Oct. 19, 1926. 1,603,576

D. H. BEELMAN

VENDING MACHINE

Filed July 23, 1923 3 Sheets-Sheet 1

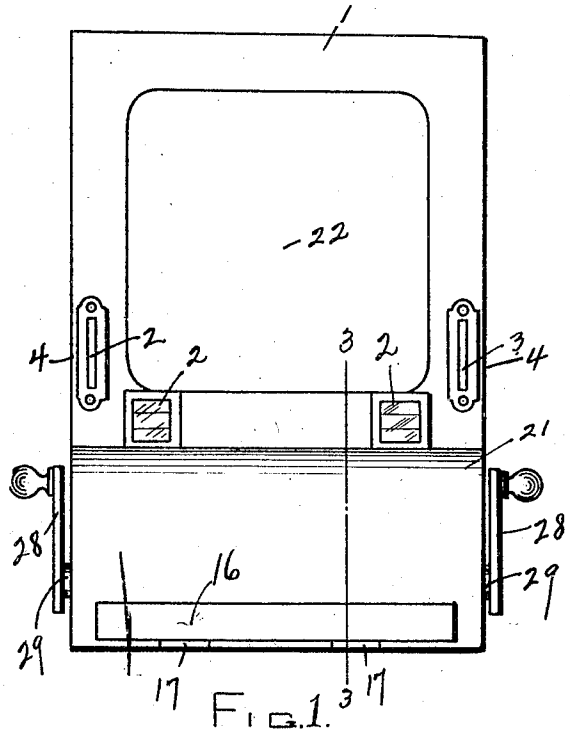


FIG. 1.

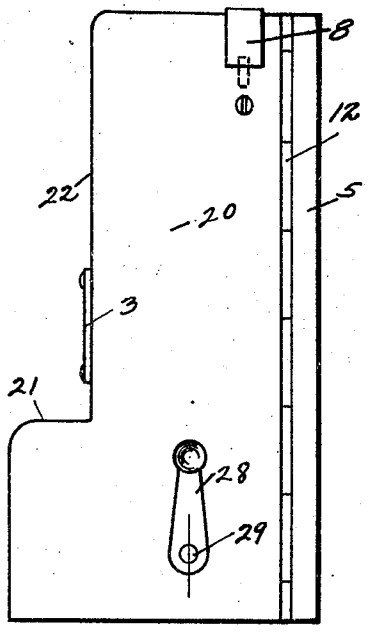


FIG. 2.

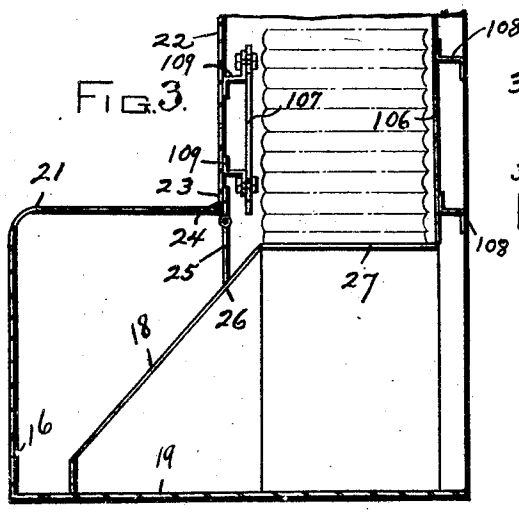


FIG. 3.

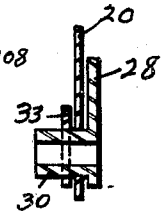


FIG. 5.

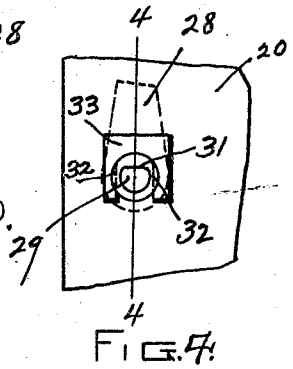


FIG. 4.

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Fig. 6.

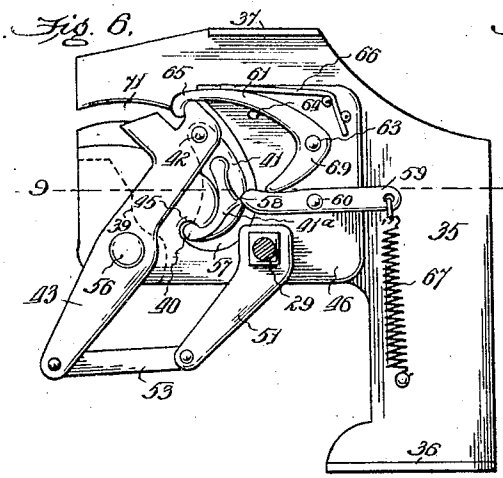


Fig. 7.

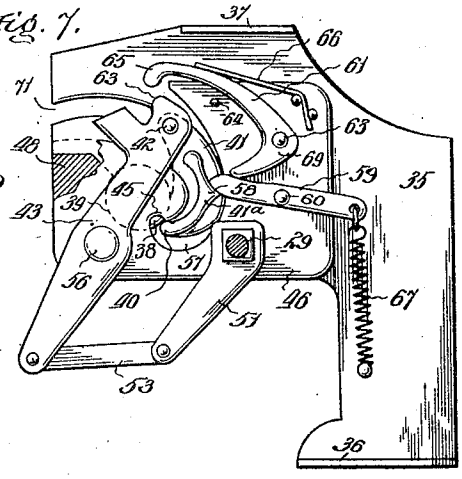


Fig. 8

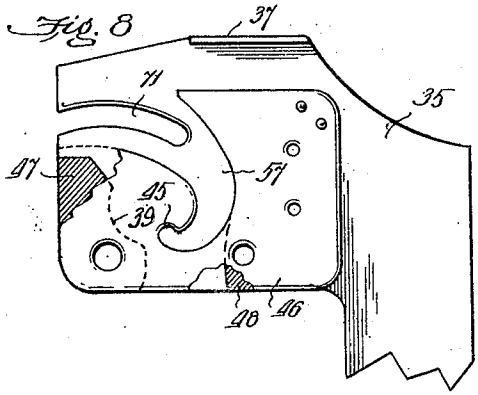


Fig. 9.

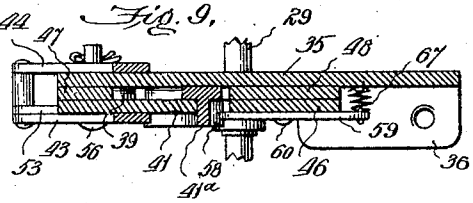


Fig. 10.

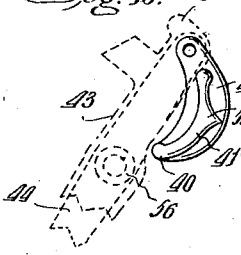


Fig. 11.

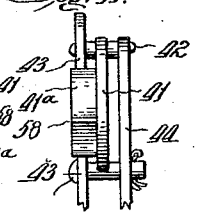


Fig. 14.

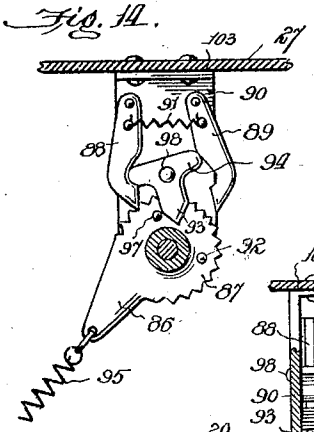


Fig. 12.

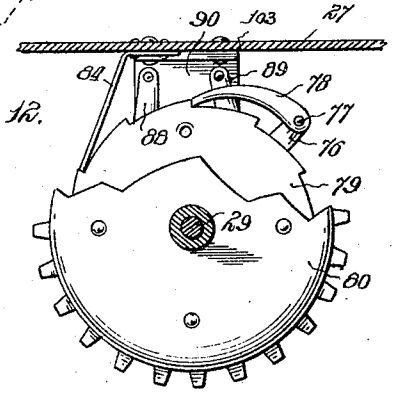
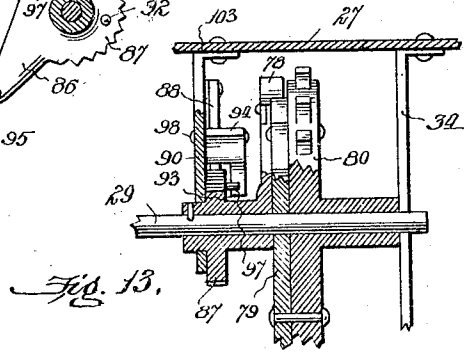


Fig. 13.



