No. 852,222. PATENTED APR. 30, 1907.

H. B. CONOVER.

VENDING MACHINE.

APPLICATION FILED OCT. 22, 1906.

4 SHEETS—SHEET 1.

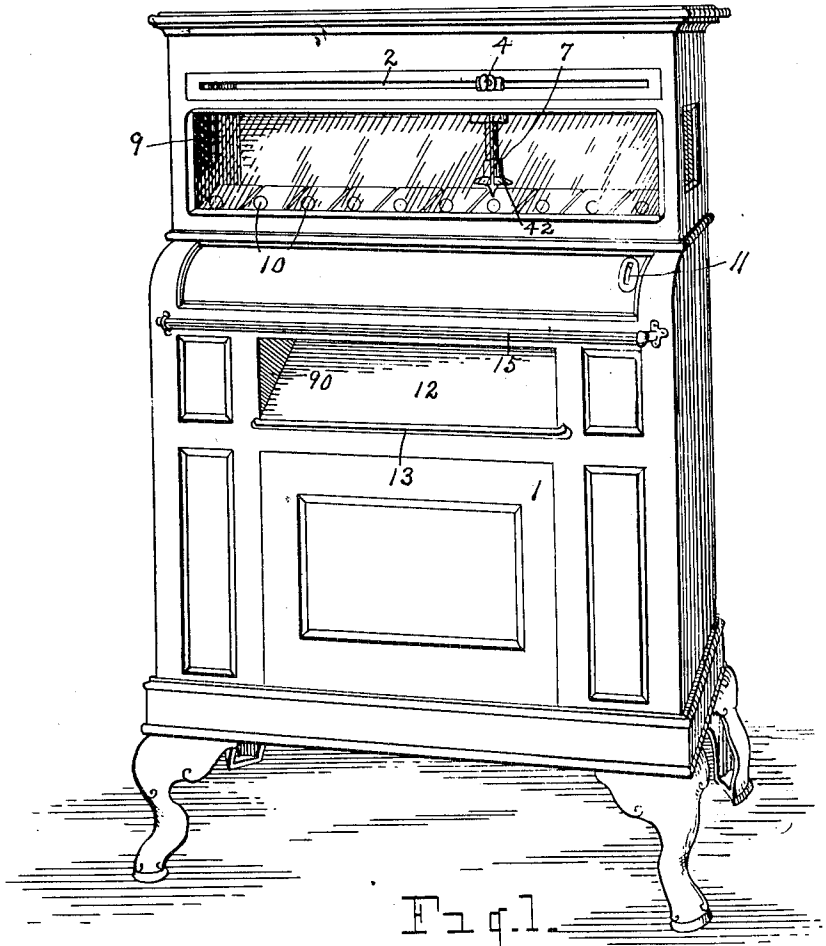


Fig. 1.

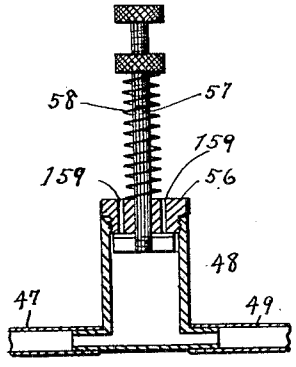


Fig. 11.

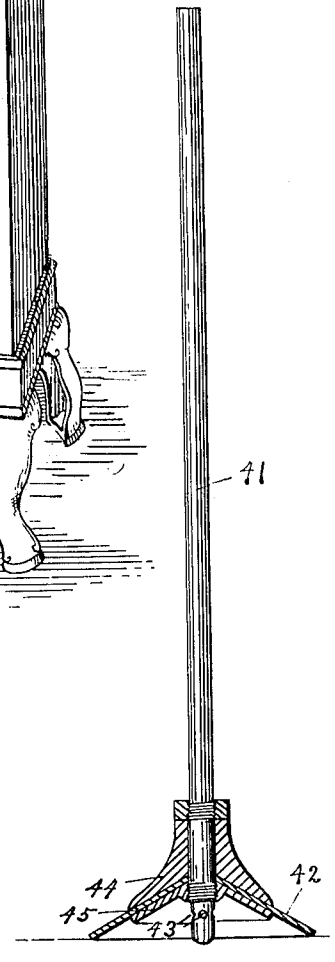


Fig. 10.

