Oct. 13, 1959 A. R. GROSS 2,908,172

POWER TRANSMISSION MECHANISM HAVING A RECIPROCATORY ELEMENT SELECTIVELY OPERATIVE IN SPACED OPERATING ZONES

Filed Aug. 1, 1956 3 Sheets-Sheet 1

Fig. 1

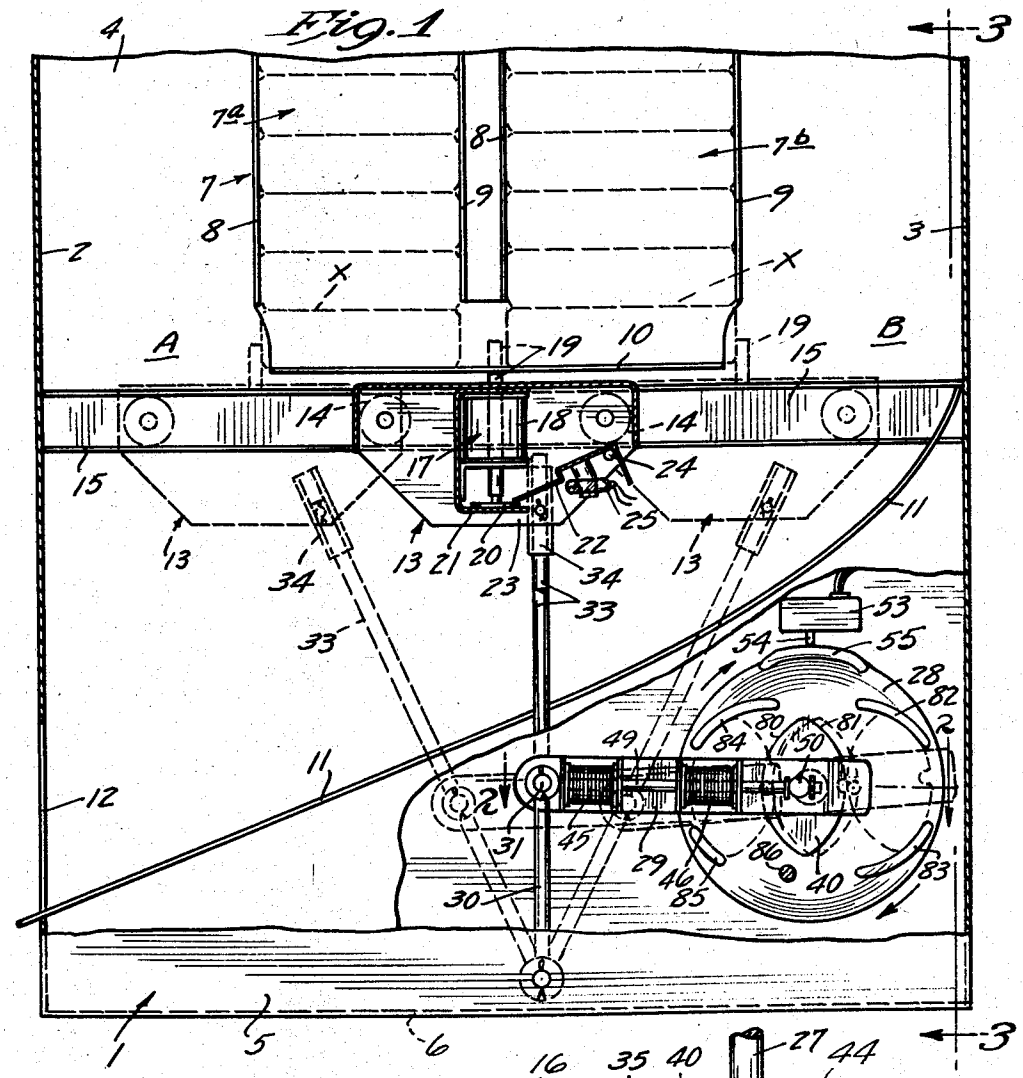
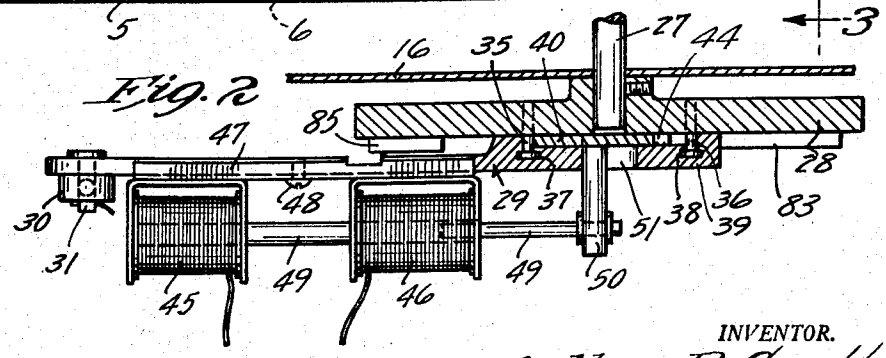


