C. F. RICHARDSON.

VENDING MACHINE.

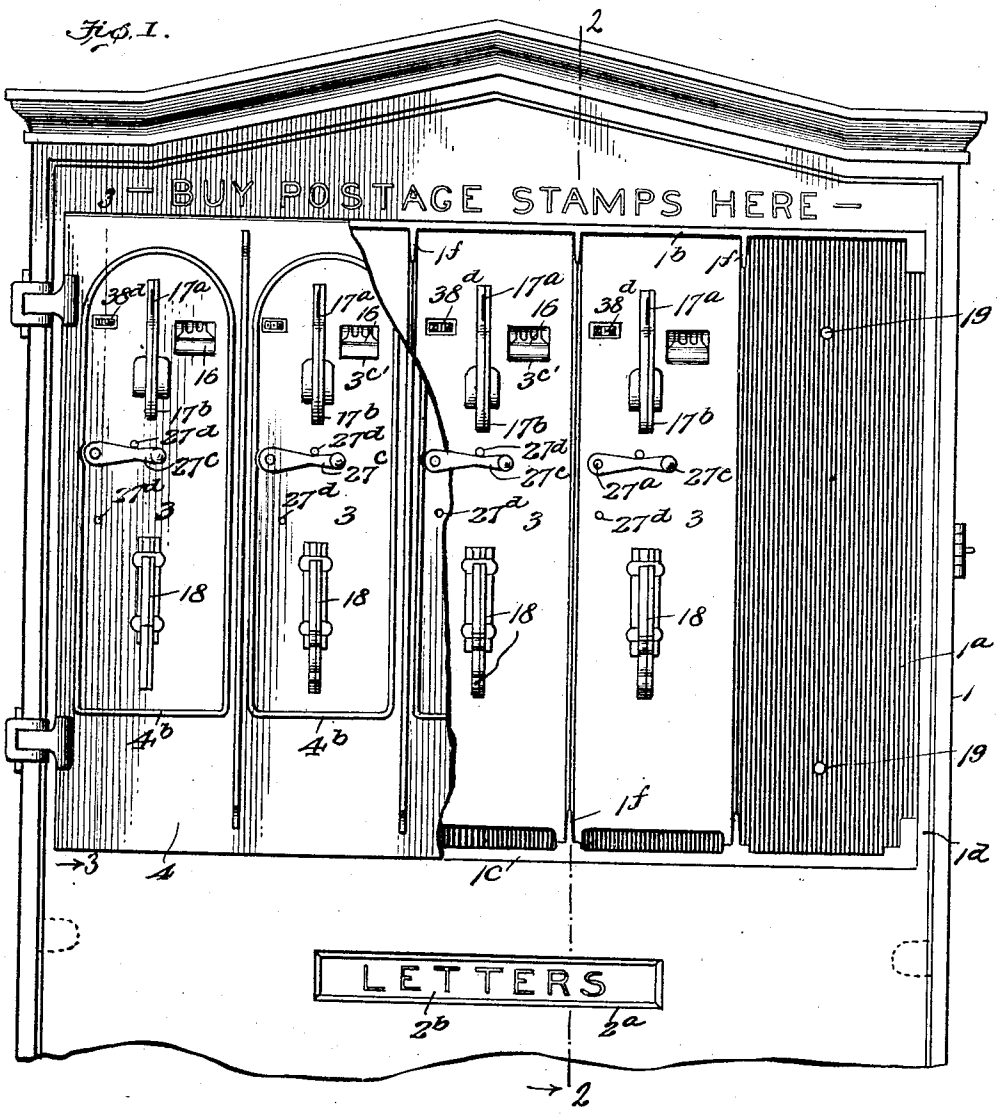
APPLICATION FILED JAN. 18, 1917.

1,336,389.

Patented Apr. 6, 1920.

6 SHEETS—SHEET 1.

Fig. 1.



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6 SHEETS—SHEET 2.

Fig. 3

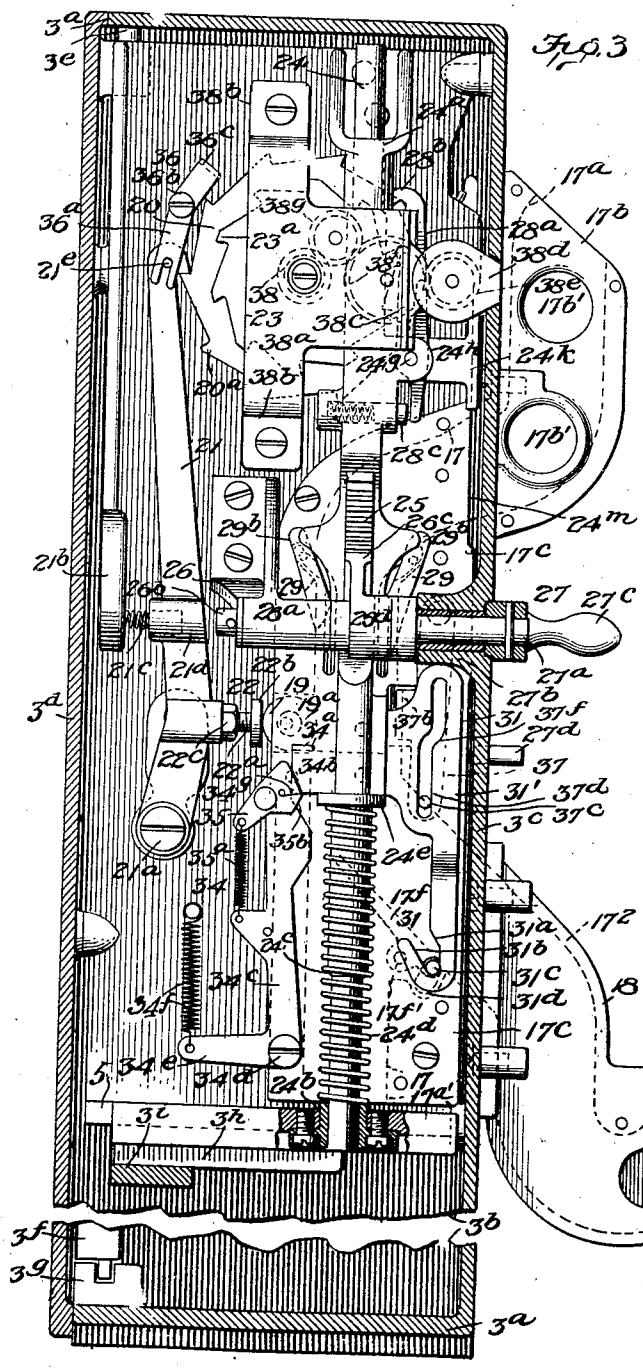
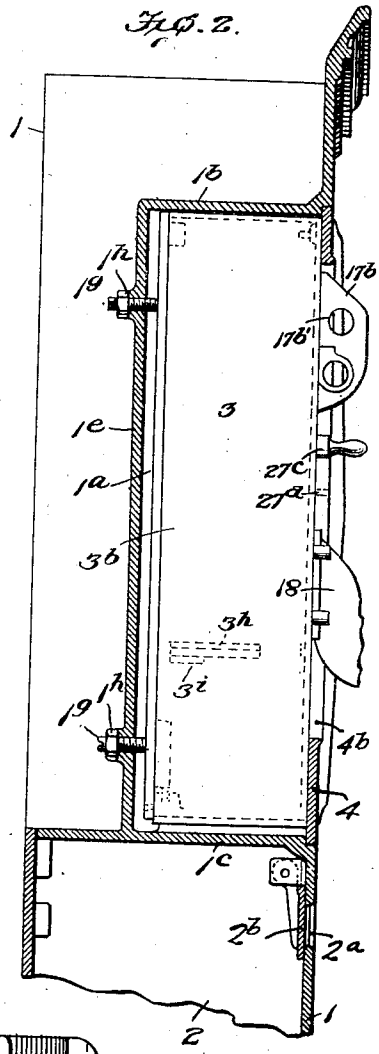


Fig. 2.



