(No Model.) 2 Sheets—Sheet 1.

G. A. MACBETH.

VENDING APPARATUS.

No. 364,028. Patented May 31, 1887.

Fig. 1.

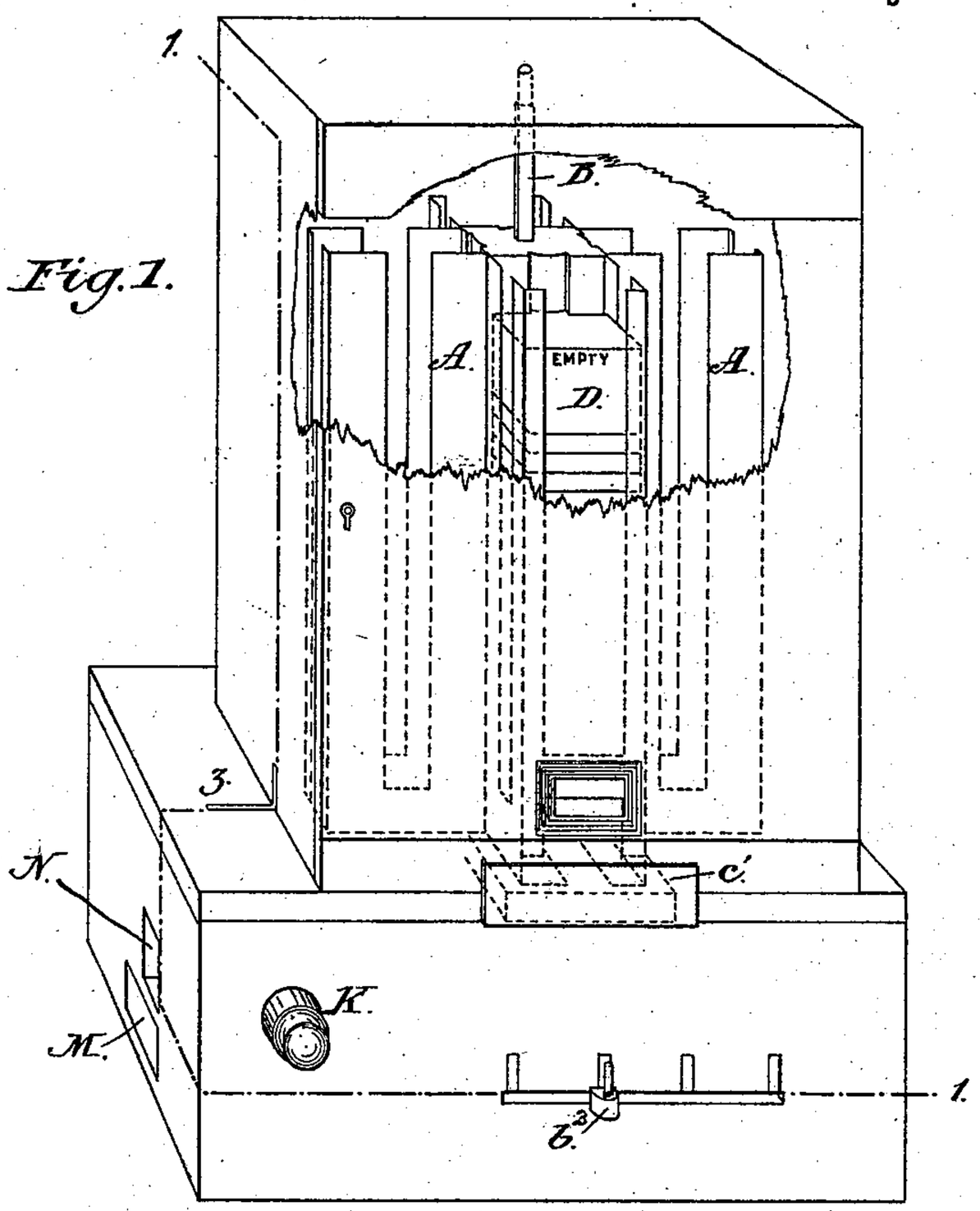
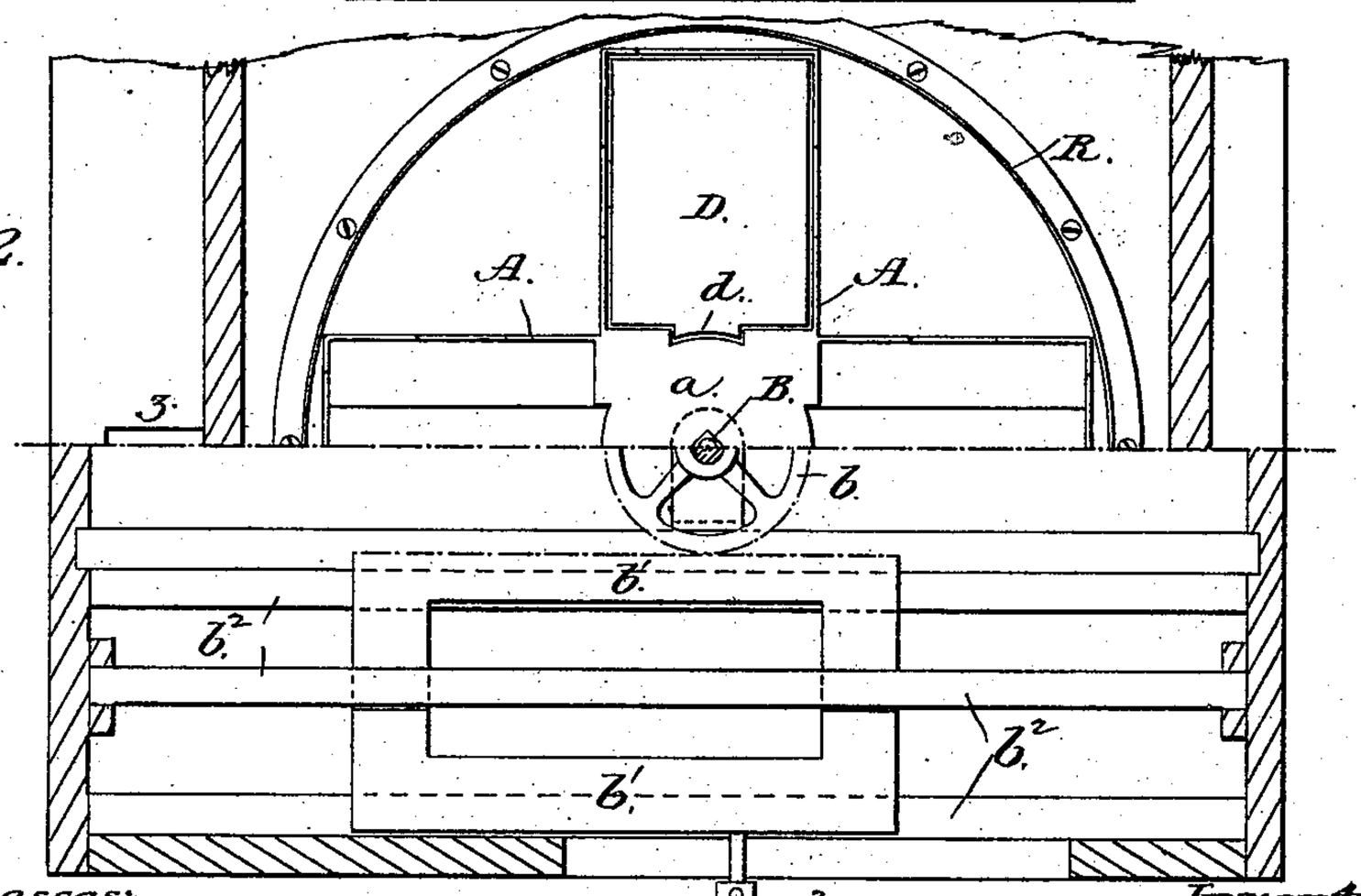