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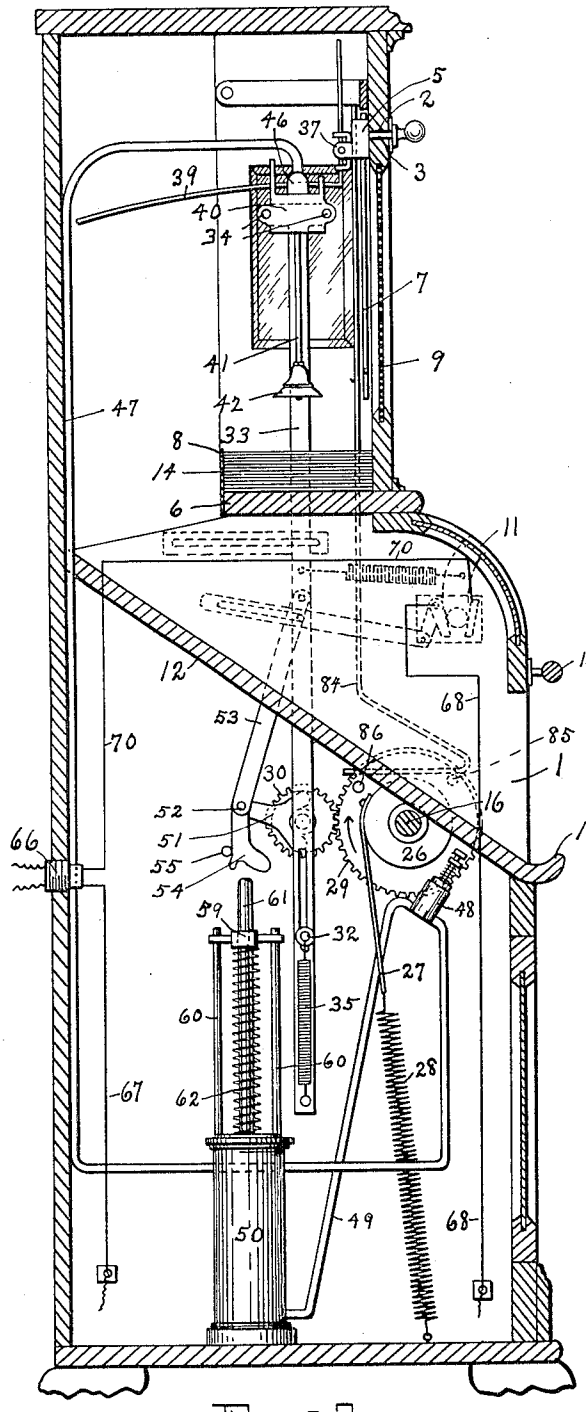


Fig. 2.

