

April 9, 1935.

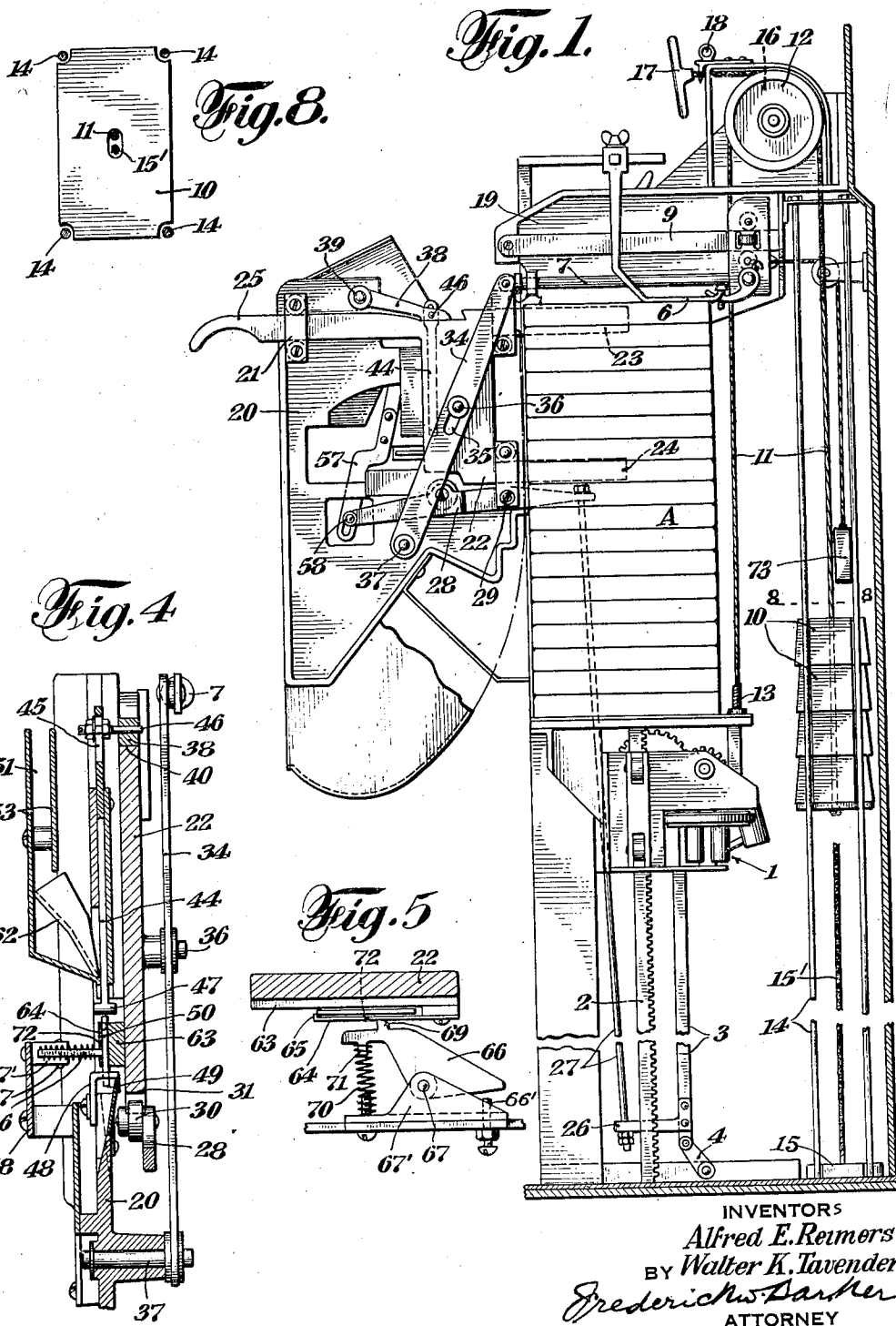
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1,997,079

