Aug. 21, 1962 R. S. KEMP 3,050,168

COIN CONTROLLED COMMODITY VENDING APPARATUS

Filed Sept. 8, 1959 4 Sheets-Sheet 1

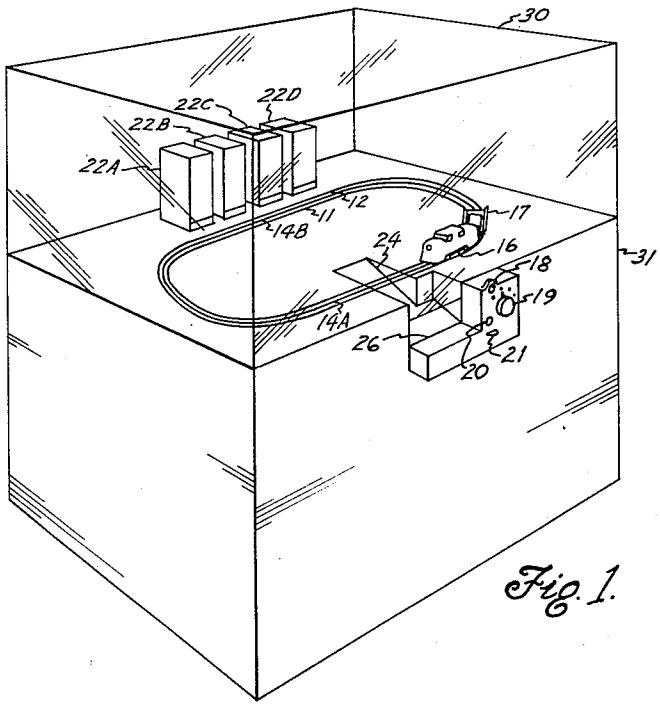


Fig. 1.

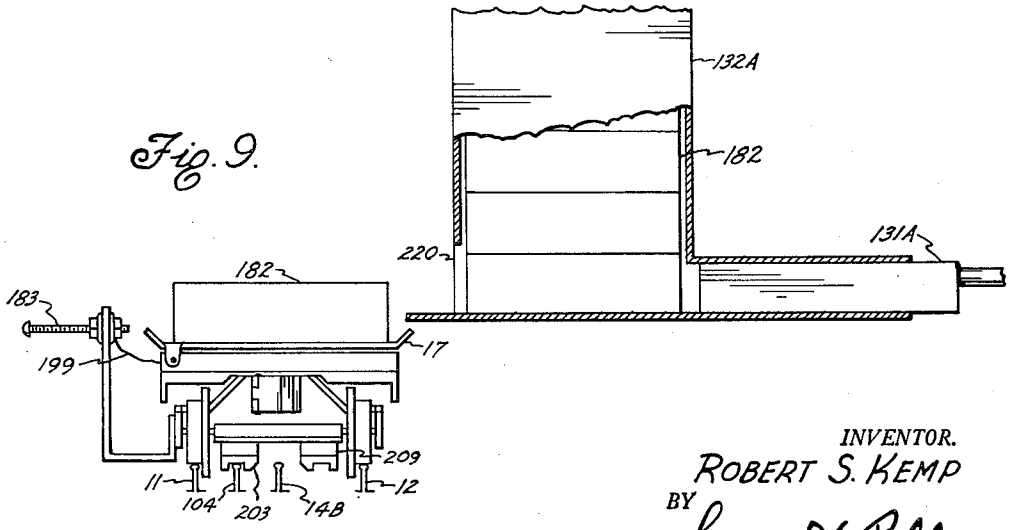


Fig. 9.

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COIN CONTROLLED COMMODITY VENDING APPARATUS

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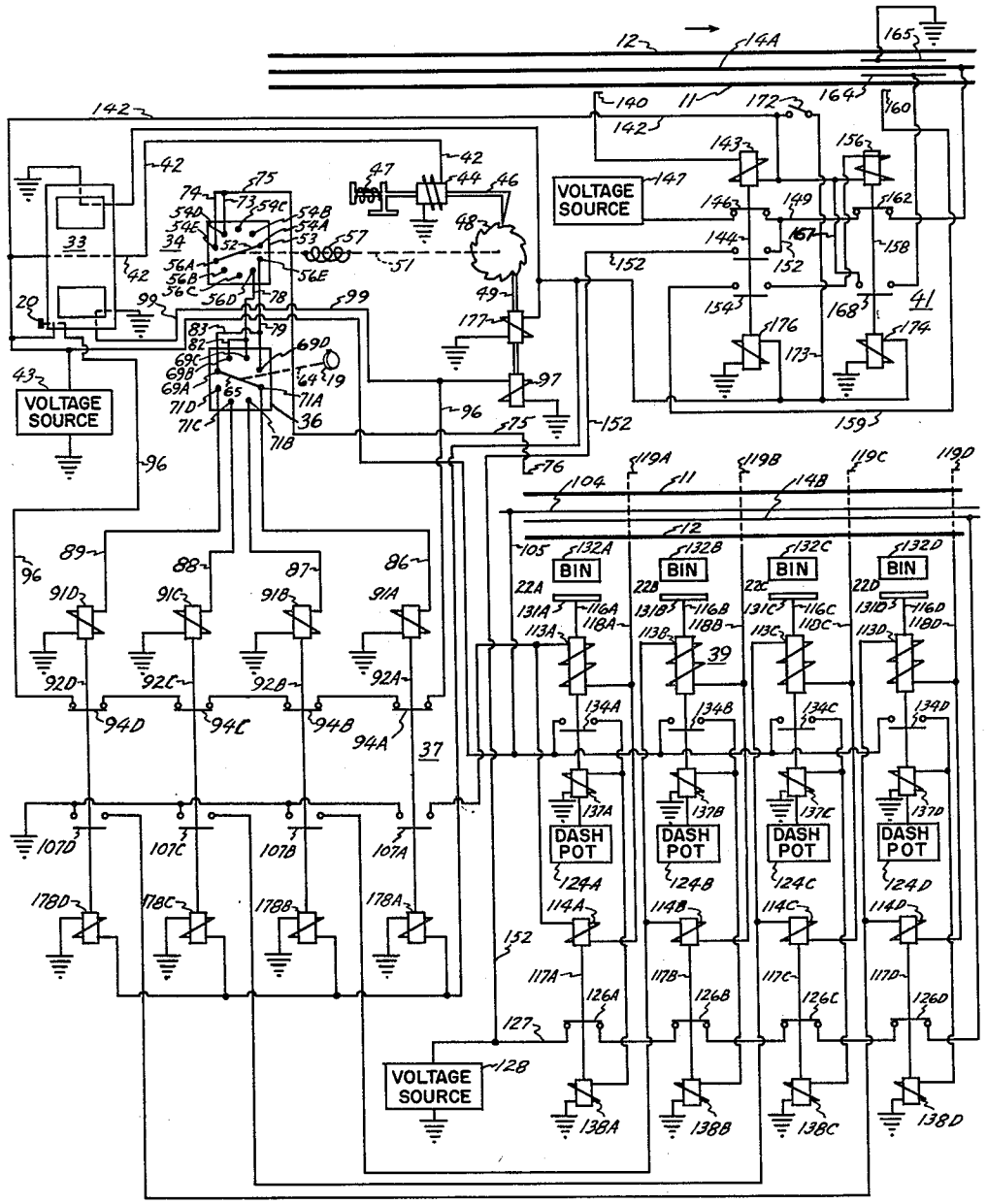