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Fig. 4

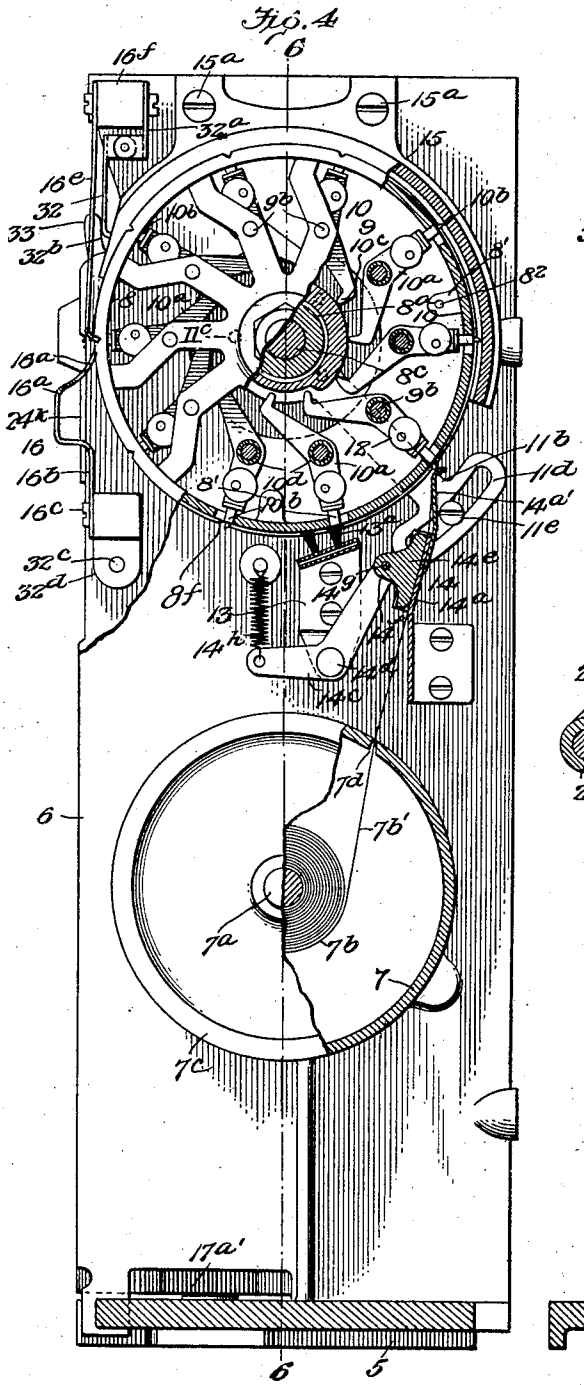
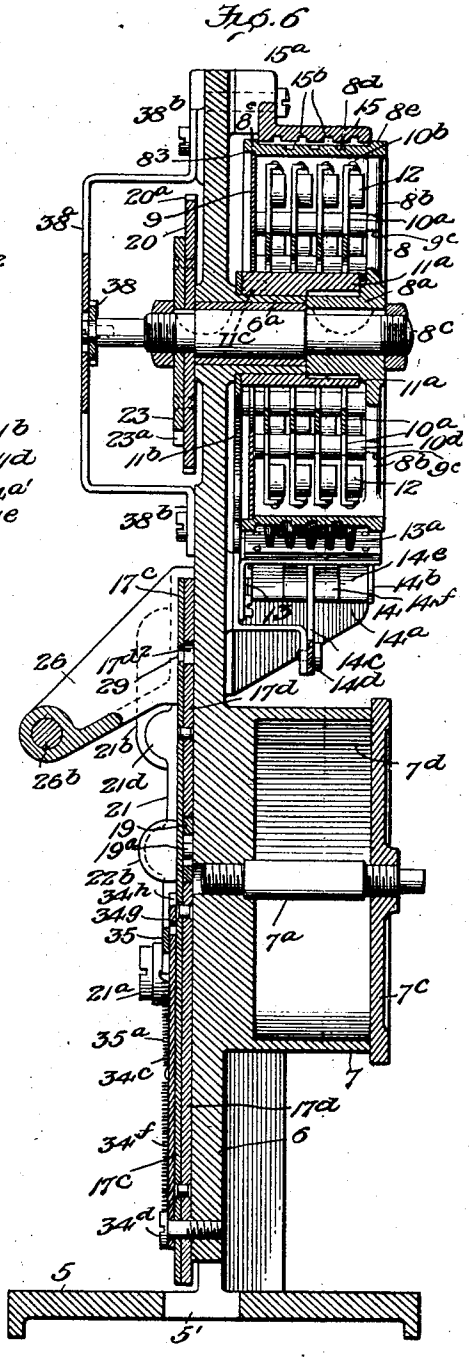


Fig. 6



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6 SHEETS—SHEET 4.

Fig. 5

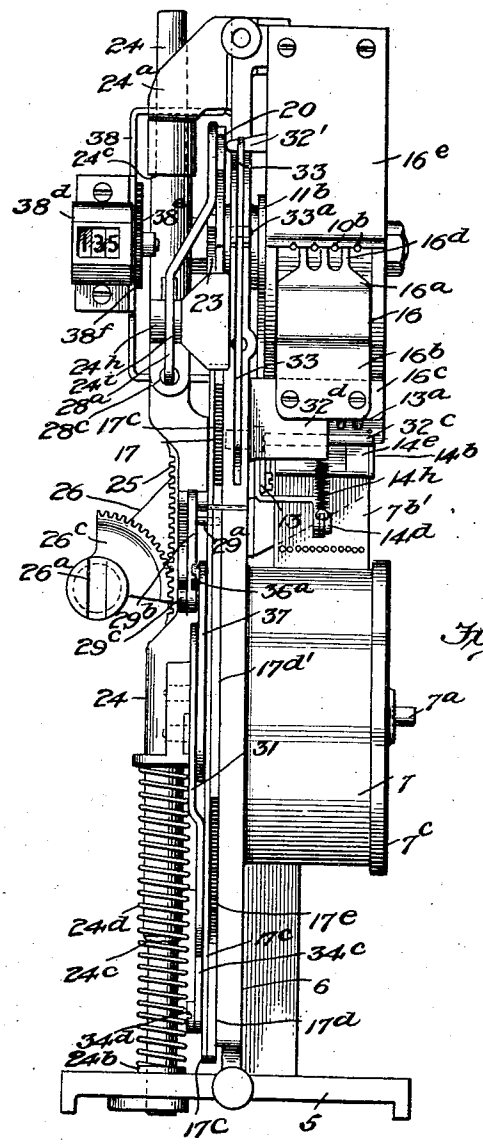


Fig. 7

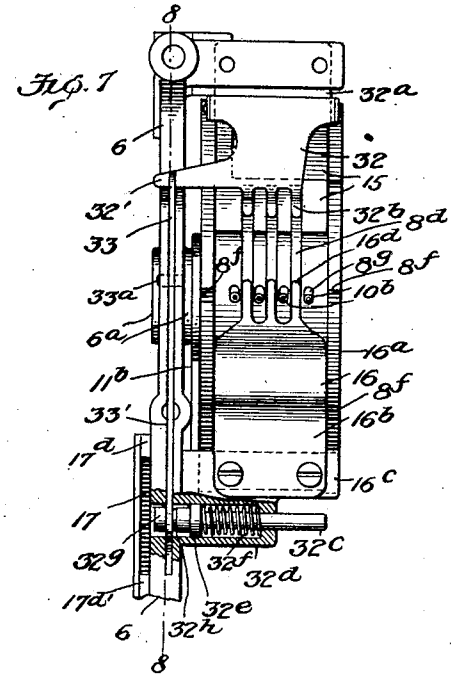
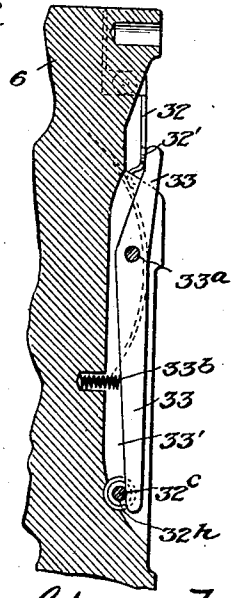


Fig. 8.



