

Oct. 27, 1931.

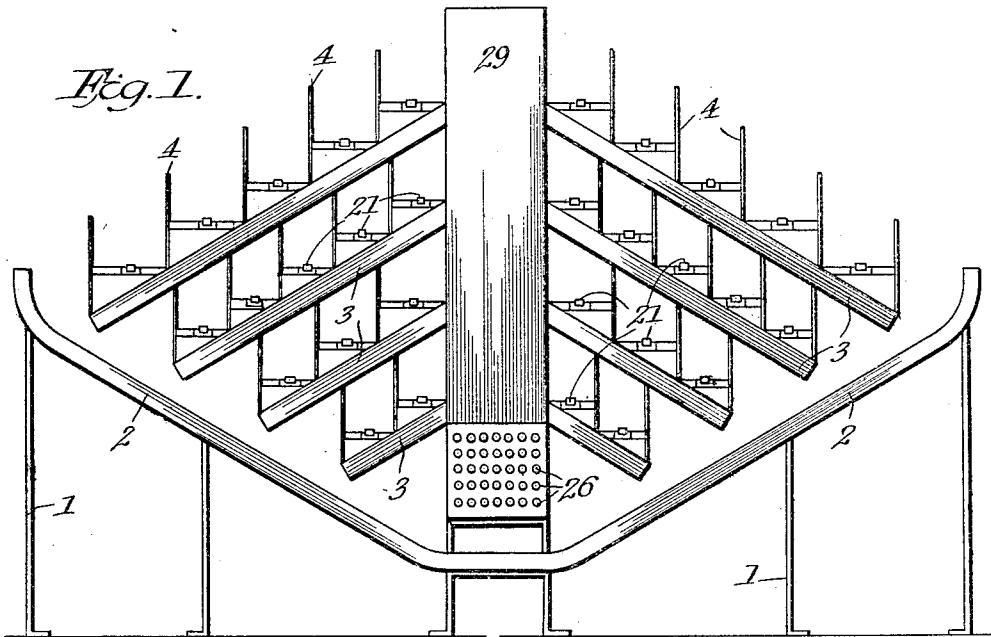
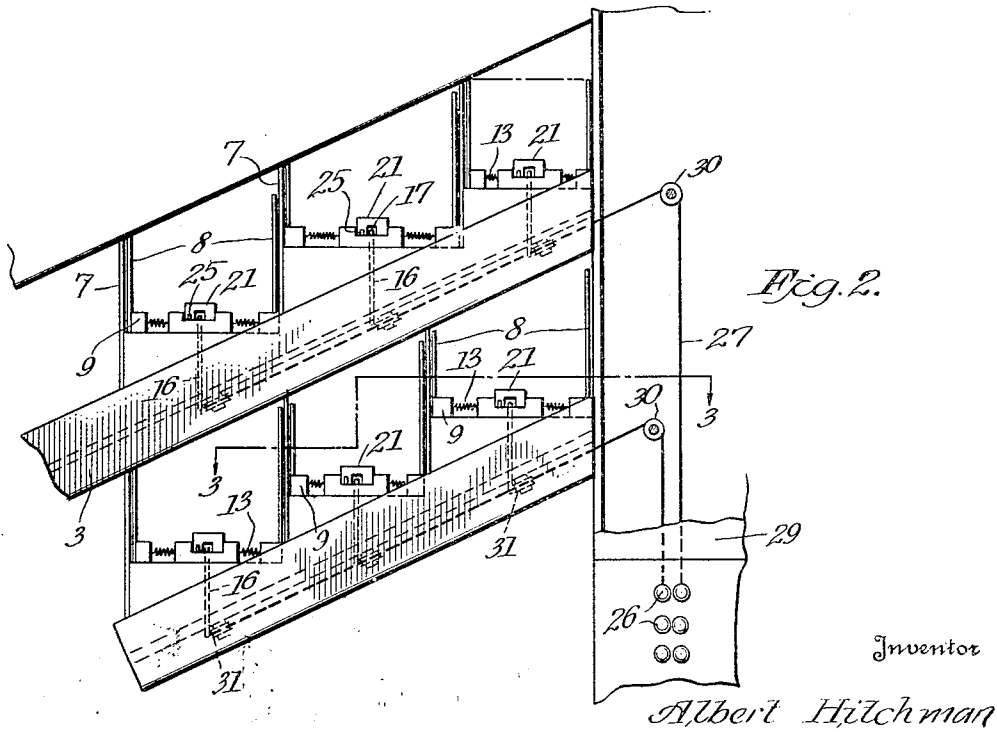
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1,829,140

STORE SERVICE APPARATUS

Filed Dec. 7, 1928

2 Sheets-Sheet 1



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Fig. 3.

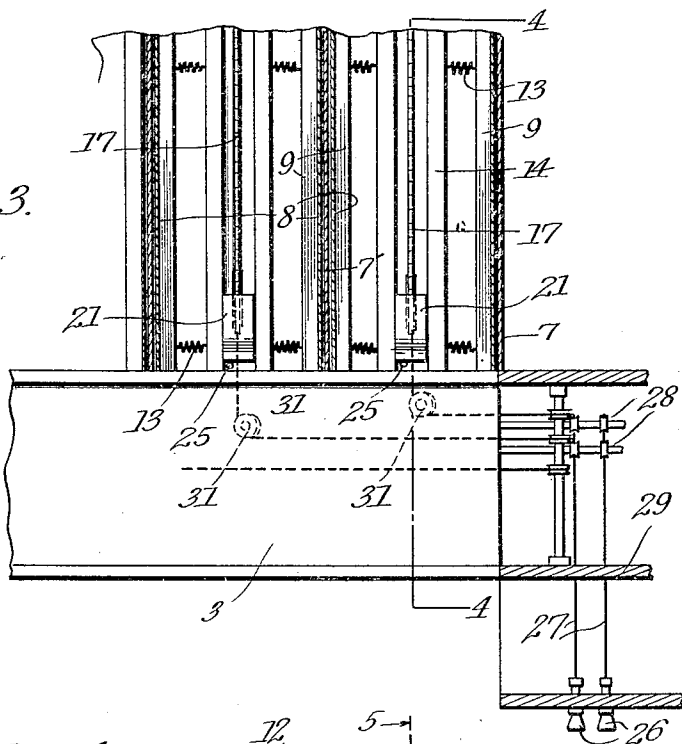


Fig. 4.

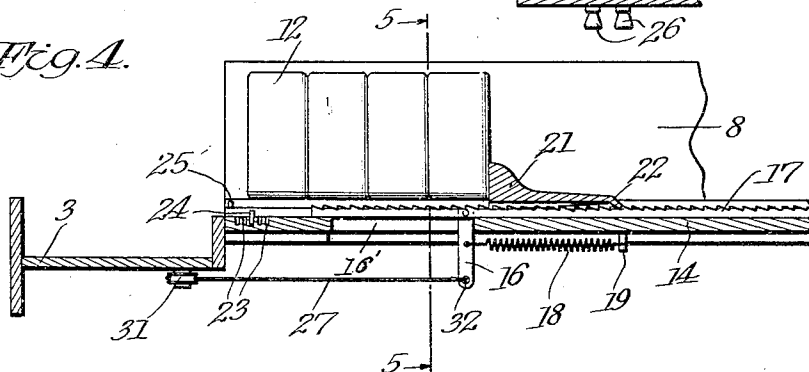
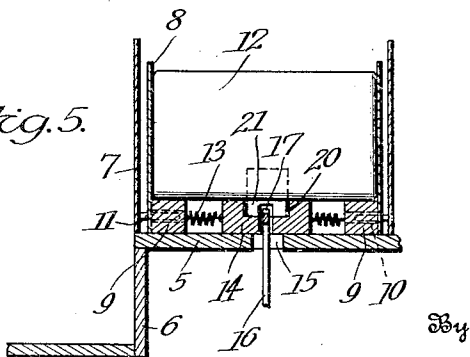


Fig. 5.



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UNITED STATES PATENT OFFICE

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STORE SERVICE APPARATUS

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This invention relates to store service apparatus and has for its primary object to provide a construction which may be readily controlled by a single operator at a predetermined station in the store so as to deliver at a designated point in the store one or more of a plurality of various articles which have been previously stored on shelves which form a part of the apparatus.

A further object of the invention resides in the provision of a selective delivery mechanism which may be readily adjusted to adapt it for use with articles of varying sizes.

Another object of the invention resides in providing a delivery mechanism of the gravity type in which the selection of the goods to be delivered is manually operated, thereby eliminating the use of motive power either in the delivery of the goods or in their selection.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawings; in which:

Figure 1 is a front elevation of the apparatus showing more or less diagrammatically the arrangement of the conveyors, shelves, etc.

Figure 2 is an enlarged detail elevational view of several of the storage shelves and the associated chutes.

Figure 3 is a horizontal sectional view through several of the storage shelves, taken on line 3—3 of Figure 2.

Figure 4 is a longitudinal sectional view through one of the shelves taken on line 4—4 of Figure 3; and

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 4.

Referring to the drawings in more detail the numeral 1 indicates a conventional type of frame structure by means of which the main gravity chute 2 is supported in proper relation to the dispensing mechanism to be described.

In the present embodiment of the invention the shelves are arranged in a plurality of tiers and in stepped relation, as indicated more particularly in Figs. 1 and 2; four tiers being shown in the present instance. While

the preferred arrangement of the shelves and tiers is as shown, it is to be understood that this particular arrangement is not essential to the proper functioning of the present invention and that the shelves may therefore be arranged in different types of stores as desired.

Leading into the main chute 2 and inclined with respect thereto, are auxiliary conveyors 3 which are common to each of the tiers of stepped shelves 4. These shelves are disclosed in greater detail in Fig. 5 and comprise bottom members 5 spaced apart in stepped relation by vertical standards 6 and are each provided with main side walls 7. Inwardly disposed from the main side walls 7 are inner side walls 8 which have attached to their lower ends longitudinally extending bars 9. These bars are perforated as indicated by numeral 10 so as to receive pins 11 by means of which the side walls 8 are guided in their sliding relation with respect to the main side walls 7. This construction provides a means for accommodating the various shelves to the size of packages stored thereon, and in order that the walls 8 may be maintained in contact with the series of packages 12 which are stored on the shelf, a plurality of coil springs 13 are attached to the respective bars 9 and have their inner ends attached to a central bar 14 which serves as a guide for the ejecting mechanism to be now described.

The bottom wall 5 of each shelf is provided with a longitudinally extending slot 15 through which extends an arm 16 for operating a ratchet bar 17. This bar 17 is slidably mounted in the base plate 14 of the shelves which is grooved to receive the bar, and the slot 16' in the plate 14 serves as a limit for the longitudinal movement of the bar 17 and its operating arm 16. This bar is normally maintained in its rearward position as indicated in Fig. 4 by means of a coil spring 18 which has one end secured to arm 16 and its other end anchored to a pin 19 fixed to the bottom plate 5 of the shelf. Slidably mounted in a groove 20 of the base plate 14 is an ejector member 21 which has its rearward end bent down in the form of a pawl 22 adapted to cooperate with the teeth

on the ejector bar 17. As the bar 17 is drawn forward therefore, the teeth on the bar by reason of their engagement with the pawl 22 will force the packages on the particular shelf forward an amount equal to the distance traveled by the ejector 21.

In order that the extent of movement of the ejector 21 may be varied so as to project from the shelf a single package irrespective of its length, it is desirable that some means be provided so that the extent of movement of the bar may be varied in accordance with the dimensions of the package stored on the shelf. To this end the central bar 14 is provided with a series of openings 23 at its forward end in any one of which may be positioned a pin 24, which pin is in alignment with the forward end of the bar 17. If a narrow package is stored on the shelf, therefore, the pin 24 will be moved rearwardly the proper distance and inserted in the particular groove which will limit the movement of the bar 17 so that only a single one of the packages will be projected from the shelf onto the conveyor 3. It is necessary, of course, that some means also be provided so as to prevent the projection of the ejector 21 off of the shelf in the event that the entire supply of articles should be dispensed, and for this purpose I provide a stop pin 25 on the central bar with which the ejector 21 is adapted to engage after all the articles have been delivered from the particular shelf.