Fig. 2



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Fig. 3

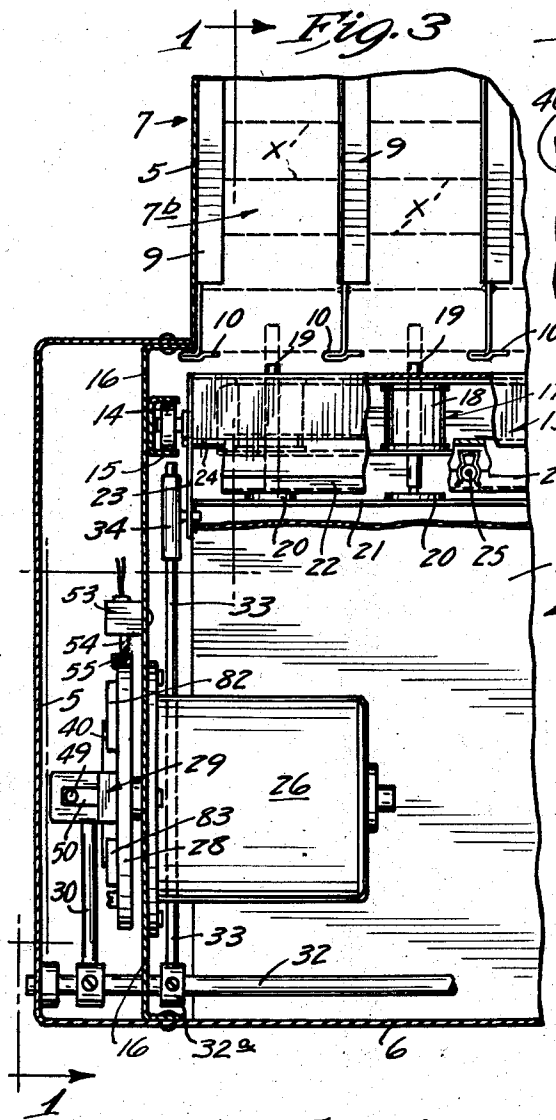


Fig. 5

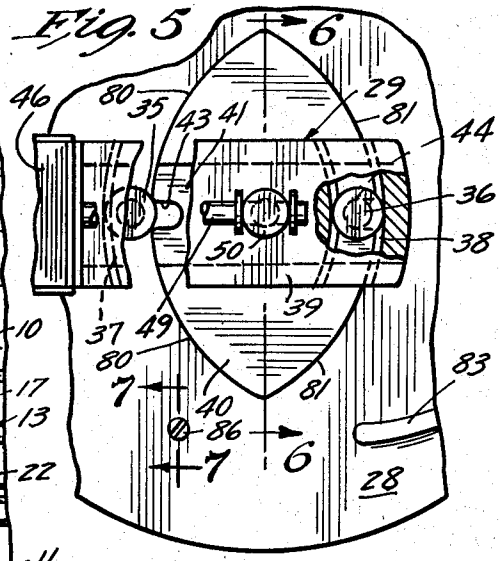


Fig. 6

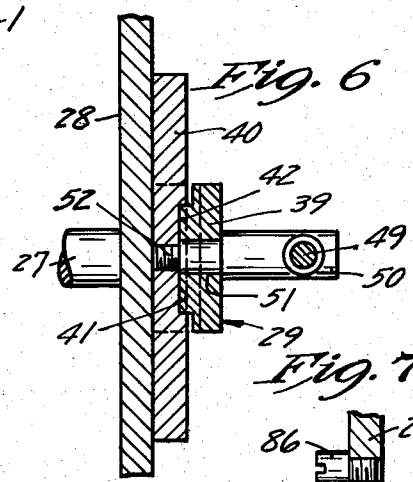


Fig. 7

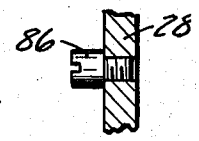
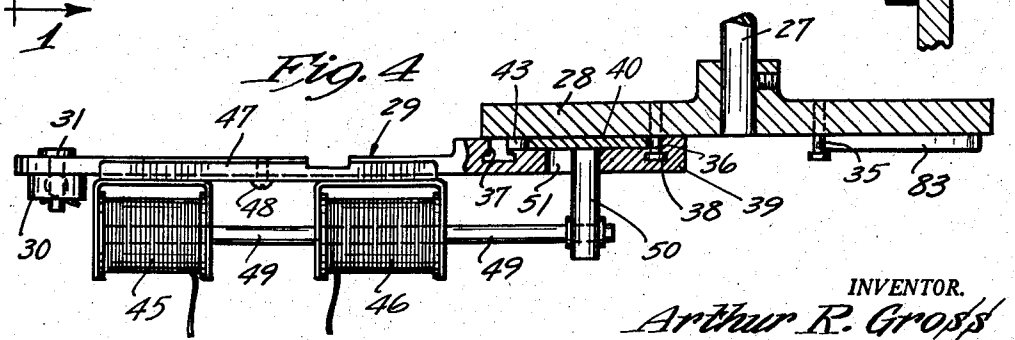