VENDING MACHINE

Filed May 4, 1932

4 Sheets-Sheet 1



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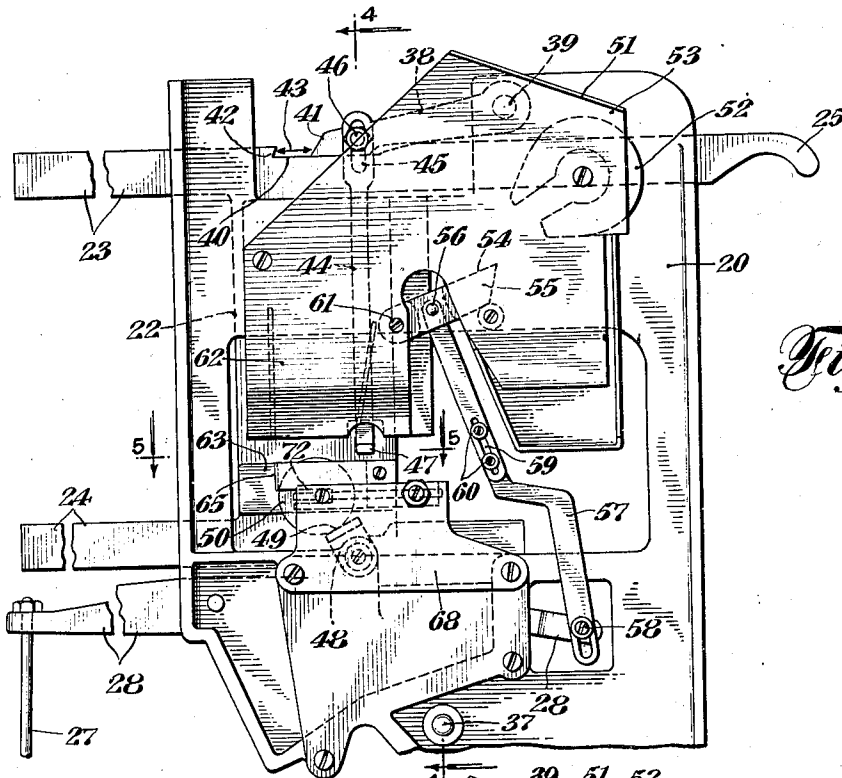


Fig. 2.

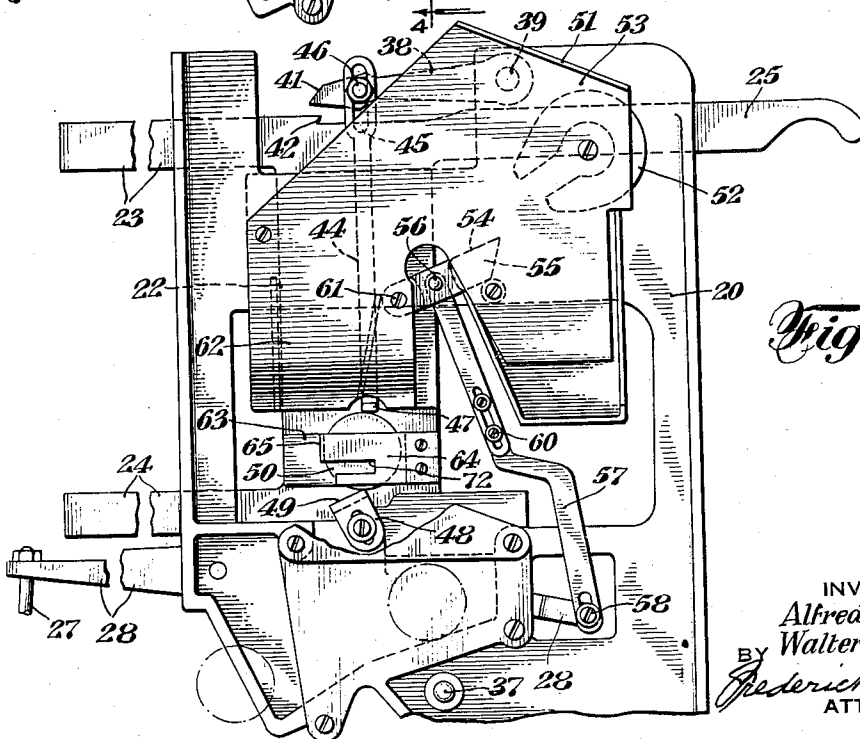


Fig. 3.

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Fig. 6.

