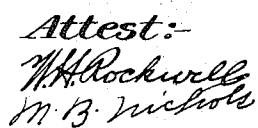


APPLICATION FILED JUNE 16, 1915.

Patented Dec. 26, 1916.

6 SHEETS--SHEET 1.



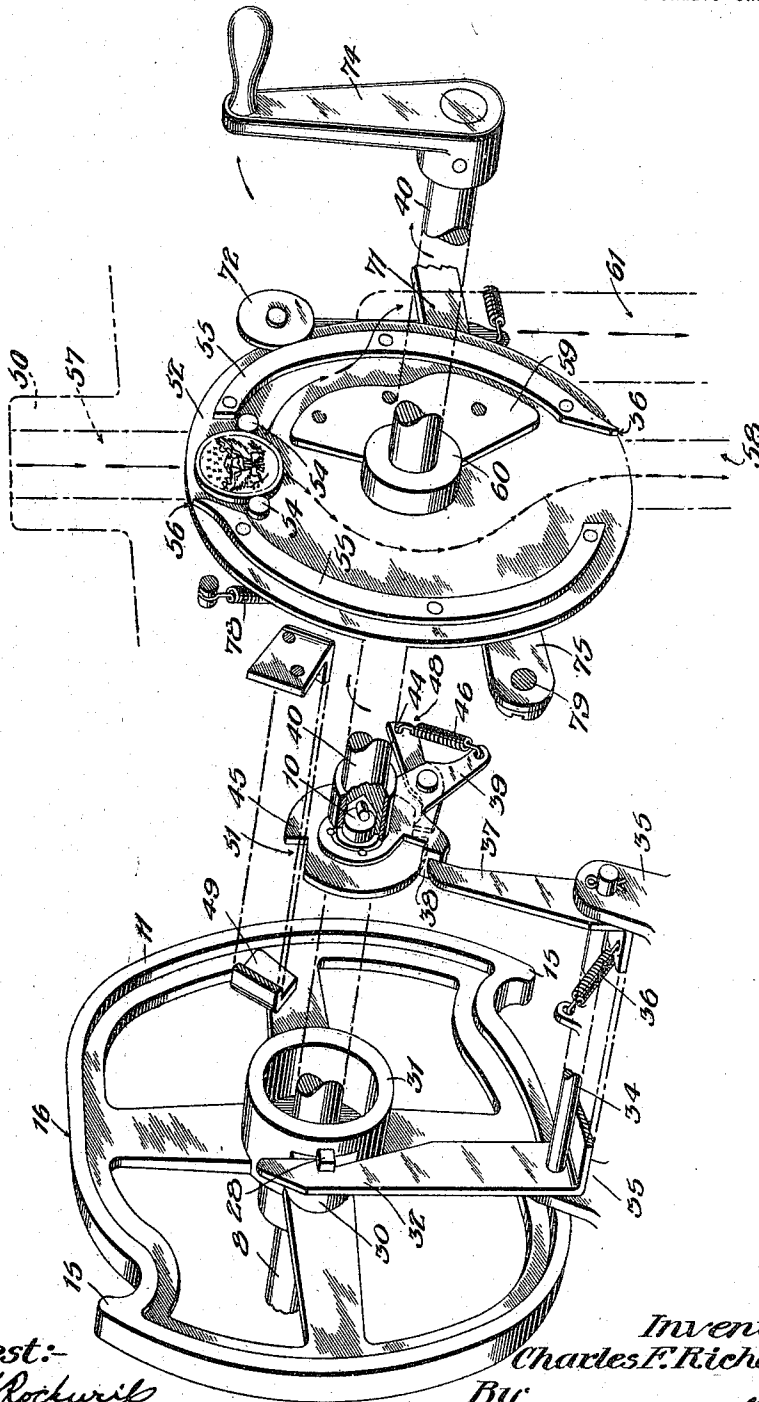
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C. F. RICHARDSON.
VENDING MACHINE.
APPLICATION FILED JUNE 16, 1915.

1,209,758.

Patented Dec. 26, 1916.
6 SHEETS—SHEET 2.

Fig. 2.



