No. 864,368. PATENTED AUG. 27, 1907.

E. P. GARNER.

VENDING MACHINE.

APPLICATION FILED JAN. 8, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

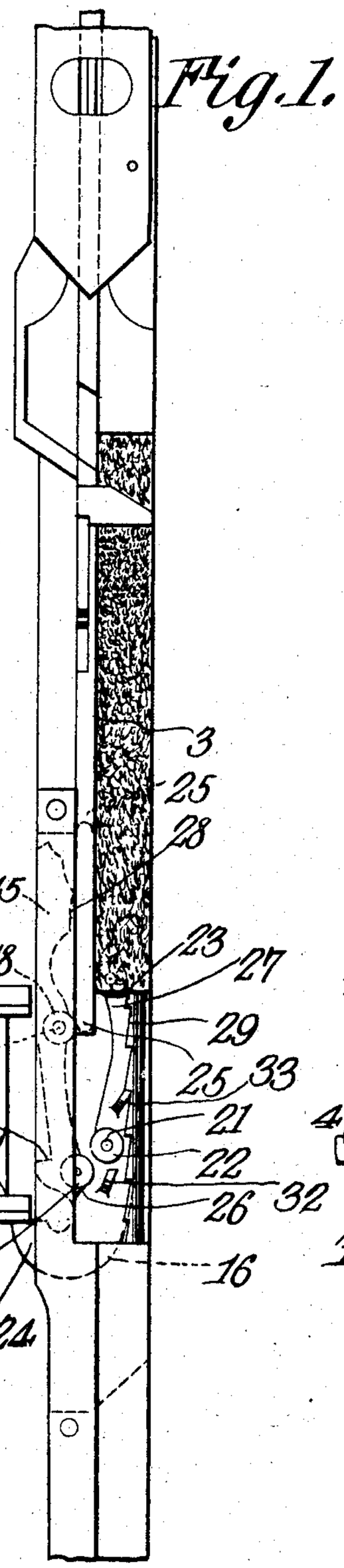


Fig. 2.

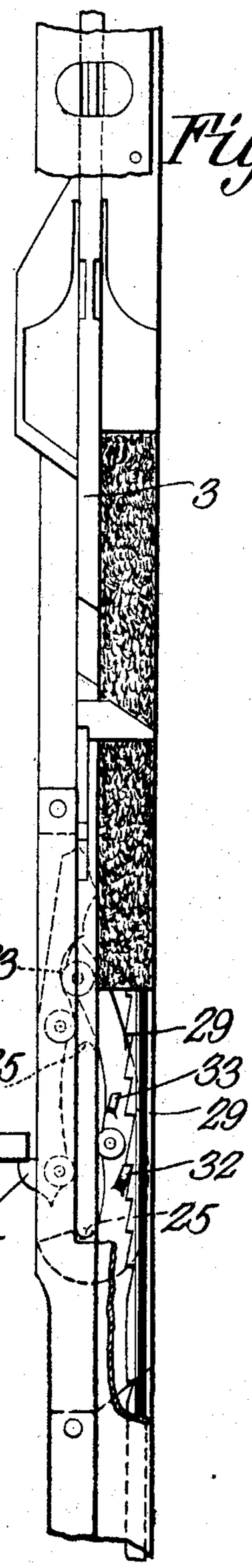
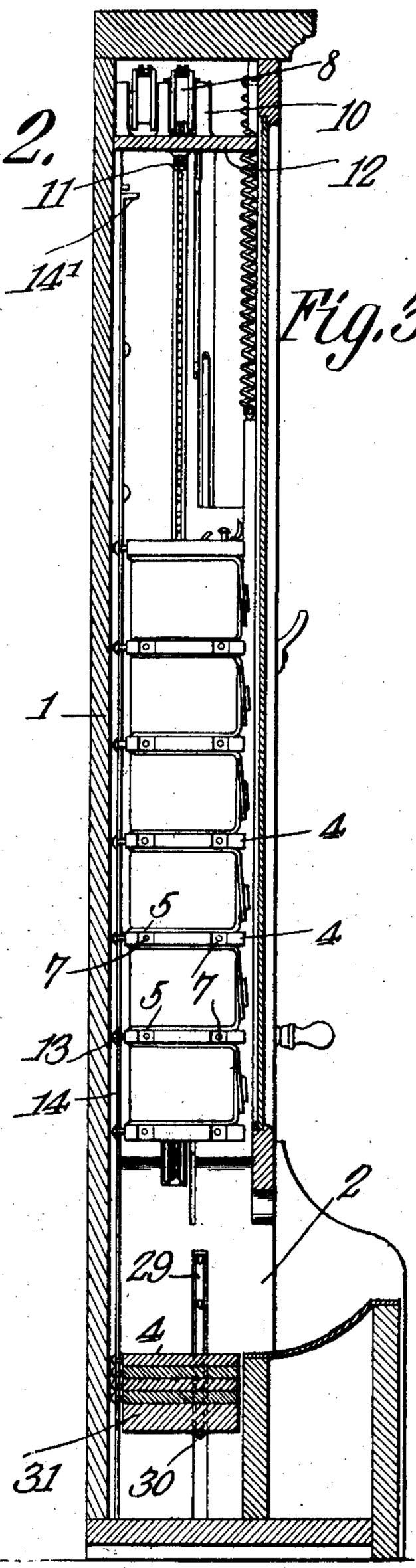


Fig. 3.



WITNESSES:

E. J. Stewart

F. T. Chapman.

Ernest P. Garner INVENTOR

By Cashow & Co.

ATTORNEYS

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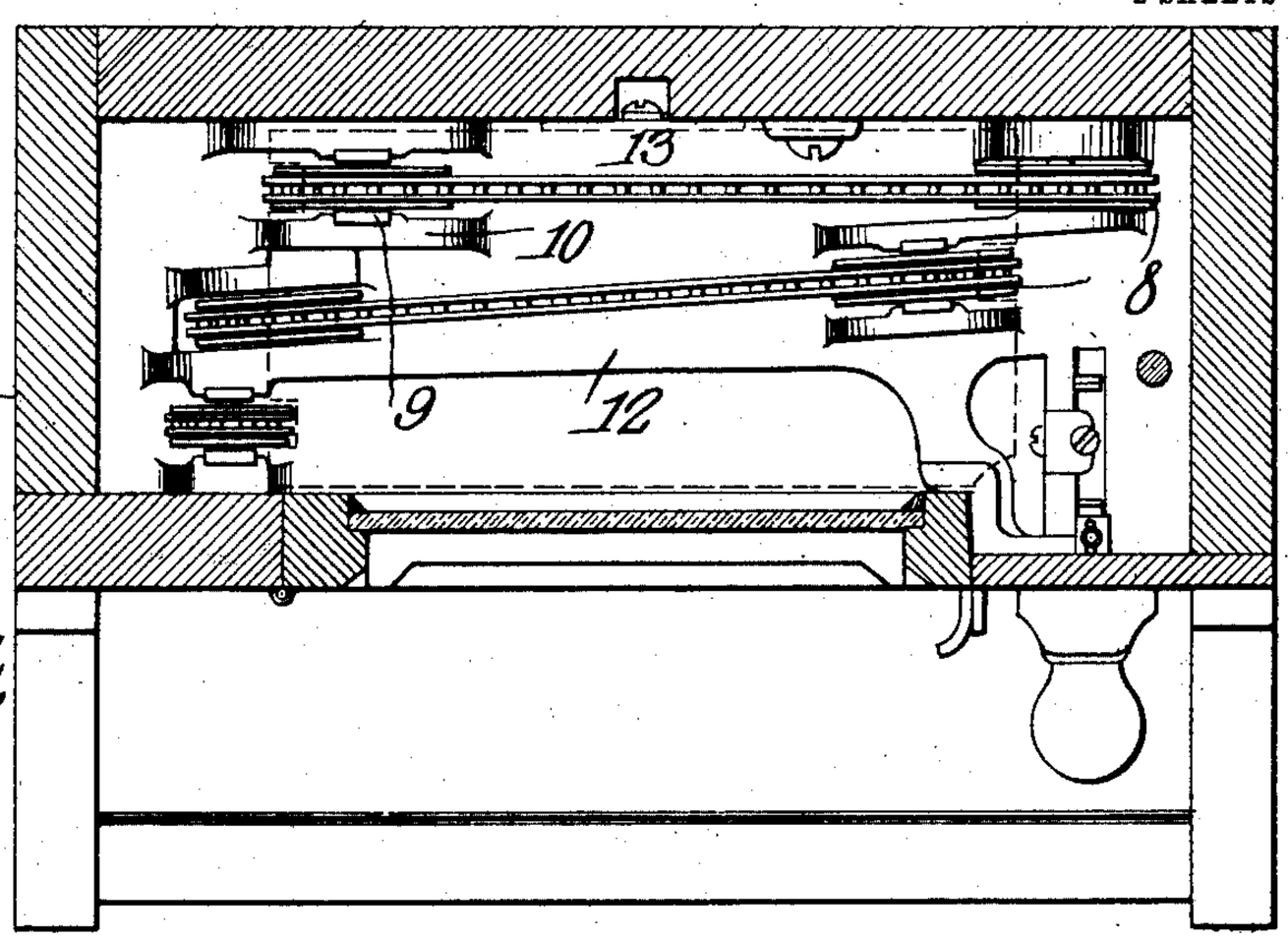


Fig. 4.

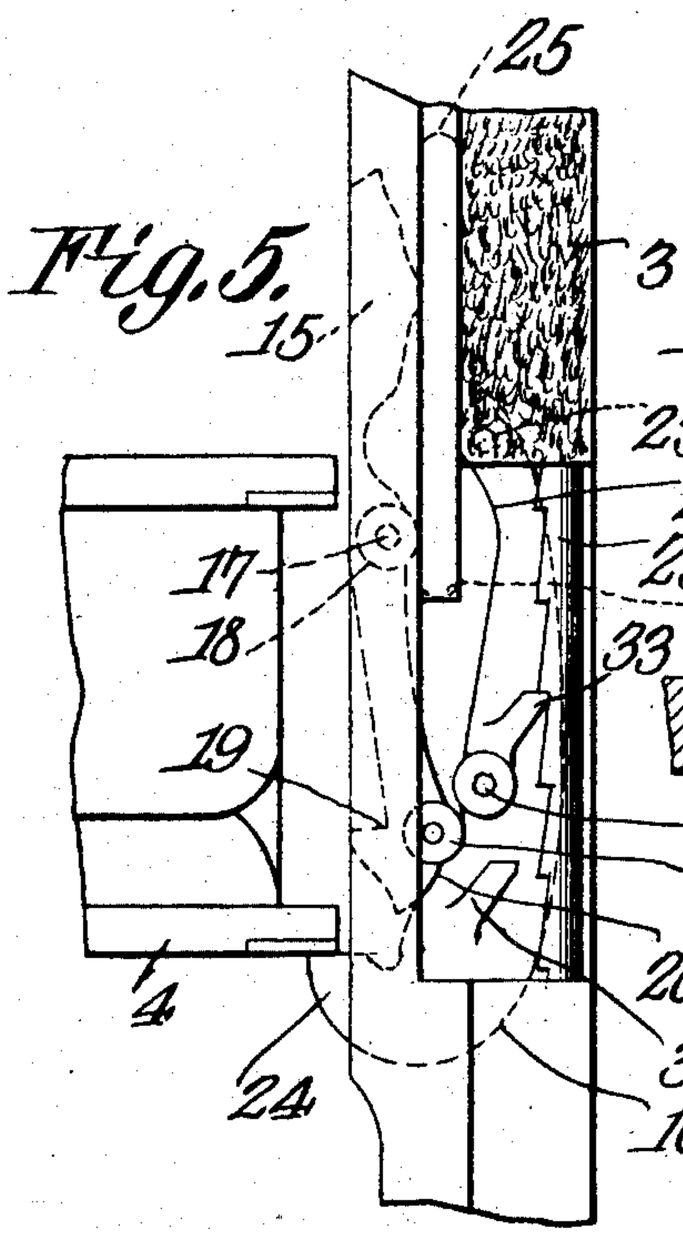


Fig. 5.

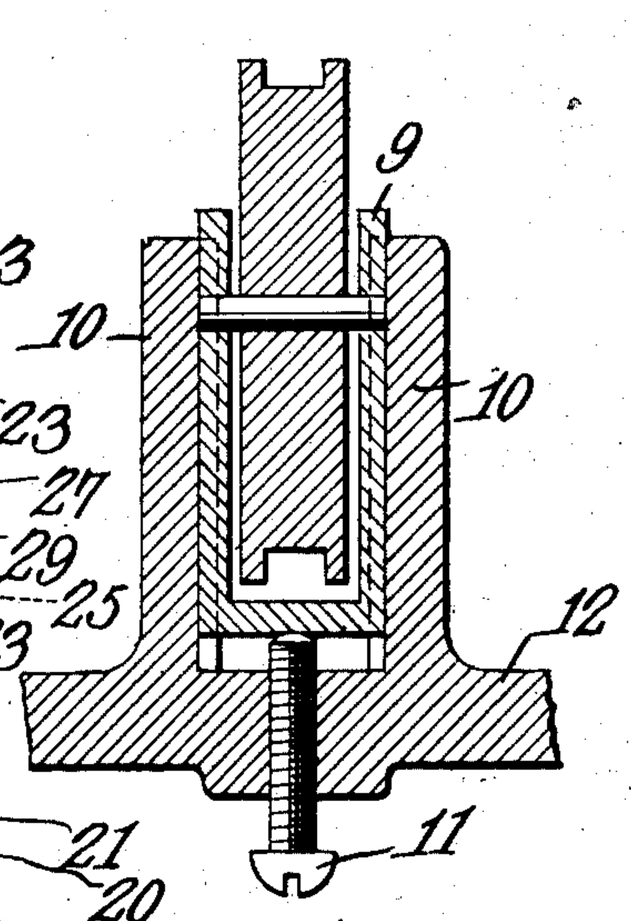
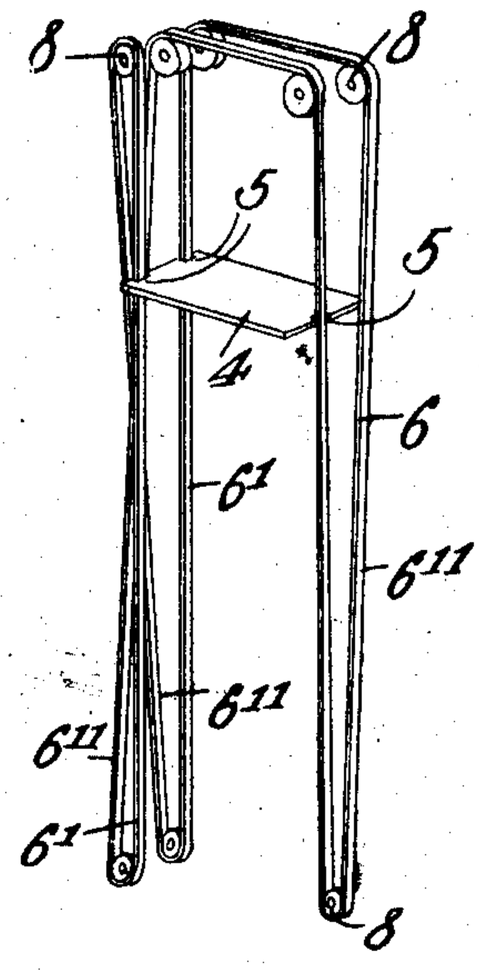


Fig. 6.

Fig. 7.



WITNESSES:

E. J. Stewart

F. T. Chapman

Ernest P. Garner,
INVENTOR.

By Crowell & Co.
ATTORNEYS

UNITED STATES PATENT OFFICE.

ERNEST P. GARNER, OF DRAPERSVILLE, VIRGINIA.

VENDING-MACHINE.

No. 864,368. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed January 8, 1907. Serial No. 351,367.

To all whom it may concern:

Be it known that I, ERNEST P. GARNER, a citizen of the United States, residing at Drapersville, in the county of Mecklenburg and State of Virginia, have invented new and useful Improvements in Vending-Machines, of which the following is a specification.

This invention has reference to improvements in vending machines intended to deliver goods on the insertion of the proper coin or coins, and it relates more particularly to the supporting and delivering mechanism for the articles.

The object of the present invention is to provide means whereby but one article at a time is delivered with certainty, and whereby various adjustments of the mechanism are provided.

To this end the invention consists in supporting and releasing coacting latches under the control of a coin-released slide, which latches are arranged in such manner that one member of the latch is moved into a position to engage an article to be delivered before the latter is released from the other member of the latch, which normally holds the entire series of articles, and the last named member of the latch is again carried into position to engage the next succeeding article of the contained series before the article just released is delivered to the customer. The articles are carried upon an endless band and fall by gravity to the point of delivery. This band constitutes an important feature of my invention.

In the accompanying drawings forming a part of this specification the parts shown are confined largely to the devices embraced in the present invention and only so much of the other operating parts is shown as is necessary for the understanding of the operation of the parts constituting the present invention.

In the drawings,—Figure 1 is an elevation of that portion of the vending machine that relates to the article-delivery mechanism; Fig. 2 is a similar view with the parts in a different position; Fig. 3 is a vertical section of a vending machine showing one part of my invention; Fig. 4 is a cross section through the top of the machine above the supporting pulleys for the carrying band; Fig. 5 is a detail view on an enlarged scale of a portion of the delivery mechanism; Fig. 6 is a detail section showing one of the pulley adjustments for the endless band; and Fig. 7 is a diagrammatic view of the endless band with one of the article shelves in position.

Referring to the drawings, there is shown a casing 1 of the usual type, near the bottom of which is the article-delivery orifice 2. In these drawings the coin-controlled releasing mechanism has been omitted except that the coin-carrying slide 3 is shown since this slide serves to operate the delivery mechanism.

The articles are to be carried upon a vertical series of shelves 4, each provided near one end with two recesses 5 and near the other end with a single recess 5 by means of which an endless band 6 of the chain type carries these shelves through the intermediary of pins 7 set in said recesses and extending into the links of the chain.

It will be observed from Fig. 7 that the band 6 passes over a system of pulleys 8, five of these pulleys being arranged in the upper end of the case and three in the lower end. This system of pulleys and the band are all arranged so that the portions 6′ of the band will move downwardly, two at one end of the shelves and one at the other end of the shelves. The other members 6″ of this band move upwardly and pass around appropriate pulleys, as indicated. Now, by making the bearings of one or more of these pulleys in the form shown in Fig. 6, that is, a U-shaped bracket 9 held in guides between two standards 10—10 and adjustable in a direction to stretch the band by means of the set-screw 11, the band may be maintained at all times sufficiently taut.

The pulleys 8 located in the top of the casing are all supported upon a casting 12 on which are carried the bearings for the several pulleys, some being mounted directly on the standards 10 and others upon the adjustable brackets 9, the whole structure thus being made compact and rigid.

It will be observed that the downward traveling members of the band, 6′, pass around the pulleys 8 in the lower end of the casing and outwardly in opposition, and the links which hold the pins in the shelves 4, and thereby support the shelves, are withdrawn from those pins and the shelves then drop to the lower part of the casing. Now, that the shelves may not be removed when the goods are removed, each shelf has at the rear end one or more headed pins 13 engaging in a slotted runway 14 in such manner as to not interfere with the free downward movement of the shelves. Near the lower end of the casing, out of reach of the delivery opening 2, there is a latch mechanism for delivering one shelf and the articles thereon one at a time, and only when the push bar 3 has been depressed to its fullest extent, which is only possible when the proper coin or coins have been inserted and the push bar released from the locking mechanism, which is neither here shown nor described since it forms no part of the present invention. This releasing mechanism consists of two juxtaposed and coacting pawls 15—16. The pawl 15 is pivoted at 17 to the casing and surrounding the pivot is a roller 18, the purpose of which will hereinafter appear. The lower end of the pawl 15 is formed into a tooth 19 and also carries on the side opposite the tooth a roller 20. The pawl 15 is so located that the tooth 19 may be brought into position to engage under one of the shelves 4 or may be moved out of the path of the said shelf.

The pawl 16 is pivoted at 21 and the pivot also carries

a roller 22. The upper end of the pawl 16 carries a roller 23 and the lower end is formed into a tooth 24 which may also be brought into the path of the shelves 4 or moved away therefrom. The tooth 24 is lower than the tooth 19 so that when the tooth 19 is moved from under a shelf and the tooth 24 is moved into the path of the shelves, the released shelf will fall upon the tooth 24 and be there held. If, now, the tooth 19 be again moved into the path of the shelves and afterward the tooth 24 moved out of the path of the shelf it held, the last named shelf will drop and the entire series of shelves will fall until caught by the tooth 19. The shelves are so spaced that when released by the tooth 24 the entire series will fall by gravity until the last shelf has been freed from engagement with the chain band 6, while the next succeeding shelf is caught by the tooth 19 before it has fallen low enough to escape from the chain band 6. The two pawls 15 and 16 are spaced so that when the tooth 24 has caught a shelf and the tooth 24 is out of the path of the shelves, the lug 25 on the lower end of the slide bar 3 will enter between the roller 23 on the upper end of the pawl 16 and the roller 18 on the pivot point of the pawl 15, and passing between these two rollers in its downward movement will ultimately engage the rollers 20 and 22 on the respective pawls 15 and 16. The lug 25 will pass the rollers 18 and 23 without action and will likewise pass the roller 22 without action, but as soon as it reaches the roller 20 on the pawl 15 it will force the latter to one side and into the path of the shelves 4, at the same time moving the upper end of the said pawl 15 in the opposite direction so as to be in the path of the return movement of the said lug 25. A further downward movement of the lug 25 on the bar 3 causes it to engage the pawl 16 on a curved face 26 and force the same around its pivot out of the path of the shelf 4 which it had until this time supported. The last named shelf is now free to fall, and the next succeeding shelf is brought into engagement with the tooth 19 on the pawl 15. The return movement of the bar 3 now carries the lug 25 back over the path through which it descended. It first engages the curved wall 27 on the corresponding edge of the pawl 16 and this face is so shaped that the lug 25 will turn the pawl 16 on its pivot until the tooth 24 is again in the path of the shelves 4. A further upward movement of the lug 25 now engages the curved face 28 on the corresponding edge of the pawl 15 and this moves this pawl on its pivot until the tooth 19 is out of engagement with the shelf 4 it had been supporting. The series of shelves now drop by gravity until caught by the tooth 24 on the pawl 16, when the mechanism is in condition for a repetition of the operation just described when the bar 3 is again depressed.

Mounted on one side of the casing there is a toothed rod 29 having an extension 30 supporting a platform 31 at a point below the opening 2 and in line with the series of shelves 4, and it is upon this platform 31 that the shelves drop when released from the chain band 6. The rod 29 is controlled by an escapement mechanism consisting of two lugs 32—33 formed upon the pawl 16 so that when this pawl is operated the rod 29 is allowed to drop step-by-step. Under normal conditions the rod 29 is held by the lug 33 which is located above the pivotal point of the said pawl and which engages one of the teeth of the said rod. Now, when the pawl 16 is moved from out of the path of the shelves the lug 33 is moved from engagement with the toothed rod 29, but as the rod escapes from the lug 33 the other lug 32, which is located below the pivotal point of the pawl 16, has been moved into the path of one of the teeth on the rod 29. The proportion of the parts is such that when the rod escapes from the lug 33 it will drop a distance equal to half the thickness of a shelf before being caught by the lug 32. When the pawl 16 is again moved into the path of the shelves the lug 32 is moved out of engagement with the rod 29 and the lug 33 is again brought into the path of one of the teeth on said rod and the latter again drops a distance equal to half the thickness of a shelf before being caught by the lug 32. The total fall, therefore, of the rod 29 during one entire reciprocation of the pawl 16 is equal to the thickness of a shelf, so that when a shelf has been released by the pawl 16 and finally escapes from the chain band 6, the platform 31 has been lowered sufficiently to receive a shelf, so that its upper surface is at or just below the lower edge of the opening 2. In this position a customer may remove the article upon the shelf but cannot get a hold of the shelf. The entire movement of the rod 29 is such, and the successive step-by-step movement of the same is so timed, that it will receive the shelves as dropped and maintain the last shelf dropped on a level with the bottom of the opening 2.

The shelves can be removed from the lower part of the casing by an authorized person who can open the front of the casing and thereby reach a finger-hole 14′ on the upper end of one portion of the runway 14 so as to move the same a sufficient distance away from the other portion of this runway to permit the escape of the headed pins 13.

By making adjustable the bearings of those of the pivots 8 over which pass the downwardly-traveling members 6′ of the band 6, not only may this band be kept taut but the members 6′ of the band may be so adjusted that the shelves will at all times remain level.

It will be observed that the pivotal support of the pawl 16 is located at a point between the lugs 32 and 33 and the tooth 24. The weight of the series of shelves containing the articles, supported by the lug 24, is to an extent counter-balanced by the empty shelves carried by the rod 29, so that the friction between the lug 25 and the pawl 16 is correspondingly lessened.

The mechanism has been described as intended to be used in a vending machine designed to be normally locked against manipulation, and to be unlocked by the insertion of one or more coins of the proper value; and the locking mechanism, of whatever character used, will be so constructed as to control the push bar 3, but as this locking mechanism forms no part of the present invention it is not shown; nor is it material to the present invention what style of locking mechanism is used so long as the bar 3 is permitted to have the extent of movement necessary to operate the shelf latches.

I claim:—

1. In a vending machine, a suitable carrier, a series of shelves spaced upon and supported by said carrier and movable by gravity toward the lower portion of the machine, and a release mechanism for the shelves timed in operation to permit the lowermost shelf to fall a distance sufficient to free itself from said carrier and at the same

time locking the other shelves against downward movement.

2. In a vending machine, a single endless band carrying a series of shelves for the articles to be delivered and movable by gravity toward the delivery orifice, and means for engaging and then releasing the successively lowermost shelf of the series.

3. In a vending machine, a single endless band having portions moving in the same direction for supporting both ends of shelves carried thereby and then moving in opposite directions and away from each other to release the shelves.

4. In a vending machine, the combination with a series of shelves movable by gravity to the discharge opening, of a latch for supporting the series of shelves, another latch below the first mentioned latch and movable into the path of the shelves, and means for operating the latches in succession to first move into the path of the shelves above the lowermost shelf and out of the path of the latter to permit the lowermost shelf to escape and to hold the succeeding shelves.

5. In a vending machine, the combination with a series of article-holding devices fed by gravity to a delivery orifice, of a latch mechanism comprising two pawls engaging and then releasing the successively lowermost shelf, and means for operating the pawls in the proper sequence.

6. In a vending machine, the combination with a series of shelves for holding goods to be delivered, of a chain band carrying said shelves to the point of delivery and then automatically releasing them, a sliding member, and a pawl system successively operated by the movement of the sliding member to release the lowermost shelf and to then engage and hold the remaining shelves.

7. In a vending machine, the combination with a series of spaced shelves and an endless chain band supporting the same and moved by gravity, of a reciprocating sliding member, and a pawl system comprising two pawls in the path of travel of the sliding member and moved successively into and out of the path of the lowermost shelf of the series and again returning to the initial position during one full reciprocation of the sliding member.

8. In a vending machine, the combination with a reciprocatory sliding member, of a pawl system operated thereby and consisting of two pawls on opposite sides of and in the path of travel of the sliding member and provided with anti-friction bearing surfaces for contact with said sliding member.

9. In a vending machine, a series of spaced shelves fed by gravity to the delivery opening, in combination with a shelf-receiving mechanism, and means for lowering the shelves in the same succession but to a less distance than the travel of the spaced shelves.

10. In a vending machine, the combination with a series of spaced shelves fed step-by-step to a delivery opening, of a receiving mechanism for the shelves below said delivery opening having a step-by-step movement timed with but of less extent than that of the spaced shelves.

11. In a vending machine, the combination with a series of spaced shelves fed step-by-step to a delivery opening, of a shelf-receiving mechanism below said delivery opening, and means for feeding said shelf-receiving mechanism by the operation of the shelf-delivery mechanism.

12. In a vending machine, the combination with a series of spaced shelves supported to be fed by gravity to a delivery opening and then deposited upon a shelf-receiving mechanism below said delivery opening, of a shelf-releasing mechanism comprising two pawls operating in sequence to release one shelf at a time, one of the pawls acting upon the shelf-receiving mechanism to drop the same as deposited upon the said shelf-receiving mechanism to an extent commensurate with the thickness of the shelves.

13. In a vending machine, the combination with a series of spaced shelves, of an endless chain band supporting the same and adapted to release the shelves to a delivery opening, and releasing means for the shelves comprising a pawl system arranged to be operated by a sliding member to move successively into and out of the path of the lowermost shelf during each movement of the sliding member, a shelf-receiving mechanism below the delivery opening, and means whereby the pawl system controls the shelf-receiving mechanism to lower the same step-by-step to an extent commensurate with the thickness of the shelves.

14. In a vending machine, a single endless band for carrying article-receiving shelves, said band having members engaging both ends of each shelf and moving in the same direction, and other or return members out of the path of said shelves.

15. In a vending machine, a single endless band for carrying the article-receiving shelves having two members engaging the shelves at one end and a single member engaging the shelves at the other end, and all moving in the same direction, and other or return members out of the path of said shelves.

16. In a vending machine, a series of shelves for carrying articles to be delivered by the machine and each provided with an engaging means, a runway for receiving and holding the engaging means and separable to permit the disengagement of the shelves.

17. In a vending machine, a series of shelves for carrying articles to be delivered by the machine, and each provided with a headed pin on one edge, and a slotted two-part runway for confining the heads of the pins, one part of the runway being movable to release the pins.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ERNEST P. GARNER.

Witnesses:
LE ROY WILLIS,
L. WITT GARNER.