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Teichelman

[11] **3,734,344**

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[54] **COIN OPERATED ARTICLE VENDING MACHINE**

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[52] **U.S. Cl.** **221/14,** 221/22, 221/129, 221/227

[51] **Int. Cl.**.....**G07f 11/00**

[58] **Field of Search**.....221/11, 14, 22, 227, 221/129, 133

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Assistant Examiner—Thomas E. Kocovsky
Attorney—Oberlin, Maky, Donnelly et al.

[57] **ABSTRACT**

A coin-operated vending machine has a cabinet with a delivery compartment and containing a series of dispensing units, each having a magazine to contain a stack of articles to be vended supported by a platform which is elevated by an electric drive, interrupted when the top article is raised to a discharge station at a top outlet from the magazine. An ejector operates on prepayment of coins and operation of a selector switch to eject the top article from the selected magazine to the delivery compartment.

3 Claims, 8 Drawing Figures

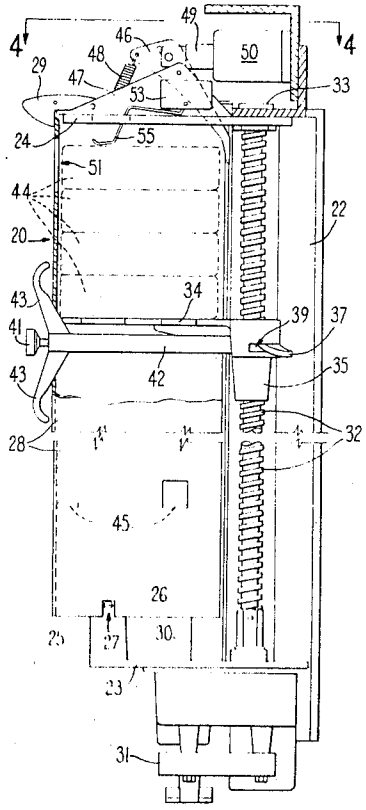


FIG. 1

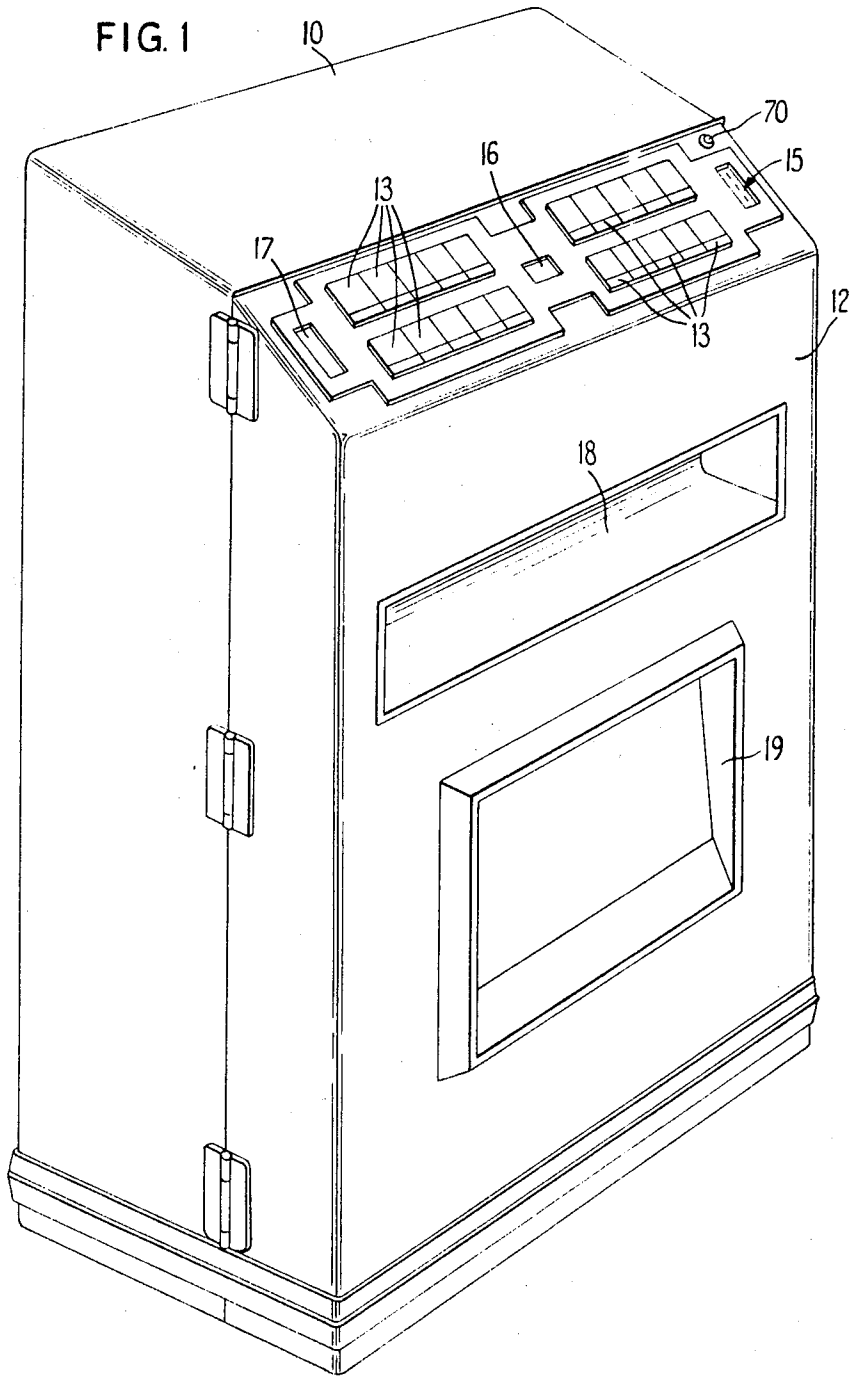
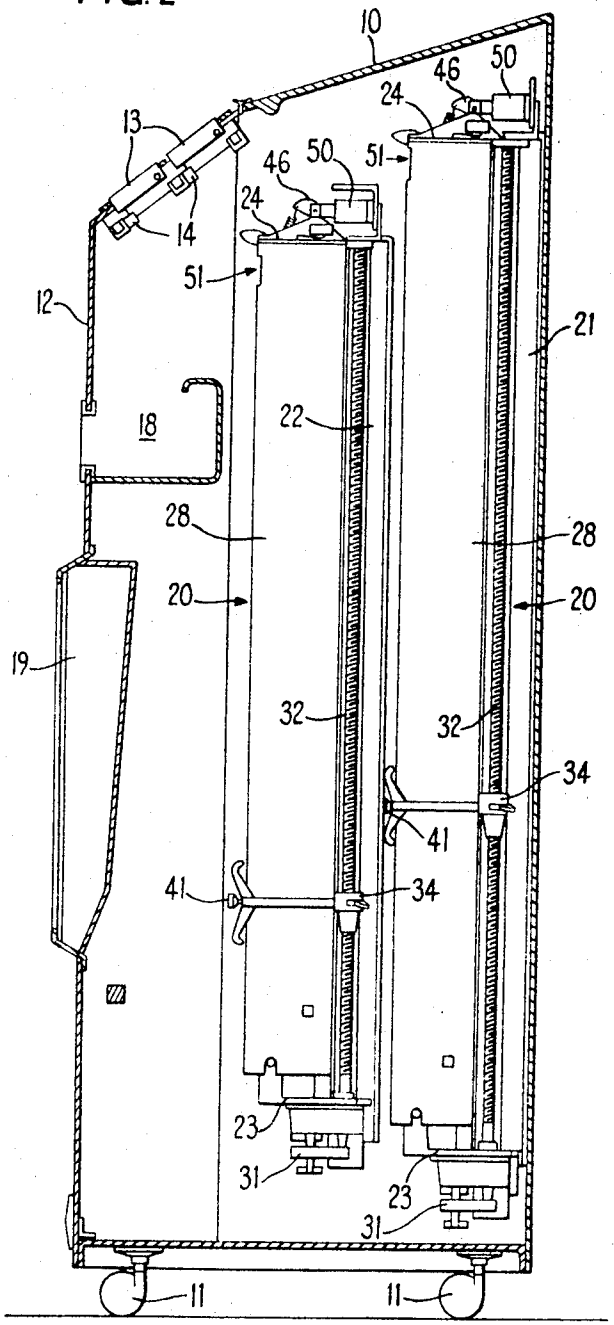


FIG. 2


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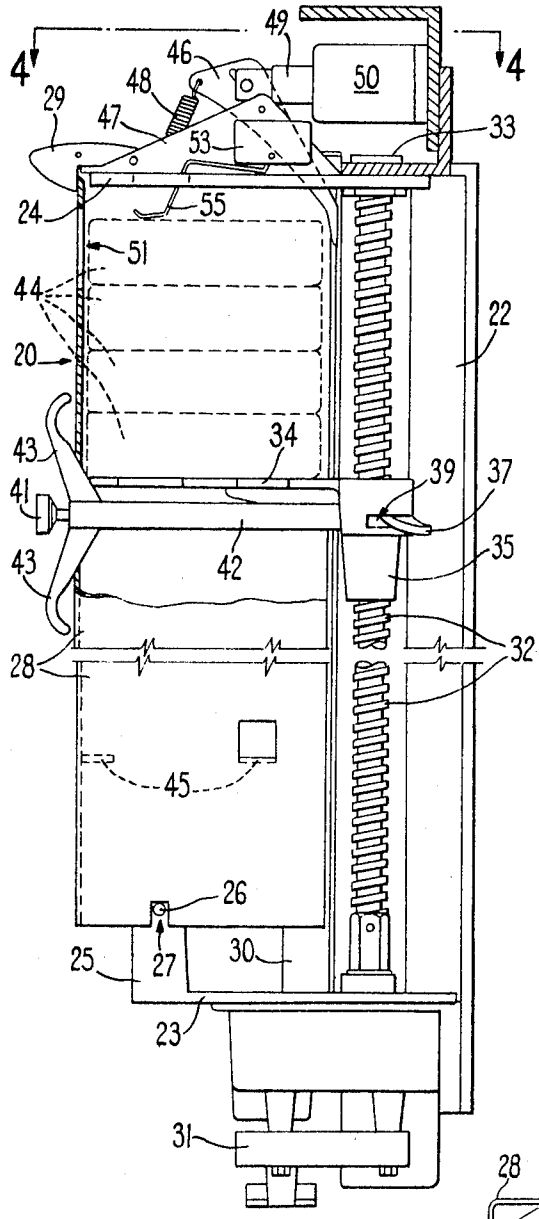


FIG. 3

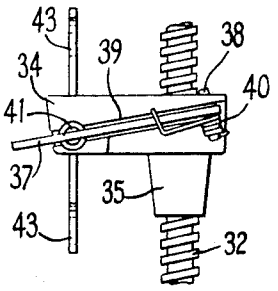


FIG. 5

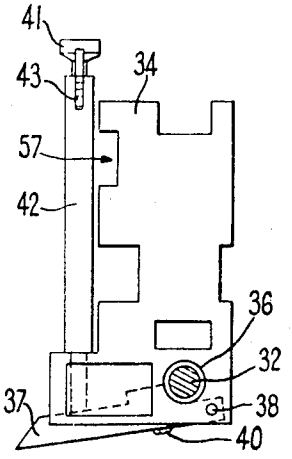


FIG. 6

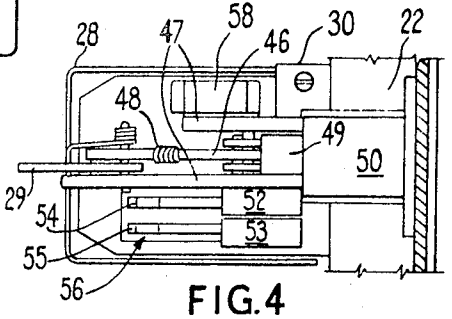


FIG. 4

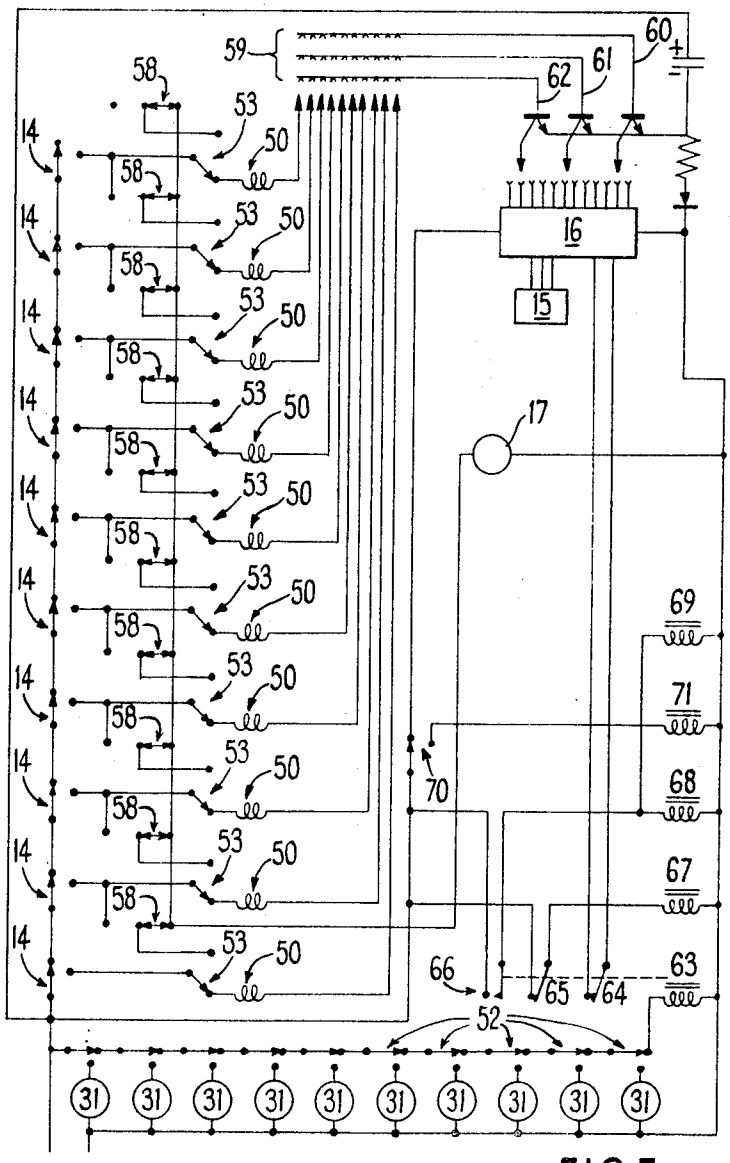

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FIG. 7

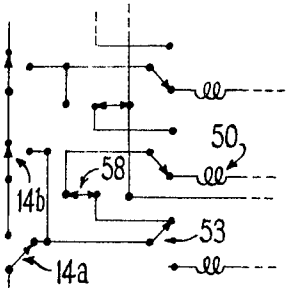

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58
14b
53
14a

FIG. 8

COIN OPERATED ARTICLE VENDING MACHINE

This invention relates to a coin-operated vending machine, of the type which will, upon insertion to the machine of a predetermined value of coins, and upon operation of a selector button by a purchaser, will vend a selected one of a number of different types of articles stored in the machine.

An object of the invention is to provide a coin-operated vending machine which is particularly quick and efficient in operation. Other objects which may be achieved by the invention are to provide such a machine which dispenses purchased articles at a conveniently high level, which includes means for automatically carrying a vending operation over from one supply of articles to the next adjacent supply whereby for more popular brands of articles the machine can be stocked according to demand, which can accommodate a particularly large number of types of articles to be vended, and which may be very easily and conveniently re-charged with fresh supplies of articles when required.