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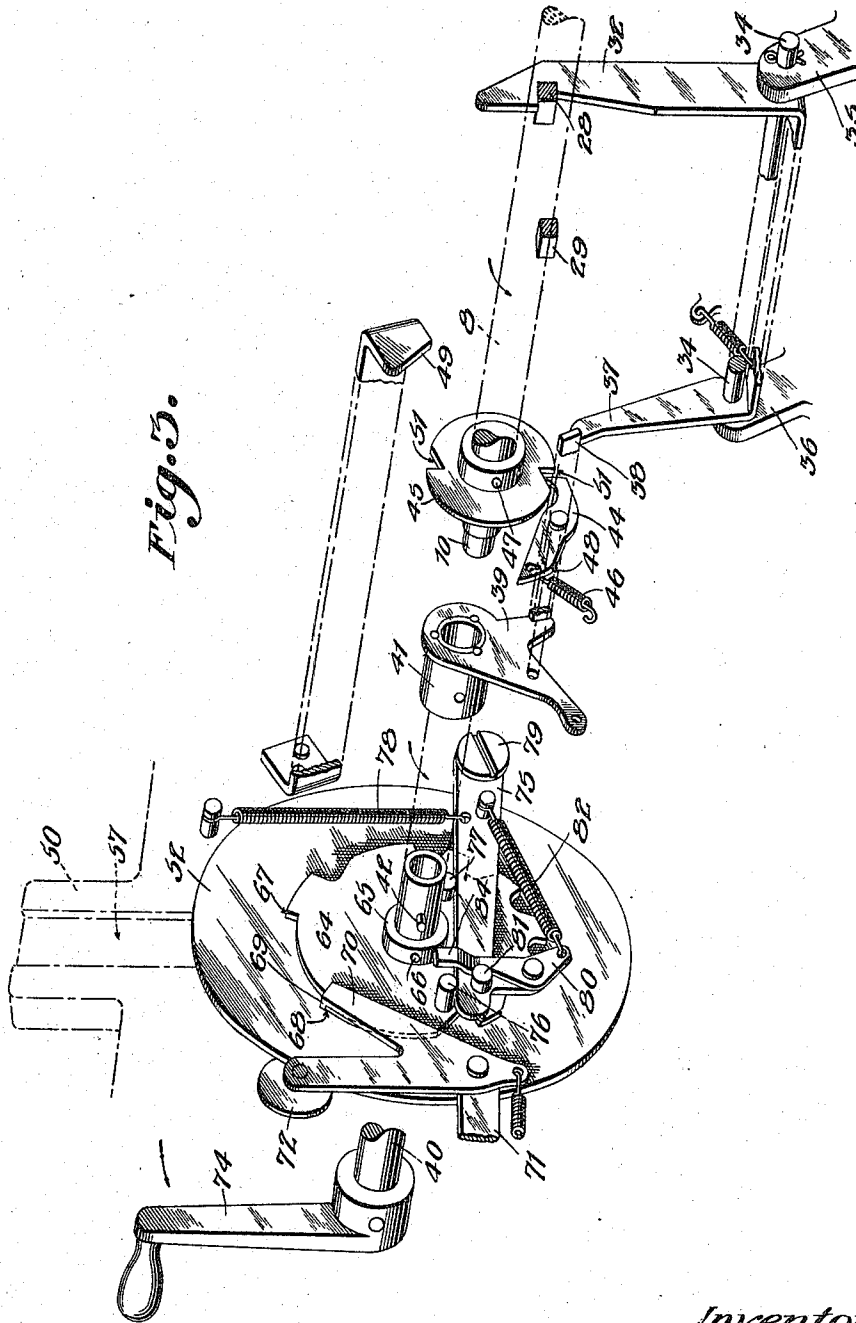
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6 SHEETS—SHEET 3.



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Fig. 3.

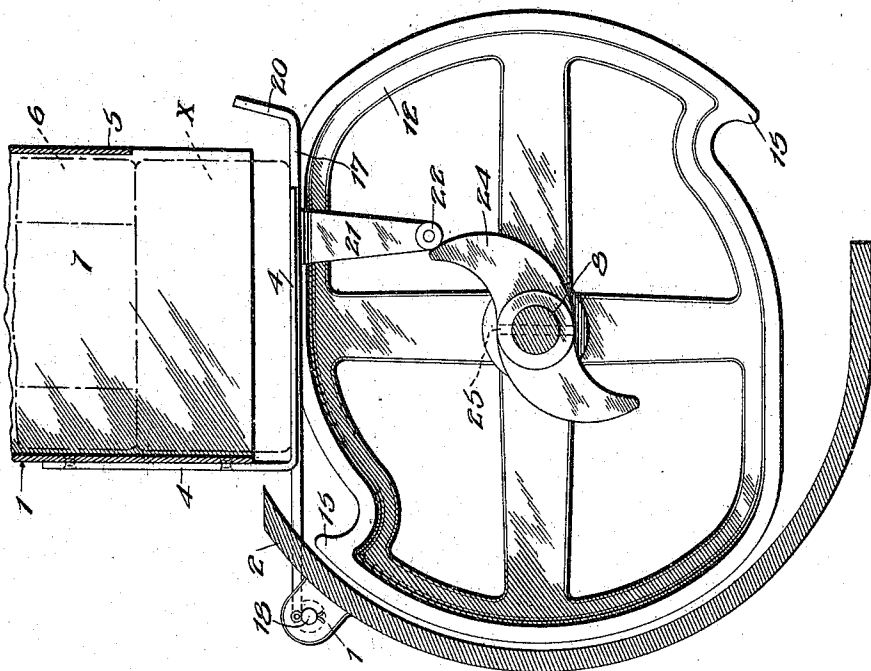
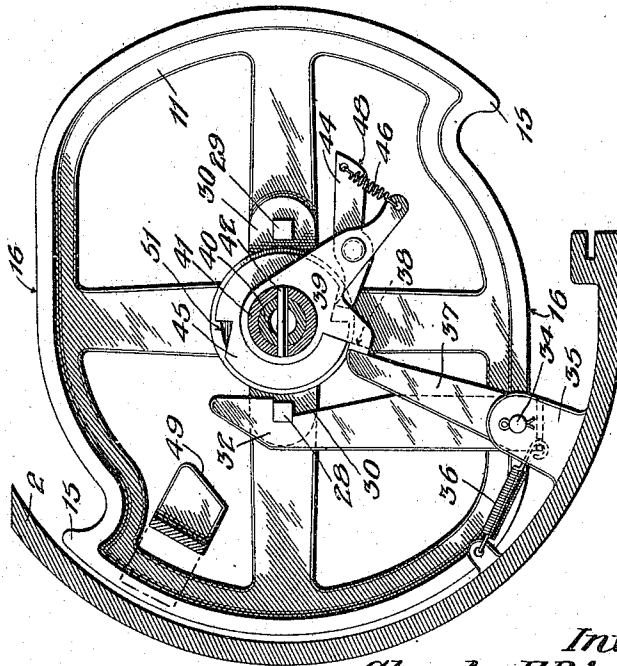


Fig. 4.



