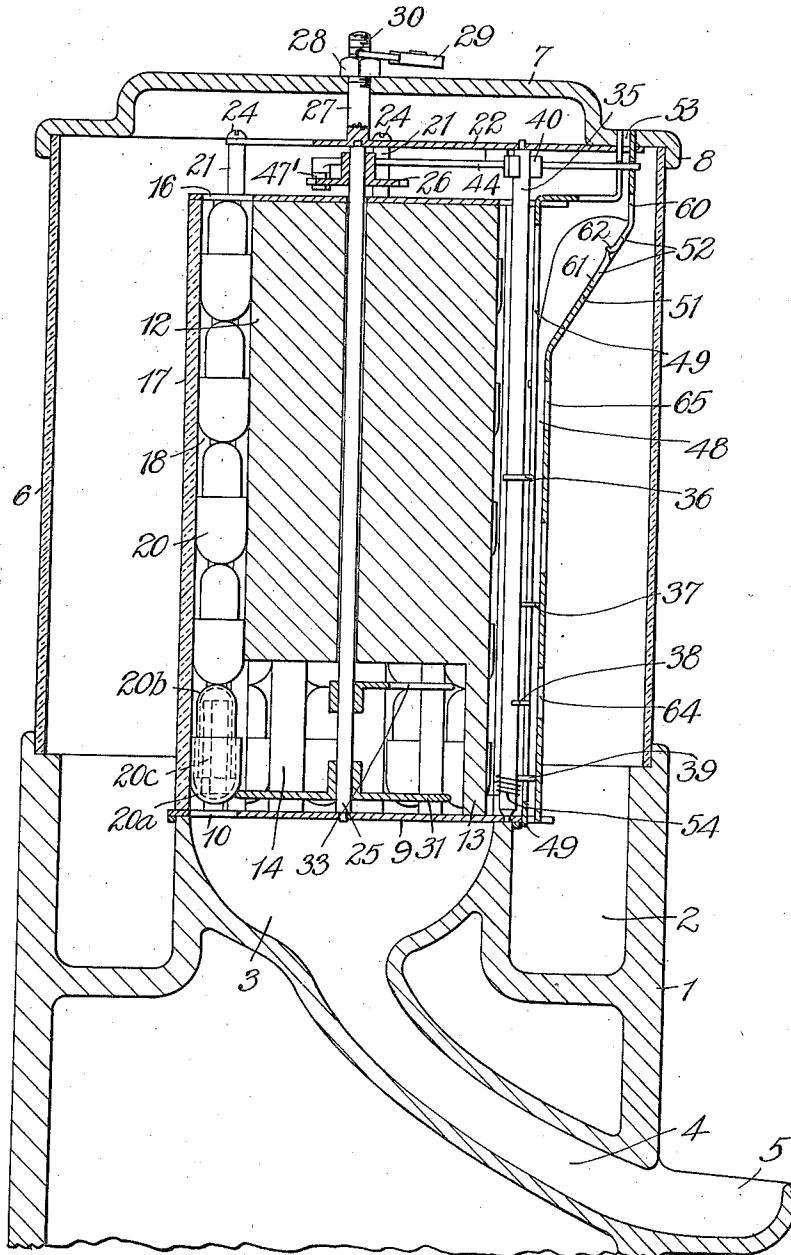


J. A. BIRSFIELD.
VENDING MACHINE.
APPLICATION FILED JULY 1, 1910.

1,067,211.

Patented July 8, 1913.
4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 3.