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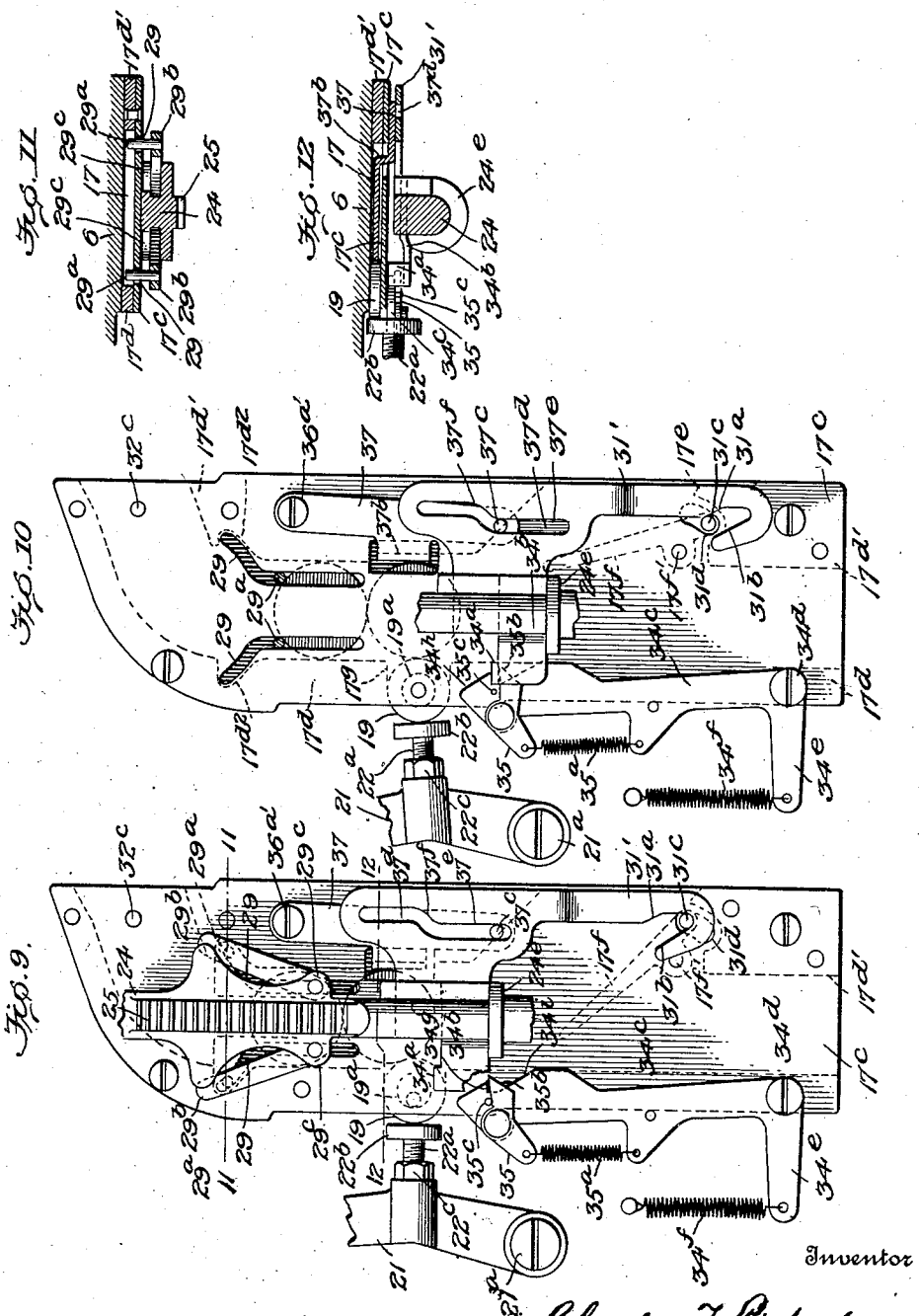
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6 SHEETS—SHEET 5.



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6 SHEETS—SHEET 6.

Fig. 15.

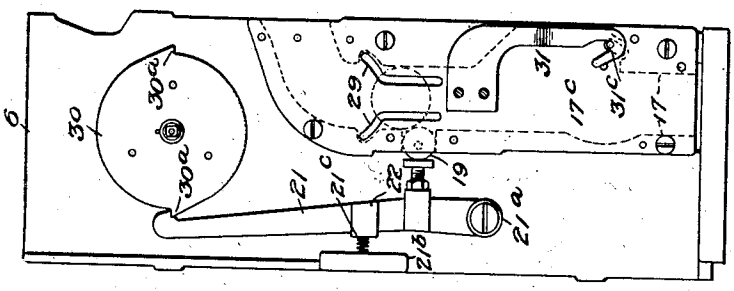


Fig. 14.

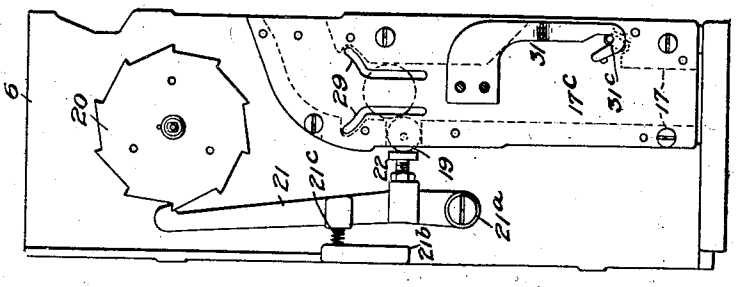
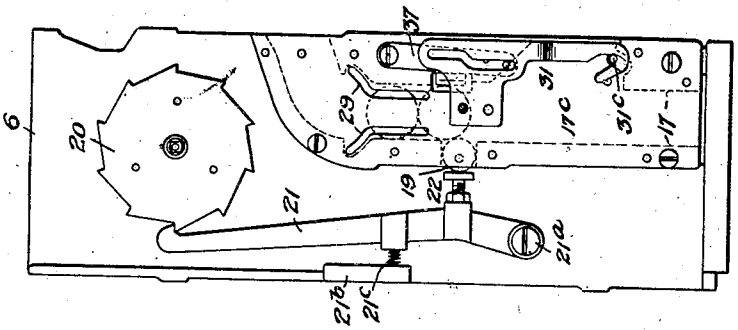


Fig. 13.



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UNITED STATES PATENT OFFICE.

CHARLES F. RICHARDSON, OF WOONSOCKET, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GEORGE B. PITTS, TRUSTEE, OF CLEVELAND, OHIO.

VENDING-MACHINE.

1,336,389. Specification of Letters Patent. Patented Apr. 6, 1920.

Original application filed December 31, 1910, Serial No. 600,254. Renewed April 3, 1915, Serial No. 19,036. Divided and this application filed January 18, 1917. Serial No. 142,974.

To all whom it may concern:

Be it known that I, CHARLES F. RICHARDSON, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in and Relating to Vending-Machines, of which the following is a specification.

This invention relates to vending machines, the delivery mechanism of which may be adapted to deliver stamps, tickets, checks or the like, or portions of a strip of material.

For the purpose of illustration, I have, in the accompanying drawings, shown and herein described one form of vending mechanism embodying my invention.

Figure 1 is a front view of the upper part of a casing, with the door of the casing broken away to illustrate the position of the vending machines, or units, one of the latter being omitted.

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is a section, enlarged, through one of the units on the line 3—3 of Fig. 1, showing the coin control mechanism in side elevation.

Fig. 4 is an elevation, partly in section, of the vending apparatus removed from the unit casing or section.

Fig. 5 is a front elevation of the parts shown in Fig. 4.

Fig. 6 is a section on the line 6—6 of Fig. 4.

Fig. 7 is a front view of the upper portion of the delivery mechanism, the stamp separator or cutter being removed to illustrate the means for controlling the coin way or opening.

Fig. 8 is a section on the line 8—8 of Fig. 7.

Fig. 9 is a side elevation of a portion of the coin control mechanism, showing the form of coin control mechanism for delivering a two-cent stamp by the insertion of two pennies.

Fig. 10 is a view similar to Fig. 9 with certain parts in a different position, and also broken away for the purpose of clearly illustrating the operation.

Fig. 11 is a section on line 11—11 of Fig. 9.

Fig. 12 is a section on line 12—12 of Fig. 9.

Fig. 13 is a side view of the coin control mechanism adapted for the delivery of one two-cent stamp upon the insertion of two pennies, the plunger mechanism being omitted.

Fig. 14 is a side elevation similar to Fig. 13 but adapted for the delivery of one one-cent stamp by the insertion of one penny.

Fig. 15 is a view showing the parts adapted for the delivery of five one-cent stamps upon the insertion of one five-cent piece.

In the drawings, 1 indicates a support, preferably comprising a casing or housing, within which is formed a chamber 1^a having a top wall 1^b, a bottom wall 1^c, side walls 1^d and a rear wall 1^e.

The support 1 may be of any ordinary or preferred construction, but preferably is provided with a mail holding receptacle 2 below the chamber 1^a. 2^a indicates an opening through which mail matter is inserted, such opening being closed normally by a pivoted plate 2^b.

3 indicates a vending unit removably mounted in the chamber 1^a. As shown in the drawings, the casing or housing 1 is preferably of a size to accommodate a series of units 3. By this arrangement, one unit may be capable of vending stamps or tickets of one denomination and another unit stamps or tickets of a different denomination.

4 indicates a hinged door for the chamber 1^a, which door may be locked by any suitable means. 4^b indicates an elongated opening formed in the door 4 (see Fig. 2). I preferably provide an elongated opening 4^b for each unit 3, whereby the major portions of the front faces or walls thereof are exposed to view.

1^f indicates guiding and spacing devices provided on the top wall 1^b and bottom wall 1^c of the chamber 1^a. These devices properly space the units 3 relative to each other and permit them to be easily inserted and removed from the chamber 1^a.

1^g indicates abutment devices carried by the rear wall 1^e of the chamber 1^a. These devices are preferably screw threaded and fitted to suitable screw threaded openings in the said rear wall 1^e, whereby they may be adjusted. 1^h indicates nuts fitted to the abutments for locking them in their adjusted positions. As shown in Fig. 2, the abutments are adjusted so that the space between their inner ends and the inner face of the door 4 is substantially equal to the depth of the units, so that when the door 4 is closed, the units 3 are held rigid, the guiding and spacing devices 1^f operating to prevent their sidewise movement.