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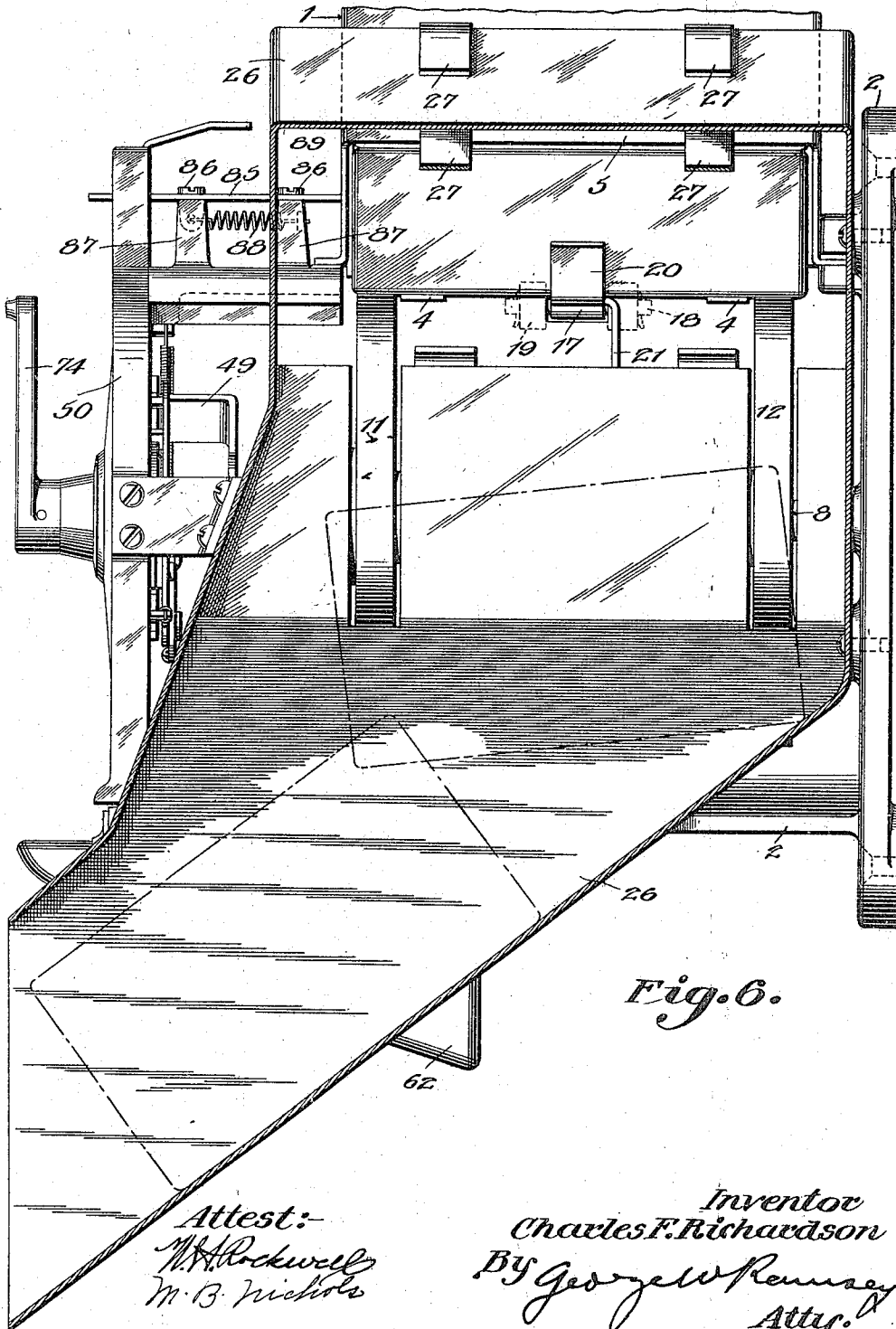
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6 SHEETS—SHEET 5.



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VENDING MACHINE.

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6 SHEETS—SHEET 6.

