(No Model.) 4 Sheets—Sheet 1.

F. B. COCHRAN.

COIN OPERATED VENDING MACHINE.

No. 425,163. Patented Apr. 8, 1890.

Fig. 2.

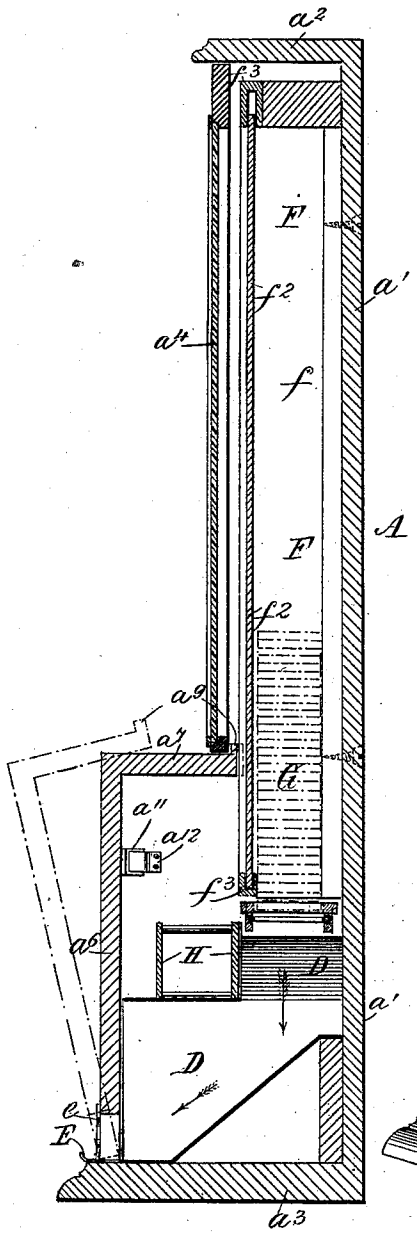
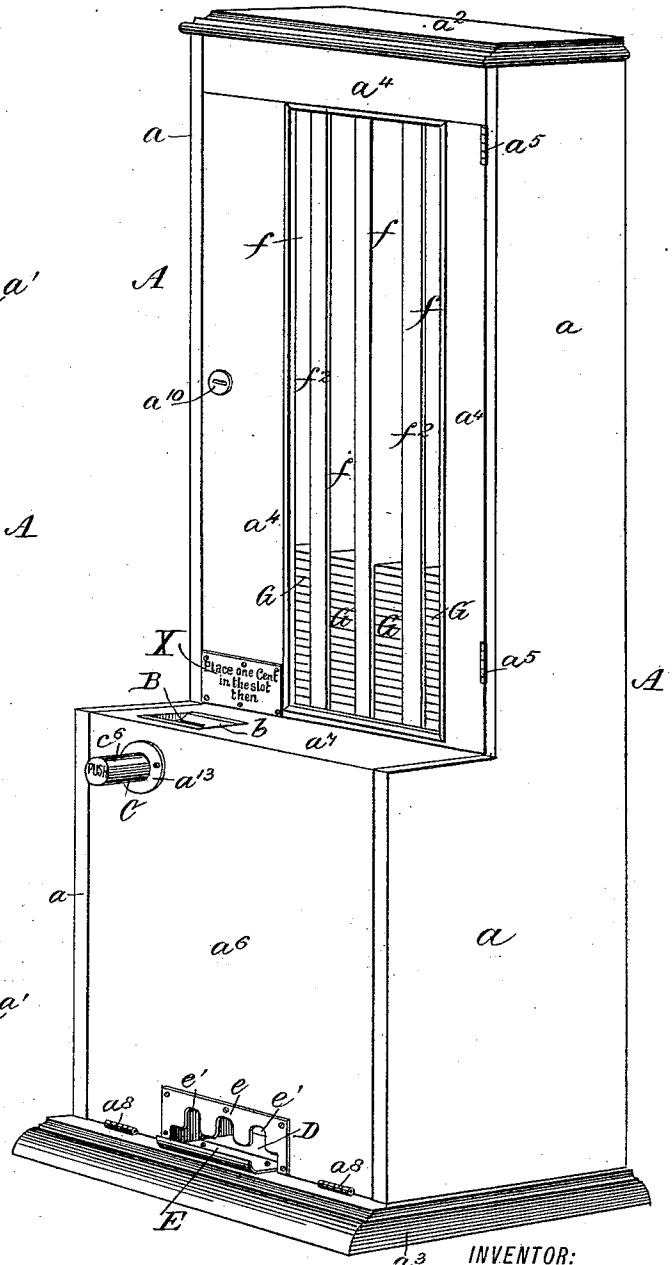


Fig. 1.



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Fig. 3.