Fig. 2.



Witnesses:
John A. Ellis
C. Sedgwick

Inventor:
G. A. Macbeth

By Munn & Co
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

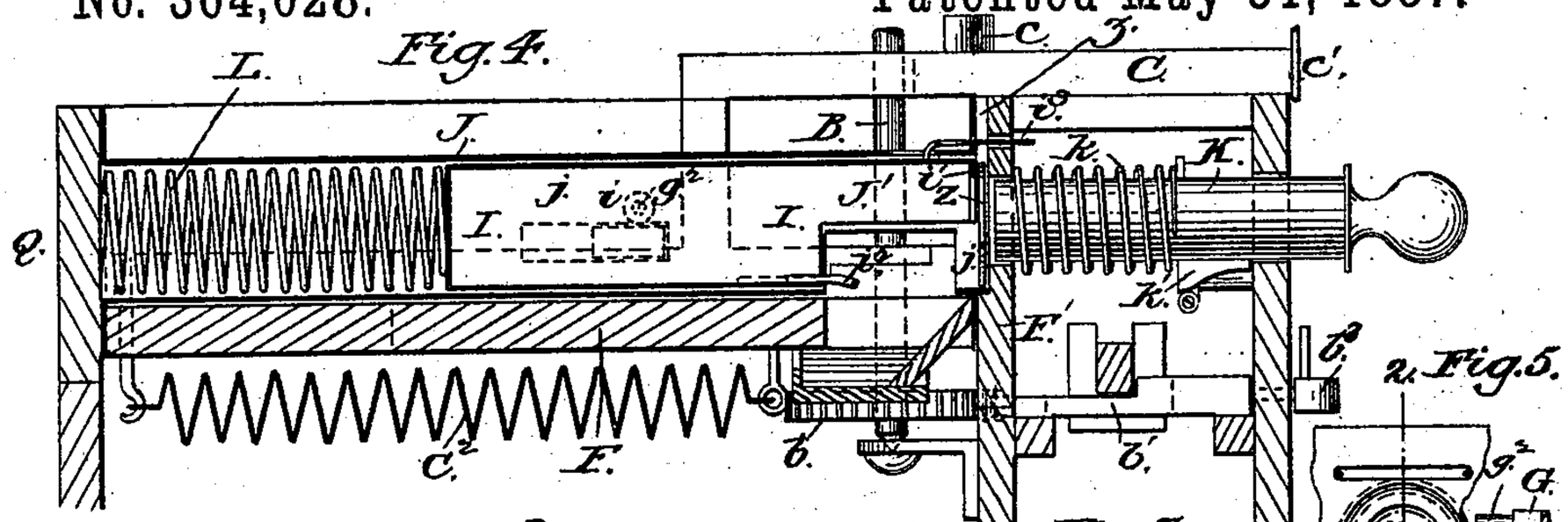


Fig. 5.

Fig. 6.

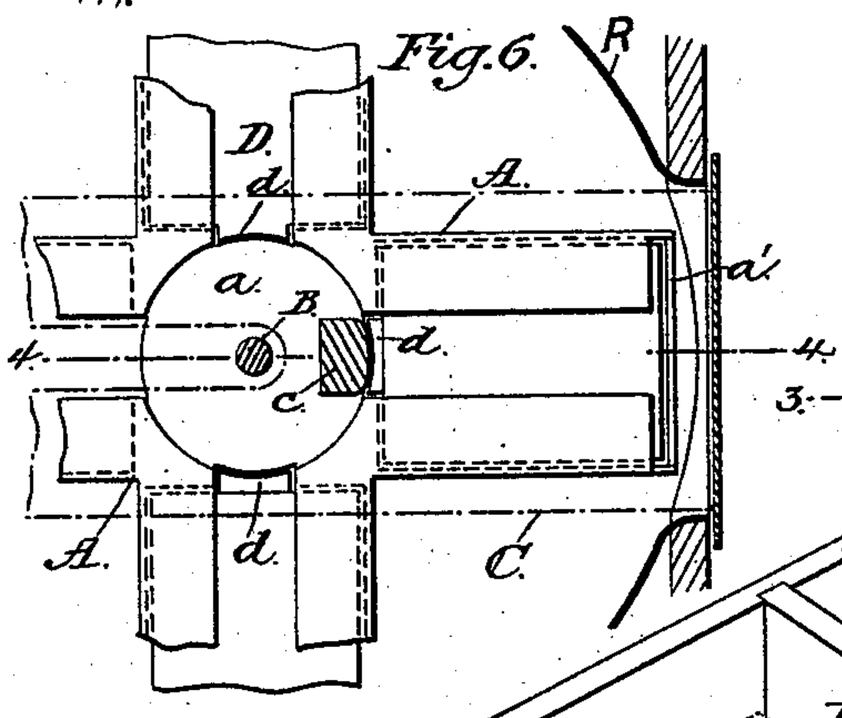


Fig. 7.

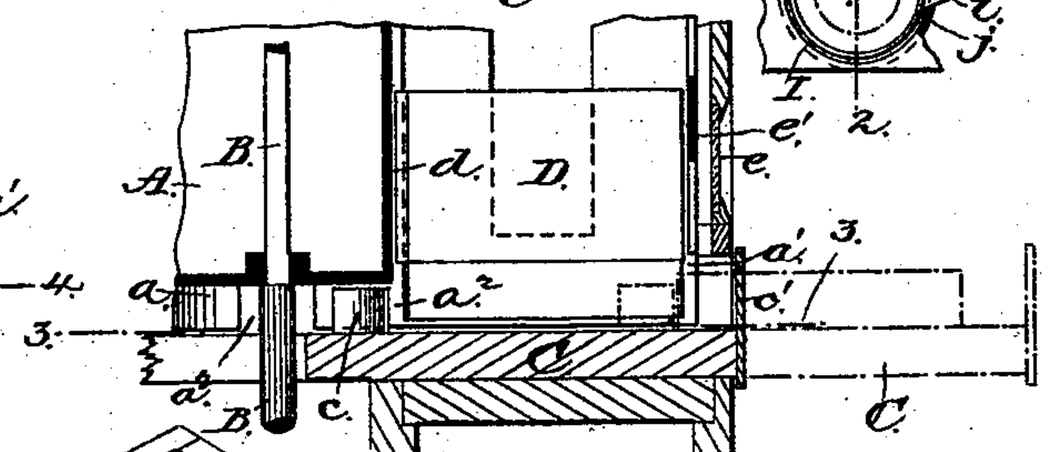
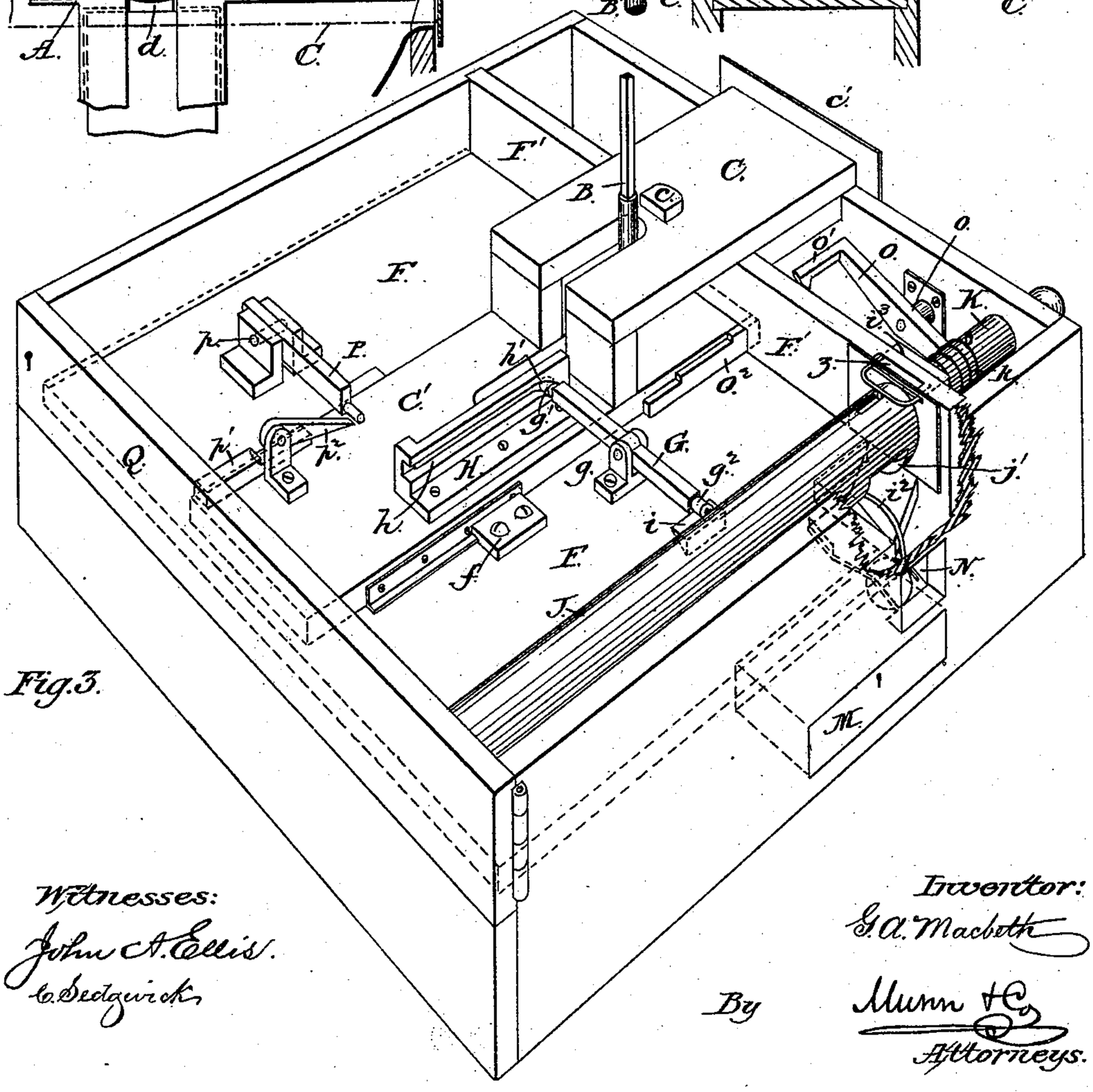


Fig. 3.



Witnesses:
John A. Ellis.
C. Sedgwick.

Inventor:
G. A. Macbeth
By Munn & Co
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE ANDREW MACBETH, OF GLENISLA EALING, COUNTY OF MIDDLESEX, ENGLAND.

VENDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 364,028, dated May 31, 1887.

Application filed December 30, 1886. Serial No. 222,964. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ANDREW MACBETH, at present residing at Glenisla Ealing, in the county of Middlesex, England, outfitter, have invented new and useful Improvements in Apparatus for the Delivery of Prepaid Goods, of which the following is a full, clear, and exact description.

My invention relates to apparatus for automatically retailing or delivering articles or goods in exchange for coin, the said apparatus comprising a rotating magazine or multiple hopper containing a supply of the goods, a delivery drawer or slide by which the articles are withdrawn singly from a hopper of the magazine, and mechanism for locking the delivery drawer or slide each time it is pushed in or closed, and for releasing the drawer on the introduction of a coin of the proper denomination to enable the goods to be delivered.

The object of my invention is to simplify the construction of such apparatus and to provide means for preventing the fraudulent abstraction of the goods either by the introduction of a coin other than one of the proper value, or by continuing to operate the mechanism after the article for which payment has been made has been delivered to the purchaser.

By the employment of a rotating magazine or multiple hopper, as herein described, any one of the hoppers may be brought into position for delivery, and consequently if goods of different kinds be placed in the different hoppers a variety of goods may be delivered by the same apparatus at the option of the purchaser, and when one compartment or hopper of the magazine is empty another may be brought into position for delivery.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a perspective view (partly broken away to show the interior) of the automatic delivery apparatus. Fig. 2 is a horizontal section on line 1 1, Fig. 1, drawn to a larger scale. Fig. 3 is a perspective view of the drawer or slide and its locking and releasing mechanism, the magazine and its case being removed. Fig. 4 is a vertical section on line 2 2, Fig. 5, through the tube in which the releasing push-piece is received. Fig. 5 is an end view of the same tube. Fig. 6 is an under side view of part of the magazine, taken on line 3 3, Fig. 7, the outline of the delivery drawer or slide which comes beneath it being shown in broken lines. Fig. 7 is a vertical section through one hopper of the magazine and delivery drawer or slide on line 4 4, Fig. 6.

The same letters of reference indicate the same parts in all the figures.

The magazine containing the supply of goods consists of a rotating drum composed of an assemblage of vertical tubes or hoppers, A, rotating on a vertical axis, B, within the upper part of the casing of the apparatus, the axis being mounted in a bearing at the top of the casing and in a step-bracket at the lower end. The hoppers or tubes A are of a form (usually rectangular in cross-section) corresponding to the form and size of the packets in which the goods are made up for delivery.

C C′ is the delivery-drawer, fitted to slide in and out of the casing immediately beneath the magazine, the drawer being slotted, as shown in Fig. 3, to permit of the magazine-axis passing through the drawer without interfering with the sliding motion of the latter.

The hoppers or compartments of the magazine are arranged around the axis, as shown in Figs. 2 and 5, the one from which it is desired to withdraw an article being situated for the time being immediately over the delivery part C of the drawer or slide. Each hopper or compartment has a through radial slot in the bottom from front to back, the slot opening at the inner end into a circular cavity, *a*, about the axis B, and common to the slots of all the hoppers. In the front side of the hopper, immediately above the bottom thereof, is an aperture, *a′*, of the full width of the hopper, and of such a height as to permit of the lowermost only of the pile of articles (which are superposed within the hopper in the manner of tickets in ticket-delivery apparatus) being withdrawn at a time. This withdrawal is effected by means of a lug or finger, *c*, projecting from the upper surface of the drawer C and sliding in the slot above mentioned, the range of motion of the drawer C being so limited in the forward or outward direction that

the lug *c* will not pass beyond the position shown in dotted lines in Fig. 7, so that it never passes from beneath the pile of goods in the forward direction. The cavity *a* is formed in the bottom of the center part or boss, by which the hoppers are carried, and the front face of the lug *c* is curved to correspond to the periphery of the cavity. In the rear or innermost wall of each hopper is a central vertical slot, a^2, extending the whole height of the hopper, in which slides a filling piece or rib, *d*, carried by a weighted follower, D, which presses on the pile of goods in the hopper, the filling-piece *d* being curved on its face to correspond with the periphery of the cavity *a*, so that when a hopper is empty the weight will be at the bottom, and the piece *d* will fill up the lower end of the opening a^2 and complete the wall of the cavity at that part, so as to prevent the lug *c* entering the slot in the bottom of the hopper. The magazine must then be rotated by means of the mechanism hereinafter described, in order to bring a full hopper into position for the delivery of its contents.

The rotation of the magazine is effected by means of a pinion, *b*, fixed to the lower end of the axis B, and a rack, *b'*, gearing therewith and sliding along guides b^2, fixed transversely within the lower part of the casing and operated by a thumb-knob, b^3, passing through a slot in the front of the casing, and provided with a pointer, showing on an adjacent scale when each particular hopper of the magazine is in position for delivery. By means of this mechanism any one of the hoppers may (at any time while the delivery drawer or slide is in its locked position) be brought by the purchaser into position for delivery, the nature of the contents of the different hoppers being indicated at the different points of the scale with which, when the hoppers are respectively in position for delivery, the index coincides.

In the front of the casing is an aperture to which the delivery-apertures *a'* of the hoppers come opposite, this aperture corresponding in size to the apertures *a'*, and being closed when the drawer is pushed inward by a flange, *c'*, at the front end of the drawer or slide. Immediately above this aperture there is, in the front of the casing, a glazed window, *e*, through which is visible a label, *e'*, on the front of the hopper, denoting the nature of its contents, said label occupying the upper half of the window and being immediately above an aperture in the front of the hopper, at which the word "Empty," carried by the weighted follower D, above mentioned, appears when the follower has descended to the bottom in consequence of that particular tube or hopper of the magazine being exhausted, so that an intending purchaser may know that it is necessary to rotate the magazine, so as to bring another hopper or tube into position for delivery before a further delivery can be made.

The delivery drawer or slide is constructed of an upper portion, C, which slides through the front of the casing, and a lower portion, C', which slides between guides *f*, fixed to a horizontal division, F, of the casing, and also through a transverse vertical division, F'. This portion of the slide is also slotted longitudinally to permit of the passage of the magazine-axis B, and the drawer has a constant tendency to be forced outward by the tension of a strong spiral spring, C^2, attached at one end to a fixed point and at the other to a hook attached to the under side of the slide C' and working in a slot in partition F.

The locking mechanism by which the drawer or slide is held closed consists of a locking-lever, G, at right angles to the line of motion of the drawer, said lever being pivoted at *g* in a bracket fixed to the partition F. The one end of this lever carries an anti-friction roller, *g'*, which plays in a slot, *h*, formed in a bracket, H, fixed on the slide C', and coinciding in direction with the line of motion thereof. This slot is curved downward at its front end to form a notch, *h'*, in which the end of the lever will engage in such manner as to act as a stop to lock the drawer or slide in the closed position, as hereinafter described. The slot is curved at this point to the arc of a circle of about sixty degrees, so as to present the working faces of the slot at such an angle as to tend to cause the lever to engage in the notch on the completion of the inward movement of the drawer, and to lift it out therefrom on the commencement of the outward motion of the drawer. This disengagement of the lever from the downwardly-curved portion *h'* of the slot is, however, prevented by an anti-friction roller, g^2, at its other end bearing upon a bracket, *i*, projecting from the side of an inner tube, I, through a slot, *j*, in an outer fixed tube, J, in which the tube I is fitted to slide. The drawer C cannot therefore slide out for the purpose of delivering an article from the hopper until the stop *i* is removed from beneath the roller g^2 at the end of the lever G, so as to permit of the roller *g'* at its other end rising into the horizontal portion of the slot *h*. Immediately, however, this stop *i* is withdrawn the lever G is oscillated, and the drawer is shot out rapidly by the action of the spring C^2, the finger *c* pushing out the lowermost packet of goods contained in the hopper, which is at that moment situated above the drawer C, the same being thereby delivered to the purchaser through the aperture in the front of the casing and on the fore part of the drawer, as represented in Fig. 7. This withdrawal of the stop *i* is effected by a push-piece, K, acting on the end of the tube I through the intervention of a coin, Z, placed between the push-piece K and the tube I in such position as to close the end of the tube, which corresponds in diameter to the diameter of the coin, which bears against an inwardly-projecting flange or lip, *i'*, on the end of the tube and extending around the upper half only of the circumference of the tube. The push-piece enters the tube freely and without acting on it when the coin is absent. The push-piece K slides through and is

guided by the front of the casing and the partition F′, and is forced outward by a spiral spring, *k*, interposed between the partition F′ and a shoulder or pin on the push-piece.

The relocking of the lever G is effected by a spiral spring, L, forcing the tube I outward and so carrying the bracket *i* again under the end g^2 of the lever G immediately the delivery-drawer has been pushed in. The lever cannot become relocked by the bracket *i* until its other end has engaged in the notch *h′*, as the two ends of the lever cannot rest at the same time on the two respective planes formed by the lower face of slot *h* and the face of bracket *i*.

The coin is dropped into operative position in front of the push-piece K through a slot, *z*, in the top of the lower part of the casing, the conducting-channel for the coin being formed immediately beneath said aperture in the rear side of the partition F′.

The tube J extends forward at the lower side slightly in front of the tube I, (whose motion is limited by the bracket *i*,) so as to form a resting-place, *j′*, to support the coin in position between the push-piece and the tube I. The tube J has an opening, J′, immediately in rear of this ledge *j′* of a size to allow the coin to fall through when released by the return or outward motion of the push-piece, and the inner tube, I, is entirely cut away to the extent of the lower half of its circumference at the front end, as shown, so that should a coin of less than the proper size be inserted it will be pushed off the ledge *j′* and fail to act on the tube I. All coins fall through an aperture, *f′*, in the partition F down a chute into a receptacle, M, in the lower part of the apparatus. On its way to the receptacle M the coin is arrested opposite a glazed aperture, N, at which the coin remains visible until the apparatus is again operated, the object being to enable bystanders to detect any attempt to use dummy-coins.

The coin is removed from the window and transferred to the receptacle M by a finger, i^2, carried by the tube I, which pushes the coin off the ledge by which it was arrested at the next time the apparatus is operated. i^3 is a shutter, working across the entrance for the coin and carried by a forked arm or yoke fixed to the upper side of the tube I and working through a slot in the tube J, as shown in Figs. 3 and 4. This shutter closes the entrance for the coin, so long as the tube I has not returned to its forward or locking position, so that a second coin cannot be introduced until the apparatus is reset for another delivery by the action of closing the drawer.

To prevent a second delivery of goods by the drawer C for a single operation of the unlocking mechanism, checking devices O and P are provided to prevent the partial inward and outward motion of the drawer. The lever O, pivoted at *o*, presses by one end against a cam, *k′*, on the push-piece, and its other and heavier end, *o′*, is lowered (so long as the push-piece K is not allowed to come forward) into the path of a stepped rack, o^2, on the side of the slide C′, whereby inward motion of the slide or drawer is prevented, except when the push-piece is at the outer end of its stroke. The latch-lever P, pivoted at *p*, drops into the path of a stepped rack, *p′*, fixed on the slide C′; but when the slide C′ is pushed quite in, the latch-lever P comes in front of a pivoted switch, p^2, up the inclined surface of which the end of the lever rides on the next forward motion of the slide or drawer, whereby the lever is carried clear of the rack. On the next inward motion of the slide the lever passes beneath the switch p^2 in position to engage with the rack and prevent any outward motion of the drawer before its inward motion is completed. The door Q at the back of the casing permits of the partition F and the mechanism carried thereby being withdrawn in case of need.

R is a circular flange fixed on the partition that separates the lower from the upper part of the casing within which the magazine rotates, said flange coming opposite the delivery-apertures at the lower ends of the hoppers, and preventing the contents flying partially out therefrom by centrifugal action, should the magazine be very rapidly rotated, the flange terminating, as shown in Fig. 6, at either side of the delivery-drawer.

The operation is as follows: The purchaser drops a coin of the proper size into the slit *z*, and then pushes in the push-piece K, thereby forcing back the inner tube, I, through the intervention of the coin, whereby the lever G is unlocked and the drawer C instantaneously released and automatically forced forward, carrying with it one of the packets from out of the hopper above. The push-piece must then be released (thus allowing the coin to fall into its receptacle) before the drawer can be pushed in, and the drawer must be closed and the whole mechanism reset before another delivery can be effected either from the same or a different hopper of the magazine. Should an intending purchaser find the drawer C in any position but the locked position, he will be unable to drop a coin in the slit *z* on account of the shutter i^3 closing it; consequently he must push the drawer right in before he can purchase.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is—

1. In an automatic delivery apparatus, a revoluble magazine for the goods to be delivered, consisting of vertical tubes or hoppers mounted on a vertical axis, in combination with a single spring-actuated delivery slide or drawer provided with a finger or lug working in a slot in the lower end of the hopper and received when the magazine is being rotated in a central cavity in rear of the hoppers, as described.

2. In an automatic delivery apparatus, a revoluble magazine for the goods to be deliv-

ered, consisting of vertical tubes or hoppers mounted on a vertical axis, in combination with pinion *b*, rack *b'*, and index knob or finger b^3, for bringing any one of the tubes or hoppers into position for delivery, and with a single spring-actuated delivery slide or drawer provided with a finger or lug working in a slot in the lower end of the hopper, and received when the magazine is being rotated in a central cavity in the rear of the hoppers, as described.

3. In an automatic delivery apparatus, the combination of a revoluble magazine or multiple hopper, a delivery drawer or slide working beneath the magazine and engaging by its lug or finger in the bottom of one of the tubes or hoppers, as described, and a weighted follower in each of the tubes or hoppers, acting as a stop to prevent the outward motion of the delivery drawer or slide when the mechanism is unlocked and that particular tube or hopper which is in position for delivery is empty.

4. In an automatic delivery apparatus, the combination, with the revoluble magazine or multiple hopper and delivery drawer or slide engaging by a lug or finger in the bottom of one of the tubes or hoppers, as herein described, of locking mechanism consisting of a rocking lever at right angles to the direction of motion of the drawer, said lever engaging by one end in a longitudinal slot on the slide, said slot having a curved or angular portion forming a notch at its forward end, and by its other end with a movable stop so situated as to engage with and lock the lever when its other end is engaged in the notch aforesaid, as specified.

5. In an automatic delivery apparatus, the combination, with the revoluble magazine, the delivery drawer or slide working beneath the magazine and withdrawing goods therefrom, as described, the rocking lever engaging by one end in a longitudinal slot carried by the slide, and having a curved or angular notch at its front end, a movable stop engaging with and locking the lever, as specified, and springs tending constantly, the one to force out the drawer or slide, and the other to move the stop into operative engagement with the locking-lever, substantially as specified.

6. In automatic delivery apparatus, the combination of a spring-actuated delivery slide or drawer, a spring-actuated locking mechanism engaging with the slide or drawer, as described, releasing mechanism consisting of a sliding tube carrying the locking-stop, the locking mechanism having at its front end an abutment for a coin, a sliding spring push-piece in alignment with the open end of the sliding tube, and a transverse channel and resting-place for the coin, the push-piece being adapted to force the tube inward when the end of the tube is closed by a coin of the proper size intervening between the tube and the push-piece, as described, and being free to enter the tube without operating it when no coin of the proper size intervenes between them.

7. In automatic delivery apparatus, a spring-actuated delivery slide or drawer, spring-actuated locking mechanism engaging with the slide or drawer, as described, releasing mechanism acting on the locking mechanism, as described, and consisting of a sliding spring-actuated tube constructed as described, sliding push-piece adapted to act on said tube through an intervening coin, as herein described, combined with the drawer and push-piece, a check-lever acted on by a cam on the latter, and engaging with a step-rack on the former in such manner as to prevent inward motion of the drawer while the push-piece is pressed in, for the purpose specified.

8. In automatic delivery apparatus comprising a delivery slide or drawer, locking and releasing mechanism, as herein described, the combination, with the said drawer or slide, of a check-lever, *p*, mounted at one side of the drawer and at right angles to the direction of motion thereof, a rack, *p'*, fixed on the slide, and a switch-piece, p^2, pivoted on the slide and occupying such position with regard to the rack that the lever will pass up the switch, and be thereby carried clear of the rack when the slide is drawn outward from its extreme inward position, but will pass under the switch in position to engage with the rack while the slide is being pushed in, so that the drawer will be prevented by the rack from being pulled out again before its inward motion is completed, substantially as described.

The foregoing specification of my improvements in apparatus for the delivery of prepaid goods signed by me this 1st day of December, 1886.

GEORGE ANDREW MACBETH.

Witnesses:

WALTER J. SKERTEN,
17 *Gracechurch Street, London, E. C.*

B. E. KNIGHT,
53 *Chancery Lane, London.*