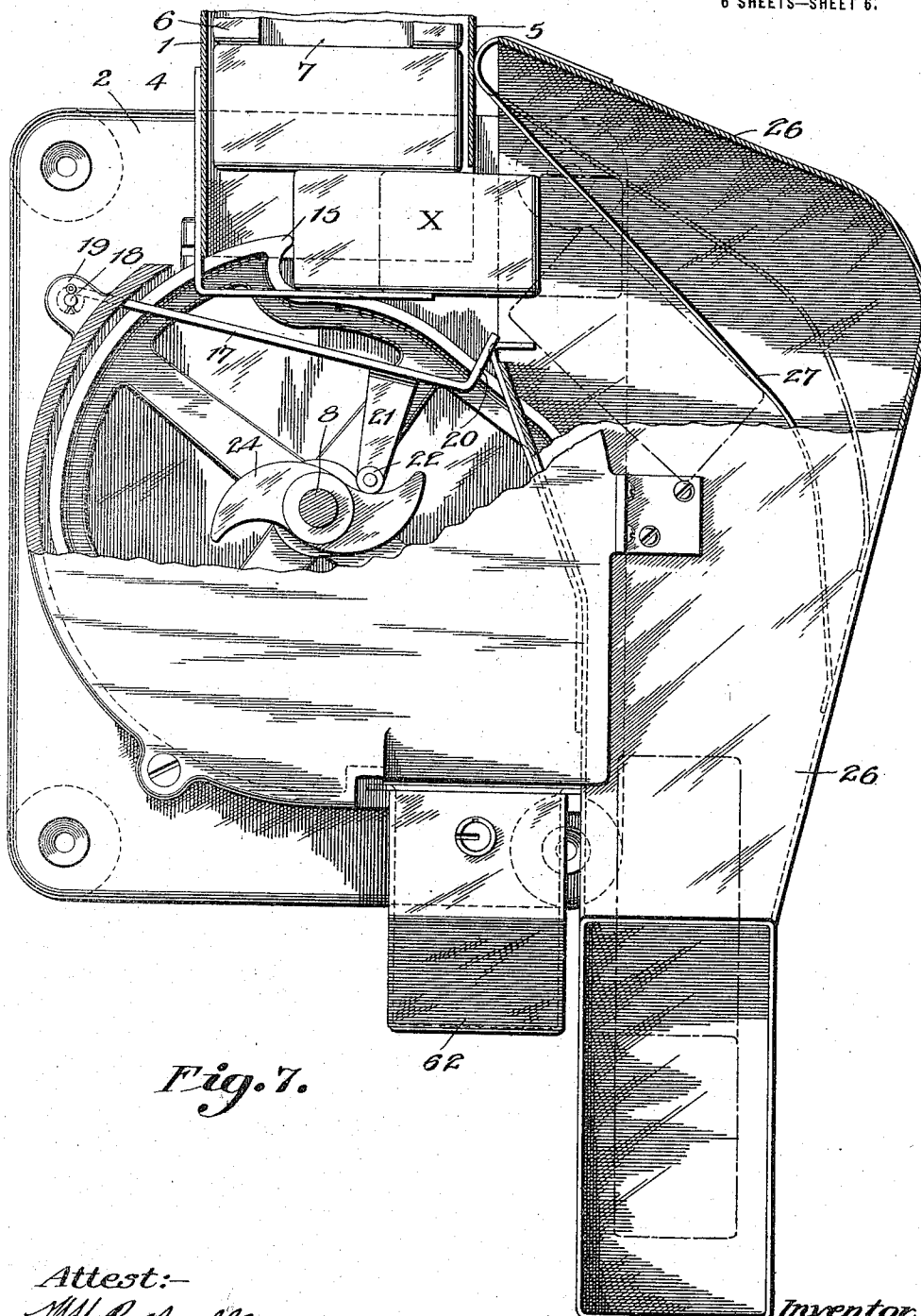


Fig. 7.

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UNITED STATES PATENT OFFICE.

CHARLES F. RICHARDSON, OF WOONSOCKET, RHODE ISLAND, ASSIGNOR TO WM. FILENE'S SONS COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

VENDING-MACHINE.

1,209,758.

Specification of Letters Patent.

Patented Dec. 26, 1916.

Application filed June 16, 1915. Serial No. 34,448.

To all whom it may concern:

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

This invention relates broadly to check controlled apparatus and more specifically to the delivery mechanism for a coin controlled vending machine.

The principal object of this invention is to provide a delivery mechanism for a vending machine with locking devices which prevent the actuation of the delivery mechanism until after the coin controlled devices have completed a predetermined operation.

Another object of this invention is to provide a delivery mechanism for a vending machine wherein the coin controlled locks and coin handling devices have a predetermined movement prior to the movement of the delivery mechanism which is provided with locking devices for positively preventing movement of the delivery mechanism during the said preliminary movement of the coin handling mechanisms.

A further object of this invention is to provide a delivery mechanism for a coin controlled vending machine wherein the delivery devices are controlled and operated by a shaft which is journaled in and has the same axis of rotation as the shaft which carries the coin handling mechanisms.

A still further object of this invention is to provide a delivery mechanism for a coin controlled vending machine wherein the articles to be vended are carried in a magazine directly over the axis of the shaft upon which rotary ejectors are mounted whereby the lowermost package in a column of packages within the magazine is ejected during the operation of the delivery mechanism.

A still further object of this invention is to provide a delivery mechanism for a vending machine wherein the articles to be delivered are arranged in a vertical stack directly over the ejecting mechanism in such manner that the lowermost article is ejected at substantially right angles to the axis of said stack, the ejecting mechanism including rotary ejectors mounted directly beneath the said stack of articles.

A still further and primary object of this

invention is to provide the ejecting devices of a delivery mechanism for vending machines with yielding means to control the direction of delivery of the vended article after its ejection from a magazine.

A still further and primary object of this invention is to provide an ejecting mechanism for a delivery device for vending machines, which ejects a package sidewise from a magazine in substantially a horizontal direction and delivers said package from a delivery chute in an endwise downwardly inclined direction.

A further object of this invention is to provide a delivery mechanism for a vending machine wherein the delivered article is ejected sidewise from a magazine, turned through substantially ninety degrees, and delivered endwise from a delivery chute.

Still other and further objects of this invention will in part be obvious and will in part be pointed out hereinafter in the specification by reference to a preferred form of my invention as illustrated in the accompanying drawings forming a part of this specification and wherein like characters are used to represent like parts throughout the several figures thereof.

Figure 1 is an elevational view showing portions of one embodiment of my invention with the parts sectioned on substantially a mid-vertical plane of the device. Fig. 2 is an extended diagrammatic perspective view illustrating the relationship between the coin controlled apparatus and a portion of the delivery mechanism including one of the ejector wheels. Fig. 3 is likewise a diagrammatic extended perspective view illustrating the relationship of parts, and more particularly the clutch, and locking mechanisms intermediate the coin controlled device and the delivery mechanism. Fig. 4 is an elevational detail view of a portion of the mechanism intermediate section lines A and B in Fig. 1 looking in the direction of the arrow. Fig. 5 is a view similar to Fig. 4, with the exception that the view is taken between the section lines B and C of Fig. 1 also looking in the direction of the arrow. Fig. 6 is a detail view with a portion of the delivery chute broken away to illustrate the action and movements of a package during the operation of delivery of the package. Fig. 7 is a detail view showing a part of the front portion of the device broken in section and

also illustrating the action and movements of a package during its delivery from the magazine.

The drawings and specification together with the claims, all presented herewith and constituting the present application, relate more especially to a preferred embodiment of the delivery mechanism of my vending machine; the coin controlled mechanism of which is more fully illustrated, described and specifically claimed in the companion application Serial No. 10,892 filed in the United States Patent Office on or about the 27th day of February, 1915. The claims in that case relating to the coin controlled structure specifically, whereas in the present application the delivery mechanism constitutes the specific feature which is herein claimed.