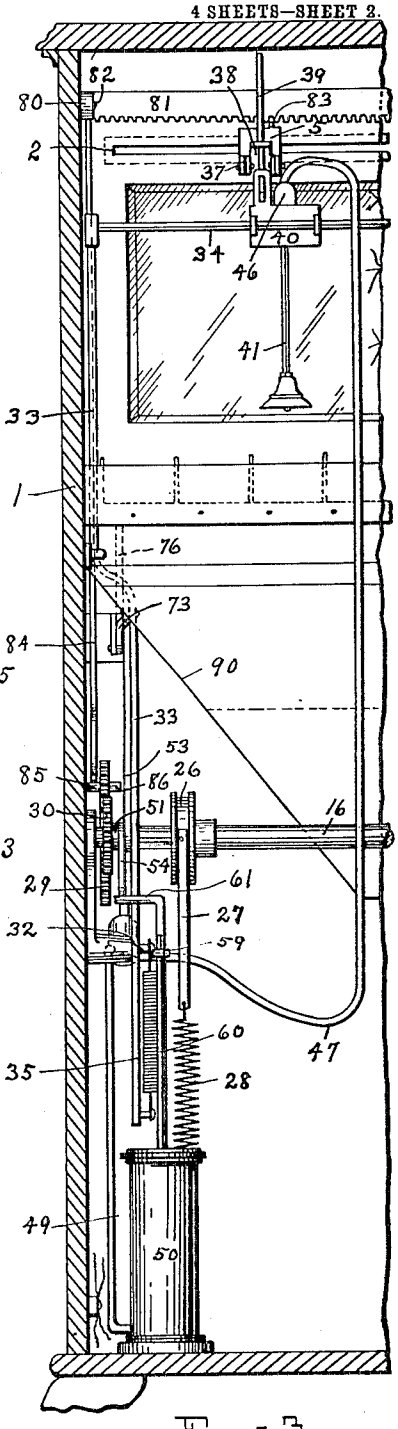


Fig. 3.

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4 SHEETS—SHEET 3.

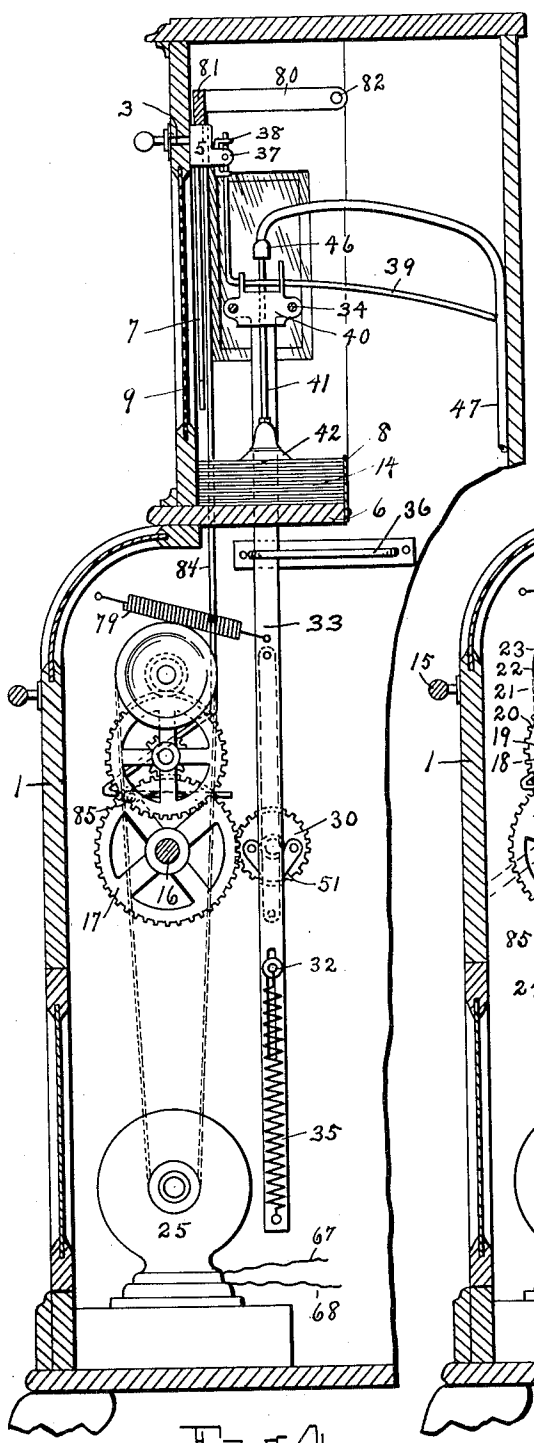


Fig. 4.