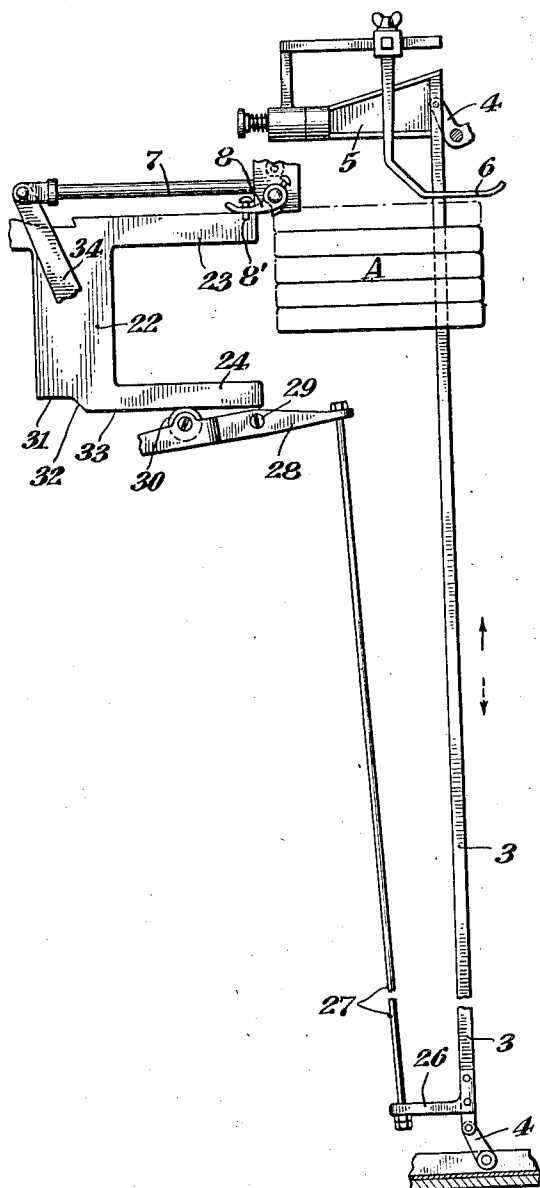
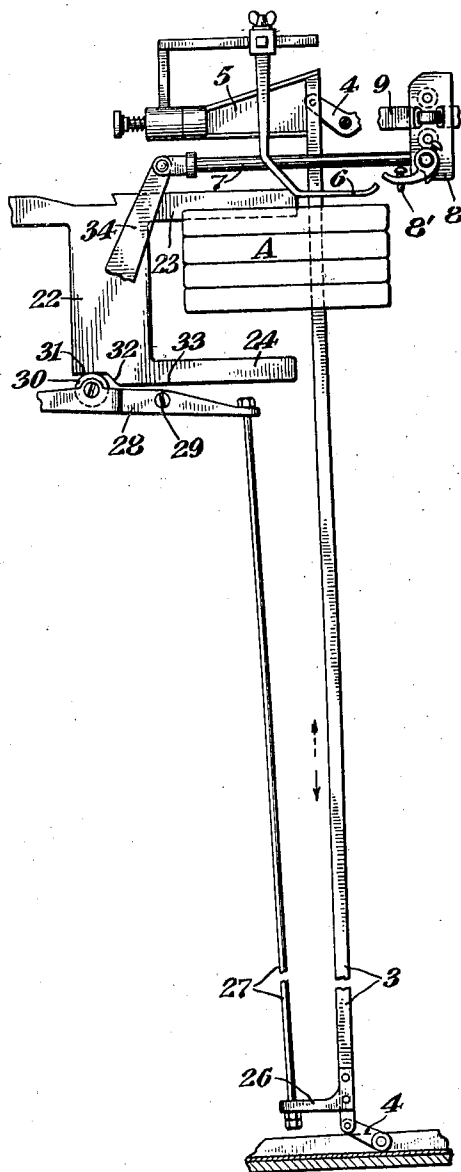


Fig. 7.



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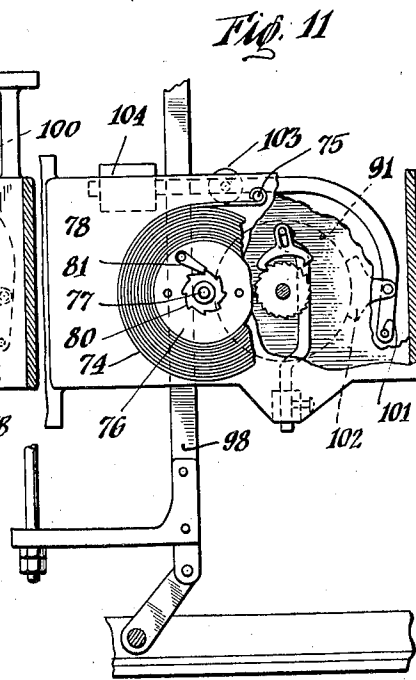
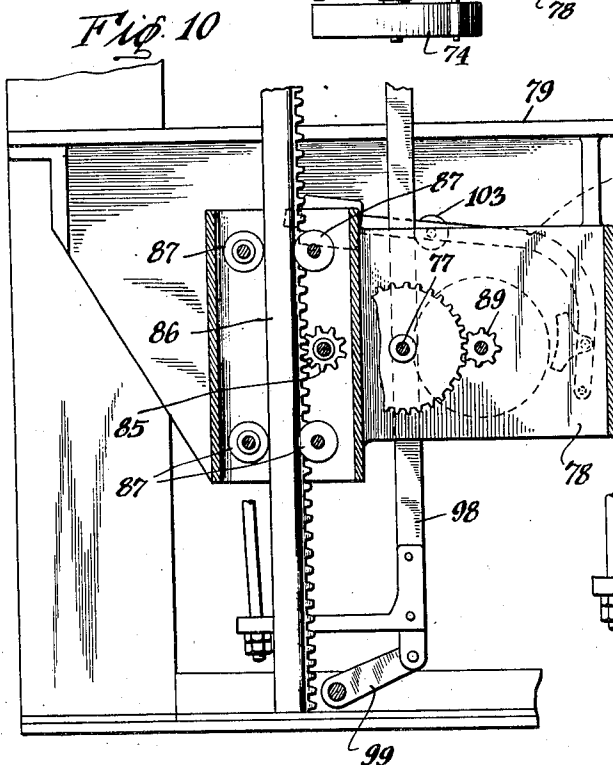
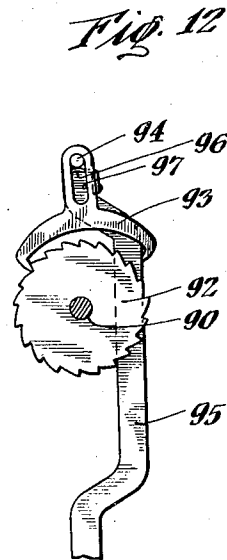
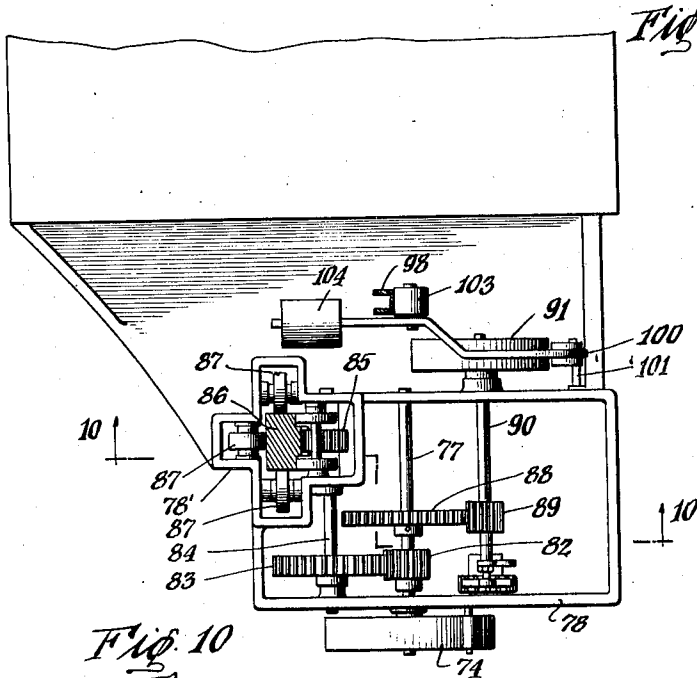
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UNITED STATES PATENT OFFICE

1,997,079

VENDING MACHINE

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Application May 4, 1932, Serial No. 609,300

10 Claims. (Cl. 312—68)

This invention relates to vending machines and our improvements comprehend a development of the vending machine described in our earlier application, Serial No. 589,822, filed January 30, 1932, for the purpose of imparting certain additional features and functions thereto.

In said earlier application the carriage which elevates the vendible articles is arrested by a brake which is caused to be applied when the topmost article of a stack upon the carriage engages height limiting fingers, whereupon certain kick-off mechanism is operable, through the medium of a pull rod, to deliver the topmost article. But in said earlier application no provision is made to free the height limiting fingers from contact with the upper surface of the topmost article, so that a frictional drag may occur to interfere with delivery of said article, and in some instances, where such article is of a fragile nature, it may suffer injury in its delivery.

Therefore one of the purposes of this application is to provide means, actuatable in the operation of the pull rod, to cause the article rise-limiting fingers to be further lifted for the purpose of providing a clearance between said fingers and the topmost article after the brake has arrested the carriage upward movement.

Also our improvements include the provision of a manipulable slide member, and pivotal means intermediate the pull rod and said slide member whereby the full pull rod stroke may be performed with a relatively short stroke of the slide member.

Further, our improvements include the provision of means for holding the slide member for the pull rod locked against the article delivery outstroke of the pull rod until an interponent, such as a proper coin or its equivalent is displacably included in certain lock release mechanism that is also provided with respect to said slide member, said lock release mechanism being operable during the initial movement of the slide member.