Each unit 3 comprises a casing having top and bottom walls 3^a, side walls 3^b, a front wall 3^c, formed with a stamp delivery opening $3^{c'}$ and a rear wall, which is preferably in the form of a removable plate 3^d. 3^e indicates pins carried by the plate 3^d at its upper end and adapted to fit suitable openings in the top wall 3^a. 3^f indicates a lock carried by the plate 3^d and having a bolt or latch which engages a keeper 3^g preferably carried by the bottom wall 3^a. The pins 3^e and the openings therefor, and the lock, bolt and keeper serve as one form of construction for holding the plate 3^d in position.

3^h, 3^h, indicate a pair of ribs, supported by the opposite inner faces of the side walls 3^b. Each rib 3^h is provided with suitable guide walls adapted to slidingly support a base or platform 5. 3^i indicates a cross rod or bar, preferably cast integral with the side walls 3^b of the unit casing, to keep those portions of the walls adajcent to the ribs 3^h from bulging.

6 indicates a vertical wall or member preferably cast integral with the base 5 and extending upwardly therefrom substantially centrally of the unit casing. The wall 6 supports the stamp feed and delivery mechanism on one side thereof and the coin control mechanism, which actuates the stamp feed and delivery mechanism, on the other side thereof.

Of the strip or stamp feed and delivery mechanism, 7 is a box, preferably of cylindrical shape, secured to or formed integral with the wall 6. 7^a is an arbor or shaft, preferably stationary and arranged centrally of the box. The shaft 7^a is adapted to receive and support a roll of strip material 7^b, (such as checks, tickets or postage stamps), which may be weakened on transverse lines. 7^c is a cover or end plate for the box fitted on the screw threaded end of the shaft 7^a. 7^d is an elongated slot formed in the wall of the box 7 through which opening the strip $7^{b'}$ is drawn by the feed and delivery mechanism.

8 indicates a strip delivery drum or wheel having a hub 8^a and spokes 8^b which connect with the hub 8^a at one end thereof. 8^c indicates a shaft mounted in a suitable bearing 6^a in the wall 6 and preferably extending laterally therefrom at either side. The drum or wheel 8 is fixed to the shaft 8^c and is driven or rotated thereby intermittently, as will be later described. 8′ indicates a plurality of lugs extending inwardly from the inner surface of the delivery wheel 8 near that edge opposite to the spokes 8^b. These lugs 8′ are preferably formed with screw threaded openings to receive screws 8^2, which secure an annular cap or plate 9 to the wheel. The wheel 8 is preferably rabbeted, as shown at 8^3 to form a suitable seat for the plate 9, having a series of openings (not shown) which are arranged concentrically of the axis of the wheel 8. 9^b indicates a series of transverse shafts, preferably in the form of bolts, carried by the wheel 8. One end of each bolt is reduced and provided with screw threads, as shown at 9^c, and fitted to a suitable screw threaded opening formed in each spoke 8^b, and the opposite end, or head thereof is supported in one of the openings of the plate 9.

8^d, 8^d, 8^d, are spaced circumferential grooves formed in the feed drum or wheel 8, which at either side is flanged, as indicated at 8^e. At regular intervals these flanges are notched or recessed, as indicated at 8^f, the notches on one flange being alined with the notches on the opposite flange and the notches being spaced apart on the said flanges the distance occupied by each of the stamps on the periphery of the drum or wheel.

8^g indicates sets of elongated openings formed in the wheel 8, the openings comprising each set being arranged side by side, as clearly shown in Fig. 7.

10 indicates sets of perforation finding devices, one set for each set of openings, and adapted to move relative to the drum or wheel 8 and strip in order to "find" the perforations between the adjoining ends of two stamps, checks or tickets. There are preferably four devices 10 to each set, as shown in Fig. 6. Each device 10 preferably comprises an arm or lever 10^a loosely pivoted upon the adjacent shaft 9^b, a pin 10^b at the free end of the lever 10^a, which pin projects through the adjacent opening 8^g in the circumferential wall of the wheel 8 and slightly beyond the outer surface thereof, and a tail piece 10^c which rides on a normally stationary cam 11, the latter effecting the movement of the pin 10^b longitudinally of the adjacent opening 8^g.

As shown in the drawings, when the pins

10^b of each set of finders 10 are in operative position, that is, at the forward end of the adjacent openings 8^g, they are in line with two alined notches or recesses 8^f (see Fig. 4).

10^d indicates spaces or washers mounted on each shaft 9^b and interposed between adjacent arms or levers 10^a and between each wheel spoke 8^b and the adjacent lever 10^a to keep the arms or levers in properly spaced position along said shafts 9^b.

The cam 11 preferably comprises a sleeve 11^a adjustably mounted on the sleeve or bearing 6^a. 11^b indicates a bar, which is fixed to the sleeve 11^a by screws 11^c. This bar preferably extends radially of the delivery wheel, and is preferably enlarged at its free end and formed with an elongated curved opening or slot 11^d. 11^e indicates a set screw, adapted to a suitable opening in the vertical member 6 and arranged to secure the bar 11^b thereto. By loosening the set screw 11^e, and moving the bar in one direction or the other, the cam 11 may be adjusted on the bearing hub within certain limits and thus effect the swinging of the devices 10 at one point or another during the revolution of the wheel 8, the purpose of which will be later described.

12 indicates a weight carried by each perforation finding device 10, and so arranged relative to the pivot thereof as to maintain the pin 10^b at the rear end of the adjacent opening 8^g during a portion of its movement about the axis of the wheel 8. Preferably, the cam 11 is arranged so that when each device 10 is at its lowermost position, it is free to swing about its pivot, and then as said device 10 moves upwardly with the drum 8 about the axis thereof, the weight 12 on the device will cause it to swing in a clockwise direction, as viewed in Fig. 4, and move the adjacent pin 10^b to the rear end of its slot 8^g.

As shown in Fig. 4, the strip $7^{b'}$ is delivered substantially tangentially to the surface of wheel 8 on that side which moves upwardly, and the cam 11 is positioned to move the pins 10^b forwardly relative to the wheel 8 and the strip $7^{b'}$ at approximately the same time that the strip engages with the wheel. As will be understood, when the pins 10^b are in inoperative position or at the rear end of the openings 8^g, they are behind or rearward of the perforations of the strip. As the pins 10^b move forwardly, which movement is at a speed slightly greater than the speed of the strip $7^{b'}$, they automatically "find" or move into registry with and enter the said perforations.

13 indicates a bracket suitably supported by the wall 6. 13^a indicates one or more brushes or sets of fibers projecting upwardly into the path of the pins 10^b. These brushes operate to clean the pins prior to their engagement with the stamp strip and are preferably so arranged relatively to the cam 11 that they will positively swing the pins 10^b rearwardly prior to their operation of finding and entering the perforations between adjoining stamps, checks or tickets, without materially retarding the movement of the wheel 8.

14 indicates devices for guiding and tensioning the strip $7^{b'}$ as it is delivered from the stamp-roll box 7 to the delivery wheel 8. Of these devices, 14^a indicates a flat bearing plate preferably provided with flanges or side walls 14^b which guide the strip $7^{b'}$ to the wheel. The plate 14^a is secured to the wall 6 in any well known manner. 14^c indicates a lever or arm freely pivoted on a stub shaft 14^d which is suitably supported by the vertical wall 6. 14^e indicates a shoe adapted to engage with the strip $7^{b'}$ and press it against the bearing plate 14^a. The shoe 14^e may be provided with a pair of apertured lugs 14^f, between which one end of the lever 14^c is arranged, a pin 14^g being provided for pivotally connecting the shoe and lever together.

14^h indicates a spring which is connected at one end to the end of the lever 14^c that is opposite to the shoe carrying end. The opposite end of the spring is secured to some suitable connection on the wall 6. As will be clearly understood, the shoe 14^e is yieldingly held against the strip $7^{b'}$ by the spring 14^h with sufficient force to permit the proper feeding of the strip $7^{b'}$ to the delivery wheel 8, when the latter is operated, without causing a separation or breaking of the said strip. $14^{a'}$ indicates an auxiliary strip guide extending upwardly from the plate 14^a and arranged to support the stamp strip $7^{b'}$ in close proximity to the wheel 8 as it is fed thereto.

15 indicates a curved strip guide fixed to the wall 6 by screws 15^a and extending around a portion of the circumference of the delivery wheel 8, but spaced therefrom slightly to permit the strip $7^{b'}$ to freely feed around the wheel to the delivery opening $3^{c'}$ in the front wall 3^c of the unit 3. The guide 15 is of a width to fit between and slightly below the upper surfaces of the flanges 8^e of the wheel 8 and thus prevents the strip $7^{b'}$ from running off the wheel. The guide 15 is provided with spaced longitudinal grooves 15^b to receive the free ends of the pins 10^b.

