

Sept. 7, 1965

D. O. RUMER, JR., ET AL

3,204,648

COIN DEVICES

Filed Oct. 3, 1963

2 Sheets-Sheet 1

FIG. 1

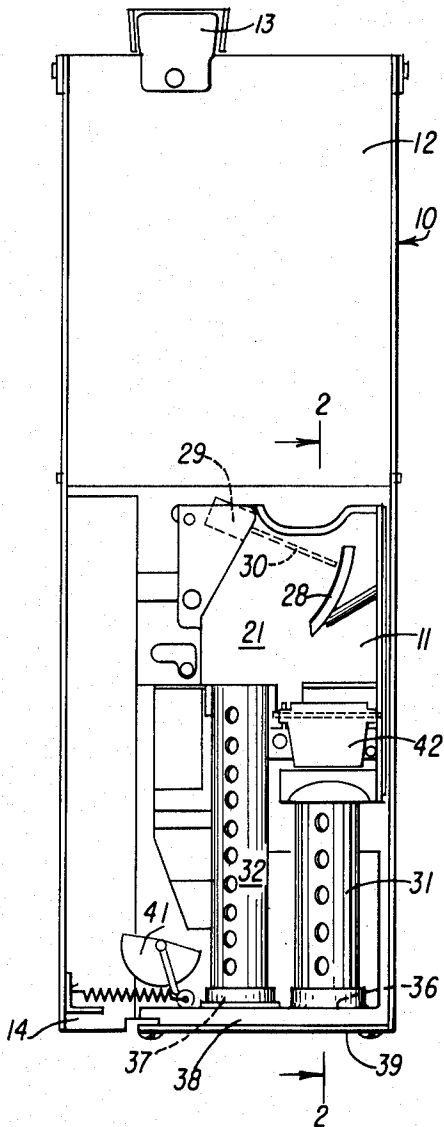
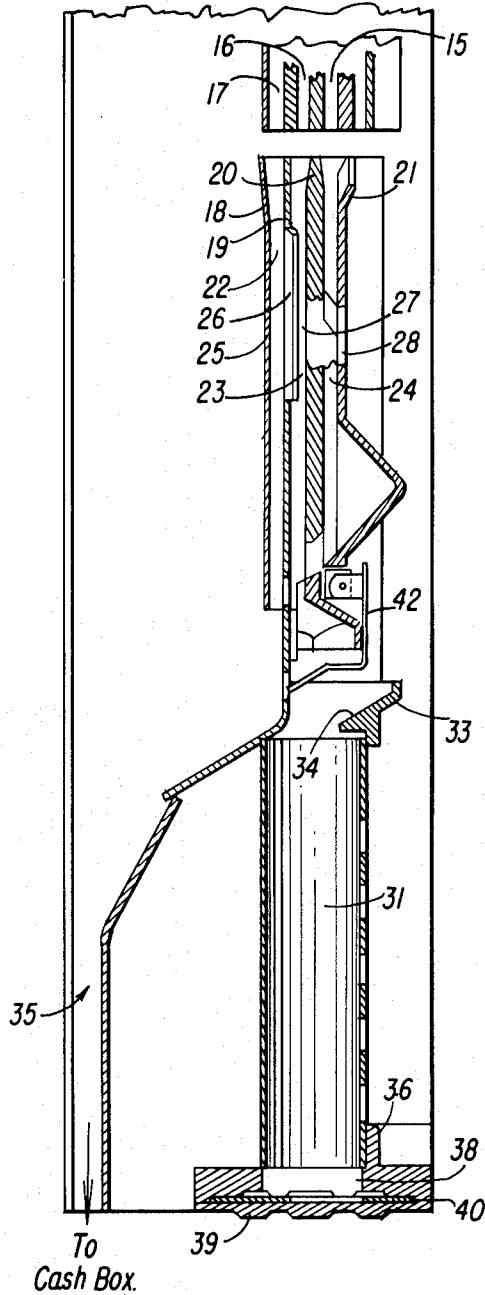