Fig. 2.

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COIN CONTROLLED COMMODITY VENDING APPARATUS

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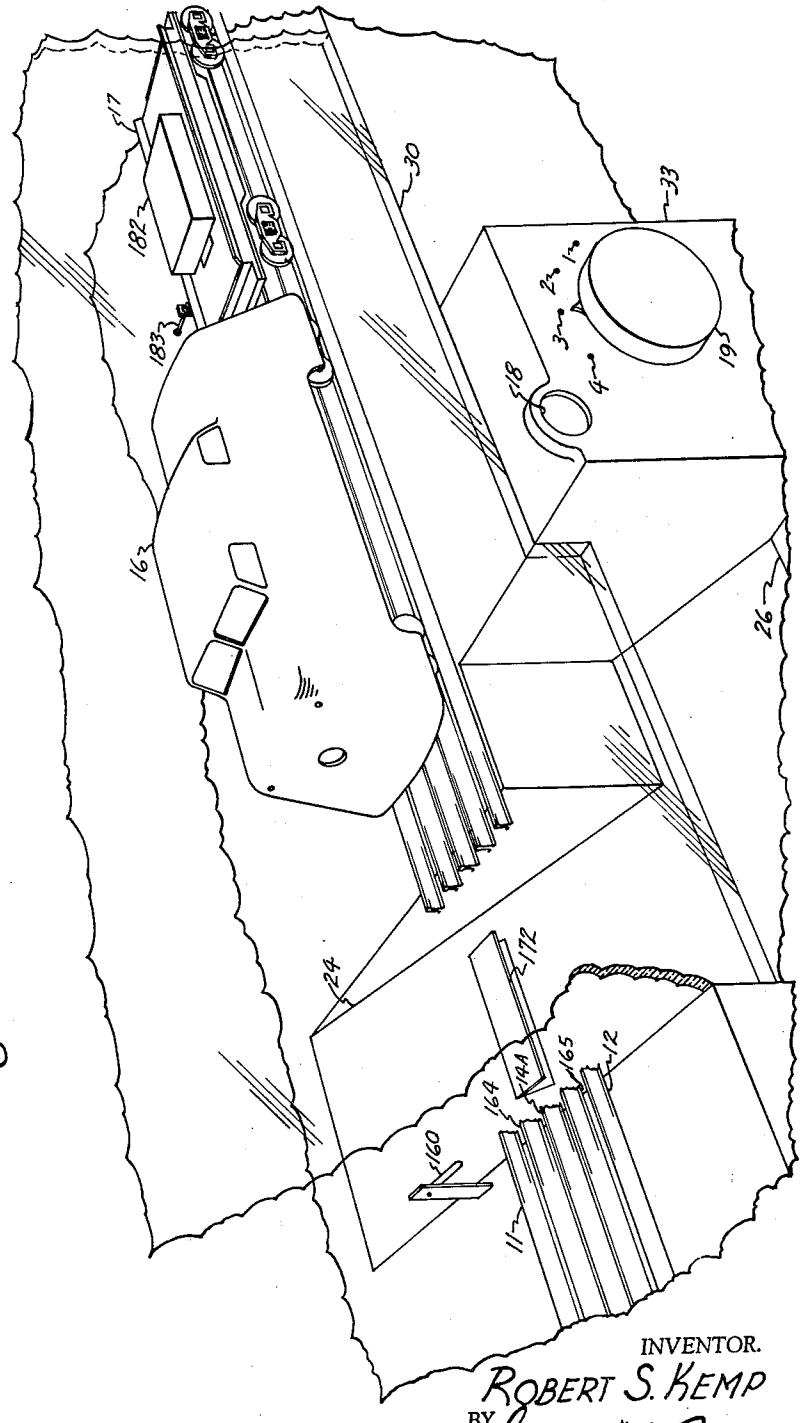


Fig. 3.

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COIN CONTROLLED COMMODITY VENDING APPARATUS

Filed Sept. 8, 1959 4 Sheets-Sheet 4

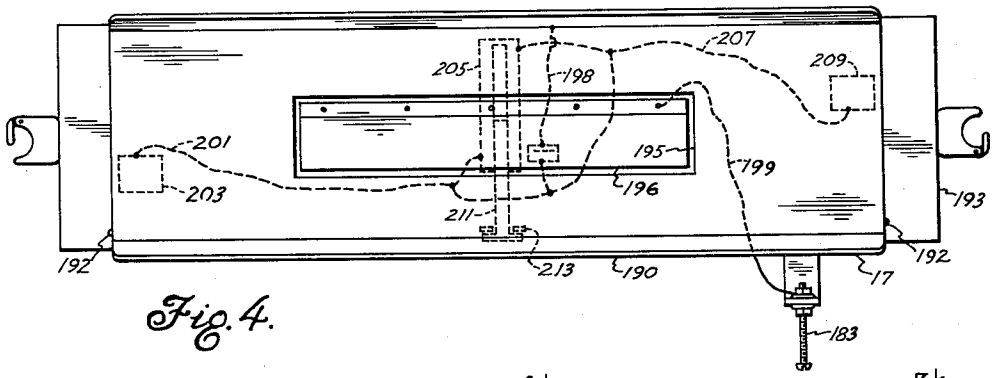


Fig. 4.

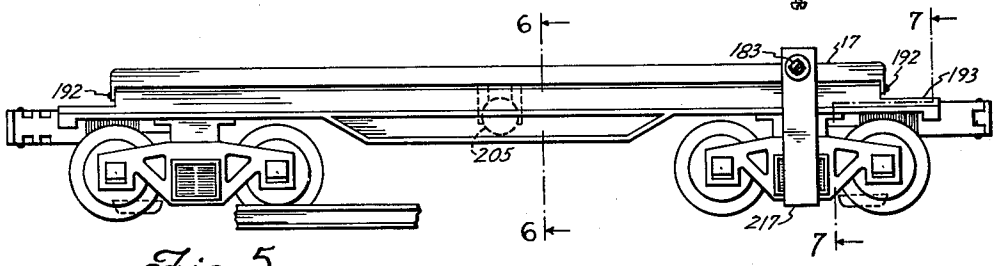


Fig. 5.

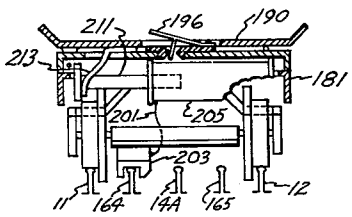


Fig. 6.

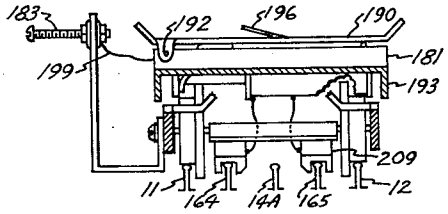


Fig. 7.

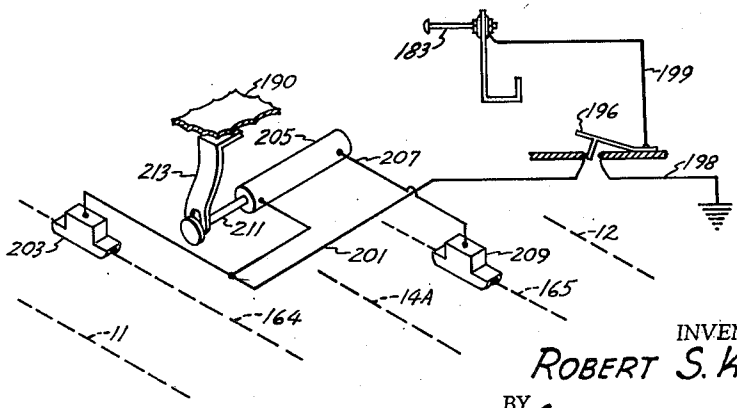


Fig. 8.

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United States Patent Office 3,050,168 Patented Aug. 21, 1962

3,050,168

COIN CONTROLLED COMMODITY VENDING APPARATUS

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Filed Sept. 8, 1959, Ser. No. 838,503
8 Claims. (Cl. 194—10)

The present invention relates to an improved coin controlled vending apparatus and more particularly to a vending apparatus in which an electrical train arrangement dispenses selected commodities.

An object of the present invention is to provide an improved automatic commodity vending apparatus.

Another object is to provide an improved automatic vending apparatus that attracts customers.

A further object of the present invention is to provide an improved automatic commodity vending apparatus that attracts customers by interest in its operation.

These and other objects are achieved in a preferred embodiment of my invention in which an electrical engine pulls a commodity carrying car in cyclic fashion past a dispensing station and a plurality of loading stations, all of which are adjacent the track. When a customer deposits coins and operates a selector mechanism, a circuit is completed that stops the train at the loading station having the commodity that was selected. After the commodity is loaded, the engine automatically starts and pulls the car to the dispensing station where the commodity is dumped into a chute that carries it to the customer.

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of a preferred vending apparatus embodiment of the present invention;

FIG. 2 is a circuit diagram of a preferred vending control circuit for the present invention;

FIG. 3 is a perspective view of the electrical train at the dispensing station;

FIG. 4 is a top plan view of a commodity carrying car;

FIG. 5 is a side view of the car illustrated in FIG. 4;

FIG. 6 is a cross-sectional view of the car illustrated in FIG. 5 taken along the line 6—6 in the direction of the arrows;

FIG. 7 is a cross-sectional view of the car illustrated in FIG. 5 taken along the line 7—7 in the direction of the arrows;

FIG. 8 is a circuit diagram of a preferred unloading device embodiment for the car; and

FIG. 9 is an enlarged sectional view of a portion of a loading station with the car at the station.

In the preferred vending apparatus embodiment of FIG. 1, a single track layout is illustrated as comprising an inner rail 11, an outer rail 12, and a center rail of at least two energized segments 14A and 14B, each segment of which with the adjacent rails 11 and 12 forms a "block."

The train comprises an electrical engine 16 for pulling a single car 17 carrying the selected commodity. If desired, other cars may be included such as for decorative effects.

The manual control elements, which are placed within easy reach of and accessible to the customer, include a coin slot 18, a commodity selector knob 19, a coin return button 20, and a coin return slot 21.

A plurality of loading stations 22A, 22B, 22C, and 22D, respectively containing supplies of the several commodities that can be selected, are positioned adjacent the section of track having the center rail 14B, while the dispensing station, which includes a chute 24 and a recess 26, is positioned alongside the section of track with center rail 14A.

The top of the vending apparatus is preferably a transparent barrier 30 which may be formed of glass or plastic and which prevents the customers from touching the train or removing packages of cigarettes, while permitting them full view of the train operation. The control circuits are housed in a lower enclosure 31.

In the circuit diagram of FIG. 2, which is a preferred embodiment of the control circuit for the present invention, the principal components are: a coin receiving and value sensing device 33, a value accumulating switch arrangement 34, a commodity selector arrangement 36, a relay circuit 37, a commodity loading arrangement 39, and a dispensing station 41.

The coin receiving and value sensing device 33, which is illustrated only in block diagram form since suitable devices are well known in the art, transmits signal pulses to other circuit components as a function of the value of coins deposited. Also, it returns the deposited coins if the coin return button 20 is pressed prior to the start of operations in the control circuit. After the commodity has been delivered, device 33 deposits the coins into a receptacle.

The value accumulating switch arrangement 34, which is energized by signal pulses from device 33, produces different current path connections depending upon the value of the coins deposited in device 33. These current paths can be placed in series with certain individual current paths associated with commodity selector arrangement 36, the particular ones depending upon the operation of knob 19. The two current paths are connected in series when the operation of the commodity selector arrangement 36 corresponds to that of value accumulating switch arrangement 34, and they thus form a circuit that can be completed by a train to one of a plurality of relays in relay circuit 37, which relay circuit controls the operation of commodity loading arrangement 39. Specifically, a relay is energized to complete a circuit for the energization of the loading station in arrangement 39 containing the commodity selected by the customer. After these circuits have been completed the train automatically stops in front of this station, the commodity is loaded onto car 17, and the circuits are automatically completed for the reenergization of engine 16.

When the loaded train passes in front of dispensing station 41, engine 16 is deenergized and the train stops. The commodity is then dumped into dispensing chute 24, after which engine 16 is reenergized and the control circuit is returned to its initial condition.

Referring to the principal components now in more detail, device 33 controls the energization of a lead 42 by a voltage source 43 that may, for example, supply a direct voltage of 30 volts. When a coin is deposited of the lowest denomination that device 33 accepts, a circuit is completed from voltage source 43 causing a voltage pulse to be applied to lead 42. If device 33 receives coins of different denominations, the number of pulses applied corresponds to the value of the deposited coin as compared to the lowest acceptable denomination of coin. For example, if device 33 accepts nothing smaller than nickels, a single voltage pulse may be applied to lead 42 when a nickel is deposited; when a dime is deposited, two voltage pulses are applied to lead 42, and when a quarter is deposited, five voltage pulses are applied.

The voltage pulses on lead 42 are conducted to a drive solenoid 44 around a pawl 46. Each time drive solenoid 44 is energized, the solenoid action predominates over the force of a biasing spring 47, causing pawl 46 to engage a ratchet wheel 48. Then when the voltage pulse subsides, spring 47 forces pawl 46 to return, and in so doing to rotate ratchet wheel 48 in a counter-clockwise direction

to a new position in which it is maintained by a stop pawl 49. Thus, device 33 produces rotation of ratchet wheel 48 through an angle the magnitude of which depends upon the total amount deposited.

Ratchet wheel 48 is connected by a drive shaft 51, in dotted-line form, to a wiping-type switch arm 52 in a multi-terminal value accumulating switch 53. As wheel 48 rotates, arm 52 is driven into successive engagement at one end with one set of terminals 54A, 54B, 54C, 54D, and 54E and at the other end with another set of terminals 56A, 56B, 56C, 56D, and 56E. The number of terminals in each set is, for the above mentioned application of voltage pulses, preferably at least equal to the maximum number of voltage pulses produced by device 33 in one operation. For example, if device 33 accepts nickels, dimes, and quarters, it produces a maximum of five voltage pulses for any one operation in which case there are preferably at least five terminals in each of these sets.

When stop pawl 49 disengages ratchet wheel 48, a biasing spring 57, which urges shaft 51 in the clockwise direction, returns wheel 48 and switch arm 52 to their initial or "no value" positions.

In the commodity selector arrangement 36, commodity selector knob 19 is connected by a drive shaft 64 to a wiping type switch arm 65 in a multi-terminal commodity selector switch 67. Knob 19, depending upon its position, causes switch arm 65 to make connections between opposed terminals of one set 69A, 69B, 69C, and 69D and those of another set 71A, 71B, 71C, and 71D. Each of these sets should have as many terminals as there are different commodities that can be selected, here assumed to be four.

Some of the terminals of switches 53 and 67 form ends of current paths. In one current path, terminals 54D and 54E of switch 53 are connected by leads 73 and 74, respectively, to a lead 75 and through lead 75 to an unloaded car sensing element illustrated as a contact finger 76 that can be positioned alongside the track at nearly any point for sensing the unloaded condition of car 17. Preferably, it is positioned a short distance from the commodity loading arrangement 39 in a direction opposite to that of the movement of the train so that the train passes it immediately before arriving at the commodity loading arrangement 39. There are as many leads from switch 53 to finger 76 as there are different priced commodities, and these leads are connected from the terminals of the set 54 corresponding to these priced commodities. If value accumulating switch arm 52 has an initial position on terminal 54A, and if device 33 accepts nickels but not pennies, then terminal 54B corresponds to a nickel commodity, terminal 54C to a dime commodity, terminal 54D to a fifteen cent commodity, and terminal 54E to a twenty cent commodity. For the purposes of this explanation, it is assumed there are only two different priced commodities: fifteen cent and twenty cent and thus leads extend to contact finger 76 from only terminals 54D and 54E.

Terminals 56D and 56E of value accumlating switch 53 are connected, respectively, by leads 78 and 79 to terminals 69C and 69D of switch 67. Also, a jumper lead 82 extends from lead 78 to terminal 69B and another jumper lead 83 from lead 79 to terminal 69A. These jumper leads interconnect terminals of commodity selector switch 67 corresponding to the same priced commodities which for the illustrated arrangement are twenty cents for terminals 69A and 69D and fifteen cents for terminals 69B and 69C. It is to be realized, however, that the number of commodities of any one price and the number of different priced commodities are not limited except by the number of terminals that conveniently can be placed in a switch.

Switch terminals 71A, 71B, 71C, and 71D are connected by leads 86, 87, 88, and 89, respectively, to lift solenoids 91A, 91B, 91C, and 91D, mounted, respectively, on relay armatures 92A, 92B, 92C, and 92D, of the loading station control relays in relay circuit 37. These relays are of the bi-positional type: i.e., armatures 92A, 92B, 92C, and 92D, each have two stable positions.

A plurality of coin return control circuit switch arms 94A, 94B, 94C, and 94D are mounted, respectively, on relay armatures 92A, 92B, 92C, and 92D. Before energization of lift solenoids 91A, 91B, 91C, and 91D, these armatures are in a down position in which they complete a current path from coin return button 20, through a lead 96 to a release solenoid 97 on stop pawl 49. Then when button 20 is pressed, release solenoid 97 is energized causing armature 49 to disengage from wheel 48 and thereby permit the biasing spring 57 to return the value accumulating switch arm 52 to its initial position.

A lead 99 also conducts current from the coin return circuit to a coin return mechanism in device 33 which when energized causes the coins to be dropped into coin return slot 21, illustrated in FIG. 1. Up until the time one of the lift solenoids 91A, 91B, 91C, or 91D is energized, the customer can obtain his coin by pressing button 20.

The energization circuit for one of the lift solenoids 91A, 91B, 91C, and 91D is completed when unloaded car sensing element or contact finger 76 is engaged by and senses a predetermined condition of a circuit closing means illustrated as a conductor 183 carried by the train, as later described. Contact finger 76 is adjacent a section of track at which an auxiliary rail 104 is connected by a lead 105 to voltage source 43. When the train with an empty car passes over rail 104, finger 76 is engaged by the contact finger engageable bolt 183 and is connected through a switch circuit, that is closed when the car is empty, to a rail shoe riding on auxiliary rail 104. Thus, when this contact finger engageable bolt engages finger 76, finger 76 senses the unloaded or empty condition of this car and if the car is empty, current from source 43 flows through switches 53 and 67 to energize one of the start solenoids 91A, 91B, 91C, and 91D, providing, of course, that a correlation exists between switch arms 52 and 65 such that a current path extends to one of these solenoids.

Each relay in circuit 37 controls the operation of a different loading station in arrangement 39, which are at least equal in number to the commodities to be dispensed. Since the operation is identical for each relay and loading station, the following discussion is directed to only one relay and loading station.

A loading station control switch arm 107A is mounted on relay armature 92A for controlling the grounding through a lead 108A of ends of drive solenoid 113A and lift solenoid 114A mounted, respectively, around a loading armature 116A and a track voltage control armature 117A in loading station 22A. The other ends of solenoids 113A and 114A are connected by lead 118A to a train stopping contact finger 119A positioned along the track. These solenoids are actuated when the contact finger 119A is engaged by the aforementioned contact finger engageable bolt, if the bolt is connected to a rail shoe 203 (described later) that rides on energized auxiliary rail 104. Since, as will be shown, this connection is established when, and only when, the car is not loaded, finger 119A serves as an energizing and sensing element responsive to the arrival of an unloaded car.

Loading armature 116A reacts more slowly to solenoid action than does track voltage control armature 117A due to the action of a dashpot 124A connected to armature 116A. However, if armature 116A and its associated moving parts have sufficient mass to produce the desired lag in movement, a dashpot is not required. Track voltage control armature 117A should react faster since it deenergizes center rail 14B and thus stops the train, while loading armature 116A loads car 17, which loading should occur after the train has stopped.

A low voltage switch arm 126A mounted on armature 117A controls the energization of center rail 14B through

a lead 127 from a reduced voltage source 128 that produces a low voltage—e.g. 9 volts—sufficient only to move the train slowly through the block in front of the loading stations. When lift solenoid 114A is energized, which occurs when finger 119A is energized and providing the corresponding relay in circuit 37 has been energized, the track energizing control armature 117A raises thereby opening the circuit to center rail 14B and stopping the train in front of loading station 22A.

At the same time that solenoid 114A is energized, drive solenoid 113A is also energized thus causing loading armature 116A to move forward, but with a time delay due to the action of dashpot 124A. When loading armature 116A moves forward, a plunger 131A mounted upon it engages a single commodity in a bin 132A, such as a single pack of cigarettes, and pushes this commodity onto the empty car 17. At the same time an armature return switch arm 134A mounted on loading armature 116A completes a circuit from a voltage source 43 through lead 105 and a lead 136 to a return solenoid 137A mounted on armature 116A and a return solenoid 138A mounted on armature 117A. The resulting solenoid action returns loading armature 116A and track voltage control armature 117A to their initial positions, the latter movement of which causes low voltage switch arm 126A to close the energizing circuit to center rail 14B to thereby reenergize engine 16.