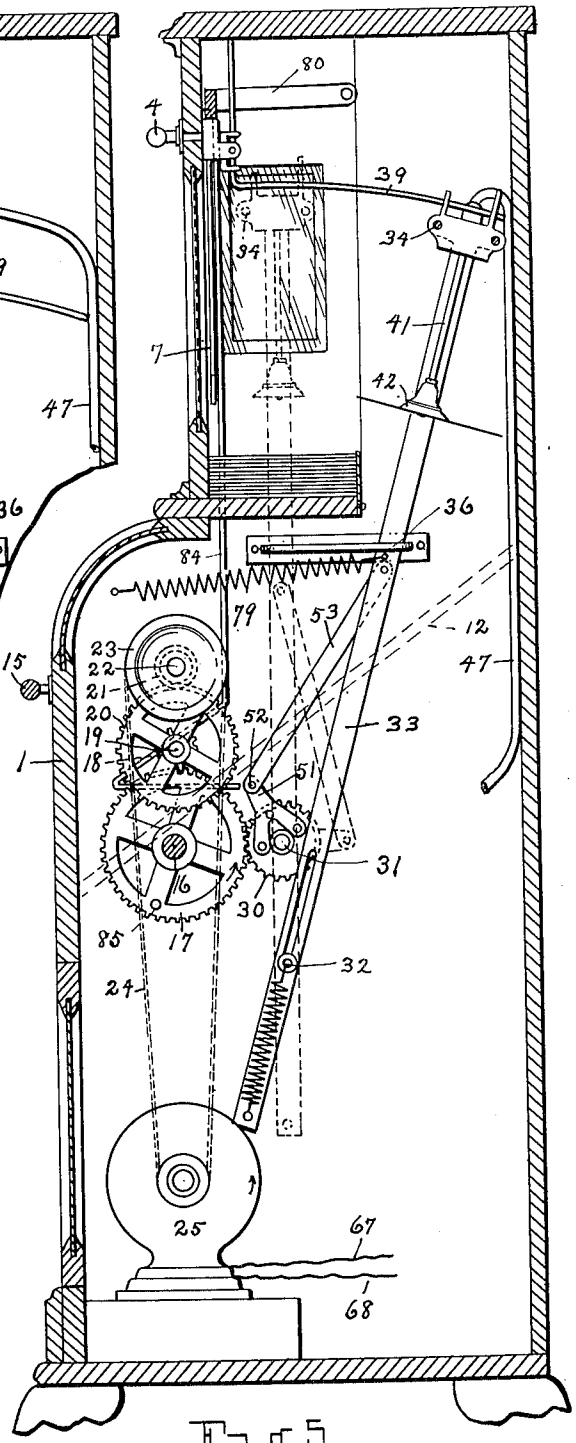


Fig. 5.

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4 SHEETS—SHEET 4.