FIG. 2



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FIG 5

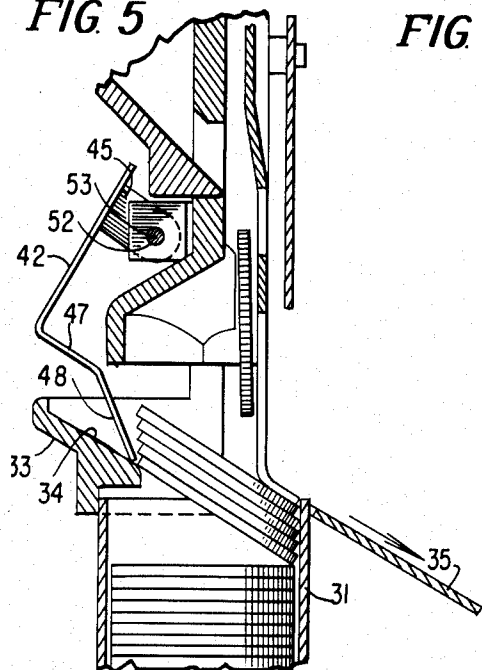


FIG 3

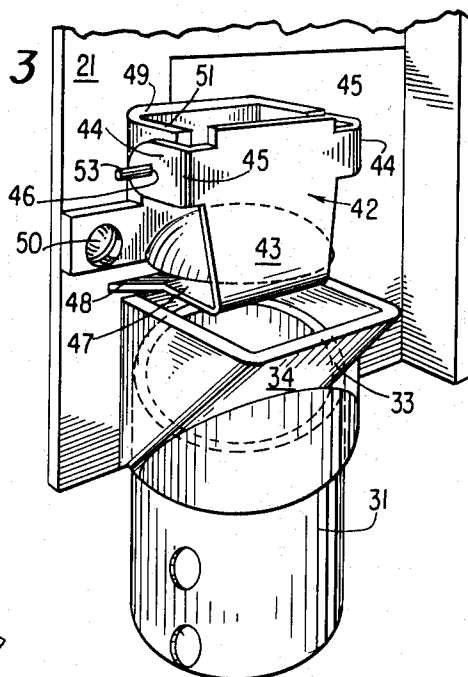


FIG 6

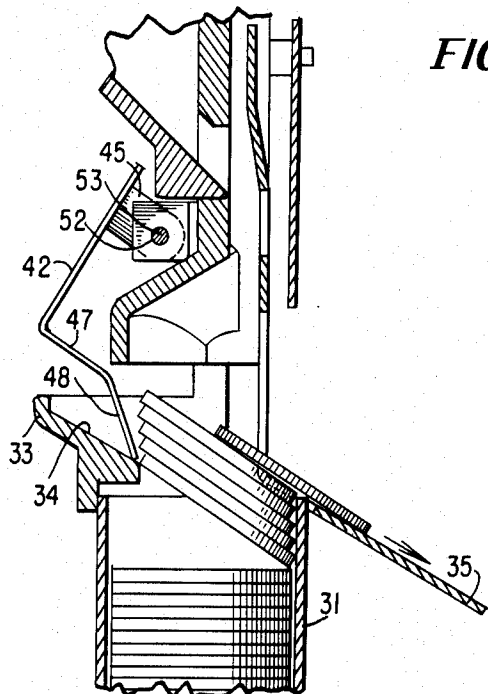
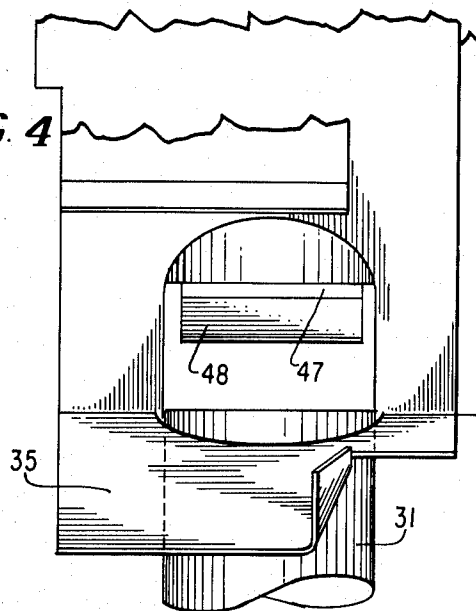


FIG 4



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## 3,204,648 COIN DEVICES

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3 Claims. (Cl. 133—2)

This invention relates to a coin device and more particularly to an improvement in such a device.