A still further feature of the present application consists in a modified guide means for the weights employed in elevating the carriage, together with novel means for suspending the weights while the carriage is being reloaded with vendible articles.

In the modification of our invention, herein referred to, we may employ a clock spring having an escapement and gear train as means for raising the article supporting carriage, instead of or auxiliary to the use of weights for such pur-

pose, thereby also dispensing with the use of the governor.

Other features and advantages of our invention will hereinafter appear.

In the drawings:

Figure 1 is a side elevation of a vending machine, constituting a complete unit, of which one or more may be included in a suitable cabinet.

Fig. 2 is an opposite side view of the slide mechanism, for co-operation with the pull rod, also having the lock means, and the lock release means, this view showing the lock in its engaged position.

Fig. 3 is a similar view, but showing the lock as released.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Fig. 5 is a section on the line 5—5 of Fig. 2.

Fig. 6 is a schematic view showing the brake bar in its operated position in which it has been caused to lift the article stack arresting fingers in creating a clearance between said fingers and the topmost article.

Fig. 7 is a similar view showing the brake bar in its pre-operation position.

Fig. 8 is a section on the line 8—8 of Fig. 1.

Fig. 9 is a plan view of a modified form of power means for raising the carriage.

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

Fig. 11 is a front view, with a portion of the frame broken away.

Fig. 12 is an enlarged, detail view of the escapement means.

In said views let 1 indicate the carriage supporting a stack A of vendible articles, 2 the rack bar along which said carriage travels, 3 the brake bar, pivotally connected to links 4 respectively at its upper and lower ends, 5 the bracket in the form of a channel member, carried by the brake bar at its upper end, said member carrying the fingers 6 which are opposed to the stack of articles on the carriage and serve to arrest the carriage when the topmost article comes in contact therewith, thereby shifting the brake bar to cause the brake to be applied and at the same time raising the brake bar a certain degree until the brake stops the carriage movement, 7 the pull rod, and 8 the kick-off device which travels along guide bar 9; these parts corresponding with like parts disclosed in our said application Serial No. 589,822.

In our said earlier application weights which overbalance the carriage are provided with certain means for holding them suspended while free from said carriage in the loading operation of the latter, but in the present application dif-

ferent weight suspending means are provided. The weights 10 are here shown as engaged by a cable 11 that passes over a pulley 12 and is engaged at 13 with the carriage 1, said weights being 5 guided in their travel by the vertical rods 14. Also the weights 10 are engaged by a block 15, secured to a chain 15' that passes over a sheave 16 and is provided with a handle 17 whereby the weights can be drawn upwardly by hand and held 10 suspended at any desired position by engagement of the chain in a fixed spur 18, so that said weights may be suspended whilst the carriage is being loaded.

Through the medium of our present improvements we intend to provide means enabling the 15 brake rod 3, after it has been shifted in the rising contact of the stack of articles with the fingers 6, whereby said brake bar has caused the brake to be applied for arresting the travel of the carriage, to be given a further lift, which is 20 also communicated to fingers 6, so as to create a clearance between the topmost article of the stack and said fingers, thus enabling said topmost article to be withdrawn, for delivery, without subjecting said article to such frictional resistance as it would suffer if it were in contact 25 with said fingers. This extra lift is imparted to the brake bar and fingers in the initial part of the movement of the article delivery means by mechanism which will now be described:—

To the main frame 19, forwardly thereof, there is attached, at one side, a supplemental frame 20, which has horizontal guideways 21 in which 35 a member 22 is slidable, said member having the upper and lower, spaced bars 23, 24, that provide bearing surfaces for member 22 when sliding forwardly. Also member 22 has a forwardly projecting handle 25, which may be termed the article delivery handle.

The brake bar 3 is shown as provided, near its 40 lower end, with a bracket 26, to which one end of a rod 27 is affixed, the upper end of said rod being connected to a lever 28, that is pivoted at 29 to the frame 20, said lever carrying, at the other side of its pivot, a pivotal roller 30, whose 45 periphery projects above the upper surface of said lever. Normally, in the operation of the machine, that is, when the brake bar is unshifted and the brake is idle, with the carriage rising, (see Fig. 7) the roller 30 lies in a recess 31 formed 50 in the under surface of member 22, said recess leading by a curved shoulder 32 to the main under surface 33 of member 22, said surface 33 being in a lower plane than recess 31. Also, when 55 the brake bar has been shifted to the position indicated in Fig. 1, in which position the brake has been applied, the lever 28 has been rocked slightly, causing the roller 30 to leave contact with surface 31, though still being opposed to shoulder 32. Now, it will be apparent that as member 22 60 is drawn forwardly, its first effect will be to further rock the lever 28 as the roller 30 is rolled over shoulder 32 into contact with surface 33, and in so doing rod 27 is caused to further lift the 65 brake bar 3, through the medium of bracket 26, and in this extra lift of the brake bar consequently the bracket 5 is raised and with it the fingers 6 are lifted clear above the arrested position of the topmost article, which is then free to be delivered, 70 as through the medium of pull rod 7 and the kick-off device 8, having article engaging stud 8'.

In instances where the articles to be delivered are of considerable length obviously the stroke of the pull rod 7 might be of undesirable extent 75 in direct manual operation, and for the purpose

of reducing the manual effort required a link is provided between member 22 and pull rod 7, said link being in the form of a lever 34, having an intermediate, lengthwise slot 35 by which it is 5 slidable on a stud 36, fixed to the member 22, the other end of said lever being pivoted, at 37, to the frame 20. By these means the stroke of member 22, performed by pulling on handle 25, is of considerably less extent than the communicated full length delivery stroke of pull rod 7. 10

It is however undesirable that an article shall be delivered before a releasable interponent, such as a proper coin, has been inserted in the machine, wherefore we have provided lock mechanism that prevents the operation of the article 15 delivery mechanism until an interponent has been added to become a part of the lock release means.

The lock mechanism aforesaid comprises a latch 38, pivoted at 39 to the frame 20 and lying 20 normally in a recess 40 formed in the top of member 22, the nose 41 of said latch being opposed to a shoulder or abutment 42, at one end of recess 40. A clearance represented by a double pointed arrow 43 normally separates the nose 41 25 from shoulder 42, and member 22 can be drawn forwardly the extent of that clearance, until shoulder 42 comes into contact with nose 41, which locks member 22 against further withdrawal.

In order to release the lock for the operation 30 of the machine in delivering a topmost article from the stack thereof, we provide means operable during the initial outward movement of member 22, while shoulder 42 thereon is approaching latch nose 41, to lift said latch above 35 said shoulder, so that said member 22 is then free to continue its outward movement. The lifting means include a vertically disposed bar or member 44, having a slot 45 toward its upper end, which engages a pin 46 carried by the latch 38, 40 said pin being adjustable in said slot, for regulating the vertical position of bar 44. Said bar 44, at its lower end, is provided with a foot 47, which is to be engaged by means adapted to lift said bar.

Fixed to the frame 20, in a plane below and 45 spaced from foot 47, is a member 48, having a surface 49 that is inclined upwardly in the withdrawal direction of member 22. An interponent, as for example a proper coin 50, is to be supported in part upon incline 49 in the normal 50 position of member 22, that is, before initial movement of said member has occurred, whereby, in the withdrawal movement of member 22, while shoulder 42 is travelling toward latch nose 41, said interponent, whose diameter exceeds the distance separating foot 47 from the top of incline 55 49, will, in moving up said incline, exert pressure against said foot, thereby lifting bar 44 and causing latch 38 to be raised above shoulder 42, thus releasing the lock engagement and permitting 60 the full article withdrawing operation of slide member 22 and pull rod 7.

A proper coin 50, intended for service as an interponent in the lock release mechanism described, is introduced into the machine through 65 a slot 51, and passing over a horse shoe magnet 52, located between the spaced plates 53 which form the coin passageway, falls upon the inclined surface 54 of a guide member 55, which is pivoted at 56 to an arm 57 that is pivotally connected, at 58, to the free end of lever 28, said arm 57 having a slot 59 which slidably engages fixed studs 70 60. The member 55, having fixed pivotal connection at 61, is capable of rocking thereon in the movement of lever 28, the position of said lever, 75

in Fig. 2, being that in which member 55 is held with its surface 54 in an attitude that directs the coin into a chute 62, which delivers it upon the inclined surface 49 of member 48. When upon surface 49 the coin is supported at its sides between the fixed plates 63, 64, plate 63 being attached to member 22, and plate 64 being secured to plate 63, in spaced relation therewith, the spacing between plates 63 and 64 being just sufficient to non-frictionally receive a proper or designated coin, and the plate 64 having a rear end flange 65 which co-acts with incline 49 to position the coin prior to the forward movement of member 22. When the proper coin or interponent, thus halted, has performed its function of releasing the lock, it will, after passing incline 49, fall toward a coin box (not shown) in the manner indicated in Fig. 3, the coin appearing in dot and dash lines in its descent.

But if a smaller coin or token should be used, it will not be held in operative position on incline 49, and will instead be rejected.

When the lever 28 is in the position shown in Fig. 7, that is prior to the brake applying shift of brake bar 3, the surface 54 of member 55 will be removed from the path of an object falling through slot 51, wherefore, in this condition of the machine, before the carriage has been arrested in its upward movement, or provided the machine is empty, coins entered through slot 51, will fall inoperatively through the machine and may be delivered into the article receiving trough.

The magnet 52 is so positioned that magnetizable disks will be attracted by its poles and deflected thereby to fall out inoperatively.

For arresting washers and the like we employ a wing shaped member 66, pivoted at 67 to webs 67' that project from a fixed plate 68, said member 66 having a spur 69 that is slightly pressed against the surface of plate 64 by a spring 70 in the normal position of member 22, said spring being located between the portion 71 of member 66 and plate 68. But plate 64 has a slot 72, adapted to receive spur 69 in the outward movement of member 22, and, while the spur 69 will glide over a coin that may be held between plates 63, 64, yet if a washer is so held the spur will be spring pressed into its hole and cause dislodgement of said washer before it can have the opportunity to effect the lock release. The rotation of member 66 is limited by means of an adjustable stop 66'.

It should be particularly noted that with this apparatus no opportunity occurs for manipulating the article withdrawing means, in the delivery of succeeding articles from the stack with the insertion of a single proper coin, for this reason:—It is necessary that the brake be applied to arrest the movement of the carriage before the topmost article, which itself becomes a part of the instrumentation for arresting the carriage, can be removed. When said article has been delivered the pull rod and member 22 will be returned as by the gravity action of weight 73. But if the intending manipulator should try, by holding handle 25 from return, and working it to and fro in an attempt to extract another article this attempt will be fruitless, because the surface 33 of member 22 is on roller 39, the brake is held applied, and hence, there is no topmost article that can be engaged by the kick-off device.

In the modification illustrated in Figs. 9 to 12 we have shown spring power means, controlled by an escapement, for urging the carriage upwardly, together with means which coact with the

brake operating means for arresting the rise of said carriage.

In said views let 74 indicate a coiled spring having one end fixed as at 75 and its other end secured to a drum 76 that is loose upon a shaft 77, said shaft being journaled in a frame 78, which forms a part of the carriage, the table 79, for supporting a stack of articles, being extended above frame 78.

The spring 74 is to be wound in the anti-clockwise rotation of shaft 77, under the control of a ratchet 80 and pawl 81.

Fast upon shaft 77 is a pinion 82, that meshes with a gear 83 upon a shaft 84, journaled in frame 78 in parallel relation to shaft 77, and said shaft also carries a pinion 85, which is in meshed engagement with a rack bar 86, to thereby cause the carriage to be raised in the expanding action of spring 74 and the consequent rotation of pinion 82, gear 83 and shaft 84. The pivotal rollers 87, carried by frame portion 78', co-acting with the sides of rack bar 86, serve as anti-friction guides in the travel of the carriage along the rack bar.

The shaft 77 also carries a gear 88, that is in mesh with a pinion 89, fast on a shaft 90, which is journaled in frame 78, said shaft 90 at one end carrying a brake drum 91, and at its other end carrying an escapement wheel 92, mounted on shaft 93, with which wheel the double toothed pawl 93 co-acts, said pawl being pivoted upon a support 94. The escapement means aforesaid are provided to control the travel speed of the carriage, the pawl 93 having a pendulum 95, and being provided with a vertical slot 96, by which it is suspended from pivot 94, and in the extent whereof it can be shifted over said pivot, to release said pawl from wheel 92, when the carriage is being lowered, for which purpose a spring detent 97 in the slot serves to localize the pawl in its shifted position.

The brake bar 98 of this modification, which is operable in the same manner as brake bar 3, is connected at its ends with the frame by links 99, although only the lower link appears in Figs. 10 and 11, said brake bar serving in a modified manner to control the means for arresting the travel of the carriage, as will now appear.

A brake arm 100, pivoted at 101 to the frame 78, carries a shoe 102 which is adapted to co-act with brake drum 91, said arm 100 also pivotally carrying a roller 103, that, in the normal position of brake bar 98 (see Fig. 10), with which it is held in contact by a weight 104, carried at the free end of arm 100, thereby holds the shoe 102 out of contact with drum 91 to permit travel of the carriage.

But when the brake bar 98 is shifted upwardly and laterally, as appears in Fig. 11, then the weight 104, which causes roller 103 to follow such lateral movement, will have drawn the brake shoe against the drum 91, thereby arresting the movement of the gear train and the travel of the carriage.

Variations within the spirit and scope of our invention are equally comprehended by the foregoing disclosure.

We claim:

1. The combination, in a vending machine, having a carriage adapted to support a stack of 70 articles, means for raising said carriage, braking means therefor, and means opposed to the topmost article adapted to apply said braking means when contacted therewith, of means operable to deliver said article, and means actuable by said 75

delivery means to release said opposed means from contact with said article prior to delivery of the latter.

2. The combination, in a vending machine, 5
having a carriage adapted to support a stack of 10
articles, means for raising said carriage, braking 15
means therefor, a shiftable brake bar to operate
said braking means, and means opposed to the
topmost article adapted when contacted there-
with to shift said brake bar, of means operable to
deliver said article, and means actuatable by said
delivery means, in the initial part of its operation,
to further shift said brake bar, whereby said op-
posed means is released from contact with said
article prior to delivery of the latter.

3. The combination, in a vending machine, 15
having a carriage adapted to support a stack of
articles, means for raising said carriage, braking
means therefor, a shiftable brake bar to operate
said braking means, and means opposed to the
topmost article adapted when contacted therewith
to shift said brake bar, of a slidable member op-
erable to deliver said article, a pivotal rock lever
actuatable by said slidable member in its initial
movement, and connecting means between said
brake bar and rock lever whereby said rock lever,
in the initial part of the operation of the deliv-
ery means, transmits motion through said brake
bar to release said opposed means from contact
with said article prior to delivery of the latter.

4. The combination, in a vending machine, 30
having a carriage adapted to support a stack
of articles, means for raising said carriage, brak-
ing means therefor, a shiftable brake bar to op-
erate said braking means, and means opposed to 35
the topmost article adapted when contacted
therewith to shift said brake bar, of a slidable
member operable to deliver said article, said
slidable member having a recess formed in its
main under surface, a pivotal rock lever, a pro-
jecting roller carried thereby and lying normally
in said recess, and connecting means between
said brake bar and rock lever, whereby said rock
lever, in the initial part of the operation of said
slidable member, moves said roller from the recess
to its main under surface, thereby rocking said
lever and causing it to transmit motion through
said brake bar to release said opposed means from
contact with said article prior to delivery of the
latter.

5. The combination, in a vending machine, 50
having a carriage adapted to support a stack of
articles, of a fixed rack, a frame upon said car-
riage, a pinion journaled in said frame, said
pinion meshing with said rack, a clock spring upon
said carriage, a gear train to transmit energy
from said spring to said pinion, and escapement
means to control the operation of said spring.

6. The combination, in a vending machine, hav- 60
ing a carriage adapted to support a stack of ar-
ticles, of a fixed rack, a frame upon said carriage,

a pinion journaled in said frame, said pinion
meshing with said rack, a gear train to transmit
energy from said spring to said pinion, escape-
ment means to control the operation of said
spring, a brake drum operable by said gear train, 5
a brake arm having a shoe to co-act with said
drum in arresting the travel of the carriage, and
means releasably engaging said brake arm to hold
said shoe normally out of contact with said drum.

7. In a vending machine a merchandise storage 10
compartment, an elevator therein, adapted to
raise the merchandise, a counterweight adapted
to raise the elevator, means for regulating the
speed of the elevator, means for stopping the ele-
vator when the merchandise has been raised to 15
the proper position for vending, means for eject-
ing the merchandise, and independent means for
locking the elevator during the operation of said
ejecting means.

8. In a vending machine, a merchandise stor- 20
age compartment adapted to receive a column of
containers and formed with a discharge opening,
an elevator adapted to raise the column of con-
tainers, automatic means adapted to raise the
elevator, friction braking means actuated by the 25
uppermost container in the column and adapted
to gradually bring the elevator to rest as the
uppermost container approaches the position
alined with the discharge opening, means for
ejecting the containers and means for maintain- 30
ing the engagement of said friction braking
means while the ejecting means are in operation.

9. In a device of the class described, an elevator
adapted to carry articles of merchandise, means
for operating said elevator, control means for said 35
operating means adapted to be operated by an
article on the elevator at a predetermined posi-
tion of the article for causing the discontinuation
of operation of the elevator, ejector means for
removing the article from the elevator adapted 40
to maintain the control means in position to
render the operating means ineffective during the
ejection of the article and to permit said control
means to move at the end of the ejection opera-
tion to render the operating means effective to 45
operate the elevator for replacing the removed
article with another article.

10. The combination, in a vending machine, 50
having a carriage adapted to support a stack of
articles, means for raising said carriage, braking
means therefor, a shiftable brake-bar to operate
said braking means, and means opposed to the
topmost article adapted when contacted there-
with to shift said brake-bar, of a slidable member
operable to deliver said article and means carried 55
by said brake-bar adapted to co-act with said
member to elevate said brake-bar and cause it to
release said opposed means from contact with
said article prior to delivery of the latter.

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