16 indicates a delivery device, the purpose of which is to guide the stamp, check or ticket at the free end of the strip $7^{b'}$ outwardly through the opening $3^{c'}$ as the strip is moved forwardly by the wheel 8. This device preferably comprises an inclined plate 16^a extending outwardly and downwardly relative to the delivery wheel 8. The plate 16^a has an inwardly turned member 16^b which is secured to a laterally extending

support 16^e. The upper or free end of the plate 16^a is preferably provided with fingers or projections 16^d which run in the grooves 8^d. By this construction, it will be seen that as each succeeding stamp, check or ticket of the strip $7^{b'}$ reaches a point substantially opposite the opening $3^{c'}$ it engages with the plate 16^a and is guided outwardly thereby through the opening $3^{c'}$ where it can be grasped and removed or disconnected from the strip.

16^e indicates a stamp, check or ticket separator or cutter preferably comprising a plate extending downwardly from a support 16^f, with its lower or cutting edge in front of the drum or wheel 8 and opposite the delivery opening $3^{c'}$ (see Fig. 5). The plate 16^e is preferably formed from resilient sheet metal so that its cutting edge, which is bent inwardly slightly, may yieldingly press against the wheel 8. The plate may extend entirely across the face of the wheel 8. When so constructed it rides on the flanges 8^e during the rotary movement of the wheel, but when the wheel 8 stops and a portion of the strip has been delivered at the opening $3^{c'}$, the adjacent alined notches 8^f, which receive the free end of the cutter 16^e, permit its tearing or cutting edge to move into close engagement with the strip $7^{b'}$. The portion of the strip delivered at the opening $3^{c'}$ may then be readily separated from the strip along the line of perforations, the cutting edge of the separator or cutter facilitating this separation without tearing or mutilating the adjoining portion of the strip.

Of the coin operating and control mechanism, 17 indicates the coin slot or way, the path or direction of which is shown by dotted lines in Figs. 3, 9 and 10. The coin inlet opening to the slot 17 is indicated at 17^a, and the discharge opening is indicated at $17^{a'}$ and registers with an opening $5'$ formed in the base 5 through which opening the coins drop into the lower portion of the unit casing. The walls of a portion of the slot 17 are formed by a pair of plates 17^b, 17^b, which are secured to the front wall 3^c of the unit casing, one of the plates being cut away to form one side wall and the opposite end walls thereof. The other portion of the slot is formed between a plate 17^c and the adjacent face of the wall 6. 17^d, $17^{d'}$, indicate side plates interposed between the plate 17^c and wall 6 to form the opposite end walls of the slot.

17^e indicates a branch slot or chute leading from the slot 17 to a point outside of the unit. The purpose of the chute 17^e is to carry off spurious and defective coins or other devices which may be inserted in the slot 17. 17^f indicates a switch normally arranged in the path of the coin through the slot 17 and adapted to guide the coin into the chute 17^e. The switch 17^f is pivoted on a pivot or shaft $17^{f'}$ mounted in the plate 17^c and wall 6, and it is thrown out of the path of the coin or coins through the slot 17 automatically when proper or good coins are inserted therein, as will be hereinafter described.

18, 18, indicate a pair of plates placed face to face and secured to the front wall 3^c of the unit. One of these plates is cut away to form the slot 17^2 which is a continuation or extension of the slot 17^e. The slot 17^2 is preferably curved upwardly and one of the plates 18 is cut away as shown at 18^a whereby the defective coin or device can be easily grasped and removed.

19 indicates a coin arrester slidingly mounted between the plate 17^c and wall 6 intermediate the ends of the slot 17 and normally arranged to project into the slot 17. The plate 17^d is cut away, as shown at 17^g (Figs. 9 and 10) to form upper and lower guide walls for the said arrester and permit it to slide laterally. The arrester 19 preferably comprises a ring shaped member and surrounds a fixed pin 19^a which limits its sliding movement in either direction.

20 indicates a rotary control member fixed to the shaft 8^c for controlling the movement of the wheel 8. This member preferably consists of a disk or wheel having a series of ratchet teeth 20^a, corresponding in number to the number of sets of perforation finders 10 carried by the drum or wheel 8. 21 indicates a lock and release pawl adapted for engagement with the ratchet teeth 20^a. 21^a indicates a shaft, or pin, preferably screw threaded to the wall 6, on which the pawl 21 is swingably supported. 21^b indicates an abutment preferably comprising a projection formed integral with the wall 6 at or near its rear edge. 21^c indicates a compression spring arranged between and having its opposite ends mounted in suitable recesses formed in the abutment 21^b and pawl 21, the latter being enlarged at 21^d to permit the formation of such recess. The spring 21^c operates to normally maintain the pawl 21 in engagement with the teeth 20^a of the control member 20.

22 indicates thrust devices interposed between the coin arrester 19 and the pawl 21, whereby when the coin arrester is moved laterally it, operating through the thrust devices, will swing the pawl on its pivot 21^a against the tension of the spring 21^c and out of engagement with the adjacent tooth 20^a of the control member 20. The latter is then free to rotate. As shown in the drawings, the thrust devices 22 are connected to the pawl 21 at a point relative to its pivot so that comparatively slight movement of the coin arrester 19 will effect a long throw of the pawl 21 at its free end. By this arrangement it will be seen that the control member 20 is quickly released from

the pawl. The thrust devices 22 preferably comprise a rod 22^a, having screw threaded connection with the pawl 21, and a bearing plate 22^b with which the arrester 19 engages. This form of construction permits the thrust member to be made longer or shorter and to thus regulate the normal position of the arrester 19 in the slot or way 17 so it will extend there-across to a greater or lesser extent according to the size of the coins which it is intended to stop. As the rod 22^a is capable of minute adjustments, the coin arrester 19 can be accurately regulated to arrest or stop coins of a standard size, but permit coins of slightly smaller size to pass through the slot 17 and out into the chute 17^e. 22^c indicates a lock nut to secure the rod 22^a in position.

23 indicates a driver fixed to the shaft 8^c and preferably comprising a ratchet wheel having teeth 23^a.

24 indicates a plunger preferably mounted to slide at its upper end through an opening in a bracket 24^a fixed to the wall 6 and guided at its lower end by a collar 24^b which may be mounted in an opening in the base 5. The plunger 24 is preferably reduced at its upper and lower ends to form shoulders 24^c which operate as stops to engage with the base 5 or collar 24^b to limit the downward movement of the plunger and with the bracket 24^a to limit its upward movement. 24^d indicates a spring preferably coiled around the plunger 24. The lower end of the spring 24^d bears against the base 5 or collar 24^b, while its upper end engages with a flange or extension 24^e, provided on the plunger 24. The spring operates to normally press the plunger upwardly with the upper shoulder 24^c thereof in engagement with the bracket 24^a. Any suitable means may be provided for operating the plunger 24. In the present instance I preferably provide manually operated means, of which 25 indicates a rack provided on one side and extending longitudinally of the plunger 24.

26 indicates an arm extending laterally from the wall 6 and carrying at its free end a bearing member 26^a. 26^b indicates a rock-shaft mounted in the bearing member and provided at its front end with a segmental gear 26^c which meshes with the rack 25. When the gear 26^c is operated, the plunger is moved downwardly against the tension of the spring 24^d.

27 indicates an operator for operating the gear 26^c. This operator preferably comprises a shaft 27^a mounted in suitable bearings 27^b provided in the front wall 3^c of the unit, and a crank having a handle 27^c. The inner end of the shaft 27^a is preferably provided with a key or interlocking device which fits into a recess or opening 26^d, formed in the front end of the rock shaft 26^b. The key and recess provide for the disconnection of the shaft 26^b from the handle 27^c so that the stamp delivery and control mechanisms can be removed from the unit casing and then replaced therein in a convenient manner. The normal position of the operator 27 is shown in Figs. 1 and 3. Stops 27^d, 27^d, may be provided upon the front face of the unit to limit the movement of the handle 27^c in either direction.

28 indicates a reciprocating driver-engaging member adapted to engage with the teeth 23^a of the driver 23, one by one, and rotate the driver the distance of one tooth each time the plunger 24 is operated in the downward direction. The reciprocating member 28 is connected to and moves with the plunger 24. It preferably comprises a lever 28^a, having a dog 28^b which engages with the driver teeth 23^a, pivoted on a pin 24^g between two projections or lugs 24^h, 24^i, carried by the plunger 24. 28^c indicates a spring pressed pin, mounted in a suitable recess in the plunger 24 and adapted to press against the tail of the lever 28^a and thereby normally maintain the dog 28^b in the path of the teeth 23^a. By this construction, it will be understood that in the upward movement of the plunger 24 to normal position, the dog 28^b rides the adjacent tooth 23^a and assumes its normal position ready to engage therewith when operated the next time. Preferably, the projection 24^i is extended forwardly and carries a plate 24^k which, when the plunger 24 moves downwardly, closes the slot 17 and thus prevents the introduction of an additional coin or coins during the vending operation. As shown at 24^m, the plate 17^c is cut away to allow the plate 24^k to slide downwardly.

29, 29, indicate two elongated slots formed in the plate 17^c adapted to receive and guide two coin engaging devices 29^a, 29^a, which extend transversely across the coin way 17. The upper portion of the slots 29 curve or extend outwardly in opposite directions so that when the coin engaging devices 29^a, 29^a, are at the upper ends of the slots, they occupy positions to one side and out of the path of the coins through the way 17. To permit this positioning of the coin engaging devices, the opposing walls of the plates 17^d, $17^{d'}$, are cut away as shown at 17^{d2}, 17^{d2}. 29^b, 29^b, indicate arms or rods, each supporting at its upper or free end a coin engaging device 29^a and pivoted at its opposite end to a suitable projection 29^c carried by the plunger 24. When the plunger 24 is operated, the arms or levers 29^b move therewith and the devices 29^a, which are guided inwardly and downwardly by the walls of the slots 29, engage with the upper edge of a coin and force it or the set of coins past the coin arrester 19. The coin or coins are then free to fall into the coin

receptacle, or lower portion of the unit casing.

This operation of the plunger 24 and devices 29^a in forcing the coin or coins past the coin arrester 19, moves or slides the latter laterally and disengages the pawl 21 from the adjacent tooth 20^a of the control member 20. At the same time the driver-engaging member 28 moves downwardly, engages with and rotates the driver 23 the distance of one tooth, such engagement taking place immediately following the release of the control member 20; the driver in turn, operating through the shaft 8^c, rotates the drum or wheel 8 the distance of one stamp, check or ticket so that each time the plunger 24 is operated downwardly, one stamp, check or ticket, that is, a predetermined portion of the strip, is delivered through the delivery opening $3^{c'}$. At each operation of inserting a coin (or set of coins, such as two pennies, in the form of the invention shown in Figs. 3, 9, 10 and 13) and moving the plunger 24, the control member 20 is released, rotated one tooth, and then locked by the pawl 21 and remains locked until the operation is repeated.

In Fig. 15 I have shown a slightly modified form of control member which permits more than one stamp to be vended upon the insertion of one coin or set of coins, this figure representing a machine for vending five one-cent stamps upon the insertion of a five-cent piece, or five two-cent stamps upon the insertion of a ten-cent piece.

Referring to this figure, 30 indicates a control member provided with a series of teeth 30^a, which are spaced from each other a number of steps or spaces equal to the number of stamps to be vended for one coin or set of coins. Since the form of invention illustrated in Fig. 15 is adapted to deliver five stamps for each coin inserted, obviously the teeth 30^a are arranged a distance equal to five stamps or spaces from each other. As the control member 20 in Figs. 3, 13 and 14 is provided with ten teeth, it will be understood that the control member 30 is therefore provided with two teeth 30^a arranged diametrically opposite each other.

The operation of the apparatus in vending five stamps by the insertion of one coin may be described as follows: The coin is inserted in the opening and falls into engagement with the arrester 19. The plunger is then operated. This operation forces the coin past the arrester and disengages the pawl 21 from the adjacent tooth 30^a. This operation also rotates the control member 30 one step and delivers one stamp through the delivery opening $3^{c'}$. At the end of this operation the pawl 21 returns to normal position, but as the control member is not locked thereby, the operation of depressing the plunger 24 can be repeated four times, or until the other or succeeding tooth 30^a engages the pawl 21, each such operation effecting the delivery of a stamp through the delivery opening $3^{c'}$. Each of said stamps can be detached from the strip at the end of each operation or all five can be left intact until the completion of the last operation.

31 indicates means for operating the switch 17^f. As has already been stated, this switch is normally arranged in the path of the coins through the slot 17. If defective coins are inserted in the slot, the switch 17^f guides them into the chute 17^e. When the proper size coin is inserted it is of course arrested by the arrester 19 and when the plunger 24 is depressed, the switch 17^f is automatically thrown upwardly out of its path. The switch throwing means 31 preferably comprise an arm or plate 31′ rigidly connected to move with the plunger 24 and provided with two inclined cams 31^a, 31^b. 31^c indicates a pin connected with and projecting laterally from the switch 17^f and movable through a slot 31^d formed therefor in the plate 17^c. The pin 31^c is arranged in the path of the cams 31^a and 31^b. As will be seen from Figs. 9 and 10, when the arm or plate 31^a moves downwardly, the cam 31^a engaging the pin 31^c moves the switch upwardly out of the path of the coin through the slot 17 and closes the entrance to the chute 17^e. When the arm or plate 31^a moves in the opposite direction, the cam 31^b engages the pin 31^c and positively throws the switch back to its normal position.

I preferably provide means for closing the coin slot 17 when the entire strip of stamps is exhausted or in case the strip becomes separated at any time and the remaining portion of the strip fails to feed forwardly to the delivery opening $3^{c'}$. These means are preferably arranged immediately behind or above the stamp delivery opening so that it will operate after or at the time the last stamp comprising the strip $7^{b'}$ is delivered from the machine. Of these means, 32 indicates a plate pivoted upon a suitable support 32^a carried by the wall 6. The lower end of this plate is preferably provided with a series of strip engaging fingers 32^b which aline with the grooves 8^d of the delivery wheel or drum 8. As shown in Fig. 8 these fingers 32^b rest upon the strip $7^{b'}$, but when the end of the strip is reached said fingers move inwardly into engagement with the bottom wall of the grooves 8^d. 32^c indicates a rod or pin slidingly mounted in a suitable recess formed in a laterally projecting member 32^d which is formed integrally with the wall 6. The rod 32^c is enlarged to form a collar 32^e against which a spring 32^f surrounding the pin 32^c presses at one end, the opposite end of the spring bearing against the end wall

of the recess. The spring 32^f operates to press the pin longitudinally so that its head or front end 32^g will extend transversely across the slot 17 and prevent the passage of coins therethrough. 32^h indicates a groove or recess, preferably extending annularly around the pin 32^c.

33 indicates a lever preferably mounted in an elongated recess 33′ formed in the front edge of the wall 6 and mounted upon a shaft 33^a extending across said recess. The upper end of this lever 33 presses against an arm 32′ fixed to the plate 32 while its opposite end is adapted to fit within the groove 32^h formed in the pin 32^c and maintain the pin in locked position with its head to one side of the slot 17. 33^b indicates a spring engaging with the lever 33 and normally tending to throw its pin engaging end outwardly. When the strip $7^{b'}$ is placed in position and extends around the drum wheel 8 to the delivery opening, the plate 32 is slightly elevated to lie in engagement with the upper surface of the strip. This forces the lower or pin engaging end of the lever 33 inwardly and thus locks the pin 32c, the latter being moved laterally for this purpose and the spring 32^f compressed. When the end of the strip or the last stamp or check is reached, the movement of the fingers 32^b inwardly permits the pin engaging end of the lever 33, under the action of the spring 33^b, to move outwardly and thus releases the said pin. The spring 32^f then moves the pin 32^c across the slot 17. In case an attempt is made to insert coins and to operate the machine when the slot 17 is closed by the pin 32^c, the openings $17^{b'}$, $17^{b'}$, formed in the plates 17^b, 17^b, permit the coin to be moved upwardly and taken out at the inlet opening 17^a.

34 indicates means for preventing the operation of the plunger 24, and the removal of more than one stamp from the machine when one coin or set of coins is inserted. That is, the means 34 prevent the plunger 24 from being depressed partially or far enough to release the control member 20 and then reciprocated in a manner to gradually work more stamps from the machine for the price of one coin. Of these means, 34^a indicates a dog carried by an arm 34^b which is rigidly connected to and moves with the plunger 24. 34^c indicates a lever pivoted at 34^d and provided with an arm 34^e. 34^f indicates a spring connected at one end to the wall 6 having its opposite end connected to the arm 34^e. This spring maintains the lever 34^c in normal position but permits it to swing laterally. 34^g indicates a shoulder provided at or near the free end of the lever 34^c the purpose of which shoulder is to engage with the dog 34^a and lock the plunger 24 against upward movement, when the latter is not depressed the full distance. 34^h indicates a cam provided on the lever 34c which cam is engaged by the dog 34^a and permits the latter to swing the said lever laterally to bring the dog 34^a beneath the shoulder 34^g.