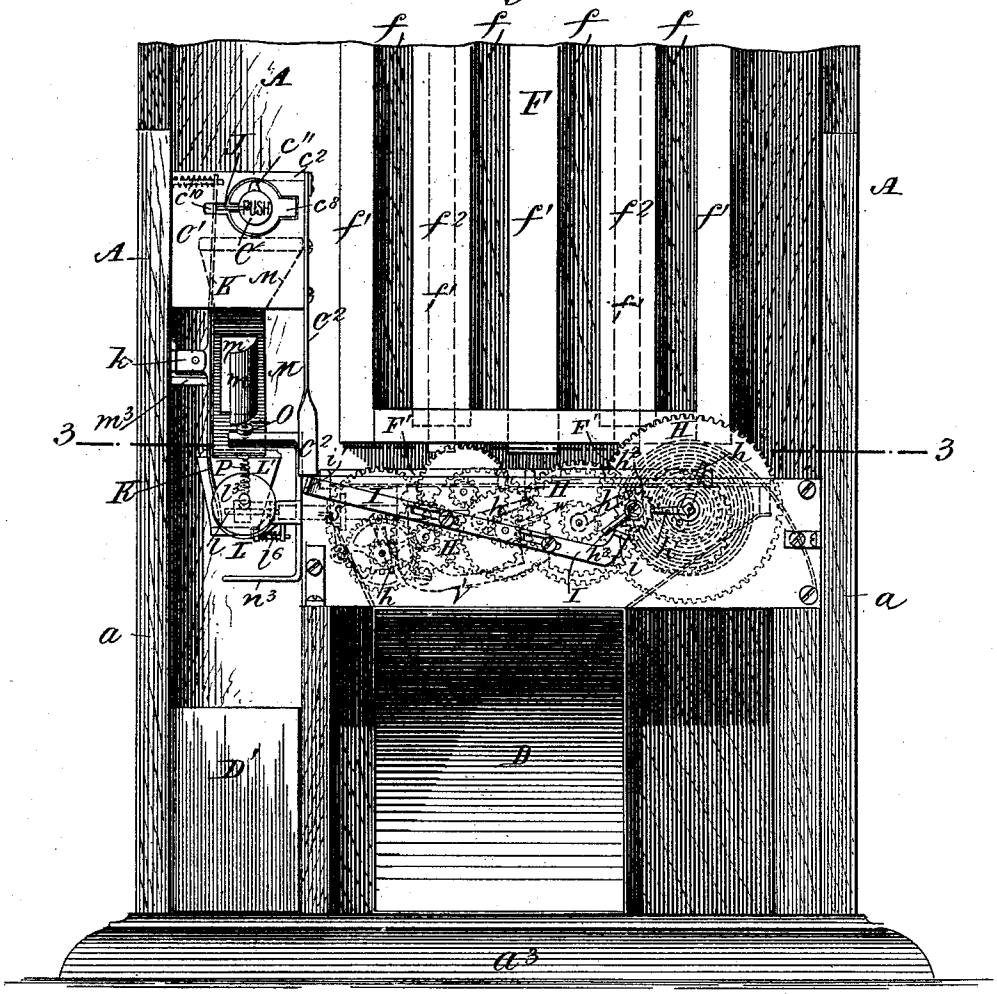


Fig. 4

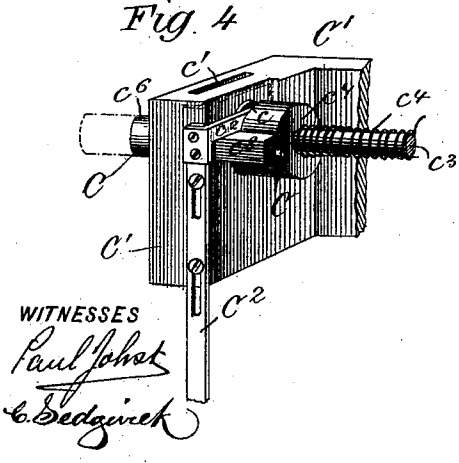
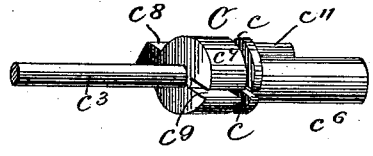


Fig. 5.



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Fig. 6.

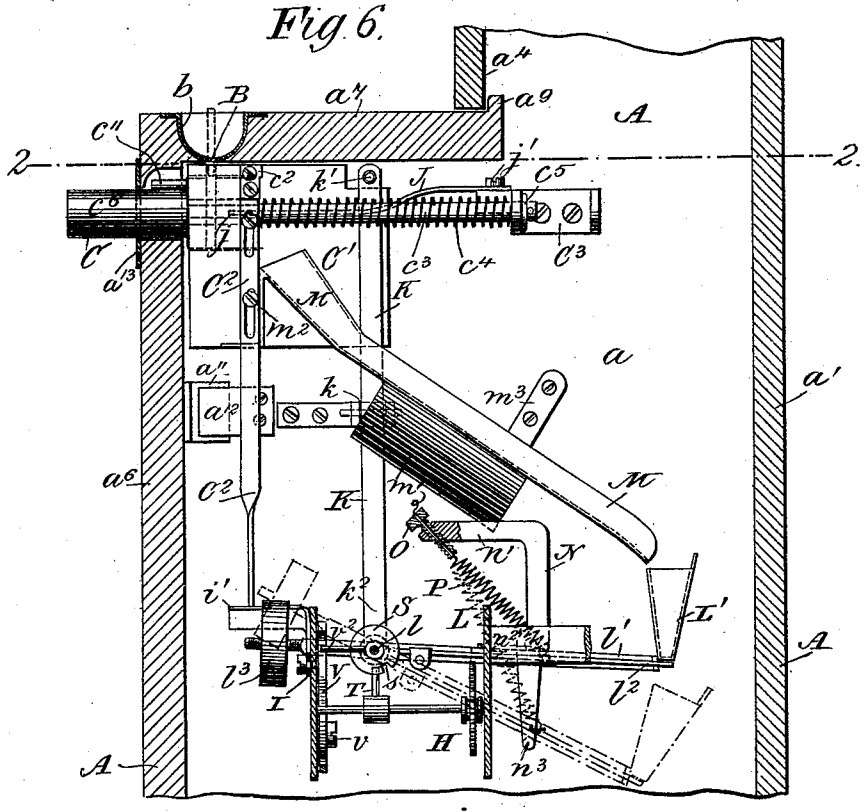


Fig. 4.

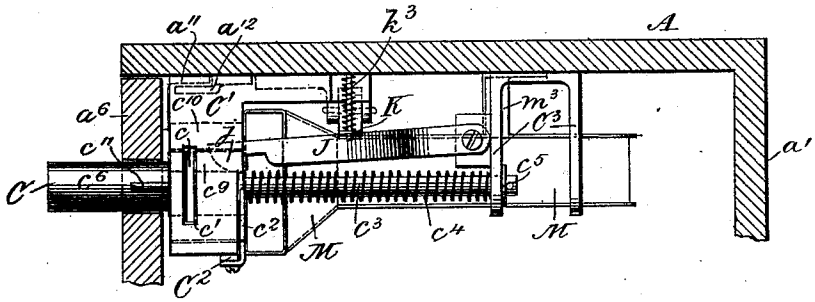
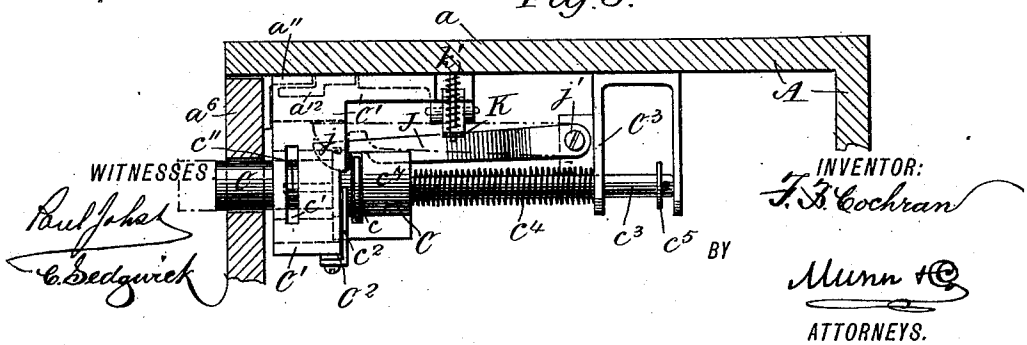


Fig. 8.



