

C. W. OSNER ET AL
CUSHIONING LOCK FOR SLIDING DOOR

2 Sheets-Sheet 1

Fig.1

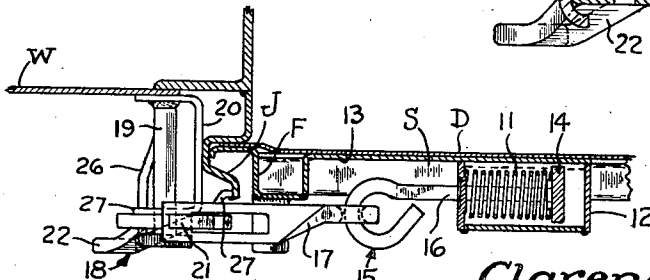


Fig. 2

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2 Sheets-Sheet 2

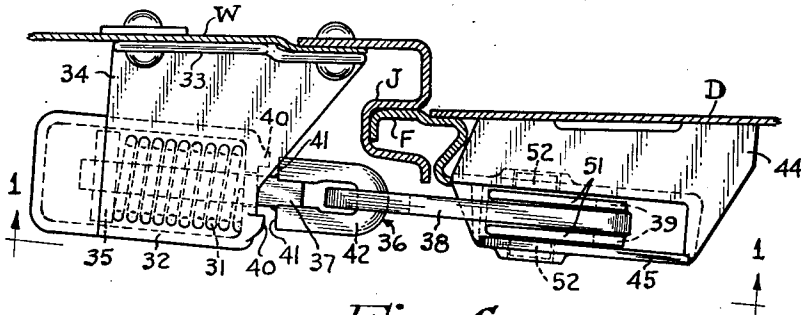


Fig. 6

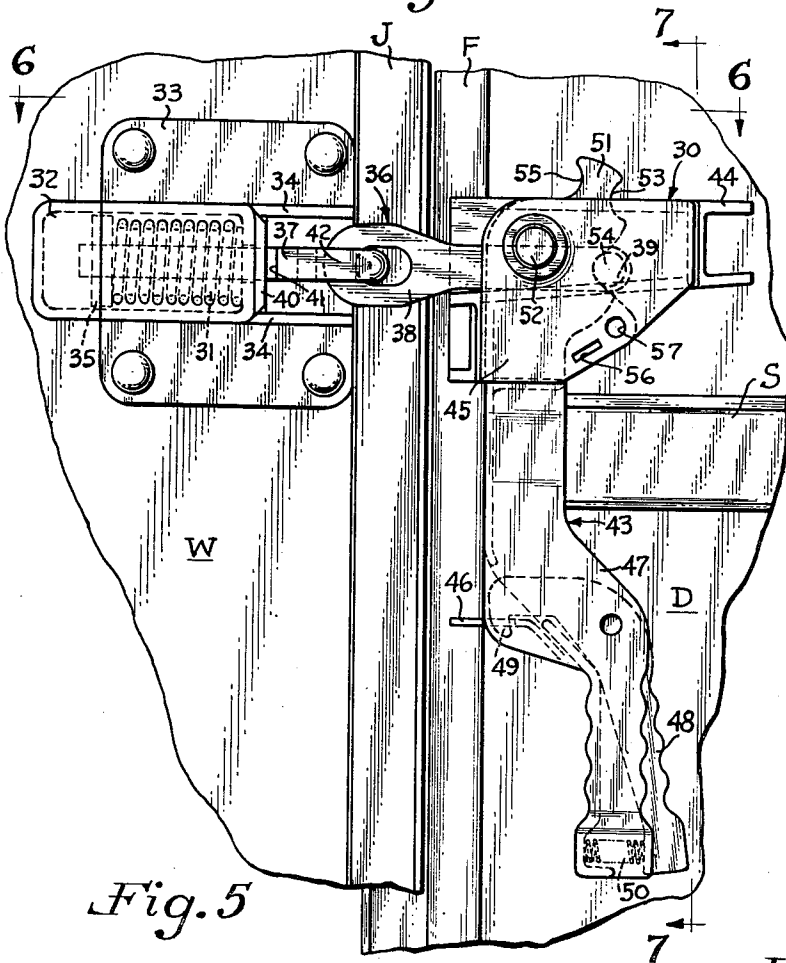


Fig. 5

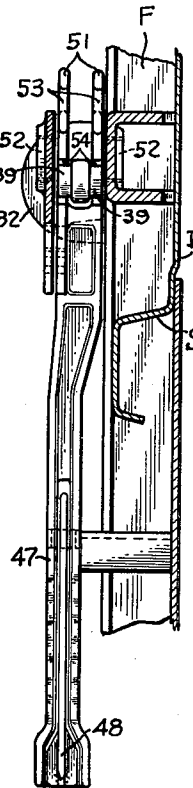


Fig. 7

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CUSHIONING LOCK FOR SLIDING DOOR

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7 Claims. (Cl. 292-101)

The present invention relates to a cushioned lock construction primarily for sliding doors of railway cars and the like, and more particularly to such a lock for resiliently holding a sliding door fully closed.

The invention is illustrated by way of example as embodied in two forms of a lock for railway box car side doors, in each case comprising essentially a lever pivoted on one of the relatively movable members represented by the door and the car side, a spring (or spring group) mounted on the other of such members, a hasp of two linked parts of which one is connected to the spring and the other is engageable with and disengageable from the lever, and abutment means on the same one of said members as the spring. To close the door, the lever is engaged with the hasp and swung in a direction to draw the members together, the spring yieldingly resisting the resultant hasp movement and being stressed thereby. Latch means are provided to hold the lever in a locking position corresponding to the fully closed position of the door and prevent any possibility of return movement of the lever under the action of the spring. When the door is to be opened, the lever is released and swung in the direction opposite to its door closing movement so that it may be disengaged from the hasp, the spring being returned to its original condition by this reverse movement. Another pivotal movement of the lever then effects application of door-opening force against the abutment means for separating the members.

In one illustrated form of the lock, the lever is formed with a hook portion to engage in a slot or eye of the hasp for closing the door upon pivoting in one direction, and bears directly against the abutment means to separate the members upon another pivotal movement in the same direction.

In the other form illustrated, the lever is bifurcated to receive the hasp and is notched on its opposite sides for engagement with lugs on the hasp upon pivotal movements in opposite directions, movement in one direction closing the door and in the other projections on the hasp engage abutments formed on the spring housing to open the door. In this form, also, the lock parts are shown as disposed in a plane extending at an angle to the plane of movement of the door so that the door is biased laterally inwardly relative to the car side wall for secure closure.

Locks for sliding doors of railway cars commonly do not prevent all play of the door in closed position, largely because such doors ordinarily must be mounted with a relatively loose fit to move without binding and with a minimum of effort. This is particularly true in the case of large and heavy doors subject to hard usage, as for example box car doors, requiring correspondingly massive locks which do not lend themselves to close tolerances. Variations in the dimensions of the parts, or in the application and assembly thereof, wear or damage of parts, and vibration as in railway cars, will result in such a degree of play of the door that it can move to a partly

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open position. While such opening of the door is undesirable enough in itself, it has the further disadvantage that the lock and other parts are subjected to sharp strains and blows by alternate opening and closing movements of the door, and may be broken if the door is moved with sufficient force, as by a particularly severe shock to a box car.

The cushioned lock of this invention permits resilient yielding for limited opening of the door, in locked condition, under severe shocks without the imposition of such strains on the lock parts as to cause breakage, while at the same time holding the door against opening due to minor shocks, jars, and vibration, or at most permitting only slight opening movement and immediately acting to draw the door back to closed position. The lock structure serves as a door starter or opener in addition to its functions as a door closer and lock. The operating lever at the end of its door-closing movement is held in locking position by latch means so that accidental unlocking is prevented. If due to variations of the car or lock parts the full closing movement of the lever does not cause complete closing of the door, the spring arrangement acts to draw the door to fully closed position. The resilient construction prevents or greatly minimizes movement and rattling of the door in closed position, particularly when the angled arrangement of the lock relative to the door plane is employed to bias the door laterally. The lever is readily releasable from the spring action for operation to open the door, the disengagement from the hasp being aided by the spring action itself. In the second form mentioned, the lever and hasp cooperate to apply the door-opening force to the abutment means. The lock of this invention thus provides not only for secure locking of the door but for easy opening and closing, assures a close sealing engagement of the door with the car side, and by its resiliently yieldable construction, lengthens the life of the door and prevents breakage of parts.

It is an object of the present invention to provide a lock construction for a sliding door or the like which resiliently holds the door in closed position.

It is another object to provide a cushioned lock for a sliding railway car door or the like which absorbs and minimizes jarring and vibration of the door in service.

Another object is the provision of a cushioning lock for a sliding railway car door or the like which substantially prevents breakage of parts.

Another object is the provision of a resilient lock construction for a sliding railway car door or the like which holds the door securely closed against the action of normal forces encountered in service but yields to allow limited opening of the door under the action of abnormal forces.

Another object is the provision of a lock for a sliding railway car door or the like which has a resilient construction to compensate for the effects of wear, vibration, and variations in the manufacture and application of parts and assure complete closing of the door.

Another object is the provision of a resilient lock construction for a sliding railway car door or the like which biases the door laterally relative to the door casing to effect a close seal therebetween.

It is another object to provide a cushioned lock device for a sliding railway car door or the like effecting ready opening, closing, and locking of the door.

Another object is the provision of a lock for a sliding railway car door or the like which affords a resiliently stressed connection between the car and door in closing and locking of the door and is operable to release the connection and open the door.

Other and further objects, advantages, and features of the invention will be apparent to those skilled in the art

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from the following description, in conjunction with the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevation of a railway box car showing one form of the invention applied to the sliding door;

Fig. 2 is a horizontal sectional view taken substantially as indicated by the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is another horizontal sectional view taken substantially as indicated by the line 4—4 of Fig. 1;

Fig. 5 is an elevational view similar to Fig. 1 but showing another form of the invention;

Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 5 and showing the lock in plan; and

Fig. 7 is a vertical sectional view taken on the line 7—7 of Fig. 5.

Referring first to Figs. 1 to 4 of the drawings, there is shown a box car side wall W with a door opening having a front door stop or jamb J of the usual channeled form to receive the front stile F of a sliding door D having the horizontal stiffeners S, which may be corrugations formed in the door sheets or channel members secured to the door. One form of the lock, generally designated 10, is secured to the wall W and door D. The lock comprises a pair of compression springs 11 disposed in parallel horizontal relation within a housing 12 secured to the door D over a reinforcing plate 13, in spaced relation to the stile F. The springs are compressible between the front wall of the housing and a follower plate 14 movably disposed in the housing. A hasp 15 is provided, comprising a hasp part 16 secured to the follower plate 14 and extending between the springs 11 to project through a suitable aperture in the front wall of the spring housing, and a link part 17 swingably connected to the part 16 by a loop or eye formed on the outer end of the hasp part. The free end of the link part 17 is formed with a slot in which the operating lever 18 may engage for closing and locking the door.

The lever 18 is mounted on a pivot 19 secured on the wall W adjacent the jamb J by a U-shaped bracket 20 welded to the wall and jamb somewhat below the level of the hasp part 16. One leg of the bracket lies against the wall W and the other is disposed slightly outwardly of the jamb J, and the pivot 19 projects through the outer leg with the lever 18 rotatably secured on its projecting portion. The lever is thus spaced outwardly from the car wall and located more or less in the plane of the spring housing 12 and hasp 15, the door D being disposed laterally outwardly of the wall in the usual manner. The upper portion of the lever terminates in a hook-like formation 21 directed forwardly, or away from the door, for engaging in the slot provided in the hasp link part 17. The lower portion of the lever is formed as a handle 22 which is offset forwardly and outwardly so that it may be conveniently grasped and manipulated. The rear edge of the handle portion is convexly curved as shown at 23 and adapted to engage with a stud or boss 24 welded to the door stile F for shifting the door from its closed position. A retainer or latch 25 for the lever 18 is fixed on the side wall and door jamb, comprising a plate 26 extending outwardly from the wall W beyond the plane of the handle portion 22 and having its outer edge bent to provide a rearwardly directed lip, and a brace plate 27, disposed inwardly of the plane of the lever handle and extending between and welded to the jamb J and the stop plate 26. The lever 18 has a certain amount of play on the pivot 19 so that it may be shifted or swung laterally inwardly or outwardly of the lip of stop plate 26, which holds the lever against clockwise rotation, as viewed in Fig. 1, when the lever is positioned adjacent the brace plate 27 and engaging the stop plate 26. A pair of corresponding apertures 28, one in the lever handle 22 and the other in the brace plate 27, are provided for the reception of a seal (not shown).

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The door D is shown in locked condition, with the lock 10 in locking position, the springs 11 being partially compressed and tending to turn the lever 18 clockwise, against which movement it is held by the latch 25. The door may be opened for authorized access to its interior by removing the seal, swinging the operating lever 18 counter-clockwise and outwardly to clear the lip of the stop plate 26, and then swinging the lever clockwise past the latch 25 to relieve the springs 11 and permit the link part 17 of the hasp 15 to be disengaged from the hook 21. The lever is then again pivoted counter-clockwise past the latch so that the convex portion 23 of its rear edge bears on the boss 24. Pressure on the lever handle 22 now causes the door to move rearwardly to a partly open position, after which it may readily be opened completely. To close the door, it is first moved manually or otherwise to as fully closed position as is conveniently possible, usually to within a short distance of the jamb J. The link part 17 of the hasp is raised and the lever 18 pivoted clockwise so that the hook 21 may be engaged therewith as previously explained, and the lever is then pivoted counter-clockwise, partially compressing the springs 11 and by reason of the mechanical advantage it affords drawing the door D to fully closed position with the front stile F engaged in the jamb. In this movement, the handle 22 is moved outwardly of and slightly past the latch 25, then inwardly and clockwise to bear against the stop plate 26. A seal may then be passed through the apertures 28 in the usual manner. The characteristics of the springs 11 are such that they go solid before the hasp 15 can be moved forwardly a sufficient distance to be disengaged from the hook 21 of the lever 18 in its locking position. By the same token, the door cannot be forced open against the resistance of the springs a distance sufficient to permit entry into the car. Thus unauthorized access to the interior of the car is impossible without breaking the seal or otherwise leaving evidence of such act. If for any reason, such as improper application of the car or lock parts, the stile F would not be fully engaged in the jamb J upon pivotal closing movement of the lever as far as it can swing, or in other words if even with the springs 11 solid the door would not be fully closed, the springs 11 will complete the closing of the door by means of the energy stored in them by compression. In the same way, if the door D is partially opened by the effect of a shock or jar to the car, it is brought back to closed position by the springs. Shocks to the lock parts as well as to the door and jamb in both such opening and closing of the door are absorbed and cushioned at least to a large degree by the springs, so that damage to the parts is substantially prevented. Furthermore, the compressed springs constantly urge the door to closed position, that is, into close engagement with the jamb, to minimize the effects of jarring and vibration and thus maintain a tight seal. The springs 11 are preferably placed under initial compression in the housing 12 so as to hold the hasp part 16 against any substantial movement when the lock is released.

In Figs. 5 to 7, another form of the lock is shown, generally designated 30, and comprising a single spring 31 in a housing 32 secured in spaced relation to the wall W by a bracket having a base 33 riveted or otherwise secured to the wall and projections 34 extending outwardly beyond the plane of the door D and welded to the housing. The housing is generally cylindrical for accommodating the spring 31 conveniently, but has its laterally inward side of flattened configuration to prevent rotation of a spring follower plate 35 disposed therein and conforming to its interior in shape. The spring extends between the rear wall of the housing and the follower plate so that it may be compressed by rearward movement of a hasp 36 having a hasp part 37 extending through the spring secured to the follower plate 35 and projecting through the rear wall of the housing, and a link part 38 having an eye at one end by which it is

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movably connected to the hasp part 37 and having at its other end a pair of lugs 39 projecting transversely from its opposite sides. The outer face of the housing rear wall is formed with a pair of abutments 40 between which the hasp part 37 passes and which are engageable by a pair of forwardly directed projections 41 provided by ends of a U-shaped member 42 forming an eye on the rear end of hasp part 37 linked with the eye of the link part 38. Both eyes are elongated to provide for a certain amount of play or lost motion between the two parts of the hasp 36.

The spring 31 is under sufficient initial compression to hold the projections 41 against the abutments 40 in released or open position of the lock. An operating lever 43, of generally channel form with a web at its forward edge and flanges extending rearwardly therefrom, is pivotally mounted on the door D in substantially the same vertical plane as the hasp part 37, at an inward and forward angle relative to the door and the side wall W. The mounting of the lever is by means of an outwardly extending bracket 44 having a channel portion the flanges or legs of which are welded to the door and the web of which serves as the inner of a pair of parallel vertical supporting plates between which the lever extends. The outer supporting plate 45, extending downwardly below the bracket web or inner support plate, is welded to outward projections at the front and rear of the bracket, the front projection being below the level of the hasp part 36. Below the bracket 44, a keeper 46 in the form of a suitably shaped plate is welded to the door and front stile projecting outwardly with its rear portion preferably bent downwardly. The lower part of the lever 43 provides a handle 47 which is offset rearwardly and outwardly and has an L-shaped latch 48 pivoted within the channel thereof, between the flange portions. One arm of the latch extends forwardly through an aperture in the handle web and has a hook 49 on its end which rides over the rear keeper portion to engage the keeper upon clockwise pivotal movement of the lever to the locking position as shown in Fig. 5, and thus prevents reverse movement of the lever. The outer arm of the latch 48 extends downwardly and is biased rearwardly out of the handle by a spring 50, so that the hook 49 is urged downwardly for secure engagement with the keeper 46. The depending arm of the latch thus must be swung into the handle 47 against the action of the spring in order that the latch may be released to allow counter-clockwise swinging of the lever. This may readily be done by merely grasping the handle and the downwardly and rearwardly projecting latch arm, as is obvious.

The upper portion of the lever 43 is bifurcated to provide a pair of parallel ear portions 51 between which the link part 38 of the hasp may be received, and which have transversely aligned pivot lugs 52 each rotatably disposed in an apertured boss on the respectively adjacent supporting plate. The lever may thus swing between the front and rear projections of bracket 44 to which the outer support plate 45 is secured. The ear portions 51 extend rearwardly of the pivot lugs 52 in the vertical position of the lever and have upward extensions offset rearwardly of the pivots, on the rear edges of which are formed transversely aligned notches 53 for receiving the lugs 39 of the hasp link part 38, and similar notches 54 are formed in the rear edges, below the pivot axis of the lever. The radial spacing of the upper notches 53 from the pivotal center of the lever is greater than that of the notches 54. The forward edges of the upper extensions are formed with notches 55 also adapted for engagement with the link part lugs 39, but directed oppositely to the notches 53. The lever 43 and hasp 36 may thus be manipulated to dispose the link part 38 between the ear portions 51 with the lugs 39 engaged in notches 53 or 54 for link movement away from the spring housing 32 upon clockwise pivotal movement of the lever as viewed in Fig. 5, or to engage the lugs 39 in notches 55 for

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opposite movement upon counter-clockwise pivoting of the lever. The laterally outer of the ear portions 51 extends downwardly adjacent the lower part of the outer support plate 45, and the plate and ear portion are provided with a pair of corresponding seal-receiving apertures 56. A pair of lock-receiving apertures 57, as for a padlock or the like, may similarly be provided.

The operation of the lock 30 is generally similar to that of the lock 10 previously described. The lock 30 is shown in locking position holding the door D fully closed with the front stile F closely engaged in the jamb J of the wall W. The spring 31 is partially compressed, tending to draw the hasp 36 to the left as viewed in Figs. 5 and 6, and to hold the lever 43 in the locking position due to application of the spring force below the pivot axis by engagement of the link part lugs 39 in the notches 54. The latch 48 is engaged with the keeper 46. To open the door, after removal of any seal or lock which may have been applied, the handle 47 and the depending latch arm are grasped to swing the latch out of engagement with the keeper and free the lever, which is then swung counter-clockwise so that spring 31 draws the projections 41 of hasp part 37 against the abutments 40, and the lugs 39 and notches 54 are brought to a loosely engaged position above the pivots. The link part 38 of the hasp then may be moved to swing the lugs 39 forwardly past the extensions of the lever ear portions 51, thus disengaging the lever from the hasp so that the door may be moved away from the jamb. The link part and lever are then manipulated to engage the lugs in the notches 55 in the forward edges of the ear portions 51. The lever 43 is now again swung counter-clockwise to force the link part 38 against the eye portion 42 of hasp part 37. The force applied to the lever is therefore transmitted and applied to the abutments 40 by the hasp 36, and since the lever is connected to the door by its pivots, the door is moved away from the jamb J a distance determined by the particular proportions and locations of the hasp and lever parts and the degree of pivotal lever movement. When the door D has been thus partially opened it is movable to fully open position with relative ease. In order to close and lock the door, it is moved to within a fairly short distance of the jamb, the link part 38 is swung upwardly and the extensions of the lever ear portions 51 are swung downwardly to permit engagement of the lugs 39 in the notches 53, and the lever is moved clockwise. The hasp 36 is thus pulled to the right as viewed in Fig. 5, compressing spring 31 beyond its initial compression and drawing the door to fully closed position with the stile F snugly engaged in the channel of the jamb J. The lever comes to its locking position, the latch 48 engaging with keeper 46 to prevent return movement. If the mechanical advantage afforded by the lever with the hasp lugs 39 engaged in the notches 53 is insufficient to overcome the resistance to closing movement of the door, the lever is swung counter-clockwise so that the lugs can be disengaged from these notches and instead engaged in the notches 54 to obtain a greater mechanical advantage because of the location of the latter notches closer to the pivot or fulcrum point of the lever. Clockwise rotation of the lever 43 then effects closing of the door, the parts coming to the positions shown in the drawings with the latch 48 holding the lever against return movement from its locking position and the link part 38 thrown past center relative to the lever pivots to urge the lever clockwise. Such movement of the lever is prevented by the front projection of the lever mounting bracket 44. Even if the lever can effect closing of the door with the link part lugs 39 engaged in notches 53, it is preferable finally to dispose the lock in the locking position shown in Fig. 5, with the lugs 39 engaged in the lower notches 54, for better securement and minimization of forces acting on the lever as the result of shocks or the like tending to cause the door to open. Of course, if the door can be

initially moved close enough to fully closed position for engagement of the link lugs 39 in the notches 54, they need not be engaged preliminarily with the notches 53. As in the case of the springs 11, the spring 31 goes solid before the hasp 36 can be moved outwardly relative to the housing 32 a sufficient distance to permit the lugs 39 to disengage either notches 54 or notches 53, so that the door is securely locked. The action of the lock 30 in drawing and holding the door closed, cushioning shocks, and yielding for limited opening of the door, is substantially similar to that of the lock 10. Because of the angled disposition of the lock parts relative to the wall W and door D, however, the door is biased laterally inwardly relative to the wall in closed position so that the stile F is urged into relatively tight engagement with the laterally inner flange portion of the jamb channel to effect a close seal therebetween, as will be clear from Fig. 6. In opening movement of the door, the lever tends to move the door outwardly to facilitate the initial separation of the door from the wall. The angular relation of the lock to the door and wall may be reversed to bias the door outwardly in closed position and inwardly in opening movement, if it is desired to have the door engage closely against the outer flange portion of the jamb channel.

It may be pointed out that in each of the forms as illustrated, the mounting of the lock parts may be reversed from the arrangement shown. That is, the lever of lock 10 may be secured on the door and the springs and hasp mounted on the wall, or the lever of lock 30 may be pivoted on the wall and the spring and hasp secured on the door, as may be convenient or desired. Instead of the helical metal springs illustrated, other cushioning means may be employed. While the resilient means may be arranged to be tensioned instead of compressed in closed condition of the door, the compressive arrangement shown and described is preferred both because it permits a compact construction and because the compression springs serve as stops limiting movement of the hasp upon closing movement of the lever, due to their going solid when sufficiently compressed. The lock of this invention is applicable to the common sliding box car door and the lift type sliding door and operates effectively with either. Of course, while the invention, for convenience in description, has been disclosed in connection with sliding doors of railway cars, it is applicable also to sliding doors of other vehicles.

What is claimed is:

1. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a cushioned lock for the members comprising resilient means mounted on one of the members, a lever mounted on the other member for pivotal movement about an axis transversely of the member, hasp means biased away from the other member by the resilient means and engageable with the lever to cause the opening to be covered and stress the resilient means upon one pivotal movement of the lever, abutment means on said one member for receiving thrust from the lever upon another pivotal movement thereof to expose the opening.

2. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a combined opener and closer and lock for the members comprising resilient means mounted on one of the members, abutment means on said one member, hasp means biased away from the other member by the resilient means, a lever mounted on the other member for pivotal movement about an axis transversely of the member engageable with the hasp means to cause the opening to be covered and stress the resilient means upon pivotal lever movement in one direction and disengageable from the hasp means upon pivotal movement in the opposite direction and also engageable with said abutment means to expose the

opening upon pivotal movement in said one direction when disengaged from the hasp means, and means to hold the lever against return movement from locking position and thereby maintain the resilient means under stress for yieldably holding the closure member over the opening.

3. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a cushioned lock for the members comprising resilient means mounted on one of the members, hasp means biased away from the other member by the resilient means, a lever mounted on the other member for pivotal movement about an axis transversely of the member, means adapted for engaging the lever with the hasp means to cause the opening to be covered and stress the resilient means upon pivotal movement of the lever in one direction and also adapted for disengaging the lever from the hasp means upon opposite pivotal movement of the lever to relieve the resilient means and permit the opening to be exposed, and means on the lever for engaging the hasp means to apply pressure thereto to expose the opening upon pivotal lever movement in said opposite direction after disengagement of the lever and hasp means.

4. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a cushioned lock for the members comprising resilient means mounted on one of the said members, hasp means biased away from the other of the said members by the resilient means, a lever mounted on the other of said members for pivotal movement about an axis transversely of the said other member and engageable with the hasp means to cause the opening to be covered and stress the resilient means upon pivotal movement of the lever in one direction and also disengageable from the hasp means upon pivotal movement in the opposite direction to relieve the resilient means and permit the opening to be exposed, said lever also being engageable with the hasp means to apply thrust thereto to expose the opening upon another pivotal movement in said opposite direction after such disengagement from the hasp means, first abutment means on said one of said members, and second abutment means on the hasp means engaging the first abutment means upon said other pivotal lever movement to transmit thrust thereto to expose the opening.

5. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a cushioned lock for the members comprising resilient means mounted on one of the members, hasp means biased away from the other member by the resilient means, a lever mounted on the other member for pivotal movement about an axis transversely of the member having means on its side remote from said one member for engagement with the hasp means to cause the opening to be covered and stress the resilient means upon pivotal lever movement away from said one member and for disengagement from the hasp means to relieve the resilient means and allow the opening to be exposed upon opposite pivotal movement and also having means on its side adjacent said one member for engaging the hasp means to apply thrust thereto to expose the opening upon pivotal movement toward said one member after disengagement of said remote side means from the hasp means.

6. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a cushioned lock for the members comprising resilient means mounted on one of the members, hasp means biased away from the other member by the resilient means, a lever mounted on the other member for pivotal movement about an axis transversely of the member having a plurality of means on its side remote from said one member differently spaced from the pivot each adapted for engaging the hasp means to cause the opening to be covered and stress the

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resilient means upon pivotal movement of the lever away from said one member and also adapted for disengaging with the hasp means to relieve the resilient means and allow the opening to be exposed, said lever also having means on its side adjacent said one member for engaging the hasp means to apply thrust thereto to expose the opening upon pivotal movement toward said one member after disengagement of said remote side means for the hasp means.

7. In a freight vehicle, a wall member provided with an opening, a closure member slidable in a plane parallel to the wall member to cover and expose the opening, and a cushioned lock for the members comprising resilient means mounted on one of the members, hasp means biased away from the other by said resilient means, a lever mounted on the other member for pivotal movement about an axis transversely of the member engageable with the hasp means to cause the opening to be covered and stress the resilient means upon pivotal movement of the lever in one direction, a latch pivoted on the lever, a keeper

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secured on said other member for engagement by the latch upon said movement of the lever, and means biasing the latch in a direction to engage the keeper and prevent reverse movement of the lever.

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