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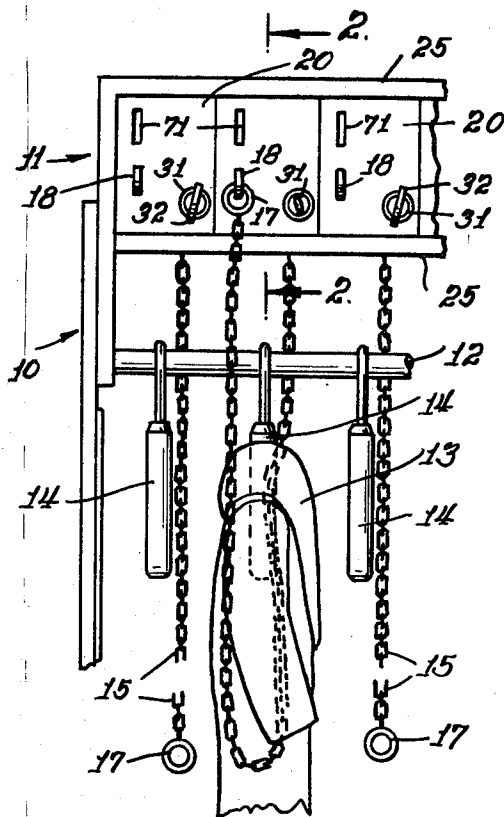
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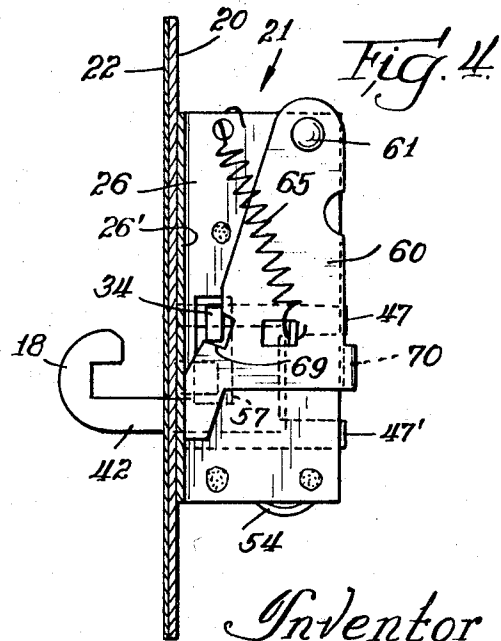
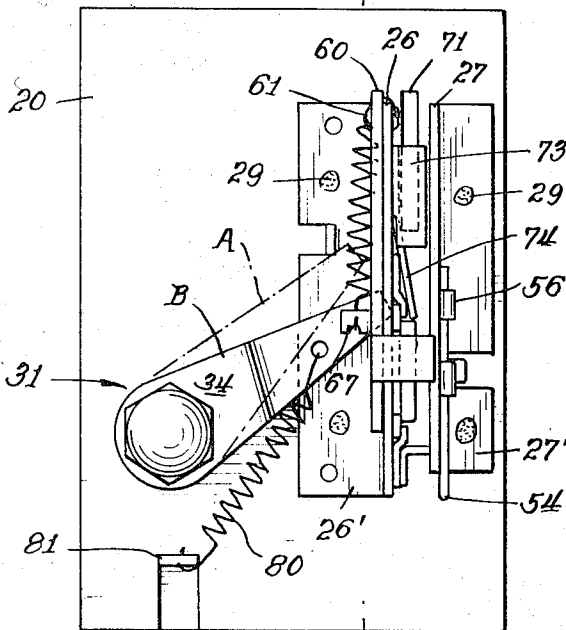
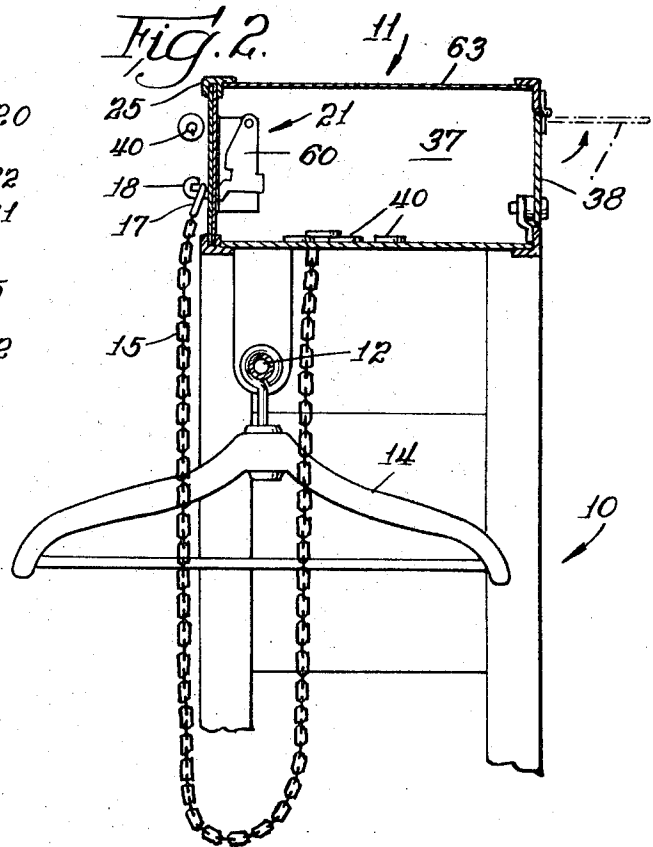
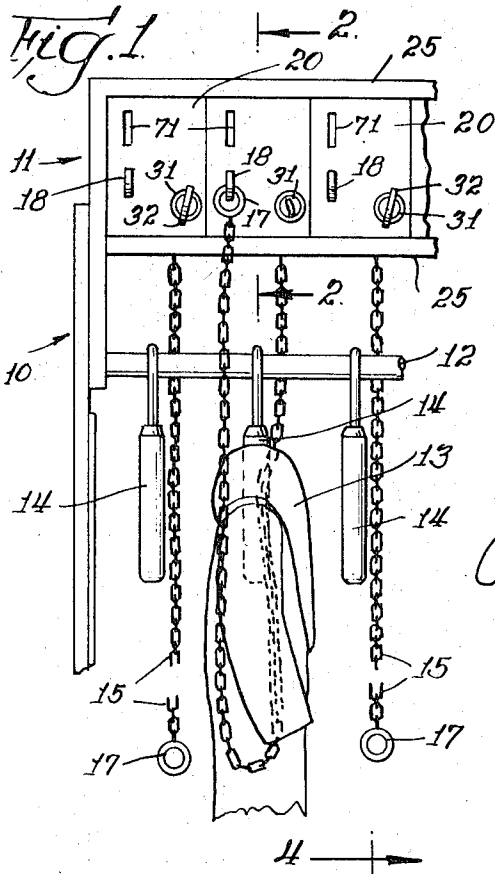
[54] **CONVERTIBLE COIN OPERATED LOCKING MECHANISM**
4 Claims, 10 Drawing Figs.