What has been stated above with reference to loading station 22A applies as well to the operation of stations 22B, 22C, and 22D. The particular station operated depends upon which loading station control relay in circuit 37 is energized, which, in turn, depends upon the settings of switches 53 and 67, as has been explained.

From the above explanation it is seen that the depositing of coins in device 33 along with the operation of the commodity selector switch 67 results in the stopping of the empty train in front of the loading station having the selected commodity. This station automatically loads the commodity on the train, and after the train has been loaded, it energizes the train for travel to the dispensing station which is positioned alongside the block having center rail 14A.

When the train approaches the dispensing station 41 the contact finger engageable bolt 183 on car 17 engages a loaded car sensing element, illustrated as a speed retarding contact finger 140, and when car 17 is loaded, grounds it. This grounding completes a circuit from voltage source 43 through lead 142 to a lift solenoid 143 around a track voltage control armature 144 that then raises. This raising opens a series circuit that includes a full voltage switch arm 146 mounted on armature 144, a high voltage source 147, a lead 149, and the center rail 14A. The voltage from source 147, applied to center rail 14A, energizes the train to the maximum desired speed, but when voltage control armature 144 raises, the full voltage switch arm 146 opens this circuit and at the same time a reduced voltage switch arm 151 closes a circuit from reduced voltage power source 128 through a lead 152 to lead 149 and center rail 14A. This produces a reduced voltage on center rail 14A causing the train to decelerate and operate at slow speed.

The raising of track voltage control armature 144 also closes a circuit setting switch arm 154 in a current path extending from lead 142 through a train stopping solenoid 156 on a track energization control armature 158, and through a lead 159 to a sensing element, illustrated as a train stopping contact finger 160, positioned adjacent dispensing chute 24 at the dispensing station 41. When the grounded contact engageable bolt 183 on the loaded car 17 engages finger 160, which occurs when the loaded car is at the dispensing station 41, solenoid 156 is energized, armature 158 raises and a voltage interrupting switch arm 162 on armature 158 opens the energizing circuit to center rail 14A.

The lifting of track energization control armature 158 also produces energization from source 43 of one of a pair of auxiliary rails 164 and 165. Voltage is applied to rail 164 through lead 142 and a lead 167, through a switch arm 169 on armature 158, and through another lead 170. Rail 165 is permanently grounded. The energization of rail 164, as will be explained in the discussion of FIG. 6, energizes a dumping mechanism which dumps the commodity into dispensing chute 24.

In sliding down the chute 24, the commodity momentarily closes a commodity switch 172 and produces a current flow from source 43 through lead 142 and a lead 173 to a return solenoid 174 on track energization control armature 158. The resulting solenoid action returns armature 158 to its initial position thereby causing voltage interrupting switch arm 162 to close a circuit to center rail 14A to reenergize engine 16. Also, the circuit to auxiliary rail 164 is opened, thereby deenergizing the dumping mechanism.

Current also flows through commodity switch 172 to an armature return solenoid 176 on armature 144 to produce closing of the circuit from the relatively high voltage source 147 to center rail 14A, and at the same time the opening of the circuit from the relatively low voltage source 128. The then fully energized train moves away from station 41 at full speed. Also, the circuit to train stopping solenoid 156 is opened, which opening prevents the stopping of the train until the next cycle of operation.

With the closing of commondity switch 172, an unlocking solenoid 177 on stop pawl 49 is also energized to withdraw pawl 49 from engagement with wheel 48 to permit spring 57 to return the value accumulating switch arrangement 34 to its initial condition.

When commodity switch 172 closes, it also completes circuits to return solenoids 178A, 178B, 178C, and 178D in the relay circuit 37, the only effect of which is the lowering of the one raised armature, which for this discussion is assumed to be armature 92A. Thus, the relay circuit 37 is returned to its initial condition.

Finally, the closing of commodity switch 172 also completes a circuit from lead 173 through a lead 179 to the coin release mechanism in device 33, which mechanism then drops the deposited coins into a receptacle.

From the above explanation, it is seen that when the commodity slides down chute 24 and closes commodity switch 172, the control circuit is returned to its initial condition ready to respond again to the depositing of a new set of coins in device 33 and to appropriate operation of the knob 20.

In FIG. 3 the train is illustrated as approaching the dispensing station 41 with a package of cigarettes 182 on car 17. Attached to car 17 is a contact finger engageable bolt 183, so positioned on the car as invariably to engage contact finger 160 as well as fingers 76, 140, 119A, 119B, 119C, and 119D (all illustrated in FIG. 2) each time the car arrives at the respective position of each of the fingers. The contact finger 160 is positioned such that when bolt 183 engages it, thereby causing the deenergization of center rail 14A, the car 17 stops in front of dispensing chute 24.

In FIGS. 4 through 8 are various views of a flat car 17 that is described and claimed in my copending application Serial No. 805,037, filed April 8, 1959. In the top view of FIG. 4 a car bed 190, hinged at one side by pins 192 to the car body 193, has a centrally positioned aperture 195 in which a switch armature plate 196 is mounted to be depressed by a commodity when one is on the bed 190. The closing of switch 196 completes a connection from a grounded wheel of the car 17 or from a grounded portion of the car body 193, through a lead 198, and through another lead 199 to contact finger engageable bolt 183 (these connections are best seen in FIG. 8). Therefore, when the car is loaded, bolt 183 is at ground potential.

If the car bed 190 is empty, switch 196 raises by its

own spring action to complete a connection between bolt **183**, through lead **199**, and a lead **201** to a rail shoe **203**. Bolt **183** is then no longer grounded and has no effect on the dispensing station arrangement **41**. Actually, as is mentioned in the following paragraph, there is always a ground connection to bolt **183** through a dump solenoid, but the impedance of this solenoid is sufficient to prevent a significant current flow to ground when switch **196** is in a raised position.

When car **17** with the package **182** of cigarettes arrives at the dispensing station **41**, bed **190** is tilted to dump the commodity into the dispensing chute **24**. This dumping is produced upon the energization of a dump solenoid **205** (illustrated in FIGS. 4–8) that is electrically connected by a lead **207** to rail shoe **203** and to another rail shoe **209**, that are positioned to ride upon the auxiliary tracks **164** and **165**, respectively. Thus, when track **164** is energized, as previously described, current flows through solenoid **205** thereby producing a solenoid action that pulls in on an armature **211** connected through a bracket **213** to car bed **190**, which then pivots about pins **192** to dump the commodity.

FIG. 5 is a side view of car **17** illustrating the position of bolt **183**.

In the cross-sectional view of FIG. 6 the switch **196** is shown in its raised position. Also shown is rail shoe **203**. In the cross-sectional view of FIG. 7 both rail shoes **203** and **209** are illustrated.

FIG. 9 is a side view, partly in section, of one of the bins **132A** containing one of the brands of cigarettes. Bin **132A** has an aperture **220** only slightly larger than a single pack of cigarettes, thereby permitting plunger **131A** to push only one package at a time onto car **17**.

The foregoing discussion has been directed to a detailed discussion of the system circuits and components as well as their operation. In the following discussion, which is directed to the operation of the complete system, no specific mention will be made of the figures since all of them are considered.

For the purposes of this discussion assume that device **33** accepts nickels but not pennies and that there are two brands of cigarettes priced at fifteen cents and two at twenty cents. Also assume that the customer desires a twenty cent package of cigarettes corresponding to position 4 of the commodity selector knob **19**. When the customer deposits his twenty cents in coin slot **18** the voltage pulses from device **33** cause drive pawl **46** to move ratchet wheel **48** four notches. As a consequence, switch arm **52** of value accumulating switch **53** is rotated by shaft **51** into engagement with terminals **54E** and **56E**. Thereafter when the customer moves knob **20** to position 4, a current path exists from contact finger **76** through switch **53**, through lead **79**, jumper lead **83**, through switch **67** and lead **86** to the lift solenoid **91A** on armature **92A** in relay circuit **37**.

If the car **17** is empty, bolt **183** is connected to shoe **203**. Then when bolt **183** engages finger **76**, current flows from the energized auxiliary rail **104** through shoe **203**, finger **76**, and switches **53** and **67** to lift solenoid **91A**. The resulting solenoid action lifts armature **92A** and opens the coin return circuit while at the same time it closes a ground path to the solenoids **113A** and **114A** in loading station **22A**. A short time later the train is in front of station **22A** where bolt **183** engages finger **119A**. Current then flows from rail **104** through lift solenoid **114A** to cause track voltage control armature **117A** to raise and open the energizing circuit to center rail **14B**. The deenergized train stops with the car **17** in front of the bin **131A**. At the same time current flows through drive solenoid **113A** and loading armature **116A** is moved forward, but more slowly due to the action of dashpot **124A**, and plunger **132A** pushes a package of cigarettes onto the car **17**. When loading armature **116A** reaches its point of maximum forward movement it closes circuits to return solenoids **137A** and **138A** which then urge armatures **116A** and **117A**, respectively, to their initial positions. When armature **117A** returns it closes the energizing circuit to rail **14B** and the train is again put into motion.

The weight of the loaded package of cigarettes **182** on switch **196** opens the circuit from bolt **183** to shoe **203** and closes a circuit from bolt **183** to ground. Then, when the loaded train approaches the dispensing station **41** and the bolt **183** engages speed retarding contact finger **140** and grounds it, current flows from source **43** through a lift solenoid **143** on track voltage control armature **144**, which then lifts and opens the high voltage circuit to center rail **14A** while closing a low voltage circuit to it, thus causing the train to decelerate. The lifting of armature **144** also closes a current path from dispensing contact finger **160** through lift solenoid **156** to voltage source **43**. Thus, when the grounded bolt **183** engages dispensing finger **160**, solenoid **156** is energized, and track energizing control armature **158** lifts to cause the energizing circuit to rail **14A** to open and the train to stop with the car **17** by the chute **24**. The lifting of armature **158** also completes a current path to auxiliary rail **164**. Current then flows through the dump solenoid **205** on car **17**, and the commodity is dumped into chute **24**.

As the package of cigarettes **182** slides down dispensing chute **24** it closes a circuit that results in armatures **144** and **158** returning to their initial positions, which in turn reenergizes the train which then moves away from station **41**. Also, the closing of commodity switch **172** produces the return of the value accumulating switch **34** arrangement to its initial condition and the dropping of the deposited coins into a receptacle. Then the circuit is ready for another operation.

From the above, it is evident that this vending apparatus is completely automatic, requiring only the depositing of coins and the operation of the selector knob **19**. The mechanism, including the train, which accomplishes the dispensing is not only efficient, reliable and inexpensive, but inherently attractive and interesting to observe in operation. The result is a vending apparatus that operates for long periods without the necessity for frequent repairs and which attracts customers.

While only a certain preferred embodiment of this invention has been shown and described by way of illustration, many modifications will occur to those skilled in the art and it is, therefore, desired that it be understood that it is intended in the appended claims to cover all such modifications as fall within the true spirit and scope of this invention.

What is claimed as new and what it is desired to secure by Letters Patent of the United States is:

1. In a commodity vending apparatus, a train track, an electrical train on said track comprising an electrical engine and a car moved by said engine, a commodity loading arrangement adjacent said track for loading selected commodities onto said car, manual selection means for energizing said commodity loading arrangement, means responsive to the unloaded condition of said car for stopping said train before said commodity loading arrangement to permit loading of said car with a commodity corresponding to the operation of said manual selection means, a dispensing station having a dispensing chute, and means responsive to the loaded condition of said car for stopping said train at said dispensing station and for dumping said loaded commodity into said dispensing chute.

2. In a coin controlled commodity vending apparatus, a train track, an electrical train on said track comprising an electrical engine and a car moved by said engine, a plurality of commodity loading stations adjacent said track for loading commodities onto said car, manual selection means for selectively controlling the operation of said commodity loading stations, means responsive to the loaded condition of said car and the operation of said manual selection means for stopping

said train before a preselected commodity loading station, a dispensing station having a dispensing chute, unloading means for dumping a commodity from said chute, and means responsive to the loaded condition of said car for stopping said train at said dispensing station and for operation of said unloading means.

3. In a coin controlled commodity vending apparatus, a track, an electrical engine and a car moved by said engine on said track, a coin receiving device for producing output electrical signals in response to deposited coins, a first conductor adjacent said track, a first set of current paths, a value accumulating switch arrangement for making preselected connections between said first conductor and individual ones of the current paths of said first set as a function of the electrical signals from said coin receiving device, a second set of current paths, a commodity selector switch for interconnecting individual current paths of said first and second sets in response to manual operation, a loading arrangement comprising a plurality of loading stations having different commodities, said loading stations being adjacent said track, a plurality of second conductors respectively associated with and adjacent to individual ones of said loading stations, a plurality of loading means respectively associated with individual ones of said loading stations, said loading means upon energization for loading the commodities onto said car at the respective loading stations, a relay circuit comprising a plurality of relays responsive, respectively, to the energization of different ones of said current paths of said second set for making connections between said second conductor at each respective loading station and said associated loading means whereby upon energization of one of said second conductors said respective loading means is energized to load a commodity onto said car at the respective loading station, a dispensing station including a chute, said dispensing station being adjacent said track, a third conductor at said dispensing station, means for unloading said car upon energization of said third conductor, a fourth conductor on said car for engaging said first, second, and third conductors, and means associated with said car and responsive to the weight of a commodity on said car for applying a first potential on said fourth conductor when said car is empty for energizing said first and second conductors and for applying a second potential different from said first potential when said car is loaded for energizing said third conductor.

4. In a coin controlled commodity vending apparatus, a train track, a dispensing station adjacent said track, a commodity loading station adjacent said track, a self-propelled electrical train on said track and including an engine and a commodity carrying car, a stationary coin receiving and value sensing device for producing an electrical signal as a function of the value of coins deposited therein, a manually operated commodity selector switch, means responsive to the electrical signal from said device and the operation of said commodity selector switch for loading a commodity from said loading station onto said car, means responsive to the loaded condition of said car at said dispensing station for stopping said train and for unloading said commodity, and means responsive to the unloading of said commodity for starting said train.

5. In a coin controlled commodity vending apparatue, a train track, an electrical train on said track comprising an electrical engine and a car moved by said engine, a stationary coin receiving and value sensing device for producing an electrical signal as a function of the value of coins deposited therein, a first conductor adjacent said track, a second conductor adjacent said track spaced therealong from said first conductor, a third conductor on said car for engaging said first and second conductors, means responsive to electrical signals from said device for completing a first current path through said first and third conductors, means controllably connected in normally incomplete circuit with said second and third conductors for loading in response to completion of such circuit a commodity onto said car, and means responsive to completion of said first current path for completing said normally incomplete circuit when said second conductor is contacted by said third conductor.

6. In a commodity dispensing apparatus, a train track, an electric train including an engine and a car on said track, first and second electrical rail connection shoes on said car, said track comprising a first and second rail each electrically insulated from the other and individually contacted by the the respective said shoes, a contact finger on said car, two stationary contact elements adjacent said track spaced therealong and positioned for contact by said finger as said car moves on said track from one such element to the other, said car being adapted to receive a load thereon, switch means on said car responsive to a load thereon connecting said finger to said first shoe in the absence of such load and to said second shoe when said car is loaded, means comprising a circuit connected to said one element and to said first rail for depositing a load on said car in response to contact of said finger with said one element when said car is unloaded and means comprising a second circuit connected to said other element and to said second rail for removing the load from said car in response to contact of said finger with said other element when said car is loaded.

7. In a vending apparatus, a track, an electrical engine and a car moved by said engine on said track, a plurality of commodity loading stations adjacent said track for loading commodities onto said car, sensing elements individually located at said loading stations and responsive to the unloaded condition of said car, manual selection means for individually energizing said sensing elements, engine deenergizing means responsive to circuit completion through the selected energized one of said sensing elements for stopping said train at the corresponding one of said stations, circuit closing means carried by said car for completing a circuit through the sensing element energized by said manual selection means when said car is in front of said one loading station adjacent said selected energized one of said sensing means, and means responsive to said circuit closing means for loading a commodity from such one selected station onto said car.

8. The vending apparatus as defined in claim 7 and a dispensing station including a dispensing chute, dispensng sensing means for sensing the loaded condition of said car, engine deenergiziing means responsive to the circuit completion through said dispensing sensing means by said circuit closing means for stopping said train, and means for unloading a commodity from said car onto said chute.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,050,168 August 21, 1962

Robert S. Kemp

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 9, line 3, after "said" insert -- car into said --; column 10, line 19, strike out "the", second occurrence.

Signed and sealed this 4th day of December 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents