United States Patent [19]

Hazzard et al.

[11] **3,748,011**

[45] **July 24, 1973**

[54] **CLOSURE CONTROLLING MEANS**

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[22] Filed: **May 18, 1971**

[21] Appl. No.: **144,557**

[52] **U.S. Cl.**..... **312/333,** 292/76, 292/DIG. 65

[51] **Int. Cl.**..... **A47b 88/04,** E05b 65/44

[58] **Field of Search**..... 292/70, 73–75, 292/77–79, 155, 173, 176, 252, 302, 76; 312/332, 333

[56] **References Cited**

UNITED STATES PATENTS

2,711,944	6/1955	Meek et al.	312/333
1,069,932	8/1913	Dupart	292/73
84,088	11/1868	Campbell	292/90
1,408,637	3/1922	Pratt	292/252

FOREIGN PATENTS OR APPLICATIONS

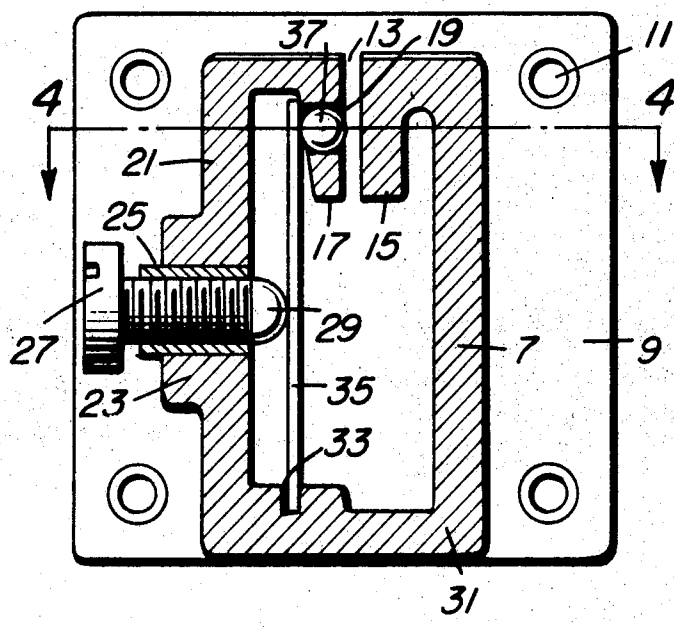
768,748	5/1934	France	292/73
100,164	10/1940	Sweden	292/75
362,706	4/1906	France	292/75

Primary Examiner—Marvin A. Champion
Assistant Examiner—Lawrence J. Staab
Attorney—Peck & Peck

[57] **ABSTRACT**

Means for varying the force required to open a closure member, drawer, or the like. A stationary compartment and a movable closure member for said compartment, a keeper member fixed in said stationary compartment, and a latch mechanism fixed on said movable closure member and in closure member closed position coactive with said keeper member. Means associated with said latch mechansim for varying the coactive tension between it and the keeper member to vary the force necessary to open the closure member, drawer or the like. A method of assembling the latch mechanism and the keeper member and for affixing the keeper member to the compartment in alignment with said latch mechanism for proper coaction therebetween when the closure member, drawer, or the like is in closed position.

5 Claims, 14 Drawing Figures



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FIG. 1

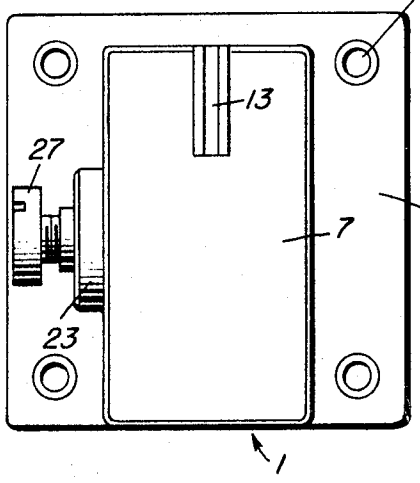


FIG. 2

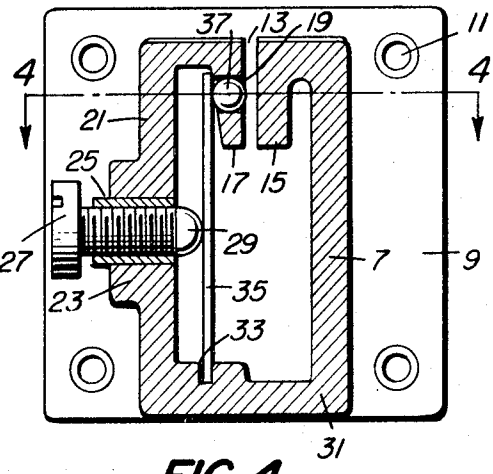


FIG. 3

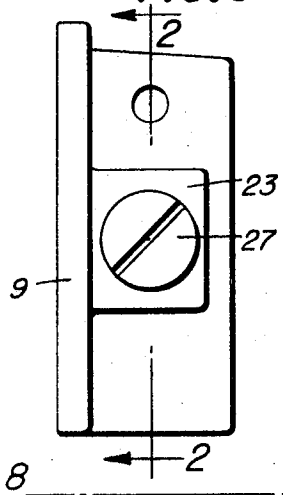


FIG. 4

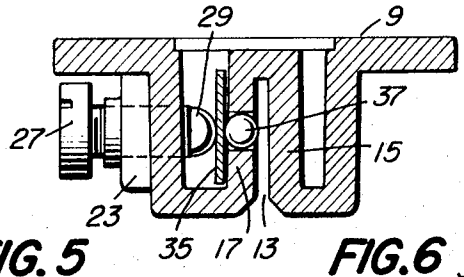


FIG. 5

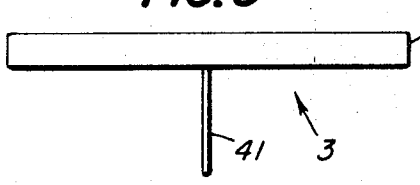


FIG. 6

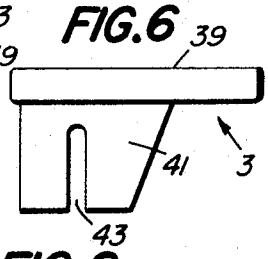


FIG. 7

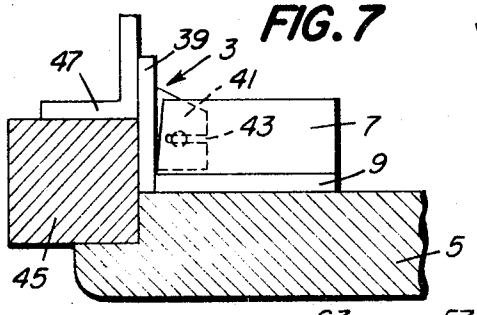


FIG. 8

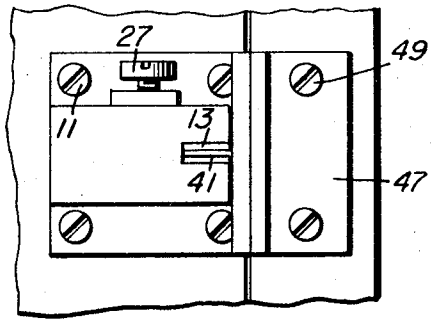


FIG. 9

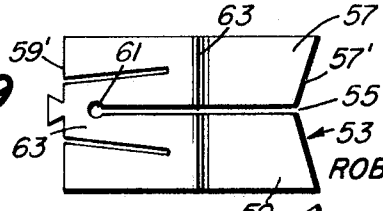
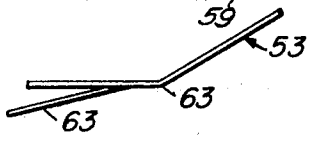


FIG. 10



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FIG. 12

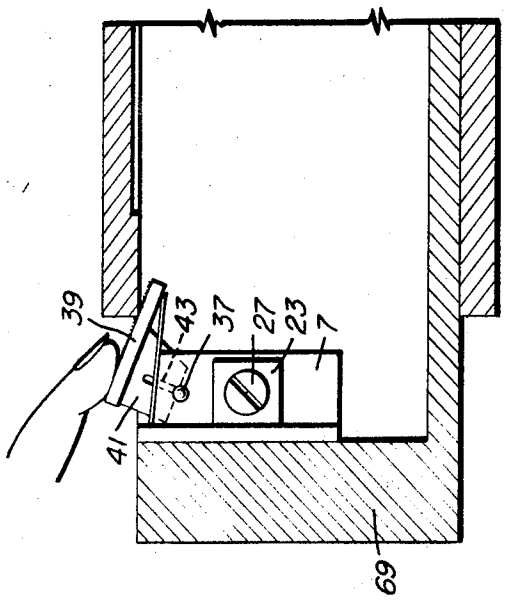


FIG. 14

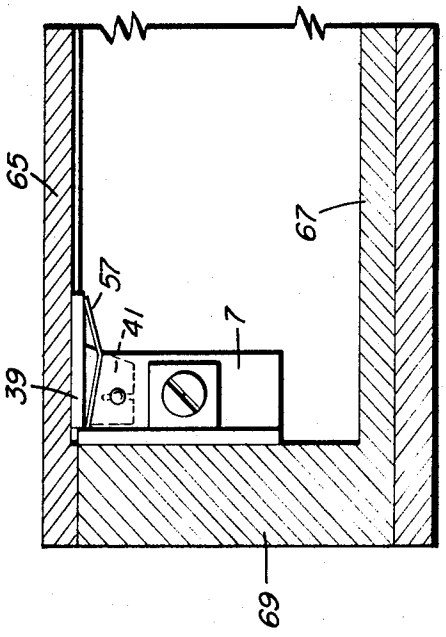


FIG. 11

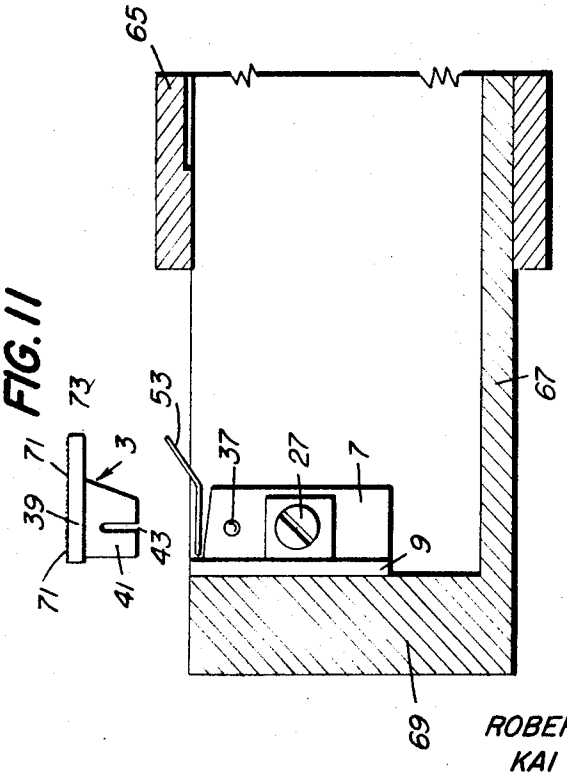
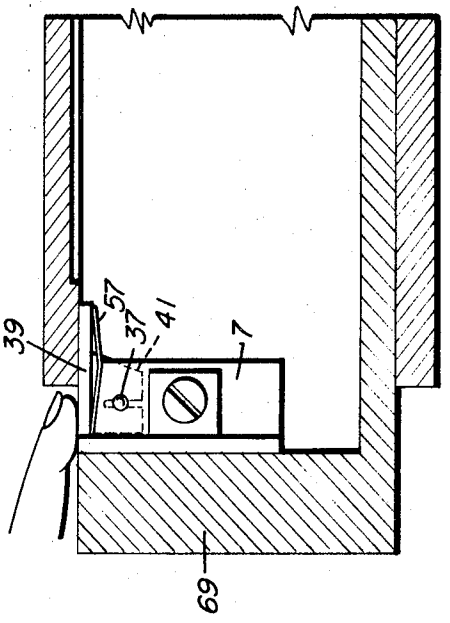


FIG. 13



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CLOSURE CONTROLLING MEANS

This invention relates broadly to the art of latching mechanism for closure members, drawers, and the like; and in its more specific aspects, it relates to such mechanism wherein means is provided for manually varying the mechanism to thereby vary the force required to open the closure member, drawer, or the like. The invention also embodies a unique method of assembly of the various members involved in the latching mechanism whereby such members will be in proper alignment for the necessary coaction therebetween; and the nature and objects of the invention will be readily recognized and understood by those skilled in the arts to which it relates in the light of the following explanation and detailed description of the accompanying drawings illustrating what we at present believe to be preferred embodiments or mechanical expressions of our invention from among various other forms, arrangements, combinations and constructions, of which the invention is capable within the spirit and scope thereof.

It is well known that in the latching discipline for closures it is highly desirable to maintain closure members, drawers and the like in closed position so that children may not gain access to the interior of the compartment which might contain injurious materials and to also maintain cabinets, and the like, which, while perhaps not containing materials which would be harmful to children may contain pots, pans and other utensils which are attractive to children and which when removed from the cabinet and played with create a substantial annoyance factor to the person in charge of the child.

We are aware that a plurality of methods and devices have been designed to maintain compartments in closed position so that children may not gain access thereto, while access may be had by adults. Various types of arrangements having keys have been designed, as well as relatively automatic means for achieving these purposes. All of such devices, of which we have knowledge, are relatively complicated, expensive to produce and difficult to install, and in many instances, involve keys or other opening means which are subject to loss.

We have evolved a latching mechanism which is adaptable in a simple manner to closure members, drawers, and the like. The mechanism which we have developed requires no special knowledge of the mechanical or other arts to operate, requires no key or other releasing means and may be installed expeditiously and with ease by following simple directions.

Our mechanism has been designed to permit adult opening while preventing unwanted opening of a closure member, drawer, or the like by children of varying ages and of varying strengths. It will be appreciated, as the description of our invention proceeds, that this tension or force varying feature of the arrangement allows easy opening of the closure member by an adult when it is being maintained in closed position but prevents access by relatively young children who have relatively less strength than older children. Again, this adjusting feature of our invention may be employed to require greater force or strength to open the closure member, so that children of advanced age may not open the closure.

Means have been conceived by us whereby the force or strength required to open the closure member may be varied by a simple adjustment by an adult. Thus, the closure controlling mechanism may be varied to adapt it to prevent it being opened by children of various ages.

It is also considered to be significant that the aforesaid adjusting means is located in the arrangement so that when the closure member, drawer, or the like is in closed position, such mechanism is disposed within the closed compartment out of reach of a child so that it may not be tampered with so that the closure member might be opened by a child.

In accomplishing our highly desirable results, we have not sacrificed simplicity of design and operation, and thus, the mechanism may be economically produced and subjected to normal use of substantial lengths of time without requiring maintenance services.

As will become apparent as this description proceeds, the entire latching mechanism involves a movable mechanism and a stationary mechanism which is coactive therewith in the latching operation. It is necessary that the stationary member and the movable mechanism be properly affixed in the compartment and the movable closure member, respectively, so that they will be in the necessary proper alignment for mutual coaction in the operation of maintaining the closure member in position against opening by children.

We have devised a simple method of assembly of these various parts so that the proper alignment will be realized and the maintaining operation will be effective and accurate. The method of assembly constitutes steps which may be easily followed and are such that the services of a skilled worker is not required in the proper installation of the parts.

With the foregoing general objects, features and results in view, as well as certain others which will be apparent from the following explanation, the invention consists in certain novel features in design, construction, mounting and combination of elements, as will be more fully and particularly referred to and specified hereinafter.

Referring to the accompaning drawings:

FIG. 1 is a view in elevation illustrating the movable mechanism of the device mounted on the movable closure member of the compartment, drawer, or the like.

FIG. 2 is a view in section of the mechanism of FIG. 1 taken on the line 2—2 of FIG. 3.

FIG. 3 is a side elevational view of the mechanism illustrated in FIGS. 1 and 2.

FIG. 4 is a view in section taken on the line 4—4 of FIG. 2.

FIG. 5 is a view in end elevation of the keeper member and its supporting plate which is mounted on a stationary part of the compartment.

FIG. 6 is a side view in elevation of the keeper member and the supporting plate.

FIG. 7 is a side view of the mechanism mounted on a movable closure member and the keeper member mounted on a fixed wall of the compartment and illustrating the coaction which occurs between the two when the closure member is in closed position.

FIG. 8 is a view taken on the line 8—8 of FIG. 7.

FIG. 9 is a top plan view of the resilient or spring element which is utilized in the method of assembly of the movable mechanism and the stationary member.

FIG. 10 is a side view of the resilient or spring member illustrated in FIG. 9.

FIG. 11 illustrates the first step in the method of assembly.

FIG. 12 illustrates the second step in the method of assembly.

FIG. 13 illustrates the third step which is followed in the method of assembly.

FIG. 14 illustrates the final step in the method of assembly.

In the accompaning drawings we have used the numeral 1 to designate, in its entirety, the latching mechanism of this invention and numeral 3 to designate generally the keeper member which as will be explained, in the closure controlling operation, coact with one another. The latching mechanism 1 is affixed to a movable closure member 5 and comprises a casing 7 which is mounted on a base plate 9, the base plate 9 being secured to the closure member 5 by means of screws or the like 11, or in any other suitable manner. The casing 7 and the base plate 9 may, if desired, comprise an integral structure and may be formed of any suitable material. The casing 7 is preferably of hollow construction and is provided with a transversely extending slot 13 formed in the top thereof and extending through the forward wall of the casing, as clearly illustrated in FIG. 1 of the drawings. The slot 13 is bounded on each side thereof by downwardly depending flanges or lips 15 and 17, the flange 15 being of solid, imperforate construction while the flange 17 is provided with an aperture 19 extending completely therethrough. The purpose of the aperture 19 will be explained hereinafter. The side wall 21 of the casing which is adjacent to but spaced from the depending flange 17 is provided with a centrally disposed outwardly extending boss 23 thereon having an aperture extending therethrough in which is fixed an internally threaded sleeve 25, the sleeve being in horizontal alignment with aperture 19. Threaded in the threaded sleeve 25 is a tension varying screw 27 having a rounded inner nose 29 thereon. The bottom or lower wall 31 of the casing 7 is provided with a groove 33 therein, in which groove is positioned a resilient plate 35 which extends upwardly from its mounted position in the groove 33 to a point at least adjacent to the aperture 19 in flange 17, and the resilient plate 35 extends upwardly to this position on the side of the flange 17 adjacent to, but spaced from, the wall 21 of the casing. Positioned within the aperture is a keeper engaging steel ball 37 which is movably carried in the aperture 19. It will be appreciated that the steel ball 37 is of somewhat greater diameter than the length of the aperture 19, and that the flange 15 keeps the steel ball from completely falling out of the aperture on the side thereof at which the flange 15 is located. The resilient plate 35 is maintained in its upright position by the nose 29 of the screw 27 which is in engagement with the resilient plate 35, and by threading the screw 27 so that the nose 29 thereof moves inwardly, it will be appreciated that such inward movement of the plate will cause it to engage the steel ball 37 and move it inwardly a distance through aperture 19 and into the slot 13.

The keeper member 3 comprises a base plate 39 to which is fixed a keeper member 41 which depends from the base plate. The keeper member 41 is provided with a slot 43 which extends upwardly a distance from and through the lower edge of the keeper. The keeper member 3 is fixed to a stationary wall or the like 45 of the compartment which is closed by the movable closure member 5. If the stationary wall 45 is of insufficient width to fully receive and have the base 39 affixed thereof, an angle member 47 may be provided, such member being fixed to the stationary wall 35 by means of screws or the like 49, or in any other suitable manner.

With the latching mechanism 1 affixed to the movable closure member 5 or movable drawer, as described above, and the keeper member 3 fixed to the stationary part 35 of the cabinet or compartment, or to the framework in which a drawer slides, when the movable closure member is in closed position, the slot 13 of the casing 7 will receive therein the keeper 41 and the tension upon such keeper member may be varied by tightening or loosening the screw 27 to thereby, by means of member 35, project the ball 37 further into the slot 13 or to lessen the projection of the ball into the slot. With the closure member closed the slot 43 in the keeper member will be in a line with the steel ball 37 so that when the steel ball is projected by the force of the plate 35 thereagainst an arc of the ball will extend into the slot 43 of the keeper. It will be appreciated that the further the ball is projected into the slot 13, and the slot 43 of the keeper, the greater force required to open the closure member, or drawer, so that a child having insufficient strength will be unable to open the closure member, drawer or the like. An adult with greater strength will be able to open the closure member by exerting sufficient force thereon to cause retraction of the steel ball against the resilient plate 35 which will flex under this force, and permit the keeper member to be released therefrom.

In FIGS. 9 and 10, we have illustrated one type of resilient or spring member which may be used in assembling the components of the closure controlling means of this invention. We have designated, in its entirety, the resilient or spring member by the numeral 53 and this member 53 is of bifurcated construction providing a slot 55 between two leg members 57 and 59. It will be noted that the slot extends from and through one transverse edge 57' of the member to a point 61 adjacent to but inwardly spaced from the opposite transverse edge 59' of the member. The member 53 is transversely bent as at 63 and is provided at the transverse edge 59' thereof with a tongue 63 which is split from the body of the spring and is downwardly bent as is clearly illustrated in FIG. 10.

Thus, we have provided a resilient or spring member having angled sections thereof which function in the method of assembly in a manner which will now be described.

It is within our contemplation to vary the configuration of the member 53, since there are several configurations which may be used which will function to generate the necessary tensions and forces in the assembling operation. Various configurations of the resilient or spring member will, therefore, fall within the spirit and scope of our invention.

In FIGS. 11–14 we have illustrated the steps which are followed in the practice of assembling the various components of the closure controlling means so that the operation thereof will be as desired. In FIGS. 11–14 we have illustrated the method of assembling the components on a drawer or the like; it is to be distinctly understood that the same method will be followed in the assembly of these components on, for instance, a swinging closure member.

We have illustrated a stationary framework 65 in which the drawer 67 slides, the drawer having a front

face 69 and being open at its top in the usual manner of drawers.

The latching mechanism is fixed to the inner surface of the front wall 69 of the drawer by causing the plate 9 to be affixed to the inner surface in any suitable manner. The latching mechanism 1 is mounted in substantially intermediate transverse position with respect to the front wall 69 of the drawer, and is mounted so that the slot 13 therein is upwardly disposed. With the latching mechanism so mounted, the resilient or spring member 53 is disposed on the top wall of the casing 7 with the slot 55 which is provided in the spring member in vertical alignment with the slot 13 in the casing 7. With the spring 53 so mounted, it will be seen particularly from FIG. 11 of the drawings that the legs 57 and 59 will extend upwardly and beyond the casing and the tongue 63 will be in engagement with the top wall of the casing 7. The base 39 of the keeper 3 has had an adhesive 71 applied to the upper surface thereof. A decomposer is applied to the adhesive 71 whereupon the keeper 3 is positioned as disclosed in FIG. 11 with the tail or extending portion 73 of the base 39 extending rearwardly. With the keeper 3 in the position illustrated in FIG. 11, it is positioned on the casing 7 with the keeper member 41 extending through the slot 55 in the member 53 and being received in the slot 13 of the latching member 1. Pressure is then applied to the base 39 of the keeper so that the extending portion 73 of the base will engage and start to depress the upwardly bent legs 57 and 59 of the member 53. With pressure being maintained in the keeper it is tilted forwardly and downwardly as disclosed in FIG. 12, whereupon the drawer is closed and the base 39 of the keeper will be in engagement with the inner surface of the wall 65 and when the drawer is completely closed, as illustrated in FIG. 14, the base member 39 of the keeper will be tightly maintained against the inner surface of the framework 65 to cause the decomposed adhesive 71 to adhere to the inner surface of the framework 65. It will be noted that upward adhering pressure will be applied to the base plate 39 by the legs and the tongue of the resilient or spring member 53; thus, ample adhering pressure is applied in fixing the keeper in proper position within the drawer framework.

With the drawer or closure member in closed position as illustrated in FIG. 14, it is maintained in this position until the adhesive 71 has set so that the keeper member 73 will soundly adhere to the inner surface of the framework 65. We have found by experience that this setting time is on the order of 15 minutes. At the expiration of this period the drawer is withdrawn and the resilient member or spring will drop from its position and may be discarded.

It will now be evident that our method of assembly of the components insures that the keeper member will be set on the framework, or stationary member, due to the action of the upward pressure of the spring, and it will be so set and affixed in the correct position so that when the drawer or closure member is moved into closed position, the keeper member 41 will slide into the slot 13 and an arcuate portion of the steel ball 37 will be received in the slot 43 in the keeper member 41. It will be, of course, appreciated that the pressure may be varied on the ball by manipulating the screw 27.

It is within our contemplation to reverse the positions of the latching mechanism and the keeper so that the former will be mounted on the movable member, while the latter will be mounted on the stationary member.

We claim:

1. Closure controlling means, including in combination, a compartment having solely one end open and a closure member operative to open and close said open end of said compartment, a stationery keeper member fixed to and extending from a wall of said compartment, and a latching mechanism fixed to and movable with said closure member in its opening and closing movements, said latching mechanism including a casing having a slot therein and said keeper member being received in said slot and positioned in said casing when the closure member is in closed position, means positioned in said latching mechanism and in engagement with said keeper member when the closure is in closed position, finger operable means having a portion thereof extending exteriorly of said casing and a portion thereof extending into said casing and connected with said means positioned in said latching mechanism and operable to vary the tension of said means positioned in said latching mechanism on said keeper member to thereby vary the force required to open said closure member, and said exteriorly extending portion of said finger operable means being completely within said compartment and inaccessible exteriorly thereof when said closure member is in position closing the open end of said compartment and an elongated element being mounted in said casing, said elongated element being supported at one end thereof in said casing and means on said casing limiting movement of said elongated element at said one end, the other end of said elongated element being freely movable, the freely movable end of said elongated element being in engagement with and operable on said means positioned in said latching mechanism and said finger operated means being in engagement with said elongated element and finger operable to vary the pressure of said elongated element on said means positioned in said latching mechanism.

2. Closure controlling means in accordance with claim 1, wherein said casing is substantially closed and is provided with a slot therein in line with said keeper member and said keeper member being received in said slot when the closure member is in position closing the open end of said compartment, said finger operable means being disposed exteriorly of said casing and said means positioned in said latching mechanism being positioned within said casing.

3. A closure controlling means in accordance with claim 2, wherein spaced apart members depend in said casing providing an unobstructed area there between and in alignment with the slot, and said means positioned in said latching mechanism is operably mounted in one of said spaced apart members.

4. Closure controlling means in accordance with claim 3, wherein one of said spaced apart members is provided with an aperture therein and said means positioned in said latching mechanism is operably positioned in said aperture, and said elongated element is in operable engagement with said means positioned in said latching mechanism at a point thereon remote from the unobstructed area and the other of said spaced apart means is imperforate.

5. Closure controlling means in accordance with claim 1, wherein said elongated element and said means positioned in said latching mechanism are positioned within the casing laterally of said slot.

* * * * *