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Fig. 9.

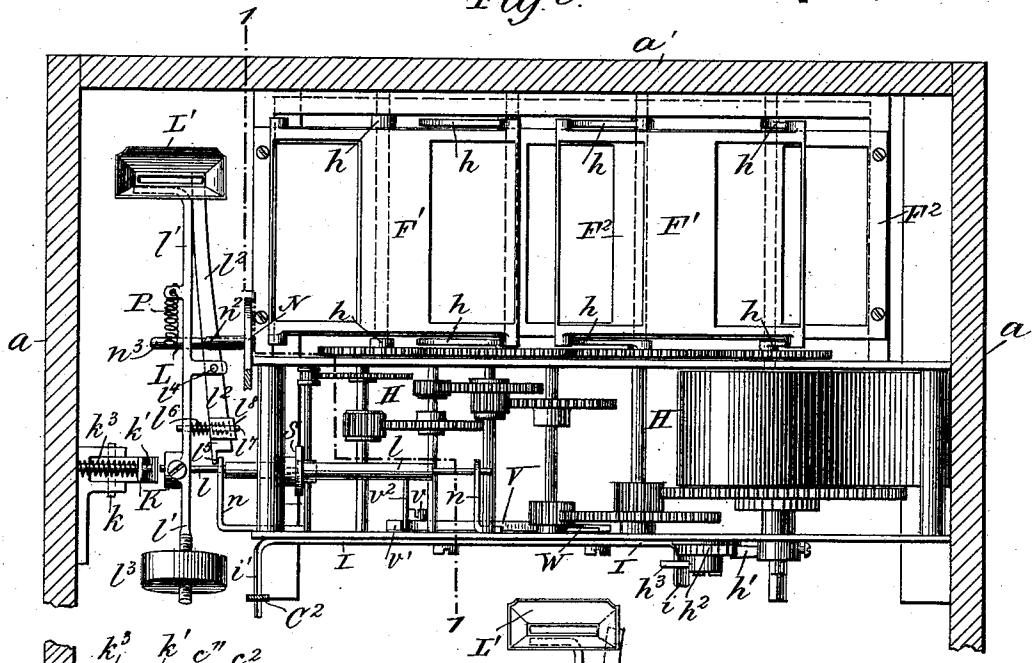


Fig. 11.

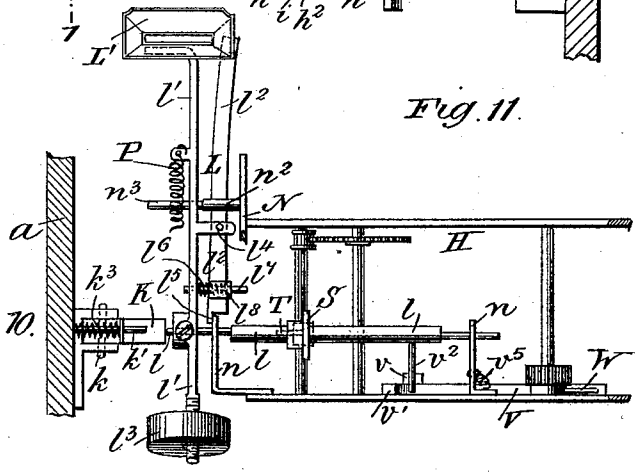
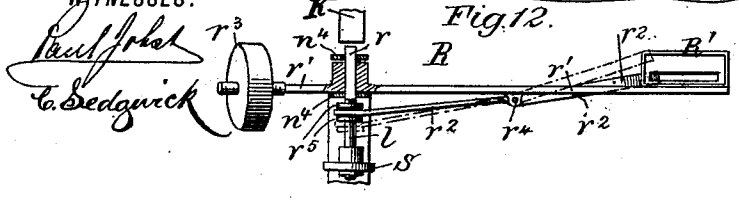


Fig. 10.

Fig. 12.



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UNITED STATES PATENT OFFICE.

FREDERIC B. COCHRAN, OF NEW YORK, N. Y.

COIN-OPERATED VENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 425,163, dated April 8, 1890.

Application filed September 14, 1889. Serial No. 323,923. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC B. COCHRAN, of the city, county, and State of New York, have invented new and useful Improvements in Coin-Operated Vending-Machines, of which the following is a full, clear, and exact description.

My invention relates to a vending machine or apparatus which automatically delivers small wares—such as chocolate or other confections, chewing-gum, cigarettes, and the like—on payment of a proper coin passed into the machine by a purchaser; and the invention has for its object to provide a compact, efficient, reliable, and comparatively inexpensive machine of this character.

The invention consists in certain novel features of construction and combinations of parts of the vending apparatus, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front perspective view of my improved automatic coin-operated vending-machine as it appears in use. Fig. 2 is a central vertical sectional side view of the machine-case and a few parts of the interior mechanism. Fig. 3 is a front view of the lower portion of the machine with the lower hinged front of the case removed. Fig. 4 is a detail inside perspective view of the coin-receiving block and plunger and shows the plunger locked in innermost position, as when any predetermined quantity of goods is sold out of the machine. Fig. 5 is a rear perspective view of the plunger with its stem partly broken away, as in Fig. 4. Fig. 6 is a side elevation with the case in vertical section and taken on the irregular line 1 1 in Fig. 9, and is intended more particularly to show the coin-receiving plunger and coin-lever mechanism of the machine. Fig. 7 is a detail plan view taken on the line 2 2 in Fig. 6 to show the coin plunger and chute, the plunger being in normal outward position. Fig. 8 is a like view, but with the chute omitted and with the plunger in innermost position. Fig. 9 is a plan view of the machine, partly in horizontal section on the line 3 3 in Fig. 3, and shows the coin-lever and goods-delivery mechanism. Fig. 10 is a front view of the mechanism shown in Fig. 9, but with the coin-lever counterpoise and most of the clock-works wheels omitted. Fig. 11 is a detail plan view of the coin-lever and adjacent mechanism and shows the trip-arm of the lever adjusted to allow a coin to drop from the lever-bucket, and Fig. 12 is a plan view of a modification of the coin-lever.

The case or boxing A of the machine is preferably made of wood and with opposite sides a a, a back a', a top a^2, and a bottom or base plate a^3, all rigidly connected together in any approved manner. The front of the case consists of two hinged portions or doors, an upper one a^4, which is hinged at a^5 at one side edge to one side of the case, and is preferably glazed to show the goods being sold, and a lower door a^6, made with a front vertical plate and a rigidly-connected horizontal plate or ledge a^7, which correspond in general form with the deeper or broader lower front parts of the sides of the case. The lower door a^6 is preferably hinged at a^8 at its lower edge to the case, and at its rear part the door-ledge a^7 is provided with an upwardly-projecting rib or flange a^9, in front of which the closed upper door a^4 stands; hence a single lock a^{10}, applied to the upper door and having a bolt shooting into one side of the case, will securely lock both closed doors, and when the upper door is unlocked and swung fully open to one side the lower door may then be swung down, thus leaving the entire front of the case open for access to its interior. As the lower door a^6 closes lugs a^{11} projecting inward from it, lock inside of flanged keepers a^{12}, fixed to the case side walls to prevent the latter warping laterally outward from the closed door.

The coin paid for a piece of goods is placed in a slot B, formed, preferably, in or through a metal concaved mouth-piece b, fixed to the lower door-ledge a^7, and passes thence into a slot c' in a block C', and thence into a slot of a plunger C, fitted in said block. When this plunger is pushed in, it drops the coin into a chute, whence it falls onto a coin-lever, which, if the coin be a proper one, will trip the goods-delivery mechanism into action and cause

one piece of goods to fall into a chute D and thence into a tray E, located at the bottom of the chute and preferably fixed to the bottom of the case and passing through and projecting beyond an opening made in the front door a^6.

The goods-holding device, the chute, the plunger, the coin-lever, and the goods-delivery mechanism will be hereinafter more fully described.

I guard the opening at the tray E by a metal plate *e*, which is secured to the case-front above the tray and approaches it quite closely at its lower edge, which is provided with a series of vertical notches *e'*, admitting the buyer's fingers into the tray behind the delivered piece of goods to draw it conveniently from the tray should it not be thrown forward beyond the face-plate. The plate E prevents mischievous persons passing their hands upward into the machine next the tray, and thus obviates tampering with the interior mechanism of the machine.

The goods box or holder F is a frame-like structure, which is held to the inside of the case A, directly above the goods-delivery mechanism, by screws passing through the back wall of the case or otherwise. The goods-box shown has four vertical compartments *f*, which are open at their lower ends and are formed between five vertical walls *f'* of the box. In front of the second and fourth walls *f'* are held detachable slats f^2 f^2, which are fitted into mortises f^3 at the head and foot of the box-frame and lap over each side face of these walls, as indicated by the dotted lines in Fig. 3 of the drawings. When these slats are removed, all four compartments *f* of the goods-box may be filled with chocolate or other confections G by passing them in directly from the front of the box between its walls *f'*, and when the compartments are filled wholly or in part, as desired, the two front slats f^2 will then be readjusted at the ends into the frame-mortises, and will overlap the fronts of all four compartments to hold the goods therein.

The pieces of goods are delivered one at a time from the goods-box F by slides F', reciprocating laterally over a table F^2, which has slots through which the goods fall into the chute D. These slides are actuated by a series of tappets *h*, operated from or by a clock-works mechanism H, sustained in the machine-case. The clock-works gearing is arranged so that a tappet-arm *h'* on one of the shafts or wheels—say the shaft of the main-spring—makes one revolution for any certain number of pieces of goods dropped by the slides—say twenty pieces—and this tappet-arm every time it rotates turns a ratchet-wheel h^2 the distance of one tooth, and if this wheel have fifteen teeth it will be turned completely around when three hundred pieces of goods have been sold out of the machine. This ratchet-wheel h^2 or its shaft carries an arm or pin h^3, which when any predetermined number of pieces of goods are sold will strike a projecting stud or arm *i* at the back end of a trip-bar I, which is adapted for endwise movement on the clock-works frame and will withdraw the opposite end stud or arm *i'* of the trip-bar from under a gravity-latch C^2, which is held loosely to the plunger block or bearing C', and will thus allow the latch to fall upon the plunger and into its coin-slot *c*, when the plunger is pushed in—that is to say, the upper arm or lug c^2 of the latch C^2 by falling into the coin-slot *c* of the plunger locks the plunger inward and prevents insertion of coins until the machine is reset, as will be hereinafter more fully explained. The goods-receiving chute D slopes from both ends and sides and also at the bottom to deliver pieces of goods falling from any one of the box-compartments *f* into the tray E, and the coin paid for each piece of goods is automatically discharged from the coin-lever and drops into a box D'. (Shown in Fig. 3 of the drawings.)

The coin-receiving plunger C is fitted to slide inward in the block C', which is fixed to the adjacent side wall *a* of the case and has a stem c^3, which slides in the front arm of a two-armed bracket C^3, the rear arm of which limits the inward movement of the plunger. On the stem c^3 is placed between the plunger body and bracket C^3 an expanding spring c^4, which throws the plunger outward to normal position, where it is stopped by contact of a pin and washer c^5 on the stem with the front arm of the bracket. When the plunger is thrown outward, its coin-slot *c* registers with the slot *c'* of the block C', which always coincides with the coin-slot B in the machine-case. The body portion of the plunger is peculiarly formed. The front part c^6 of it, which works through the case front or door a^6, is preferably made somewhat smaller in diameter or cross-section than its rear or inner part c^7, which has about the same diameter or cross-sectional area as the coin to be used—say one cent—and in which is formed the coin-slot *c*, above named. This slot practically divides the plunger into two end parts or sections, which are held in proper relative positions to form the slot by means of a lug or side rib c^8, which ranges along one side of the rear part c^7 and moves in a slot made for it in the plunger-block C'. The part c^7 of the plunger is provided also with a radial side slot c^9, which is preferably directly opposite the rib c^8, and when the plunger is in place opposes a slot c^{10}, made in the plunger-guide block C'. This slot c^{10} accommodates the beveled head *j* of a lever J, which is fulcrumed at *j'* at its rear end to a lug on the bracket C^3 or on the machine-case. The inclined edge of the lever-head faces the plunger and enters its side slot c^9, so that when a coin is dropped into the slot *c* of the plunger and the plunger is pushed inward the coin will strike the head of the lever J and push it to one side, and thereby push outward the

upper end of the lever K, which rises at the outer edge of the lever J. The lever K is fulcrumed at k to suitable lugs or brackets on the side of the machine-case, and is preferably fitted at its upper end loosely around a pin k', fixed in the case, this pin serving to steady the lever, so that its lower end k^2 always is fairly presented to the end of the shaft l of the coin-lever L. A spring k^3, placed on the pin k', normally presses the top of the lever K inward against the edge of the lever J and holds its head in against the base of the coin-plunger slot c^9, to positively assure the lateral movement of the lever J and consequent operation thereby of the lever K to move the coin-lever shaft l endwise every time the plunger is pushed inward after a coin is deposited in it, as above described. The effect of this bodily endwise movement of the shaft l and consequent lateral movement of the coin-lever L, connected therewith, will be hereinafter explained. It will be noticed that the instant the slot c of the inmoving plunger C passes beyond the inner face of the front portion of the guide-block C′ the coin will drop from the plunger into a chute M, which delivers it to the bucket L′ of the coin-lever L, and the instant the coin leaves the plunger-slot the lever J, which had been pushed to one side by the inmoving coin, will be instantly readjusted to normal position by the expansion of the spring k^3, forcing the lever K inward against the lever J. The lever J may have its own independent spring to keep its head j into the coin-plunger slot c^9; but by lapping the lever K at the edge of the one J one spring k^3 readjusts both levers to normal positions. This trip device, consisting of two levers J K, is but a preferred construction, it being obvious that the lever K may be so located at its upper end that the coin in the plunger would work directly on it to shift the coin-lever shaft endwise. The location of the plunger-bearing block C′ makes it more convenient to use the two-lever trip device; hence this construction is at present adopted. It will be seen that by making the outer front part c^6 of the plunger C smaller than its body portion c^7, which has the slot c^9, and that by fitting the front part a^6 of the case or a metal plate a^{13} thereon quite closely to the front end c^6 of the plunger the slot c^9 is fully concealed and protected from outside the case; hence it will be impossible to pass a wire or other instrument in at or next the plunger to damage or tamper with the lever mechanism J K L, above mentioned. The front portion c^6 of the plunger is provided with a lug or flange c^{11}, which has for its object to sustain a coin entered at the receiving-slot B and prevent it falling so far into the case that it cannot be recovered should the coin be dropped into the slot after the plunger is locked in by the latch C^2 in the manner above described. In this case the coin would remain in the position indicated in dotted lines in Fig. 6 of the drawings, so that it could readily be taken back from the slot by an intending purchaser. This guard-lug c^{11} is always out of sight behind or within the front of the case A of the machine.

The coin-chute M is provided in its floor with a slot m, too narrow to allow the proper coin to drop through it, but permitting buttons or other smaller substances to drop through directly into the box D, thus preventing their passage into the bucket of the coin-lever. A guard-plate m', held to the chute, causes any substances dropping through the slot m to be deflected to one side and prevents them dropping onto and catching in the coin-lever mechanism, which is below the chute. The guard-plate m' is preferably formed by pressing down the metal removed from the chute-floor to form the slot m therein. The coin-chute is held in place by an upper bracket m^2, fixed to the plunger-guide block C′, and a lateral bracket m^3, held to the adjacent side wall of the case.

The coin-lever L is made with two scissor-like arms or limbs l' l^2. The former carries at one end the coin-bucket L′, and is provided at the other end with a counter-weight l^3, which may or may not be adjustable. This limb l' is fixed to the coin-lever shaft l and moves laterally and also rocks with it. The other limb l^2 is pivoted at l^4 to the limb l', and at one end is provided with a shoulder or lug l^5, which normally stands next one of the two bearings n n in which the lever-shaft l is journaled, said bearings being preferably held to the clock-works frame. The other end of the lever-limb l^2 normally underlies one end of the throat or discharge opening of the coin-bucket L′, as shown in Fig. 9 of the drawings, and is held in this position by a spring l^6, placed loosely on a pin l^7, which is fixed in the lever-limb l', between which and a lug l^8, held to the limb l^2, the spring expands.

A bracket N, preferably fixed to the clock-works frame, is provided at its upper end with a laterally-extending arm n', into which is threaded a milled head-screw O, to which is connected one end of a delicate spiral spring P, which preferably extends rearward and downward obliquely and is fixed at its other end to the coin-lever at a point between its shaft and coin-bucket. The spring P sustains the coin-actuated lever in position to allow operation of the clock-works to cause delivery of a piece of goods each time a proper coin is deposited in the machine, and also prevents operation of the clock-works and goods-delivery mechanism should a spurious coin be dropped into the machine. I find that the spiral spring is as efficient and more desirable than a bow-spring; hence I specially claim it for the purpose described. I specially mention the oblique position of this spring, which is necessarily sensitive, as I find that by setting it obliquely it has a much better effect in preventing excessive tilting or rocking movements of the coin-lever due to the impact of a coin. In other words, when a proper coin is dropped in the lever-bucket the

lever should tilt to a certain intermediate position and keep this position quite steadily for a time or until the piece of goods is delivered for which the coin had paid. Should the spring P be set about vertical, the tilted coin-lever would not be so quickly and steadily held in this intermediate position as when the spring ranges obliquely; hence the advantage of the obliquely-set spring is obvious. When the coin-lever is evenly balanced in about horizontal position on its shaft l and the spring P is once set so that the weight of a coin in the lever-bucket will hold the lever in proper intermediate tilted position, any deviation in the sustaining force or resiliency of the spring may easily be corrected by turning the screw O in or out in the bracket-arm n'. As a further means of adjusting the spring, and also as a simple and effective means for connecting the spring to the screw, I make the screw hollow and pass the end of the spring-wire through its interior and bend or twist the wire outside the head of the screw, as best shown in Fig. 6 of the drawings. The bracket N is provided with upper and lower laterally-projecting arms n^2 n^3, which limit the upward and downward tilting movements of the coin-lever.