35 indicates a pawl or lever, pivoted on the lever 34^c. One arm of the lever 35 extends beyond the end of the shoulder 34^g and into the path of the dog 34^a so that the latter will operate it in its downward movement.

35^a indicates a spring having one end fixed to the other arm of the pawl 35 and its opposite end suitably connected to the lever 34^c and operating to normally maintain the dog engaging arm thereof in the path of the dog 34^a. 35^b indicates a cam or inclined wall provided on the lower edge of the pawl 35 which cam is engaged by the dog 34^a when the latter moves upwardly. 35^c indicates a pin or stop carried by the lever 34^c and operating to limit the movement of the pawl 35 in one direction. The parts of the plunger locking means 34 cooperate with each other to lock the plunger 24 in that position thereof when the pawl 21 has been disengaged from the tooth of the control member and prior to the forcing of the coin entirely past the coin arrester 19; that is, in case the plunger 24 is not operated its entire distance downwardly but only far enough to force the coin into a "dead center" position between the arrester 19 and the opposite end wall of the slot 17, these means 34 prevent the upward movement of the plunger 24 and can only be released therefrom by first depressing the plunger 24 to its fullest extent.

The plunger locking means 34 operate in the following manner: When the plunger is depressed, the dog 34^a engages the cam 34^h and swings the lever 34^c laterally until it passes below the shoulder 34^g. The lever then swings back to its former position to bring the shoulder 34^g in the path of the dog 34^a. The dog 34^a also engages with and swings the pawl 35 downwardly. If the plunger 24 is fully depressed, the pawl 35 is released and swings backwardly to normal position. Now when the spring 24^d moves the plunger upwardly, the dog 34^a engages with the cam or inclined wall 35^b of the pawl 35, again swinging the lever 34 laterally so that it can ride past the shoulder 34^g. If the plunger is depressed only partially, that is, to the position shown in Fig. 10, the dog 34^a, which has been moved below the shoulder 34^g (but not far enough to permit the pawl 35 to swing back to normal position), will be locked against upward movement by the said shoulder 34^g. Under these conditions, the plunger can only be returned to normal position by a completion of its downward stroke. The lever 34^c is preferably provided with a cam 34^i which

is engaged by the dog 34^a to move the lever laterally and effect a quick release or disengagement of the pawl 35 from the dog 34^a.

36 indicates means for engaging with the control member and preventing it from rotating more than the distance of one tooth during an operation of vending a stamp from the machine, or while it is released from the pawl 21. The purpose of these means is to prevent the operation of the controlling mechanism in such manner that the end of the stamp strip, which may be forced through the delivery opening by a partial operation of the handle 27^c, can be grasped and pulled outwardly. Under such circumstances where the controlling mechanism is only partially operated, it might be possible to catch hold of the stamp strip and pull it entirely out of the machine. Of these means, 36^a indicates a lock lever pivoted at 36^b to the wall 6. This lever is provided at one end with a projecting lug or dog which is arranged to move into the path of the teeth 20^a of the control member 20. The opposite end of the lever 36^a is provided with an elongated slot in which is mounted a pin 21^e carried by the pawl 21. When the pawl 21 is thrown outwardly and unlocks the control member 20, the dog 36^c moves inwardly ready to engage with the next or preceding tooth of the control member 20. It will be understood that while the pawl is disengaged from the control member 20 the dog 36^a prevents the control member from rotating except for a very short distance. The pawl 21 assumes its normal position ready to engage the next tooth following that previously released as soon as the coin has been forced past the arrester 19 and simultaneously moves the dog 36^a out of the path of the tooth 20^a, whereby the rotation of the feed or drum wheel 8 can be effected by the engagement of the dog 28^b with a tooth 23^a of the driver 23. The machine may be adapted to vend a single stamp upon the insertion of a set of coins, for instance one two-cent stamp for two pennies (see Figs. 3, 9, 10, 13). In operating a vending mechanism of this character, the coins are inserted separately in the slot 17, the first being stopped by the arrester 19 and the second coin, which is inserted immediately after the first coin falls, upon the upper edge thereof. The coin engaging devices 29^a engage with the upper edge of the second coin and force both coins past the arrester 19. In this form of the invention the arrester 19 is arranged farther down the slot 17, to permit the positioning of two coins between it and the devices 29^a, and the pawl 21 is lengthened, to bring the thrust devices 22 in line with the arrester 19.

As the arrester 19 is moved back to normal position in the slot 17 by the compression spring 21^c very quickly after the first inserted coin has been forced by it, I preferably provide means for enlarging the slot 17 adjacent or opposite to the arrester to permit the second coin to freely move or drop through the slot and not be stopped by the arrester. Of these means 37 indicates an arm, pivoted at $36^{a'}$ to the wall 6 and movable in a recess formed in the end wall plate $17^{d'}$. 37^b indicates a flange or lip provided along one longitudinal edge of the arm 37 and adapted to form the end wall of the slot 17 opposite the arrester 19. 37^c indicates a pin carried by the free end of the arm and movable in a slot 37^d, preferably formed in the plate 31', and having a straight portion 37^e and a cam portion 37^f. As the plate 31' moves downwardly the pin 37^c moves from end to end of the slot 37^d and swings the arm 37 outwardly when the pin 37^e enters the cam portion 36^f. In the upward movement of the plate 31', the arm 37 is returned to normal position. As will be understood, the cam portion 37^f of the slot is arranged to operate the arm 37 and the flange 37^b immediately following the movement of the first coin past the arrester. By this construction and operation the slot 17 is enlarged so that the second coin is free to move or fall downwardly behind the first coin without being stopped by the arrester 19.

The length of movement of the plunger 24 downwardly at each operation is controlled by the stop 24^c near its lower end and also by the handle 27^c engaging one of the stops 27^d on the adjacent front wall 3^c. These control devices are arranged so that in case only one coin is inserted, the plunger cannot be depressed far enough to bring the coin engaging devices 29^a into engagement therewith and cause the operation of the delivery mechanism.

38 indicates a gear wheel carried by the shaft 8^c near one end thereof. 38^a indicates a frame supported by feet 38^b at one side of the wall 6 and provided with a flange 38^c. 38^d indicates a register or indicating device mounted on the flange 38^c. 38^e indicates a gear fixed to the shaft of the register 38^d. 38^f, 38^g, indicate intermediate or idle gears mounted on shafts which are supported by the frame 38^a, and adapted to communicate the rotative movement from the gear 38 to the gear 38^e. It will be understood that each time a stamp or ticket is vended from the machine, the counting device 38^d is operated one point. The gear mechanism between the indicator 38^d and the shaft 8^c is arranged to rotate the numbers backwardly, that is, to subtract one from the number shown each time the machine is operated. When the stamp box 7 is filled, the indicator is set to show the total number of stamps placed in the machine and each time a stamp is delivered the number is reduced one unit or number. The indicator will therefore indicate

at all times the number of stamps remaining in the machine.

To those skilled in the art of making vending machines of the class described, many alterations in construction and widely differing embodiments and applications of my invention will suggest themselves, without departing from the spirit and scope thereof. My disclosures and the description therein are purely illustrative, and are not intended to be in any sense limiting.

This application is a division of my application Ser. No. 600,254, filed December 31, 1910, upon which Letters Patent No. 1,215,862 were granted February 13, 1917.

What I claim is:

1. In a machine of the class described, the combination with a casing having a delivery opening, of a strip delivery wheel adapted to deliver portions of a strip through the opening at each operation of the machine, a coin slot, a closing device for the slot, means for locking the closing device in inoperative position, and means arranged immediately behind said delivery opening having connections with said locking means for operating the latter after the last portion of the strip is delivered through said opening.

2. In a machine of the class described, the combination with a casing having a delivery opening, of a strip delivery wheel adapted to deliver portions of a strip through the opening at each operation of the machine, a coin slot, a closing device for the slot, means for locking said closing device in inoperative position, a pivoted plate arranged immediately behind the delivery opening and resting upon the strip, and connections between the plate and the locking means for operating the latter after the last portion of the strip is delivered.

3. In a machine of the class described, the combination with a casing having a delivery opening, of a strip delivery wheel adapted to deliver portions of a strip through the opening at each operation of the machine, a coin slot, a closing device for the slot, a pivoted plate arranged immediately behind the delivery opening and resting upon the strip, and a spring pressed lever having one arm arranged to lock the said closing device in inoperative position and its opposite arm pressing the said plate upon the strip, whereby when the end of the strip is reached the movement of the pivoted plate permits the said lever to release the closing device.

4. In a control mechanism for a machine of the class described, the combination of a lock and release member, a pawl for controlling said member, a plunger, a coin arrester, means carried by the plunger for engaging with and forcing the coin past the said arrester, and adjustable connections between the arrester and the said pawl.

