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Voegeli

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[54] **COIN-OPERATED LATCH MECHANISM WITH COIN RETURN MEANS**

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[51] **Int. Cl.** **G07f 5/00**

[58] **Field of Search** ..... 194/DIG. 15 C, 1 D, 54, 194/71, 55–59

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[57] **ABSTRACT**

This invention provides a coin-operated latch mechanism to be used in a coin-operated dispensing device including a cabinet body providing an opening with a closure member to cooperatively close the opening where the latch is urged to locked position by movement of the door member and is released when a selected coin combination is received by a cooperative coin receptacle associated with the dispensing device. The latch mechcanism includes a latch mounted for both pivotal movement about and axial movement along a generally horizontal long axis of an axle carried by the closure member and a retractable bent coin-return plunger member that is engageable with the latch and is mounted on the cabinet for movement along an axis that is generally parallel to the long axis of the latch axle.

11 Claims, 9 Drawing Figures

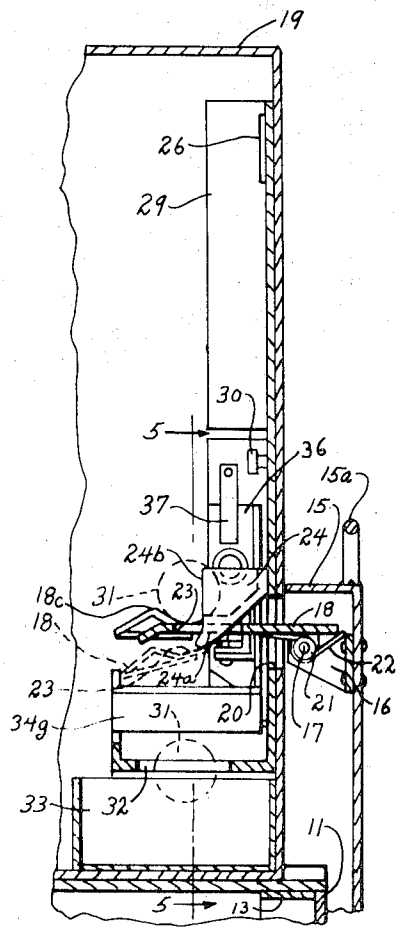
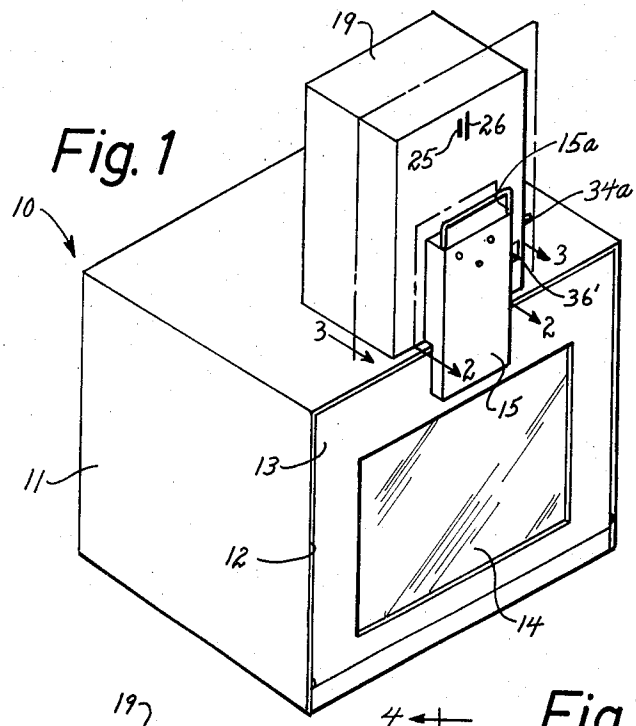


Fig. 1



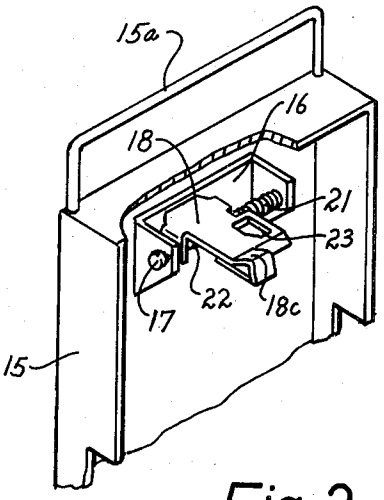


Fig. 2

Fig. 3

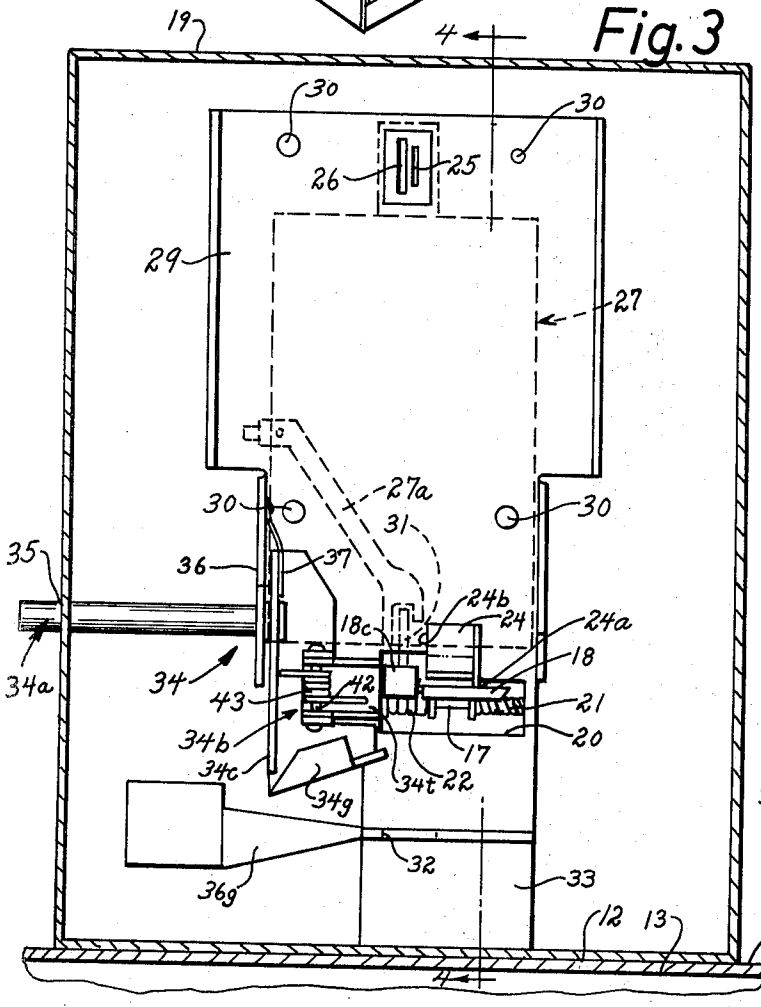
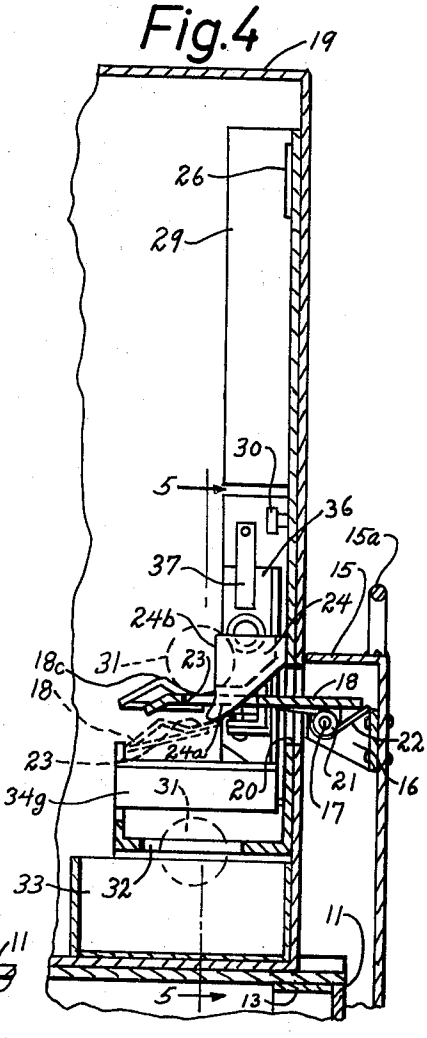


Fig. 4



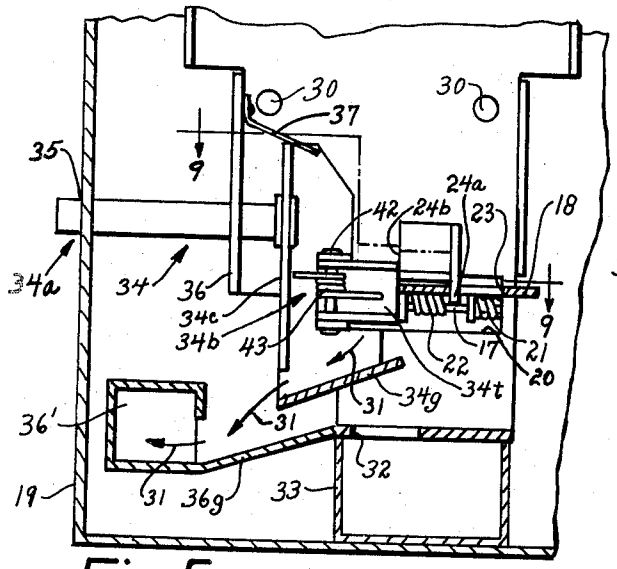


Fig. 5

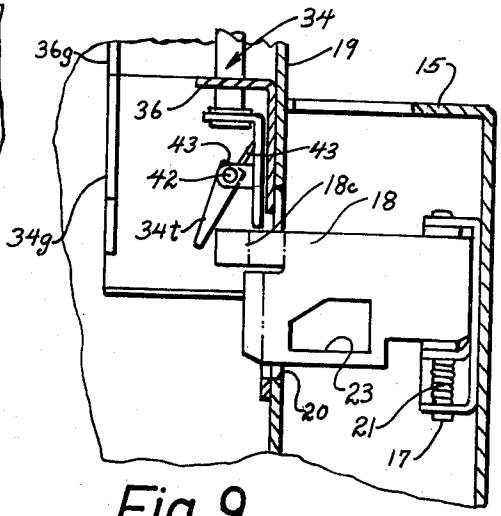


Fig. 9

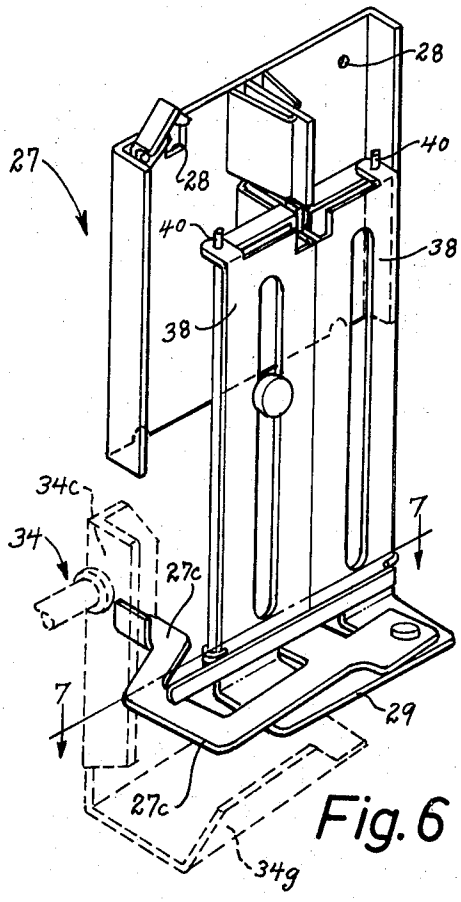


Fig. 6

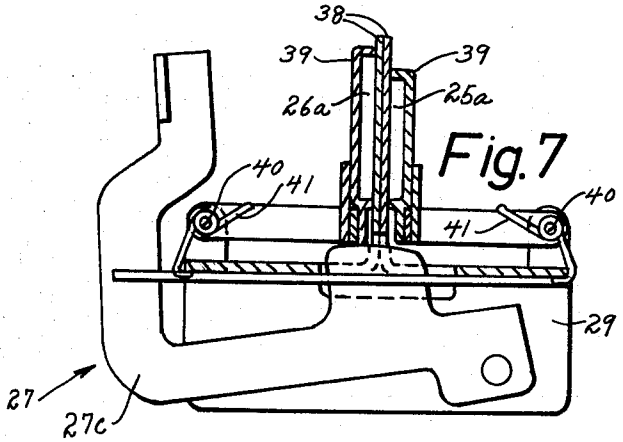


Fig. 7

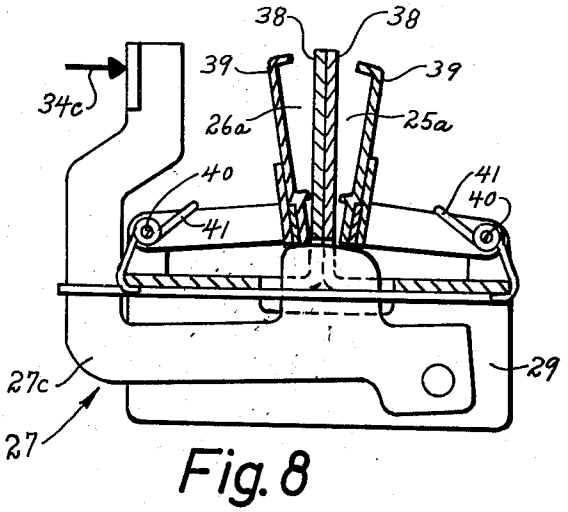


Fig. 8

COIN-OPERATED LATCH MECHANISM WITH COIN RETURN MEANS

BACKGROUND OF THE INVENTION

The present invention relates to a latch mechanism that is particularly useful in connection with coin-operated vending machines. More particularly, the present invention relates to a latch mechanism for a coin-operated vending machine for dispensing newspapers and other periodicals.

The latch mechanism provided by the present invention is particularly useful in combination with a modified form of the coin-operated mechanism shown and described in detail in my U.S. Pat. No. 3,760,923, issued Sept. 25, 1973, and provides coin-return means which radically differ from and are superior to those described in U.S. Pat. No. 3,265,177.

SUMMARY OF THE INVENTION

The present invention provides a coin-operated latch mechanism to be used in a coin-operated dispensing device including a cabinet body providing an opening with a closure member to cooperatively close the opening where the latch is urged to locked position by movement of the door member and is released when a selected coin combinition is received by a cooperative coin receptacle associated with the dispensing device.

Basically, the latch mechanism includes: a latch mounted for both pivotal movement about and axial movement along a generally horizontal long axis of an axle carried by a closure means; first yieldable means yieldably urging the latch toward a first axial position along the long axis of the latch axle; a strike mounted on the cabinet and having a first portion releasably engageable in an aperture provided in the latch when the closure means is located in a position closing the cabinet access opening; a coin-receiving member mounted on the cabinet so as to trap a coin received therein generally vertically with its edge located atop a cam section provided on the latch and with one of the coin sides located contiguously to a second portion of the strike and thus to pivot the latch about the long axis of the latch axle against the yieldable urging of second yieldable means and disengage the latch aperture from the strike upon attempted removal of the closure means from a position closing the cabinet access opening and to then discharge the coin into a coin-collecting receptacle; and coin-return means including retractable plunger means mounted on the cabinet for movement along a second axis generally parallel to the long axis of the latch axle. The plunger means has a first end protruding from the exterior of the cabinet and a second end that is engageable with the latch and the coin-receiving member by movement of its first end toward the interior of the cabinet to cause the latch to overcome the yieldable urging of the first yieldable means and be moved axially along the long axis of the latch axle to a second position and, thus, to cause the coin to be released from the coin-receiving member and to be diverted by the second portion of the strike into a coin-return opening extending through an outer wall of the cabinet, rather than into the coin-collecting receptacle.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated in the accompanying drawings, wherein:

FIG. 1 is a somewhat schematic elevational perspective view of a vending machine incorporating a presently preferred form of the coin-operated latch mechanism of the present invention;

FIG. 2 is a greatly enlarged fragmentary sectional view taken generally along line 2—2 of FIG. 1, but illustrating the vending machine closure means or door and the latch carried by it in their open and unlocked positions;

FIG. 3 is a greatly enlarged fragmentary sectional view taken generally along line 3—3 of FIG. 1, but with only one coin and the coin-trapping portions of the coin-receiving member shown in shadow lines and with the retractable plunger means of the coin-return means shown in its retracted first position;

FIG. 4 is a fragmentary sectional view taken along line 4—4 of FIG. 3, but also illustrating in shadow lines the movement of the latch and of the coin into the coin-collecting receptacle as the closure member or door is moved away from closure of the cabinet access opening;

FIG. 5 is a fragmentary sectional view taken along line 5—5 of FIG. 4 and is generally similar to that shown in FIG. 3, except that the retractable plunger means of the coin-return means is, instead, shown in its inserted second position causing axial movement of the latch and diversion of the coin into the coin-return opening, rather than into the coin-collecting receptacle;

FIG. 6 is a greatly enlarged fragmentary elevational perspective view showing in detail the construction of the coin-trapping, coin-receiving member and (in shadow lines) its operation by the retractable plunger means of the coin-return means;

FIG. 7 is a somewhat enlarged fragmentary sectional view taken generally along line 7—7 of FIG. 6 and shows the chute sections of the coin-trapping, coin-receiving member engaging one another when the retractable plunger means of the coin-return means is in its retracted first position;

FIG. 8 is a view similar to FIG. 7, but showing the moveable chute sections of the coin-receiving member being disengaged from their respective fixed chute sections when the retractable plunger means of the coin-return means is moved into its inserted section position; and

FIG. 9 is a fragmentary sectional view taken generally along line 9—9 of FIG. 5, but illustrating a condition which can occur through attempted movement of the closure means or door from a position opening the cabinet access opening towards a position closing the cabinet access opening while the retractable plunger means is being held in its inserted second position.

DETAILED DESCRIPTION

Referring to the drawings and more particularly to FIGS. 1–5 thereof, there is illustrated a newspaper vending machine **10** incorporating a presently preferred form of the coin-operated latch mechanism that is provided in accordance with the present invention.

The vending machine **10** comprises a generally vertically arranged cabinet **11** having an access opening **12** for withdrawal of periodicals, for example, newspapers, held by the vending machine **10.** Closure means, such as a door **13,** is provided to be received by the cabinet access opening **12** to selectively close the access opening **12** to prevent unauthorized withdrawal of periodi-

cals from the cabinet **11**. The door **13** preferably includes a transparent window **14** to facilitate display of periodicals held within the cabinet **11**.

The closure means or cabinet access opening door **13** has its lower end hinged to the front of the cabinet for pivotal movement between its generally horizontal open position (not shown) and its generally vertical closed position (FIG. 1). The door **13** is normally biased to its closed position (FIG. 1) by springs or the like (not shown) which are connected between it and the interior of the cabinet **11**.

The upper end of the access door or closure means **13** centrally mounts a generally channel-shaped member **15**, the top of which is provided with a handle **15***a*, and on the upper interior web of which there is journalled by a U-shaped bracket **16** an axle **17** on which there is mounted, for both pivotal movement about and axial movement along the generally horizontal long axis thereof, a latch **18**.

A coin-handling box **19** is mounted atop the front center of the cabinet **11** and includes a slot **20** (FIGS. **3–5** and **9**) which can receive the latch **18**.

As best shown in FIGS. **2–5** and **9**, first yieldable means, such as a coil spring **21** which surrounds the latch axle **17**, are provided for yieldably urging the latch **18** toward a first axial position along the long axis of the latch axle **17** (FIGS. **2–4**), and second yieldable means, such as a torsion spring **22**, are also provided to yieldably urge pivotal movement of the latch about the long central axis of the latch axle **17** in a direction causing an aperture **23** provided in the latch to be releaseably engaged with a first portion **24***a* of a strike **24** that is mounted on the cabinet **11** within the coin-handling box **19** adjacent to the latch-receiving slot **20**, when the door **13** is located in a position closing the cabinet access opening **12** (FIGS. **1** and **3** and FIG. **4** solid lines).

As further shown in FIGS. **1**, **3** and **4**, the coin-handling box **19** is provided with a pair of coin deposit slots **25** and **26**, with one of these slots **25** preferably accepting only U.S. dime coins and the other of these two slots **26** preverably accepting both U.S. nickel and quarter coins. The insides of these two coin deposit slots **25** and **26** are respectively aligned with the tops of two chutes **25***a* and **26***a* of a coin-receiving member **27**, that is removeably mounted on the inner side of the front wall of the coin-handling box **19** by apertures, such as apertures **28** (FIG. **6**) that are provided in its base plate **29** and can be readily slipped over studs, such as studs **30** (FIGS. **3–5**) which are affixed to the inner side of the front wall of the coin-handling box **19**.

This coin-receiving member **27** is preferably a modified form the coin-operated mechanismm described in detail in my aforenoted U.S. Pat. No. 3,760,923 and is constructed, as shown in shadow lines in FIGS. **3** and **4** and some detail in FIGS. **6–8**, to function to retain the latch **18** in a position retaining the cabinet access door **13** in its closed position with its aperture **23** engaging the first portion **24***a* of the strike **24** (as best shown in solid lines in FIG. **4**) until it has trapped with means such as the illustrated pivoted pawl **27***a* carried by it at least one coin (such as the coin **31** illustrated in FIGS. **3** and **4**) of the required selected value generally vertically within the lower end of one of its two chutes **25***a* or **26***a* with the edge of the coin located atop a cam section **18***c* provided on the latch **18** and with one of the coin sides located contiguously to a second portion **24***b* of the strike **24**.

As best illustrated in FIG. **4**, a coin, such as the illustrated coin **31**, when so trapped as just described above by the coin-receiving member **27**, and if of the selected value, will operate to pivot the latch **18** about the long axis of the latch axle **17** against the yieldable urging of the second yieldable means or torsion spring **22** and disengage the latch aperture **23** from the strike **24** (as shown in shadow lines in FIG. **4**) upon attempted removal of the closure means or door **13** from a position closing the cabinet access opening **12**, as by manually pulling the handle **15***a* in a clockwise direction as shown in FIG. **4**, and simultaneously discharge the coin **31** into an opening **32** provided in the top of a coin-collecting receptacle **33** that is aligned over and slightly to the rear of the cam section **18***c* of the latch **18**.

In further accordance with the present invention the latch mechanism is also provided with coin-return means which can be employed to return a coin, such as the illustrated coin **31**, to the operator of the vending machine **10** in the event that the coin is bent or placed in the improper one of the two coin deposit slots **25** and **26**, etc.

In the form of the present invention illustrated in the drawings, these coin-return means include retractable plunger means **34** mounted on the cabinet **11** for movement along a second axis that is generally parallel to the long axis of the latch axle **17**. The retractable plunger means **34** has a first end **34***a* protruding from the exterior of the cabinet through an aperture **35** provided in one of the sides (the right side as illustrated in FIG. **1**) of the coin-handling box **19**, and a second end **34***b* that is engageable with both the latch **18** and the coin-receiving member **27** by movement of its first end **34***a* from a retracted first position (FIGS. **1**, **3** and **4**) toward the interior coin-handling box **19** of the cabinet **11** to cause the latch **18** to overcome the yieldable urging of the first yieldable spring **21** which surronds the latch axle **17** and be moved axially along the long axis of the latch axle **17** to an inserted second position (FIG. **5**) and, thus, to cause the coin **31** to be released from the coin-receiving member **27** and to be diverted by the second portion **24***b* of the strike **24** into a coin-return opening **36** extending through an outer wall of the cabinet **11** (the lower right front side of the front wall of the coin-handling box **19** as shown in FIG. **1**), rather than into the coin-collecting receptacle **33**.

As shown in detail in FIGS. **3–8**, the inner or second end **34***b* of the retractable plunger means **34** is supported for the aforedescribed movement within the coin-handling box **19** of the cabinet **11** by an apertured bracket **36** that is mounted on the inside of the front wall thereof and includes first cam means **34***c* carried by it which engage and move (FIGS. **6** and **8**) second cam means **27***c* pivotally carried by the coin-trapping, coin-receiving member **27** and a tip portion **34***t* which also engages and axially moves the latch **18** when the first end **34***a* of the plunger means **34** is moved from its retracted first position (FIGS. **1**, **3** and **4**) to its inserted second position (FIG. **5**).

As yet further shown in FIGS. **6** and **8**, the first cam means **34***c* which are carried by the inner or second end **34***b* of the retractable plunger means **34** further include a guide portion **34***g* which cooperates with the second portion **34***b* of the strike **24** and other guide means **36***g* (FIG. **5**) located within the coin-handling box **19** to divert the coin **31** into the coin-return opening **36'** when the outer or first end **34***a* of the plunger means **34** is ax-

ially moved from its retracted first position (FIGS. 1, 3 and 4) to its inserted second position (FIG. 5). And, third yieldable means, such as the illustrated leaf spring 37 (FIGS. 3 and 5) are mounted on the bracket 36 which serve to yieldably urge movement of the outer or first end 34*a* of the plunger means 34 outwardly from the coin-handling box 19 of the cabinet 11 towards its retracted or first position (FIGS. 1, 3 and 4).

As best shown in FIGS. 6–8, the coin-trapping, coin-receiving member 27 comprises two generally vertically arranged chutes, such as the two chutes 25*a* and 26*a*, and each of these two chutes 25*a* and 26*a* includes a first section 38 that is fixed with respect to the cabinet 11 on the base plate 29 of the coin-receiving member 27 and a second section 39 that is mounted for pivotal movement about the long axis of an axle 40 that is arranged generally vertically on the base plate 29 with respect to the cabinet 11. And, as further shown in FIGS. 6–8, fourth yieldable means, such as torsion springs 41, are provided for yieldably urging the moveable second sections 39 of each of the two chutes 25*a* and 26*a* into engagement with their respectively fixed first sections 38 (FIG. 7) unless such yieldable urging is overcome by action upon the moveable chute sections 39, as through pivotal movement of the second cam means 27*c* by the engagement therewith (FIGS. 6 and 8) by the first cam means 34*c* carried by the inner or second end 34*b* of the plunger means 34 when the plunger means 34 is moved axially from its retracted first position (FIGS. 1, 3 and 4) to its inserted second position (FIG. 5).

As best still further illustrated in FIGS. 5 and 9, the tip portion 34*t* of the inner or second end 34*b* of the retractable plunger means 34 of the coin-return means is mounted thereon for pivotal movement by another axle 42 which has its long axis arranged generally perpendicular to that of the latch axle 17 and is yieldably urged by fifth yieldable means, such as the illustrated torsion spring 43, against movement about that long axis of its axle 42 toward the interior of the coin-handling box 19 of the cabinet 11 unless the yieldable urging of the fifth yieldable means 43 is overcome by sufficient inward pressure being applied against the tip portion 34*t* through the engagement therewith of the distal end of the latch 18 through attempted movement of the closure means or door 13 from a position opening the cabinet access opening 12 toward a position closing the cabinet access opening 12 while the outer or first end 34*a* of the plunger means 34 is also being moved towards the interior of the coin-handling box 19 of the cabinet 11. This arrangement avoids possible damage to either the latch 18 or the tip portion 34*t* of the second end 34*b* of the plunger means 34 which engages the latch 18 and permits the latch 18 to enter the slot 20 in the coin-handling box 19 and to engage its aperture 23 with the first portion 24*a* of the strike 24 and, thus, lock the closure member or door 13 in a position closing the cabinet access opening 12, even though the outer or first end 34*a* of the plunger means 34 is being held in its inserted or second position.

While it should be apparent that while there has been described what is presently considered to be preferred embodiment of the present invention in accordance with the Patent Statutes, changes may be made in the disclosed apparatus without departing from the true spirit and scope of this invention. It is, therefore, intended that the appended claims shall cover such modifications and applications that may not depart from the true spirit and scope of the present invention.

What is claimed is:

1. A latch mechanism for use in a coin-operated dispensing device including a cabinet having a cooperative opening to provide access to said cabinet, closure means to selectively close said opening, and a coin-operated mechanism actuatable upon receipt of at least one coin of selected value, comprising:

a. a latch mounted for both pivotal movement about and axial movement along a generally horizontal long axis of an axle carried by said closure means;

b. first yieldable means yieldably uring said latch toward a first axial position along said long axis of said axle;

c. a strike mounted on said cabinet and having a first portion releasably engageable in an aperture provided in said latch when said closure means is located in a position closing said opening;

d. a coin-receiving member mounted on said cabinet so as to trap a coin received therein generally vertically with its edge located atop a cam section provided on said latch and with one of the coin sides located contiguously to a second portion of said strike and thus to pivot said latch about said long axis of said latch axle against the yieldable urging of second yieldable means and disengage said aperture from said strike upon attempted removal of said closure means from a position closing said opening and to then discharge said coin into a coin-collecting receptacle; and

e. coin-return means including retractable plunger means mounted on said cabinet for movement along a second axis generally parallel to said long axis of said latch axle,

f. said plunger means having a first end protruding from the exterior of said cabinet and a second end being engageable with said latch and said coin-receiving member by movement of said first end towards the interior of said cabinet to cause said latch to overcome said yieldable urging of said first yieldable means and be moved axially along said long axis of said latch axle to a second position and, thus, to cause said coin to be released from said coin-receiving member and to be diverted by said second portion of said strike into a coin-return opening extending through an outer wall of said cabinet, rather than into said coin-collecting receptacle.

2. The invention of claim 1, wherein:

a. said second end of said plunger includes a tip portion that is engageable with said latch to cause its movement to said second position,

b. said tip portion is mounted on said plunger means by a second axle having its long axis arranged generally perpendicular to said long axis of said latch-mounting axle, and

c. said tip portion is yieldably urged by third yieldable means against movement about said long axis of said second axle towards the interior of said cabinet unless said yieldable urging of said third yieldable means is overcome by sufficient inward pressure being applied against said tip portion through the engagement therewith of the distal end of said latch through attempted movement of said closure means from a position opening said cabinet access opening towards a position closing said cabinet ac-

cess opening while said first end of said plunger means is also being moved towards the interior of said cabinet.

3. The invention of claim **2,** further including fourth yieldable means yieldably urging said plunger means toward movement outwardly from said cabinet along said second axis.

4. The invention of claim **1,** further including third yieldable means yieldably urging said plunger means toward movement outwardly from said cabinet along said second axis.

5. The invention of claim **4,** wherein:

a. said coin-trapping coin-receiving member comprises at least one generally vertically arranged chute including a first section that is fixed with respect to said cabinet and a second section that is moveable about a generally vertical axis with respect to said cabinet, and

b. fourth yieldable means are provided for yieldably urging said moveable second chute section into engagement with said fixed first chute portion to enable said trapping of said coin unless said yieldable urging of said fourth yieldable means is overcome by action upon said moveable second chute section by said movement of said plunger means toward second position.

6. The invention of claim **5,** further including cam means carried by said plunger means for engagement with other means connectable with said moveable second chute section to move the same out of engagement with said fixed first chute section.

7. The invention of claim **6,** wherein said other means comprises other cam means mounted on said coin-receiving member and engageable with said moveable second chute section to move the same out of engagement with said fixed first chute section.

8. The invention of claim **7,** wherein:

a. said second end of said plunger includes a tip portion that is engageable with said latch to cause its movement to said second position,

b. said tip portion is mounted on said plunger means by a second axle having its long axis arranged generally perpendicular to said long axis of said latch-mounting axle, and

c. said tip portion is yieldably urged by fifth yieldable means against movement about said long axis of said second axle towards the interior of said cabinet unless said yieldable urging of said fifth yieldable means is overcome by sufficient inward pressure being applied against said tip portion through the engagement therewith of the distal end of said latch through attempted movement of said closure means from a position opening said cabinet access opening towards a position closing said cabinet access opening while said first end of said plunger means is also being moved towards the interior of said cabinet.

9. The invention of claim **1,** wherein:

a. said coin-trapping coin-receiving member comprises at least one generally vertically arranged chute including a first section that is fixed with respect to said cabinet and a second section that is moveable about a generally vertical axis with respect to said cabinet, and

b. third yieldable means are provided for yieldably urging said moveable second chute section into engagement with said fixed first chute portion to enable said trapping of said coin unless said yieldable urging of said third yieldable means is overcome by action upon said moveable second chute section by said movement of said plunger means toward second position.

10. The invention of claim **9,** further including cam means carried by said plunger means for engagement with other means connectable with said moveable second chute section to move the same out of engagement with said fixed first chute section.

11. The invention of claim **10,** wherein said other means comprises other cam means mounted on said coin-receiving member and engageable with said moveable second chute section to move the same out of engagement with said fixed first chute section.

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