device mounted on said carriage for each store of articles, each feeding device being so proportioned that its rate of feed will accord with the value of its respective article, the cheaper articles having the more rapid feeding devices while the dearer articles have proportionately slower feeding devices.

7. In a vending machine, feeding rollers, a ratchet wheel fast on the shaft of one feeding roller, a second gear wheel loose on said shaft and carrying a spring-pressed pawl adapted to engage the teeth of said ratchet when said gear wheel is revolved in one direction, but to ride over the same when said gear wheel is revolved in the reverse direction, a rack adapted to engage said gear wheel, a spring adapted to return said rack to one end of its path and operating means driven from the outside of the machine for actuating said rack against the force of said spring to drive the feed rollers.

Signed at Boston in the county of Suffolk and State of Massachusetts this 30th day of January A. D. 1906.

HARRY H. DANIELS.

Witnesses:
M. I. NORTON,
A. L. KELLY.