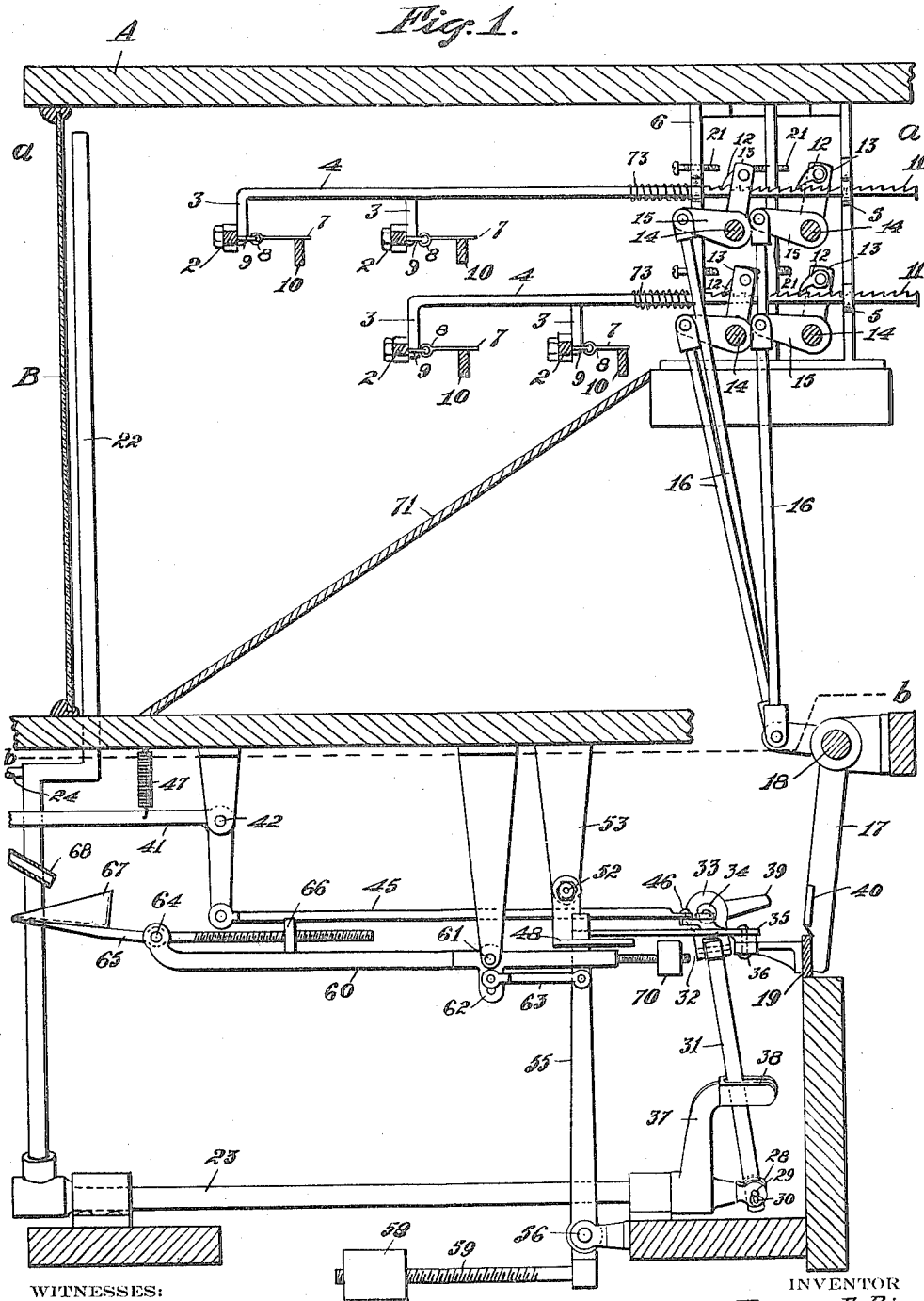


N. E. RICE.
 VENDING MACHINE.
 APPLICATION FILED JULY 19, 1913.

1,123,378.

Patented Jan. 5, 1915.

3 SHEETS-SHEET 1.



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3 SHEETS-SHEET 2.

Fig. 2.

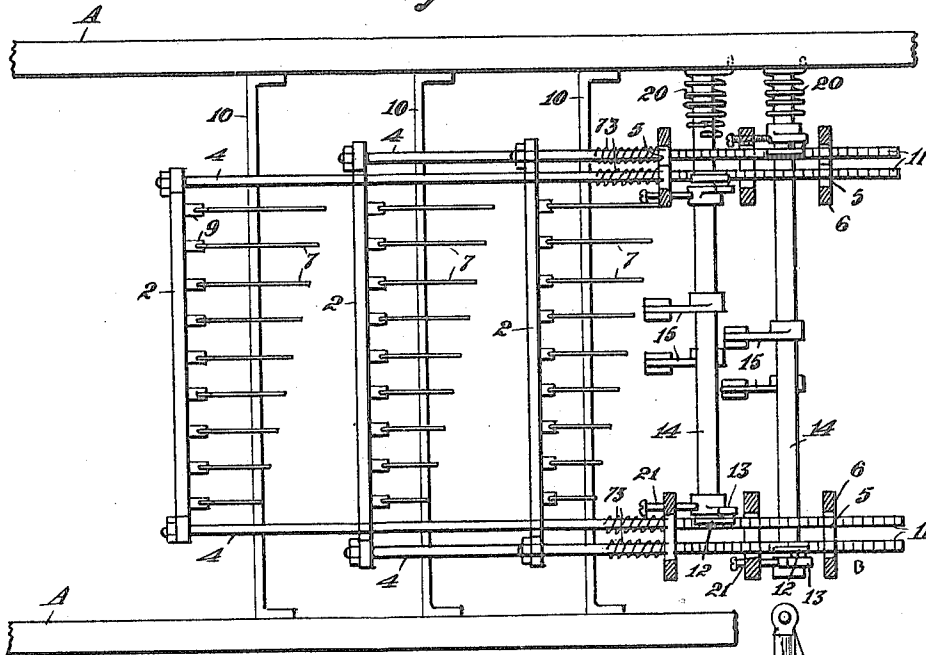
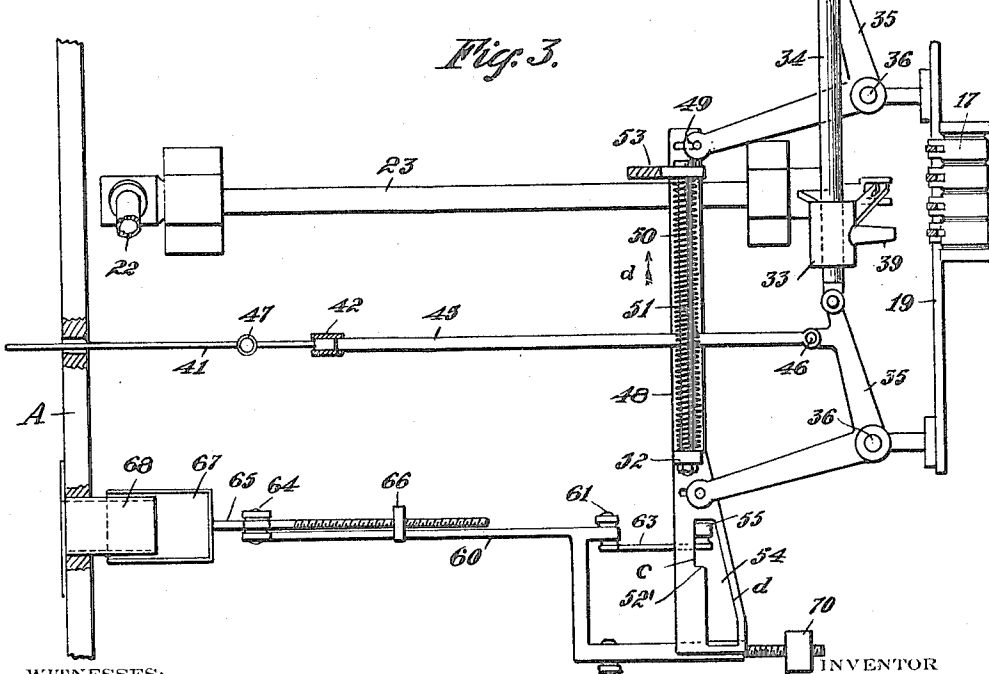


Fig. 3.



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3 SHEETS-SHEET 3.

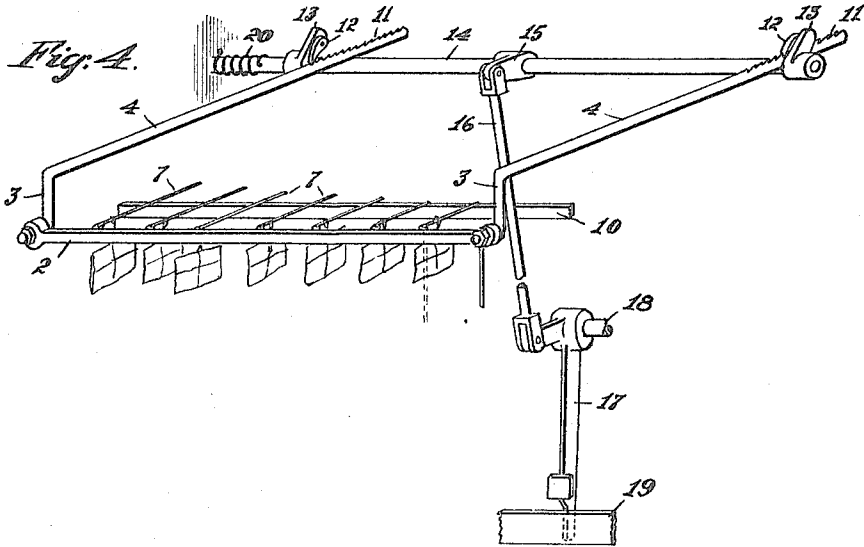
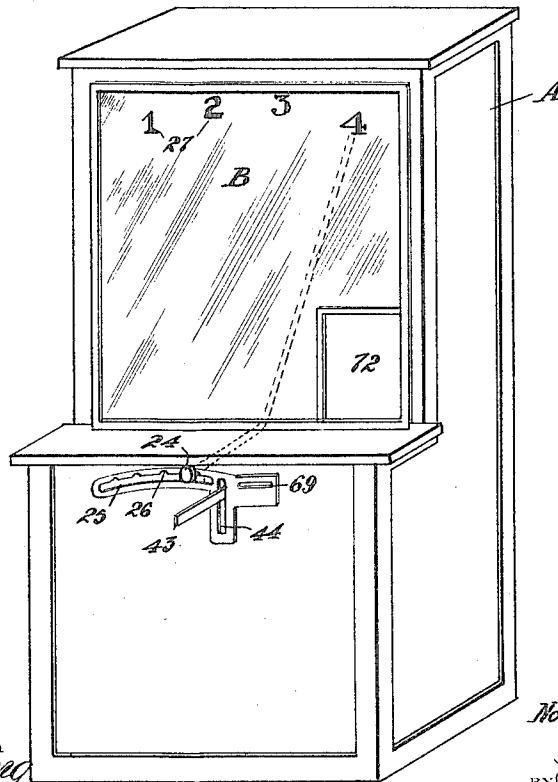


Fig. 5.



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UNITED STATES PATENT OFFICE.

NORMAN E. RICE, OF EUREKA, CALIFORNIA.

VENDING-MACHINE.

1,123,378.

Specification of Letters Patent.

Patented Jan. 5, 1915.

Application filed July 19, 1913. Serial No. 780,004.

To all whom it may concern:

Be it known that I, NORMAN E. RICE, a citizen of the United States, residing at Eureka, in the county of Humboldt and State of California, have invented new and useful Improvements in Vending-Machines, of which the following is a specification.

This invention relates to a vending machine.

It is the object of this invention to provide a vending machine in which a large variety of articles of various shapes and sizes may be vended by one apparatus, and to provide a selective mechanism by means of which any one of a number of different articles contained in the machine may be selected and discharged therefrom on the depositing of a proper coin or token and the operating of a check-controlled mechanism.

Another object is to provide means by which a number or quantity of each of the various articles to be vended may be stored in a vending machine and arranged to be delivered therefrom, one at a time.

A further object is to provide a vending machine of the above character which is simple in construction, efficient and reliable in operation, not liable to get out of order, and of few simple parts readily assembled.

The invention primarily resides in a series of banks of article holders, each holder in each bank being operable independent of all the other holders to release an article carried thereby, check-controlled means for operating the article holders to release the articles, and a selective mechanism by which an article in any one of the banks of holders may be selected and discharged from the machine on the depositing of a proper coin or token on the operation of the check-controlled mechanism.