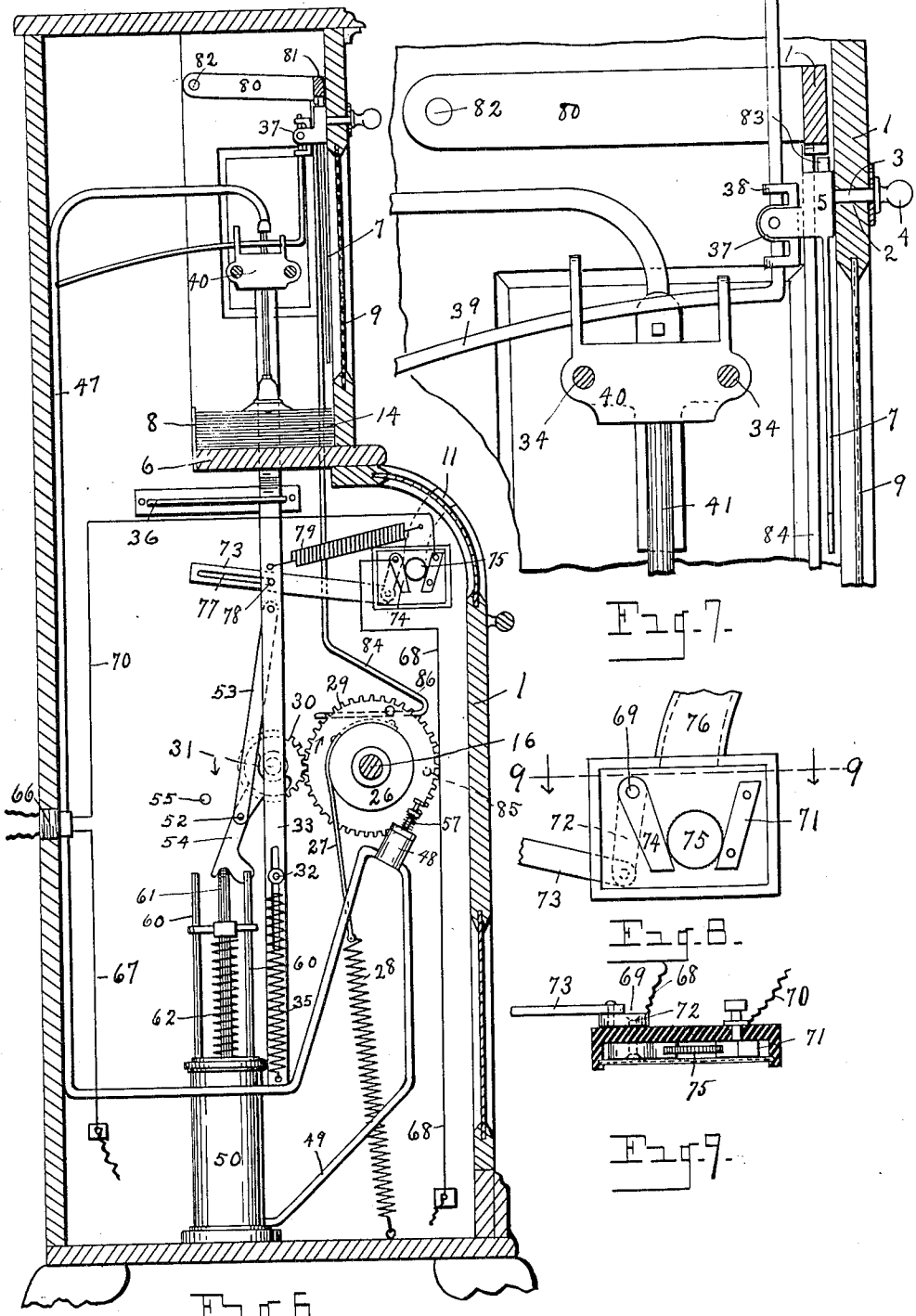


Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE.

HOWARD B. CONOVER, OF DETROIT, MICHIGAN, ASSIGNOR TO CAILLE BROTHERS COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

VENDING-MACHINE.

No. 852,222. Specification of Letters Patent. Patented April 30, 1907.

Application filed October 22, 1906. Serial No. 339,958.

To all whom it may concern:

Be it known that I, HOWARD B. CONOVER, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Vending-Machine, of which the following is a specification.

My invention relates to vending machines for postal and picture cards, thin packages and the like, and the object of my improvements is to provide a machine of this kind wherein the purchaser may position a selecting mechanism so as to receive his choice of a large number of articles.

My invention consists in a novel case for a vending machine wherein a large number of different kinds of articles may be displayed.

It also consists in a novel selecting mechanism which may be positioned from without the case.

It consists further of novel automatic mechanism which will take up the article selected and carry it to a position from which it will easily pass out of the case.

