

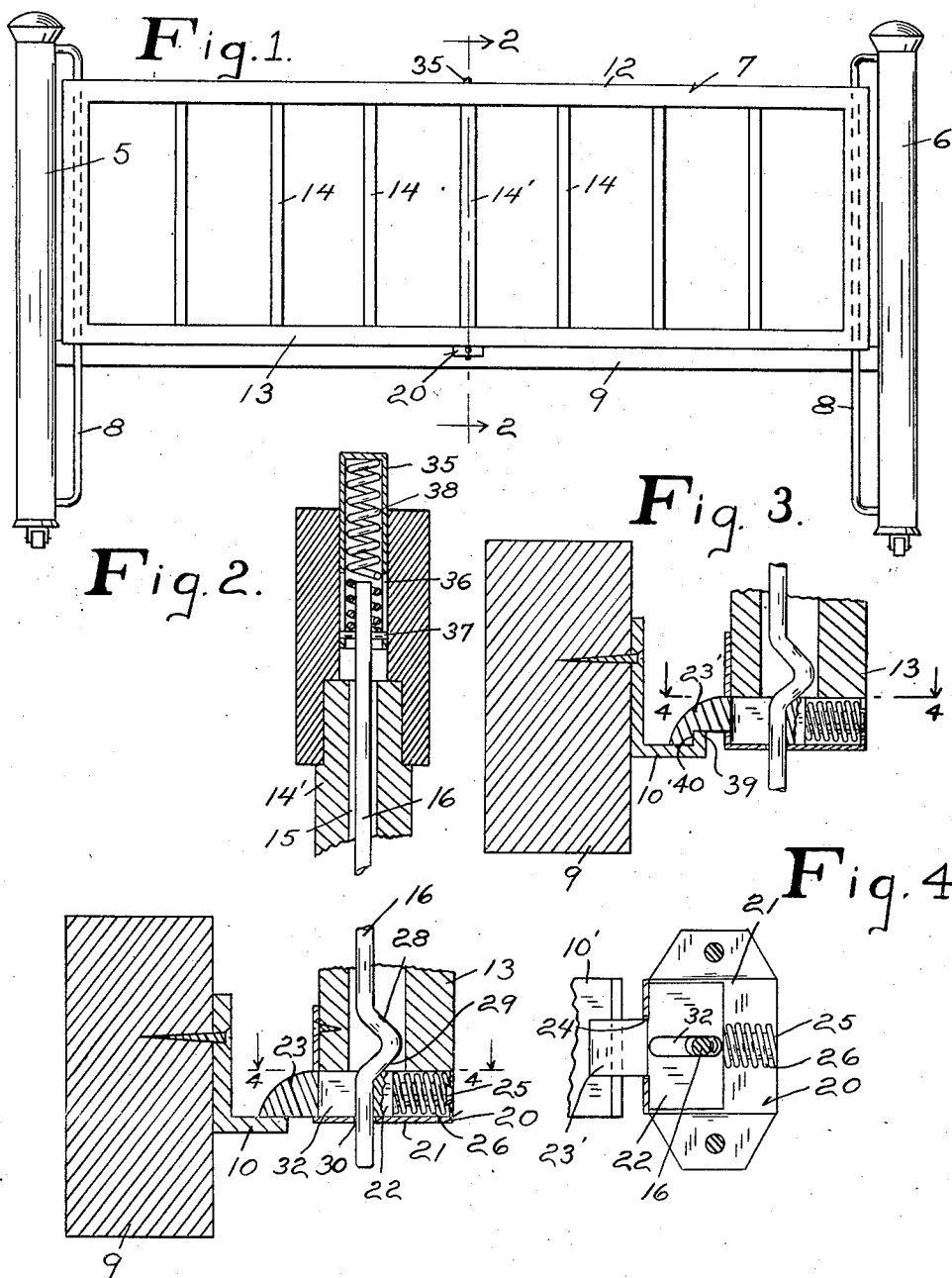
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CRIB LATCH

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CRIB LATCH.

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This invention relates to improvements in latches. More particularly stated this invention relates to an improved latch mechanism particularly adapted for use in connection with a child's crib or the like.

It is the object of this invention to produce a novel and improved type of latch mechanism which can be operated freely by one hand of the operator when it is relieved of pressure but will resist every attempt to operate it on the part of a person who is unfamiliar with the requirement that the pressure must first be relieved therefrom.

In the accompanying disclosure this improved mechanism is shown in conjunction with a child's crib, a service for which it is peculiarly adapted. Cribs having sides which let down have heretofore ordinarily been provided with latches at each end of the said sides too far apart to be reached simultaneously by a child. The necessity for making it impossible for the child to operate the latch has heretofore resulted in a device which is inconvenient for an adult since both hands of the operator have heretofore been required to release the ordinary latch or latches which are proof against operation by a child. The present device can readily be operated by the adult with one hand but, as a preliminary to its operation, the adult is required to lift slightly the side of the crib to release the latch of pressure. It is therefore the object of this invention to produce a novel and improved type of latch which will combine convenience for the operator with absolute safety against accidental release. The necessity for having to move the latch operating part in one direction after preliminarily adjusting the latch control part in an opposite direction makes the possibility of a child's accidentally operating the device so remote as to be almost non-existent.

In the drawings Figure 1 is a side elevation of a crib to which this invention has been applied.

Figure 2 is a section taken on line 2—2 of Figure 1.

Figure 3 is a detail view corresponding to the lower portion of Figure 2 and illustrating a modified and preferred construction.

Figure 4 is a section taken on line 4—4 of Figures 2 and 3.

Like parts are designated by like reference characters throughout the several views.

Since this invention is particularly adapted for use in connection with a crib there are illustrated at 5 and 6 the end posts of a crib having a vertical adjustable side 7. The bars 8 attached to end posts 5 and 6 guide the side frame 7 for its vertical movement in the usual way. Any horizontal rail 9 of the crib may be employed to carry the latch seat 10 from which the adjustable side frame 7 may be supported.

As is freely shown in Figure 1, the side frame 7 may conveniently be made up of top and bottom rails 12 and 13 interconnected by spindles 14. One of these spindles, particularly designated by reference character 14', may be made hollow through the provision of the central bore 15 in which an actuating rod 16 is disposed for vertical movement. Any desired type of latch mechanism may be operated by this rod. In the particular construction herein illustrated I have selected a very simple latch device designated in its entirety by reference character 20 and including a pressed metal housing 21 in which there is, guided for transverse reciprocation, a plunger 22 of rectangular cross section which carries a latch bolt 23 projecting from the housing through an aperture 24 therein. The plunger may have a stud 25 projecting rearwardly therefrom as a guide for a compression spring 26 which normally presses a bolt 23 into a position for operative interengagement with the latch seat 10. For the operation of this type of latch the rod 16 is bent at 28 to provide a cam surface 29. The lower end of the rod is guided in aperture 30 in a housing 21 and projects through a slot 32 in a plunger or guide member 22. The arrangement is such that the downward movement of rod 16 will, through the interaction of cam surface 29 with plunger 22, result in a rearward movement of the plunger against a portion of spring 26 to retract the latch bolt 23 from engagement with the latch seat 10. Upon the release of the rod 16 spring 26 will expand and cause a reverse movement of the parts. The above construction may be understood to exemplify any desired type of latch.

For the purpose of depressing rod 16 to actuate the latch I provide a manually operable button 35 which projects from the upper rail 12 of side frame 7. This button comprises a tube closed at its top and slotted at 36 to receive the cross pin 37 in rod

16. This simple arrangement confines the button operatively to the rod and the cross pin constitutes a convenient seat for the compression spring 38 which is housed within the tubular button structure. It will be observed that the length of slot 36 is such as to permit button 35 to be depressed until it is received within the upper rail 12 without transmitting any positive motion to the shaft 16. The depression of the button simply compresses spring 38 and, if shaft or rod 16 is free to move downwardly the compression of spring 38 will be relieved by such downward movement. If, however, the downward movement of shaft or rod 16 is opposed by a resistance greater than the pressure required to compress spring 38, it will obviously be impossible for the operator to cause the rod 16 to move.

Such a resistance is furnished in the present device by the frictional engagement of latch bolt 23 with seat 10 and by the friction existing between the parts required for the retraction of the said bolt together with the pressure of spring 26 resisting such retraction. It has been demonstrated by actual tests that if the operator slightly lifts the side frame 7 of the crib and subsequently depresses button 35 the compression of spring 38 may be entirely adequate to retract the bolt against the compression of the relatively lighter spring 26. If, however, the weight of the crib side frame 7 is supported from the crib frame proper through the latch bolt 23 and stop 10, the resulting friction will so increase the resistance to movement of rod 16 as to prevent retraction of the bolt regardless of any attempts on the part of the operator to press downwardly on button 35. Obviously the tendency of the operator is to press upon the latch confined part in the direction in which it is expected that this part will move if the latch is released. As a consequence the uninformed person, in attempting to operate this latch is apt to add some degree of weight to the weight of the crib side 7 and thereby render even greater the resistance of the latch to the attempted operation.

In the construction above disclosed, it is necessary to arrive at a predetermined balance between the forces required to compress the springs 38 and 26, and as has just been explained it is necessary that spring 38 be sufficiently strong to overcome spring 26 unless the spring 26 is aided by the friction between the parts, and at the same time the spring 26 must be sufficiently strong so that when assisted by said friction it will produce adequate resistance to overcome the pressure of spring 38. This balance is readily obtainable and the device when constructed as indicated is very satisfactorily operable, but for commercial manufacture

it is preferable to employ a construction in which no such balance is required. For this purpose it is only necessary to modify the latch stop 10 in the manner indicated at 10' in Figure 3 to provide an upwardly extending flange 39 and to form the latch bolt 23' with a shoulder at 40 adapted for positive interengagement with the flange 39. This arrangement, in which the positive interlocking engagement exists between the bolt 23' and stop 10' in a manner adapted normally to provide a retraction of the latch bolt, makes it unnecessary to figure on friction. It is only necessary to make sure that the spring 38 is sufficiently strong to overcome spring 26 and to provide retraction of the bolt when the bolt is free to move. In order to avoid any necessity for close calculation of this minimum strength of spring 38, I have illustrated in the modified construction a device in which the springs may be made as powerful as is desired. It will be obvious that when the parts are in interlocking engagement no amount of pressure on button 35 regardless of the strength of spring 38 will retract the bolt. Whereas in the Figure 2 construction, it is sufficient merely to relieve the bolt 23 of the weight of the side frame 7 without actually lifting such frame, in the Figure 3 construction it is necessary actually to lift the side frame until the shoulder 40 clears flange 39.

It will be seen from the foregoing that the latch mechanism herein disclosed is such that it requires for its operation a preliminary adjustment which is contrary to the normal expectation of a person attempting to operate the latch. At the same time this adjustment is so simple and can so readily be performed by a person acquainted with it that it complies with the objects expressed for this invention. The normal method of operation will involve the placing of the operator's fingers beneath the rail bar 12 and the operator's thumb upon button 35, a simultaneous operation of the fingers and downward movement of the thumb, as if in naturally compressing the hand, will result in the release of the latch for downward movement of the crib frame 7. The frame may readily be restored to its lifted position since the latch bolt is provided in the usual manner with a bevel upper surface which, in the upward movement of the side frame 7, interacts with the plate 10 to throw the bolt aside.

I claim:

1. In a device of the class described, a seat for a latch-bolt, a latch bolt arranged to engage said seat when in operative position and to support a load thereon, an operating part for said latch-bolt having a resilient connection therewith, the strength of said connection being so related to the resistance of said bolt that it is adapted to

retract said bolt from said seat only when the latter is relieved of load.

2. In a device of the character described, the combination with relatively fixed and 5 movable members and a latch bolt and seat respectively connected with said members, said movable member having a tendency to move with respect to said fixed member and said bolt being adapted normally to interact 10 with said seat to restrain such movement, of manually operable means impositively connected with said latch bolt for the retraction thereof from said seat, the impositive connection between said means and said bolt 15 being normally inadequate for the retraction of said bolt while said bolt is operative to restrain said movable member as aforesaid, and being adequate for the retraction of said bolt when said bolt is not operative to re- 20 strain said movable member from movement.

3. In a device of the character described, the combination with a latch seat element, 25 of a latch bolt element retractable with reference to said seat and formed for interlatching engagement with said seat element in a manner adapted to oppose positively such retraction, and resilient means operable 30 upon said bolt element in a direction tending to retract said bolt element from said seat element upon disengagement of said interlatching elements.

4. In a device of the character described, 35 the combination with a latch seat and a member adjustable with reference thereto, of a bolt movable between advanced and retracted positions and adapted in its advanced position to contact said seat, whereby

to support the load of said member and to 40 restrain said member from adjustment with reference thereto, an actuator for said bolt adapted to move said bolt toward its retracted position, a manually engageable part, and a spring interposed between said part 45 and said actuator, said spring having a strength sufficient to transmit movement from said part to said actuator in a direction to retract said bolt when said bolt is re- 50 lieved of the load of said member.

5. In a device of the character described, 50 the combination with a latch seat, of a bolt retractable therefrom, said seat and said bolt being provided with interlocking shoulders adapted normally to prevent such retraction, 55 a member supported by said bolt from said seat and adapted for movement in a direction to afford clearance between the said shoulders of said bolt and said seat, where- 60 by said bolt is retractable, and means for retracting the bolt, said means including a manually operable part and impositive motion transmitting connections between said 65 part and said bolt and operatively adapted for the retraction of said bolt.

6. In a device of the class described, a 65 seat for a latch-bolt, a latch bolt arranged to engage said seat when in operative position and to support a load thereon, an operating part for said latch-bolt having a yield- 70 ing spring connection therewith, the strength of said spring being so related to the resistance of said bolt that it is adapted to retract said bolt from said seat only when 75 the latter is relieved of load.

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