It is particularly desirable that the delivery mechanism of a vending machine be constructed in such manner that it is not operative unless under complete control of a coin controlled device which has been properly unlocked by the introduction of a predetermined coin. It is also particularly desirable that the delivery mechanism of a vending machine be simple in its construction, yet positive in its actuation in order to insure the delivery of a package when the machine is properly operated. Since vending machines are used by the general public and are liable to abuse during operation it is necessary that the parts, and particularly the delivery mechanism, be constructed to guard against breakage and also to guard against surreptitious operation of the machine by unscrupulous persons who may attempt to secure the goods without depositing the proper coin in payment therefor. In order to solve these problems I have in my preferred embodiment constructed the coin controlled mechanisms as one unit and the delivery mechanisms as a different unit and have provided intermediate devices whereby the coin controlled mechanisms are enabled to control the delivery mechanisms. To obtain simplicity and strength in my preferred embodiment I have constructed the delivery mechanism of such character that substantially all major movements thereof are rotary motions. To guard against surreptitious operation of the delivery mechanism, in the preferred embodiment of my invention, I have provided the ejecting mechanism with a positive lock, which lock is constructed to be released after the coin controlled mechanism has been unlocked by a proper predetermined coin. To facilitate the delivery of relatively long and flat articles, for example boxes, in the preferred form of the embodiment of my invention I have constructed the ejecting and delivery mechanisms so that such an article is ejected sidewise from a magazine and is

then delivered endwise through a proper predetermined exit opening.

Referring to the drawings and more particularly to Figs. 1, 5, 6 and 7, the packages X to be vended are arranged in a stack in a removable magazine 1 which is mounted upon and secured to the main frame 2 of the machine. A pair of L-shaped brackets 4 are attached to the lower side of the removable magazine 1 and extend beneath the said magazine to comprise supports upon which the lowermost package in the stack is adapted to rest. The wall 5 on the delivery side of the magazine is cut away to provide an opening through which the package to be vended may be ejected. The vertical distance between the upper surfaces of the L-shaped brackets 4 and the lower edge of the wall 5 is slightly greater than the individual vertical height of the packages in the stack. Since the packages are removed from the stack by sliding the lowermost package sidewise through the opening in the side wall 5, it will be seen that the relationship specified, between the brackets 4 and the lower edge of the side wall 5, prevents more than a single package from being ejected at one time. In order to maintain the packages seated securely upon the L-shaped brackets I provide a weight follower 6 which rests upon the uppermost package. The sides of this follower are recessed as at 7 to accommodate the shoe of a coin slot closure in a manner which will be hereinafter explained.

In the preferred form of my invention, a main shaft 8 for the delivery mechanism is mounted directly beneath the package magazine and the ends of this main shaft, as at 9 and 10, may be reduced to comprise studs which are journaled in the main frame and in the driving shaft, respectively. This main shaft 8 carries a pair of irregularly shaped delivery wheels 11 and 12 that are secured upon the main shaft in any convenient manner, as for example by means of the pins 14. These delivery wheels are provided with ejector projections 15 which are arranged at one side of and adjacent to the flat portions 16, and are adapted to contact with the edge of the package to be delivered to eject the same. A gate 17 is pivotally mounted, as for example upon a short shaft 18, that is carried by the studs or bosses 19 on the main frame 2. This gate 17 is normally retained horizontally beneath the lowermost package with the barrier 20 on the outer end thereof in the path which the lowermost package must traverse in being ejected from the magazine. When in normal position it will be seen that the barrier 20 on the gate 17 positively prevents the surreptitious removal of any packages by means of hooks or catches which might possibly be introduced through the delivery chute with the

intention of fraudulently extracting packages from the machine. In order to maintain the barrier 20 in position, the gate 17 is provided with a downward extension 21 which preferably carries at its lower end a small anti-friction roller 22 which normally rests upon a tip of an S-shaped cam 24 which is fixedly mounted upon the main shaft 8, as for example by means of the pin 25. By referring to Figs. 2, 4 and 5, it will be noted that when in normal position the flat portions 16 of the delivery wheels are directly beneath the lowermost package in the stack of packages. From Figs. 5 and 7 it will be noted that the flat portions terminate in curves which tend to slightly tip the edge of the package adjacent the ejectors 15 and this has a tendency to facilitate the ejection of the package when the delivery mechanism is actuated.

Referring now more particularly to Figs. 6 and 7, the delivery chute 26 is provided with a pair of light leaf springs 27 which engage the edge of a package as it is ejected from the stack and are flexed in such manner as is illustrated by dotted lines in Fig. 7. It will be noted in this figure that the parts are shown with the delivery mechanism actuated to such position that the ejector projections 15 have engaged the edge of the package to be delivered and have moved the said package a slight distance from its normal position in the magazine. It is also to be noted that the barrier 17 has dropped because of the anti-friction roller 22 having passed into the depression in the S-shaped cam 24 sufficiently to remove the barrier 20 entirely from the path of the package. As the package is ejected as is indicated by the dotted line position thereof, it will be noted that it is turned through substantially ninety degrees by means of the combined action of the ejector wheels and the light leaf springs 27 so that the package drops upon one edge and slides endwise out of the mouth of the inclined delivery chute. By ejecting the package edgewise and delivering it endwise, considerable space is conserved and also one corner of the package first engages with the bottom of the chute so that the pivoted falling movement of the package gives it a good initial start which tends to properly eject the same from the exit chute (see Fig. 6).