Fig. 4



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Fig. 8

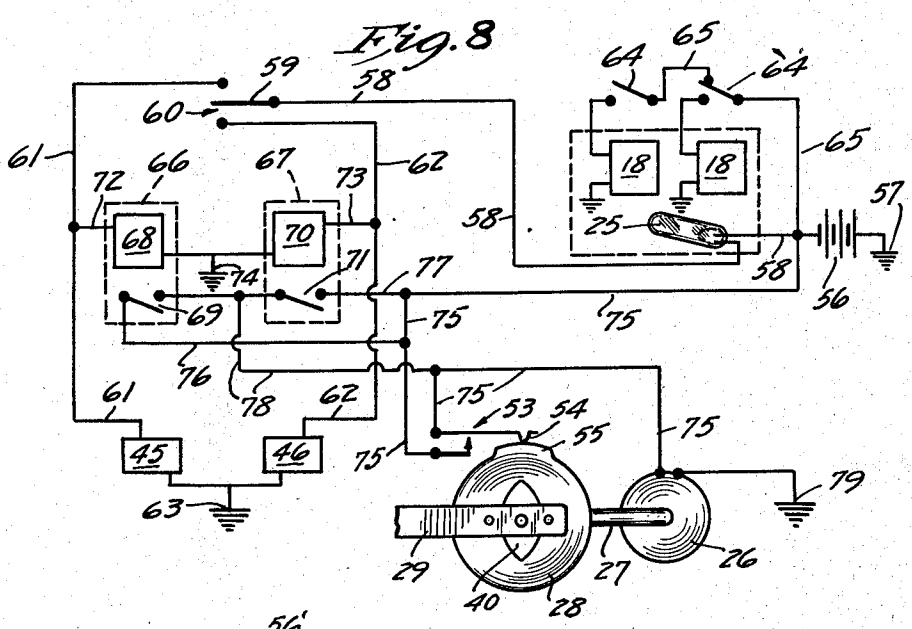


Fig. 9

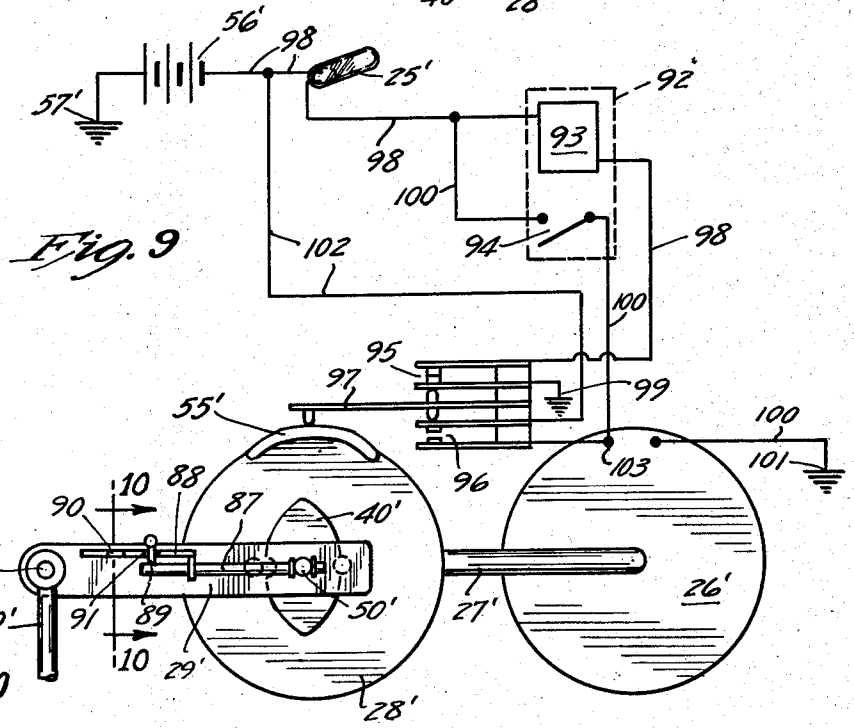
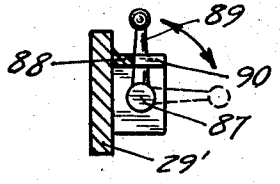


Fig. 10



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2,908,172

POWER TRANSMISSION MECHANISM HAVING A RECIPROCATORY ELEMENT SELECTIVELY OPERATIVE IN SPACED OPERATING ZONES

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Application August 1, 1956, Serial No. 601,410

10 Claims. (Cl. 74—40)

My invention relates particularly to power transmission mechanisms, and more particularly to such mechanisms employing a reciprocatory element movable selectively in different directions between a neutral position and spaced operating zones.

More specifically, my present invention relates to such power transmission mechanisms that are particularly advantageous when used in vending machines which dispense articles of merchandise responsive to insertion of one or more coins in a receptacle therefor, a type of such machine being disclosed in my prior United States Letters Patent No. 2,693,299 issued November 2, 1954.

Vending machines for dispensing various brands of packaged goods such as cigarettes, candy bars and the like are usually provided with magazines which store, and from which are dispensed selectively, a plurality of items having different brand names, sizes, flavors, et cetera, a plurality of units of each thereof being contained in a different magazine, and the magazines being normally disposed in side by side relationship within the machine. Usually, the units in each magazine are stacked one on another and, in order to provide for a substantial number of such units and avoid refilling the magazines at unduly frequent intervals, the magazines have necessarily been of substantial height or depth. Heretofore, machines utilizing such a plurality of magazines, each comprising two or more magazine sections, one behind the other, have employed relatively complicated mechanism for dispensing units first from one section of a magazine and then from a second section of the magazine when the supply of units from the first section thereof has been exhausted.

The primary object of my invention is the provision of extremely simple mechanism for moving a reciprocatory element selectively in different directions between a neutral position and spaced operating zones.

Another object of my invention is the provision of dispensing mechanism including a single different article ejecting device for each magazine, each device being selectively operable in each of a pair of feeding zones at the delivery ends of a cooperating pair of magazine sections, whereby units of merchandise may be delivered from either section of a given magazine by the same ejector device.

Another object of my invention is the provision of mechanism of the type set forth including an article engaging ejector which is selectively movable in one direction from a neutral position to cause delivery of an article from one of a pair of spaced magazine sections, and in a reverse direction from said neutral position to deliver an article of merchandise from the other magazine section of said pair.

Another object of my invention is the provision of novel means including a motor and a rotary plate or disc element for imparting feeding and return movements to an article engaging ejector device of the above type selectively in a pair of spaced feeding zones, and

linkage including a pitman element operatively coupled to said plate or disc element, and shiftable means on one of said elements selectively engaging spaced portions of the other one of said elements at points longitudinally spaced with respect to the direction of power transmitting movement of the pitman element to transfer the feeding and return movements of the ejector device from one of said feeding or delivery zones to the other thereof.

Another object of my invention is the provision of novel means for positively restraining said shiftable means against shifting movement during an operating cycle except at predetermined relative positions of the plate or disc and pitman elements substantially at the beginning or end of an operating cycle.

The above and still further highly important objects and advantages of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings which illustrate the invention, and in which like reference characters indicate like parts throughout the several views:

Fig. 1 is a fragmentary view partly in side elevation and partly in section of the delivery mechanism of a vending and dispensing machine showing a preferred embodiment of my invention, and taken substantially on the irregular line 1—1 of Fig. 3;

Fig. 2 is an enlarged view partly in plan and partly in section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary view partly in rear elevation and partly in section taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a view corresponding to Fig. 2 but showing a different position of some of the parts;

Fig. 5 is an enlarged fragmentary view in side elevation corresponding to a portion of Fig. 1 and showing a different position of some of the parts, some parts being broken away;

Fig. 6 is a fragmentary section taken on the line 6—6 of Fig. 5;

Fig. 7 is an enlarged fragmentary section taken substantially on the line 7—7 of Fig. 5;

Fig. 8 is a wiring diagram;

Fig. 9 is a view partly in side elevation and partly in diagram showing a modified arrangement; and

Fig. 10 is a fragmentary section taken on the line 10—10 of Fig. 9.

In the preferred embodiment of my invention illustrated in Figs. 1–8 inclusive, a vending and dispensing machine is shown as comprising a housing or cabinet 1 having front and rear walls 2 and 3 respectively, end walls 4 and 5 and a bottom wall 6. Suitably mounted within the cabinet 1 are a plurality of magazines 7 in side by side relationship, and each comprising a front magazine section 7a and a rear magazine section 7b. The magazine sections 7a and 7b are open at their tops for loading and are customarily loaded each with a single row stack of merchandise units such as cigarette packages, the magazine sections of each magazine storing a different brand from those of an adjacent magazine. The merchandise units or cigarette packages are indicated at X. The front and rear of each magazine section 7a and 7b are defined by vertically disposed retaining flanges 8 and 9 respectively, and the bottoms thereof are defined by horizontally disposed inturned flanges 10. With reference to Figs. 1 and 3 it will be seen that the front and rear flanges 8 and 9 terminate at their lower ends in upwardly spaced relation to the bottom forming flanges 10 a distance slightly greater than the thickness of each package X to permit delivery of the lowermost package X in each magazine section from the magazines. The lowermost packages X in the front magazine sections 7a are adapted to be ejected

from their respective magazine sections in a forward direction, whereas the lowermost packages X in the rear magazine sections 7*b* are adapted to be ejected from their respective magazine sections in a rearward direction, said ejected packages falling by gravity to a rearwardly inclined chute or the like **11** which delivers the packages to the customer through an opening **12** in the front wall **2** of the machine. The magazines **7** including their respective sections 7*a* and 7*b* are clearly shown and described in my prior United States patent above identified.

An ejector carriage **13** extends transversely of the housing or cabinet **1** and is provided at its opposite ends with journaled rollers **14** which support the carriage **13** in a pair of channel-like rails **15**, one thereof rigidly secured to the end wall **4**, the other being welded or otherwise rigidly secured to a vertical partition **16** in inwardly spaced relation to the end wall **5**, see Fig. 3. The guide rails **15** extend forwardly and rearwardly of the machine and mount the carriage **13** for reciprocatory movements in forward and rearward directions from a neutral position generally centrally disposed between the lower delivery ends of the magazine sections 7*a* and 7*b*.

The carriage **13** supports a plurality of electromagnetic ejectors **17**, one for each of the magazines **7**, each ejector **17** comprising a solenoid coil or winding **18** and an armature **19**, each armature **19** being provided at its lower end with a flange **20** which normally rests on a supporting lip **21** of the carriage **13**. With reference to Figs. 1 and 3, it will be seen that the upper ends of the armatures **19** are normally disposed below the lowermost packages X in their respective magazine sections 7*a* and 7*b*, and, that upon energization of a given solenoid **18**, the upper end of its respective armature **19** moves upwardly between the lowermost packages X in their respective magazine sections 7*a* and 7*b*. Thus, a given armature **19** is positioned to engage the lowermost package X in its respective magazine section 7*a* upon movement of the carriage **13** in a forward direction to move the engaged package X forwardly of the respective magazine section 7*a* to a delivery zone indicated generally at A. Likewise, rearward movement of the carriage **13** will cause the upper end of the armature **19** to engage the lowermost package X in its respective magazine section 7*b* and move the same rearwardly to a delivery zone indicated generally at B. Upon reaching either delivery zone A or B, the ejected packages X will fall by gravity to the chute **11** and be delivered outwardly through the opening **12**.

An elongated plate-like bracket **22** is pivotally secured at its opposite ends to the opposite end walls **23** of the carriage **13**, as indicated at **24**, the front edge portion of the bracket **22** resting on the heads **20** of the several armatures **19**. The bracket **22** carries a switch **25**, the purpose of which will hereinafter be described. The switch **25** may be of any suitable type, but as shown is in the nature of a tube or bulb having spaced switch contacts therein and a small quantity of mercury which is adapted to flow toward and away from the switch contacts to close and open the gap therebetween upon tilting of the switch in opposite directions. The carriage **13** together with the ejectors **17** and switch carrying bracket or damper plate **22** are fully disclosed in my prior patent above identified, and further detailed showing and description thereof herein is believed unnecessary.

For the purpose of ejecting the lowermost packages X from a selected magazine section 7*a* or 7*b* of a given one of said magazines **7** I provide an electrically operated motor **26** and novel linkage now to be described. The motor **26** is shown as being mounted on the partition **16** and is preferably of the type having built-in speed reduction gearing terminating in an output shaft **27** on which is rigidly mounted a disc-like plate **28** to which is connected one end portion of a pitman, indicated in its entirety by the reference numeral **29**. The opposite end of the pitman **29** is pivotally connected to the outer end of a relatively short crank arm **30**, as indicated at **31**, with the opposite end of the crank arm **30** being rigidly secured to a rockshaft **32** journaled at its opposite ends in suitable bearings **32***a*, one of which is shown in Fig. 3, mounted on the end walls **4** and **5** of the housing **1**. A pair of relatively long crank arms **33** have their lower ends rigidly secured to the rockshaft **32**, their upper ends being longitudinally slidably contained in tubular members **34** one each thereof being pivotally connected to an opposite end wall **23** of the carriage **13**.

The disc-like plate **28** is provided with a pair of diametrically opposed axially outwardly projecting portions in the form of pins **35** and **36** that are adapted to move in arcuate tracks **37** and **38** respectively in the adjacent end portion **39** of the pitman **29**. A shiftable device in the form of a generally elliptical plate-like member **40** is movably mounted on the end portion **39** of the pitman **29** and is provided with a groove **41** for the reception of a cooperating tongue portion **42** of the pitman **29** whereby the plate-like member **40** is held against rotation with respect to the pitman **29** but longitudinally slidable with respect thereto between the arcuate tracks **37** and **38**. The shiftable plate-like member **40** is provided with a pair of opposed recesses **43** and **44** each of which is adapted to receive a respective pin **35** and **36** upon shifting movements of the member **40** in opposite directions. With reference to Figs. 2, 4 and 5, it will be seen that, when the shiftable plate-like member **40** is moved to the left, the pin **35** is received in the notch **43**, and the pitman **29** is then pivotally connected to the plate **28** by the pin **35**, the pin **36** traveling longitudinally through the channel **38** during rotation of the plate **28**. Conversely, when the shiftable member **40** is moved to the right with respect to Figs. 2, 4 and 5, the pin **35** will be released from the recess **43**, and the pin **36** will be received in the recess **44** whereby the shiftable connection of the pitman **29** to the plate **28** will comprise the pin **36**, and the pin **35** will move longitudinally through the guide channel **37** upon rotation of the plate **28**. With this arrangement, when the pin **36** is received in the recess **44**, and rotary movement is imparted to the plate **28**, the carriage **13** will be caused to reciprocate between its neutral full line position of Fig. 1 and its dotted line delivery position adjacent the delivery zone A of Fig. 1. When the member **40** is shifted to cause the pin **35** to be moved in the recess **43**, and rotary movement is imparted to the plate **28** in the same direction as previously done, the pivotal connection between the plate **28** and the pitman **29**, comprises the pin **35**, and the effective field of movement of the pitman **29** is shifted in a direction longitudinally thereof. The extent of shift of the effective field of movement is equivalent to the distance between the pins **35** and **36**, and, the shift occurring when both pins are in register with the respective recesses, the same are selectively engaged at points longitudinally spaced with respect to the general direction of power transmitting movement of the pitman **29**. With the pin **35** acting as the pivotal connection between the plate **28** and the pitman **29**, the carriage **13** will be moved in a reverse direction from its neutral full line position of Fig. 1 to its dotted line position at the delivery zone B, and back to said neutral position.

For the purpose of imparting shifting movement to the member **40** to cause engagement thereof with a selected one of the pins **35** and **36** I provide a pair of spaced solenoid coils **45** and **46** mounted on the pitman **29** by means of a bracket element **47** secured to the pitman **29** by a machine screw or the like **48**. An elongated armature rod **49** extends through aligned axial openings in the solenoid coils **45** and **46** and is rigidly secured at one end to the outer end of a leg **50** which extends laterally inwardly through a longitudinally extended slot **51** in the end portion **39** of the pitman **29**, and which is screw threaded or otherwise rigidly secured to the central portion of the plate-like shiftable member **40**, as indicated at **52**. The disposition of the solenoid

coils or windings 45 and 46 with respect to the armature 49 is such that, when the solenoid winding 45 is energized, the shiftable member 40 is moved in a direction to cause the pin 35 to be received in the recess 43. Energization of the solenoid winding 46 causes movement to be imparted to the shiftable member in the opposite direction to cause reception of the pin 36 in the recess 44 of the member 40.

Inasmuch as the plate 28 must be properly positioned to permit the above-described shifting movement of the member 40, I provide means for deenergizing the motor 26 and stopping of rotation of the plate 28 when one of the pins 35 or 36 is substantially in register with its respective recess 43 or 44. A motor cutoff switch 53 is mounted on the partition 16 adjacent the plate 28, said switch having an operating button or the like 54 which extends toward the peripheral edge of the plate 28. The peripheral edge of the plate 28 defines a cam having a raised portion 55 that engages the switch button 54 to open the switch 53 and deenergize the motor 26 when a disconnected one of the pins 35 or 36 is in register with its cooperating recess 43 or 44 in the shiftable member 40.

With reference to Fig. 7, it will be seen that the solenoid coils or windings 45 and 46 are each adapted to be connected in series with the mercury switch 25 and a source of electrical potential as exemplified by a battery 56, one side of which is grounded as at 57. The mercury switch 25 is interposed in a power lead 58 connected to the battery 56, and which extends to a movable contact element 59 of a 2-position switch 60, one side of which is connected to the solenoid winding 45 by a lead 61, and the other side of which is connected to the solenoid winding 46 by a lead 62. The solenoid windings 45 and 46 are grounded to the machine as indicated at 63. The windings or coils 18 of the several ejectors 17 are each energized by closing of a respective selector switch 64, said switches being normally interposed in series in a lead 65 that is connected to the power source 56. The selector circuits for the several ejector solenoid coils 18 are fully disclosed in my prior patent above identified, and for the sake of brevity, detailed showing and description in this application is omitted. It will be noted, however, that energization of any one of the selector solenoid coils 18 causes the mercury switch 25 to be closed whereby to cause energization of a selected solenoid winding 45 or 46. The switch 60 may be controlled by any suitable means, but for the purpose of the present example, it may be assumed that the switch 60 is manually operated. The circuit of Fig. 7 further includes a pair of control relays 66 and 67, the former of which includes a coil or winding 68 and a normally open switch 69, and the latter of which comprises a coil or winding 70 and a normally open switch 71. The relay coils 68 and 70 are connected in parallel with the solenoid coils 45 and 46 respectively, by means of respective leads 72 and 73 connected to the leads 61 and 62 respectively, and a common ground connection 74. The motor 26 is energized by the mercury switch 25 through a portion of a lead 75 which extends to the holding and cutoff switch 53, and from thence to the motor 26 to hold the same energized when the switch 53 is closed. A pair of leads 76 and 77 are connected at one end to the lead 75, and at their other ends are connected to one side of a respective relay switch 69 and 71. The opposite sides of the switches 69 and 71 are connected to the motor 26 by a common lead 78 and a portion of the lead 75, the motor being grounded as indicated at 79.

Assuming that the movable switch contact 59 of the switch 60 is positioned to energize the solenoid coil 45, closing of one of the selector switches 64 will cause closing of the mercury switch 25 by upward swinging movement of the bracket or damper plate 22 and energize the relay winding 68 to close the switches 69 and 70, whereby to energize the dispensing motor 26. Energization of the motor 26 causes the disc-like plate 28 to rotate to initiate ejection of a package X from the selected magazine section 7*a*. As fully disclosed in my prior patent, above identified, movement of the ejector carriage 13 to its dotted line position of Fig. 1 at the dispensing zone A causes the mercury switch 25 to be opened to deenergize the coil 68 of the relay 66 and opening of the switches 69 and 70 thereof. However, by the time the switch 25 is opened, the holding and cutoff switch 53 has been closed and the motor 26 continues to operate until the switch 53 is reopened by the cam 55.

Inasmuch as energization of the shifting solenoids 45 and 46 is controlled by the mercury switch 25 as well as the switch 60, shifting of the shiftable member 40 to disengage one pin and engage the other can be accomplished only when the switch 25 is closed and when the pins 35 and 36 are aligned or in register with their respective recesses 43 and 44 of the shiftable member 40.

It will be noted that, during rotation of the plate 28, the engaged or operative one of the pins 35 or 36 exerts rotating force on one side or the other of its respective recess, thus tending to move the shiftable member 40 out of engagement with the engaged pin during part of an operating cycle. Also during a part of said cycle the load of the carriage 13 is transferred by the linkage therebetween and the plate 28 to the member 40, tending to shift the member 40 out of engagement with the engaged or operative pin. As above indicated, the member 40 is of general elliptical shape, having opposed arcuate edges 80 and 81 each extending from opposite sides of adjacent recesses 43 and 44. The arcuate edge 80 is concentric with the pin 36 when the pin 36 is seated in its cooperating recess 44, whereas the arcuate edge 81 is concentric with the pin 35 when the same is seated in its cooperating recess 43. The radii of the arcuate edges are such that, when one of the pins is seated in its respective recess, the other pin travels in close proximity to the opposite arcuate edge of the member 40 during a part of the rotary movement of the plate 28. For the purpose of further preventing shifting movement of the member 40 during rotation of the plate 28, I provide guide means in the nature of spaced arcuate flanges 82, 83, 84, and 85 projecting generally axially or laterally from the adjacent face of the plate 28, and a guide pin 86 screw-threaded into the plate 28. The guide flanges 82 and 83 define arcs of a circle concentric with the pin 36, and the guide flanges 84 and 85 define arcs of a circle concentric with the pin 35, the guide pin 86 and pin 36 cooperate with the flanges 84 and 85 to define the last mentioned circle. Further, the pin 35 cooperates with the guide flanges 82 and 83 to define the first mentioned circle. When the pin 35 is seated in the recess 43, the arcuate edge portions 81 are adapted to be engaged by the flanges 84 and 85 and the pin 36 and the guide pin 86, which cooperate to confine the member 40 against shifting movement when both pins 35 and 36 are not in register with their respective recesses 43 and 44. In like manner, when the pin 36 is seated in its respective recess 44 the arcuate edge portions 80 are adapted to be engaged by the pin 35 and guide flanges 82 and 83 which cooperate to confine the member 40 against shifting movement during the operational cycle of the machine. Preferably, the pins 35 and 36 are rigidly secured to the plate element 28, and the several guide flanges 82–85 are integrally formed with the plate element 28. For this reason, the guide pin 86 is removable to permit shifting movement of the member 40 during such time that one or the other of the pins is out of register with its cooperating recess in the member 40, whereby to permit assembly or disassembly of the pitman 29 from the plate 28 in a direction transversely of the axis of the plate 28.

In the modified form of the invention illustrated in

Fig. 9, the disc-like crank, pitman, shiftable member and plate arm are identical to those illustrated in Figs. 1–8 and carry like reference numerals with prime (') marks added. Thus, the disc-like plate is indicated at 28', the pitman 29' being provided with a shiftable member 40', and being connected at its outer end to the crank arm 30' as indicated at 31'. In this modification, a shifting bar or shaft 87 is connected at one end to the leg 50' which extends laterally outwardly from the shiftable member 40'. The shaft 87 is longitudinally slidably carried by one end of a latch bracket 88 mounted on the pitman 29'. The shaft 87 is provided with a laterally outwardly projecting latch bolt 89 that is receivable selectively in one of a pair of spaced recesses 90 and 91 in the latch bracket 88, to lock the shaft 87 and shiftable member 40' in a selected position with respect to the pins carried by the disc-like plate 28'.

An operating circuit for the motor 26' which is connected to the plate 28' by the drive shaft 27', is shown as comprising the source of potential 56', the mercury switch 25', a relay 92 comprising a winding or coil 93 and a normally open switch 94 and a pair of switches 95 and 96 operated by a control arm 97 engageable with the cam 55' of the plate 28'. The switch cooperates with the mercury switch 25' to control operation of the relay coil 93, and the switch 96 is a holding switch similar to the holding switch 53 to maintain the motor 26' energized until the control arm 97 is engaged by the cam portion 55' to deenergize the motor 26' when the shiftable member 40' and both pins on the plate 28' are in relative positions permitting shifting of the member 40'. As shown, the mercury switch 25' relay coil 93 and switch 95 are serially connected in a lead 98 connected at one end to the battery 56' and grounded as indicated at 99. The battery 56' is also grounded as indicated at 57' to complete the circuit through said relay coil 93. The relay switch 94 and motor 26' are serially connected in a lead 100 which extends from the lead 98 between the mercury switch 25' and relay coil 93 the opposite end of the lead 98 being grounded as at 101. The holding circuit for the motor 26' includes the switch 96 which is interposed in a lead 102 that is connected at one end to the lead 98 between the source of potential 56' and the mercury switch 25', and at its other end to the motor 26' as indicated at 103. Obviously, the mercury switch 25' is controlled in the same manner as the switch 25, showing of the selector switches and solenoids thereof being omitted.

My novel disc-like plate and pitman arrangement has been shown and described as a power transmission mechanism for vending and dispensing machines as an example of the use for which the same is adapted. However, the device is capable of application to various machines requiring the peculiar movements achieved by instant structure. It will be further noted that, if desired, the pitman 29 may be utilized as the driving member from a suitable pair of spaced prime movers, not shown, to impart rotary movement to the disc-like plate 28.

While I have shown and described a commercial embodiment of my novel device, and a single modification thereof, it will be understood that the same is capable of further modification without departure from the spirit and scope of the invention as defined in the claims.

What I claim is:

1. In a power transmission mechanism, a power driven rotatable plate and a cooperating pitman, a pair of diametrically opposed pins on said plate, a generally elliptical pin engaging member, means mounting said member on said pitman for shifting movements longitudinally thereof, opposed arcuate edges of said member defining opposed recesses each receiving a different one of said pins upon shifting movements of said member in opposite directions relative to said pitman, mechanism for imparting movement to said member to move one of said recesses out of engagement with the cooperating pin and the other of said recesses into engagement with its cooperating pin when the recesses and pins are in registration to shift the field of movement of said pitman in a direction longitudinally thereof, and means for restraining said pin engaging member against shifting movements when either of said recesses is out of registration with the cooperating pin, said means comprising spaced arcuate confining guide flanges on said plate engageable with the arcuate edges of said pin engaging member during rotation of the plate and inoperatively spaced therefrom when said recesses are in register with the respective pins, one of said flanges being concentric with one of said pins, another of said flanges being concentric with the other of said pins with each of said pins cooperating with a different one of said flanges to restrain said pin engaging member against said shifting movement.

2. The structure defined in claim 1 in which one of said flanges is relatively long, another thereof being relatively short, and in further combination with a guide pin removably secured to said plate on the circumferentially extended arc of said relatively short flange in circumferentially spaced relation thereto, whereby removal of said guide pin permits shifting movements to be imparted to said pin engaging member when the disengaged pin is out of registration with the respective recess and also out of engagement with the cooperating arcuate surface of said pin engaging member to enable said pitman and pin engaging member to be removed from engagement with said plate in a direction transversely of the axis of said plate.

3. The structure defined in claim 1 in which said mechanism for imparting movement to the pin engaging member includes solenoid means mounted on said pitman and cooperating armature structure operatively coupled to said pin engaging member and movable in opposite directions by said solenoid means.

4. In a power transmission mechanism, a plate element and a cooperating pitman element movable relative to the plate element, a pair of pivot pins mounted on one of the said elements, said pivot pins being fixed in spaced relationship to each other relative to the direction of movement of said pitman element, a pin engaging member, means mounting said pin-engaging member on the other said element for shifting movement thereon relative to the pivot pins to a plurality of operative positions, said pin engaging member having a pair of pin-receiving recesses in spaced relationship to each other relative to the direction of movement of said pitman element, one of said pins being received in one of said recesses upon shifting movement of the pin engaging member to each of the operative positions, and mechanism for imparting shifting movement to said pin engaging member between the operative positions to move one of said recesses out of engagement with the cooperating pin and the other recess into engagement with the other pin to shift the effective field of movement of said pitman element between a neutral zone and spaced operative zones.

5. In a power transmission mechanism, a power driven disc and a cooperating pitman, a pair of pins positioned in diametrically opposed relationship to each other on said disc, a pin engaging member mounted on said pitman for shifting movement thereon generally longitudinally thereof, said pin engaging member having a pair of spaced recesses each for receiving a different one of the pins upon shifting movement of the pin engaging member in opposite directions relative to the pitman, and mechanism for urging one of the recesses of the pin engaging member out of engagement with one of the pins and the other recess into engagement with the other pin to shift the effective field of movement of said pitman between spaced operative zones.

6. In a power transmission mechanism, a plate element and a cooperating pitman element movable relative to the plate element, a pair of pivot pins mounted on one

of the said elements, said pivot pins being fixed in spaced relationship to each other relative to the direction of movement of said pitman element, a pin engaging member movably mounted on the other said element for shifting movement relative to the pivot pins to a plurality of operative positions, said pin engaging member having a pair of recesses in spaced relationship to each other relative to the direction of movement of said pitman element, one of said pins being received in one of said recesses upon shifting movement of the pin engaging member to each of the operative positions, mechanism for urging said pin engaging member between the operative positions to move one of said recesses out of engagement with the cooperating pin and the other recess into engagement with the other pin to shift the effective field of movement of said pitman element between a neutral zone and spaced operative zones, and guide means on the said one element for engaging the pin engaging member to enable the shifting movement of the member only when the pins are positioned to be engaged by the recesses.

7. In a power transmission mechanism, a power driven rotatable disc and a cooperating pitman, a pair of pins positioned in diametrically opposed relationship to each other on said disc, a pin engaging member mounted on said pitman for shifting movement thereon generally longitudinally thereof, said pin engaging member having a pair of spaced recesses each for receiving a different one of the pins upon shifting movement of the pin engaging member in opposite directions relative to the pitman, mechanism for imparting shifting movements to said pin engaging member to move one of the recesses of the pin engaging member out of engagement with one of the pins and the other recess into engagement with the other pin to shift the effective field of movement of said pitman between spaced operative zones, and guide means on said disc for engaging the pin engaging member to confine said member against shifting movement during rotation of the disc and enabling such shifting movement only when the pins are positioned to be selectively engaged by the recesses of the pin engaging member.

8. In a power transmission mechanism, a plate element and a cooperating pitman element movable relative to the plate element, a pair of pivot pins mounted on the plate element in spaced relationship to each other relative to the direction of movement of the pitman element, a shiftable device movably mounted on the pitman element for shifting movement relative to the pivot pins to a plurality of operative positions to selectively engage the pivot pins, and mechanism for moving the shiftable device out of engagement with one of the pivot pins in one selected operative position and into engagement with the other pivot pin in another operative position to shift the effective field of the pitman element between spaced operative zones.

9. The structure defined in claim 8, in further combination with means on the plate element for engaging the shiftable device to enable the shifting movement of the shiftable device only when the pivot pins are positioned to be selectively engaged by the shiftable device.

10. In a power transmission mechanism, a rotatable plate element and a linkage operatively coupled to the plate element, said linkage including a pitman movable relative to the plate element, a shiftable element mounted on said pitman for movements relative thereto and selectively engaging spaced elements mounted on said plate element at points longitudinally spaced with respect to the direction of power transmitting movement of said pitman, a pin connected to said shiftable element and mounted on said pitman in spaced generally parallel relation thereto for shifting movements in opposite directions longitudinally thereof, and a latch bolt projecting laterally outwardly of said pin, said pitman defining latch bolt receiving recesses for locking said pin and shiftable element at opposite ends of the shifting movement thereof.

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