April 12, 1949. S. S. LAUVER 2,466,855

FREIGHT CAR DOOR LOCK

Filed Aug. 1, 1947

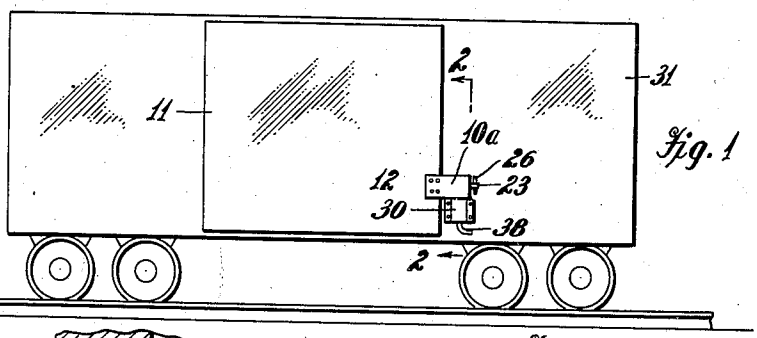


Fig. 1

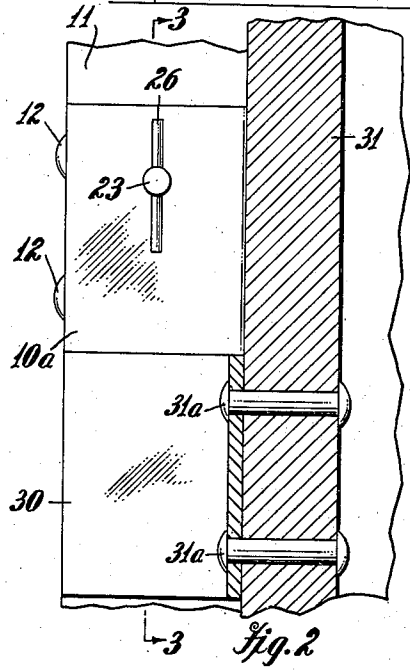


Fig. 2

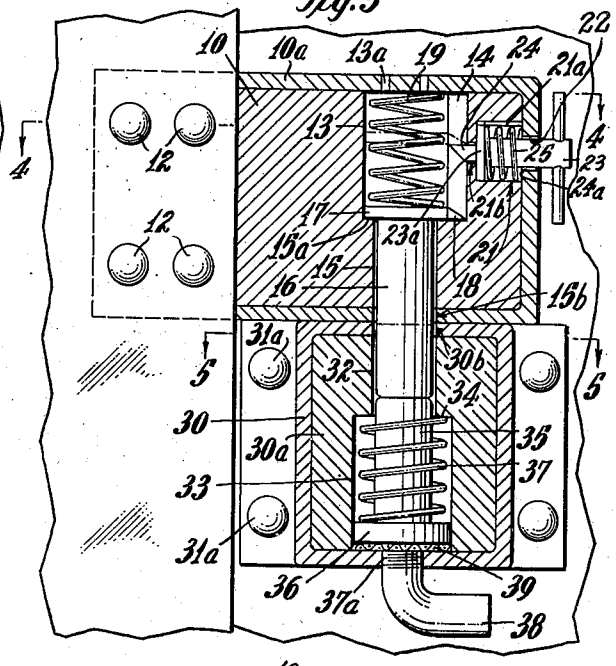


Fig. 3

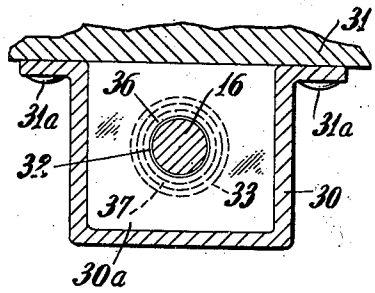


Fig. 5

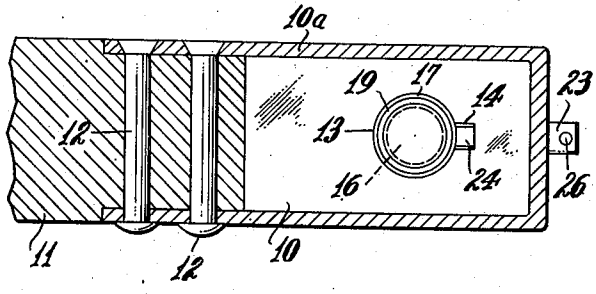


Fig. 4

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FREIGHT CAR DOOR LOCK

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1 Claim. (Cl. 292—144)

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This invention relates to freight car door locks, and aims to provide a safe, positive, and burglar-proof lock for freight car doors, the entire device and combination being so constructed that in order to unlock the door a supply of compressed air is required, and thus the door could only be unlocked by a person having a source of compressed air available, such as, for instance, a member of the train crew who could open a valve from the compressed air line of the train, into an air line to the lock of this invention.