There are known devices which in conjunction with a vending machine are capable of accepting a variety of coinage, dispensing a purchased item and dispensing the difference between the amount of coinage originally inserted and the purchase price of the item dispensed. The coin mechanism of these devices are so constructed that certain of the inserted coins are subsequently used to pay out the difference between the value of the coinage inserted into the device and the price of the article dispensed. To accomplish this certain type of inserted coinage are conveyed to one or more coin stacking tubes for subsequent dispensing (pay out) upon the insertion of coinage into the device in an amount in excess of the price of the item selected for purchase.

In order for a device of the type described to achieve its objectives inserted coinage must be conveyed to the upper end of the coin stacking tubes and must in the course of operation move toward the lower end of the tubes so as to be in position to be dispensed therefrom. If coins are not directed to the coin tubes or if they do not progress smoothly thru the coin tubes a time will arrive when the device is incapable of dispensing change. When this occurs items can only be vended when the customer has the correct amount of change since the device has lost its change making capability. As a result many sales are lost.

A like situation may occur if the device pays out change at a faster rate than it receives change of the same denomination. However this situation is not often experienced since the individual coin tubes are adapted to hold a relatively large amount of coinage.

The situation which most generally causes the device to lose its change making capability is that involving individual coins which, as they enter their coin tubes, become tilted or skewed in one manner or another so as to become jammed in or about the coin tubes. This jamming is of course compounded as additional coins are inserted in the device. In a very short time the device becomes incapable of dispensing change and in many cases incapable of any operation. In any event a service call must be made in order to rectify the situation. The fact that at least a portion of the device is out of service during the jamming and the fact that a service call must be made to cure the difficulty makes this general situation a serious problem.

The same problem can also arise when one or more of the coin tubes is filled with coins due to the fact that subsequently inserted coins are prevented from entering the filled tube and thereby susceptible to jamming.

It is therefore obvious from the above that existing purchase change devices or any device which operates on the principle of collecting inserted coinage in coin tubes is subject to a variety of conditions which may result in jamming the device.

We have carefully studied the problem and have evolved a mechanism which when incorporated in existing coin devices serves the purpose of eliminating coin jamming which arises in the above manners.

It is therefore an object of this invention to provide a means by which coinage inserted in a coin device may be expeditiously conveyed to a coin tube.

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Another object of this invention is to provide a simple and inexpensive means for assuring that coinage is conveyed to a coin tube in a coin device in such a manner that each coin will enter the coin tube in a position to assure that the coin will lie flat therein.

A further object of this invention is to provide means for preventing coins which are to be stacked in a coin tube from jamming in or thereabout.

A further object of this invention is to provide means which will enable coins to become stacked in a flatwise manner in a coin tube and which will also serve to deflect coins to a collection area when the coin tube is incapable of accepting additional coins as a result of its being filled.

A still further object of this invention is to provide an anti-jamming coin mechanism which may be incorporated in existing coin devices with a minimum of difficulty and at a nominal cost.

A still further object of this invention is to provide means which will process all coins of a given denomination in the same manner irrespective of their momentum.

Other objects and advantages of this invention will be apparent from the following description of a preferred embodiment of the invention taken in connection with the accompanying drawings in which

FIGURE 1 is a view in frontal elevation of a coin device which incorporates the present inventive improvement.

FIGURE 2 is a sectional view of FIGURE 1 taken along the lines 2—2.

FIGURE 3 is a view in perspective of the anti-jamming improvement in conjunction with one of the coin tubes.

FIGURE 4 is a view in rearward elevation of the anti-jamming improvement and the upper end of the coin tube associated therewith.

FIGURE 5 is a cutaway view in side elevation of the anti-jamming improvement in conjunction with a portion of the coin tube associated therewith showing the coin tube filled with coinage and incapable of accepting additional coinage.

FIGURE 6 is a cutaway view in side elevation similar to that of FIGURE 5 but showing a coin being deflected to a coin collection area.

The coin device illustrated in the drawings is designed for the sale of a ten cent item and for returning one dime and one nickel in change in response to the insertion of a quarter and the dispensing of the article selected. It is to be expressly understood that the improvement herein described can be utilized with coin devices other than that illustrated and that it is described in this particular context merely to facilitate the understanding of the invention.

In FIGURE 1 there is shown a housing 10 which is divided into an upper coin testing portion 12 and a lower portion which is adapted to house a purchase change device 11 in vertical alignment with the coin testing portion. The coin tester 12 may be of conventional design and may incorporate features of U.S. Patents 2,588,510 and 2,823,783. However any coin tester may be utilized and the one illustrated is described by way of example only.

The coin tester 12 receives coinage thru the coin entranceway 13 and then operates to separate the inserted coinage into its various denominations so that individual denominations of coins may be subsequently tested for validity. Such tests may include those based on magnetic attraction or repulsion, composition, bounce and the like. As a result of these tests spurious coinage is conveyed to the coin reject chute 14 for return to the customer. Those coins which pass the validity tests are deemed acceptable and pass to coin slots which are spaced from the reject chute 14 in such a manner that nickels enter the slot 15, dimes the slot 16 and quarters the slot 17 (FIGURE 2).

The purchase change mechanism 11 includes a vertically disposed rear cover plate 18, an intermediate cover plate 19, a primary support plate 20 and a frontal cover plate 21. The various plates are rigid with respect to one another and as a result of their spaced apart relation serve to define a quarter slot 22 between the plates 18 and 19, a dime slot 23 between the plates 19 and 20 and a nickel slot 24 between the plates 20 and 21. The coin slots 22-24 are in respective alignment with the quarter slot 17, dime slot 16 and nickel slot 15 in the coin testing mechanism. It can therefore be seen that quarters will pass from the slot 17 into the slot 22 while dimes will pass from the slot 16 into the slot 23 and nickels from the slot 15 into the slot 24.

Each of the plates 18-21 is provided with an arcuate elongate aperture. The apertures are in cross-wise alignment and are respectively identified as 25, 26, 27 and 28. A switch 29 has a switch arm 30 which extends thru each of the arcuate apertures so that a coin passing down any one of the coin slots 22-24 serves to deflect the switch arm to actuate the switch to initiate a vend cycle. Various other switches which are well known may also be provided but these are not shown since they do not form an integral part of the invention.

Beneath the dime slot 23 a coin stacking tube 31 is positioned and is adapted to receive a stack of dimes. A similar coin stacking tube 32 is disposed beneath the nickel slot 24. Each of the coin tubes is so located that coins passing down the associated slot will fall normally therein. The coin tubes may be provided with a collar member 33. This collar member may depend from one of the coin plates and generally surrounds a portion of the upper periphery of the coin tube and can include an inwardly and downwardly extending runway 34 which facilitates the manual insertion of coins into the coin tubes. Coins are inserted manually by a serviceman into the coin tubes when the device is initially put into operation and at any time thereafter when the coin tubes become exhausted or depleted of coins. Normally however, the coinage inserted by the customer is sufficient to keep the coin tubes relatively filled with coins.

The lower end of the quarter slot 22 communicates with a coin collection passageway 35 which conveys quarters to a collection or cash box. The lower ends of the coin tubes 31 and 32 are received within respective openings 36 and 37 in a basal support plate 38. The opening 36 is dimensioned to allow a dime to pass flatwise therethru while the opening 37 is dimensioned to allow a nickel to pass flatwise therethru.

Beneath the basal support plate 38 is a payout slide cover plate 39 which has openings therein which correspond to the openings 36 and 37 in the basal support plate but which are offset to one side thereof but these are not shown. Intermediate the basal support plate 38 and the payout slide cover plate 39 is a movable payout slide plate which has openings which correspond to the openings 36 and 37 and the openings in the payout slide cover plate. A cam which may spring or motor operated may be utilized to cause the payout slide 40 to move from a position wherein the openings therein are in registry with the openings in the basal plate 38 to a position wherein the openings therein are in registry with the openings in the basal cover plate 39. It can therefore be seen that reciprocation of the payout slide plate with respect to the cover plate and the support plate serves to convey coins from the coin tubes to the purchaser. This particular operation is quite conventional and no further description of the components which support this action will be undertaken.

In the device thus far described legitimate nickels, dimes and quarters are respectively processed thru the slots 15-17 in the coin tester to the coin slots 24, 23 and 22 in the purchase change device. The quarters then pass thru the passageway 35 to the cash box while the

nickels are conveyed to the nickel coin tube 32 and the dimes to the dime coin tube 31. In time the nickels and dimes in the coin tubes will be dispensed therefrom in the form of change for a quarter. However the ability of the coins to be "paid out" thru the action of the payout slide plate 40 is dependent upon the coins in the coin tubes being in flatwise stacked relation. If, as often, happens, a coin enters one of the coin tubes in a tilted manner it may retain this position as subsequently inserted coins build up thereabove. As this occurs there is a great tendency that the payout mechanism will eventually jam due to the slanted coins. Quite frequently coins will enter the coin tubes in such a manner that they stand on end. This condition will also cause jamming of the device. Jamming can also occur when coins being processed to the coin tubes take what is known as a "bad bounce." In this situation the particular coin does not act like most coins and may, for example, fall into the coin tube and bounce right out again into a position where it might cause jamming.

It is to avoid the above described jamming conditions and other conditions which can render the device incapable of performing its function that we have provided an anti-jamming member 42 at the upper entranceway to one or more of the coin tubes. For purposes of simplicity the member is only shown in connection with the dime coin tube but it could be equally utilized in conjunction with the nickel coin tube. FIGURES 3-6 illustrate this member in conjunction with a single coin tube but it is to be clearly understood that the member could be associated with a variety of coin tubes.

The member 42 includes a planar portion 43 which has spaced apart ear members near the upper end thereof. The ear members 44 are bent over to define portions 45 which extend at substantially right angles from the planar portion 43. Aligned apertures 46 are positioned in each of the portions 45. An intermediate portion 47 of the member 42 extends at generally right angles to the planar portion 43 in the same general direction as do the portions 45. A lower portion 48 of the member 42 extends inwardly and downwardly from the intermediate portion 47 at what preferably may be an acute (from the horizontal) of approximately 35 degrees.

While the member is shown in the form of a stamping of relatively light weight metal such as aluminum or tin it can take the form of a series of interconnected components which are constructed of any one or more of a wide variety of metallic, plastic or other compositions.

A support member 49 is affixed as by screws 50 to the coin plate 21 immediately above the collar member 33 and the entranceway to the coin tube. The support member 49 is provided with spaced apart projecting ears 51 which are spaced apart by a distance which is approximately equal to the distance between the ear portions 45 on the member 42. Each of the projecting ears 51 has an aperture 52 therethru. A pin is utilized to join the member 42 to the support member 49 as by passing it thru the apertures 46 and 51. In this manner the member 42 is pivotally mounted on the pin 53 in the path of a descending coin. By virtue of its construction the member 42 normally assumes a position wherein the lower portion 48 thereof is directly in the path of coins of the denomination which are adapted to enter the coin tube therebelow.

When the coin tube is not filled, for example, with dimes an inserted dime will pass down the coin slot 23 and impinge against the portion 48 of the member 42. The momentum of the dime will cause the member 42 to rotate about the pivot pin 53 thereby opening the way for the dime to enter the dime tube. The member 42 absorbs energy from the falling dime and this in conjunction with its pivotal movement serves to deflect the dime in such a manner that it falls into the coin tube in such a fashion as to lie flush against the previously stacked coins. The member thusly constitutes a positive control

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which prevents the random stacking of coins within the coin tube by positively insuring that all coins entering the coin tube are assembled in proper stacked relationship so that tilted or skewed coin conditions are avoided. Since every coin that is ready to enter the coin tube will in general cause the member 42 to pivot in approximately the same manner it can be seen that the member assures that all coins enter the coin tube in the same proper manner. In this connection it should be noted that the pivotal motion of the member is limited in one direction by the collar 33 and in the other direction by the coin plate.

When the coin tube is relatively filled with coins subsequently inserted coins must be deflected to the cash box until the stack of coins in the coin tube is depleted by virtue of coins being paid out. If this does not occur the subsequently inserted coins would tend to jam the device. The member 42 also aids in performing this very important function. When the coin tube is relatively filled with coins the next inserted coin will impinge against the member 42 in the manner above described but due to the filled condition of the coin tube it will be prevented from entering therein (see FIGURE 5). The coin therefore rests against the uppermost coin in the tube at its lower end and at its upper end against the portion 48 of the member 42 and against a portion of the collar runway 34. If sufficient coins are paid out before additional coins are inserted this particular coin will drop properly into the coin tube. However if additional coins are inserted before coins are paid out they will build up as in FIGURE 5 in the form of a tilted stack. It should be noted that the stack is tilted in the direction of the cash box. When a number of coins stack up in this fashion (five are shown) and the device is accepting coins faster than it is paying them out the next inserted coin will attempt to join the tilted stack but since it will lie above the lip of the coin tube it will slide over the uppermost coin in the tilted stack and into the cash box. The tilted stack of coins thereby presents a configuration such that the uppermost coin in the stack constitutes an inclined deflection surface. In this context the member 42 performs the function of developing an inclined stack of coins when the coin tube is relatively filled with coins such that subsequently inserted coins are deflected to the cash box without any tendency toward jamming the device.