With the foregoing and other objects in view, the invention resides broadly in a coin operated vending machine including an upright magazine; a platform in the magazine, the magazine being adapted to contain, and the platform being adapted to support within the magazine, a stack of superimposed articles to be vended; a discharge station at the upper part of the magazine; an outlet from the magazine at the discharge station; an electric motor; elevating means adapted to be operated by the motor to lift the platform and articles supported thereby; an elevator switch adapted to be operated, by an article elevated to the discharge station, to interrupt the operation of the elevating means; an ejector adapted, when actuated, to eject an article at the discharge station through the magazine outlet; and coin-operated actuating means adapted, after the insertion of predetermined coins thereto, to actuate the ejector. Preferably the machine includes a cabinet containing a number of dispensing units, each having a magazine with outlet and ejector, platform, elevating means with a drive from an electric motor and elevator switch, the coin-operated actuating means being associated with selector switches, one for each magazine, so that on prepayment of the coins and operation of any desired selector switch, the ejector of a dispensing unit corresponding to that selector switch is actuated, articles dispensed from all dispensing units being ejected to a delivery compartment convenient to the purchaser. Preferably in each dispensing unit, the elevating means consists of an upright screw driven from the electric motor, the platform being slidably mounted on the screw and provided with a clutch normally engaged with the thread of the screw but capable of being disengaged to enable the platform to be slidably lowered or raised on the screw. Other features of the invention will become apparent from the following description.

A coin-operated cigarette vending machine according to the invention is shown in the drawings, wherein:

FIG. 1 is a perspective view of the machine,

FIG. 2 is a cross-sectional view,

FIG. 3 is a detail drawing showing in section and to enlarged scale one of the dispensing units of the machine,

FIG. 4 is a section along line 4—4 in FIG. 3,

FIG. 5 is a rear view of the platform of the unit,

FIG. 6 is a plan view of the platform,

FIG. 7 is a circuit diagram of the machine, and

FIG. 8 shows part of the circuit diagram of FIG. 7 with modifications.

The cigarette vending machine has a cabinet **10** mounted on castors **11** and with a box-like hinged door **12** at the front. At the top of the door is an arrangement of selector buttons **13** each, when pressed against the action of a spring, closing an associated selector switch **14.** At the top of the door there are also a coin-operated selector unit at **15** to which coins may be fed through slots, a money box (not shown) to receive coins from the selector unit, a coin counter at **16** and a "sold out" light which when illuminated is visible at **17.** In the upper front part of the door is a baffled delivery compartment **18,** and below is a display window **19** for advertising material.

Within the cabinet **10** are two assemblies of dispensing units **20,** one in front of the other. Each of these assemblies includes a rigid rectangular frame, the frame **21** of the rear or innermost assembly being fixed to the back of the cabinet, the frame **22** of the front assembly being hinged within one side of the cabinet so that when the door **12** has been opened the front assembly may be swung hingedly forwards to give access to the rear assembly.

Electric power supply for the working parts of the machine is conducted from mains supply through a transformer (not shown) within the cabinet and a switch (not shown) is automatically operated when the door **12** is opened to cut off the supply of power to the transformer.

Although the circuit diagram of FIG. 7 for convenience shows ten dispensing units, there may be, for example, ten of the units **20** in each of the two assemblies. Each of the dispensing units **20** includes a base **23** mounted on the bottom of the frame **21** or **22** and a head **24** mounted on the top of the frame. The base **22** has a pair of lugs **25** with outwardly extending studs **26** engaging notches **27** in the bottom of the sides of a magazine **28** made of sheet material, preferably transparent, and comprising parallel sides and a front perpendicular thereto. A spring catch **29** on the head **24** releasably engages the top of the magazine holding it upright and in engagement, at one side, with a vertical support **30.** On releasing the catch, the magazine may be swung hingedly forward and removed.

Below each base **23** is an electric motor **31** which drives through an associated gearbox, an elevating mechanism including a vertical screw **32** of which the plain upper end is rotatable in a bearing **33** in the head **24.** The platform **34** extends into each magazine **28** through its open back, and at the rear is increased in depth and formed with a boss **35.** A plain round hole **36** is formed axially through this boss and the rear part of the platform to receive the screw **32.** A clutch arm **37** pivoted at one end at **38** to one side of the rear of the platform is largely housed in an oblique groove **39** formed across the rear of the platform and intersecting the hole **36,** a torsion spring **40** urging the clutch arm into the slot and hole to engage the screw **32** so that, when the screw is driven by the motor **31,** the platform is raised. The clutch arm **37** may be disengaged from the screw **32** either by moving it directly by its protruding end remote from the pivot **38,** or indirectly, from the front of the dispensing unit, by pressing a plunger

41 slidable in a tube 42 fixed to the platform 34 and located to one side of the magazine 28, the plunger then moving the clutch arm 37 to disengaged position. Finger pieces 43 on the front of the tube facilitate the operation of the plunger. When the clutch arm is disengaged the platform may be freely raised or lowered on the screw 32.

The magazine 28 is adapted to contain a stack of cigarette packets 44 which are then supported by the platform 34. Lugs 45 pressed inwardly from the front and sides of the lower part of the magazine prevent the stack from descending below them, but the platform is shaped to clear these lugs and may be brought lower.

An ejector 46 is pivoted between a pair of lugs 47 extending upwardly from the head 24, and has a lower end passing through an aperture in the head and located normally behind the uppermost of a stack of packets 44 in a discharge station, within the upper part of the magazine, a tension spring 48 urging the ejector to this position. The upper end of the ejector is pivoted to the movable core 49 of a solenoid device 50 mounted above the head 24 so that, when the solenoid is energized to retract the core 49, the ejector is pivoted to eject the uppermost packet 44 which is in the discharge station, forwards and through an outlet opening 51 in the upper part of the front of the magazine 28, to fall into the delivery compartment 18. The dispensing units 20 of the rear assembly are of greater height than those of the front assembly, as shown in FIG. 2, and the outlets 51 of the rear magazines are at a higher level than those of the front magazines. Consequently, a packet ejected from a rear dispensing unit will be thrown over the top of the corresponding front dispensing unit.

On the head 24 are two switches 52 and 53, with actuating arms 54 and 55 respectively extending downwardly through an opening 56 in the head. Switch 52, in the circuit of the motor 31, is closed when its actuating arm 54 drops upon the ejection of the uppermost packet 44, so that the motor 31 operates to lift the platform 34 until the next packet 44 is so raised as to lift actuating arm 54, open switch 52, and stop the motor 31. When the last packet 44 of the stack has been ejected, the platform 34 will act similarly to stop the motor.

Switch 53, in the circuit of the "sold out" light, is opened by the lifting of its actuating arm 55 by the uppermost packet 44 of the stack; but when the last packet of the stack has been ejected the platform 34, which is cut away at 57, does not lift the actuating arm 55, and so switch 53 remains closed.

A further switch, being a change-over switch 58, the purpose of which will be hereinafter explained, is mounted on the head 24, and is manually operable.

Different types of cigarettes in the machine may be of different prices, and provision is made therefore for a particular type to be dispensed only on the insertion of coins to an adequate value. If, for example, there are three different amounts required for the various articles to be vended, the ejector solenoids 50 are connected to the coin counter 16 and coin selector 15 through appropriate taps on a pricing board 59 to "high," "medium" and "low" connections indicated respectively at 60, 61 and 62. As a purchaser inserts coins to the coin selector 15, the cumulative value of these is shown by the coin counter 16. When the appropriate amount has been paid, the purchaser presses the selected button 13 to operate the associated selector switch 14, so that the appropriate ejector 46 is actuated and a packet 44 of the selected type is ejected to fall into the delivery compartment 18. Switch 52 thereupon closes so that the motor 31 is operated to lift the next pack of the stack into position and is then stopped.

As shown in the circuit diagram of FIG. 7, each switch 52 is a change-over switch, and when it is operated to close the circuit of a motor 31, at the same time it breaks the circuit of a vend relay at 63. Thereupon two switches 64 and 65 are opened and a switch 66 is closed. On the opening of switch 64, power to the coin counter is cut off, and the counter returns to zero. On the opening of switch 65, the circuit of a coil lock-out relay opens with the result that any additional coins inserted are diverted from coin sensing device 15 and returned to the delivery compartment 18. On the closing of switch 66 a coin accept solenoid 68 is energized causing coins received in the coin sensing device to be discharged to the money box, and a transaction counter 69 operates to record the transaction on a mechanical counter (not shown) within the cabinet 10.

Near to the coin slots at the top of the door 12 is a press-button operated change-over switch 70, which when operated breaks the circuit to the coin counter 16, which therefore is zeroed; and the circuit of a coin return solenoid 71 is closed, causing coins inserted to the coin sensing device 15 to be returned to the customer by being discharged to the delivery compartment 18. Thus, if coins are inserted to the machine and, when the selected button 13 is pressed, the "sold out" light is illuminated, the customer may, by pressing the switch 70, recover the money paid.

In the case of popular brands of cigarettes, it may be desirable that two or more adjacent magazines 28 may be stocked with the same type. In such a case, each of the two or more dispensing units 20 will have similarly marked selector buttons 13, and when any one of these is pressed, a packet will be delivered as long as the magazine 28 of any one of the units contains a packet. To couple two adjacent dispensing units in this way, the change-over switch 58 of the first dispensing unit 20 is operated, and the circuit is modified as shown in FIG. 8. In this figure, the selector switch 14*a* of the first dispensing unit has been operated, by pressing the appropriate selector button 13, but the magazine 28 of this unit is empty so that the switch 53 has been operated. However, switch 58 having been re-set, the ejector solenoid 50 of the next succeeding unit is operated to deliver a packet. The modifications to the circuit, shown in FIG. 8, ensures that whether selector switch 14a of the first unit or selector switch 14b of the second unit should be operated, packets will be dispensed first from the first unit and, only after this unit has been emptied, from the second unit.

The vending machine will be found to be capable of holding a very large number of articles to be vended, and also many different types of articles, saleable at different prices. The delivery of the vended articles at a high level is particularly convenient, and such articles are delivered very quickly after insertion of the appropriate coins and operation of the appropriare selector button. A customer may, by pressing a selector button before inserting coins ascertain if the required articles are sold out or not, for if the appropriate magazine is empty, the "sold out" light will be illuminated upon the pressing of the button.

What we claim is:

1. A coin operated article vending machine comprising a cabinet; a door at the front of the cabinet; a delivery compartment in the door, accessible from without; electrically operated coin-freed actuating means and a plurality of manually operable selector switches mounted on the cabinet; and two series of adjacent dispensing units within the cabinet, a rear series being within the rear of the cabinet, a front series being mounted on a frame hinged within one side of the cabinet; each of the dispensing units including an upright magazine, a platform in the magazine, the magazine being adapted to contain, and the platform being adapted to support within the magazine, a stack of superimposed articles to be vended, a discharge station at the upper part of the magazine, an outlet from the magazine at the discharge station, the outlets of the rear series of dispensing units being above the level of the top of the front series of dispensing units, a vertical screw at the rear of the dispensing unit, a clutch on the platform releasably engaged with the screw, an electric motor operated drive to the screw to rotate the screw to lift the clutch, and the platform and articles supported thereby, an elevator switch operated by an article elevated to the discharge station to interrupt the electric motor operated drive, and an ejector operated by the insertion of predetermined coins to the coin-freed actuating means and the operation of a selector switch corresponding to the appropriate dispensing unit to eject an article at the discharge station through the magazine outlet to the delivery compartment.

2. A coin operated vending machine according to claim 1 wherein there are provided electrical switching means whereby, on the insertion of predetermined coins to the coin-freed actuating means and the operation of a selector switch corresponding to a dispensing unit from which all articles have been vended, the ejector of another dispensing unit, if containing articles to be vended, will be actuated.

3. A coin operated vending machine according to claim 1 wherein there is provided in each dispensing unit a "sold out" switch adapted, when all the articles have been dispensed from the said unit and the selector switch corresponding to that unit is operated to illuminate a "sold out" light mounted in the cabinet.

* * * * *