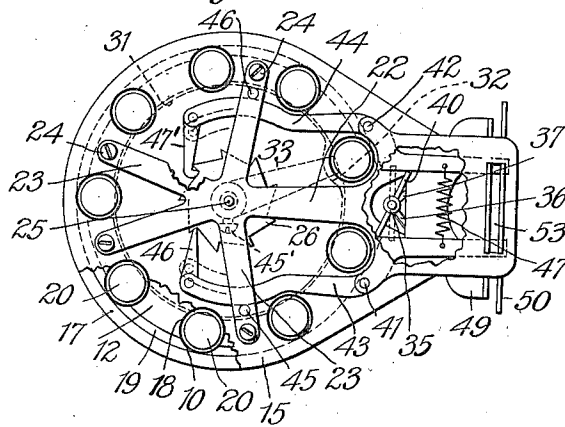
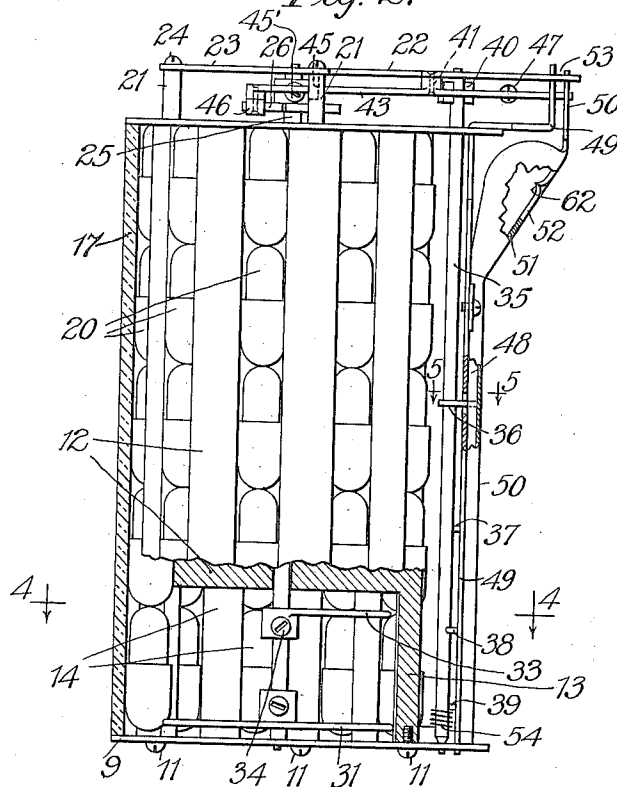


Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4.

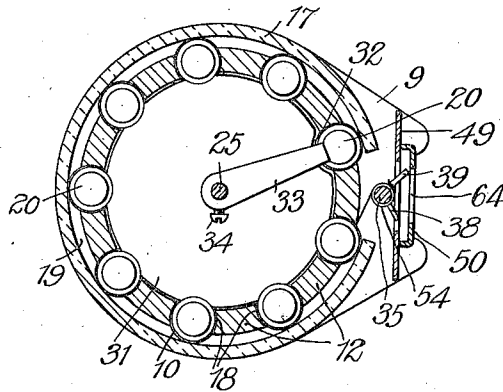


Fig. 5.

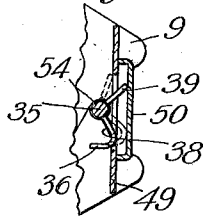
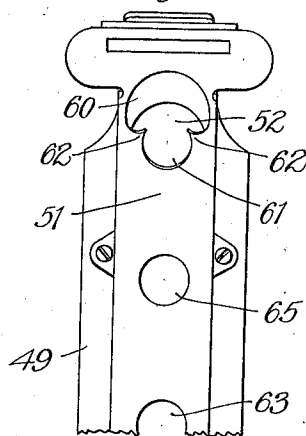


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

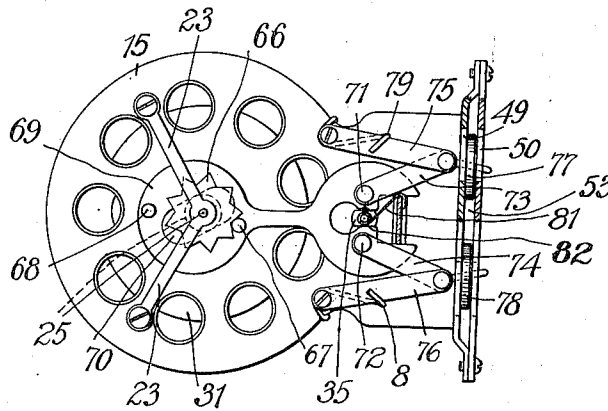


Fig. 9.

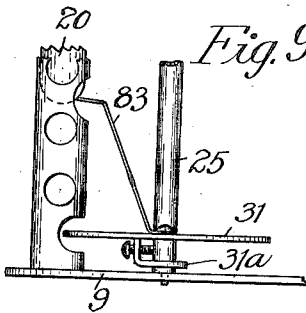


Fig. 8.

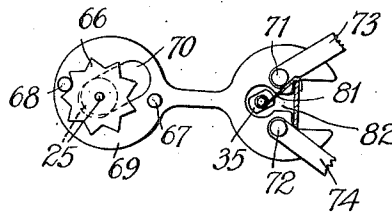
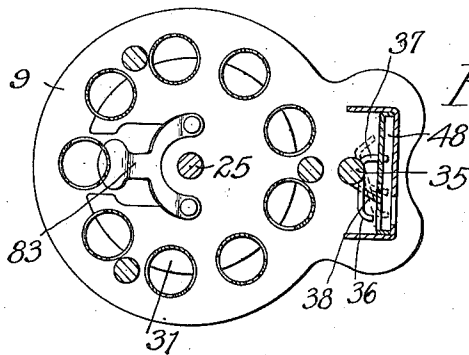


Fig. 10.



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UNITED STATES PATENT OFFICE.

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VENDING-MACHINE.

1,067,211.

Specification of Letters Patent.

Patented July 8, 1913.

Original application filed September 1, 1909, Serial No. 515,566. Divided and this application filed July 1, 1910. Serial No. 569,894.

To all whom it may concern:

Be it known that I, JULES A. BIRSFIELD, a citizen of the United States, residing at La Crosse, in the county of La Crosse and State of Wisconsin, have invented a certain new and useful Improvement in Vending-Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to vending machines and has particular reference to a form of vending machine which is adapted to deliver articles preferably contained in capsules on the deposition of a coin in the machine.

This is a divisional application of a co-pending application, Serial No. 515,566, filed September 1, 1909 and is directed particularly to the vending or dispensing mechanism characterizing my machine.

Heretofore the use of vending machines has been considerably limited by reason of the range of articles which are adapted to be sold in connection with such machines. The sale of postage stamps, powders, and the like has not been practicable, inasmuch as no method has been employed by which these articles could readily be put up in shape to be packed in vending machines, and subsequently delivered when a coin was deposited.

According to the improved system which I employ the articles to be sold are preferably put in transparent capsules, these capsules being suitably packed end to end in the machine. On account of their lightness capsules cannot be successfully handled unless they are thus packed end to end in a suitable guiding passage. By my improved system of packing the capsules, I experience no difficulty in delivering the requisite number from the machine. The capsules are retained in their position by means of a rotatable disk. When a coin is deposited in the machine, the disk is at first rotated through part of a space which separates the different columns of capsules, and the coin on traveling downward strikes a trip which causes the disk to move through the balance of the space, and thereby automatically delivers one capsule in which is contained the article to be vended. The operation is entirely automatic in that it is unnecessary to operate a lever after the coin is deposited. The dep-

osition of the coin in the slot, and the action of a trip as the coin drops through the coin passage serves to perform the entire operation of the machine.

The machine is constructed with a glass casing so that the objects to be vended are constantly visible, and it may readily be determined when the machine has become empty. A further advantage of my machine resides in the fact that if a coin smaller than the proper one is deposited, the coin automatically drops into the receiving trough and does not operate the vending machine. On account of the glass casing of the machine all the coins are in plain view and if a ten cent piece, for example, is deposited in place of the proper five-cent piece, the attention of the proper person can be called to the mistake and the ten cent piece readily recovered. As the coins are deposited, two of them constantly remain in sight through the proper openings in the front of the coin passage, each coin moving down one space as the new coin is deposited and in this way if a slug or counterfeit coin is placed in the machine, it is quickly detected. These and other advantages of my vending machine will be more apparent by reference to the accompanying drawings in which—

Figure 1 is a vertical section of the vending machine showing the operating parts, the coin trough and the delivery chute; Fig. 2 is an elevation and partial vertical section through the operating mechanism of the machine. Fig. 3 is a plan view of the parts shown in Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a sectional view on the line 5—5 of Fig. 2. Fig. 6 is a fragmentary elevation of the coin passage. Fig. 7 is a plan view of a modified form of mechanism actuated by the coin for driving the vending or dispensing mechanism. Fig. 8 is a detail view of the operating parts shown in Fig. 7 moved to their alternate position. Fig. 9 is a side view of a modified form of mechanism for delivering but one article at a time from one of the receptacles for the articles to be vended. Fig. 10 is a plan view of the parts shown in Fig. 9.

Similar numerals refer to similar parts throughout the several views.

The base of the vending machine consists of a casing 1 having the annular portion 2 in which the coins collect as they come

from the operating mechanism of the machine. In the central part of the casing 1 is a chamber 3 for receiving the articles to be vended, the delivery chute 4 leading directly from the chamber 3 to the pocket 5 from which the articles may be moved by the purchaser after they are delivered from the chute 4. A glass tube or casing 6 engages the upper rim of the casing 1 and on its upper edge is provided with the metallic top 7, this top being provided with a lip 8 which projects downwardly outside of the upper edge of the glass casing 6.

Securely fastened to that portion of the casing 1 which encircles the chamber 3 is the base plate 9 of the operating mechanism of the vending machine. In the base plate 9 are openings 10 through which the articles to be vended are delivered as will be explained hereafter. Rigidly attached to the base plate 9 by means of screws 11 is the metallic block 12 which in its lower part is provided with the downwardly extending projections 13 in which the screws 11 are fastened. By means of this structure it will be evident that the chamber 14 is provided in the bottom part of the block 12, the object of which will be apparent hereafter. On the top of the block is provided a plate 15 in which are circular openings 16. Held between the upper plate 15 and the lower plate 9 is the circular glass casing 17 which partially incloses the block 12.

Extending vertically in the periphery of the block 12 is a series of grooves 18. As most clearly shown in Fig. 3, a space 19 exists between the periphery of the block 12 and the inside of the glass casing 17. On account of this space the circular character of the grooves 18 is interrupted and when the capsules 20 are inserted in the grooves 18 they may be readily seen through the glass casings 17 and 6.

On the top of the plate 15 are the supports 21 to which is attached the horizontal frame work 22 as most clearly shown in Fig. 3. This framework consists of a number of projecting arms 23 which are attached to the bars 21 by means of screws 24.

A rod 25 having a bearing on its lower end in the plate 9 and on its upper end in the frame 22 extends through a suitable opening in the center of the block 12. Rigidly attached to the rod 25 by means of the screw 45' is the ratchet 26.

Extending upwardly from the center of the frame 22 and rigidly connected with the same is the rod 27 which passes through the opening in the top 7. The end of the rod 27 is threaded and a nut 28 holds the top 7 firmly in engagement with the glass casing 6. The nut 28 is prevented from being removed from the rod 27 by means of padlock 29 which engages in a hole 30 passing through the rod 27.

Inasmuch as the casing 1 is rigidly connected to the base plate 9, and this base plate is in turn connected with the block 12 which again through the top 15, the supporting rod 21 and the screws 24 is connected to the frame 22, it is evident that the parts of the vending machine cannot be separated until the nut 28 is removed from the rod 27. Tampering with the machine is thereby effectually prevented.

Rigidly attached to the lower part of the rod 25 is the circular disk 31 rotatable within the chamber 14 as the rod 25 is rotated. In the disk 31 is provided a notch 32.

Adjustably mounted on the rod 25 is the arm 33, the end of which lies in the same vertical plane as the notch 32. The arm 33 is held in position by means of screw 34 and can be adjusted on the rod 25.

When a column of capsules 20 is placed in suitable position between one of the grooves 18 and the glass casing 17, the disk 31, as most clearly shown in Figs. 1 and 2 engages the bottom of the lowermost capsule and prevents the same from dropping through one of the openings 10 into the chamber 3 and being delivered through the chute 4 into the pocket 5. As the disk 31 is rotated it is evident that when the notch 32 registers with one of the openings 10 in the base plate 9, the lowermost capsule will be allowed to drop through the hole 10 and will be delivered into the chamber 3. At the same time, however, the arm 33 engages the bottom of the capsule next above the one which has just been delivered and in this way the whole column of capsules is prevented from dropping through the hole 10 and but a single one is delivered. As the various columns of capsules fall equally on account of taking a single one from each column, it can be readily seen from any side of the machine when the capsules are exhausted.

A rod 35 has a bearing on its upper end in the frame 22 and on its lower end in the base plate 9. To this is rigidly attached the trip 36 and the stops 37, 38 and 39. On the upper end of the rod 35 is rigidly attached the cross-piece 40.

Pivotally attached to the frame 22 by means of the pivots 41 and 42 are levers 43 and 44 which are normally held against the stops 45 and 46 by means of the spring 47 by which the two levers are connected. Pivotally attached to the end of the lever 43 is the pawl 46 engaging the ratchet 26, and pivotally attached to the end of the lever 44 is the pawl 47' also adapted to engage the ratchet 26.

The coin passage 48 is formed by means of the plate 49 immediately in front of the rod 35 and the plate 50 which is separated from the plate 49 by a distance slightly greater than the thickness of the coin which is to pass through the passage. At its upper

portion the plate 50 is bent at an oblique angle and forms the upper portion 51 in which is the opening 52, the object of which will be explained hereafter. At their extreme upper ends the plates 49 and 50 form the slot 53 in which the desired coin is to be deposited. It is, of course, evident that a suitable opening is provided through the top 7 through which the upper portions of the plates 49 and 50 may pass. As shown in Figs. 4, 5 and 6, the plate 49 is somewhat wider than the plate 50 and the plate 50 is bent on its edges so that the side walls are formed for the coin passage 48.

The frame 22, as shown in Figs. 1, 2 and 3, extends to the right and has an opening near its edge through which the upper parts of the plates 49 and 50 pass, the edges of the coin passage at this point being formed by means of the edges of this opening in the plate 22. As best shown in Fig. 3, the plates 49 and 50 just below the plate 22 extend in a lateral direction to a slight distance.

When in their normal position the outer ends of the levers 43 and 44 occupy positions in the slot 53 so that when the coin is inserted in this slot, the ends of the levers are forced apart against the pressure of the spring 47. On the lower end of the rod 35 a spring 54 is fastened, the other end of the spring being attached to the downward extension 13 of the block 12 or to some other suitable portion of the framework of the machine. The tendency of the spring 54 is to rotate the rod 35 so that when the levers 43 and 44 are forced apart, the cross piece 40 moves into the position shown in dotted lines in Fig. 3, thereby holding the levers 43 and 44 apart. At the same time the trip 36 passes through the opening in the plate 49 and extends into the coin passage 48. The stop 38 is also similarly brought into the coin passage 48, while the stops 37 and 39 are simultaneously moved out of this passage. The construction of the trip 36 and the stops just mentioned is most clearly shown in Fig. 5. The object of this construction will be described hereafter.

The opening 52 consists of an upper portion 60 which is somewhat smaller than the maximum diameter of the coin which is to be used in connection with the vending machine. The bottom portion 61 is much smaller and between the upper and lower portions 60 and 61 are the projections 62, which also are inclined in a backward direction as shown in Figs. 1 and 2. When a coin is deposited in the slot 53 it travels downwardly until striking the projections 62, the lower part of the coin meanwhile passing downwardly through the upper portion 60 of the opening 52. If the coin is of the proper size to be used in connection with

the particular vending machine, the coin is then swung over inwardly and passes downward into the coin passage 48. If, however, the coin is smaller than the proper size, it will pass through the upper portion 60 of the opening 52 and drop directly into the coin trough 2.

One of the principal features of my invention is the use of the capsules 20 which are made of transparent material, as, for example, gelatin, and are formed in two portions 20^a and 20^b, as shown in Fig. 1, the portion 20^b being adapted to tightly fit within the portion 20^a. Any suitable object, as for example a postage stamp 20^c may be readily contained within the capsule.

The operation of my improved vending machine may now be readily understood. The parts being in their normal positions, as shown in the drawings, and the top 7 removed, all of the grooves 18 are filled with capsules 20. The top 7 is then replaced, the nut 28 screwed on and the pad lock 29 suitably fastened. A coin being placed in the slot 53, the outer arms of the levers 43 and 44 are forced apart thereby bringing the inner arms of these levers into the positions shown in dotted lines in Fig. 3. The ratchet 26 is moved a distance equal to one-half the distance between the teeth of the ratchet by means of the pawl 46, and inasmuch as the pawl 47' is moved by the lever 44 an equal distance, the pawl 47' is brought into engagement with the next tooth of the ratchet 26. By the action of spring 54 operating through rod 35 the cross piece 40 is brought into the position shown in dotted lines in Fig. 3 and the outer arms of the levers 43 and 44 are held separated. The coin continues to travel down through passage 48 until it strikes the trip 36 which, as explained above, has meanwhile been brought into the passage 48. When the coin strikes the trip 36, the trip is moved out of the passage 48 and the cross piece 40 is returned to its normal position. The spring 47 now becomes effective and the outer arms of the levers 43 and 44 are brought together. It is evident that inasmuch as the number of teeth of the ratchet 26 corresponds to the number of grooves 18 in the machine, the notch 32 in the disk 31 will have been moved half way from one opening 10 to another when the outer arms of the levers 43 and 44 are forced apart. When by means of the return of the trip 36 to its normal position, the outer arms of the levers 43 and 44 are returned to their normal positions, the pawl 47' will rotate the ratchet 26 a distance equivalent to another half space between the openings 10 in the base plate 9. The notch 32 will thus be brought to register with the next opening 10 and the capsule 20 will be allowed to drop through this opening into

the chamber 3 and thence through the chute 4 to the delivery pocket 5. In the meantime the arm 33 retains the capsule 20 next above the one which was delivered. As explained above, the arm 33 is adjustable on the rod 25 so that this arm should be adjusted in proper position according to the length of the capsules which are being used. The capsules of all of the other grooves 18 are held in position by means of the disk 31 which, as explained above, engages the bottoms of these capsules. When the trip 36, as explained above, is forced back into its normal position by the passage of the coin, the stop 37 is moved into the passage 48 and the coin is thereby held in position just back of the opening 63 in front of the plate 50. When the next coin is deposited in the slot 53 and the outer arms of the levers 43 and 44 are forced apart, the rod 35, as explained above, is again partially rotated and the stop 37 is moved out of the passage 48 and the stop 38 is moved into it. The coin above described is thereby allowed to pass from a position behind the opening 63 to a similar position behind the opening 64 and when the new coin strikes the trip 36, the first coin again passes downwardly and is held by the stop 39. It is evident that normally a coin will remain behind opening 63 only a few moments so that if a coin is found behind this opening, it shows that some one has been tampering with the machine, so that levers 43 and 44 are forced apart and the trip 36 not actuated. Such a condition might result on the deposition of an improper coin, the position of the preceding coin thus acting as a telltale. Any desired number of stops and openings may be provided in the machine, the object of these openings being to immediately render apparent the deposition of a slug or counterfeit coin. When the coins have passed through the full extent of the passage 48 after being retained by stops, the coin is finally deposited in the coin trough 2 where it is in plain sight. An opening 65 is provided near the trip 36 so that if the machine fails to operate properly, it may immediately be determined whether a coin has caught near the trip. When all of the capsules have been delivered the top 7 is again removed and the outer casing 6 lifted from the outer rim of the casing 1. The coins can then readily be removed from the coin trough 2. The vending machine is then again charged with capsules and the operation continued as described.

In the modified form of apparatus, shown in Figs. 7 and 8, the ratchet wheel 26 is replaced by a wheel 66 having blunt pointed teeth adapted to be alternately engaged by the pins 67 and 68 carried by the reciprocating bar 69 when such bar is moved back and forth upon the rod 25 by the actuating

mechanism. A slot 70 is formed through the bar 69 near its left hand end to permit a reciprocating motion of such bar and this slot is so disposed relatively to the pins 67 and 68 that when the bar is reciprocated the pins serve to advance the wheel 66 and parts carried thereby one step for each complete reciprocation. The bar 69 has pivoted to its right hand end at 71 and 72 links 73 and 74, the other ends of which are pivotally connected with the levers 75 and 76. The other ends of the levers 75 and 76 are pivoted to the top plate 15 of the machine and their right hand ends are extended through the plates 49 and 50 to support rollers 77 and 78 between such plates at such a distance apart that a proper coin, as a five-cent nickel, cannot be inserted between the plates 49 and 50 without separating such rollers and therefore the levers 75 and 76 connected therewith. Suitable springs 79 and 80 maintain the springs 75 and 76 normally in the position indicated in Fig. 7. As a result of the construction described, when the rollers 77 and 78 are separated by the insertion of a proper coin, the links 73 and 74 are moved to the right thus moving the bar 69 to the right to the position indicated in Fig. 8 in which position it is temporarily retained by the flattened upper end of the rod 35 under the action of the comparatively light spring 81. The right hand end of the bar 69 is slotted so that when it occupies the position indicated in Fig. 7 it engages the flattened sides of the rod 35 to retain it in the position indicated in Fig. 7 against the action of the spring 81, and when the bar 69 is moved to the position indicated in Fig. 8 the rod 35 is in a released position in a clearance formed at the left hand end of the slot 82 which normally retains the rod 35 in the position referred to. As a result of the construction described, when the rod 35 is caused to occupy the position indicated in Fig. 8, the bar 69 is located in its right hand position against the action of the springs 79 and 80 and this condition continues until the coin deposited in the coin chute engages the trip pin 36 which moves the rod 35 to the position indicated in Fig. 7 thus permitting the springs 79 and 80 to move the bar 69 and parts carried thereby to the position indicated in Fig. 7.

As shown in Figs. 9 and 10, the disk 31 is secured to the lower end of the rod 25 is stamped from a single piece of metal, the part removed from the portion allowing delivery of the capsule from one of the vending tubes being folded beneath the body portion of the disk 31 to form an additional support for such disk as indicated at 31^a. In this modification the arm 33 is replaced by a flat spring member 83 riveted to the disk 31 in such a position that it engages

the articles in any one of the vending tubes at the same time that the delivery opening in the disk 31 permits the delivery of the articles from such tube. The member 83 may readily be bent to secure exactly the adjustment that is necessary.

While I have referred throughout this specification to coins as the means by which the mechanism is actuated, I do not wish to be understood as restricting the use of the machine to money of any particular coinage, since the machine obviously may be used with circular metallic disks however they may be marked as long as the disks are of a proper size to actuate the mechanism.

Instead of using the exact construction which I have described, a series of small glass tubes could be used which would act as passages for the capsules or metal tubes provided with openings therein through which the capsules could readily be seen might easily be used.

What I claim is:

1. In a vending machine, the combination of a plurality of receptacles for containing articles to be vended, said receptacles having delivery openings in their bottoms, common means for restricting the openings of said receptacles to prevent the escape of said articles therefrom, said restricting means having an opening adapted to register with the opening in the bottom of each of said receptacles thereby allowing the delivery of an article to be vended, means for successively bringing said openings in such restricting means in register with the openings in the bottoms of said receptacle, and means carried rigidly with said restricting means for retaining in the receptacle all of the articles to be vended except a predetermined number which are allowed to escape when the opening in said restricting means is brought in register with the opening in the bottom of any of said receptacles.

2. In a vending machine, a plurality of vertical passages, each passage adapted to contain a column of articles to be vended, common means for restricting the openings in the bottoms of such passages thereby retaining said articles within said passages, said restricting means having an opening adapted to register with the openings in the bottoms of said passages, means carried rigidly with said first-named restricting means for restricting each passage at a predetermined height when the opening of said lower restricting means registers with the opening in the bottom of said passage, and means for successively bringing the openings in said lower restricting means in register with the openings in the bottoms of said passages, thereby delivering a predetermined number of articles from each passage and retaining the balance of said articles in said passage.

3. In a vending machine, a plurality of vertical passages, each passage adapted to contain a column of articles to be vended, a rotatable disk for restricting the bottoms of said passages thereby preventing the escape of said articles therefrom, said disk having an opening adapted to remove the restriction from the bottom of one of said passages, a rotatable arm in the same vertical plane as the opening in said disk, said arm adapted to restrict at a predetermined height the passage with which the opening in said disk registers, and means for rotating said disk and said arm from one to a second of said passages thereby delivering a predetermined number of articles from said second passage.

4. In a vending machine, a plurality of vertical passages, each passage adapted to contain a column of articles to be vended, a rotatable disk for restricting the bottoms of said passages thereby preventing the escape of said articles therefrom, said disk having an opening adapted to remove the restriction from the bottom of one of said passages, a rotatable arm in the same vertical plane as the opening in said disk, said arm adapted to restrict at a predetermined height the passage with which the opening in said disk registers, and means for imparting a step-by-step movement to the disk so that a first step moves a delivery opening in the disk from below a first passage to a position between said first passage and a second passage and the next step moves the delivery opening below a second passage, thereby delivering a predetermined number of said articles to be vended from said second passage.

5. In a vending machine, a plurality of vertical passages, each passage adapted to contain a column of articles to be vended, a rotatable disk for restricting the bottom of said passages thereby preventing the escape of said articles therefrom, said disk having an opening adapted to remove the restriction from the bottom of one of said passages, a rotatable arm in the same vertical plane as the opening in said disk, said arm adapted to restrict at a predetermined height the passage with which the opening in said disk registers, a shaft on which said disk and said arm are mounted, a ratchet on said shaft, an escapement adapted to rotate said ratchet, said arm and said disk a distance sufficient to move the opening in said disk part way from one to a second passage for containing articles to be vended when said escapement is moved in one direction and to rotate said ratchet and its associated parts to move the opening in said disk into register with said second passage on movement of said escapement in the opposite direction, means for moving said escapement in one direction, means for re-

taining said escapement in the position to which it is moved, and means for moving said escapement in the opposite direction thereby delivering a predetermined number of articles from said second passage.

6. In a vending machine, the combination of a casing, a receptacle for the articles to be sold, and a lock for positively holding the receptacle in place.

7. In a vending machine, the combination of a casing, interchangeable receptacles loosely supported by the casing, and a lock for positively holding the receptacles in place.

8. In a vending machine, the combination of a base, a container for the goods loosely supported by the base, a cover for the container, and a lock for positively holding the parts in proper place.

9. A vending machine comprising a capsule receptacle support, a plurality of tubular capsule receptacles disposed in circular arrangement carried by said support, a disk disposed at the lower end of said receptacle to prevent the escape of capsules from all of the receptacles but one, and a member connected with said disk adapted to limit the number of capsules passing from said unrestricted receptacle.

10. A vending machine, comprising a plurality of capsule receptacles disposed in circular arrangement, a rotatable disk adapted to restrict the lower ends of all of the receptacles but one, and an auxiliary restricting member connected with said disk and located at a predetermined distance above

said disk to limit the number of capsules passing from said unrestricted receptacle.

11. A vending machine, comprising a plurality of capsule receptacles disposed in circular arrangement, a disk adapted to restrict the lower ends of all of the receptacles but one, a shaft supporting the disk, and auxiliary restricting means secured to said shaft at a point above said disk, said auxiliary restricting means being adapted to limit the number of capsules passing from said unrestricted receptacle.

12. A vending machine, comprising a plurality of capsule receptacles disposed in substantially circular arrangement, a disk adapted to restrict the lower ends of all of the receptacles but one, and an auxiliary restricting device connected to the disk and located at a different level from the disk for restricting the other receptacle.

13. In a vending machine, the combination of a plurality of stationary vertical tubular receptacles disposed in substantially circular arrangement, a first rotary device located near the bottom of the receptacles to restrict all of said receptacles but one, a second restricting device for restricting the remaining one of said receptacles at a different level, and mechanism for rotating the restricting devices.

In witness whereof, I hereunto subscribe my name this 16th day of June, A. D., 1910.

JULES A. BIRSFIELD.

Witnesses:

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MARIE A. SIMMERLING.