We have extensively tested the member described and find that thru its use jamming of the associated coin device occurring in the manner previously common has all but been eliminated.

The anti-jamming means described is particularly versatile since it may be incorporated in a wide variety of coin mechanisms and utilized with a great variety of domestic and foreign coinage. The means is simple and inexpensive to manufacture and due to its minimal number of moving parts is capable of performing countless positioning operations. It can also be incorporated into existing coin devices with very little modification of the basic structure.

While one particular embodiment of the invention has been shown and described, it will be obvious to those skilled in the art that various changes and modifications can be made therefrom without departing from the invention and, therefore, it is intended for the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

We claim:

1. In combination a coin tube of a diameter slightly larger than the coins it is adapted to hold and having a member positioned at its upper end in such a manner that a cross-wise dimension of the entranceway is reduced below the diameter of the inserted coins, and pivotal means pivotally mounted in the vicinity of the coin tube

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entranceway and having a portion which normally blocks at least a portion of said entranceway, said pivotal means being counter weighted and when said coin tube is relatively filled with coins being adapted when struck by the next descending coin to position such coin on an incline between the uppermost coin in said coin tube and said member whereby additional descending coins develop an inclined coin stack such that the uppermost coin in said inclined coin stack defines a surface over which subsequently inserted coins can be conveyed away from the filled coin tube to a collection area.

2. In combination a coin tube of a diameter slightly larger than the coins it is adapted to hold and having a member positioned at its upper end in such a manner that a cross-wise dimension of the entranceway is reduced below the diameter of the inserted coins, and pivotal means pivotally mounted in the vicinity of said coin tube entranceway and having a portion thereof normally blocking at least a portion of the upper end of said entranceway, said pivotal means being counter balanced and when struck by a descending coin being movable from blocking to unblocking position with respect to the upper end of said coin tube to allow a coin to enter said coin tube in such a manner that it will be stacked in a flat-wise vertical manner, said pivotal means being constructed and arranged so that when said coin tube is relatively filled with coinage the next descending coin is positioned on an incline between the uppermost coin in said coin tube and a portion of said member and wherein said pivotal means is prevented from returning to blocking position by the location of such coin, whereby additional descending coins develop an inclined stack of coins above said first inclined coin such that the uppermost coin in the inclined stack will eventually define a surface over which subsequently descending coins can be conveyed to a collection area.

3. In combination a coin tube of a diameter slightly larger than the coins it is adapted to hold and having a first member positioned at its upper end in such a manner that a cross-wise dimension of the entranceway is reduced below the diameter of the inserted coins, and a pivotally mounted member having a first portion and at least one other portion which protrudes from said first portion and which is adapted to normally block said entranceway, said one other portion being movable from blocking to unblocking position with respect to said entranceway when struck by a descending coin and in so moving serving to deflect said coin in such a manner that it will enter said coin tube in a position to become a portion of a vertical stack of coins, said pivotally mounted member being so constructed that said one other portion will return to blocking position after said coin enters said coin tube, said pivotally mounted member being constructed and arranged such that when said coin tube is relatively filled with coinage the next descending coin is positioned on an incline between the uppermost coin in the coin tube and said first member to thereby prevent said pivotally mounted member from returning to blocking position, whereby additional descending coins develop an inclined stack of coins above the first inclined coin such that the uppermost coin in the inclined stack will eventually define a surface over which subsequently descending coins can be conveyed to a collection area.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

2,655,243 10/53 Hehn ..... 133-2 X  
3,106,924 10/63 Peacock et al. .... 133-2 X

EVERETT W. KIRBY, *Primary Examiner*.