The invention further consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a vertical section and elevation of the mechanism of a vending machine constructed in accordance with this invention. Fig. 2 is a plan view of the article holders on the line *a—*a** of Fig. 1. Fig. 3 is a plan view of the check-controlled-actuating mechanism on the line *b—*b** of Fig. 1. Fig. 4 is a perspective view illustrating the manner of operating a bank of the article holders to re-

lease the articles, one at a time, therefrom. Fig. 5 is a perspective view of the exterior of a vending machine.

In the drawings A represents the case of a machine which may be of any suitable construction, and in which the article carriers, selective mechanism, and check-controlled apparatus, are inclosed. The case A is preferably formed with a glass plate B arranged in front of a bank of article carriers for the purpose of displaying the various articles carried by the latter. The article-carrying mechanism, particularly shown in Figs. 1, 2 and 4, consists of a series of horizontally-extending bars 2, which bars are pivotally connected at their ends to and are carried by cranks 3 formed on the outer ends of rods 4, which are preferably circular in cross-section, and are mounted to reciprocate lengthwise in suitable guide bearings 5, formed on a supporting frame 6, rigidly mounted in the case A.

Mounted on each bar 2 is a series, or bank, of pivoted article carriers 7. The carriers 7 are here shown as made of wire and formed with loops 8 which engage and are turnable in relation to laterally projecting lugs 9, formed on the bars 2. The carriers 7 on each bar 2 are of various lengths in relation to each other, and are designed to be supported in a horizontal position on rigid supporting bars 10, suitably mounted in the case A; the carriers 7 being adapted to be released, one at a time, from the supporting bars 10 on an advancing movement of the rods 4 and bars 2, so as to gravitate into a vertical position and thereby release the articles which are supported on the carriers 7 preferably by hooks or loops, as shown in Fig. 4.

The rods 4 are formed with rack teeth 11 on their upper faces at their inner ends, which are normally engaged by pawls 12, carried by cranks 13, mounted on rock shafts 14, supported in suitable bearings. A rock shaft 14 is provided for each pair of rods 4 and arranged as shown in Fig. 1, and each rock shaft 14 carries a pair of cranks 13 and pawls 12, so that when a rock shaft 14 is rocked in a forward direction, a pair of rods 4, supporting a bar 2, will be advanced in unison. Each rock shaft 14 is provided with a crank 15, which is pivoted at its outer end to the upper end of a connecting rod 16, which extends downwardly and is

pivotaly connected at its lower end to the short arm of a bell-crank lever 17, pivoted on a shaft 18; the long arm of the bell-crank lever 17 extending in a downwardly direction. A bell-crank lever 17 is thus provided for each rock shaft 14, and in this case four in number, and the series of bell-crank levers are arranged side by side on the shaft 18, as shown in Fig. 3. The long arms of the bell-crank levers 17 are normally arranged in alinement with each other, and are maintained against the rear face of a rigidly mounted alining plate 19 by the action of torsion springs 20, wound on the rock shafts 14, with one end engaging the shaft 14 and the other end connected to a rigid part of the machine. The cranks 13 are so disposed on the shafts 14 in relation to the bell-crank levers 17 that when the latter are in their normal advanced position, the cranks 13 will be in a retracted position. The bell-crank levers 17 are adapted to be rocked separately to actuate a rock shaft 14 and advance a bar 2 through the medium of the rods 4, pawls 12 and cranks 13, sufficiently far to allow one of the carriers 7 to be released from a supporting bar 10; the movement of the bell-crank levers 17 and the bar 2 being limited by means of stops 21 mounted on the frame 6, which form abutments in the path of travel of the cranks 13 and limit the distance of travel of the latter in a forward direction. The stops 21 are in the form of screws and are adapted to be adjusted to vary the distance of travel of the cranks 13, and consequently vary the length of movement of the rods 4 and bars 2 when the bell-crank levers 17 are actuated.

The various bell-crank levers 17 are designed to be operated by a single operating lever, as will be later described. For this purpose a selective mechanism, particularly shown in Figs. 1 and 3, is provided. This selective mechanism consists of an arm or pointer 22, which is connected at its lower end to a rock shaft 23, and extends upwardly rearward of the glass plate B, and is provided with a hand-hold 24 which extends through an arcuate slot 25 in the case A, by means of which the arm 22 may be manually rocked from one side to another. The arm 22 is tensioned to normally maintain the stem of the handle 24 in engagement with any one of a series of notches 26, formed on the upper edge of the slot 25; the notches 26 are here shown as four in number and represent the four positions the arm 22 is designed to assume.

A series of numbers or other indicating marks are mounted on the plate B, as shown at 27, each mark 27 representing or indicating the article carried by each bank of carriers 7; the rocking of the arm 22, so that it will point to any one of the characters 27, operating to set the apparatus so

that the article indicated by the character 27 will be delivered from the machine, as will be later described.

The rock shaft 23, on which the arm 22 is mounted, extends rearwardly in a horizontal direction and has a yoke 28 on its inner end. A pivot pin 29 in the yoke 28, extends through a longitudinal slot 30, formed in the lower end of an upwardly-extending arm 31, which arm is thus mounted to oscillate in relation to the shaft 23 and to move a short distance lengthwise on its pivotal mounting. The upper end of the arm 31 is pivotally connected at 32 to downwardly-extending lugs formed on a sleeve 33, slidable longitudinally on a horizontally-extending rod 34, pivotally mounted at its ends to parallel correspondingly-arranged bell-crank levers 35, pivoted at 36 to a rigid support.

Mounted on the rock shaft 23 is an upwardly-extending arm 37, having a yoke 38 on its upper end, which is disposed astride of the arm 31 in such manner as to bear against the latter when the rock shaft 23 is rocked so as to shift the sleeve 33 backward and forward on the rod 34. The rod 34 is positioned in front of and parallel with the forward faces of the long arms of the bell-crank levers 17, and formed on the sleeve 33 is a finger 39, which is adapted to be positioned in front of a shoe 40, carried on each bell-crank lever 17. By operating the hand-hold 24 and the arm 22, the sleeve 33 may be positioned as desired on the rod 34 so as to dispose the finger 39 immediately in front of any one of the bell-crank levers 17, thus selecting any one of the banks of carriers 7 it is desired to operate.

The mechanism for manually operating the bell-crank levers 17 and their connections through the selective mechanism just described consists of a bell-crank lever 41 pivoted at 42 within the case A and having a handle 43 extending through a vertical slot 44 in the case. The short arm of the bell-crank lever 41 extends in a downward direction and is pivoted to the end of a connecting rod 45, the other end of which is pivoted at 46 to one of the bell-crank levers 35, as shown in Fig. 3. An extension spring 47 normally maintains the hand-lever 43 in its uppermost position in the slot 44, and also maintains the bar 34 in such position that the finger 39 on the sleeve 33 is out of contact with the shoes 40 on the bell-crank lever 17. The arms of the bell-crank levers 35, opposite those on which the bar 34 is carried, connect with a horizontally-disposed, slidable carriage 48 by means of a pin and slot connection 49. The carriage 48 is normally held in a retracted position by means of an expansion spring 50 wound on a bar 51, rigidly mounted on and supported by an upwardly-extending lug 52 on the carriage 48 and slidable in a

stationary guide bearing 53; the spring 50 exerting a pressure between the bearing 53 and the lug 52 to normally retain the carriage 48 in its retracted position. The spring 50 also operates in conjunction with the spring 47 to maintain the bell-crank levers 35 and the bar 34 in the normal position shown in Fig. 3.

Formed in the carriage 48 is a slot 54, one longitudinal wall *c* of which is off-set to form a shoulder 52' and the other longitudinal wall *d* of which is arranged diagonal to the wall *c*. Extending upwardly through the slot 54 is a lever 55, pivoted at 56, and provided with an adjustable counterweight 58 on a threaded horizontal stem 59, carried by the lever 55 below its pivotal point 56, which counterweight serves to normally maintain the upper end of the lever 55 against the wall *c* of the slot 54.

It will now be seen that when the lever 55 is in its normal position the carriage 48 can only be reciprocated a short distance and is limited in its movement by the shoulder 52' engaging the lever 55. Check-controlled means are provided for moving the lever 55 out of the path of travel of the shoulder 52' to permit full movement of the carriage 48. This means consists of a horizontal lever 60 pivoted at 61, and having a downward extension 62 which is connected to the lever 55 adjacent to the upper end of the latter by means of a link 63.

Pivotaly mounted at 64 on the forward end of the lever 60 is a balanced lever 65, one end of which is threaded to receive a counterweight nut 66. The outer end of the balanced lever 65 carries a pan or pocket 67 for the reception of a coin or check, which is delivered to the pan 67 through a chute 68 connecting with a slot 69 on the case A. The slot 69 is of a length corresponding to the diameter of the coin required for operating the check-controlled mechanism. The counterweight 66 is designed to be adjusted on the lever 65 so as to balance the weight of the outer end of the lever 65 and a coin carried by the latter; the lever 65 being designed to rock on the pivot 64 when a coin of excess weight is deposited in the pan 67, so as to automatically reject coins or checks of a greater weight than that selected for the operation of the machine.

The inner end of the arm 60 is threaded to receive a counterweight nut 70, which is adjusted on the lever to balance the latter on its pivot 62, so that when a coin is deposited in the pan 67 the weight of the coin will exert sufficient downward pressure on the outer end of the arm 60 to rock the lever 55 in a rearward direction against the inclined side *d* of the slot 54 in the carriage 48.

In the operation of the invention the

hand-hold 24 is manipulated to actuate the selective mechanism according to the article it is desired to eject from the machine. Like articles being suspended from the carriers 7 of a bank and each bank being designated with a character 27, the operator moves the arm 22 so that it points to the character corresponding to the article to be vended, thus positioning the finger 29 opposite the bell-crank lever 17 controlling the bank of carriers suspending the desired article. A coin or check is then deposited in the coin slot 69 so as to cause the upper end of the lever 55 to bear against the inclined face *d* of the slot 54, before described. The hand-lever 43 is then depressed. This action rocks the bell-crank levers 35 simultaneously, so as to advance the carriage 48 in the direction of the arrow *d* in Fig. 3, and at the same time causes the bar 34 to move laterally toward the bell-crank levers 17. The carriage 48 is now free to move sufficiently far to allow the finger 39 on the sleeve 33 to contact the shoe 40 on a bell-crank lever 17, to rock the latter by reason of the lever 55 being caused to ride out of alinement with the shoulder 52'. The finger 39 being advanced with the bar 34 rocks one of the bell-crank levers 17 and thereby actuates a pair of bars 4 through the pawls 12, cranks 13, rock shaft 14, crank 15 and connecting rod 16. The rods 4 will be moved lengthwise by the action of the pawls 12 a sufficient distance to allow one of the carriers 7 to be released from the supporting bar 10, whereupon the carriers 7 will drop into a vertical position and thereby release the article carried thereby, which will fall on to an inclined conveyer 71 and be delivered to a discharge opening 72 in the case A.

On releasing the hand-lever 43 it is restored to its normal position by action of the spring 47, the carriage 48 and the bar 34 being restored to their normal position by the action of the spring 50 in conjunction with the spring 47, while the bell-crank levers 17 in the rock shaft 14 will be restored to their normal position by the action of the spring 20; the rods 40 remaining in their advanced position. In the meantime the upper end of the lever 55 in traveling along the inclined face *d* of the slot 54, by the action of the weight of a coin in the pan 67, will allow the coin to rock the lever 60 sufficiently far to cause the coin to be discharged from the pan 67 into any suitable receptacle; the levers 60 and 55 being restored to their normal positions by the action of the counterweights 58 and 70, so that when the carriage 48 is restored to its normal position the lever 55 will ride into the off-set portion of the side *c* of the slot 54 in front of the shoulder 52', so as to necessitate the depositing of another coin before the ma-

chine can be re-operated. When the rods 4 have been thus advanced sufficiently far to discharge all the articles from the carriers 7 and it is desired to recharge the carriers, the rods 4 are turned by reciprocating the bars 2 longitudinally. This action moves the ratchet teeth 11 out of engagement with the pawls 12 and permits the rods 4 being moved rearwardly back to their normal positions. This rearward movement of the rods 4 is effected by means of extension springs 73 which normally exert a rearward pull on the rods 4. The springs 73 also serve to prevent the rods being impelled an excessive distance by the action of the pawls 12, thus preventing the discharge of more than one article at any time.

It is manifest that while I have shown the machine as having a series of four banks of article carriers, this number may be increased or decreased to any desired extent.

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

1. In a vending machine, a plurality of laterally movable bars, a series of pivoted article carriers on said bars of graduated lengths, means for normally holding said carriers in a horizontal position, and means for advancing any one bar laterally independently of the other bars to release an article carrier.

2. In a vending machine, a plurality of laterally movable bars, a series of pivoted article carriers on said bars of graduated lengths, means for normally holding said carriers in a horizontal position, means for advancing any one bar laterally independently of the other bars to release an article carrier, and means for limiting the advance movement of each to prevent the release of more than one article carrier at a time.

3. In a vending machine, a plurality of laterally movable bars, a series of pivoted article carriers on said bars of graduated lengths, means for normally holding said carriers in a horizontal position, means for advancing any one bar laterally independently of the other bars to release an article carrier, and means for selecting the bar to be advanced.

4. In a vending machine, a laterally movable bar, a series of pivoted members of graduated lengths on said bar, means for normally holding said members in a horizontal position, and means for reciprocating said bar laterally to release said members, one at a time.

5. In a vending machine, a plurality of laterally movable bars, a series of pivoted article carriers on said bars of graduated lengths, means for normally holding said carriers in a horizontal position, means for advancing any one bar laterally independently of the other bars to release an article

carrier, means for limiting the advance movement of each to prevent the release of more than one article carrier at a time, and means for selecting the bar to be advanced.

6. In a vending machine, a horizontal bar, rods on which said bar is mounted, a series of pivoted article carriers of graduated lengths on said bar, means for supporting said carriers in a horizontal position, rack teeth on said rods, pawls engaging said rack teeth, a rock shaft carrying said pawls, bell-crank lever means by which the actuating of the bell-crank lever will rock the rock shaft, and means for operating the bell-crank lever.

7. In a vending machine, a series of banks of article-carriers, a plurality of levers corresponding in number to the banks of article-carriers, means connecting said levers to said banks of article-carriers by which the latter may be actuated to release articles carried thereby, a single hand-lever, and means by which the operation of the hand-lever will actuate any one of the plurality of levers.

8. In a vending machine, a series of banks of article-carriers, a plurality of levers corresponding in number to the banks of article-carriers, means connecting said levers to said banks of article-carriers by which the latter may be actuated to release articles carried thereby, a single hand-lever, means by which the operation of the hand-lever will actuate any one of the plurality of levers, and means controlling the operation of the hand-lever.

9. In a vending machine, a plurality of levers, a bank of article-carriers controlled by said levers and adapted to be actuated by the rocking of said levers to release articles one at a time from the carriers, a bar, a sleeve slidable on said bar, a finger on said sleeve, means for sliding the sleeve on the bar to dispose the finger thereon in front of any one of the levers, and means for moving the bar to advance the finger to rock the lever.

10. In a vending machine, a plurality of levers, a bank of article-carriers controlled by said levers and adapted to be actuated by the rocking of said levers to release articles one at a time from the carriers, a bar, a sleeve slidable on said bar, a finger on said sleeve, means for sliding the sleeve on the bar to dispose the finger thereon in front of any one of the levers, means for moving the bar to advance the finger to rock a lever, and means controlling said bar-moving means.

11. In a vending machine, a plurality of banks of article-carriers including a series of transversely movable bars, a number of pivoted carrier-arms of graduated lengths on said bars and means for supporting said arms in a horizontal position; a plurality

of levers, means by which the rocking of said levers in one direction will advance said bars to release said arms one at a time, a finger adapted to be moved in front of
5 any one of said levers, means for so moving said finger, and means for advancing said finger to cause it to contact and actuate a lever.

12. In a vending machine, a plurality of
10 banks of article-carriers including a series of transversely movable bars, a number of pivoted carrier-arms of graduated lengths on said bars and means for supporting said arms in a horizontal position; a plurality
15 of levers, means by which the rocking of

said levers in one direction will advance said bars to release said arms one at a time, a finger adapted to be moved in front of any one of said levers, means for so moving
20 said finger, means for advancing said finger to cause it to contact and actuate a lever, and means for permitting the operation of the finger.

In testimony whereof I have hereunto set my hand in the presence of two subscribing
25 witnesses.

NORMAN E. RICE.

Witnesses:

JOHN H. HERRING,
W. W. HEALEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."