Since freight car thieves would find it extremely inconvenient to carry an air compressor and necessary attachments with them when on a thieving errand, it is obvious that the contents of cars equipped with this invention would be safe.

The above broad as well as additional and more detailed objects will become apparent in the following description wherein characters of reference refer to like-numbered parts in the accompanying drawing. It is to be noted that the drawing is intended for the purpose of illustration only and that it is neither desired nor intended to limit the invention to any or all of the specific details of construction shown excepting insofar as they may be deemed essential to the invention.

Referring briefly to the drawing,

Fig. 1 is a side elevational view of a freight car showing one manner in which the safety lock may be applied thereto.

Fig. 2 is a fragmentary sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 3.

Referring in detail to the drawing, the numeral 10a indicates a hollow substantially rectangular housing or shell of any suitable material such as, for instance, steel, which is completely filled by a steel block 10. The combination 10a—10 is fixed on the edge of the car door 11 by any suitable means such as, for instance, rivets 12. The block 10 is provided with a vertical bore 13 closed at the top by the shell 10a and extending downward substantially half the depth of the block 10. One or more air vents 13a extend through the shell 10 above the bore 13. A vertical channel 14 of substantially rectangular cross-section is cut into the outer wall of the

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bore 13. A bore 15, axially aligned but substantially smaller in diameter than the bore 13 extends from the lower extremity of the block 10 into the bore 13, forming a shoulder 15a and in alignment therewith is an opening 15b through the shell 10a.

A cylindrical bolt 16, substantially equal in diameter to the bore 15 and of substantially greater length than the latter, registers slidably therein. The bolt 16 has rigid thereon or integral therewith, a piston-like head 17, substantially equal in diameter to the bore 13, and slidably registering in the latter. A nose 18 with its extremity beveled substantially as shown, is provided integral with the edge of the piston 17 and registers slidably in the channel 14. A coiled compression spring 19 is interposed between the shell 10a and the piston 17. The bolt 16 normally under urging by the spring 19 on the piston 17 maintains the latter against the shoulder 15a and thus the bolt 16 protrudes a distance below the lower edge of the shell 10a. The bolt 16 is slidable upward so that at the upper extremity of its stroke the lower edge thereof lies substantially flush with the lower edge of the shell 10a, as indicated in broken lines in Fig. 3.

A bore 21 having a keying slot 21a, extends through the block 10 at right angles to the bore 13 and is positioned substantially intermediate the height of the latter, communicating with the channel 14 through the reduced opening 24b. A reduced axial opening 22 is provided in the wall of the shell 10a, providing a peripheral shoulder 24a on the recess 21. A pin 23 is provided with a piston-like head 23a and a nose 24 whose extremity is beveled complementarily to the nose 18, and is slidable in the recess 21. A coiled compression spring 25 surrounds the pin 23 and is interposed between the piston 23a and the shoulder 24a, and normally urges the piston 23 forward and hence positions the nose 24 within the channel 14. A handle 26 is rigidly mounted on the extremity of the pin 23.

The numeral 30 indicates a second substantially rectangular hollow shell or housing having a solid block 30a filling the same, mounted on the side 31 of the freight car, by bolts 31a and positioned so that when the door 11 is closed the housing 30 lies adjacent and directly below the housing 10a, with a degree of clearance, not shown, between the housings.

A vertical bore 32 having its axis aligned with that of the bore 15 extends downward into the block 30a and an aligned opening 30b is pro-

vided through the top of the shell 30. A second bore 33 extends through the block 30a through the remainder of the height of this block, in alignment with the bore 32 and separated therefrom by a shoulder 34. A rod 35 of a diameter and length substantially equal to that of the bore 32 registers slidably in the latter, and has integral therewith a piston-like head 36 of a diameter substantially equal to the diameter of the bore 33. A coiled compression spring 37 surrounds the rod 35 and is interposed between the shoulder 34 and the piston 36. A threaded opening 37a, communicating with the cylinder 33, is provided in the underside of the housing 30 into which an air line elbow 38 is threadably connected. A screen or filter 39 is mounted in the base of the cylinder 33 adjacent the opening 37a for the purpose of preventing any foreign matter from being introduced into the device from the compressed air source, not shown.

With the door in closed condition shown, the bolt 16 is normally urged downward to its lower limit by means of the spring 19 pushing the piston 17 downward and against the shoulder 15a. The bolt 16 registers slidably in the bore 32 of the lower block 30a, thus locking the door closed, as illustrated in Fig. 1.

To unlock the door, the operator opens an air valve, not shown, connecting the main air line with the air line elbow 38 leading into the block 30a, allowing air under pressure to enter the cylinder 33 and drive the piston upward against the resistance of the spring 37. The pin 35 is thus driven upward and in turn drives the bolt 16 upward and compresses the spring 19. As the bolt 16 is driven upward, the nose 18 engages the nose 24 of the pin 23 in cam-like fashion and drives the latter outward until the nose 18 has risen above the nose 24, as shown in broken lines in Fig. 3, whence the latter is forced back into position in the channel 14 by means of the spring 25. At the upper limit of travel of the bolt 16, the lower extremity thereof is substantially flush with the lower surface of the housing 10a, and the nose 24 underneath the nose 18 maintains the bolt 16 in the upward or unlocked position. The air pressure may then be removed by closing the air valve, not shown, and the door will remain in unlocked condition, the rod 35 being driven back into its downward position by means of the spring 37 acting on the shoulder 34 and the upper surface of the piston 36.

To lock the door after closing, the handle 26 on the pin 23 is pulled outward, compressing the spring 25 and withdrawing the pin 23, and hence the nose 24, thus allowing the nose 18 to pass downward in the channel 14. As soon as the nose 24 is withdrawn, the force of the spring 19 drives the piston 17 and the bolt 16 downward, thereby causing the bolt 16 to register in the bore 32 of the block 30a. The rod 32 is maintained in its lowered position by means of the urging of the spring 19, and thus the door is securely locked until air pressure is again applied to the air line inlet elbow 38 in order to unlock the device.

Thus a secure locking device has been provided for freight car doors which can only be opened by authorized persons by the use of a supply of compressed air, and which will remain unlocked until placed in locked condition by a positive action on the part of the operator, so that there is no doubt whether the door is locked or not.

Obviously, modifications in form and structure may be made without departing from the spirit and scope of the invention.

I claim:

In combination with a door frame and a door, means for locking the door in closed position comprising a block secured at one end in horizontal position against the edge of the door and extending beyond said edge, a second block secured against said frame on a level below that of the lower edge of said first block, a bore extending upward into said first block, a bore of the same diameter as said first bore extending downward into said second block, said bores being positioned horizontally with respect to their said respective blocks so that when the door is in closed position said bores are vertically aligned, a bolt slidably mounted in said first bore, resilient means in said first bore normally urging said bolt downward, limit stop means partly on said bolt and partly in the surrounding wall of said block intermediate the height of said bore limiting the downward movement of said bolt to a position where the lower end of said bolt protrudes from its said bore, said bolt having such a length that upon maximum upward sliding thereof the lower extremity thereof lies at least flush with the lower edge of said first block, releasable locking means for retaining said bolt in said upward position, a rod slidably mounted in said second bore, limit stop means partly on said rod and partly in the surrounding wall of said second bore limiting the stroke of said rod to a length at least equal to the distance by which the lower end of said upright bolt protrudes from the lower edge of said first block in the lowermost position of said bolt, said second block having an opening into said second bore at the lower end of the latter, said opening being adapted to receive compressed air, said releasable locking means comprising a radial nose projecting from the top of said bolt, a horizontal opening through the wall of said block into said first bore, a pin slidably mounted in said horizontal opening, resilient means normally urging said pin toward said first bore thereby normally projecting the inner extremity of said pin into said first bore, limit stop means limiting the distance of projection of said extremity of said pin into said first bore to a maximum equal to the length of said radial nose, said nose and said inner extremity of said pin being complementarily beveled.

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