[52] U.S. Cl..... 194/74
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 [50] Field of Search..... 194/40, 49,
 64, 78, 83, 54, 55, 61, 74

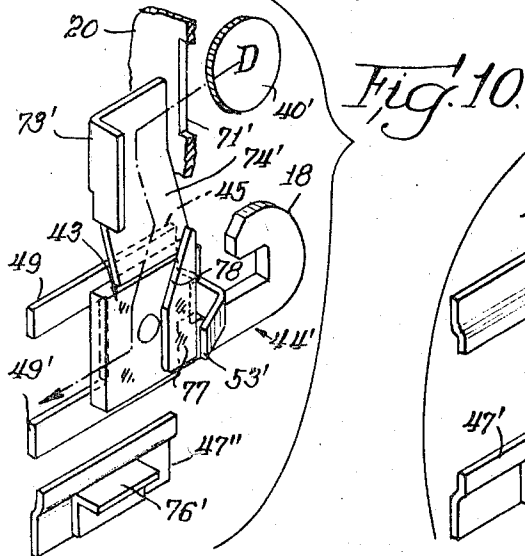
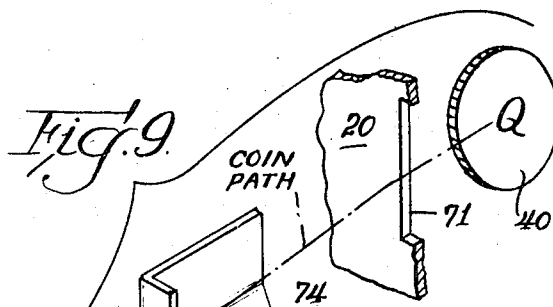
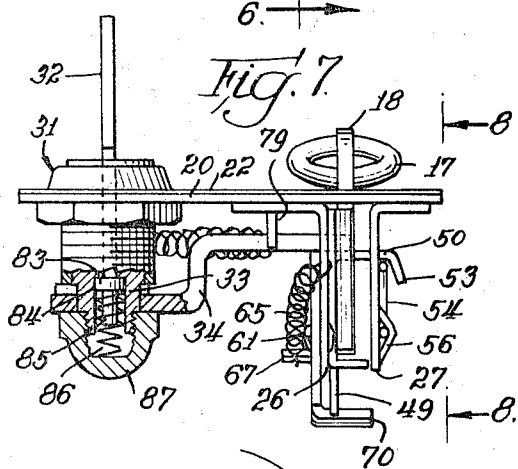
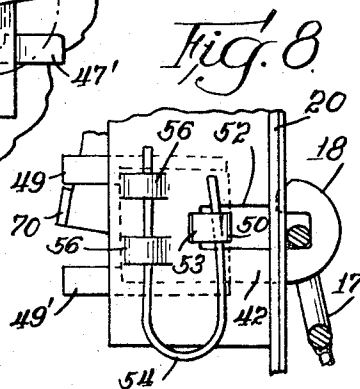
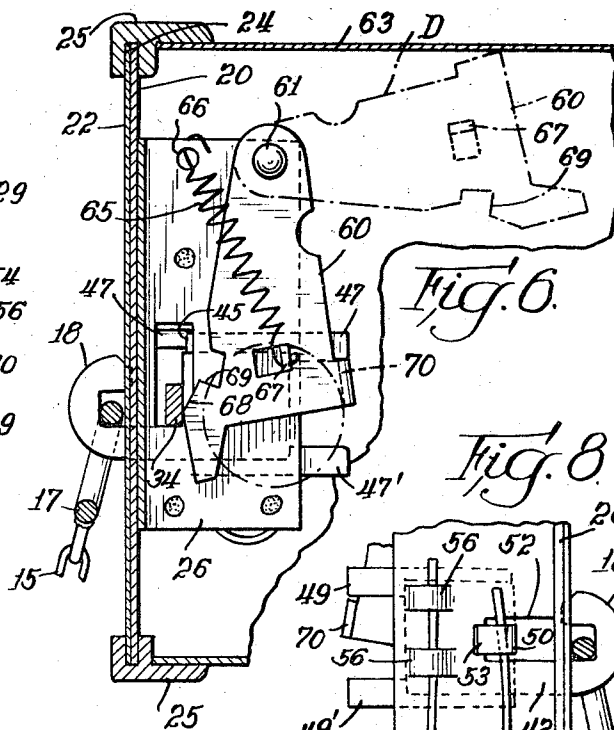
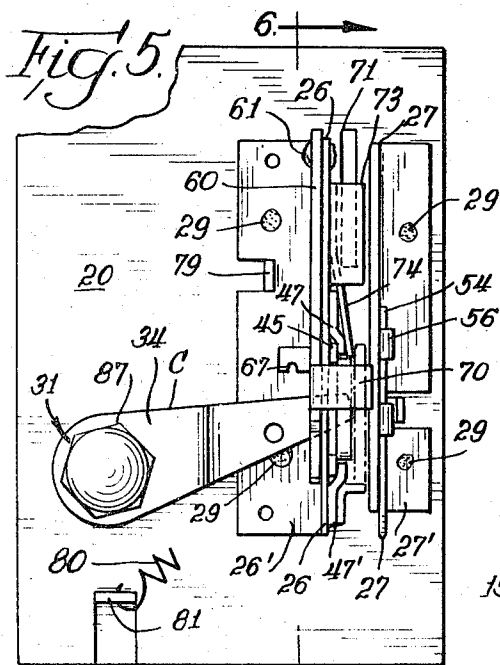
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ABSTRACT: A locking device capable of being readily converted from a coin controlled to noncoin controlled condition. A pivotal bolt shield is normally backed out of a bolt-blocking position by a coin which serves as a linkage element. This shield can also be retained in a swing-away position in which the bolt is not blocked. When the shield is in the latter position, the mechanism does not require a coin to operate.





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CONVERTIBLE COIN OPERATED LOCKING MECHANISM

BACKGROUND OF THE INVENTION

Many types of coin-operated locking mechanisms are well known. For example, German patents 604,041 and 811,406 show coin-operated locking mechanisms which utilized a coin as a link which is essential in order to accomplish locking of the mechanism. These German patents show a removable plunger which can be secured in the locking mechanism by a bolt. The bolt cannot reach the plunger, in the absence of a coin, due to the presence of a bolt-obstructing shield. The inward movement of the plunger, when a coin is in a linkage position, backs away the bolt-obstructing shield thus permitting the bolt to engage and lock the plunger. Similar devices are shown in U.S. Pat. No. 2,982,388 and 3,028,941. The latter U.S. patents show the use of similar locking mechanisms in conjunction with a coat rack. While such locking mechanisms are generally satisfactory in coin-operated checking facilities, they are not readily converted from a coin-operated to noncoin-operated condition.

Restaurant operators may find it desirable to use such a garment checking facility in a coin-operated condition, for example during the evening dinner hours, and yet wish to convert the unit to a noncoin-operated condition, for example, for use in connection with the luncheon trade, or for use in semiprivate gatherings.

SUMMARY OF THE INVENTION

In accordance with this invention, a locking mechanism, having a bolt biased towards a lockable traveler, is provided with a bolt-obstructing shield which is pivotal, and which can be backed out of bolt-obstructing position by the inward movement of the lockable traveler when a coin is inserted. The shield is manually pivotable to a second position and retainable in the second position to permit continual contact of the bolt against the lockable traveler. In the latter condition the locking mechanism is noncoin-operated, and insertion of the traveler will cause the traveler to be locked, even without a coin.

DESIGNATION OF THE FIGURES OF THE DRAWING

FIG. 1 is a fragmentary elevational view of a garment checking facility utilizing a locking mechanism in accordance with this invention.

FIG. 2 is a cross-sectional elevational view taken approximately along the line 2-2 of FIG. 1.

FIG. 3 is an elevational view from the rear of the locking mechanism for example, as viewed through the rear door at the upper right of FIG. 2.

FIG. 4 is a cross-sectional view taken approximately along the line 4-4 of FIG. 3.

FIG. 5 has a rear elevational view similar to that of FIG. 3 showing the relative position of the components, when the mechanism is in locked condition.

FIG. 6 is an enlarged cross-sectional view taken approximately along the line 6-6 of FIG. 5.

FIG. 7 is a plan view showing the relative position of components when the locking mechanism is in a locked condition, showing some of the components partially cut away.

FIG. 8 is an enlarged detailed view taken approximately along the line 8-8 of FIG. 7.

FIG. 9 is an exploded perspective view of a portion of the locking mechanism taken from above and behind an embodiment adapted for use in conjunction with a large coin.

FIG. 10 is also an exploded perspective view taken as in FIG. 9 except that it shows modifications incorporated to adapt the embodiment shown in FIG. 9 for use in conjunction with a small coin.

DESCRIPTION OF PREFERRED EMBODIMENTS

Reference to the drawings indicates the clothes rack at 10 having a headpiece section generally 11 and a garment support section generally 12. Each chain 15 is secured to the headpiece section at one end and has an open loop 17 at the other end. Open loops 17 are adapted to engage hooklike projections 18 which extend forwardly of the supporting facings 20 which support and carry locking mechanism, generally 21. The illustrated embodiment includes an optional decorative facing 22. Both support facing 20 and decorative facing 22 reside in slots 24 in headpiece framing members 25. Secondary support structures 26 and 27 are preferably spot welded to support facing 20 and decorative facing 22 is therefore desirable as a convenient, readily maintained facade to cover the spot weld marks on supporting facing 20 as illustrated. Secondary supports 26 and 27 are preferably platelike elements extending rearwardly from support facing 20, and having flanges 26', 27', extending at right angles therefrom, which are welded or otherwise secured to support facing 20. Shaded areas 29 indicate points at which spot welding is preferred.

Key locks, generally 31, include a normally retained, but removable key 32, a rotatable cylinder 33 and pivotal bolt 34 carried by rotatable cylinder 33. The lock mechanism is preferably a conventional mechanism of the type which retains key 32 in the lock while the locking mechanism is in unlocked condition, but releases key 32 while the locking mechanism is in locked condition. Thus while the cylinder 33 is in the position corresponding to the bolt position indicated at A, or B, of FIG. 4, the key is automatically retained in the key lock. When the locking mechanism is in the locked position and bolt 34 is pivoted to the position shown at C in FIG. 5, the key is released automatically.

Locking mechanism 21 thus resides behind facing 20 and in enclosed rectangular compartment 37 which has lockable access door 38 at the rear thereof. Coins 40 are thus retained within enclosed compartment 37 and can be removed through the access door 38.

Traveling unit generally 44, includes projection 18, shaft 42, plate 43, and traveler 45. Hooklike projection 18 is at the end of shaft 42 which terminates with enlarged platelike portion 43 and is welded to elongated traveler 45. Traveler 45 is slidably retained in opposing brackets 47, 47', 47''. Top and bottom traveler projections 49, 49' assist in maintaining traveling unit 44 in proper horizontal orientation, thus facilitating sliding of traveling unit 44. Fingerlike projection 50 extends laterally from traveler 45 across enlarged portion 43 through opening 52 in secondary support structure 27 and terminates in rearwardly extending finger 53. Spring 54, which is retained by slit-grips 56 and projection 50 and finger 53, biases traveling unit 44 forwardly. Projection 50 serves three additional functions. Projection 50 limits the forward motion of the traveling unit when it bears against the inner surface of facing support 20; it limits the rearward movement of the traveling unit when it bears against the rear edge 57 of opening 52; and it engages a coin when the coin is in linkage position described more fully hereinafter.

Pivotal shield 60 is secured to secondary support structure 26 by axle rivet 61. In the illustrated embodiment, pivoted through more than 90° arc. The arc is limited by facing support 20 and ceiling 63 of enclosure 37. Spring 65 is secured through hole 66 in secondary support member 26 at a point between rivet 61 and facing 20 on a level approximately horizontal to rivet 61. The other end of spring 65 is secured to tab 67 which is located at the other end of pivotal shield 60. Thus when tab 67 is in that portion of the arc which is below the horizontal line through hole 66 and rivet 61, spring 65 biases shield 60 in the direction of frontal support 20. However, when tab 67 is above the horizontal line through hole 66 and rivet 61 the shield 60 is urged or biased upwardly against ceiling 63 whereby the shield is retained in the elevated position, which is indicated at D in FIG. 6. Thus the same spring 65 which biases the shield 60 forwardly against facing support

20 is utilized to keep shield 60 in a position swung away from the locking mechanism generally 21.

Pivotal shield 60 includes angular edge 68, and bolt-restraining surface 69 and laterally extending projection or finger 70 at the rearward extreme thereof.

During the frontward-backward movement of traveling unit 44, projecting fingers 49, 49' pass above and below finger 70. Thus the travel of the traveling unit has no effect with respect to the moving shield element 60 when a coin is not in what is referred to below as linkage position.

Coin slot 71, which is shown in facing support 20, permits entry of coin 40 into enclosure 37. Coin stops 73, 73' stops the rearward motion of the coin and the coin descends by force of gravity. Lateral movement of the coin in either direction is controlled by secondary support structures 26, 27. As the coin drops it is moved sidewardly by shunt 74, 74' so that coin 40 is positioned next to enlarged portion 43 of traveling unit 44. Thus the coin is positioned between lateral extension 70 and projection 53, and is prevented from moving laterally or from pivoting by secondary support structure 27 and enlarged portion 43. Downward movement of the coin is stopped by second coin stop 76, 76', which is spot welded or otherwise affixed to traveler retaining brackets 47', 47''. It is essential that coin stop 76, 76' be in a position at that level in which coin 40 is retained between lateral projections 70 and 53. It is also essential that the coin stop 76, 76' be sufficiently long to prevent the dropping of the coin in the event of inadvertent forward-rearward motion of the coin. Thus the dimensioning of several of the components of the locking mechanism of this invention is different depending on the size of the coin for which the mechanism is intended. Slot 71 is shown larger than slot 71'. The coin stop 73' is shown closer to facing 20 than the distance between stop 73' and facing 20. Shunt 74' is shown to be longer than shunt 74. Bottom stop 76 is shorter than bottom stop 76'. Thus only minor differences in dimensioning or positioning is needed to adapt one basic structure for use with different sized coins. This is of considerable significance from the manufacturing viewpoint inasmuch as only one basic locking mechanism need be manufactured, which mechanism can be adapted for use with many different sized coins depending on the dimensioning of only a few of the components.

Thus the only additional component required to adapt the basic structure for use with a smaller coin is shim 77 which has sloped top surface 78. Thus when shim 77 is added to accommodate a smaller coin, such as an American dime, the coin drops from shunt 74', engages the top surface 78 of shim 77, and is moved rearwardly where it continues to drop until it strikes bottom stop 76'.

The only structures shown in FIG. 10 are those structures shown in FIG. 9 which are altered, or added, in order to adapt the basic structure, which is dimensioned to operate with a larger coin, e.g. American quarter, for use with a smaller coin, e.g. an American dime.

OPERATION

Whenever a patron wishes to check a garment using the apparatus of this invention, one of the chains 15 is dropped through the sleeve of the garment 13 either before or after it is placed on hanger 14, and end loop 17 of chain 15 is placed over hooklike projection 18. Should the patron attempt to turn the key 32 at this stage the rotation of the bolt is limited in one direction by shield 60 or by the side of traveler 44, should shield 60 be swung to position D and is limited in or the other direction by bolt stop 79. The purpose of bolt stop 79 in limiting upward rotation of bolt 34 is the prevention of the generation of excessive velocity as the bolt strikes pivotal shield 60. Bolt 34 is biased in the direction of shield 60 by spring 80 which is secured below the key lock 31 to post 81. In the absence of bolt stop 79, bolt 34 could be swung upwardly beyond position indicated as A in FIG. 3, by rotation of key 32. Release of key 32 while the bolt is rotated substantially beyond position A in FIG. 3 causes the bolt to slam

downwardly against bolt-restraining surface 69 and this occasionally causes bolt 60 to bounce rearwardly a sufficient distance to permit the locking of the unit without insertion of the coin. By placing bolt stop 79 in a position which substantially limits the rotation of pivotal bolt 34 in the direction away from shield 60, this undesirable characteristic is eliminated.

Should the patron push hooklike projection 18 inward without prior insertion of a coin, traveler unit 44 simply moves rearwardly against the biasing force of spring 54, and fingers 49, 49' simply move above and below lateral projection 70 on shield 60 and nothing further happens in the locking mechanism. Thus as soon as the patron stops pushing inwardly on projection 18 the biasing force of spring 54 returns travel unit 44 and projection 18 to the initial position.

However, when an appropriately sized coin 40, 40' is placed in slot 71 in facing support 20, the coin enters enclosure 37, is stopped by first stop 73, 73' and commences to drop by gravity against shunt 74, 74' until downward motion is terminated when the coin strikes bottom stop 76, 76'. The dimensioning between lateral projection 50 of traveling element 44 and lateral projection 70 of shield 60 must be such that the coin can fall therebetween, and yet provide a push-linkage therebetween when traveling element 44 is moved rearwardly. Thus after insertion of the coin pushing traveling element 44 inwardly, e.g. by pushing in on hooklike projection 18, moves the coin rearwardly until it strikes lateral projection 70 on shield 60. Continued rearward motion of traveling element 44 thus causes continued rearward motion of shield 60, e.g. as shown in FIG. 6. Thus the bolt is no longer restrained by shield 60 and presses against the side of traveling element 44 due to the biasing of spring 80. As soon as the enlarged portion 43 of traveling element 44 moves behind the bolt 34 the biasing action of the spring causes the bolt to pivot in front of portion 44, and into the path of traveling element 44 as illustrated in FIGS. 5 and 6.

It is noted that shield 60 has an angular edge 68 below the bolt-restraining edge on notch 69. This edge 68 functions to facilitate the dropping of the coin out of the locking mechanism. Thus the instant traveler 45 has moved the coin 40 and shield 60 rearwardly enough to push bolt restraining surface 69 behind the bolt 34, the sudden downward snap of bolt 34 along edge 68 which is angled under the path of the bolt, snaps shield 60 rearwardly. This rearward snap is so quick that the shield 60 moves rearwardly faster than the coin. Thus at the moment of the snap the coin is no longer engaged between fingers 50 and 70 as a push-link, but is free, rearwardly, and is pushed by finger 50. Thus, the coin commences to fall under force of gravity the instant bolt 34 clears restraining surface 69.

It has been conventional to provide locking mechanisms similar to a key lock 31 in which design key 32 cannot be removed from the lock while bolt 34 is in any position, e.g. from position A to position B as shown in FIG. 3, other than the locked position. When bolt 34 rotates to the position indicated at C in FIG. 5, i.e. to the "locked" condition, the key 32 can be removed from key lock 31.

It is preferred that key 32 be partially ejected from the lock as soon as the lock is in "locked" position. This is preferably accomplished by providing piston 83 having an enlarged end portion 84 and narrow shaft 85. The end of the enlarged portion 84 is positioned to bear against the end of key 32 and the rear surface of portion 84 adjacent to shaft 85 serves as a flange or a collar to engage compressed spring 86 which is retained by cap nut 87. Thus as soon as key 32 is released it is partially ejected. Key 32 can be removed from key lock 31 when bolt 34 is in lock position and hooklike projection 18, forming a locking encirclement around end loop 17, cannot be moved outwardly to release end loop 17 without the use of the key. Reinsertion and turning of the key to raise or pivot bolt 34 permits traveling unit 44 to slide forwardly under the biasing forces of spring 54 until lateral projection 50 strikes facing support 20, thereby returning the hooklike projection to the "unlocked" position as is shown in FIG. 4. Also, elevation of

bolt 34 permits return of biased shield 60 thereunder so that automatically the locking mechanism is returned to the coin-operated condition. That is, bolt 34 cannot engage, i.e. obstruct, traveling unit 44 until shield 60 is again backed from under bolt 34.

CONVERSION TO NONCOIN-OPERATED CONDITION

To convert the locking mechanism of this invention to a noncoin-operated condition, it is simply necessary to back the rotating shield 60 to that portion of the arc through which shield 60 can swing in which the shield does not obstruct the bolt from engagement with traveling element 44. This is most conveniently done in the embodiment shown by simply elevating shield 60 to the position indicated at D in FIG. 6. In the embodiment shown spring 65 biases shield 60 upwardly against ceiling 63, thus retaining shield 60 in this position. Alternative structures may be employed for retaining shield 60 in that portion of its arc in which it does not obstruct the pivoting of bolt 34. It will be appreciated that any means which serves to retain the shield 60 in that portion of the arc will serve to maintain the locking mechanism in the noncoin-operated condition.

Thus, whenever shield 60 is maintained in the second portion, i.e. nonbolt obstructing portion, of its swingable arc, bolt 34 is urged against traveling element 44 when the locking mechanism is in its unlocked position. Pushing of the hooklike projection 18 inwardly then causes traveling element 44 to slide against bolt 34 until finally bolt 34 falls in front of enlarged portion 43 thus preventing reverse, or outward movement of traveling element 44. Again the key is automatically partially ejected from key lock 31 when the bolt 34 is in the latter mentioned portion of the swingable arc. To unlock the chain the patron must now insert the key and rotate the key in bolt 34 until bolt 34 is rotated out of the path of traveling element 44. Because of the continuous biasing forces exerted by spring 54 traveling element 44 slides forward as soon as the bolt 34 is cleared. Release of the key now brings bolt 34 down against the side of traveling element 44, in which condition it is again ready for immediate relocking without the use of a coin.

ACHIEVEMENTS

It will be appreciated from the foregoing specification that this invention permits the manufacture of the "basic" locking mechanism which can be conveniently and economically modified during manufacture to set the mechanism for use with various sized coins.

It is also apparent that the mechanism can be almost instantly converted from a coin operated to a noncoin-operated condition by maintaining shield 60 in a nonbolt obstruction portion of its swingable arc. It is also apparent that the mechanism can be instantly reconverted from noncoin operation to coin-operated condition by releasing shield 60 and permitting it to reside in the bolt-obstructing portion of its swingable arc. It is further noted that the invention requires the use of no tools, and no special skills in order to convert the mechanism from coin-operated to noncoin-operated condition.

Moreover, the apparatus of this invention is eminently satisfactory either as a coin operated unit, or a noncoin-operated unit. Thus the manufacturer can supply a single article even if the customer needs it solely for use as either a coin-operated unit, or a noncoin-operated unit. Moreover, if a customer wants only a noncoin-operated unit, the same mechanism from facing 20 and rearwardly can be supplied, (except that shield 60 is secured in its swung-away position)

and a decorative facade inserted instead of 22, which is identical to 22 in every respect but lacking coin slot 71. The economic advantages flowing from the unexpected, high degree of flexibility of the basic locking mechanism provided in this invention are readily apparent.

I claim:

1. A locking device capable of being readily converted by an operator from a coin controlled to a noncoin controlled condition, comprising: a facing support; coin entrance and coin channel, keylock; slidable lockable traveler; biased pivotal bolt carried by keylock; and biased pivotal shield; said coin channel including means for guiding the movement of a coin, under force of gravity, into a linkage position between said traveler and said shield; the keylock being carried by the support and having a rotatable cylinder into which a key is insertable; said bolt being carried by the cylinder and biased toward the traveler, and swingable away from the traveler by a partial turn of the cylinder; said traveler having portions which are external and internal respectively with respect to the facing support, and including means for slidably retaining said traveler in said locking device, and means for limiting the outward and inward movement of said traveler, the external portion of said traveler including encircling means for receiving an object when the traveler is at the limit of its outward movement, and for forming an object retaining encirclement when the traveler is moved inwardly, the internal portion of said traveler including bolt-engaging means, and first coin-engaging means, the bolt-engaging means being in line for engaging the bolt whenever the traveler is moved inwardly to receive the bolt as a lock against outward movement of the shaft; said pivotal shield being swingable through an arc having a first and second portion, the bolt being biased against the shield when the shield is in the first portion of the arc, the bolt being biased directly against the traveler when the shield is in the first portion of the arc; the bias means urging the shield into the first portion of the arc; means for retaining the pivotal shield in a second portion of the arc; said pivotal shield including second coin-engaging means positioned adjacent the first coin-engaging means, said linkage position being between said first and second coin-engaging means, said traveler and said shield being free to move independently of each other in the absence of a coin in the linkage position, said shield being backed from a first portion of the arc into a second portion of the arc when a coin is in the linkage position and the traveler is moved inwardly; said locking device being convertible from a coin operated condition to a noncoin-operating condition by an operator by moving the shield into the second portion of the arc and retaining the shield in the second portion of the arc.

2. The locking mechanism of claim 1 in which the shield is spring biased by a spring attached to a support approximately on the level of the shield pivot between the shield pivot and the facing support, whereby said spring serves both to bias the shield into said first portion of the arc, and also serves to retain the shield in the second portion of the arc when the point at which the spring is attached to the shield is swung above the shield pivot.

3. The locking mechanism of claim 1 in which the shield includes a bolt-restraining notch in the edge thereof, and an angular edge portion adjoining the notch, the angular edge portion being positioned to engage the bolt during downward pivoting of the bolt as soon as the notch is backed from under the bolt, whereby said shield is snapped rearwardly as the bolt snaps downwardly.

4. The locking mechanism of claim 1 which includes stop means for preventing substantial pivoting of the bolt in the direction away from the shield.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,552,535 Dated January 5, 1971

Inventor(s) Herman D. Strang

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In column 2, line 61 insert "pivotal shield 60 can be" between "embodiment" and "pivoted".

In column 3, line 22 insert the numeral "43" between "tion" and "Downward".

In column 3, line 47 "coins" (second occurrence) should be "coin".

In column 3, line 66 delete "or".

In column 5, line 52 "obstruction" should be "obstructing".

Signed and sealed this 17th day of August 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents