

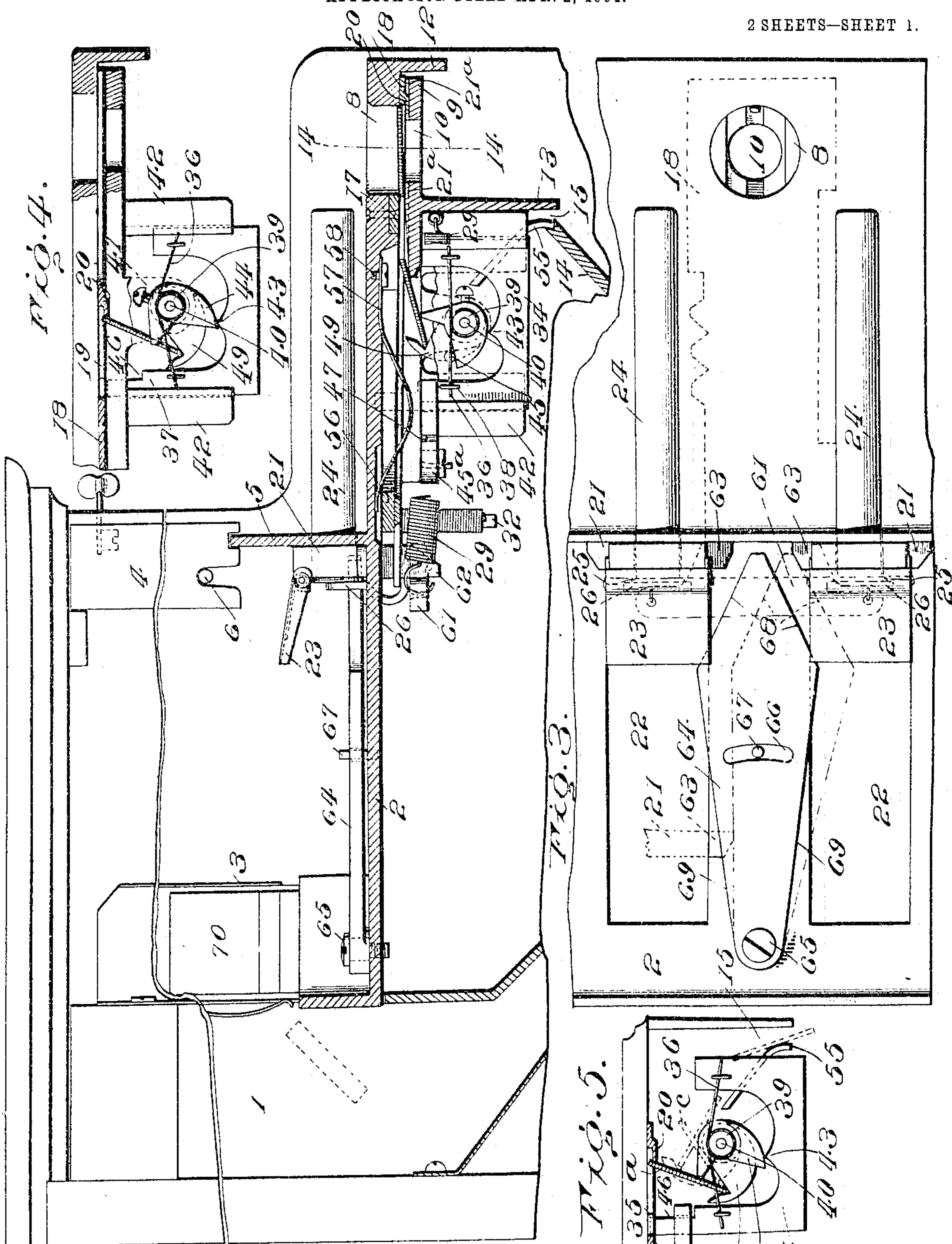
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F. E. HALL & A. MACLEOD.
COIN CONTROLLED MACHINE.

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2 SHEETS—SHEET 1.



Witnesses

James S. Maguire
James S. Maguire

Fig. 1.

By,

Fred E. Hall.
Alexander MacLeod.

Wm. W. Hall
Attorney

Inventors

UNITED STATES PATENT OFFICE.

FRED E. HALL, OF BROOKLINE, AND ALEXANDER MACLEOD, OF BOSTON, MASSACHUSETTS; SAID MACLEOD ASSIGNOR TO UNITED STATES VENDING CORPORATION, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

COIN-CONTROLLED MACHINE.

SPECIFICATION forming part of Letters Patent No. 782,197, dated February 7, 1905.

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To all whom it may concern:

Be it known that we, FRED E. HALL, of Brookline, in the county of Norfolk, and ALEXANDER MACLEOD, of Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Coin-Controlled Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The primary object of this invention is to provide in a coin-controlled vending-machine especially designed for the automatic vending of articles of merchandise improved releasing mechanism so constructed that the machine cannot be operated upon the introduction of spurious devices, such as iron slugs or disks of any metal, less in diameter or in thickness than a proper coin or in any dimensions differing therefrom.

A further object is to provide improved means for interchangeably locking all but one of a plurality of delivery mechanisms to which a single releasing mechanism is common; and a further object is to improve and simplify the construction of this class of machines, promote efficiency in operation, and guard against loss of a coin consequent upon the premature release of pressure on the pusher.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view, the coin mechanism being in side view and portions of the inclosing casing broken away. Fig. 2 is a bottom plan view of the coin mechanism and adjustments. Fig. 3 is a plan view with parts omitted. Figs. 4 and 5 are enlarged side views of the lock and means for actuating it. Figs. 6 and 7 are side edge and bottom plan views of the coin-slide. Figs. 8 and 9 are side and bottom plan views of the guide-plate for the coin-slide. Figs. 10 and 11 are face and edge views of the lock-plate. Figs. 12 and 13 are views of the magnet. Fig. 14 is a cross-section on line 14 14, Fig. 1. Fig.

15 shows different views of one of the hooked arms with which the coins coact. Fig. 16 represents the lock-actuating cam.

Referring to the drawings, 1 designates the inclosing casing, which may be of any preferred construction, and 2 a shelf extending the width of the casing and supporting at its inner rear end the tubes 3, containing the packages of merchandise. The front portion of the shelf is exposed, its rear half being concealed from view by the door 4, which rests upon an upwardly-projecting plate 5, extending from the shelf, said door in its lower edge having two grooves, one to accommodate plate 5 and the other a stud 6, projecting inwardly from the side of the casing. In the front end of the shelf, extending downwardly there-through, is a round opening 8 of slightly greater diameter than a coin of the proper size which is designed to be deposited therein. To the under side of this shelf is secured a plate 9, the space between which and the shelf being sufficient to accommodate coins of proper size. In this plate, coincident with the opening 8, is a smaller opening 10 to allow of the insertion from beneath of a suitable instrument to remove from the former a coin or slug that may become lodged therein. The forward edge of plate 9 is adjacent to a downwardly-extended flange 12 of shelf 2, while a plate 13, depending from the under side of plate 9, extends beneath the upper edge of the bottom front wall 14 of the casing. The space between this wall and plate 13 forms an opening 15 for the outlet of spurious or imperfect coins, which thereby are returned to the operator, the machine not having been manipulated. On the upper surface of the plate 9 are two or more ridges 16, inclined inwardly toward the machine, so as to guide a coin in a slightly-downward direction toward the forward edge of the central portion of the plate, and thereby direct it more positively against the lock-controlling means, the central portion of such plate having an inclination the same as the ridges. To the under side of the shelf, at the lower rear edge of the opening 8, is a steel plate 17 to resist wear and abrasion, the space between

such plate and the top of plate 9 being just sufficient to permit of the passage of a coin of the proper thickness.

18 is the coin-conveying slide. It is in the form of a flat plate fitting snug, but not tight, within the guideway formed between the shelf and the plate 9. It is grooved on its under side to accommodate ridges 16 and is formed at its outer end with an opening 19 of the same diameter as opening 8, with which such opening 19 is designed to coincide when the slide is in its normal position. To the under side of the slide, at the outer side of opening 19, is secured a small tongue 20, to accommodate which plate 9 is formed with longitudinal grooves 21^a on its upper surface. At the inner end of the slide is an ejector-block 21, movable within a longitudinal opening 22 in the inner half of shelf 2. This block is shown as mounted on a movable plate 22^a. It carries a slightly-elevated spring-pressed tongue 23, designed to engage the lowermost article of merchandise and effect the removal thereof upon the full rearward movement of the slide. Through coincident openings in this block and the vertical plate 5 is passed a push-rod in the form of a tube 24, closed at its outer end, while its inner end 25 is flanged, which flange is held against the inner face of the ejector-block by a plate 26, secured to the under side of the slide. The purpose of this plate 26 is to protect the machine from robbery where a dishonest person applies such violent force to the pusher as to ordinarily force the slide past the lock. This plate is made of material having just sufficient strength to retain its shape in all ordinary usage. If, however, violent pressure should be applied to the pusher, the plate will bend out of shape before the slide and lock can be fractured. When so bent, it no longer offers a support or bearing to the flanged end of the tube, and hence the latter can no longer carry with it the ejector-block or slide when moved rearwardly. A spring 29 holds the slide in its normal position. The slide 18 is equipped along one of its edges with ratchet-teeth 30, designed to engage with a spring-held pawl 31, mounted on a depending stud 32, said pawl normally being at right angles to the slide. As the latter moves rearward after the lock is removed this pawl will engage with first one tooth and then the other, preventing thereby accidental return of the slide before the article of merchandise has been ejected; but by the time the slide has traveled sufficiently rearward to effect the removal of the lowermost article of merchandise the pawl will have been cleared by the last of the ratchet-teeth and will thereupon assume its normal position, so that when pressure is released on the pusher the slide may return to its normal position without hindrance on the part of the pawl. By this means the danger of a person losing the benefit of his coin by prematurely releasing

the pressure on the pusher is avoided. In the other longitudinal edge of the slide is a cut-out 33, into which projects the lock 34, so that when the slide is moved rearward, if the lock be not moved out of line therewith, the former will be arrested when the shoulder 35 comes into contact with the lock. If, however, the lock be moved out of the way, the slide may travel without hindrance. This lock is shown in the form of a plate with sides of unequal lengths, the longer side 37 being normally held in the path of shoulder 35 by spring 36, passed through eyes 38, said spring being wound around a sleeve 39 on a journal 40. This journal is supported by depending ears 41 of plate 9, while the lock-plate is movable vertically in guideways formed in plates 42, also depending from plate 9. This lock-plate has an upwardly-extending shoulder 43, with which is designed to engage a cam 44, fast on sleeve 39, so that when the latter is turned the cam upon bearing downwardly on the shoulder will force the locking-plate downwardly, removing the upper end of its side 37 out of the line of travel of the coin-slide. A stop-pin 45 limits the movements of the cam, and hence the lowering and raising of the lock, such pin projecting from one of the plates 42. When the lock is thus lowered by the cam, a temporary holding-lever 45^a will fit into a cut-out 46, formed in the edge of side 37, being held therein by a spring 47. When the slide returns to its normal position, a tappet 48, depending therefrom, upon engaging the rear end of this lever will so turn the latter on its fulcrum as to withdraw the other arm from the cut-out 46, and thereby allow the lock to return to its normal position within the cut-out of the coin-slide.

49 49 designate two arms fast on sleeve 39 and having their ends cut out at an acute angle, as shown at 50, the farther face of such cut-out being turned slightly outward, as shown at 51. The normal position of these arms is at about equal distances from the center of motion of the coin, the two arms being a less distance apart than the diameter of a coin. In such normal positions the outer points of these arms are adjacent to the bottom of the coin-slide and a little to the rearward of a vertical position, as clearly shown in Fig. 1. When a coin has been introduced in the inlet-opening 8 and is pushed rearward by the slide, the advancing edge of the coin after clearing the central portion of plate 9 will drop into the hooked ends of arms 49, as shown in dotted lines, Fig. 1. When now the pressure on the slide is continued, the coin will be pushed rearward and downward, as shown in Fig. 4. During a part of this movement the retreating edge of the coin is in engagement with the rear end of the opening of the coin-slide; but as it begins to turn downward the engagement is taken up by the tongue 20, so as to insure the continued engagement

between the coin and the slide during the entire operation. When the coin is thus pushed forward and downward, it forces the arms 49 and the sleeve 39 to rotate, the sleeve carrying with it the cam 44, and through the latter's engagement with shoulder 43 the lock-plate will be forced downward out of the line of travel of the coin-slide. In order that a sufficient motion shall be given to the lock, it is necessary that a coin of certain exact dimensions be employed. Spurious disks of lesser dimensions will not rotate arms 49 sufficiently to effect the withdrawal of the lock, since it is manifest that a very slight rotating movement of the cam effects a considerable up-and-down movement at its operating edge. The arms 49 are so shaped that very slight discrepancies in the thickness or in the diameter of spurious disks will make a material difference in the point of engagement between such disks and the hooked arms. A thin disk will sink deeper into the hooks than a thick one, and as a result of this the distance between the hooks and the slide will be less with the engagement of a thin disk. This is also true with disks of scant diameter. In Fig. 5, in full lines, we have indicated a thin disk at *a*, the cam being represented as having traversed less than its proper distance on shoulder 43, as will be seen by comparison between Figs. 4 and 5. In the latter it will be observed that the shoulder 35 of cut-out 33 has come into engagement with the lock before such lock was moved out of the line of travel of the slide. The hooked arms 49 are so positioned in relation to the lock that when the proper coin and slide have been pushed forward to the position shown in Fig. 4 the end of side 37 will be clear of the slide just at the moment when shoulder 35 has reached the edge of such end. As a result of such adjustment any discrepancy in the lowering of the lock at this point will cause such shoulder to engage the lock and prevent its further progress. When the opening of the lock has been effected by a proper coin, permitting the slide to be securely pushed onward, the coin will be carried beyond its engagement with the slide and will fall from the hooked arms into a suitable receptacle or cash-drawer. If a coin or disk of proper size attached to a string should succeed in operating the machine, such operation cannot be repeated by the withdrawal of the string, as the coin or disk will leave the hooks during the first operation in the manner described. As before stated, when the proper coin has been inserted and the lock lowered it is so held by lever 45^a and cannot return to its normal position until such lever is moved by the tappet 48. The return movement of the slide is entirely independent of the coin mechanism, and hence when a spurious disk has been inserted the release of pressure on the pusher will allow the slide to return through part of its course while the lock remains in engage-

ment with lever 45^a. Thus the coin will drop out of engagement between the arms 49 and the slide. Then the tappet will strike the rear arm of lever 45^a and allow the lock to return to its normal position, the arms 49 at the same time turning with sleeve 39. The spurious disk which has lodged upon the flat surfaces of the hooked arms will then be carried to the position shown at *c* in dotted lines, Fig. 5, from which it will readily slide downward and outward over a wall 55 and through opening 15. It sometimes happens that proper coins become worn to such an extent that they are considerably less in diameter than new coins. They will likewise fail to operate the machine and will be returned in the manner just stated.

56 designates a magnet embedded in the under side of shelf 2, with its lower surface about in line with the upper surface of the coin-slide, and the poles of the magnet are about midway between the coin-inlet 8 and hooked arms 49. The advancing end of a disk of steel or iron will have to come into close proximity to the magnet-poles before the disk has lost its support on the inclined surface of plate 9. Its advancing edge will be attracted by the magnet, and upon the continued advancement of the slide the entire disk will slide along the bottom surfaces of the poles. Between these poles is a flat spring 57, of non-magnetic material, held in place by a screw 58. The shape of this spring is clearly outlined in Fig. 1, and it will be readily seen that when the iron disk is pushed rearward beyond the poles of the magnet it will come in contact with the bowed portion of the spring and be stripped off from the magnet, from whence it will drop down without having operated the hooked arms, even though its dimensions were exactly the same as a proper coin. The coin-slide is formed with a longitudinal slot 59 to accommodate this spring. It sometimes happens that a coin or disk becomes wedged between the hooked arms and the end of the inclined guideway on plate 9. To remove such pieces, a projection 60 is formed on the under side of the slide, so that upon the return movement of the latter such pieces will be knocked off.

From what has been said it will be seen that a coin deposited in opening 8 will fit within the opening of the coin-slide, and when the latter is pushed rearward it will carry the coin along with it, the slide moving in a straight line; but the coin takes its direction along the inclined ridges and inclined face of plate 9. The space between the steel plate 17 and plate 9 being just wide enough to permit a coin of proper size will not admit disks of greater thickness. As the coin leaves the inclined face of plate 9 it will engage the hooked ends of arms 49 and by the further movement of the slide will effect the turning of such arms. The latter, carrying with them

the cam 44, will effect a lowering of the locking-plate, so that the upper end thereof will be out of the line with shoulder 35 before it can be engaged thereby. Such engagement
 5 will occur, however, with the use of a slug or washer of insufficient diameter, and thereby the slide will be prevented from moving rearwardly the necessary distance to effect ejection of a package of merchandise. As the
 10 latter is ejected and pressure on the pusher released the return of the slide will effect a disengagement of the lock-engaging lever, and thereupon the lock will return to its normal position under the action of its spring, and
 15 the hooked arms and cams will likewise be returned to their normal positions, and the coin-slide will be in position to receive the deposit of another coin.

It is obvious that, if desired, we may employ a single hooked arm 49, placed in the center of line of motion of the coin or that we may use a series of such arms with the hooked ends placed at such distances apart that the operation of one arm or a pair of
 25 arms will leave the next in succession in position ready for the next operation, the arms continuing in one direction around the shaft. It is also obvious that disks of paper will not have sufficient stiffness to operate the machine. By forming the faces of the hooked
 30 arms with knife-like edges disks made of soft material, such as lead or zinc, will be wedged against and into such edges, and their operating diameters will thus be reduced, so that
 35 they cannot effect the opening of the lock.

As clearly shown in Fig. 3, two or more delivery mechanisms may be so arranged that either one of them may be released by the actuation of a single releasing mechanism, the arrangement being such that only one delivery operation may be effected by such actuation of the releasing mechanism. The advantage of this is quite obvious, and the construction of machines wherein a number of delivery-compartments is employed is thus greatly simplified,
 45 and the cost of manufacture is proportionately reduced.

To the forward end of the coin-slide 18 is secured a plate 61, which forms with the slide
 50 a T shape. It is to the laterals of this plate 61 that the rear ends of spring 29 are preferably secured. Said laterals are engaged by lugs 62, depending from the ejector-blocks 21 of two adjacent delivery mechanisms, and the
 55 opposite faces of these blocks are provided with laterally-extended beveled shoulders 63. When either of a pair of plungers is pushed rearwardly, the depending lug 62 thereof will by reason of its engagement with plate 61
 60 carry the latter and the slide 18 along with it, and hence if a proper coin has been previously introduced and the slide has thereby been released either push-rod may be moved through the full length of its stroke, thereby
 65 effecting the delivery of the merchandise.

In order to prevent the simultaneous operation of both ejectors upon the introduction of a single coin, we employ a horizontally-disposed interlocking lever 64, which is pivotally secured at 65 and equipped with a slot
 70 66, through which projects a stop-pin 67. This lever at its forward end is beveled along both its sides, as at 68, so that when one of the ejector-blocks is moved rearwardly the beveled shoulder 63 thereof will so engage
 75 the beveled edge of the lever as to force it laterally, as shown in dotted lines, Fig. 3. When in this position, one of the straight edges 69 of the lever will be substantially parallel to the line of travel of the ejector-block,
 80 at which time the other beveled edge of the lever will be placed in contact with or directly in front of the beveled shoulder of the other ejector-block, making it impossible to force the pusher of the latter rearward so long as
 85 the first-actuated ejector-block bears upon one of the side edges of the lever. The latter will be held in the path of the other ejector-block until the ejector-block of the actuated pusher returns to its normal position,
 90 whereupon the other ejector may be pushed rearwardly, and the one previously actuated will be locked as against actuation. It will be noted that the width of the interlocking lever is greater than the space between the
 95 ejector-blocks, and hence it is clear that both ejectors cannot be pushed past the lever at the same time. Either one or the other may be pushed inward, and in either case the opposite block is locked as against further motion, as described. While we have shown the interlocking lever as employed with two ejector mechanisms, it is understood that the same principle may be applied to any number of such mechanisms. We do not confine ourselves to the particular shape of the lever, the broad principle being the use of the interlocking device in the manner set forth.

Upon each column of merchandise is located a weight 70. When the last package of merchandise has been ejected, the weight will occupy the position ordinarily occupied by the lowermost package. Should a purchaser insert a coin and attempt to operate the machine, the ejector cannot advance sufficiently
 115 far to allow the coin to proceed beyond the position shown in Fig. 5, with the result that on the return stroke of the slide the coin will be returned to the customer in the same manner in which spurious disks are returned, as
 120 before described.

We claim as our invention—

1. In a coin-controlled machine, a rearwardly-movable coin-conveying slide, a correspondingly-formed guideway for said slide,
 125 means for moving said slide, a lock normally in the line of passage of said slide, means rotatable in the direction of travel of such slide and designed to be actuated by a coin pushed by the latter, and means operated by said for-
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mer means for moving said lock out of the line of travel of the slide.

2. In a coin-controlled machine, a rearwardly-movable coin-conveying slide, a correspondingly-formed guideway for said slide, means for moving said slide, a lock normally in the line of passage of said slide, a hooked arm or arms designed to be rotated by a coin pushed by said slide, and means operated thereby for moving said lock out of the line of travel of the slide.

3. In a coin-controlled machine, a rearwardly-movable coin-conveying slide, a correspondingly-formed guideway for said slide, means for moving said slide, a lock normally in the line of passage of said slide, a hooked arm or arms designed to be rotated by a coin pushed by said slide, and a cam carried by said arm or arms for engaging said lock and effecting the actuation thereof.

4. In a coin-controlled machine, a rearwardly-movable coin-conveying slide, a correspondingly-formed guideway for said slide, means for moving said slide, a hooked arm or arms designed to be rotated by a coin pushed by said slide, a cam carried by said arm or arms, and a vertically-movable lock normally in the line of passage of said slide having a surface designed to be engaged by said cam to effect the lowering of the lock.

5. In a coin-controlled machine, a rearwardly-movable coin-conveying slide, a correspondingly-formed guideway for said slide, means for moving said slide, a vertically-movable lock normally in the line of passage of said slide having an upwardly-extended shoulder, a hooked arm or arms designed to be rotated by a coin pushed by said slide, a bearing whereon said arm or arms are secured, and a cam also mounted on said bearing for engaging said shoulder to effect the lowering of the lock.

6. The combination with the rearwardly-movable coin-conveying slide, of the vertically-movable lock, rotatable arms having outer hooked ends normally adjacent the bottom of the slide and designed to be engaged by a coin pushed thereby, and means movable with said arms for actuating said lock.

7. The combination with the rearwardly-movable coin-conveying slide having a shoulder, of the vertically-movable lock normally projected in the line of said shoulder, rotatable arms having hooked ends normally adjacent the bottom of the slide designed to be engaged by a coin pushed by said slide, and means movable with said arms for actuating said lock, said lock being moved sufficient to clear said shoulder only when the arms are pushed by a coin of proper diameter and thickness.

8. The combination with the rearwardly-movable coin-conveying slide having a shoulder, of the vertically-movable lock normally projected in the line of travel of said shoulder

and having a cut-out, rotatable arms designed to be engaged by a coin pushed by said slide, means actuated by said arms for moving said lock, a spring-pressed lever for entering said cut-out and holding said lock open, and means carried by the slide for disengaging said lever on the return of the slide.

9. The combination with the rearwardly-movable coin-conveying slide having a shoulder, of the vertically-movable lock-plate having a shoulder, a spring normally holding said lock-plate raised, a bearing, arms thereon having hooked ends designed to be engaged by a coin moved by said slide, and a cam also on said bearing for engaging said shoulder to effect the lowering of said lock-plate.

10. The combination with the slide, of the vertically-movable lock, the cam for actuating said lock, the arms, the bearing to which said arms and cam are secured, said arms having outer hooked ends and inner flat faces, and a guideway leading to the front of the machine for returning coins incapable of manipulating the arms the necessary extent, as set forth.

11. The combination with the coin-slide, of the plate having depending grooves and opposite ears, the vertically-movable lock-plate fitted in said grooves and having an upwardly-projecting shoulder, the journal supported by said ears, the sleeve on said journal, a cam fast on said sleeve for engaging said shoulder to effect the lowering of said lock, the hooked arms also fast on said sleeve designed to be engaged by a coin pushed by said slide, and a spring engaging said lock-plate, as set forth.

12. The combination with the coin-slide having a depending tappet, of the lock-plate having a cut-out, a spring-pressed lever for entering said cut-out when the lock-plate is actuated, said lever being disengaged by said tappet on the return stroke of the slide, and means for actuating said slide, as set forth.

13. The shelf having a coin-inlet opening, a coin-slide movable thereunder having a corresponding opening, a lock for said slide, means for actuating said lock comprising rotatable hooked arms adjacent the bottom of the slide, and a plate beneath the latter having its upper surface inclined to direct a coin carried by the slide toward the hooked ends of the arms, as set forth.

14. The shelf having a coin-inlet opening, a coin-slide movable thereunder having a corresponding opening, a lock for said slide, means for actuating said lock comprising rotatable hooked arms adjacent the bottom of the slide, and a plate beneath the latter having its upper surface inclined and equipped with inclined ridges to direct a coin carried by the slide toward the hooked ends of the arms, as set forth.

15. The combination with the shelf and the plate thereunder forming an intervening guideway, of a coin-conveying slide movable

in said guideway having a projection on its under side for dislodging a coin wedged in said guideway.

16. The shelf having a coin-inlet and a guideway, the rearwardly-movable slide having an opening for a coin, a lock, means for actuating the same by a coin pushed by said slide, a magnet with its lower surface about in line with the upper surface of the slide, the poles of such magnet being intermediate said means and said coin-inlet for arresting steel or iron disks before they leave such slide, and means secured to the shelf and extending between the poles of the magnet for stripping disks therefrom, as stated.

17. The shelf having a coin-inlet and a guideway, the rearwardly-movable slide having an opening for a coin, a lock, means for actuating the same by a coin pushed by said slide, a magnet with its lower surface about in line with the upper surface of the slide, the poles of such magnet being intermediate said means and said coin-inlet for arresting steel or iron disks before they leave the slide, and a bowed spring secured to the shelf intermediate the poles, the bowed portion of such spring intersecting the lower plane of the magnet for stripping disks therefrom in the further movement of the slide.

18. The combination with coin-controlled locking mechanism, and the ejector-block having an opening therein, of a push-rod extended through said opening, and means for holding the inner end of such rod to said block, such means being sufficiently yielding to release such hold in the event of undue pressure on the rod.

19. The combination with coin-controlled locking mechanism, and the ejector-block having an opening therein, of a push-rod extended through said opening, and having its inner end flanged, and a plate of yielding material for normally holding such end against the inner face of such block, as set forth.

20. The combination with the slide, a coin-controlled locking mechanism therefor, of the ejector-block in fixed relation to the slide having an opening, a push-rod extended through said opening and flanged at its inner end, and a plate of yielding material carried by said ejector-block and between which and said

block the flanged end of the rod is located, as set forth.

21. The combination with the merchandise-holder, and a weight or block therein, of the ejector having a forwardly-projecting tongue, a slide for actuating such ejector, a lock for the slide, means designed to be actuated by a coin moved by said slide for withdrawing the lock, and means for returning such latter means to its normal position so that in the event of said tongue engaging said weight or block a coin moved by the slide will be ejected from the machine.

22. The combination with a single coin-controlled mechanism, two ejectors having opposite beveled shoulders, and mechanism for operating both of said ejectors, of a lever interposed between said ejectors having its forward edges beveled so as to be engaged by said shoulders, said lever when moved laterally by one of said ejectors serving to lock the other ejector in place, one side edge of the lever then occupying a plane parallel to the line of movement of a rearwardly-moved ejector.

23. The combination with a single coin-controlled mechanism, and the shelf having parallel openings therein, of ejector-blocks movable in said openings, means common to the two ejector-blocks for moving the same in said openings, said ejector-blocks having opposite laterally-extended shoulders, and a lever interposed between said openings and the shoulders of said ejector-blocks, said lever being of greater width than the space between said blocks and beveled at its forward end so as to be engaged by said shoulders and thereby moved laterally, as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

FRED E. HALL.

ALEXANDER MACLEOD.

Witnesses as to the signature of Fred E. Hall:

W. H. WRIGHT,
D. A. SMITH.

Witnesses as to the signature of Alexander MacLeod:

ROBT. H. O. SCHULZ,
R. W. GREENLOW.