

April 9, 1935.

A. E. REIMERS ET AL

1,997,078

VENDING MACHINE

Original Filed Jan. 30, 1932 6 Sheets-Sheet 1

Fig. 1.

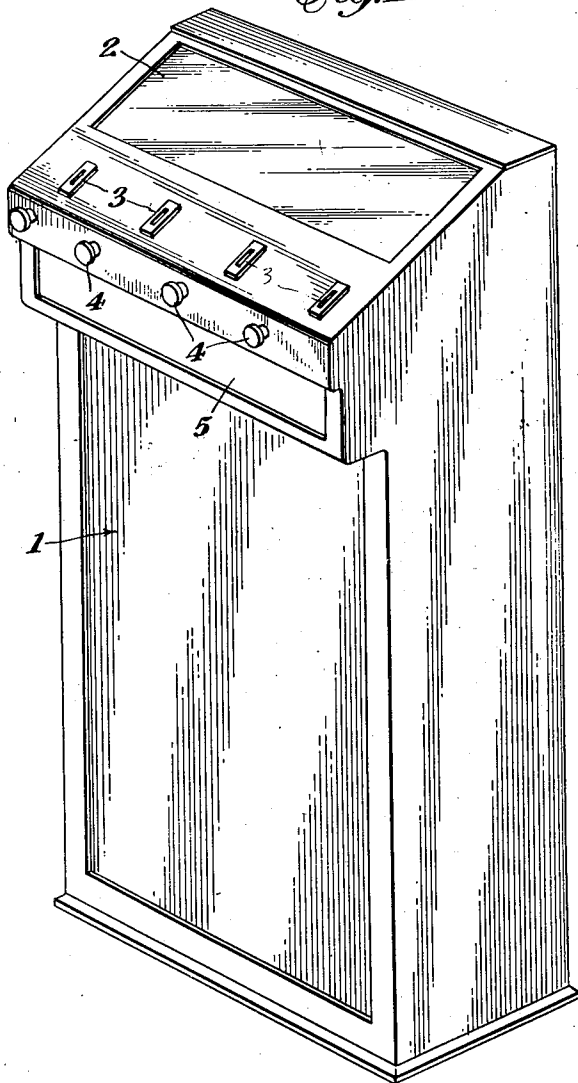
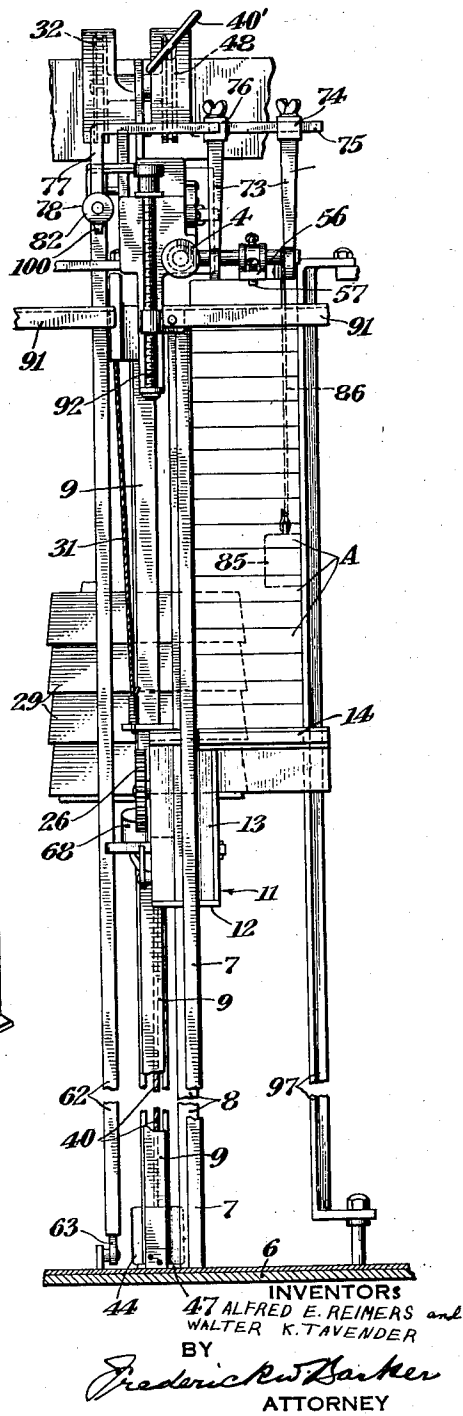


Fig. 2.



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Fig. 3.

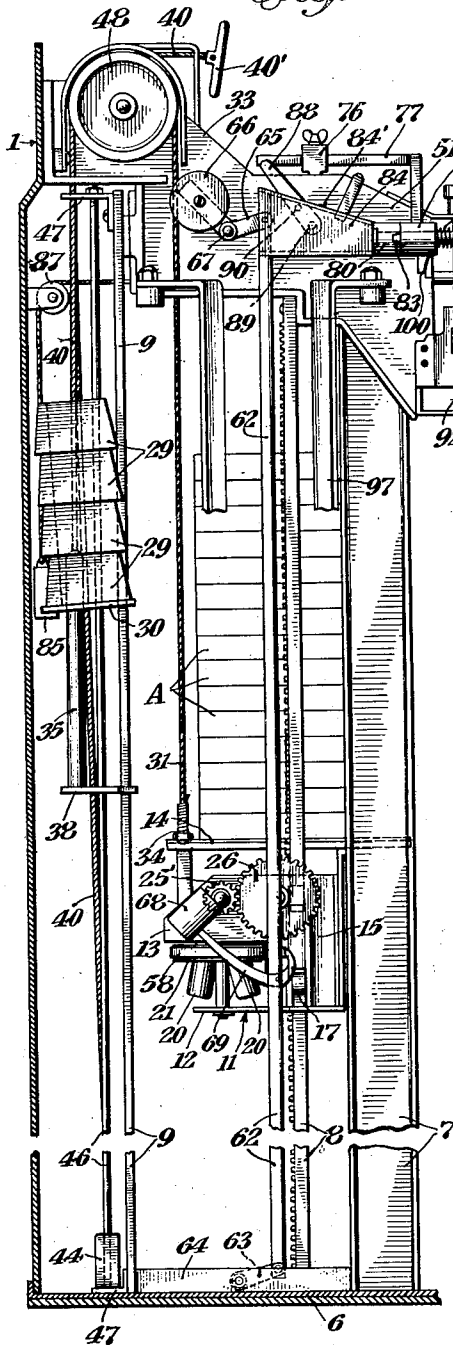
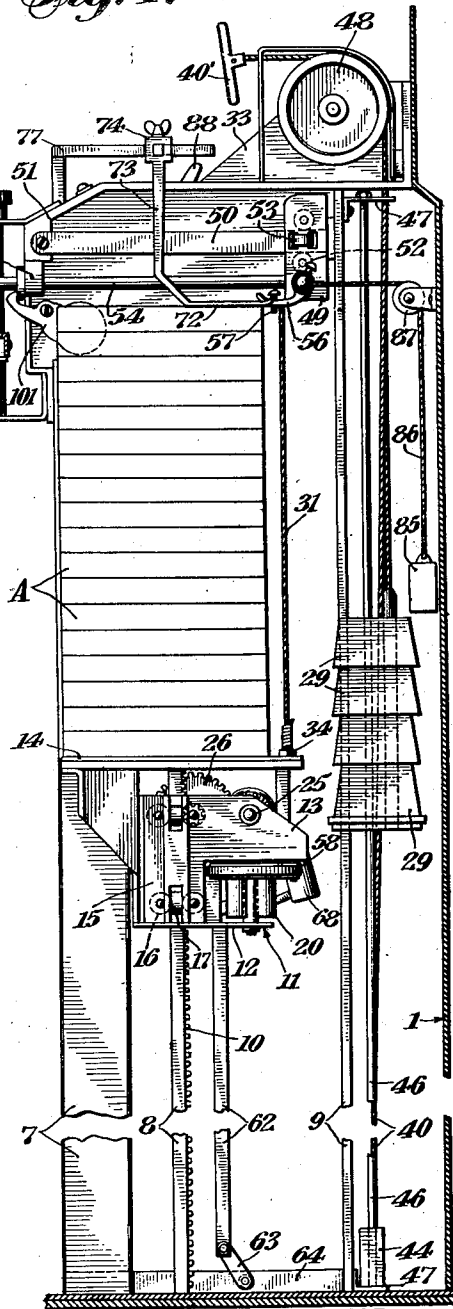


Fig. 4.



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Fig. 5.

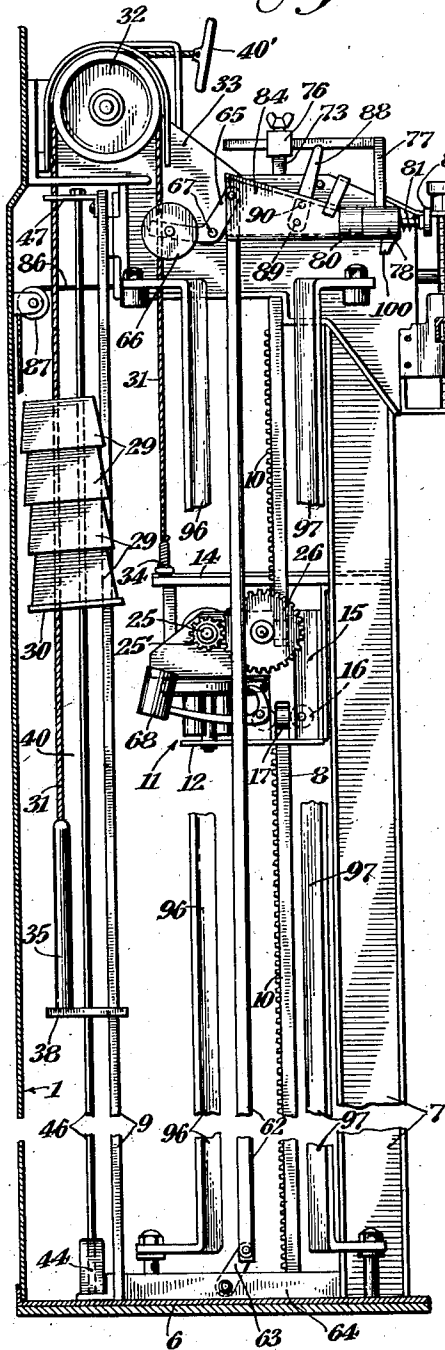
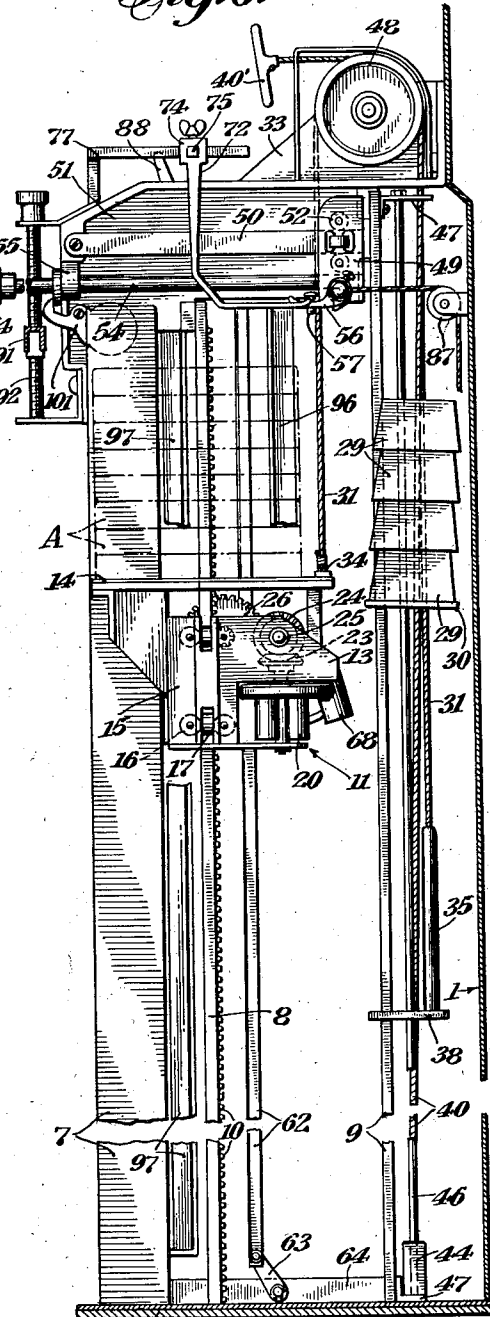


Fig. 6.



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Fig. 7.

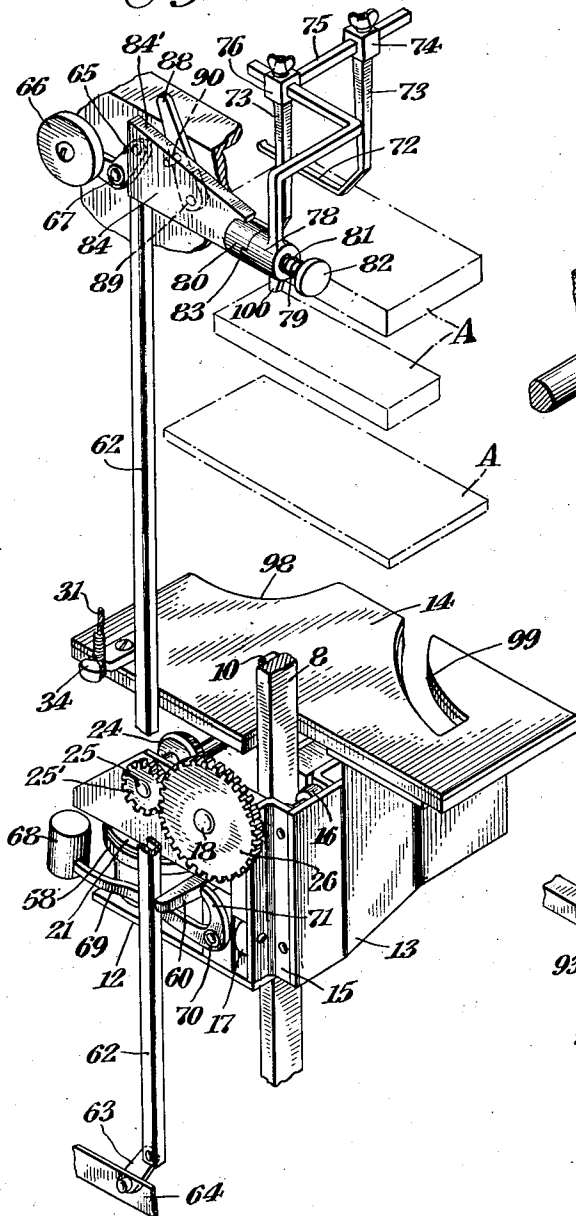


Fig. 8.

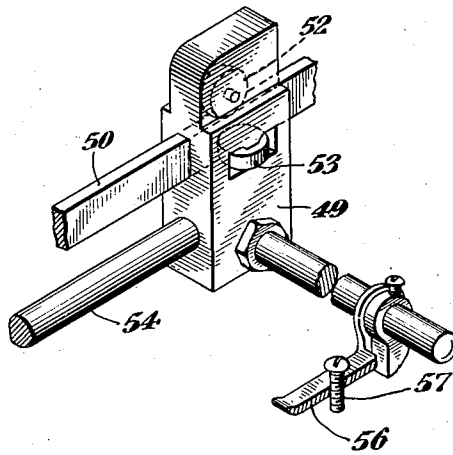
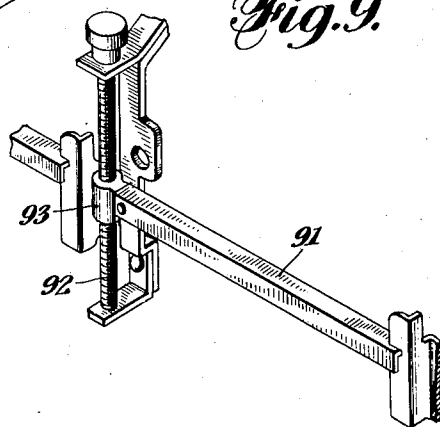


Fig. 9.



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Fig. 10.

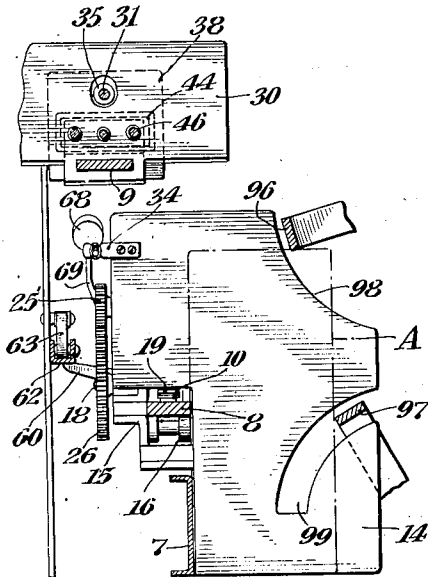


Fig. 11.

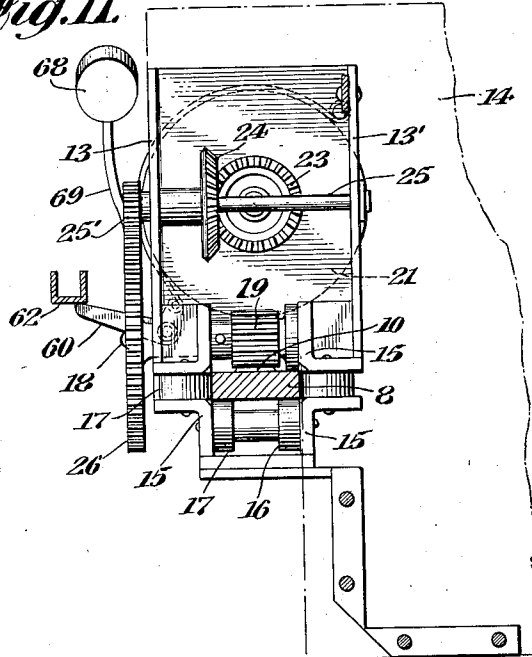


Fig. 12.

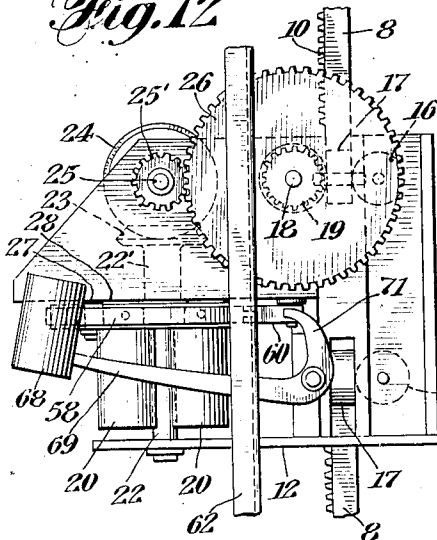
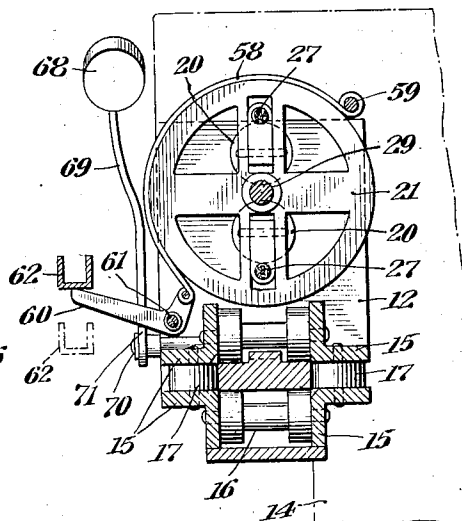


Fig. 13.



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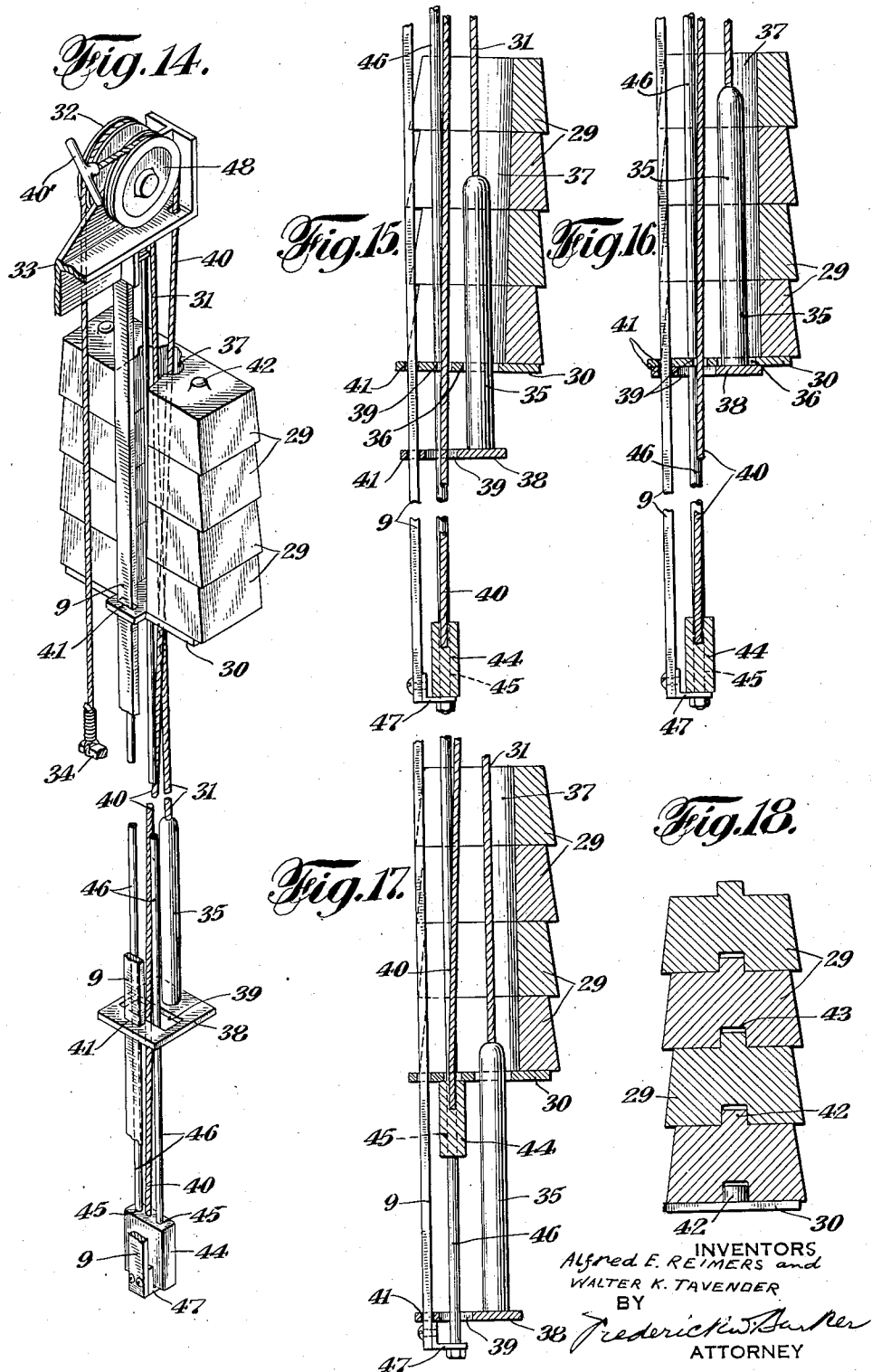
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VENDING MACHINE

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UNITED STATES PATENT OFFICE

1,997,078

VENDING MACHINE

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Application January 30, 1932, Serial No. 589,822
Renewed February 16, 1934

8 Claims. (Cl. 312—68)

This invention relates to vending machines, such as may be rendered operable by the insertion of a coin, and whereby the goods are caused to be delivered from the top of a stack thereof.

Our improvements comprehend the employment of a vertically movable carriage, which, with its supported goods, is overbalanced by gravity or equivalent means that urge it upwardly, and whose speed of travel is retarded by governor controlling means.

Also our improvements include means whereby an uppermost article on the stack thereof liberates a gravity actuable brake when said article has risen to its delivery position, thereby enabling said brake to perform its function of arresting further movement of the carriage until such article has been removed.

Our invention comprises in brief a number of dispensing units for articles of merchandise, which may be enclosed in a suitable cabinet, each unit serving to accommodate a separate stack of such articles and having means whereby a topmost article may be dispensed as through the media of a coin slot and a pull rod or its equivalent. Each of the operating units includes a base, various frame elements, a carriage to support the stack of articles, gravity means for urging the carriage upwardly, means for releasing the gravity means while loading the carriage, a governor to retard the carriage travel speed, a carriage brake, means controlled by the stack in rising for permitting the brake to function, and means operable for the delivery of the topmost article.

Other features and advantages of our invention will hereinafter appear.

In the drawings:

Figure 1 is a perspective view of an apparatus which contains several operating units.

Fig. 2 is a front elevation of a dispensing unit.

Fig. 3 is a side elevation of a unit which is in process of being loaded with a stack of articles to be vended.

Fig. 4 is an opposite side elevation showing the unit loaded and in readiness for operation.

Fig. 5 is a similar elevation to that of Fig. 3 but omitting the stack of articles.

Fig. 6 is a view similar to Fig. 4 showing the parts in position similar to Fig. 5 but with the unit partly loaded.

Fig. 7 is a perspective elevation showing the carriage, the brake bar and brake actuating fingers.

Fig. 8 is a perspective detailed view of a part of the ejecting means.

Fig. 9 is a detail of the front guide bar.

Fig. 10 is a plan view of the carriage showing the fixed and adjustable guides for the articles.

Fig. 11 is an enlarged plan view of the carriage and its mechanism.

Fig. 12 is a side elevation of the carriage operating mechanism and brake bar.

Fig. 13 is a horizontal section showing the carriage with its governor controlled brake mechanism and brake bar.

Fig. 14 is a perspective elevational view of the weight control, the weights being in a suspended position during the loading operation.

Fig. 15 is a sectional view through the weights in similar position to Fig. 14, with the weight release mechanism about to act.

Fig. 16 is a sectional view similar to Fig. 15 after the weight release mechanism has acted.

Fig. 17 is a sectional view through the weights showing the means for lifting the weights alone, and

Fig. 18 is a detailed view of the interlocking means for the weights.

In said drawings let 1 indicate a cabinet having an upper exposure provided with a cover 2 of glass or other transparent material, said cabinet containing the operating units, and having coin slots 3 and pull rod handles 4 respectively for said units, the cabinet also having a common receiving trough 5 for the dispensed articles.

The base 6 is shown as supporting vertical frame members 7, 8 and 9, the member 8 having a rack 10 formed on one side thereof. The member 8 also serves as a guide for a carriage 11, which slides vertically thereon, said carriage having a frame that includes a base member 12, channel walls 13, 13', and an upper plate or table 14, the latter serving to support a stack of vendible articles. Two pairs of angle brackets 15 pivotally carry two sets of rollers 16 that are respectively in contact with opposite faces of the frame member 8, and said brackets also pivotally carry two sets of rollers 17 that are respectively in contact with opposite sides of said member 8, these rollers 16 and 17 constituting between them anti-friction means to facilitate the travel of the carriage. The respective sets of rollers 16, 17, are spaced apart vertically, and the axle 18 for the upper set carries a pinion 19 which is in mesh engagement with the rack 10.

Since it is desirable to retard the travel speed of the carriage we employ a fly-ball governor having the pivotal expanding members 20, carried by a horizontal wheel 21, mounted on a pivot 22 that extends upwardly from the base 12, in which it is journaled, said wheel 21 having a

central, upwardly extending shaft 22', that carries a horizontally disposed bevel gear 23, which is in mesh engagement with a vertically disposed gear 24, mounted on a shaft 25, said shaft 25 also carrying a pinion 25', that meshes with a larger gear 26, which is fast upon the shaft 18, to rotate with the pinion 19. With this train of gears the rotative speed of pinion 19 induced by the travel of the carriage imparts a greatly accelerated rotative speed to the wheel 21; whose fly-balls 20, in their radial expansion press their friction contacts 27 against the opposed channel base surface 28 to thereby retard or control the speed of rotation and hence the vertical travel of the carriage.

As means for urging upwardly the carriage bearing a stack of articles we employ one or more weights 29, seated upon a platform 30, and a cable 31, which passes over a pulley 32, journaled in an upper frame member 33, is engaged at one end with the carriage, as at 34, and at its other end is provided with a post 35, that rides through a hole 36 in platform 30 and through a cavity 37 formed in the weights, said post 35 being connected at its lower end with a plate 38 that is adapted to provide a seat for the weight carrying platform 30. The platform 30, and plate 38, each have an orifice 39 for the passage of another cable 40 (to be referred to hereinafter) and also, each has an orifice 41 to receive the frame member 9, whereby said member 9, as one of its functions, serves the purpose of a guide in the vertical movements of the weights, that is, when the weights are supported on the plate 38, and are held thereby in a horizontal plane. But, seeing that the weights and their platform 30 are disposed at one side of the member 9, and that the orifice 41 in platform 31 is the only means of association between said platform, and member, therefore, when the plate 38 becomes disassociated from platform 31, thereby said weights will cant the platform and cause the edges of the orifice therein to frictionally bind the platform in a fixed position, upon member 9, as shown in Figs. 3 and 15.

The carriage can then be freely lowered, for reloading. In order that the weights may not slide off the platform, when canted, said platform may have a stud 42 to engage a recess 43 in the bottom weight, and succeeding weights may have equivalent means of interconnection.

The cable 40 is provided at one end with a block 44 that has two orifices 45 for slidable engagement with a pair of parallel guide rods 46, that are extended between brackets 47, secured respectively to the lower and upper ends of frame member 9. Said cable 40, which has a handle 40' at its other end, is passed over a pulley 48, journaled in the frame member 33, and is adapted to be operated manually for the purpose of drawing the weights upwardly when lowering the carriage for reloading.

The block 44, which is capable of passing through aperture 39 in plate 38, when drawn upwardly by cable 40, will engage platform 30, and by continued effort will raise said platform from plate 38, whereby the weights, when released, will become canted in their interlocked position with respect to guide bar 9 for loading purposes. But when the plate 38 is drawn up to and against platform 30 by cable 31 then the carriage will resume its travel under the influence of the weights.

The article dispensing or kick-off means em-

ployed with this apparatus includes a slide member 49, mounted on a rail 50 that is secured to the frame member 51, said slide member carrying anti-friction rollers 52, 53, to ease its travel along said rail. Also a pull rod 54 is connected to slide 49, and extends outwardly, parallel with rail 50, through a bearing 55 at the front of the unit, where it is provided with the handle 4. Slide member 49 carries a curved foot 56 that projects forwardly, and, in the normal position of the slide, which is in a vertical plane at the rear of the stack of articles A, the free, upwardly curved end of foot 56 lies behind and projecting above the topmost article when the stack is raised to its height limit and said topmost article is in readiness for delivery. Also the foot 56 carries an adjustable stud 57, projecting below said foot, to lie behind the topmost article so that when rod 54 is pulled forwardly it will engage the rear end of said article and draw it outwardly for delivery.

It is necessary to provide automatic means for halting the rise of the stack when the topmost article thereon has reached its delivery position, wherefore we have devised braking means that co-act with the wheel 21 to stop the rotation thereof, and in consequence causing a cessation of movement through the gear train, thus arresting the carriage.

In carrying out this phase of my invention, we place a brake band 58 about the periphery of wheel 21, anchoring said band as at 59, and connecting its other end with one arm of a bell-crank 60, that is pivoted at 61, the free arm of said bell-crank having contacting relation with a vertically disposed brake bar 62.

Said brake bar, at its lower end, is pivotally engaged with a link 63 that is pivoted to a base member 64, and at its upper end is pivoted to a link 65, whose free end carries a weight 66; the function of said weight being to rotate to partly compensate the weight of brake bar 62 and associated elements, thereby facilitating the raising of bar 62, while said bar is at the same time shifted into another, parallel, vertical plane, said shifted position of bar 62 being that position thereof wherein the brake referred to is in effect.

When the brake bar 62 is in the position indicated in dot and dash lines in Fig. 13, the brake band 58 is free from wheel 21 and therefore the travel of the carriage is unimpeded, but when said brake bar 62 has been shifted to the full line position thereof in said Fig. 13, then it has allowed a weight 68 to fall, said weight being carried by an arm 69, pivoted at 70, and said arm having a rearward hook portion 71 that lies in the path of movement of the free arm of bell-crank 60. Thus, with brake bar 62 shifted as stated, whereby it is removed from contact with bell-crank 60, thereby weight 68 is free to fall, and in so falling it co-acts by its hook 71 with bell-crank 60 and causes the brake band to frictionally engage wheel 21.

As the articles borne by the carriage near the upper limit of their travel the topmost article bears against an opposing element in the form of a pair of horizontally disposed, spaced fingers 72, which are angled from vertical members 73, one of said members having a boss 74 that is slidably adjustable along a horizontal bar 75, and said bar engaging a boss 76, with which the other member 73 is connected. The fingers and members 72, 73 are supported by an angled bar 77 that is slidably adjustable through boss 76, said bar 77 extending from a sleeve 78, mounted

on a stud 79 which projects from a boss 80, and is tensionally held thereto by a spring 81 which lies between sleeve 78 and the manipulating head 82 of stud 79, sleeve 78 and boss 80 having notch 5 and tooth interengaging means 83, to prevent relative rotation. The boss 80 extends forwardly from a bracket which is in the form of a channel 84, whose upper flange 84' is inclined forwardly downward, for a purpose to be referred to hereinafter, and said channel, at its rearward portion, is connected to the brake bar 62, by which bar the channel and its associated parts are carried.

From the foregoing description of parts and their interrelation it will appear that as the topmost article of a rising stack comes in contact with fingers 72 thereby said fingers and consequently channel 84 will be elevated through overpowering gravity of the weights, wherefore brake bar 62 will also be raised, and shifted, for the performance of the braking action upon the carriage, in the manner previously described. With the carriage and its supported stack thus at rest, then the pull rod 54 may be pulled forwardly by its handle 4, thus enabling stud 57 on finger 56, carried by slide block 49, to engage the rear of the topmost article and to pull it off the stack, for delivery.

A weight 85, having a strand 86 that passes over a pulley 87 and engages the block 49, serves to automatically return said block preliminary to a succeeding delivery of another topmost article.

The lever 88, shown as pivoted at 89 to frame 51, carries a pin 90 which is adapted to engage under the flange 84' when said lever is drawn forwardly, to thereby in a manual operation, lock the brake bar 62 in its elevated, shifted position with the carriage halted.

At 91 appears a front guard for the stack, which guard is to lie below the delivery position of the topmost article, to thereby prevent the dragging forward of the next adjacent article when the topmost one is being delivered. Guard 91 is mounted on a screw 92 that is threaded through a boss 93 at one end of said guard, and said screw is revoluble in spaced lugs 94, 95 that project from the frame at one side of the unit.

The articles A, which may be in the form of packages, or otherwise, are not limited as to their height or thickness, but accordingly thereto the front guard 91 may be adjusted by turning the screw 92, to shift said guard either up or down.

In the instance of a number of units, placed side by side in a cabinet, the frames of adjacent units may provide supporting means for the opposite ends of the guards, as indicated in Fig. 9.

Vertical guide members for the stack of articles on carriage table 14 are indicated at 96, 97, and may be adjusted to co-act with stacked articles of varying widths and lengths. For this purpose the table 14 has the arcuate edge 98 clearance for adjustment of the rear guide 96, and the arcuate slot clearance 99 for adjustment of the lateral guide 97.

The lug 100, projecting from sleeve 78 serves as a finger pull for releasing said sleeve from its engagement at 83, whereupon said sleeve can be rotated to throw the fingers 72 out of the vertical path above the carriage, for loading and reloading purposes.

At 101 we have indicated a pivotal pawl, which may be weighted and serve, until released, as a lock to prevent the operation of pull rod 54.

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 frame, of a vertically movable carriage adapted to carry a stack of articles, means to urge said carriage upwardly, governor means to retard the travel speed of said carriage, a shiftable brake bar, links pivotally connecting the opposite ends of said brake bar with said frame, a brake to co-act with said governor, means operable through the medium of said brake bar to actuate said brake, and stack engaging means carried by said brake bar, actuable by the topmost article in rising to its delivery position, for shifting said brake bar to thereby cause the brake to be applied.

2. The combination, in a vending machine, of a vertically movable carriage adapted to carry a stack of articles, means to urge said carriage upwardly, a vertical rack, governor means carried by said carriage to retard its travel speed, said governor means including a pinion in engagement with said rack, also a gear train and a wheel rotatable thereby, a brake band for said wheel, a bell-crank to operate said brake band, a brake bar that is shiftable both vertically and laterally, stack engaging means carried by said brake bar in spaced opposition to the topmost article on a rising stack, and a weighted arm urging said bell-crank to apply said brake band, said brake bar in one position engaging said bell-crank to hold said brake band released from said wheel, said stack engaging means when met by said topmost article in the rise of the carriage, and rising therewith, thereby shifting the brake bar out of engagement with said bell-crank, and permitting the weighted arm to apply the brake band, thus arresting the carriage.

3. The combination, in a vending machine, of a vertically movable carriage, a table thereon adapted to support a stack of articles, said table provided with arcuate clearances, and vertical guides adjustable with respect to said clearances to co-act with supported articles of varying widths and lengths.

4. The combination, in a vending machine, having a frame, of a carriage adapted to support a stack of articles, means for urging said carriage upwardly, guide means for said carriage, means for retarding its travel speed, a pulley mounted in an upper position on said frame, weights to overbalance said carriage, a cable connecting said weights and carriage over said pulley, and means for suspending said weights released from said cable whilst loading said carriage.

5. The combination, in a vending machine, having a frame, of a carriage adapted to support a stack of articles, means for urging said carriage upwardly, guide means for said carriage, means for retarding its travel speed, a pulley mounted in an upper position on said frame, weights to overbalance said carriage, a cable connecting said weights and carriage over said pulley, a second pulley mounted on said frame, and a handled cable thereon provided with means for engaging said weights, whereby said weights may be lifted to a suspended position, released from the carriage engaging cable.

6. The combination, in a vending machine, having a frame, of a carriage adapted to support a stack of articles, means for urging said carriage upwardly, guide means for said carriage, means for retarding its travel speed, stacked weights to overbalance said carriage, said weights having an

aperture therethrough, a platform for said weights, said platform having orifices there-
 through, a fixed vertical guide member extended
 through one of said orifices, a pulley mounted
 5 in an upper position on said frame, a cable en-
 gaged at one end with said carriage, said cable
 passing over said pulley, a plate having orifices
 therethrough, whereof one orifice receives said
 10 guide member, said plate lying beneath said plat-
 form and having means of connection with said
 cable through an orifice in said platform, a second
 cable, provided with a handle at one end and
 passing over a second pulley, also mounted in said
 15 frame, both said cables passing through the cavity
 in said weights, and aligned orifices in said plat-
 form and plate, a block engaging the other end
 of said second cable, fixed guide means for said
 block whereby it may be drawn through an orifice
 20 in said plate to engage said platform for raising
 said weights to a desired elevation when loading
 the carriage, said weights, being disposed at one
 side of their guide member, thereby causing the
 edges of the guide member containing orifice in
 the platform to frictionally suspend said plat-
 25 form and weights as they become canted over by
 their own gravity.

7. The combination, in a vending machine,
 having a frame, of a vertically movable carriage
 adapted to carry a stack of articles, means to urge
 30 said carriage upwardly, governor means to re-
 tard the travel speed of said carriage, a shiftable

brake bar borne by said frame, a brake to co-act
 with said governor, means operable through the
 medium of said brake bar to actuate said brake,
 and stack engaging means carried by said brake
 bar, actuable by the topmost article in rising to
 its delivery position, for shifting said brake bar
 5 to thereby cause the brake to be applied.

8. The combination, in a vending machine, of
 a vertically movable carriage adapted to carry a
 stack of articles, means to urge said carriage
 10 upwardly, a vertical rack, governor means carried
 by said carriage to retard its travel speed, said
 governor means being operatively connected to
 said rack, a brake band to co-act with said gover-
 nor means, a bell-crank to operate said brake
 15 band, a brake bar that is shiftable both verti-
 cally and laterally, stack engaging means carried
 by said brake bar in spaced opposition to the top-
 most article on a rising stack, and a weighted arm
 urging said bell-crank to apply said brake band,
 20 said brake bar in one position engaging said bell-
 crank to hold said brake band released from said
 wheel, said stack engaging means when met by
 said topmost article in the rise of the carriage,
 and rising therewith, thereby shifting the brake
 25 bar out of engagement with said bell-crank, and
 permitting the weighted arm to apply the brake
 band, thus arresting the carriage.

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