July 28, 1953 G. W. WAY 2,647,003

DOOR LATCHING AND OPERATING MECHANISM

Filed April 6, 1950 2 Sheets-Sheet 1

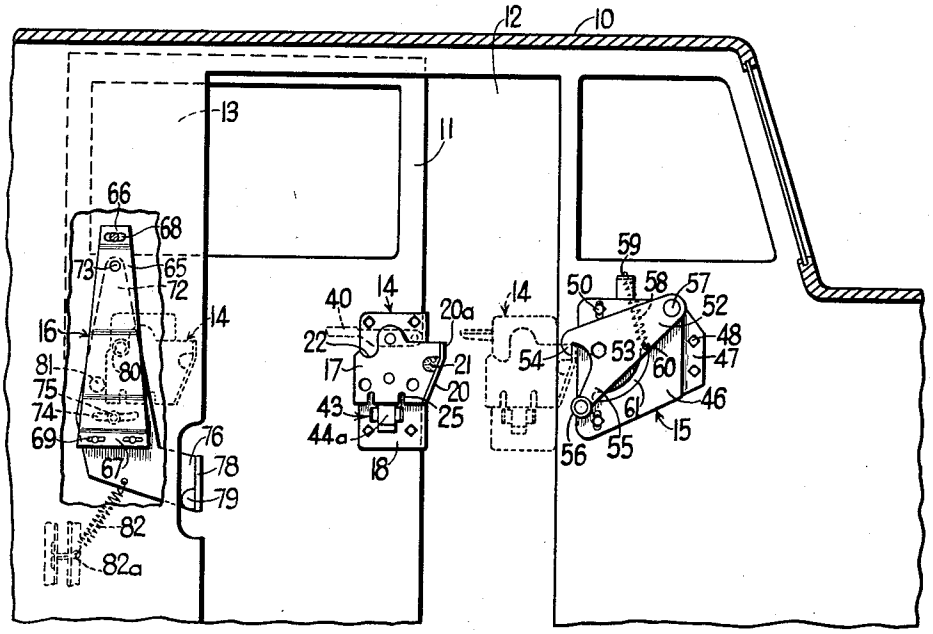


Fig. 1

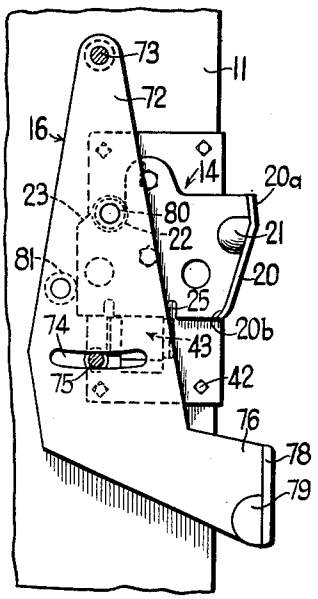


Fig. 2

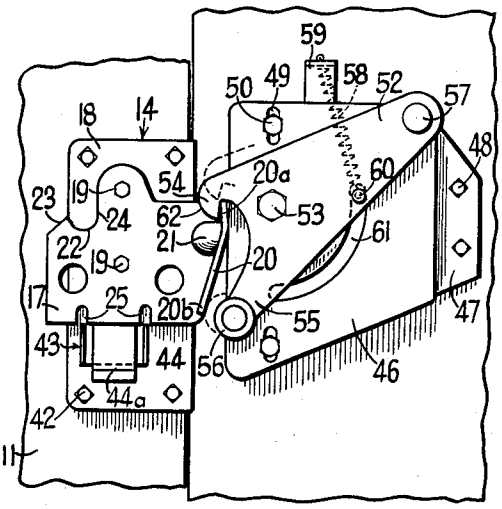


Fig. 3

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DOOR LATCHING AND OPERATING MECHANISM

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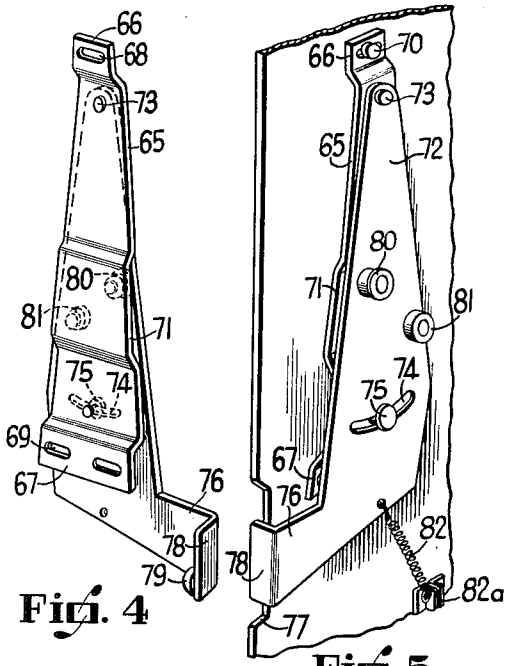


Fig. 4

Fig. 5

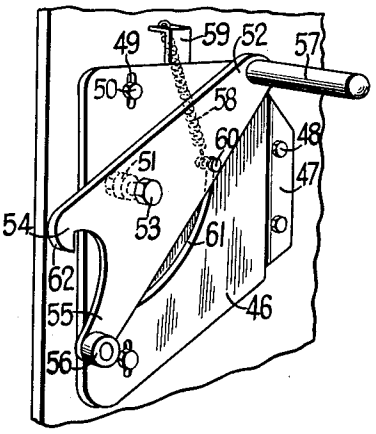


Fig. 6

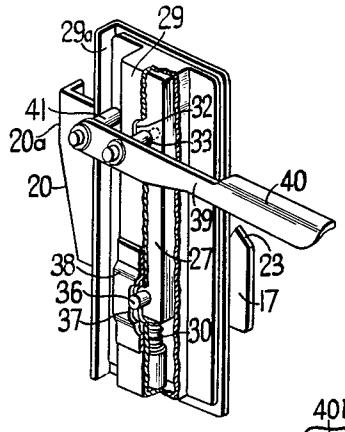


Fig. 7

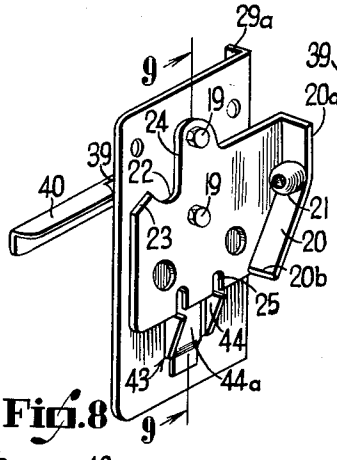


Fig. 8

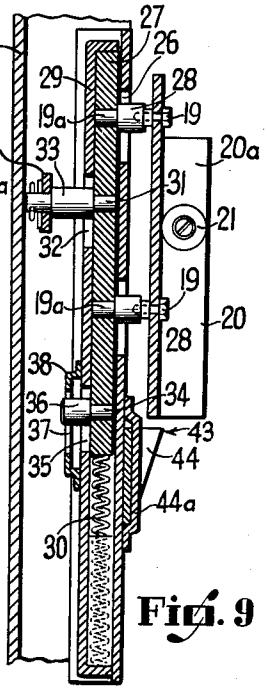


Fig. 9

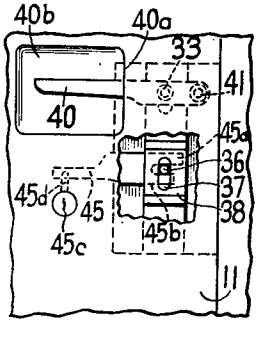


Fig. 10

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Patented July 28, 1953

2,647,003

UNITED STATES PATENT OFFICE

2,647,003

DOOR LATCHING AND OPERATING MECHANISM

Glenn W. Way, Delaware, Ohio

Application April 6, 1950, Serial No. 154,253

2 Claims. (Cl. 292—128)

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My invention relates to door latching and operating mechanism. It has to do, more particularly, with mechanism which is associated with a sliding door, such as the sliding door of a panel delivery truck, which slides between closed position over the door opening and open position in a wall pocket at one side of the opening.

One of the objects of my invention is to provide latching and operating mechanism associated with a sliding door of the type indicated above which is so designed and associated with the sliding door and opening that the door can be moved from closed position to a completely open position, where it is completely within the wall pocket, thereby exposing the entire opening.

Another object of my invention is to provide latching and operating mechanism associated with a door of the type indicated which will serve to latch the door effectively in open position or in closed position.

A further object of my invention is to provide mechanism of the type indicated which can be actuated by the driver from inside or outside the truck body when the door is in open position in the wall pocket, not only to release the door but also to force it from the wall pocket towards closed position.

Still another object of my invention is to provide mechanism of the type indicated which can be actuated by the driver, either from inside or outside the truck body, when the door is in closed position, not only to release the door but to force it into fully opened position.

Another object of my invention is to provide mechanism of the type indicated which is so designed and constructed that it will not interfere with the wall pocket even though the pocket is formed as usual within the double wall of the truck body without increasing the thickness of such wall.

Still another object of my invention is to provide mechanism of the type indicated which is so arranged and is so easy to operate that the driver can release and open the door from inside the truck body with ease even though his arms are full of packages or other articles.

An additional object of my invention is to provide mechanism of the type indicated wherein the various units thereof are so mounted that they can be adjusted to compensate for twists, strains, slippage, et cetera, which normally and naturally occur in truck bodies.

A further object of my invention is to provide mechanism of the type indicated which is rugged and is made of relatively few parts, the parts being of such a nature that they can be produced by relatively cheap stamping operations and can be assembled with ease, thereby providing a low-cost mechanism.

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Various other objects will be apparent.

According to my invention the door of the truck body which slides between closed position over the opening and opened position within the pocket, is provided with a lock assembly on that edge which is the leading edge as it moves into closed position. A latch and door opener assembly is disposed for cooperation with the lock assembly, when the door is in closed position, at the adjacent edge of the opening. A latch and door closer assembly is provided at the opposite edge of the opening within the door-receiving wall pocket but at the outer edge thereof.

The lock assembly includes a keeper which cooperates with either of the latch assemblies when the door is in its closed or opened position. When moved into closed position, the keeper of the lock assembly is automatically engaged by the latch of the associated latch assembly. The keeper of the lock assembly can be moved to release such latch by a handle provided outside the door. The latch can be actuated by a handle inside the truck body not only to release it from the keeper but to produce a camming action on the keeper to force the door into opened position. When the door reaches opened position, completely within the pocket, the keeper of the lock assembly is automatically engaged by the latch of the associated latch assembly. This latch can be actuated by a handle, either from inside or outside the truck body, not only to release it from the keeper but to produce a camming action on the keeper to force the door from the pocket towards closed position.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is an inside view of a sliding truck body door having my mechanism associated therewith.

Figure 2 is an elevational view of the latch and door closer assembly showing the lock assembly associated therewith to latch the door in opened position.

Figure 3 is a similar view of the latch and door opener assembly showing the lock assembly associated therewith to latch the door in closed position.

Figure 4 is an inside perspective view of the latch and door opener assembly.

Figure 5 is an outside perspective view of such assembly.

Figure 6 is an inside perspective view of the latch and door opener assembly.

Figure 7 is an outside perspective view, partly broken away, of the lock assembly.

Figure 8 is an inside perspective view of such assembly.

Figure 9 is a vertical sectional view taken along line 9—9 of Figure 8.

Figure 10 is a side elevational view, partly broken away, of the key-locking mechanism of the lock assembly.

With reference to the drawings, I have illustrated in Figure 1 an application of my door latching and operating mechanism. In this instance, the mechanism is applied to a truck body 10 of the delivery type which has a sliding door 11 at the side thereof which is associated with a door opening 12. In closed position, the door is moved forwardly over the opening 12 and in open position, it is moved rearwardly into a pocket 13 behind the opening which is formed between the inner and outer surfaces of the side wall of the truck body. In Figure 1, I have shown the door in full line position in partially closing relationship to the opening. In dotted line position, I have illustrated the door in opened position.

On the forward edge of the door, I provide the lock assembly illustrated generally by the numeral 14. Adjacent the forward edge of the door opening 12, I provide the latch and door opener assembly illustrated generally by numeral 15. This assembly 15 will cooperate with the assembly 14 when the door is in closed position. At the rear edge of the opening 12 and within the pocket 13, I provide the latch and door closer assembly which is indicated generally by the numeral 16. This assembly 16 will cooperate with the lock assembly 14 when the door is in opened position.

The lock assembly 14 is illustrated best in Figures 1, 3, and 7 to 9. This assembly includes a keeper 17 which is mounted for vertical movement relative to the face plate 18 by means of bolts 19 passing through the keeper. This keeper is provided with a latch-retaining flange 20 at its forward edge which has a vertically disposed latch-engaging portion 20*a* at its upper end and an inclined cam edge 20*b* at its lower end. The flange 20 carries on its inner surface a rubber bumper in the form of a button 21. The keeper is further provided with a latch-retaining notch 22 in its upper edge and with an inclined cam edge 23 between the notch 22 and the rear edge of the keeper. An additional upstanding cam edge 24 is formed on the keeper at the forward side of the notch 22. The lower edge of the keeper is provided with a pair of spaced notches 25, the purpose of which will be apparent hereinafter.

The bolts 19 extend into pins 19*a* which are anchored in the vertically movable slide lock bolt 27 and extend through the vertical slots 26 which are formed in the face plate 18. The pins 19*a* are provided with enlarged portions 28 which engage the edges of the slots 26. A lock case 29 receives the slide bolt 27 and guides its vertical movement. A compression spring 30 is provided in the lower part of the lock case and normally forces the slide bolt 27 upwardly, as shown in Figure 9. The slide bolt 27 carries the slide bolt operating pin 31 which extends from the rear side thereof through a vertical guide slot 32

formed in the rear wall of the lock case 29, the pin 31 also being provided with an enlarged portion 33 which engages the edges of the slot. In addition, at a point spaced below the pin 31, a second pin 34 is provided on the slide bolt 27 and projects rearwardly therefrom through a vertical guide slot in the rear wall of the lock case. This pin 34 is provided with an enlarged portion 36 on its projecting end which cooperates with slot 35 and with an aligning slot 37 formed in the guide member 38 which is welded to the rear wall of the lock case. A handle lever 39 which is normally substantially horizontally disposed is pivoted intermediate its ends to the outer end of the pin 31. The rear end of this lever is provided with a hand-engaging portion 40 and its forward end is pivoted to the outer end of a pin 41 which is anchored to the lock case 29. Pressing downwardly on the hand-engaging portion 40 will swing the lever 39 about pivot pin 41 which, in turn, will move the slide bolt 27 downwardly against the force of spring 30. As soon as lever 39 is released, the spring 30 will return the slide bolt 27 to its uppermost position.

The lock assembly 14 is mounted on the inside face of the door 11 (Figure 1) by means of retaining bolts 42 which are passed through suitable aligning openings in the face plate 18 and lock case 19 of the lock assembly. These bolts will pass through or into aligning openings in the door 11. The case 29 (Figure 7) will be spaced from the door surface by the outwardly turned flange 29*a* so as to provide room for operation of handle lever 39 and movement of pin portion 36. The portion 40 of the handle may extend through a slot 40*a* into a well 40*b* in the outer surface of the door. Consequently, the bolt 27 can be operated by means of handle portion 40 from outside the door. A bolt locking member 43 is mounted for lateral movement directly below the keeper 17 within a retaining clip 44*a* which is welded to the face plate 18. This locking member 43 is provided with outwardly extending vertically disposed flanges 44. Normally, the flanges 44 are in alignment with the notches 25 in the keeper 17, friction being relied upon to hold member 43 in such position. Consequently, vertical movement of the keeper with the slide bolt 27 will normally be permitted. However, when member 43 is moved laterally so that flanges 44 are out of alignment with notches 25, the flanges will engage the lower edge of keeper 17 and prevent downward movement thereof.

To lock the slide bolt 27 and keeper 17 with a key from outside the door, the key-operated mechanism shown in Figure 10 is provided. This is preferably provided on that door which is on the right side of the truck only. It comprises a key-actuated sliding bolt 45 which is mounted for sliding movement transversely of main bolt 27 in the guide member 38. The inner end of member 45 is forked to provide an upper longer finger 45*a* and a lower shorter finger 45*b*. The member 45 is moved back and forth in guide member 38 by means of a rotatable key cylinder 45*c* which has a rocker arm 45*d* that is pivotally connected to the outer end of the slide bolt 45. With member 45 in the position shown in Figure 10, the slide bolt 27 cannot move downwardly because pin portion 36 engages finger 45*b*. However, if the cylinder 45*c* is rotated to move member 45 to the left, finger 45*b* will be moved from beneath portion 36 but finger 45*a* will still

contact therewith. This will permit downward movement of the slide bolt 27 and keeper 17.

The latch assembly 15 which is adjacent the forward edge of the opening 12 is shown best in Figures 1, 3, and 6. It includes a base plate 46 which has an inwardly turned angle flange 47 on its rear edge that is provided with openings for receiving the bolts 48 which are passed into the wall of the truck body. The rear edge of the base plate is provided with vertical slots 49 through which the bolts 50 are passed into the truck body. When base plate 46 is mounted on the truck body (Figure 6) the bolts 50 are first used to secure it in place, it being apparent that spacer sleeves 51 are provided between the wall and the plate 46. The vertical position of the plate 46 can be readily adjusted due to the provision of the slots 49 and the distance of the rear edge of the plate from the wall surface can be varied by using spacers of different size. After the plate 46 is properly positioned, the bolts 48 are inserted to hold it in a fixed position.

Pivoted to the inner face of the base plate 46 is the latch lever 52. This lever is carried by the pivot pin 53 mounted on the plate 46 adjacent its forward edge and intermediate its upper and lower edges. The latch 52 is pivoted towards its rear end and is provided with a projecting latching portion 54 adjacent its rear and upper corner. This portion 54 is adapted to cooperate with the upstanding flange portion 20*a* of the keeper 17. Adjacent its lower and rear corner the latch 52 is provided with a projecting portion 55 which carries a cam roller 56 that is adapted to cooperate with the cam portion 20*b* of the keeper 17. The rear end of the latch lever 52 is provided with a handle 57 which projects inwardly at right angles therefrom. The rear end of the latch lever 52 is normally swung upwardly by means of a spring 58 which is disposed behind the plate 46 and is connected to a spring hanger clip 59 at the upper edge thereof. The lower end of the spring is connected to the latch lever by means of a pin 60 carried by the lever and extending inwardly through an arcuate slot 61 in the plate 46. It will be noted that the outer surface of the latch portion 54 is shaped to provide a curved cam edge 62.

As the door 12 is moved into closed position, the upper edge of the latch-retaining portion 20*a* of keeper 17 will contact the cam edge 62 of latch portion 54 since lever 52 will normally be held in its lowermost position by spring 58. This contact will force the latch portion 54 upwardly until it snaps over the upper end of the latch-retaining portion 20*a* of the keeper 17. The roller 56 will be spaced sufficiently from cam portion 20*b* of the keeper at this time to permit the desired degree of upward movement of the latch lever 52. The door will now be latched in closed position.

To open the door from the inside of the truck, the handle 57 is pushed downwardly either with the hand or the foot. This raises the latch portion 54 from engagement with the retaining portion 20*a* and at the same time swings the roller 56 rearwardly into engagement with the cam portion 20*b* of the keeper 17. This will actually force the door 11 rearwardly and if the handle 57 is depressed in a reasonably brisk manner, it will push the door into completely opened position and latch it in such position. In case the driver is outside the truck body at the time it is desired to open the door, he merely pushes downwardly on the handle lever 39 and will move the keeper 17 downwardly, provided member 43 is in proper position, that is, in unlocking position. Downward movement of the keeper 17 will release the latch portion 54 from retaining portion 20*a* and will again cause cam portion 20*b* to contact roller 56 and open the door, it being understood that pin 60 will contact with the upper end of slot 61 to limit downward movement of roller 56. Handle 39 will not project sufficiently to interfere with movement of the door into the pocket 13.

The latch assembly 16 which is within the pocket 13 and adjacent the rear edge of the door opening 12 is shown best in Figures 1, 2, 4 and 5. It includes a base plate 65 which is of substantially triangular form and which has the inturned angular flanges 66 and 67 at its upper and lower ends. The plate 66 is mounted on the inside wall of the pocket 13, the upper portion 66 being provided with a horizontal slot 68 for this purpose and the lower portion 67 being provided with a pair of horizontal slots 69 for this purpose. Bolts 70 may be passed through these slots into the wall of the pocket and the slots will facilitate adjustment of the plate 65 to properly position the latch assembly relative to the outer edge of the pocket and the rear edge of the door opening. The plate 65 is provided with a flat depressed surface 71 intermediate its upper and lower ends.

Mounted on the inner face of the plate 65 is a latch lever 72. This lever 72 is also of substantially triangular form and is pivoted at its upper smaller end by a pivot pin 73 to the upper end of the plate 65. Adjacent the lower end of the lever 72, it is provided with an arcuate guide slot 74 which receives a pin 75, the pin being anchored to plate 65 and having a head to prevent outward movement of the lower end of lever 72 away from plate 65. The lower end of the lever 72 is provided with a forwardly projecting door closing handle portion 76 which extends to the outer edge of the pocket 13. The edge of the pocket 13 is cut away, as at 77, at both its inner and outer walls to facilitate engagement of the handle portion 76. The handle portion 76 is provided with an inturned flange 78 which carries a bumper in the form of a rubber button 79 on its inner surface adjacent its lower end. Between the pivot pin 73 and the pin 75, the latch lever 72 carries the latch-engaging roller 80 and the door closing roller 81, the former being disposed adjacent the forward edge of lever 72 and the latter being disposed adjacent the rear edge of lever 72, roller 80 being slightly higher than roller 81. The depressed area 71 of plate 65 is provided to receive the ends of the roller supporting shafts, as shown in Figure 4. The lever 72 is retained in its rearwardmost position by means of spring 82 having its upper end anchored thereto and which extends downwardly and rearwardly and is anchored by a clip 82*a* to the wall of the pocket 13.

When the door 11 is moved into the pocket 13 in open position, as the keeper 17 moves into association with the latch assembly 16, the inclined cam edge 23 of the keeper will first engage the roller 80 of latch lever 72. This will move the slide bolt 27 and keeper 17 downwardly slightly permitting the roller 80 to snap into the retaining notch 22 of the keeper. Rearward movement of the latch lever 72 will be limited by contact of bumper button 79 with the edge of

the cut away portion 71. The door will move completely into the pocket, as indicated in Figure 1.

The door can now be opened from either inside the truck body or outside the truck body merely by pulling forwardly on the handle portion 76. This will swing the lever 72 forwardly and upwardly causing the roller 81 to push on the rear edge of keeper 17 and the roller 80 to engage the cam edge 24 thereof, the latter engagement causing keeper 17 to move downwardly against the force of spring 30 and to release the roller 80 from the retaining notch 22 of the keeper. This not only releases the latching roller from the keeper but also forces the door outwardly from the pocket towards closed position.

It will be apparent from the above description that my mechanism is so designed that the door can be moved completely into the pocket but can be started in its movement therefrom merely by operating the handle 76. The assembly 16 is made of flat members so that it will not be necessary to increase the wall thickness of the truck body to provide a suitable door pocket. The base plate 65 can be adjusted on the wall to compensate for irregularities in the wall structure. The assembly 16 will not only serve to latch the door effectively in open position but also will serve to start its closing movement, moving it sufficiently from the pocket 13 to be engaged by the driver.

The latch assembly 15 will serve to latch the door in closed position but can be operated to release the latch and simultaneously move the door into completely opened position. The plate 46 thereof can be adjustably mounted on the wall of the truck body so as to compensate for irregularities thereof. The latch unit 15 can be released so easily by engaging the handle 57 that this can be accomplished by the driver even if his hands are full merely by pressing on handle 57 with his foot.

The lock assembly 14 can be locked with a key when the door is closed and when unlocked can be actuated by the handle 39 to release the latch so that the door can be opened from outside the truck body.

Having thus described my invention, what I claim is:

1. A latch assembly for normally holding a slidable door in closed position but operable to start the door sliding towards open position comprising a flat base plate adjustably fastened to a support adjacent the path of sliding movement of the door, a latch lever of substantially triangular form pivoted adjacent its outer edge to said plate for vertical swinging movement, said latch lever having an outwardly projecting latch portion at its upper and outer corner which has a curved outer cam edge, a cam roller mounted on the lever at its lower and outer corner, a handle on the inner end of said latch lever, a spring connected to the inner end of said lever and to said support for normally swinging it upwardly, said spring being connected to the lever by means of a pin carried thereby which extends in an arcuate slot in the base plate, said cam edge of the latch engaging a latch-retaining portion on a keeper carried by the door as the door slides into closed position to force the latch portion upwardly until it snaps over said latch-retaining portion, to latch the door in closed position, said keeper being carried on the inside of the door and the latch assembly being in substantially the same vertical plane inside the path of movement of the door, said latch lever being operable by said handle from inside the door, movement of the handle downwardly raising the latch portion of the lever to release it from said latch-retaining portion and swinging said roller outwardly into engagement with a cam portion carried by the keeper so as to force the door to initiate its sliding movement towards open position, said keeper being mounted for downward movement so that the latch portion will be released thereby from the latch-retaining portion of the keeper and the said cam portion of the keeper will be engaged by said roller, and a handle on the outside of the door and connected to said keeper for moving it downwardly when desired.

2. A latch assembly for normally holding a slidable door in closed position but operable to start the door sliding towards open position comprising a latch lever pivoted to a support adjacent the path of sliding movement of the door for vertical swinging movement, said lever being pivoted intermediate its inner and outer edges and having an outwardly projecting latch portion and a cam roller at its outer edge below said latch portion, a handle at the inner edge of said latch, said latch portion engaging a latch-retaining portion on a keeper carried by the door as the door slides into closed position to latch the door in closed position, movement of the handle downwardly raising the latch portion of the lever to release it from said latch-retaining portion and swinging said roller outwardly into engagement with the keeper so as to force the door to initiate its sliding movement towards open position, said keeper being carried on the inside of the door and the latch assembly being in substantially the same vertical plane inside the path of movement of the door, said latch lever being operable by said handle from inside the door, said keeper being mounted for downward movement so that the latch portion will be released thereby from the latch-retaining portion of the keeper and the keeper will be engaged by said cam roller, and a handle on the outside of the door and connected to said keeper for moving it downwardly when desired.

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