United States Patent [19]

Manner et al.

[11] **3,854,785**

[45] **Dec. 17, 1974**

[54] **ACTUATING DEVICE**

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[22] Filed: **Sept. 17, 1973**

[21] Appl. No.: **397,657**

[52] **U.S. Cl.** **312/319**, 292/DIG. 4, 312/333

[51] **Int. Cl.** **E05c 7/06**, A47b 88/00

[58] **Field of Search** ..... 312/319, 333, 204, 222; 292/DIG. 4, DIG. 72, 198, 77, 99; 49/276

[56] **References Cited**

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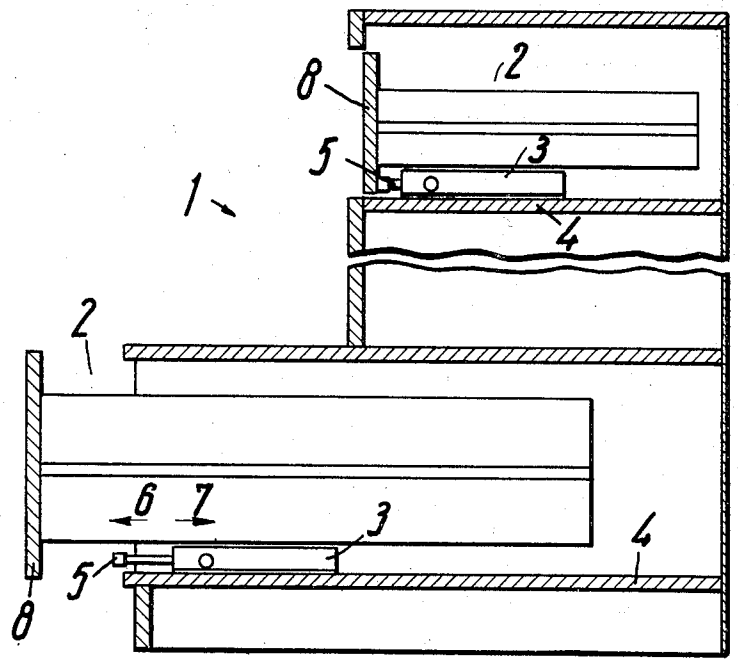
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Primary Examiner—James T. McCall
Attorney, Agent, or Firm—Walter Becker

[57] **ABSTRACT**

An actuating device adapted for being associated with a moveable member such as a drawer and operable upon pressing the drawer inwardly from a closed position to exert a force on the drawer in the opening direction which will push the drawer toward open position when released. Thereafter, upon pushing the drawer to closed position, the actuating device will latch in retracted position and from which retracted position it can, thereafter, be released by again pressing on the closed drawer in the closing direction. The actuating device includes a reciprocable push rod spring urged in the outward direction to a stopped position and having a stopped inner position from which it is released by inward pressure applied to the drawer.