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FIG. 15.

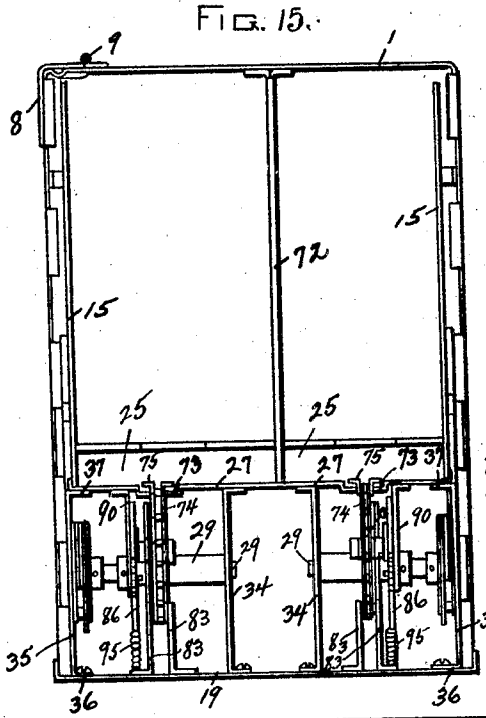
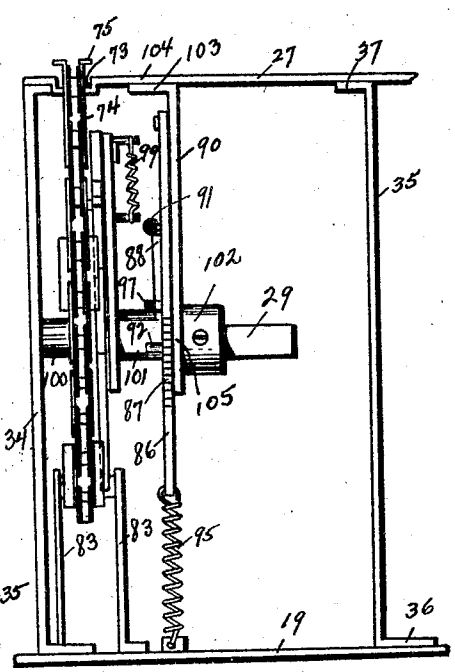


FIG. 16.



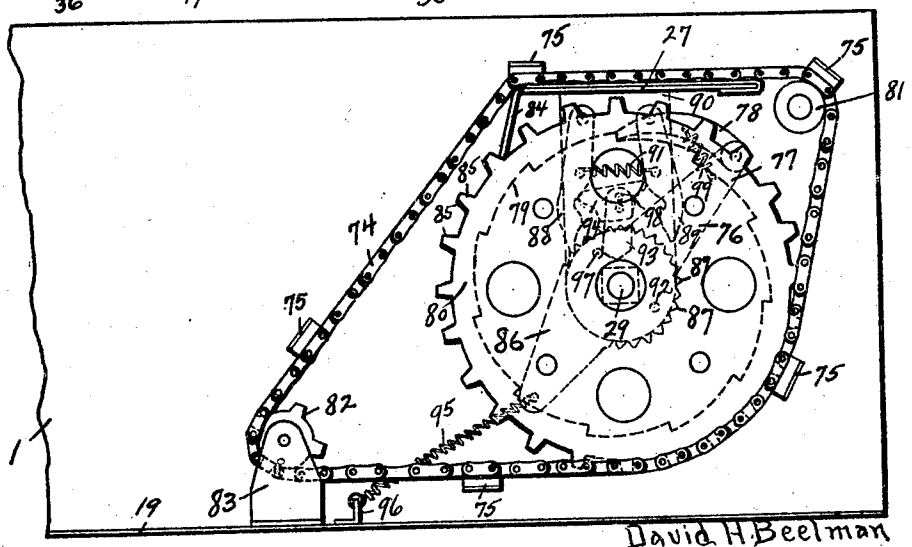


FIG. 17.

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Patented Oct. 19, 1926. 1,603,576

UNITED STATES PATENT OFFICE.

DAVID H. BEELMAN, OF YOUNGSTOWN, OHIO.

VENDING MACHINE.

Application filed July 23, 1923. Serial No. 653,087.

This invention relates to vending machines, and has for its primary object to provide an improved construction, combination and arrangement of parts in a device of this character, according to which it can be simply and economically constructed, and which will be durable in service and efficient in operation.

As will hereinafter appear my present invention contemplates a vending machine provided with improved article-discharging mechanism comprising a sprocket wheel and chain turned by means of pawl and ratchet operated by an oscillating-rotary shaft, the sprocket-chain having lugs or pushers to deliver the articles successively from the bottom of a stack on each complete movement of the shaft by the operating lever, and includes an auxiliary pawl and ratchet device for preventing a backward movement of the shaft in either direction until a full stroke of the lever is completed for the delivery of a single article after the shaft is released by coin-controlled mechanism such as illustrated in this application and which forms the subject-matter of a divisional application filed November 9, 1925, Serial Number 67,779.

Other and further objects will appear in the specification, and be specifically pointed out in the appended claims, reference being had to the accompanying drawings exemplifying the invention, and in which,

Fig. 1 is a front elevation of the device.

Fig. 2 is a side elevation of the device.

Fig. 3 is a sectional view taken on line 3—3 of Figure 1.

Fig. 4 is a detailed view showing manner of attaching operating lever.

Fig. 5 is a sectional cross section taken on line 5—5 of Figure 4.

Fig. 6 is a side view of the coin-controlled mechanism, with the parts in normal position; Fig. 7 is a similar view with the parts released by a coin; Fig. 8 is a side view of the supporting plate of the coin-controlled mechanism; Fig. 9 is a sectional view on the line 9—9 of Fig. 6; Figs. 10 and 11 are side and edge views respectively of the pivoted dog forming part of the releasing mechanism; Fig. 12 is a side elevation showing the connected sprocket and ratchet wheels of the article discharging mechanism; Fig. 13 is a front elevation, partly in section, showing parts of the article discharging mechanism and pawl and ratchet device to compel a full lever stroke in either direction; Fig. 14 is an elevation of the pawl and ratchet device;

Fig. 15 is an interior view of the device with back removed.

Fig. 16 is an enlarged detailed view of a portion of Figure 15.

Fig. 17 is an enlarged detailed view showing a side view of Figure 16.

Referring more particularly to the drawings, and, for the sake of convenience in disclosing my invention, confining my description more expressly to the adaptation shown in the drawings, the preferred form of my vending machine comprises an outer housing 1, with two small show windows 2 occupying a position slightly below the center of the housing 1 and near coin slots 3 which are located at the side edges of the front portion of the housing 1. These show windows are used for the purpose of indicating whether the housing is supplied with articles to be vended. The housing is provided with two compartments for the articles to be vended by the machine, said compartments being separated by a partition 72 and each having a side wall 15 spaced from the adjoining side wall of the housing to accommodate coin chutes 14 leading from the coin-slots 3 to the coin-controlled mechanism located below the bottom 27 of the compartments and alongside of the article-discharging mechanism. Entrance to the compartments and space below the same is accomplished in the manner usual in vending machines of this general type, that is by swinging the front portion 1 of the housing on a back portion or wall plate 5, the latter providing the means for attaching the machine to a support, and the front and back are connected at one side by a long hinge 12 (Fig. 2) and are fastened together by a hasp 8.

By referring to Figure 1 it will be seen that I have provided a rectangular opening 16 at the lower end of the front of the housing for the purpose of allowing the article vended to be withdrawn. This may be done by inserting fingers in the lower opening 17, lifting up slightly so article may pass easily through the rectangular opening 16. By referring to Figure 3 it will be seen that the device has an inclined slide 18 which is secured to the bottom of the housing 1 and has edges secured to the end walls 20 of said

housing. The housing 1 is provided with a lower projection 21 which extends outwardly at right angles to the body portion 22. This extension 21 is formed for the purpose of allowing the article vended to pass down the incline slide 18 and to take a position ready for removing as above mentioned and described. At point 23 there is provided a securing arm 24 to which is hinged an apron 25, the lower edge of which comes in contact with point 26 on the incline slide 18. This apron is used for the purpose of preventing any unauthorized attempt to disturb or withdraw any article to be vended which has been placed in an orderly way on a shelf 27 (see Figure 3). By referring to Figures 1 and 15, it will be seen that the device is provided with two operating levers 28 each of which is secured to a rock-shaft 29 corresponding parts in each of the two ejector units being designated by the same numeral. By referring to Figures 4 and 5 it will be seen that these operating levers 28 are secured to the rock-shaft 29 by slipping a collar portion 30 over the rock-shaft 29 which has a flattened portion 31 in order to keep the operating lever 28 from turning on the shaft. In order to secure these operating levers 28 to the rock-shaft 29, the collar 30 is provided with two oppositely disposed grooves 32 for the reception of bifurcated key-plate 33 which is sprung on in order that they may retain their position. The device is operated in the following manner:—

This rock-shaft 29 is supported by standards 34 and 35. By referring to Figure 9 it will be seen that the device is provided with two similar sets of mechanisms each actuated independently by a rock-shaft 29 to provide separate coin-controlled and article-discharging mechanisms for each compartment, and said mechanisms being alike in construction a description of those relating to one compartment will refer also to those of the other compartment, it being understood that one set is what might be termed right-hand, and the other left-hand, but the co-operating elements are the same and function alike in each instance. A standard 35 is secured to the bottom 19 of the housing 1 by means of the inturned flange 36 and by means of the inturned flange 37 to the shelf or bottom 27 of the compartments, and to this standard the coin-controlled mechanism is attached, or mounted thereon, for cooperating with the shaft 29.

The coin-controlled mechanism is mounted upon the body portion of the standard which has a vertical passageway for the coin to pass through and finally drop out of the lower end thereof, and for the purpose of providing this passageway said body portion is preferably made up of three plates, 46, 47 and 48, in addition to the plate of the standard; plate 46 being the outside or front plate while plates 47 and 48 are interposed between it and the standard and spaced apart from each other to provide the passageway with the inner edge of plate 47 recessed in the arc of a circle, at 39, to provide a coin-pocket cooperating with a pivoted dog 41 also located in the passageway—the coin passing between said pocket and dog to move the latter laterally in releasing a locking lever 43 through the instrumentality of the mechanism hereinafter described. The front plate 46 is provided with a curved slot 57 in which plays a cam 41^a secured to or formed integrally with the face of the dog and projecting through said slot beyond the same so that an oppositely inclined rearward projection 58 of said cam may operate a trip-lever 59 pivoted on said support. The curved slot 57 terminates at its lower end in a notch 45 in which engages the lower rounded end 40 of the cam 41^a when the dog is in normal position for operation by the coin. The dog is pivoted at its upper end between the upper ends of locking lever 43 and companion lever-arm 44 by means of a pin 42—the levers being positioned at the front and back of the support—and so as to not interfere with the swinging movement of these levers the aforesaid connecting pin passes through a slot 71 in the standard curved in the arc of a circle the axis of which is the fulcrum 56 of the levers. The lever-arms extend below the fulcrum and at their lower ends are connected by link 53 to an arm 51 fixed to the main operating shaft 29, which also passes through the support; said shaft and fulcrum pin being on the same horizontal plane whereby swinging movement of the arm 51 will be communicated to the lever-arms, and consequently when the lever-arms are locked the shaft will be locked. Lever-arm 43 constitutes the locking-lever of the coin-controlled mechanism, and for this purpose the upper end 63 thereof is engaged by the forward hook-end 65 of a catch 61 pivoted on the support at 63 and having a forwardly-projecting tail-piece 69 which is engaged by the trip-lever 59, hereinbefore mentioned, this trip-lever being pivoted at 60 and having a rearward extension to which is attached a coiled spring 67 exerting a slight tension to lift the forward end of said lever against the tail-piece of the catch. There is also a light flat spring 66 exerting a very light tension on the catch that will not interfere with the operation of said catch by the weight of a coin operating the dog, trip-lever and catch; that is to say, when the coin passes down the passageway 57 and moves the dog rearward on entering the pocket 39 said dog will lift the forward end of trip-lever 59 which in turn lifts the catch 61 by engaging the tail-piece 69 to disengage the hook-end 65 of said catch

from the locking-lever 43, thus releasing said locking-lever and permitting the operating shaft 29 to be turned. As the operating shaft is turned the upper end of the locking-lever is swung forward carrying the dog with it and after the cam-projection 58 on the dog passes the forward end of the tripping-lever both the tripping-lever and catch will be returned to normal position by the springs 67 and 66, so that on the return of the dog to the lower end of the curved slot 57—on the return stroke of operating-handle 28 of shaft 29—the aforesaid cam-projection 58 will pass the yielding tripping-lever and the end 40 of the cam again engage the notch 45. During this operation, or return of the dog, the catch is held in position to function with the upper end of the lever by means of a stop-pin 64, that is to say, when the dog slightly depresses the forward end of the tripping-lever in passing the same it will not affect the position of the catch bearing on said tripping-lever. As the dog is carried upward by the locking-lever it releases the coin so that it will fall out of the lower end of the passageway, between the operating shaft 29 and fulcrum pin 56, on to the bottom of the housing. From the foregoing the operation of the coin-controlled mechanism for locking the main operating shaft and releasing the same on the insertion of a coin will be understood, and I will now proceed to describe the means for compelling a full stroke of the operating lever in both directions and the cooperating article-discharging mechanism forming the principal subject-matter of this application.

By referring to Figure 15 it will be seen that the housing 1 is provided in its upper portion with a partition 72 for the purpose of dividing the upper space of the housing 1 into two compartments for the reception of goods to be vended. The lower end of the partition 72 rests upon the shelf 27, and the latter is provided with a depression 73 in the center of each compartment above referred to. This depression 73 is utilized for the purpose of providing a run-way for a sprocket chain 74 provided with lugs or pushers 75 formed on said chain.

Referring to Figure 17 the chain 74 is shown and the means for causing the same to move will be now described. It will be remembered that the rock-shaft 29 moves in an anti-clockwise direction when the operating lever 28 is pulled downwardly. Keyed to this rock-shaft 29 is an arm 76 the outer end 77 of which is provided with a pawl 78 engaging a ratchet wheel 79 secured to a sprocket wheel 80, said sprocket wheel carrying the chain 74. The lugs or pushers 75 are uniformly spaced apart upon the chain 74 in such distances that when the chain has been caused to move by one movement of the operating lever 28 another set of lugs or pushers 75 will be positioned in the same position relative to the shelf 27 so that the second article to be vended will lodge between the lugs or pushers of that portion of the chain directly above the shelf 27. It will also be seen that I have provided an idler 81 positioned so as to carry the chain 74 on a level with the depression 73 formed in the shelf and that a second idler 82 is oppositely disposed from the idler 81 on standards 83 secured to the bottom 19 of the housing 1.

There is a pawl 84 functioning with ratchet wheel 79, said pawl being secured to the bottom portion of that part of the shelf forming the depression 73 and prevents reverse movement of the ratchet wheel and sprocket wheel. The ratchet wheel 79 and sprocket wheel 80 are connected together and loosely mounted on the rock-shaft 29. It will also be seen that there has been provided a ratchet wheel 87 which is keyed to the rock-shaft 29, and cooperates with spaced apart pawls 88 and 89 alternately engaging the ratchet-wheel to prevent backward movement of the shaft when the latter is being turned in either direction, said pawls being positioned directly above the ratchet wheel 87 and pivotally connected to a hanger 90. These pawls 88 and 89 are moved in relation to the ratchet-wheel by means of a coil spring 91. By again referring to Figure 14 it will be seen that the pawl 88 is engaged with the ratchet-wheel 87, which indicates that the machine is in locked position. As the ratchet-wheel turns with the rock-shaft 29, a trip pin thereon 92 comes in contact with the tail-piece 93 of a tappet member 94 causing the latter to disengage pawl 88, the upper portion or cross-head of said tappet-member then permitting pawl 89 to engage the ratchet-wheel. A spring 95 is secured to the lower end of the lever portion 86 of the ratchet wheel and to a bracket 96 fastened to the bottom 19 of the housing to cause the check lever and ratchet wheel to fly back to the position shown in Figure 1. When the pawl 88 has been disengaged as above described the double acting tappet member 94 has allowed the pawl 89 to function with the teeth of the ratchet wheel 87 thereby insuring the machine from reverse action and continues to function until a second trip pin 97 engages the trip arm 93 when the pawl 89 is caused to disengage and the pawl 88 to engage. The double acting tappet member 94 is pivotally secured to the hanger 90 by means of a pin 98.

One of the essential features of a vending machine is to provide safeguards so that the device cannot be operated without unlocking the mechanism by coin. In order to safeguard this device against unauthorized or irregular movement, it will be seen that

I have provided the alternating and automatic pawls which function with the ratchet-wheel 87 in such a way as to check any undesired reverse movement of the rock-shaft 29, that is to say the pawl and ratchet devices consisting of the ratchet-wheel 87 and alternately engaging pawls 88, 89, in conjunction with the operating shaft 29, cooperate with the article delivering mechanism to insure a regular movement of the combined sprocket and ratchet wheel in delivering an article from the bottom of the stack, and also cooperate with the coin controlled mechanism in compelling a full movement of the locking-lever 43 in both directions—to first release coin 38 after it has operated dog 41 to release said lever 43 (Fig. 7) and then fully return the lever to normal or locked position (Fig. 6) in which it is engaged by catch 61 with the pivoted dog 41 returned to normal position for operation by another coin. This operation is repeated every time the mechanism is caused to operate by the placement of the coin 38 against the coin-pocket 39. By referring to Figure 6 it will be understood that when the pivoted dog 41 has been forced back by reason of the point 40 traveling on the circumference of the coin 38 until it has passed the center portion of the coin, the coin is released and drops down on to the bottom 19 of the housing 1.

By referring to Figure 16 it will be seen that I have utilized a coil spring 99 which is secured to the outer end 77 of the arm 76 and to the pawl 78 for the purpose of insuring the proper functioning of said pawl, that I have provided a spacer 100 and 101 for the purpose of holding the parts positioned on the rock-shaft 29 from displacement. It will also be seen that a collar 102 is positioned on the rock-shaft 29 adjacent to the hanger 90, and that there is provided this hanger 90 secured by a flange 103 to the shelf 27 at point 104. The rock-shaft 29 is supported at point 105 on the hanger 90.

By referring to Figure 3 it will be seen that guides 106 and 107 have been provided for the guiding of the articles to be vended. The guide 106 is secured to the housing 1 by means of the bracket 108. The guide 107 is slidably maintained upon the brackets 109 so that adjustment may be made to suit the thickness of the article placed upon the shelf 27.

What I claim is:—

1. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel below the runway, a sprocket-chain driven by said sprocket-wheel and having a portion thereof beyond the sprocket-wheel travelling on the runway and supported thereby below the plane of the shelf, and spaced apart pushers on the sprocket-chain to project above the plane of the shelf; together with means for turning the sprocket-wheel.

2. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel below the runway, a sprocket-chain driven by said sprocket-wheel and having a portion thereof beyond the sprocket-wheel travelling on the runway to be supported thereby below the plane of the shelf, an idle-roller supported on a plane with the runway for guiding the sprocket-chain from the sprocket-wheel to said runway, and spaced apart pushers on the sprocket-chain to project above the plane of the shelf; together with means for turning the sprocket-wheel.

3. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel below the runway, a sprocket-chain driven by said sprocket-wheel and having a portion thereof beyond the sprocket-wheel travelling on the runway to be supported thereby below the plane of the shelf, an idle-roller supported on a plane with the runway for guiding the sprocket-chain from the sprocket-wheel to said runway, and a second idle-roller to receive the chain from the run-way and guide it back to the sprocket-wheel, the sprocket-chain having spaced apart pushers to project above the plane of the shelf; together with means for turning the sprocket-wheel.

4. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel loosely mounted on a shaft below the runway and having a ratchet-wheel attached to one side thereof, a sprocket-chain driven by said sprocket-wheel and having a portion thereof beyond the sprocket-wheel travelling on the runway to be supported thereby below the plane of the shelf, and pushers carried by the sprocket-chain to project above the plane of the shelf; together with an arm fixed to the shaft and carrying a pawl engaging the aforesaid ratchet-wheel, and means for controlling an oscillating-rotary motion of the shaft.

5. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel loosely mounted on a shaft below the runway and having a ratchet-wheel attached to one side thereof, a sprocket-chain driven by said sprocket-wheel and having a portion thereof beyond the sprocket-wheel travelling on the runway to be supported thereby below the plane of the shelf, and pushers carried by the sprocket-chain to project above the plane of the shelf; together with an arm fixed to the

shaft and carrying a pawl engaging the aforesaid ratchet-wheel, means for controlling an oscillating-rotary motion of the shaft, and auxiliary ratchet and pawl mechanism to compel full movement of the shaft in both directions before return movement thereof.

6. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel below the runway and having a ratchet-wheel attached to one side thereof, a shaft on which the combined sprocket-wheel and ratchet-wheel is loosely mounted, an arm fixed to the shaft and carrying a pawl engaging the ratchet-wheel, means for controlling an oscillating-rotary motion of the shaft, a ratchet-wheel fixed to the shaft, two pawls engaging said ratchet-wheel, and means for moving said pawls alternately out of engagement with the ratchet-wheel for the oscillating-rotary motion of the shaft; together with a sprocket-chain driven by the sprocket-wheel and having pushers which project above the plane of the shelf as said sprocket-chain travels on the runway.

7. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel below the runway and having a ratchet-wheel connected thereto, a shaft on which the connected sprocket-wheel and ratchet-wheel are loosely mounted, an arm fixed to the shaft and carrying a pawl engaging the ratchet-wheel, means for controlling an oscillating-rotary motion of the shaft to impart a rotory motion to the sprocket-wheel by the said pawl and ratchet, and a sprocket-chain driven by the sprocket-wheel and carrying pushers, said sprocket-chain travelling on the runway below the plane of the shelf and the pushers projecting above the plane of the shelf; together with a ratchet-wheel fixed to the aforesaid shaft, a pawl to prevent movement of the ratchet-wheel in one direction, a second pawl to prevent movement of the ratchet-wheel in the other direction, a movable member engaging the pawls alternately to hold them successively out of engagement with the ratchet-wheel on movement of the shaft in opposite directions, and means operated by the shaft for so releasing the pawls at the end of each complete movement of the shaft.

8. A vending machine comprising a housing having a shelf on which articles are stacked, a runway below the shelf, a sprocket-wheel below the runway and having a ratchet-wheel connected thereto, a shaft on which the connected sprocket-wheel and ratchet-wheel are loosely mounted, an arm fixed to the shaft and carrying a pawl engaging the ratchet-wheel, means for controlling an oscillating-rotary motion of the shaft to impart a rotary motion to the sprocket-wheel by said pawl and ratchet, and a sprocket-chain driven by the sprocket-wheel and carrying pushers, said sprocket-chain travelling on the runway below the plane of the shelf and the pushers projecting above the shelf; together with a ratchet-wheel fixed to the aforesaid shaft, a pawl to prevent movement of the ratchet-wheel in one direction, a second pawl to prevent movement of said ratchet-wheel in the other direction, a rocking-member interposed between the pawls and engaging them alternately to hold them successively out of engagement with the ratchet-wheel on movement of the shaft in opposite directions, and pins on the ratchet-wheel for rocking said member on each complete movement of the shaft.

In testimony whereof I affix my signature.

DAVID H. BEELMAN.