It is particularly desirable that the delivery mechanism be positively locked until a predetermined coin has been introduced into the coin controlled mechanism and until said coin is beyond the reach and recovery of the operator. In order to accomplish this desideratum I have provided a locking latch intermediate the driving shaft, which is coin controlled, and the main delivery shaft 8. This said locking member

includes a pair of square pins 28 and 29 that are mounted in bosses 30 which are arranged adjacent the short cylinder 31 on the delivery wheel 11. A locking latch 32 is mounted on a short shaft 34 which is carried by bosses 35 formed on the inner side of the main frame 2 and the latch is normally urged toward the short cylinder 31 by means of the coiled spring 36. A release arm 37 in the present embodiment of my invention, is formed integral with the locking latch, and has its upper end in the path of the actuating lug 38 that is struck from the side of the pawl carrying arm 39 which is secured to the driving shaft 40 by such means as the collar or sleeve 41 and cooperation of the pin 42. This pawl carrying arm 39 carries a clutch pawl 44 the face of which pawl is urged against the notched clutch disk 45 by means of a spring 46. This notched disk 45 is carried upon the main shaft 8 and is fixedly secured thereon, as for example by means of the pin 47. The outer end of the clutch pawl 44 is rounded as at 48 so that when the driving shaft is rotated the rounded part 48 will engage with the stationary releasing cam 49 which is preferably mounted upon the front plate 50 and disengages the pawl from the notch in the disk 45. The relationship of the notches 51 in the clutch disk 45, the pawl 44, and the stationary releasing cam 48, is such that the main shaft 8 is turned through one-half revolution while the driving shaft 40 makes one complete revolution. By this action it will be noted that the ejector projections 15 operate in successive alternation, that is, first one set, and then the other set, are effective in the delivery of packages.

The driving shaft 40 is normally locked and is under control of coin controlled devices which, as above stated, are more specifically described and set forth in my co-pending application. The delivery mechanism forming the present application, might in a broad sense, be controlled and operated by various types of driving mechanism, however, in the present case I prefer that it be controlled by the devices disclosed in my said co-pending application. These coin controlled devices include a coin plate 52 secured on the driving shaft 40. This coin plate carries on its front portion a pair of coin studs 54 which are arranged between the ends of segmental guard members 55. The advancing end of each segmental guard is provided with a knife edge 56 that lies adjacent the periphery of the coin plate 52. It is obvious that these knife edges 56 pass adjacent the walls of the inlet chute 57 and the coin outlet chute 58 so that when the driving shaft rotates these knives will sever any strings or wires attached to the coin with the intention of extracting a coin after

the locking devices had been released. The coin studs 54 are so located that the distance between the peripheries of these studs are slightly less than the diameter of a predetermined coin to permit a coin or slug which is smaller than a predetermined coin to fall between the said studs and drop out of the machine in the path indicated by the short arrows, Fig. 2. The width of the inlet chute 57 is very slightly larger than the size of a predetermined coin to prevent slugs or tokens of a diameter greater than a predetermined coin from being inserted in the device. An ejector plate 59 is secured to the front plate 50 and lies between the segmental guards 55 and the hub 60 of the coin plate. This ejector plate 59 causes a coin to be ejected from between the pair of coin studs 54 after the coin has passed the releasing mechanism and projects the coin into the proper coin chute 61 which leads to the coin box 62. The long arrows Fig. 2, indicate the path of travel of a normal predetermined coin.

Referring to Figs. 1 and 3, it will be noted that an irregular ratchet wheel 64 is secured to the driving shaft 40, for example by means of the collar 65 and pin 66. This irregular ratchet wheel 64 is provided with two locking teeth 67 and 68 between which normally lies the locking head 69 of the locking pawl 70. This locking pawl 70 may be carried upon a bracket such as 71 which may be attached to the front plate, and in the present embodiment, the locking pawl carries integral therewith an arm which supports at its outer end a coin contact roller 72. This coin contact roller is adapted to be raised by contact with a proper coin resting on the coin studs 54 when the operating handle 74 is turned in a clockwise direction. By reference to Figs. 2 and 3 it will be noted that the raising of this coin contact roller likewise raises the locking head 69 from between the locking teeth 67 and 68 thus permitting the operating handle 74 to be turned forward to complete its revolution. After the coin controlled parts have been unlocked as just described, a further continued turning of the driving shaft 40, by means of the operating handle, causes the clutch pawl 44 to engage the clutch disk 45 and the actuating lug 38 to cooperate with the releasing arm 37 thereby unlocking the locking latch 32 and permitting the delivery mechanism to be actuated through one-half revolution.

As explained and claimed in my co-pending application, it is desirable that the operating handle 74 be maintained in a vertical position, and therefore a centering device is provided which comprises (see Fig. 3) a centralizing lever 75 that contacts with pins 76 and 77 carried on opposite sides of the ratchet wheel 64. This centralizing lever 75 is normally held in contact with said pins

76 and 77 by means of the contractile spring 78. One end of the centralizing lever 75 is pivoted to the front plate 50, as for example by means of the stud 79, and the free end of this lever carries an overthrow arm 80 which is normally held against the stop pin 81 by the spring 82. Preferably the pin 76 is longer than the pin 77 and the outer end of the overthrow arm 80 is offset as at 84 to enable the pin 77 to pass thereunder, while the offset portion will engage the pin 77, and the spring 82 in conjunction with the spring 78 will turn the parts from dead center and restore the operating handle 74 to a vertical position.

After all the packages in the magazine have been vended by the delivery mechanism, it is desirable to close the coin inlet chute 57, and for this purpose I have provided a notched plate 85 which is formed with slots to receive the screws 86 that set in the pedestals 87. This plate 85 is also provided with a depending arm to which is attached a contractile spring 88 that normally presses the shoe 89 lightly against the ends of the packages X within the magazine 1. It will be noted that as the packages are ejected the weighted follower 6 which is in contact with the uppermost package, moves downward and when the last package is ejected the weighted follower rests upon the L-shaped brackets 5. As has previously been specified, the ends of this weighted follower 6 are recessed as at 7 so that the said weighted follower does not contact with the shoe 89 of the coin closure device, consequently this follower does not interfere with the inward movement of the shoe 89 and the corresponding movement of the plate 85 caused by contraction of the spring 88, so that the coin passage notch is carried beyond the coin inlet chute and thus the coin inlet chute is substantially closed.

The weighted follower 6 has a further function in that it imposes sufficient weight upon the stack of packages to prevent the package being ejected from being tipped downward too quickly by the light leaf springs 27. The weighted follower assists in obviating the possibility of the package being caught or jammed between the ends of the brackets L and the end of the side wall 5 of the magazine.