18 Claims, 7 Drawing Figures



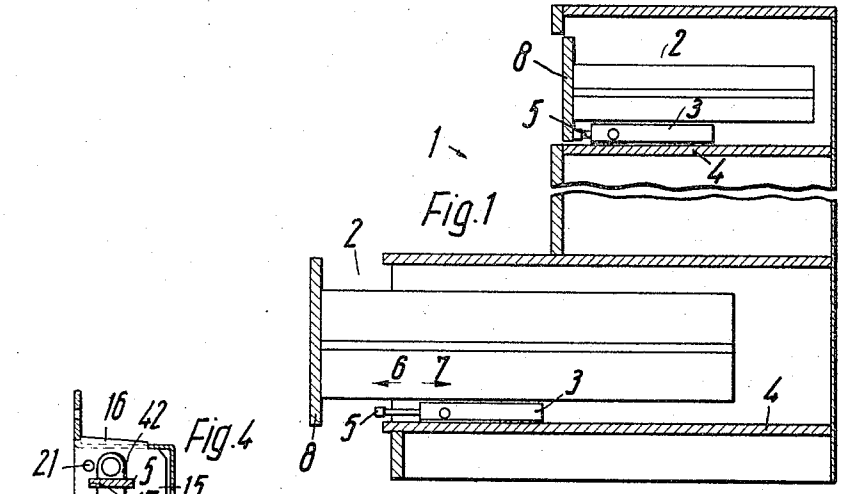


Fig.1

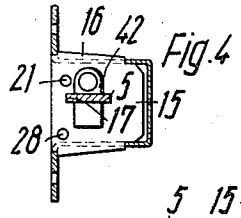


Fig.4

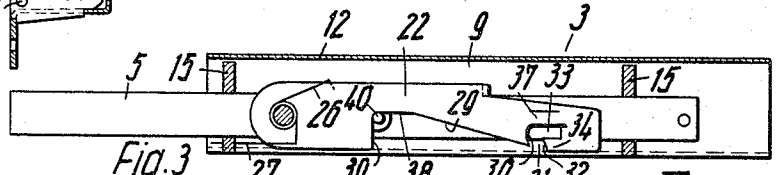


Fig.3

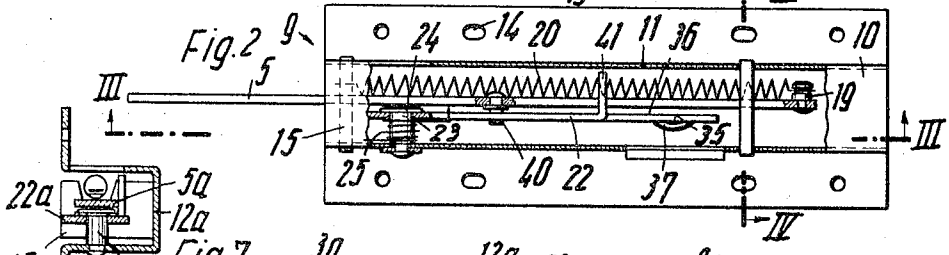


Fig.2

Fig.7

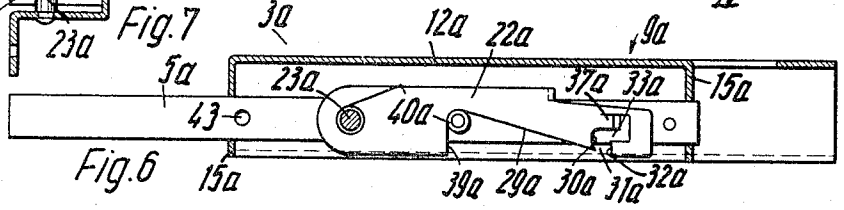


Fig.6

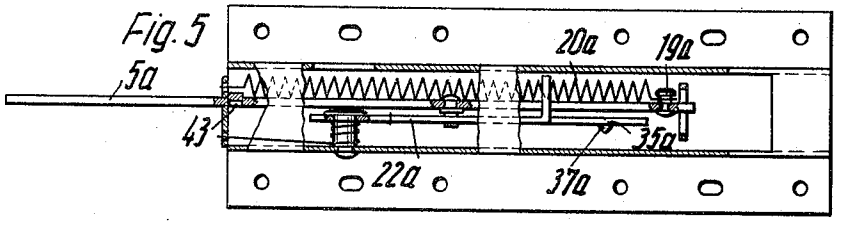


Fig.5

ACTUATING DEVICE

The present invention relates to push-out fittings for drawers and the like, equipped with a pushrod which is spring loaded in the push-out direction and which in its starting position is, by means of a pivotable latching or locking lever arrested in such a way that the latching lever is freed when the pushrod is moved inwardly by a short distance, said pushrod and said latching lever being mounted on a supporting element. The said latching lever is with its bearing movable relative to the pivot axis and is spring urged toward its locking position.

It is an object of the present invention so to design a pushout fitting of this type that an easy handling and safe operation will be assured while the push-out fitting is simple in construction.

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

FIG. 1 illustrates a vertical section through a furniture piece with fittings according to the present invention.

FIG. 2 illustrates a top view, partially in section, of the fitting according to FIG. 1.

FIG. 3 represents a section taken along the line III—III of FIG. 2.

FIG. 4 is a section taken along the line IV—IV of FIG. 2.

FIGS. 5 – 7 represent a further embodiment of the invention and illustrate the same in views similar to those of FIGS. 2 – 4.

The above mentioned objects have been realized according to the present invention by a push-out fitting, which is characterized in that the pushrod comprises a locking cam which, due to the spring force of the latching lever, moves on a first control surface of the latching lever, which first control surface is inclined with regard to the push-out direction and is furthermore located in a plane which is substantially perpendicular with regard to the pivot axis of the latching lever. The push-out fitting according to the present invention is furthermore characterized in that the first control surface merges at its rear end when looking in the push-out direction with a locking surface transverse thereto for the latching cam. The push-out fitting according to the invention is furthermore characterized in that in a direction counter to the push-out direction the locking surface has adjacent thereto, guiding means for the latching cam which guiding means is on that side which faces away from the first control surface confined by a second control surface for the end face of the latching cam. This end face is located in a plane which is at an incline with regard to the pivot axis of the latching lever and merges in push-out direction with a running surface for the latching cam, said running surface extending approximately in said last mentioned direction up to the front end of the first control surface and is located on the latching lever. The push-out fitting is additionally characterized in that the latching lever which is movable in approximately the direction of its axis is, in this direction, spring urged with the second control surface against the end face of said latching cam.

When the pushrod during the inward movement of the drawer is moved into the closing position toward the rear, the latching cam slides on the first control surface whereby the latching lever is pivoted against the spring force acting thereupon until the latching cam reaches the region of the latching surface so that the latching lever is under the influence of the spring force acting thereupon pivoted in such a way that the latching cam engages the latching surface. If the drawer is released in this position, the latching cam will, under the influence of the spring force acting upon the pushrod, engage the latching surface so that the pushrod is held fast. If now the drawer is pushed in further, slightly beyond its closing position, the latching cam with its end face will reach the second control surface due to the fact that the latching lever is under the influence of the spring force acting upon the latching lever pivoted further. The drawer can now be released because the latching cam will no longer be blocked by the latching surface but can from the second control surface, move to the running surface and via the latter to the start of the first control surface so that also the pushrod advances due to the spring force acting thereupon and pushes the drawer out.

For purposes of obtaining a protected arrangement, the latching lever projects freely approximately in a direction opposite to the push-out direction. A space saving arrangement is obtained when the latching lever is flat and is located in a plane substantially rectangular to the pivot axis of the latching lever.

The first control surface may, in a simple manner, be formed by an edge of the latching lever, preferably by the confining edge of a recess which is located on a longitudinal side of the latching lever. Similarly, the latching surface may be formed by an edge of the latching lever, which edge is preferably located at a right angle with regard to the push-out direction and faces away from the push-out end of the pushrod. A particularly safe function of the push-out fitting is assured when the latching surface is located opposite an abutment surface at a distance approximately corresponding to the diameter of the latching cam so that the latching cam when the drawer is pushed into its closing position will at the end of the first control surface, engage the abutment surface whereby the inward movement of the drawer is precisely limited and the latching cam cannot accidentally, during this movement of the drawer, move into the guiding means and onto the second control surface. Expediently, the abutment surface is substantially symmetrically located with regard to a plane which is parallel to the push-out direction and passes through that end of the first control surface which is located adjacent the latching surface so that it will assure a very safe abutment of the latching cam. A further improvement in this arrangement will be realized when the abutment surface is so designed that it re-enters because in this way, due to the abutment of the latching cam, a precisely predetermined position of the latching lever will be obtained.

For purposes of obtaining shorter control movements of the latching lever, the guiding means for the latching cam are provided directly adjacent to the abutment surface. The latching surface and the abutment surface may, in a simple manner, be designed by a cut at that longitudinal side of the latching lever which comprises the first control surface. Furthermore, the guiding means may, in simple manner, be formed by a cutout in the latching lever which cutout is adjacent to said last mentioned cut, whereby the guiding means will be located preferably at that edge which faces away from

the pertaining longitudinal side of the latching lever and pertains to the abutment member which forms the abutment surface and freely projects in the push-out direction.

In order to assure that the latching lever, for purposes of releasing the pushrod, can easily by the latching cam, be pressed away in the direction of its pivot axis, the second control surface is located at an acute angle closes in push-out direction. The second control surface may, in a simple manner, be located on that side of the guiding means which is located opposite the abutment member while said second control surface is preferably formed by a plate, or the like, bent out of the latching lever.

The second control surface may be designed rather narrow if the latching lever in its end position in which it engages the latching cam by means of the second control surface is limited by abutment means.

According to a further embodiment of the invention, the latching lever is journaled with play on a bolt in such a way that in addition to being pivotable about its axis without additional bearing means is also pivotable in a plane of this axis which is approximately parallel to its longitudinal direction, in other words, is movably journaled in the direction of this axis.

A particularly simple construction is obtained when on the bearing bolt between the latching lever and a first counterbearing, there is arranged a leg spring which is linked to the latching lever, when the helical spring-shaped section of the leg spring, which section surrounds the bolt is designed as compression spring, and when the latching lever on that side which faces away from the compression spring rests on a second counterbearing, especially an end collar of the bearing bolt, so that the latching lever is spring loaded by one and the same spring around its pivot axis and also in the direction of its pivot axis.

The running surface of the latching lever may, in a simple manner, be designed by that outer surface thereof which faces toward the pushrod.

A relatively short length of the pushrod is obtained when the latching lever is provided at the rear end of the pushrod.

For further simplifying the construction of the fitting according to the present invention, the pushrod is designed as a flat rod which preferably is located directly adjacent to the latching lever and in a plane parallel thereto.

A protected arrangement of the fitting can be realized by designing the carrier means in the form of a housing which extends preferably over the entire length of the latching lever and the supported section of the pushrod. According to a simple embodiment of this arrangement, the housing has a U-shaped cross section while preferably the U-shaped transverse web is located on that side of the latching lever which faces away from the first control surface so that the latching lever will easily be accessible when the fitting is not mounted.

Expediently, the carrier means is provided with connecting flanges which preferably are formed by outwardly bent leg ends of the housing of U-shaped cross section.

Referring now to the drawing in detail, it will be seen from FIG. **1** that within the region of the horizontally displaceable drawers **2** of a furniture piece **1** there are provided fittings **3** according to the invention, which are connected to the furniture piece **1,** for instance, to the intermediate bottom **4** and are located respectively directly below the pertaining drawer pull **2** adjacent to the opening provided for said drawer pull in the furniture piece. The pushrod **5** which extends in the displacing direction indicated by the arrows **6, 7** and pertains to the respective push-out fitting **3** is within the region of the inner side of the shield **8** of the pertaining drawer pull **2,** so located that its end will be able to engage the inner side of said shield and thereby to push the drawer out into opening position. Furthermore, as a result thereof, the pushrod **5** can, when pushing the drawer pull **2** in, be taken along by its shield **8.**

As will be seen from FIGS. **2 – 4,** the fitting **3** has a housing-shaped carrier **9** which comprises a central longitudinal part **10** which has a U-shaped cross section and the legs **11** of which are parallel to each other and at a right angle to the transverse web **12,** while the legs are bent outwardly to form strips **13** at those longitudinal sides of the legs which face away from the transverse web **12.** These strips **13** are located in a common plane and form connecting flanges which are provided with passages **14** for the connecting screws for purposes of connecting the fitting **3.**

Directly adjacent to the front end of housing **9** and in spaced relationship to the rear end thereof, the legs **11** have respectively connected thereto guiding plates **15** which are located in a plane that is perpendicular with regard to the legs **11** and the transverse web **12** and on both sides are equipped with web-shaped extensions **16.** These extensions **16** engage corresponding slots in legs **11** so that each guiding plate **15** will be safely held. Each guiding plate **15** extends to the connecting plane of the carrier housing **9** and has a passage **17** of a flat rectangular cross section. In the two passages **17** designed as guiding means, there is arranged the pushrod **5** which forms a flat bar and is displaceable in the direction of the arrows **6, 7** on the longitudinal direction of the housing **9.** This pushrod **5** is located in a plane which is parallel to the legs **11** of the housing **9** and is arranged approximately in the center between the legs **11.** At the rear end of the pushrod **5** behind the rear guiding plate **15** there is provided a rivet bolt **14** which protrudes beyond a side surface of said pushrod **5.** Linked to said bolt **19** is the rear end of a pull spring **20** which extends in the longitudinal direction of the pushrod **5** and is located at one lateral surface of said pushrod. The front end of the spring **20** engages a bore **21** in the front guiding plate **15,** said spring **20** urging the pushrod **5** in the push-out direction indicated by the arrow **6.**

Pivotally mounted on the leg which is located on that side of the pushrod **5** which faces away from the pull spring **20** is a latching lever **22.** Lever **22** is, with a bearing bolt **23** pivotable about a shaft which is located at a right angle to the legs **11.** The bearing bolt **23** is directly adjacent to the inner side of the front guiding plate **15,** and the latching lever **22** is located between the guiding plates **15.** The latching lever **22** projects from the pivot shaft **23** toward the rear. The latching lever **22** consists of a flat material and is located in a plane which is parallel to the pushrod **5** and directly adjacent to the latter. Arranged on the bolt **23** between the pertaining housing leg **11** and the latching lever **22** is a leg spring **25** of which one leg rests on that outer edge of the latching lever **22** which faces toward the transverse web **12** of the housing while the other leg **27**

engages a bore 28 in the guiding plate 15 which last mentioned bore is located at the same lever as the bore 21. That section of the leg spring 25 which is arranged on the bolt 23 serves as helical pressure spring which presses the latching lever 22 against an end collar 24 of the bearing bolt 23, said collar 24 being located between the lever 22 and the pushrod 5.

In spaced relationship to the pivot shaft 23, the one-arm latching lever 22 has that longitudinal side thereof which faces away from the transverse web 12 of the housing provided with a control surface 29 which is formed by the inner confining edge of a recess on the pertaining longitudinal side of lever 22 and extends in the direction toward the free end of the lever 22 at an incline with regard to the connecting plane of housing 9. That end of the first control surface 29 which faces away from the bolt 23 merges at an acute angle with a latching surface 30 which extends approximately at a right angle with regard to the longitudinal direction of the push rod 5 and is re-entering and concave and faces away from the bolt 23. The latching surface 30 thus extends from the merging area with the first control surface 29 in the direction toward the oppositely located longitudinal edge of the latching lever 22. The latching surface 30 is formed by a lateral confinement of a cut 31 which is provided on the pertaining longitudinal side of the latching lever 22 which is located approximately at a right angle to the longitudinal direction of the latching lever 22. The other confining edge 22 of this cut 31 forms a concave reentering abutment surface 32 which extends approximately at a right angle to the longitudinal direction of the pushrod 5. The abutment surface 32 points to the front end of the pushrod 5 and the central portion of which is located approximately opposite the merging area between the first control surface 29 and the latching surface 30. In other words, the abutment surface 32 is approximately symmetrically arranged with regard to the plane which is parallel to the longitudinal direction of the pushrod 5 and which passes through said merging area and is parallel to the pivot axis of the latching lever 22.

The cut 31 merges with a cutout 33 in the pertaining end of the latching lever 22 while this cutout 33 forms guiding means which extend from the cut 31 to the rear or free end of the latching lever 22 and together with the cut 31 forms an angular guiding means. As a result thereof, the abutment surface 32 is formed by an abutment member 34 which freely projects in the push-out direction indicated by the arrow 6.

On that side of the cutout 33 which is located opposite to the abutment member 34 and is approximately parallel to the longitudinal direction of the pushrod 5, the lever 22 forms a control surface 35 which, in the direction of the arrow 7 and in spaced relationship to the abutment surface 30 is parallel to the pivot axis 23 of the lever 22 and is offset with regard to that side of the lever 22 which faces away from the pushrod 5 while in the push-out direction indicated by the arrow 6 merging with the lateral surface 36 of the lever 22 which last mentioned surface faces the pushrod 5. The second control surface 35 is with the illustrated embodiment formed by a plate 37 which in the view of FIG. 2 is, in a pitch circle manner, bent out. The plate 37 has both ends merging with the lever 22 or forms one piece therewith. The control surface 35 is located in a plane which is parallel to the longitudinal direction of lever 22 and to its pivot axis. This plane passes approximately through the front portion of the first control surface 29. At this front end of the first control surface 29, the latter merges with an edge section 38 which is parallel to the longitudinal direction of the latching lever 22. The section 38 merges, in its turn, with an edge section 39 which is located at a right angle with regard to the longitudinal direction of the lever 22. The edge section 39 points away from the pivot shaft 23 of lever 22.

On that lateral surface of pushrod 5 which faces toward the lever 22 there is provided a latching cam 40 which is formed by a bolt and projects beyond the pushrod 5, said cam engaging the lever 22. In the push-out position of the pushrod 5, according to FIGS. 2 and 3, i.e. in the position in which the pushrod 5 has advanced farthest in the direction of the arrow 6, the cam 40 engages the edge of the lever 22, which edge forms the end abutment surface 39, so that the pushrod is fixed in this position. When the pushrod 5 is displaced in the direction of the arrow 7, i.e. in a direction opposite to the push-out direction 6, the latching cam 40 slides first along the edge section 38 and then along the first control surface 29 so that the lever 22 is, against the thrust of the leg spring 25, pivoted in the direction toward the transverse web 12 of the housing until the cam 40 abuts the abutment surface 32 so that the pushrod 5 cannot be pushed in further against the thrust of spring 20. If the pushrod 5 is now released by releasing the drawer pull 2, the pushrod 5 will, due to the thrust of its spring, slightly move in push-out direction indicated by arrow 6. At the same time, the latching lever 22 will, due to the thrust of leg spring 25, be pivoted away from the transverse web 12 of the housing in such a way that the cam 40 will abut the latching surface 30 whereby the pushrod 5 will again be blocked in the push-out direction indicated by arrow 6. If now, the pushrod 5 is moved again in a direction opposite to the push-out direction indicated by arrow 6, in other words, is moved again in the direction of the arrow 7 by a slight distance, the latching cam 40 moves into the cutout 33 until, due to its position within the region of the second control surface 35, it frees the lever 22 so that the latter, due to the thrust of its leg spring 25 can pivot further away from the transverse web 12 of the housing and thus the free end face of the latching cam 40 passes to the control surface 35. On the longitudinal side which faces the transverse web of the housing, an abutment plate 41 is bent out of the lever 22 in a direction toward the pushrod 5, said abutment plate 41 forming an end abutment for the lever 22 which when the cam 40 engages the control surface 35 will in a blocking manner engage the longitudinal edge of pushrod 5, which longitudinal edge faces toward the housing transverse web 12. If the pushrod 5 is now released, the cam 40 slides along the second control surface 35 to the lateral surface 36 which faces the pushrod 5 and is designed as running surface while pertaining to the latching lever 22. As a result thereof, the pushrod 18 will spring forward due to the thrust of spring 20 in the push-out direction indicated by arrow 6 until the cam 40 again abuts the end abutment edge 39. The lever 22 is journaled with such great bearing play on the bolt 23 that it will be pivotable on bolt 23 about an axis which is located at a right angle to the longitudinal direction of said bolt and intersects the central axis of bolt 23 at a right angle so that the lever 22 during the movement of the cam 40 on the running surface 36 is against the

thrust of leg spring **25** pressed away by pushrod **5** by a corresponding distance. As soon as cam **40** during the springing forward of pushrod **5** arrives within the region of the edge section **38,** the latching lever **22** is, by the thrust of the helical spring section of leg spring **25** moved again in the direction toward the pushrod **5** so that the cam **40** will again be located in the plane of the edges **29, 30, 32, 38, 39.**

The guiding plates **15** are expediently made of a synthetic material so that a very noise-free movement of the fitting according to the invention is obtained. Such a synthetic material may, for instance, be Teflon. The rear guiding plate **15** has a passage **42** for the helical tension spring edge **20** so that the latter can be expanded in an unimpeded manner.

In FIGS. 5 – 7, those parts which correspond to the element described above in connection with FIGS. **1** to **4** have been designated with the same reference numerals as in FIGS. **2** to **4** but with the index "*a*".

According to the embodiment of FIGS. **5** to **7,** the guiding plates **15**a are formed by plates which are bent off at a right angle from the transverse web **12***a* of the housing. The front guiding plate **15***a* is provided at the foremost end of the housing **9***a*, whereas the rear guiding plate **15***a*, when the pushrod **5***a* is in its front position is located behind the rear linkage point **19***a* of the helical tension spring **20***a*. The pushrod **5***a* is provided with an abutment cam **43** which is formed by a stamping. This abutment cam **43** has associated therewith a counter abutment formed by the inner side of the front guiding plate **15***a* and fixed by the farthest moved-out position of the pushrod **5***a*. The plate **37***a* which forms the second control surface **35***a* and pertains to the lever **22***a* protrudes freely in a tongue-like manner. The plate **37***a* is located in a plane which is at an incline with regard to the plane of lever **22***a* and which together with the plane of pushrod **5***a* encloses an acute angle which closes toward the front end of the pushrod **5***a*.

It is, of course, to be understood that the present invention is, by no means, limited to the specific showing in the drawing, but also comprises any modifications within the scope of the appended claims.

What is claimed is:

1. A device for causing outward movement of a member such as a drawer or the like from closed position, said device comprising; a frame adjacent the member, a push rod in the frame extending in the direction of movement of said member and reciprocable in said direction between an inner retracted position and an outward position and having the outer end adapted to engage the member in closed position of the member, a latch bar parallel to and adjacent one side of the push rod and pivoted in the frame, a latch pin extending outwardly from the push rod on the latch bar side, a first spring in the frame biasing the push rod in outward direction, said latch bar having a first control surface along one edge, a first inwardly facing abutment region at the forward end of said first control surface engageable by the side of said latch pin in outward position of said push rod, said first control surface also having an incline leading rearwardly from said first abutment region and along which said latch pin slides as the push rod moves in retracting direction in said frame, a second inwardly facing abutment region at the rearward end of said incline remote engageable with the side of said latch pin to hold the push rod in retracted position, a second control surface on said latch bar engageable with the end of said latch pin upon inward movement of the push rod from retracted position and operable to release said latch pin from said second abutment region, a running surface extending along said latch bar generally parallel to said first control surface and from near said second abutment region to said first abutment region, said running surface adapted for engagement with the end of the latch pin, said latch pin being slidable along said running surface when disengaged from said second abutment region, and a second spring biasing said latch bar about the axis of the pivotal support thereof on said frame in a direction toward said first control surface.

2. A device according to claim **1** in which said latch bar is pivoted in said frame near the forward end of the latch bar and extends rearwardly in the frame from the pivot, said latch bar being disposed in a plane perpendicular to the axis of said latch pin.

3. A device according to claim **1** in which said latch bar is pivoted in said frame near the forward end of the latch bar and extends rearwardly in the frame from the pivot, said latch bar having an elongated notch formed along said one edge thereof, the end of said notch nearest said pivot forming said first abutment region, the rearward portion of said notch forming said incline and the rearward end of said incline leading to near the adjacent edge of said bar, and a lateral recess extending into said edge of the bar at the rearward end of said incline, said lateral recess adapted for receiving said latch pin when the latch pin runs off the rearward end of the incline, said recess having a rearwadly facing edge forming said second abutment region.

4. A device according to claim **3** in which the forwardly facing edge of said lateral recess forms a third abutment region to abut the side of said latch pin when the latch pin runs off the rearward end of said incline.

5. A device according to claim **4** in which said third abutment region is substantially symmetrically located with respect to the rearward end of said incline so as to be directly opposed to said latch pin when the latch pin runs off the rearward end of the incline.

6. A device according to claim **1** in which said second control surface is adjacent said second abutment region.

7. A device according to claim **6** in which said second control surface is formed by a portion of said latch bar which is bent out of the plane of said latch bar.

8. A device according to claim **7** in which said second control surface extends at an acute angle to the plane of the latch bar.

9. A device according to claim **1** in which said latch bar and push rod comprise cooperating elements of abutment means which stop said latch bar in a predetermined rotated position relative to said push rod when said latch bar is under the influence of said second spring.

10. A device according to claim **1** in which said latch bar engages the pivotal support therefor with play to permit lateral movement of at least the free end of the latch bar when said latch pin is disengaged from said second abutment means by said second control surface.

11. A device according to claim **10** in which said latch bar is also moveable axially on its pivot and said second spring comprises a helical portion surrounding

the pivot and disposed between the frame and the latch bar.

12. A device according to claim **1** in which said latch pin is in about the middle of the length of the push rod.

13. A device according to claim **1** in which said frame includes spaced plates in which said push rod is guided for reciprocation in the frame.

14. A device according to claim **1** in which said first spring is a tension spring having a forward end connected to said frame and a rearward end connected to said push rod.

15. A device according to claim **1** in which said push rod is a flat plate and is parallel to the latch bar.

16. A device according to claim **1** in which said frame is a U-shaped housing having mounting flange means on the free ends of the legs thereof.

17. A device according to claim **14** in which said first control surface is on the side of said latch bar which faces the open side of said housing.

18. A device according to claim **13** in which said plates are formed of synthetic material and have laterally protruding lugs, said frame having apertures therein to receive said lugs to locate and retain said plates in said frame.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,854,785 Dated December 17, 1974

Inventor(s) Roland Manner et al.

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

On the Cover Sheet,

Assignee: Robert Krause KG
Zweigniederlassung Wielheim/Teck,
Weilheim/Teck, Germany

should read -- Robert Krause KG
Zweigniederlassung Weilheim/Teck,
Weilheim/Teck, Germany --.

Signed and sealed this 4th day of March 1975.

(SEAL)
Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
U.S. GOVERNMENT PRINTING OFFICE: 869-930

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,854,785 Dated December 17, 1974

Inventor(s) Roland Manner et al.

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

On the cover sheet insert:

-- [30] Foreign Application Priority Data

Germany P22456004 Sept. 16, 1972 --.

Signed and Sealed this

twenty-second Day of *July 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks

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