The means for operating the several ejectors 21, as well as for determining the particular ejectors to be operated, comprise a plurality of operating rods 26 which have their inner ends attached to a plurality of flexible cords or wires 27. These cords 27 are run over their respective pulleys 28 mounted in casing 29 and then extend upwardly within the casing over pulleys 30. From the pulleys 30 the cords extend over guide pulleys 31 mounted on the under side of the common conveyors 3 in staggered relationship as indicated in Fig. 3, and have their ends anchored to the arms 16 of the respective shelves as indicated by numeral 32. Obviously, therefore, as any one of the operating arms 26 is pulled forwardly the power applied thereto will be transmitted through the particular cord 27 to the ejector to be operated. When the pull on the rod 26 is released the spring 18 will return the parts to normal position; the teeth on the ratchet bar 17 sliding under the pawl 22 and setting the parts in position for a new operation when it is desired to again eject an article from the particular shelf.

In the operation of the device the battery of operating rods 26 will be placed at a convenient position so that the salesman may observe the condition of the respective shelves. When any particular article is called for the salesman will pull the proper rod 26

and through the mechanism heretofore described one of the articles on the particular shelf will be ejected into the conveyor 3 common to the particular tier of shelves and will slide by gravity down this conveyor to the main conveyor 2 from whence it will be delivered to a point adjacent the position of the operator or salesman. This projection of the articles may be continued from time to time so long as any of the articles remain on the respective shelves, after which time the ejector 21 will engage the stop pin 25 and thus indicate to the operator that the supply for that shelf needs replenishing.

If it is decided to place on any particular shelf articles of different dimensions from those previously supplied to the shelf the device will operate with equal facility, it only being necessary to vary the extent of travel of the ejector bar to accord with the lengthwise dimension of the article, and this may be readily done by adjusting the pin 24 to the proper opening 23 in the plate 14. Furthermore, by reason of the slidable walls 8 the shelves readily accommodate themselves to different sizes of packages and maintain the packages in proper relationship with the ejector 21 so as to insure the ejection of an article at each operation of the ejector mechanism.

From the foregoing description taken in connection with the accompanying drawings it will be apparent that I have provided a simple and inexpensive construction by means of which a variety of articles may be stored in compact relationship and yet may be selectively ejected from time to time as desired by an operator situated at a single point in the store; that the device is inexpensive in operation by reason of the fact that no motive power is required other than the manual labor of the operator in pulling the operating rods 26, since the conveyors 2 and 3 are of the gravity type and since the ejection of the articles onto these conveyors is accomplished by the power transmitted through the rods 26.

In accordance with the patent statutes I have described what I now believe to be the preferred embodiment of the invention, but it is to be understood that various changes in detail of construction may be made without departing from the spirit of the invention, and I intend to include all such modifications within the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a storage shelf, a ratchet bar slidably mounted on said shelf, an ejector operatively associated with said ratchet bar, and means for varying the forward limit of movement of said bar.
2. In a device of the class described, a storage shelf provided with a slot in its bottom

5 wall, a ratchet bar slidably mounted on said shelf, an ejector operatively associated with said ratchet bar, an arm connected to said bar and extending through the slot in said shelf, a spring attached to said arm and normally retaining it in retracted position, and means for drawing said arm and ratchet bar forward.

10 3. In a device of the class described, a storage shelf, an inclined chute extending across the front of said shelf and below the bottom wall thereof, a ratchet bar slidably mounted on said shelf, an ejector operatively associated with said ratchet bar, a spring normally
15 holding said bar in retracted position, flexible means connected to said bar for drawing the same forward, and a guide pulley for said flexible means connected to the under side of said chute.

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