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3,347,580

LATCH FOR SECURING A TRUCK DOOR

Filed Oct. 21, 1965

2 Sheets-Sheet 1

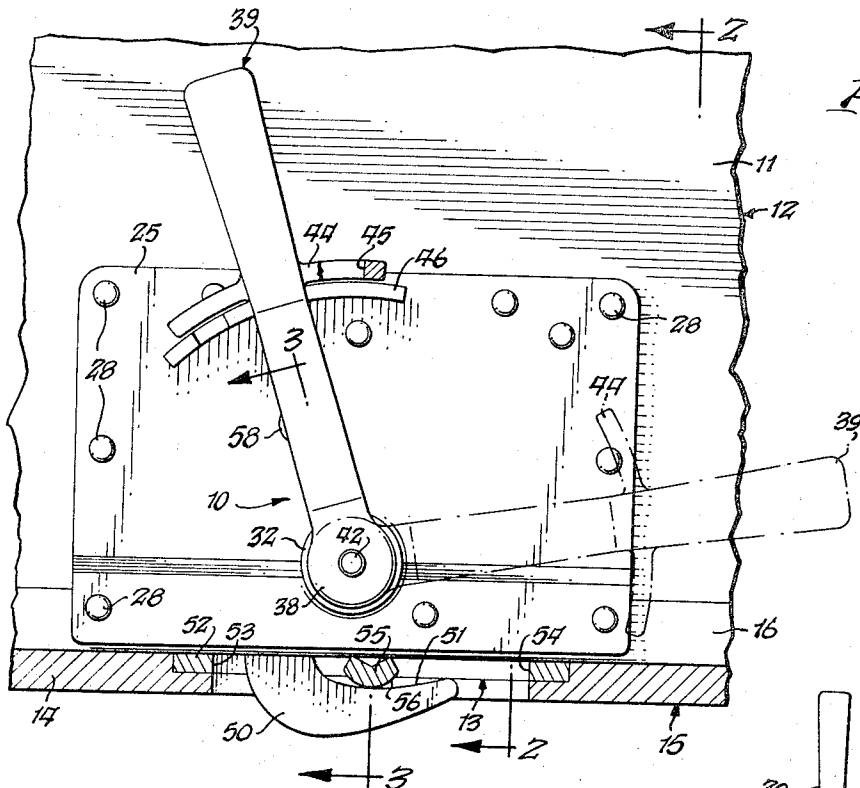


Fig. 1.

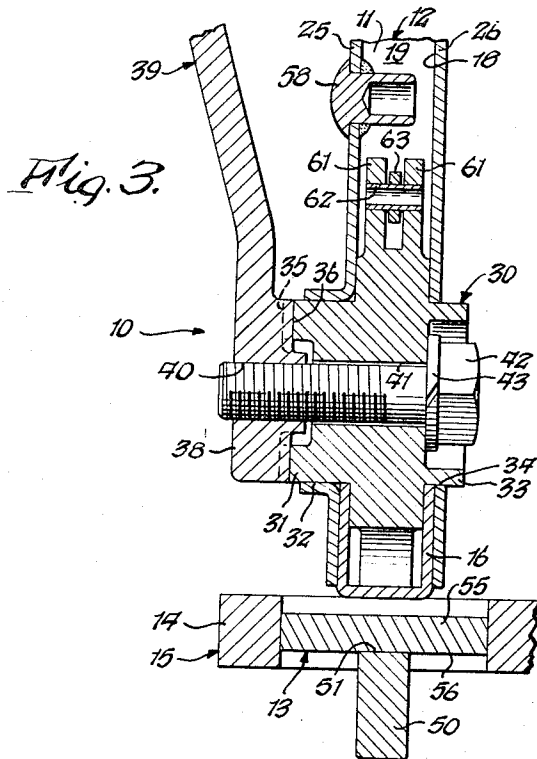


Fig. 3.

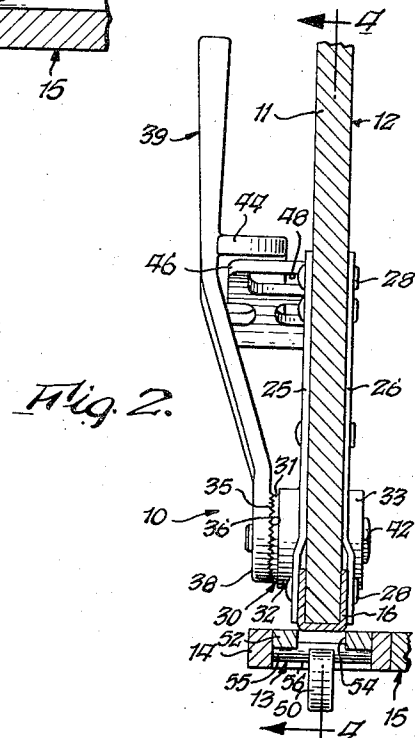


Fig. 2.

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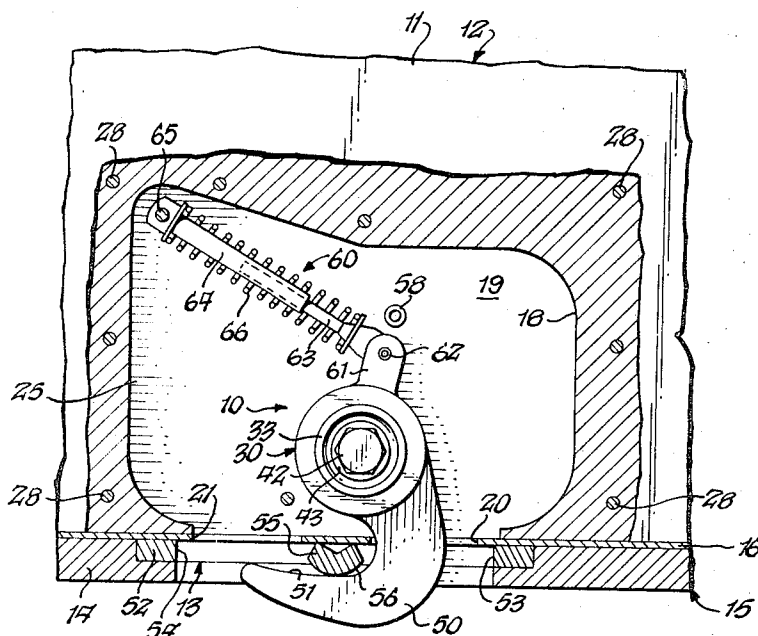


Fig. 4.

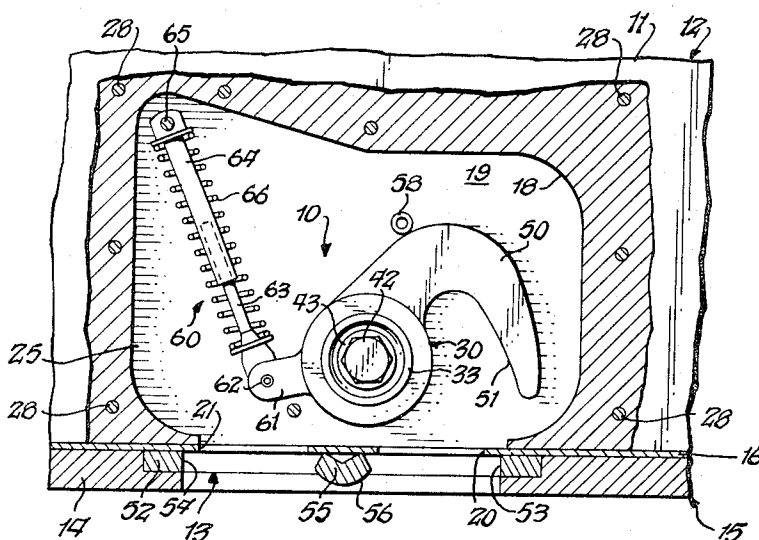


Fig. 5.

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LATCH FOR SECURING A TRUCK DOOR

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ABSTRACT OF THE DISCLOSURE

The latch is at the bottom of the vertically moving rear door of a truck and comprises a C-shaped or hook-shaped cam latch on the door bottom swinging about a horizontal axis to engage a catch on the sill. In use, an over-dead-center spring is effective not only to follow the C-shaped latch to its inoperative position and hold it there, but also to bias the closed latch and cause it to exert a spring force against the catch lengthwise of the operative stretch of the camming surface of the latch so that the usual vibration and jars of the truck operate to tighten the closed latch.

This invention relates to a latch for securing a truck door and more particularly to a latch for securing the lower section of a counterbalanced sectional sliding door to the sill of the truck platform. Such a counterbalanced sectional door and sill is illustrated in detail in my prior Patent No. 2,786,712 dated Mar. 27, 1957, for Counterbalanced Door for Cargo Carrying Vehicle and to which reference is made for a more complete disclosure of the details of the door and truck body.

One of the principal objects of the present invention is to provide a simple and inexpensive latch for such a truck door which is easily opened and easily closed and which is spring biased so as to hold itself in either of these conditions.

Another object is to provide such a latch having a cam surface between the latch and the catch and in which the catch is biased so as to urge its cam face into tighter engagement with the catch, thereby to provide increased latching pressure in response to truck vibrations. This spring biasing is augmented by the weight of the operating handle.

Another object of the invention is to accomplish such cam action, as well as yieldingly holding the latch in fully opened or fully closed position, by the same spring means, the spring traveling beyond the dead center for this purpose.

In the drawings,

FIG. 1 is a fragmentary external elevational view of a truck door, with parts broken away, equipped with a latch mechanism embodying the present invention.

FIG. 2 is a fragmentary vertical section taken generally on line 2-2, FIG. 1.

FIG. 3 is an enlarged fragmentary vertical section taken generally on line 3-3, FIG. 1.

FIG. 4 is a fragmentary vertical section taken on line 4-4, FIG. 2 showing the latch mechanism latched.

FIG. 5 is a view similar to FIG. 4, showing the latch mechanism unlatched.

While the latch forming the subject of the present invention can be used in different locations, it is shown as comprising a manually operable latch mechanism 10 mounted on the lower section 11 of a vertically movable sectional truck door 12 and as adapted to mate with a catch 13 mounted on the sill 14 which forms the rear end of the platform 15 of the truck.

The lower section 11 of the door is shown as being in the form of a wooden panel and having a channel bar 16 secured to and protecting its lower edge, and at the center this lower section is shown as having a bottom

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rectangular opening 18 forming an operating chamber 19 to receive the latch mechanism 10, the bottom channel bar 16 having a pair of openings 20, 21 along its bottom through which the latch of the latch mechanism 10 works as hereafter described.

The opening 18 is closed on its front and rear sides by outside and inside attachment plates 25, 26 which are riveted together, as indicated at 28, through the portions of the lower door section 11 surrounding the opening 18 and which form the supporting plates for the latch mechanism 10.

A rotor 30 of the latch mechanism 10 is journaled at its opposite ends in the front and rear supporting plates 25 and 26 near the lower center thereof. To this end, this rotor is provided with an outside hub 31 journaled in a circulator bearing collar 32 struck outwardly from the outside supporting plate 25 and with an inside hub 33 journaled in the rim of a circular hole 34 in the inside supporting plate 26. The outside hub 31 of the rotor 30 is radially knurled, as indicated at 35, and fitted thereagainst is the inside radially knurled face 36 of the hub 38 of an operating handle 39. This hub 38 is provided with a coaxial threaded opening 40 alining with a concentric bore 41 through the rotor 30 and the handle 39 is fixed to this rotor by a bolt 42 having its head seated through a washer 43 against the inside hub 33 and its threaded end anchored in the threaded bore 40 in the hub 38 of handle 39.

For sealing purposes, the handle 39 can have a segment extension 44 on its side toward the outside plate 25 which is concentric with its hub 38 and provided with a transverse hold 45. The outside plate 25 can be provided with a mating segment extension 46 having a hole 48 which comes into register with the hole 45 when the handle 39 is in the closed position of the latch, at which time a conventional metal seal (not shown) can be looped and attached through the holes 45 and 48 and which seal must be broken to unlatch the door, thereby to signal any unauthorized tampering.

The rotor 30 is provided with a C-shaped latch 50 preferably integral therewith and projecting downwardly and outwardly through the hole 20 in the metal channel 16 forming the protective bottom for the bottom section 11 of the truck door. This latch is provided with a curved cam face 51 which opposes the rotor 30 but is not concentric therewith but the slopes of which are tangential to circles concentric with the rotor 30 so as to draw the rotor 30 and truck door 12 toward the sill 14 when the handle 39 is moved to the extreme of its latching position, as hereinafter described.

This drawing movement is against the catch 13 fixed to the sill 14. This catch 13 is in the form of a metal plate 52 having a rectangular central opening divided into two halves 53 and 54 by a central bridge piece 55 the bottom face 56 of which is in the form of a segment of a cylinder to form a strike face engageable with the cam face 51 of the latch 50.

This strike face 56 of the bridge piece 55 forms the stop for the latch 50 and handle 39 in its closing movement, the handle being at about the 11:00 o'clock position when closed, as viewed from the outside of the door. The opening movement of these parts is limited by a stud or pin 58 secured to the inside face of the outside plate 25 in the path of the latch 50 to limit its withdrawal movement from the catch 13.

The feature of the invention resides in the inclusion of a spring means 60 between the latch 50 and supporting plates 25 and 26 and which swings beyond dead center so that in the closed position of the latch 50, this spring means urging the cam face 51 of the latch 50 into tighter engagement with the strike face 56 of the catch 13 (thereby to tighten the latching effect in response to

truck frame vibrations) and urging (in the unlatched position) the latch 50 upwardly into the door chamber 19 so as not to interfere with the free opening and closing of the unlatched door.

To attach such spring means to the rotor 30 it is provided, on its side remote from the cam face 51, with a pair of ears 61 carrying a pivot pin 62 arranged parallel with its axis of rotation. One end of a telescopic member 63 is pivotally connected to this pin and the free end of which mates with a companion telescopic member 64. The remote end of this telescopic member 64 pivotally connects with a pin 65 projecting from the inside face of the outside plate 25 and on a line intersecting the axis of rotation of the rotor 30 and the entering hole 53 of the catch plate 52. A helical spring 66 surrounds the telescopic members 63 and 64 and is compressively interposed between the ears 61 on the rotor 30 and the pin 65 at the opposite end of these telescopic members.

Assuming the latch to be fully opened, the handle 39 is at about the 3:00 o'clock position as viewed from the outside of the truck; the latch 50 is fully retracted into the space 19 between the attaching plates 25 and 26; the latch 50 is against the stop pin 58; and it is urged against this stop pin by the helical compression spring 66 which, on this side of dead center with reference to the rotor 30, biases the latch 50 upwardly against this stop 58. Accordingly both the weight of the handle 39 and the pressure of the helical compression spring 66 tends to hold the latch 55 up in between the attaching plates 25, 26, against the stop pin 58 and hence in a position where it cannot catch on or interfere with anything.

With the door closed, the bottom channel 16 is in contact with the sill 14 and its two holes 20 and 21 in line with the holes 53 and 54 of the catch 13. Upon now swinging the handle 39 upwardly, the C-shaped latch 50 is projected downwardly through the holes 20 and 53 of the door bottom channel 16 and catch 13 and then horizontally under the bridge piece 55 of the catch 13. Continued latching movement brings its cam face 51 into engagement with the strike face 56 of this catch 13, the free end of the latch 50 being capable of entering upwardly into the catch opening 54. The relation of the cam face 51 to the axis of its rotor 30 is such that such closing movement of the latch tends to tighten its cam face 51 against the strike face 56 and this tightening is augmented by the helical compression spring 66. This is due to the fact that this helical compression spring 66 (being prevented from bending sideways by the telescopic members 63 and 64) passes beyond dead center with reference to the axis of oscillation of the rotor 30 so that instead of holding the latch up, when its cam face 51 engages the strike face 56, the helical compression spring 66 urges the latch 50 in the opposite direction to tighten

its cam face 51 against the strike face 56. Accordingly body vibrations of the truck tend to tighten the closed latch.

I claim:

1. A latch for securing a truck door to its sill, comprising a rotor, a handle fixed to said rotor, means including an attaching plate interposed between said latch and handle for journalling said rotor on said truck door to swing about an axis generally perpendicular thereto and adjacent said sill when the door is closed, a C-shaped latch fixed at one end to said rotor and having a cam face opposing said rotor, a catch fixed to said sill and having a strike face positioned to engage said cam face, said cam face being arranged to draw said rotor toward said catch when said handle is turned to tighten the engagement between said cam face and strike face, and spring means connected at one end to said rotor at a place remote from its axis and adapted to be connected at its other end to said attaching plate, said spring means traveling beyond dead center and in the engaged position of said cam and strike faces biasing said rotor to urge said cam face into firmer engagement with said strike face, whereby latching pressure is increased in response to truck vibrations, and in the opposite extreme position of said rotor biasing it to hold said latch away from said catch, said spring means comprising a first telescopic member, means pivotally attaching said first telescopic member to said rotor, a companion second telescopic member, means pivotally attaching said second telescopic member to said attaching plate, and a helical compression spring surrounding said telescopic members and compressively interposed between both of said pivotally attaching means.

2. The combination set forth in claim 1 wherein said door is provided with an opening forming an operating chamber containing said rotor, latch, and spring means closed on the outside of said door by said attaching plate and wherein a second attaching plate closes said operating chamber on the inside of said door and rotatably supports the corresponding end of said hub.

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