With the aforesaid construction it is manifest that each time the coin-lever shaft l is moved endwise to the right hand, either by the lever K, operated from the plunger, or by a trip mechanism at the clock-works, presently explained, the limb l' of the coin-lever will be moved to the right with the shaft, and as the lever-limb l^2 is detained at l^5 by the shaft-bearing n the back end of said limb l^2 will be moved over clear of the discharge-opening of the coin-bucket, as shown in Fig. 11 of the drawings, to allow a coin or any other substance retained in the lever-bucket L′ to fall from it. The lever-limb l^2 normally underlies but a small part of the bucket-outlet, and will retain in the bucket any coin or other substance of a certain diameter, but will allow buttons or other small substances to fall at once through the bucket without tilting the lever. Immediately the endwise pressure on the coin-lever shaft is relaxed the spring l^6 by its expansion will shift the shaft back to normal position and will simultaneously readjust the lever-limb l^2 under the discharge-opening of the coin-bucket. As the trip-lever K is not normally in contact with the end of the coin-lever shaft, and as the lever lug or shoulder l^5 normally stands clear of or away from the adjacent bearing n of the shaft l, the tilting movements of the coin-lever are practically frictionless; hence the delicacy of poise and sensitiveness of action of the lever are maintained. The scissor-like movement of the limb l^2 of the coin-lever to clear the coin-bucket of anything it contains does not in the least interfere with the free tilting movement of the lever to trip the goods-delivery mechanism into action, as presently described.

In the modified form of coin-lever R (shown in Fig. 12 of the drawings) the main limb r' of the lever is fitted loosely onto a squared part r of the shaft l and between two bearings $n^4 n^4$, which prevent lateral bodily movement of said main limb, while allowing the shaft to have endwise movement in the limb and compelling the shaft to rock as the lever is tilted by a coin deposited in the bucket R′, which is held at one end of the limb r', while the counter-weight r^3 is on the other end of the limb. The other limb r^2 of the lever is pivoted at r^4 to the main limb r' and is adapted to underlie the mouth of the coin-bucket, as shown in full lines, and at its other end is detained between two collars r^5 r^5, fixed to the shaft; or it may be forked around or over one collar on the shaft. Thus arranged, when the shaft l is moved endwise to the right hand the coin-lever limb r^2 will be moved, as indicated in dotted lines, to withdraw its extremity from under the coin-bucket and allow a coin or other substance it contains to fall from it. As the shaft is retracted by a spring applied at its farther end or otherwise, the coin-lever limb will again be set under the coin-bucket to retain a coin therein.

I will now describe the mechanism which by the tilting of the coin-lever trips the goods-delivery mechanism into action, and also the mechanism by which the coin-lever shaft l is moved endwise by and from the clock-works to drop from the lever the coin which had started the delivery mechanism.

On the coin-lever shaft l is fixed a disk or collar S, which is provided with a radial marginal slot s, through which a tappet or arm T on one of the clock-works shafts is adapted to pass freely when the coin-lever is tilted by a proper coin, which consequently turns the lever-shaft and its disk to hold the disk-notch s in alignment with the clock-works tappet T until the piece of goods paid for is delivered to the purchaser, and the coin is dropped by endwise movement of the shaft caused by a lever V, actuated from the clock-works, as presently explained. Should a coin or other substance passed into the coin-lever bucket be too light, it will not tilt the lever sufficiently to carry the disk-notch s into line with the tappet T and the delivery mechanism will not be tripped into action, and a like result will follow should the coin in the lever-bucket be too heavy, so as to tilt the lever too low and carry the disk-notch s beyond the tappet T. It is manifest that when the notch s is in line with the tappet the latter turns through the notch until the coin in the lever-bucket is dropped to allow the spring P to lift the lever and carry the notch out of line with the tappet, which then stops at the side of the disk with a very slight pressure or frictional contact, which does not interfere with the delicate tilting motion of the coin-lever.

The coin-lever shaft receives endwise movement from the clock-works mechanism to discharge the coin which had paid for the de

livered piece of goods through the medium of an elbow or bent lever V, which is fulcrumed at v to the clock-works frame and has a short arm v', which rises in front of a pin or stud v^2, fixed in the coin-lever shaft l, and also has a long arm or tail v^3. This lever V is actuated each time one piece of goods is delivered from the machine by a pin or tappet-arm W, which is on one of the wheels or shafts of the clock-works H, and acts on its tail v^3 and slips down over its shoulder v^4 to allow a spring v^5, connected to the lever and a relatively-stationary support, to quickly restore the lever to normal position, allowing endwise retraction of the coin-lever shaft l. With this construction after the coin-lever is tilted by the coin and the clock-works start to operate one of the slides F′ to deliver one piece of goods the tappet W will, as the piece is dropped into the chute D and tray E, actuate the lever V, and thereby move the coin-lever shaft endwise to shift its limb l^2 from under the coin-bucket and allow the coin to drop, whereupon the spring P immediately lifts the coin-bucket and carries the shaft-disk S around to stop the clock-works, as above described.

On the machine-case A, and preferably at the front of the upper door a^4 thereof, is produced a phrase of instructions, which may be printed or marked on the case or on a plate X, fixed thereto near the slot B, and consists, preferably, of the words "Place one cent in the slot, then," and on the outer end of the plunger C is printed or marked the word "Push."

The continuous operation of the machine is as follows: A coin—one cent—will be dropped into the slot B and will fall into the plunger-slot c; and when the plunger C is pushed in the coin will shift the lever J, and it will actuate the lever K to move the coin-lever shaft l endwise and throw the coin-lever limb l^2 from under the bucket L′ to allow any spurious coin or other substance to drop from it. Immediately the coin drops from the plunger the levers K J are readjusted to normal positions by the spring k^3 and the lever-limb l^2 is thrown by the spring l^6 back under the bucket L′ in time to catch and retain therein the coin just dropped from the plunger into the chute M. When the proper coin drops into the bucket, it tilts the coin-lever and rocks its shaft l and holds the notch s of the disk S in the path of the clock-works tappet T to allow operation of the clock-works long enough to cause one of the slides F′ to deliver one piece of goods G into the tray E, and about as this delivery is made the trip-lever V is actuated by the tappet W to again move the shaft l endwise and carry the coin-lever limb l^2 from under the coin-bucket L′ and allow the coin to drop therefrom into the money-box D′, and immediately the coin leaves the lever-bucket the springs P l^6 readjust the lever to normal position, ready to receive the next coin to again trip the goods-delivery mechanism into action. The tappet-wheels h^2 h^3 will be set to allow locking of the plunger C by the gravity-latch C^2 when the goods have all been sold. As the last piece is being delivered the clock-works tappet h will turn the ratchet-wheel h^2 and cause its arm h^3 to strike the end lug i of the trip-bar I and move it back from under the latch C^2, which then falls and carries its upper arm or lug c^2 into the slot c of the plunger, which the coin paying for the last piece of goods had just fallen from, (see Fig. 4 of the drawings,) thereby locking the plunger inward and bringing its lug c^{11} across the plunger-block slot c', and preventing insertion of coins when no delivery of goods would follow, and thus assure a fair sale, as any coin afterward placed in the slot B would be detained by the plunger-rib c^{11} to allow it to be recovered by the intending purchaser, as above described. After refilling the box F with confections or other goods it is only necessary to turn the ratchet-arm h^3 around clear of the trip-bar lug i to the desired place and then raise the latch C^2 and slide the trip-bar I forward again until its arm or lug i' comes under the latch to support it, and the machine is ready to sell the next lot of goods, in the manner hereinbefore set forth.

It will be noticed on reference to my prior patent, No. 412,469, granted October, 1889, and after this application was presented, that I claim generally in this application what is shown and described in said patent—viz., the combination, with a goods-delivery mechanism having a tappet or projection thereon, of a tilting coin-lever the shaft of which is provided with a stop normally acting on the projection of the delivery mechanism and movable out of contact therewith by the tilting of the coin-lever, which parts are claimed in said prior patent only as elements of specific combinations of mechanism.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a coin-operated vending-machine, the case made with a hinged front having upper and lower door-sections, the lower door having a vertical face and upper ledge, said face having an opening at which the goods sold are delivered and said ledge having a lip or flange which the upper door overlaps, and a coin-admitting slot, combined with a plunger fitted through the lower door-face and adapted to receive the dropped coin, substantially as herein set forth.

2. In a coin-operated vending-machine, the case A, having rigidly-connected sides a a, back a', top a^2, and bottom a^3, and a front comprising an upper glazed door a^4, hinged at one side, and a lower door hinged to the base and comprising a front a^6 and ledge a^7, the front having an opening for delivery of goods sold and the ledge having a lip a^9, and a coin-admitting slot B, combined with a plunger fitted through the lower door and re-

ceiving the dropped coin, substantially as herein set forth.

3. In a coin-operated vending-machine, the combination, with the case having an opening for delivery of sold goods, of a notched plate held to the case at said opening, substantially as described, whereby the fingers may be inserted through the notches of the plate to recover delivered goods, while the hand is excluded, as and for the purposes set forth.

4. In a coin operated vending-machine, the combination, with the case, of a box held therein and provided with compartments receiving the goods to be sold, said box made with removable slats f^2, allowing refilling of the compartments from the front, substantially as herein set forth.

5. In a coin-operated vending-machine, the coin-plunger having a body portion of about the same diameter as the coin intended to be used and formed with two end parts and a side rib holding them in proper relation to form the coin-slot between them, substantially as herein set forth.

6. In a coin-operated vending-machine, the coin-plunger having a body portion of about the same diameter as the coin intended to be used and formed of two end parts and a side rib holding them in proper relation to form the coin-slot between them, combined with a spring projecting the plunger into position to receive the coin, substantially as herein set forth.

7. In a coin-operated vending-machine, the combination, with the case having a coin-slot, of a slotted block or bearing, a plunger having an inner larger part provided with a transverse coin-slot and fitted in said bearing and having a smaller integral front portion working in the case, said plunger next its smaller portion provided with a lug preventing full insertion of coins when the plunger is held inward, substantially as herein set forth.

8. In a coin-operated vending-machine, the combination, with the case having a coin-slot and a bearing also having a coin-slot, of a plunger fitted in said bearing and having at its body portion about the same diameter as the coins to be used and provided with a transverse coin-slot c and a side rib c^8, a front smaller portion c^6, working in the case, a lug c^{11}, next the part c^6, a stem c^3, and a spring c^4, fitted on the stem and normally projecting the plunger, substantially as herein set forth.

9. In a coin-operated vending-machine, the combination, with the case, a bearing, as C′, and a two-armed bracket C^3 therein, of a plunger having a body portion c^7, a rib c^8, a coin-slot c, and a stem c^3, said stem sliding in the outer arm of the bracket C^3 and stopping at its inner arm, and provided with a retracting-spring c^4 and a stop device c^5, substantially as herein set forth.

10. In a coin-operated vending-machine, the combination of a plunger having a transverse coin-slot and a longitudinal slot, a coin-lever held to an endwise-movable rock-shaft and made with two limbs or parts, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, and a trip-lever device entering the longitudinal slot of the plunger and actuated by the coin, substantially as described, whereby as the plunger holding a coin is pushed inward the coin will actuate the trip-lever device and shift the coin-lever shaft endwise, and thereby clear the discharge-opening of the coin-holder, as and for the purposes set forth.

11. In a coin-operated vending-machine, the combination of a plunger having a transverse coin-slot and a longitudinal slot, a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, a laterally-movable trip-lever having a head entering the longitudinal slot of the plunger, and another lever presented at opposite ends to said trip-lever and to the coin-lever shaft, substantially as described, whereby as the plunger holding a coin is pushed inward, the coin will actuate the first lever, which will move the second lever to shift the coin-lever shaft endwise, and thereby clear the discharge-opening of the coin-holder, as and for the purposes set forth.

12. In a coin-operated vending-machine, the combination of a plunger having a coin-slot c and a side slot c^9, of a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, a trip-lever J, having a beveled head j, normally entering the plunger-slot c^9, and a lever K, presented to the lever J and to the coin-lever shaft, substantially as described, for the purposes set forth.

13. In a coin-operated vending-machine, the combination, with the plunger having a coin-slot c and a side slot c^9, and a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, of a trip-lever J, having a head j entering the plunger-slot c^9, a lever K, presented to the lever J and to the coin-lever shaft, a pin k' at the lever K, and a spring k^3 on said pin, readjusting both levers to normal positions, substantially as herein set forth.

14. In a coin-operated vending-machine, the combination, with a plunger having a transverse coin-slot and a longitudinal slot, a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, a clock-works controlling delivery of goods, a notched disk on the coin-lever shaft, a tappet on the clock-works, stopping at said disk, but rotating through its notch to allow delivery of a piece of goods when the lever is tilted by a proper coin, and a trip-lever de-

vice entering the longitudinal slot of the plunger and actuated by the coin and opposing the coin-lever shaft, substantially as described, whereby as the plunger is operated a coin therein will first, through the trip-lever device, move the coin-lever shaft endwise and clear the coin-holder of its contents, and the last-dropped coin, entering the holder, will tilt the coin-lever and carry the disk on its shaft around to align with the clock-works tappet to start the goods-delivery mechanism, as herein set forth.

15. In a coin-operated vending-machine, the combination, with a plunger having a transverse coin-slot and a longitudinal slot, and a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, of a clock-works controlling delivery of goods, a notched disk on the coin-lever shaft, a tappet on the clock-works stopping at said disk, but rotating through its notch to allow delivery of a piece of goods when the lever is tilted by a proper coin, a trip-lever device entering the longitudinal slot of the plunger and actuated by the coin and opposing the coin-lever shaft, a pin on the coin-lever shaft, a lever adapted to engage said pin to move the shaft endwise, and another clock-works tappet geared to act on the last-named lever as the piece of goods is delivered to move the coin-lever shaft endwise directly from the clock-works, substantially as described, whereby as the plunger is operated the coin therein will first, through the trip-lever device, move the coin-lever shaft endwise and clear the coin-holder of its contents, and the last-dropped coin, entering the holder, will tilt the coin-lever and carry the disk on its shaft into the path of the first-named clock-works tappet to start the goods-delivery mechanism controlled thereby, and as the piece of goods is delivered the coin-lever shaft will again be moved endwise, but by the second-named clock-works tappet and the coin-lever will be actuated to drop the coin, and on resuming normal position will stop the clock-works and goods-delivery mechanism, as herein set forth.

16. In a coin-operated vending-machine, the combination, with the plunger having a coin-slot c and a side slot c^9, and a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, of a clock-works controlling delivery of goods, a notched disk S s on the coin-lever shaft, a tappet T on the clock-works, a lever K, opposing the coin-lever shaft, a lever J, entering the plunger-slot c^9 and adapted to be operated by the plunger-coin, and adapted also to operate the lever K, and retracting devices for the plunger, the coin-lever, and the levers J K, substantially as described, for the purposes set forth.

17. In a coin-operated vending-machine, the combination, with the plunger having a coin-slot c and a side slot c^9, a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, and a pin v^2 on the coin-lever shaft, of a clock-works controlling delivery of goods, a notched disk S s on the coin-lever shaft, a tappet T on the clock-works, a lever K, opposing the coin-lever shaft, a lever J, entering the plunger-slot c^9 and adapted to be operated by the plunger-coin and adapted to operate the lever K, retracting devices for the plunger, the coin-lever, and the levers J K, a lever V, acting on the coin-lever-shaft pin v^2, and a tappet W on the clock-works, operating the lever V when a piece of goods has been delivered, substantially as herein set forth.

18. In a coin-operated vending-machine, the combination, with a coin-lever held to an endwise-movable rock-shaft and made with two parts or limbs, one sustaining a coin-holder and the other normally underlying the discharge-opening of the holder, of a clock-works controlling delivery of goods, a notched disk S s on the coin-lever shaft, a tappet T on the clock-works, adapted to work through the disk, notch to trip the goods-delivery mechanism into action when the lever is tilted by a proper coin, a pin or arm v^2 on the coin-lever shaft, a lever V, adapted to engage said pin and move this shaft endwise to discharge the coin therefrom, and a tappet W on the clock-works, actuating the lever V when a piece of goods has been delivered, substantially as herein set forth.

19. In a coin-operated vending-machine, the combination, with a plunger having a coin-slot, and a clock-works mechanism controlling delivery of goods, of a latch adapted to the plunger coin-slot, a trip-bar detaining the latch to hold it from the slot, and a tappet on the clock-works, actuating the trip-bar to release the latch and allow it to lock the plunger inward and prevent insertion of coins when no delivery of goods would follow, substantially as herein set forth.

20. In a coin-operated vending-machine, the combination, with a plunger provided with a coin-slot, of a gravity-latch C^2, having an arm c^2, adapted to said slot, a trip-bar I, normally sustaining the latch, and a clock-works tappet tripping the bar I from the latch, substantially as herein set forth.

21. In a coin-operated vending-machine, the combination, with the plunger having a coin-slot, and a clock-works mechanism controlling delivery of goods, of a gravity-latch C^2, having an arm c^2, adapted to said slot, a trip-bar I, normally sustaining the latch, a ratchet-wheel h^2, having an arm h^3, adapted to withdraw the trip-bar from the latch, and a tappet h' on the clock-works, actuating the ratchet-wheel h^2, substantially as herein set forth.

22. In a coin-operated vending-machine, the combination, with a goods-delivery mechanism having a tappet or projection thereon, of

anism actuated by the clock-works, of a coin-lever made with two limbs, one limb l' sustaining a coin bucket or holder and held to an endwise-movable rock-shaft and the other limb l^2 pivoted to the limb l', a spring holding the limb l^2 with one end under the discharge-opening of the coin-holder and with the other end presented to a relatively-stationary bearing or stud, a chute guiding the coin to the coin-lever holder, a notched disk on the coin-lever shaft, to which the tappet T is adapted, a spiral spring P, sustaining the coin-lever in position to allow or prevent operation of the clock-works, a pin v^2 on the coin-lever shaft, a lever V, having an arm opposing said pin, and a tappet W on the clock-works, actuating the lever V and shifting the coin-lever shaft endwise when a piece of goods is delivered, substantially as herein set forth.

36. In a coin-operated vending-machine, the combination, with the plunger having a coin-slot c and side slot c^9, a coin-lever held to an endwise-movable rock-shaft l, having a notched disk S s and a pin v^2, said coin-lever made with two limbs, one limb l' sustaining a coin bucket or holder and held to the shaft l and the other limb l^2 pivoted to the limb l', a spring holding the limb l^2 with one end under the discharge-opening of the coin-holder and with the other end presented to a relatively-stationary bearing or stud, a chute guiding the coin to the coin-lever holder, a spiral spring P, sustaining the coin-lever in position either to allow or prevent operation of the clock-works, a lever K, opposing the coin-lever shaft l, a lever J, entering the coin-plunger slot c^9 and adapted to operate the lever K, retracting devices for the levers J K, a clock-works tappet T, adapted to the coin-lever disk S s, a lever V, opposing the coin-lever-shaft pin v^2, and a clock-works tappet W, adapted to operate the lever V, substantially as herein set forth.

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