I am aware that it is possible to vary the physical embodiment of my invention without departing from the scope thereof, so therefore I desire that the specific construction disclosed in the drawings, constituting a part of this specification, and described in the said specification, be considered as illustrative and not in a limiting sense.

Having thus described my invention, what I claim is:—

1. In a device of the class described in combination, a main frame, a magazine re-

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movably mounted upon said main frame and adapted to contain articles arranged in a stack, a main shaft beneath said magazine, delivery wheels carried by said shaft, ejector projections provided upon said delivery wheels, a barrier normally preventing the delivery of packages from said magazine, a cam mounted upon said delivery shaft to permit said barrier to move to inoperative position when said main shaft is turned, locking devices normally preventing rotary motion of said main shaft, means for operating said locking devices to release said main shaft, said means including a driving shaft, a clutch intermediate said driving shaft and said main shaft, and means for rendering said clutch inoperative when the main shaft has been rotated through a predetermined rotative distance.

2. In a device of the class described in combination, a main frame, a magazine removably mounted upon said main frame and adapted to contain articles arranged in a stack, a main shaft, delivery wheels carried by said main shaft, ejector projections provided upon said delivery wheels, a gate having a barrier on the end thereof normally in the path of the package delivered from said magazine, a cam mounted upon said main shaft to permit said gate to drop and remove said barrier from the specified path, locking devices normally preventing rotation of said main shaft, means for unlocking said locking devices, a driving shaft, a clutch intermediate said driving shaft and said main shaft, and a stationary cam cooperating with one member of said clutch to render said clutch ineffective when the main shaft has rotated through a predetermined rotative distance.

3. In a vending machine in combination, a main frame, a magazine removably secured to said main frame, a main shaft, a pair of delivery devices mounted upon said main shaft, a gate provided with a barrier for normally preventing the exit of packages from said magazine, a cam mounted on said main shaft and operatively connected with said gate to permit said gate to drop the barrier to inoperative position when said main shaft is actuated, a lock for normally preventing actuation of the main shaft, a driving shaft, a clutch intermediate said driving shaft and said main shaft, and means to release said lock prior to the effective operation of said clutch.

4. In a device of the class described in combination, a main frame, a magazine removably secured to said main frame, a main shaft, a pair of delivery devices mounted upon said main shaft, a barrier normally preventing the exit of packages from said magazine, means operated by said main shaft to move said barrier to inoperative position when said main shaft is actuated,

a lock for normally preventing the actuation of said main shaft, a driving shaft, a clutch intermediate said driving shaft and said main shaft, and means to release said locking devices prior to the effective operation of said clutch.

5. In a device of the class described in combination, a main frame, a magazine removably secured to said main frame, a main shaft, a pair of delivery wheels mounted upon said main shaft, supporting means carried by said magazine and adapted to retain packages within said magazine adjacent to said delivery wheels, a barrier normally preventing the removal of packages from said magazine, a cam carried upon said main shaft and effective to permit said barrier to be moved to an ineffective position, a lock for normally preventing rotative movement of said main shaft, a driving shaft, means for releasing said lock when said driving shaft has been rotated a predetermined amount, and a clutch for transmitting power from said driving shaft to said main shaft.

6. In a device of the class described in combination, a main frame, a magazine carried on the upper portion of said main frame, a main shaft, a pair of delivery devices mounted upon said main shaft, a barrier normally preventing the exit of packages from said magazine, a double cam carried by said main shaft and operatively connected with said barrier to drop said barrier to inoperative position when said main shaft is actuated, a lock for normally preventing the actuation of said main shaft, a driving shaft, a mechanism normally limiting the rotation of said driving shaft, a clutch intermediate said driving shaft and said main shaft, and means to release the said lock prior to the effective operation of said clutch.

7. In a device of the class described in combination, a main frame, a magazine removably secured to said main frame and being adapted to retain articles in a stack, supporting members extending beneath said magazine, one wall of said magazine terminating above said supporting members at a distance slightly greater than the individual vertical height of packages to be delivered, a barrier normally preventing packages from being removed from said magazine, a main shaft, delivery devices operated by the rotation of said main shaft, means to render said barrier ineffective when said main shaft is rotated, a driving shaft, devices intermediate said driving shaft and said main shaft to transmit power from said driving shaft to said main shaft, and a mechanism for rendering said power transmitting devices ineffective to transmit power after said main shaft has rotated through a predetermined distance.

8. In a device of the class described in combination, a main frame, a magazine removably secured to the upper portion of said main frame, a main shaft, a pair of delivery wheels mounted upon said main shaft, supporting means carried by said magazine and adapted to retain packages within said magazine adjacent to said delivery wheels, a barrier normally preventing removal of packages from said magazine, a cam upon said main shaft and constructed to permit said barrier to drop to ineffective position, a lock for normally preventing rotative movement of said main shaft, a driving shaft, means for releasing said lock when said driving shaft has been rotated a predetermined amount, a device carried by said driving shaft and normally limiting the rotation of said driving shaft, and a clutch for transmitting power from said driving shaft to said main shaft.

9. In a device of the class described in combination, a main frame, a magazine removably secured to the upper portion of said main frame, a pair of supports extending beneath said magazine, one wall of said magazine terminating above said supports at a distance slightly greater than the individual vertical height of packages to be delivered, a barrier normally preventing packages from being removed from said magazine, a main shaft, delivery devices operated by the rotation of said main shaft, means to render said barrier ineffective when said main shaft is rotated, a driving shaft, controlling devices for limiting the rotative movement of said driving shaft, devices intermediate said driving shaft and said main shaft to transmit power from said driving shaft to said main shaft, and a mechanism for rendering the power transmitting device ineffective to transmit power after said main shaft is rotated to a predetermined distance.

10. In a device of the class described in combination, a magazine adapted to maintain articles in a stack, a main shaft, delivery devices operated by said main shaft to eject packages from said magazine when said main shaft is rotated, a barrier controlling the exit from said magazine, means for rendering said barrier inoperative when said main shaft is operated, a lock for said main shaft, a driving shaft, a lock for said driving shaft, and means for transmitting power from said driving shaft to said main shaft.

11. In a device of the class described in combination, a container for articles to be delivered, said container being provided with an exit opening in one side wall thereof, a barrier normally closing the exit for said container to prevent articles from being extracted through said exit opening, means to render said barrier ineffective, rotative

devices for engaging and ejecting a package from said container, a driving shaft for operating said rotative devices, a clutch intermediate said driving shaft and the rotative devices, mechanism for normally limiting the movement of said driving shaft, and means for rendering said clutch ineffective after a package has been ejected from said container.

12. In a vending machine in combination, a vertical magazine adapted to maintain relatively flat articles in a stack, a main shaft adjacent said magazine, delivery devices operable by said main shaft to eject packages from said magazine when said main shaft is actuated, a barrier controlling the exit from said magazine, means for rendering said barrier inoperative when said main shaft is operated, a lock for said main shaft, a driving shaft having a predetermined movement independent of said main shaft, a lock for said driving shaft, and means for transmitting power from said driving shaft to said main shaft.

13. In a vending machine in combination, a container for articles to be delivered, a pair of delivery wheels provided with ejector projections, means to maintain a single article to be delivered adjacent said delivery wheels and in the path of said ejector projections when said delivery wheels are rotated, means for normally obstructing the path of the article adjacent the delivery wheels, means for rotating said delivery wheels, devices for removing said obstructing means, and a lock for normally preventing movement of said delivery wheels.

14. In a vending machine in combination, a container for articles to be delivered, a delivery wheel mounted for rotation directly beneath said container, said delivery wheel being formed with a flat portion, ejector projections adjacent said flat portion, a support to maintain a package in said magazine above said delivery wheel, a barrier for preventing the package from being removed from said support when the flat portion of said delivery wheel is beneath said package, means to actuate said delivery wheel, and a cam constructed to permit said barrier to be removed when said delivery wheel is actuated.

15. In a vending machine in combination, a container for relatively flat articles to be vended, an abutment to receive and support a predetermined article to be ejected from said vending machine, a driving shaft, a main shaft, ejecting devices operated by said main shaft, and means to cause said driving shaft to actuate said main shaft after said driving shaft has been rotated through a predetermined amount of rotation.

16. In a device of the class described in combination, a container for articles to be

delivered, a delivery wheel mounted for rotation directly beneath said container, said delivery wheel being formed with a flat portion, an ejector projection adjacent said flat portion, means to support a package above said delivery wheel, a barrier for preventing the package from being removed from said support when the flat portion of said delivery wheel is beneath said package, and means for removing said barrier when said delivery wheel is actuated.

17. In a vending machine in combination, a main frame, a magazine removably mounted upon the upper portion of said main frame, a pair of delivery wheels within said main frame and beneath said magazine, a face plate carried by and inclosing the front end of said main frame, a driving shaft carried by said face plate, a main shaft supporting said delivery wheels, said main shaft having one end journaled in said main frame and the other end journaled in said driving shaft, and means for transmitting power from said driving shaft to said main shaft.

18. In a vending machine in combination, a magazine for containing relatively flat articles in a stack, ejector devices to remove the bottom article from said stack by sliding the same in substantially a horizontal direction, a pair of light leaf springs normally in the path of the ejected article and constructed to be flexed when said article is being ejected, said springs having their upper ends fixedly mounted and their lower ends slidably mounted to exert a force to turn the ejected article through ninety degrees.

19. In a vending machine in combination, a container for a plurality of articles to be vended, ejecting devices for removing a predetermined article from said container, an exit chute adjacent said container, said exit chute being provided with an inclined bottom wall, a pair of resilient curved leaf springs having their upper ends attached to said chute, and having their lower ends slidably resting against the inner wall of said chute, said springs being constructed to be in the path of an ejected article, the parts being constructed and arranged to eject a package sidewise from said magazine, to turn said package through ninety degrees, and to discharge said package from said delivery chute endwise with the sides of said package in substantially vertical planes.

20. In a vending machine in combination, a container for a plurality of relatively flat

packages arranged in a stack, a weight resting upon said stack, a support beneath said stack, means to eject the bottom article of said stack through an exit opening, and resilient devices normally in the path of said ejected article, said resilient devices being constructed to turn said delivered article during its expulsion from said stack, said weight being of a sufficient magnitude to prevent said resilient devices from turning the said article prior to its clearing the walls of the exit opening.

21. In a vending machine in combination, a delivery mechanism, a driving device for operating said delivery mechanism, a container for articles to be delivered, a follower movable in said container in coördination with the movement of the articles in the container, and a slidable gate endwise movable when the supply of packages in the container is exhausted, a shoe connected with said gate and resting upon packages in said container, said follower being recessed to accommodate said shoe when all of said packages have been ejected from said container.

22. As an article of manufacture, a delivery wheel for a vending machine, said delivery wheel including a construction symmetric with itself when rotated through one hundred and eighty degrees and comprising on its periphery a flat portion, a convex curve extending from said flat portion, a concave curve of relatively short radius adjacent said convex portion, the center of said concave curve being outside the periphery of said wheel, an ejector projection adjacent said concave curve, and a second convex curve of relatively large radius leading a predetermined distance from said projection.

23. In a vending machine in combination, a container for articles to be vended, a driving mechanism, a delivery device for ejecting a predetermined article from said container, a clutch intermediate said driving mechanism and said delivery device, said clutch including a disk provided with a notch, an arm, a pawl mounted on said arm, and a stationary cam operative to render said pawl ineffective after said driving mechanism has rotated a predetermined distance.

CHARLES F. RICHARDSON.

Witnesses:

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