5. In a machine of the character described, a coin slot and a coin chute leading therefrom, a switch normally arranged in the coin slot for guiding inoperative coins into the chute, a lock and release mechanism, a plunger adapted, upon the insertion in said coin slot of an operative coin, to operate said mechanism, and means carried by the said plunger for operating the switch when operative coins are inserted in the coin slot.

6. In a machine of the character described, a coin slot and a coin chute leading therefrom, a switch normally arranged in the coin slot for guiding inoperative coins into the chute, a lock and release mechanism, a plunger adapted, upon the insertion in said coin slot of an operative coin, to operate said mechanism, and means automatically operating for moving the switch out of the coin slot when operative coins are inserted therein and for moving it back again at the end of the plunger operation.

7. In a machine of the character described, a coin slot and a coin chute leading therefrom, a switch normally arranged in the coin slot for guiding inoperative coins into the chute, a lock and release mechanism, a plunger adapted, upon the insertion in said coin slot of an operative coin, to operate said mechanism, and a plate provided with two cams one of which throws the switch out of the coin slot when the plunger moves in one direction and the other of which returns it into said coin slot when the plunger moves in the opposite direction.

8. In a machine of the class described, the combination of a delivery mechanism, a plunger mechanism arranged to operate the delivery mechanism, a lock and release mechanism, a coin slot through which a coin is adapted to move, said coin slot being formed with a cutaway portion, and a closing device carried by and movable with the plunger for closing the slot during the operation of the said plunger.

9. In apparatus of the class described, the combination of a coin slot adapted to receive one or more coins, a locking mechanism including a dog, a device normally projecting into the coin slot and arranged to be engaged by the coins passing therethrough, and adjustable means interposed between said device and said dog for controlling the position of said device.

10. In apparatus of the class described, the combination of a coin slot adapted to receive one or more coins, a locking mechanism including a dog, a rotatable member normally projecting into the coin slot for engagement by a coin and arranged to be moved laterally as the coin passes by it through said slot, and adjustable means interposed between said device and said dog for controlling the normal position of said device.

11. In apparatus of the class described, the combination of a coin slot adapted to receive one or more coins, a locking mechanism including a dog, a device normally projecting into the coin slot and arranged to be engaged by the coin as the latter passes through said slot, and a member adjustably connected to and carried by said dog arranged to engage said device for controlling the normal position thereof.

12. In apparatus of the class described, the combination of a coin slot having an opening at one side and adapted to receive one or more coins, a locking mechanism including a dog, an annular shaped member rotatably and slidably mounted in said opening and normally projecting into the coin slot for engagement by a coin, a pin extending through said annular shaped member for limiting its movement laterally, and an adjustable member interposed between said device and said dog for controlling the normal position of said device.

13. In apparatus of the class described, the combination of a coin slot having an opening at one side and adapted to receive one or more coins, a locking mechanism including a dog, an annular shaped member rotatably and slidably mounted in said opening and normally projecting into the coin slot for engagement by a coin, a pin extending through said annular shaped member for limiting the movement laterally, and an adjustable member carried by said dog and interposed between said device and said dog for controlling the normal position of said device.

14. In apparatus of the class described, the combination of a coin slot adapted to receive one or more coins, a control mechanism including a dog and a device normally projecting into the coin slot and arranged to be actuated by a coin as the latter is moved through said slot, a chute connected to said coin slot through which coins of a size which cannot actuate the said device, pass, a switch normally projecting across said coin slot for directing the last mentioned coins into said chute, means for moving the coins past said device, and means operated by said moving means for throwing said switch when moving past said device coins of a size capable of actuating it.

15. In apparatus of the class described, the combination of a coin slot adapted to receive one or more coins, a control mechanism including a dog and a device normally projecting into the coin slot and arranged to be actuated by a coin as the latter is moved through said slot, a chute through which coins incapable of actuating said device pass, a switch normally projecting across said coin slot for directing the last mentioned coins into said chute, and means for moving coins past said device, said moving means being provided with devices which throw said switch when moving past said device coins of a size capable of actuating it and which return said switch to normal position after the coins pass through said coin slot.

16. In apparatus of the class described, the combination of a coin slot adapted to receive one or more coins, a control mechanism including a dog and a device normally projecting into the coin slot and arranged to be actuated by a coin as the latter is moved through said slot, a chute through which coins incapable of actuating said device pass, a switch normally projecting across said coin slot for directing the last mentioned coins into said chute, means for moving the coins past said device, and cam devices operated by said moving means throwing said switch when moving past said device coins of a size capable of actuating it and returning said switch to normal position after the coins pass through said coin slot.

17. In apparatus of the class described, the combination of a locking mechanism including a dog, and means for operating said dog each time a set or predetermined number of coins is introduced into the apparatus, said means including a coin slot, a device therein arranged to be engaged and actuated by the first coin of the set, and devices for moving the coins through the slot and being constructed and arranged to permit the remaining coins of the set to pass by said device without actuating it.

18. In apparatus of the class described, the combination of a coin slot having an expanding wall at one side, a lock mechanism including a dog, a device normally projecting into the coin slot at that side thereof opposite to said expanding wall and arranged to be actuated by a coin, means for moving a set of coins through said chute, and means for operating said expanding wall after a coin of the set has actuated said device.

19. In apparatus of the class described, the combination of a coin slot having an expanding wall at one side, a lock mechanism including a dog, a device normally projecting into the coin slot at that side thereof opposite to said expanding wall and arranged to be actuated by a coin, means for moving a set of coins through said chute, and means carried by said operating member for moving said expanding wall laterally after a coin of the set has moved past said device.

20. In apparatus of the class described, the combination of a coin shute having an expanding wall at one side, a lock mechanism including a dog, a device normally projecting into the coin slot at that side

thereof opposite to said expanding wall and arranged to be actuated by a coin, means for moving a set of coins through said chute, and cam devices carried by said operating member for moving said expanding wall laterally after a coin of the set has moved past said device.

21. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a pair of movable elements one of which normally projects into the coin slot, a locking mechanism including a dog arranged in coöperative relationship with that element which normally projects into the coin slot, means for moving the coins through the slot in sets, whereby the first coin of each set will actuate that element which normally projects in the coin slot, and means for operating the other element after the first coin of each set has passed said first mentioned element.

22. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a pair of movable elements one of which normally projects into the coin slot, a locking mechanism including a dog arranged in coöperative relationship with that element which normally projects into the coin slot, means for moving the coins through the slot in sets, whereby the first coin of each set will actuate that element which normally projects in the coin slot, and means carried by said moving means for operating the other element after the first coin of each set has passed by said first mentioned element.

23. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a pair of movable elements one of which normally projects into the coin slot, a locking mechanism including a dog arranged in coöperative relationship with that element which normally projects into the coin slot, means for moving the coins through the slot in sets whereby, the first coin of each set will actuate that element which normally projects in the coin slot, and a cam carried by said moving means for operating the other element after the first coin of each set has passed by said first mentioned element.

24. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a coin arrester which normally projects into the coin slot, and a movable wall, a locking mechanism including a dog arranged in coöperative relationship with said arrester, means for moving the coins through the slot in sets, whereby the first coin of each set will actuate said arrester, and means for moving said wall after the first coin of each set has passed said arrester.

25. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a pair of movable elements one of which normally projects into the coin slot, a locking mechanism including a dog arranged in coöperative relationship with that element which normally projects into the coin slot, means, including a movable member, for moving the coins through the slot in sets whereby the first coin of each set will actuate that element which normally projects in the coin slot, and devices connected to said movable member for operating the other element in one direction after the first coin of each set has passed said first mentioned element and for returning said element to normal position.

26. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a pair of laterally movable elements one of which is rotatable and normally projects into the coin slot, a locking mechanism including a dog arranged in coöperative relationship with that element which normally projects into the coin slot, means for moving the coins through the slot in sets, whereby the first coin of each set will actuate that element which projects in the coin slot, and means operated by said moving means for operating the other element after the first coin of each set has passed by said first mentioned element.

27. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with an arrester which normally projects into the coin slot, and a movable wall, a locking mechanism including a dog, adjustable connections between said arrester and said dog, means for moving the coins through said slot in sets, whereby the first coin of each set will actuate said arrester, and means for operating said movable wall after the first coin of each set has passed said arrester.

28. In apparatus of the class described, the combination of a coin slot adapted to receive a plurality of coins, said slot being provided at diametrically opposite sides with a pair of elements, one of said elements normally projecting into the coin slot and being rotatable and slidable lat-

erally and the other element being swingable laterally, a locking mechanism including a dog arranged in coöperative relationship with said rotatable and slidable element, means for moving the coins through the slot in sets, whereby one coin of each set will actuate said rotatable and slidable element, and means carried by said moving means for operating said swingable element after that coin of each set which actuates said rotatable and slidable element has passed thereby.

In testimony whereof I have hereunto signed my name.

CHARLES F. RICHARDSON.