As this machine can be constructed to display and vend a large number of different articles, and as but one actuating mechanism is employed for all, the space occupied by the machine and the expense of construction will be relatively small for each article displayed.

In the accompanying drawings, Figure 1 is a front view of the case of the vending machine. Fig. 2 is a central vertical transverse cross section of the machine. Fig. 3 is a view of the rear of the mechanism at the right end of the machine, the back of the case being removed. Figs. 4 and 5 show the mechanism at the opposite or left side of the case in different positions. Fig. 6 shows the same mechanism as Fig. 2 with the deflector plate 90 removed. Figs. 7 to 11 are details of the mechanism.

Similar reference characters refer to like parts throughout the several views.

The case 1 of the machine is provided with a slot 2 in which is slidable a short rod 3 having a knob 4 on its outer end. A block 5 is secured to the inner end of the rod, and from it depends the pointer 7. A shelf 6 in the case supports cards, envelops or other articles, which are arranged side by side in piles, and are prevented from sliding off at the rear by the plate 8. A window 9 in the front of the case enables the purchaser to see the articles in the machine and buttons or markers 10 indicate the position the pointer should be placed for to cause the delivery of the article selected.

The machine is so constructed that when the knob 4 is shifted to bring the pointer 7 to the article selected, and a coin dropped into the slot 11, a flexible suction cup will lower onto the article; an air pump will create a partial vacuum, sufficient to sustain the article; the suction cup will rise, lift the article and carry it to the rear; the vacuum will be broken, permitting the article to fall; and the article will fall onto the inclined shelf 12 and slip down to the front of the case, being prevented from falling to the floor by the rail 13. A deflector plate 90 conveys the cards toward the center of the machine. As postal and picture cards 14 will probably be more often sold in this kind of machine than any other, I shall use the word "card" to designate the articles to be vended. The words "right" and "left" will indicate direction to a person standing facing the front of the machine.

15 is a guide or guard rail at the front of the case.

A shaft 16 extends across the case and at the left end (Figs. 4 and 5) carries a gear 17 which meshes with the pinion 18 on the pin 19. Secured to the pinion 18 is a gear 20 which meshes with a pinion 21 on the pin 22. This pinion 21 is secured to the pulley 23 which carries the belt 24, and so connects to the motor 25. Near the opposite end of the shaft 16 is a drum 26, which, when the shaft is actuated by the motor, winds up the band 27, to the lower end of which is connected the spring 28. After the motor circuit is broken, the spring 28 will return the parts to normal position. On the shaft 16 is a second gear 29, of the same size, which like the gear 17, meshes with a pinion 30 mounted on the pin 31, one at each end of the machine. Slidable on the pins 32 at each end are the bars 33, which have T shaped upper ends which carry the cross rods 34. A spring 35 between each pin 32 and the lower end of each bar holds the bars upward. A rod 36, secured to each end of the case, guides the middle portion of each bar 33.

On the rear of the block 5 are two lugs 37 between which is pivoted the saddle 38

which slidably supports the guide rod 39. This guide rod is bent to form an arc of a circle having the pins 32 as a center, but as it is raised and lowered, the radius of movement of the rods 34 changes, and to accommodate this, the saddle 38 is pivoted. The cross head 40 is slidable longitudinally on the rods 34, and transversely on the rod 39. Vertically movable in the cross head is a tube 41 which carries the suction cup 42 at its lower end.

The object of the suction cup is to raise a top card from its pile, carry it to the rear, and permit it to fall. Its construction is illustrated in Fig. 10. The tube 41 is closed at its lower end and provided with openings 43. The conical cup 42, of rubber or similar material, is secured between the washers 44 and 45. The closed end of the tube 41 preferably extends just below the normal lower edge of the cup 42, and causes the cards to separate easily by depressing the middle and thus raising the outer edges of the upper card.

At the upper end of the tube 41 is a fitting 46 to which connects the tube 47. As the fitting is larger in diameter than the bore for the tube 41, it limits the downward movement of the tube as shown in Fig. 5. The tube 47 connects to the relief valve 48, and the tube 49 connects the valve to the air pump 50. The operation and action of the air pump can be understood from Figs. 2 to 6. To each gear 30 is secured an arm 51 which carries a pin 52 at its outer end. A link 53 connects each pin 52 to each bar 33. A fork 54 is loosely hung on the pins 52 and is normally positioned by the pin 55 projecting from the right side of the case, which pin is omitted in Fig. 3 for clearness. The relief valve consists of a tubular body 48, and a perforated head 56. A pin stem 57 is slidable in the head and by means of the adjustable spring 58, normally closes the passages 159 in the head. The spring 58 is strong enough to resist all usual air pressures caused by the pump 50, but the vacuum can be broken by pressing down the stem 57. The pump is single acting and valveless. The cross head 59 is guided by the rods 60 and the piston rod 61 normally held in the upper position by the spring 62. The upper end of the rod turns to the right into the path of the fork 54 (see Fig. 3). When the gear 30 turns to the left (Fig. 2), the fork will engage the end of the piston rod and push it down, expelling the air in the pump cylinder. After the parts have reached the positions shown in Fig. 6, any further movement of the gear 30 will release the piston, when the spring 62 will return it and cause a partial vacuum in the tubes 47 and 49.

The operative movements of the mechanism are caused by the motor 25. To cause this motor to operate, current is brought over the following described circuit and controlled by a coin operated switch. To the rear of the case is secured a common two wire current plug 66. From this one wire 67 extends direct to the motor. A wire 68 extends from the motor across the bottom of the case up the right side to the pivot pin 69 of the switch. The wire 70 extends from the plug 66 to the rigid contact member 71 of the switch. Secured to the pin 69 are the arm 72 to which the link 73 is pivoted, and the movable contact member 74 of the switch. A coin 75, when dropped in through slot 11 and chute 76, will bridge the gap between the contact members 71 and 74 and thus complete the circuit. The link 73 is provided with a slot 77 through which the pin 78 on the right hand bar 33 extends. A coil spring 79 connects to each bar 33 to hold it toward the front of the case.

A yoke consisting of the side arms 80 and toothed cross bar 81 is pivoted on pins 82 in the ends of the case. Its teeth are adapted to lower and engage the tooth 83 on the block 5 while the mechanism is operating. A rod 84 at each end of the case has its lower end bent into the path of the pin 85 projecting outward from each wheel 29 and rests thereon while the parts are at rest, but at the beginning of the operation of the machine, the pins 85, rods 84 and the yoke will lower and lock the block 5 in position.

The operation of the parts are as follows. The purchaser steps before the machine and moves the knob 4 until the pointer 7 designates the button 10 of the card he desires to purchase. He then drops a coin into the slot 11 and down chute 76, when it will rest between the contacts 71 and 74, closing the circuit motor. The action of the motor is to turn the shaft 16 as indicated by the arrows, and the first result of the movement is the lowering of the pins 85, the rods 84, and the toothed cross bar 81 to engage the tooth 83 and hold the block 5 rigid. The turning of the shaft 16 turns the gears 30 and swings the crank arms 51 downward. In doing this, the links 53, bars 33, cross rods 34, cross head 40, tube 41 and suction cup 42 will be lowered. As the tube 41 is slidable in the head 40, no harm can be done by excess movement of the bars 33. While the crank arm 51 is swinging downward, the fork 54 has been depressing the piston rod until the parts all assume the position shown in Fig. 6. Immediately after this, the pin 52 crosses the line between the bent end of the piston and the shaft 31, whereupon the fork 54 flies upward under the stress of the spring 62. This causes a suction through the tubes and in the suction cup 42. As the rod 33 is still lowering, there is ample time for the pump to perform its duty. The continued revolution of the gears 30 will permit the springs 35 to raise the bars 33 to the height shown in Fig.

2. No further elevation of these bars being possible, the continued revolution of the crank arms 51 will cause the upper ends of the bars to be swung toward the rear as shown in Fig. 5. At this point, the card will be over the space between the plate 8 and the back of the case and above the shelf 12; the pin 86 on the wheel 29 at the right end of the case will contact with the stem 57 and break the vacuum, thus allowing the card to drop; and the right bar 33 will have swung so far to the rear that the pin 78 will have traveled to the end of the slot 77 and moved the link 73 to the rear, thus causing the contacts 71 and 74 to release the coin and break the circuit. During this movement, the drum 26 has been winding up the band 27 and placing the spring 28 under tension. When the circuit to the motor is broken, the spring will return all parts to normal position, all but the pump reversing their former movements, the final operation being the lifting of the rods 84 and toothed bar 81 by means of the pins 85 on the wheels 29 to release the knob 4.

Having now explained my improvements what I claim as my invention and desire to secure by Letters Patent is,—

1. The combination of a case, a plurality of groups of articles therein, a selecting means movable to indicate the group containing the article desired, and automatic mechanism positioned by the selecting means for engaging the article desired and removing it from the group indicated.

2. The combination of a case, a series of superimposed articles therein, means adapted to lift the uppermost of the articles by suction and carry it laterally, an air pump to produce the suction, and a motor to actuate the parts.

3. The combination of a case, a series of superimposed articles therein, means adapted to lift the uppermost of the articles by suction and carry it laterally, an air pump to produce the suction, a motor to actuate the parts and resilient means to return the parts to normal position.

4. The combination of a case, a plurality of series of superimposed articles therein, means adapted to lift the uppermost article by suction and carry it laterally, an air pump to produce the suction, manually operated means to position the lifting mechanism, and a motor to actuate the parts.

5. The combination of a case, a plurality of series of superimposed articles therein, means adapted to lift the uppermost article by suction and carry it laterally, an air pump to produce the suction, manually operated means to position the lifting mechanism, and a lock for said manually operated means.

6. In a vending mechanism, a longitudinally vertically and laterally movable conveying mechanism adapted to raise and transport the article to be vended and means to operate the conveying mechanism.

7. In a vending machine, a case, a plurality of piles of thin flat articles arranged therein, a shelf upon which said articles are supported, said case having an opening through which the articles may pass out of the case and an inclined chute extending up from said opening to the rear of the shelf, an indicator movable along adjacent to the articles in the case, a conveying mechanism positioned thereby, and means to operate said mechanism so it may lift any desired one of said articles and carry it to the rear of the shelf and there let it fall so the article may slide out of the case on the chute.

8. In a vending machine, a shelf, a series of piles of articles supported thereon, an air-pump, a flexible connection thereto, a suction device attached thereto, an indicator for moving the suction device over any desired one of the articles in the case, and operating mechanism adapted to cause the suction device to lower, engage the desired article, lift it and carry it to the rear and drop it.

9. In a vending machine, a case, a pile of articles to be vended supported in said case, an air pump, a connection thereto, a suction device attached thereto, a valve in said suction pipe, and operating mechanism adapted to cause the suction device to lower, engage the uppermost of the articles to be vended, rise with it and move to the rear, then open the valve to break the suction and permit the article to fall, and to return the suction device to its former position, said case having a chute upon which the article may slide out.

10. In a vending machine, the combination of a case, a series of piles of articles to be vended within the case, an indicator, a motor, a conveyer actuated thereby, and connecting means between the conveyer and the indicator whereby the conveyer will be properly positioned to carry the desired article from the selected pile.

In testimony whereof I have signed my name in the presence of two subscribing witnesses.

HOWARD B. CONOVER.

Witnesses:
T. E. O'BRIEN,
T. ARTHUR CAILLE.