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Börner

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[54] **ACTUATING MECHANISM FOR VENDING AUTOMATS**

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Apr. 23, 1971 Germany ..... P 21 19 833.4

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[51] **Int. Cl.** **G07f 11/00**

[58] **Field of Search** 194/55, 57, 58, 74, 194/75, 78, 80

[56] **References Cited**

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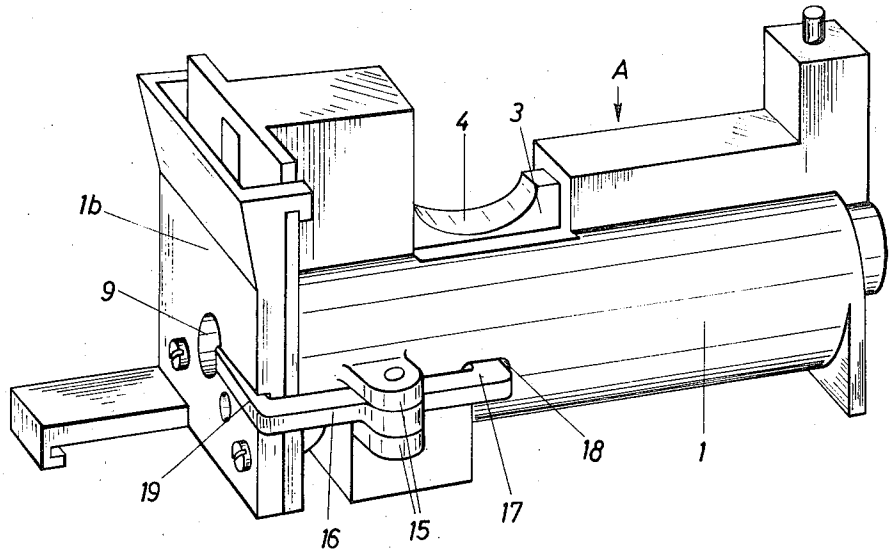
[57] **ABSTRACT**

An actuating mechanism for a coin controlled vending machine in which a locking member is provided reciprocable against a spring bias from a rest position to an actuated position wherein vendable material is released from the vending machine. The locking member has a bore therein and a pressing member is provided for moving the actuating member and is receivable in the bore. A coin slot is provided for receiving a coin which will close the end of the bore in the actuating member to permit actuation thereof by the pressing member while a coin receiver is provided for receiving the coin near the position which it occupies when the locking member is moved into actuated position.

8 Claims, 4 Drawing Figures



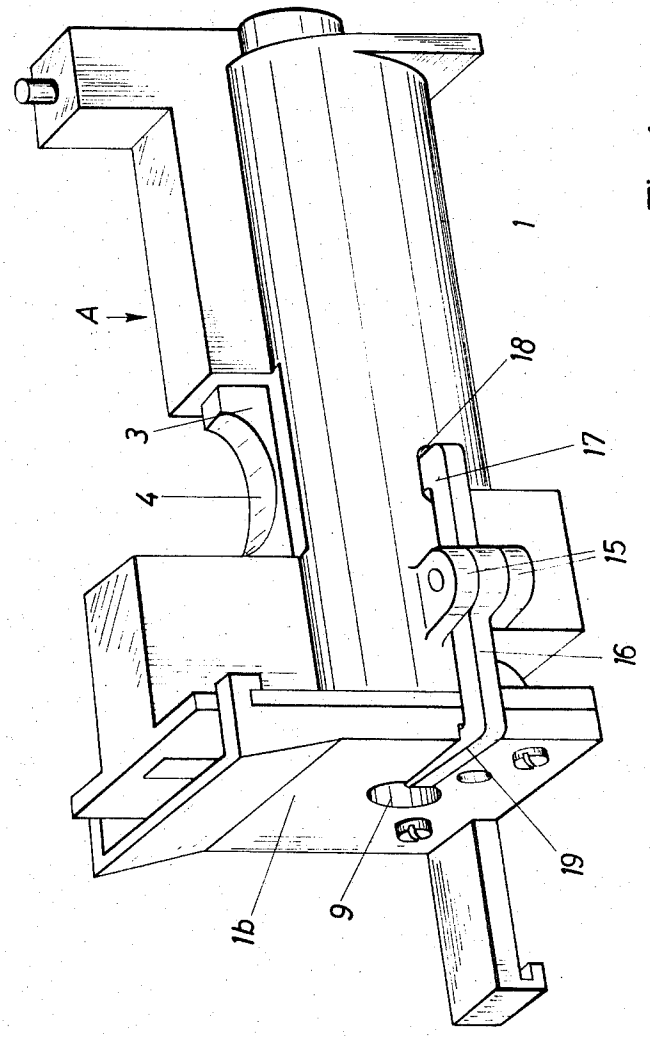


Fig. 1

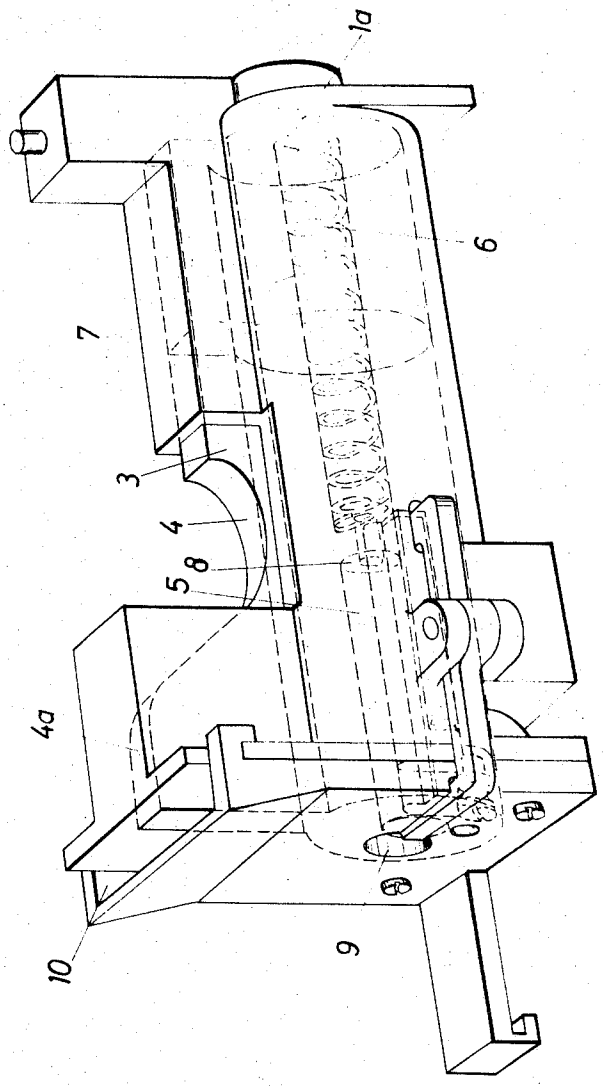


Fig. 2

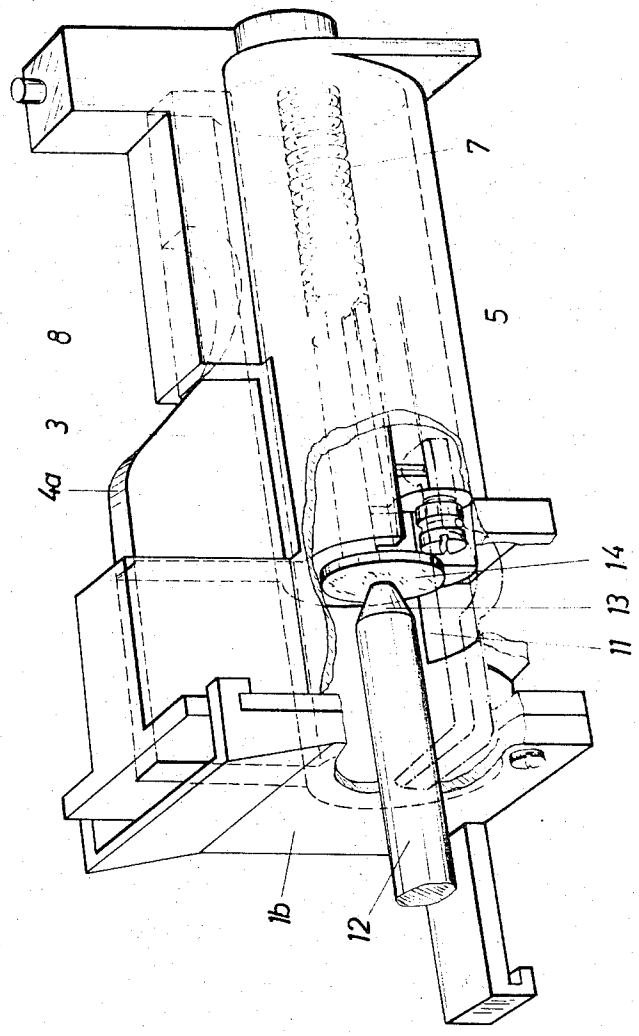


Fig.3

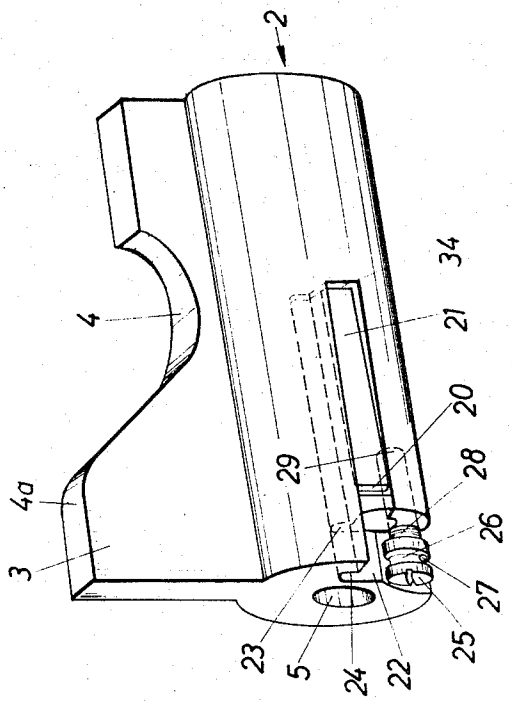


Fig. 4

ACTUATING MECHANISM FOR VENDING AUTOMATS

The present invention relates to an actuating mechanism for vending automats with a locking member which, for actuating a release mechanism to release goods after the insertion of a checked coin, is longitudinally displaceable in a housing against the thrust of a return spring. Such actuating mechanism is intended to be used in particular in connection with a vending automat having a parallelepiped-shaped housing the front side of which is closed by a detachable cover or lid and has at least one dispensing opening for the goods while comprising a plurality of compartments for receiving the goods, the compartments being arranged one above the other. The compartments for receiving the goods are formed by a plurality of flaps pivotally conected to the housing within the range of the rear wall thereof. These flaps, by means of one of their front corners, respectively rest on a supporting cam of an elastic yoke stationarily mounted on a vertical wall. For purposes of releasing the flaps, the yoke is pivotable by means of a slide which is displaceable in vertical direction and is pivotable toward the front. After the insertion of a checked coin into the automat, the slide is after actuation of the locking member stepwise movable in upward direction by means of a displaceable locking strip.

Vending automats of the just described fundamental construction are known in various embodiments. Vending machines with individual compartments usually receive such types of goods which cannot be directly stacked one upon the other.

It is an object of the present invention to provide an actuating mechanism for vending automats which will be simple in construction and inexpensive to produce and which will assure that an actuation of the vending machine, i. e., a release of goods, will be possible only when a checked coin corresponding to the price of the respective selected goods has been inserted into the vending machine.

This object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is an isometric view on an enlarged scale of the actuating mechanism according to the invention.

FIG. 2 is an isometric view of the actuating mechanism according to the invention while indicating in dash lines a portion of the inner structure.

FIG. 3 represents an isometric view of the actuating mechanism according to the invention with the locking member in pushed-in condition, some parts of the inner structure being exposed by showing some parts of the actuating mechanism broken away.

FIG. 4 represents a perspective view of the locking member.

The actuating mechanism according to the present invention is characterized primarily in that the locking member is provided with a longitudinal bore into which a pressing member may be inserted which is passed from the housing for the locking member toward the outside. The actuating mechanism according to the invention is furthermore characterized in that in front of the opening of the locking member in its rest position, a coin chute is so arranged that a coin inserted into the coin chute covers up the opening of the bore, a passage for the coin displaceable by the pressing member together with the locking member and covering up the opening of the bore being arranged blow the locking member.

In this way it will be assured that a displacement of the locking member for actuating the release mechanism will be possible only when a checked coin has been inserted into the vending machine and in the coin chute occupies occupies a position in front of the opening of the bore, because only by pushing in the pressing member with the bore opening being covered up by the coin is it possible to displace the locking member into its position for actuating the release mechanism. If no coin is present and thus the opening of the bore is free, the pressing member will, when being pushed in, be pushed into the bore of the locking member without bringing about a movement of the locking member.

According to a further feature of the invention the locking member has its outside provided with arresting means into which a nose drops for briefly arresting the locking member in this actuating position when the locking member occupies the position for actuating the release mechanism. The nose is located at one end of a resilient pivotable lever the other end of which is equipped with a stud which, when the pressing member is pushed in to the housing for the locking member, engages the outside of the pressing member whereby the nose is resiliently pressed against the outside of the locking member. This arresting member serves to briefly arrest the locking member during the return movement of the pressing member so that the coin which previously was clamped fast between the locking member and the pressing member and covered up the bore opening of the locking member will be released so that it can pass through the passage into a collecting container.

According to a further development of the invention, that end of the pressing member which faces the locking member has a section with a reduced diameter so that the stud of the pivotable lever can move inwardly for relieving the nose. In this way it will be assured that, when the pressing member after displacement of the locking member is again pulled out to a sufficient extent from the housing of the locking member so that the section of reduced diameter is located opposite the stud, the nose can move again out of the arrested position and the locking member will return to its starting or rest position under the influence of a return spring.

Inasmuch as in practice, due to machining tolerances, it will not always be assured that with all vending machines the actuation of the release mechanism for dispensing the goods will correspond to one and the same position of the pushed in locking member, it is provided according to a further development of the invention that the outside of the locking member is provided with a recess for receiving a strip which is adapted to be arrested in different positions, the arresting member being provided in this strip. With an arrangement of this type it is possible for each vending machine after installation of the actuating mechanism to bring the arresting member precisely into the position which corresponds to the proper function of the vending machine, which means can be brought into the position in which it is assured that each coin can be used only once for actuating the release mechanism and after actuation of the release mechanism will drop through the passage into the collecting container.

For infinitely variably adjusting the strip, the latter is in conformity with the present invention provided with a thread meshing with the outer thread of an adjustable screw which is rotatably mounted in the locking member but is not adjustable in axial direction.

Referring now to the drawings in detail, the actuating mechanism according to the present invention is of particular advantage in connection with vending machines as they are described, for instance, in German Offenlegungsschrift No. 1,907,824. With vending machines of this type, the locking member of the actuating mechanism is adapted to displace an arresting strip in vertical direction, the arresting strip forming a portion of the release mechanism for the release of goods after the insertion into the vending machine of a checked coin. The actuating mechanism and the release mechanism are so designed and cooperate with each other in such a manner that, after the insertion of a coin, the arresting strip of the release mechanism is, after the locking member has been pressed into the housing therefor, lifted by a certain distance in order to bring about a release of the respective goods.

The problem in connection with the actuating mechanism according to the present invention consists in making the displacement of the locking member for actuating the release mechanism dependent on the insertion of a checked coin corresponding in value to the price of the selected goods into the vending machine.

The actuating mechanism A according to the present invention comprises a housing **1** for the locking member **2** which latter is displaceable in the housing **1** in horizontal direction. The locking member **2** has substantially the shape of a cylinder block the top side of which has formed thereon an extension **3** which extends in the longitudinal direction of the locking member **2.** This extension **3** is for forming a cam path **4** provided with a corresponding recess as illustrated more specifically in FIG. **2.** The locking member **2** which is displaceable in axial direction is surrounded substantially on all sides by the housing **1,** with the exception of that portion of the extension **3** which is provided with the cam path **4.** The extension **3** is exposed toward the outside so that, for instance, a non-illustrated roller or the like can rest on the cam path **4** and roll on this path in response to a displacement of the locking member **2.** This roller, which is not illustrated, but rests on the cam path **4** forms a part of the release mechanism of the vending machine in such a way that by a displacement of the locking member **2** in horizontal direction, the roller which is guided in vertical direction will change its position as to height and when it has reached the upper section **4a** of the cam path **4** will actuate the release mechanism in such a way that the selected goods will be released.

The locking member **2** is provided with a longitudinal bore **5** which is open toward the front side of housing **1.** A return spring **6** has one end resting against the rear end of the locking member **2,** while its other end rests against the rear wall **1a** of housing **1.** The return spring **6,** when in relaxed condition, is partially located in a longitudinal bore **7** provided in the locking member **2,** the longitudinal bore **7** being separated from the longitudinal bore **5** by a transverse partition **8.** The locking member **2,** when in its rest position, is pressed by return spring **6** in the direction toward the front wall **1*b*** of housing **1.** This front wall **1*b*** is provided with a bore **9** which is in alignment with the longitudinal bore **5** of the locking member **2.** When the locking member **2** is in its rest position, it is by means of a suitable non-illustrated abutment held in spaced relationship to the front wall **1*b*** by such a distance that between the front wall **1*b*** and the front end of the locking member **2** there will be left free a gap which will be sufficient for receiving a coin fed through the coin chute **10.** This coin receiving gap which forms the lower end of the coin chute **10** is so arranged and designed that a coin which is located in the coin receiving gap will cover the opening of the longitudinal bore **5** of the locking member **2.**

The bottom side of the housing **1** is at a distance from the front wall **1*b*** provided with a passage **11** leading to a non-illustrated coin collecting container.

The actuating mechanism A according to the invention furthermore comprises a pressing member **12** which is diagrammatically illustrated in FIG. **3** and has a conical end **13.** This pressing member **12** is in the rest position of the actuating mechanism mounted in such a way and guided in the longitudinal direction in such a manner that the conical end **13** will be located outside the bore **9** in the front wall **1*b*** of housing **1** or will only partially extend into the bore **9** of the front wall **1*b*** of the housing.

When the actuating mechanism A or the locking member **2** occupy the rest position shown in FIG. **2** and no coin has been inserted through the coin receiving chute, an actuation, in other words an introduction of the pressing member **12** into the housing **1,** will exert no influence upon the locking member **2** because the pressing member **12** can be pushed into the longitudinal bore of the locking member **2.**

When, however, a non-illustrated coin **14** is through the coin chute **10** conveyed to the coin checking device, and the opening of the longitudinal bore **5** of the locking member **5** is covered up, the locking member **2** can by actuation or inward movement of the pressing member **12** be displaced against the thrust of a return spring **7** into its rear abutting position because the pressing member **12** will no longer be able to enter the longitudinal bore **5** since the coin **14** closes off the opening of the longitudinal bore **5.** During the displacement of the locking member **2,** the non-illustrated roller which forms a part of the release mechanism will through the intervention of the cam path **4** be displaced in upward direction by the actuation of the release mechanism so that the selected goods will be released. In the rear abutting position of the locking member **2,** the front end of the locking member **2** will be located above the passage **11** so that the coin **14** can drop out of the housing **1** downwardly into the non-illustrated coin collecting container after the clamping effect exerted upon the coin between the front end **13** of the pressing member **12** and the front side of the locking member **2** has been eliminated. This will occur when the pressing member **12,** after a proper actuation of the actuating mechanism, has returned to its starting position due to the action of a non-illustrated return spring.

The housing **1** is within the region of its front end provided with laterally protruding bearing ears **15** which serve for pivotally bearing a resilient two-arm pivotable lever **16.** One end of lever **16** is provided with a nose **17** which through a recess **18** of housing **1** extends inwardly, whereas the other end of lever **16** is provided with an angled off stud **19** which embraces the front wall **1*b*** of housing **1.** In the rest position of the actuating mechanism A, which means when the press-

ing member 12 is not or only with its conical end 13 moved into the bore 9, the stud 19 extends partially from the side beyond the bore 9. The lever 16 with nose 17 and stud 19 is so designed that in the rest position of the actuating mechanism, the nose 17 will either not at all or only under a slight pressure rest against the outside of the displaceable locking member 2, whereas by moving the pressing member 12 which fills the bore 9 over the major portion of its length, the stud 19 pivots outwardly whereby the nose 17 is pressed outwardly.

The locking member 2 is within the region of its mantle line located opposite nose 17 provided with an arresting notch 20 which is provided in a strip 21 that is displaceable in the longitudinal direction of the locking member 2. For displaceably mounting and guiding the strip 21, the locking member 2 is provided with a recess 22 which extends in the longitudinal direction of the locking member 2 and which has an undercut portion 24 into which a nose 23 extends which latter extends substantially over the entire length of strip 21. Within the region of its front end, the strip 21 closes the interruption of the arched line of the cylindrical main body portion of locking member 2 which interruption is formed by the recess 22. Strip 21 tapers towards its rear end in such a way that there will be formed a radially inwardly widening groove 37. This groove 37 is intended in the rest position of the locking member 2 to receive nose 17 of the lever 16. For purposes of adjusting strip 21 in the longitudinal direction of the locking member 2 there is provided a setting screw 25 which within the region of its head is provided with a circular groove 26. A transverse pin 27 extends into groove 26 in such a way that, while the screw 25 may turn, an axial adjustment of screw 25 will be prevented. This screw 25 has its threaded shank 28 extending into a longitudinal bore 29 in the locking member 2. Bore 29 has a greater diameter than the outer diameter of the threaded shank 28. That side of strip 21 which faces toward the threaded shank 28 is provided with thread windings meshing with the thread windings of the shank 28. By turning the screw 25, strip 21 can be adjusted in axial direction.

OPERATION OF THE ACTUATING MECHANISM.

When the opening of the longitudinal bore 5 is covered up by a checked coin 14, the locking member 2 can, after the pressing member 12 has been pressed inwardly, be displaced toward the rear so that the release mechanism will be actuated by the non-illustrated roller which moves on the cam path 4. When the locking member 2 occupies its rear end position in conformity with the release of the respective goods, the nose 17 of lever 16 engages the notch 20 of the displaceable strip 21 at relatively great force. This force is due to the fact that the stud 19 of lever 16 has by the pressing member 12 been pivoted outwardly out of the range of bore 9 with the result that the nose 17 pivots inwardly. When subsequently the pressing member 12 is again released and returns to its starting position under the influence of a non-illustrated return spring, the stud 19 will over the major portion of the length of the pressing member 12 remain in its outwardly pivoted arresting position so that nose 17 will remain in its notch 20 engaging position. Consequently, the coin 14 which then no longer is clamped-in between the front end 13 of the pressing member 12 and the front side of the locking member 2 will be able to drop out of the housing through the passage 11. When the pressing member 12 has moved out of the housing 1 to such an extent that the tapered end 13 of the pressing member 12 is within the range of bore 9, the stud 19 of the resilient lever 15 can again escape inwardly so that the holding force at which the nose 17 engages the notch 20 is reduced and the locking member 2 is released. As a result thereof, the locking member 2 will be able under the influence of its return spring 6 again to return to its front rest position. The adjustability of the notch 20 or of the strip 21 will permit to make up any machining inaccuracies within the region of the release mechanism so that the notch can be placed for each individual vending machine into the proper position in which it will be assured that in response to the actuation of the release mechanism and the release of the respective goods the coin 14 inserted into the actuating mechanism will always be able through passage 11 to drop downwardly and cannot be used a second time for the actuation of the release mechanism.

It is, of course, to be understood that the present invention is, by no means, limited to the particular construction shown in the drawings, but also comprises any modifications within the scope of the appended claims.

It may be added that a machine in connection with which the mechanism of the present invention may be used is disclosed in the copending U.S. application, Ser. No. 70,058; filed Sept. 8, 1970, and now U.S. Pat. No. 3,685,689.

What is claimed is:

1. In an actuating mechanism for a coin controlled vending machine; a housing member, a locking member reciprocably mounted in said housing member, a spring in the housing member biasing said locking member in one direction, a single pivot lever engagable with said locking member, said locking member being moveable against the thrust of said spring to cause vendable material to be released from said machine, a longitudinal bore extending into said locking member from the one end thereof which faces in said one direction, an upwardly extending coin chute formed in said housing and at the bottom overlying said one end of said locking member whereby a coin inserted in said chute will drop to the bottom thereof and overly the end of said bore, a reciprocable pressing member at said one end of said locking member aligned with the bore and no larger in diameter than said bore, said pressing member being operable to move said locking member against the thrust of said spring only when a coin overlies the end of said bore and therefore to actuate said pivot lever to engage said locking member, and a coin release aperture disposed to register from below with a coin at the said one end of said locking member when the locking member is moved to material releasing position.

2. In an actuating mechanism for a coin controlled vending machine; a housing member, a locking member reciprocably mounted in said housing member, a spring in the housing member biasing said locking member in one direction, said locking member being moveable against the thrust of the spring to cause vendable material to be released from said machine, a longitudinal bore extending into said locking member from the one end thereof which faces in said one direction, an upwardly extending coin chute formed in said housing and at the bottom overlying said one end of said locking member whereby a coin inserted in said chute

will drop to the bottom thereof and overly the end of said bore, a reciprocable pressing member at said one end of said locking member aligned with the bore and no larger in diameter than said bore, said pressing member being operable to move said locking member against the thrust of said spring only when a coin overlies the end of said bore, and a coin release aperture disposed to register from below with a coin at the said one end of said locking member when the locking member is moved to material releasing position, said housing member having a hole to receive said pressing member, a lever moveably carried by said housing and at one end having a portion in said hole so as to be moved by said pressing member when the latter recriprocates in said hole, said lever at the other end having a nose which resiliently engages the side of said locking member when said pressing member engages said portion, and a notch formed in said locking member means said one end and into which said nose drops when said locking member is in actuated position, said nose at least briefly arresting said locking member.

3. An actuating mechanism according to claim **2** in which the end of said pressing member nearest said locking member is formed to a reduced diameter.

4. An actuating mechanism according to claim **2** which includes means supporting said pressing member outside said housing and including a biasing means to return said pressing member from actuated position thereof.

5. An actuating mechanism according to claim **2** in which said locking member is formed with a longitudinal recess, a strip mounted in said recess, one end of said strip being engageable with said portion of said lever in the rest position of said locking member.

6. An actuating mechanism according to claim **5** which includes means for adjusting the axial position of said strip in said recess.

7. An actuating mechanism according to claim **5** which includes a screw rotatable on said locking member but nonaxially moveable thereon, and threads on said strip engaged by the threads on said screw, said screw being rotatable for adjusting the axial position of said strip in said notch.

8. An actuating mechanism according to claim **2** in which the end of said pressing member which faces said bore is tapered inwardly.

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