W. W. CORNMAN.

DOOR LOCKING DEVICE.

APPLICATION FILED NOV. 12, 1908.

913,700. Patented Mar. 2, 1909.

Fig. 1.

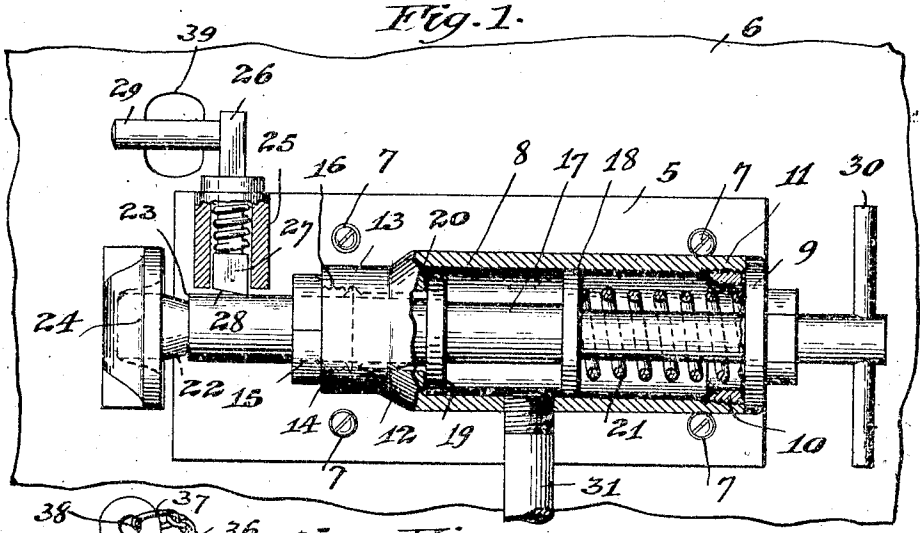


Fig. 2.

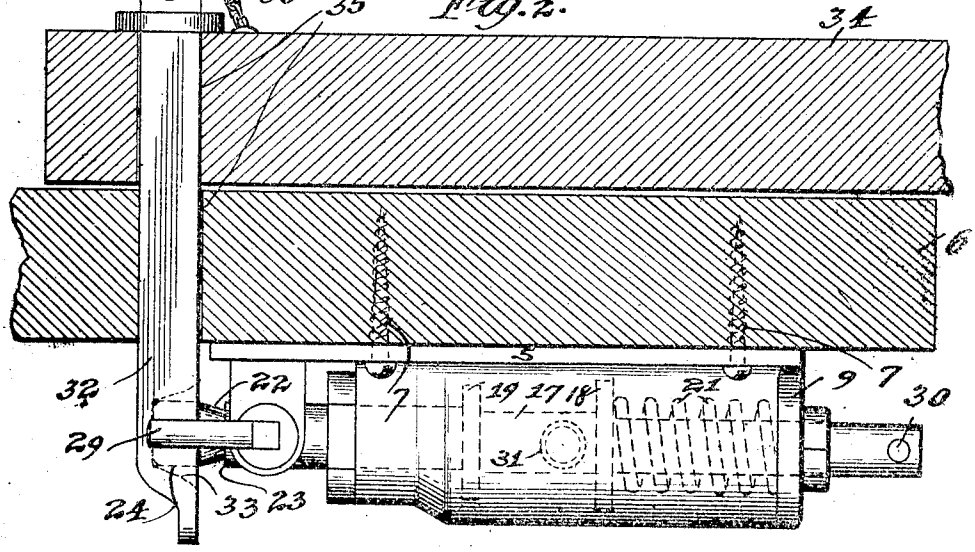


Fig. 3.

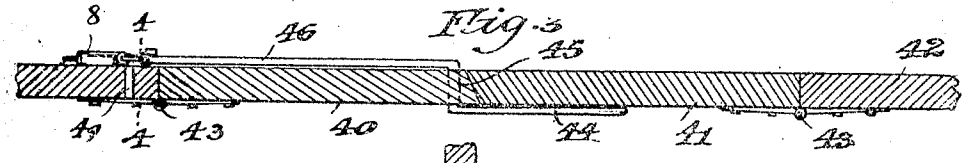
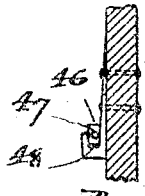


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DOOR-LOCKING DEVICE.

No. 913,700. Specification of Letters Patent. Patented March 2, 1909.

Application filed November 13, 1908. Serial No. 462,272.

To all whom it may concern:

Be it known that I, WILLIAM W. CORNMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Door-Locking Devices, of which the following is a specification.

The invention relates in general to a door locking device for a plurality of doors, but pertains more in particular to a lock adapted to be released by compressed air or a compressed fluid, and means for springing the lock when the door is in a closed position.

The principal object of the invention is to provide locks adapted to be connected to a plurality of doors and having a common pipe adapted to carry compressed air and connected to each lock whereby all of the doors such as on a train of cars may be simultaneously unlocked.

Other objects of the invention will appear throughout the specification and are shown in the drawings in which—

Figure 1 is a side elevational view of the device applied to a body member, with parts broken away and other part in section. Fig. 2 is a top plan view of the device in locked position, the door and body members to which the device is applied being shown in cross section. Fig. 3 is a cross-sectional view of a refrigerator door consisting of two doors hinged to swing outwardly with my improved device applied thereto. Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Referring now more particularly to the drawings, 5 represents a base plate, preferably composed of metal, and adapted to be secured to a body member 6, such as a side wall of a car, by means of the screws 7. Preferably formed integral with said base plate 5 is a cylinder 8, but it is obvious that the cylinder might be formed separate and secured to the base plate in any suitable manner. The cylinder 8 is provided with a cylinder head 9 having an externally threaded boss 10 formed integral therewith and adapted to coöperate with the internal threads 11 at the end of said cylinder; said cylinder head being suitably apertured for the sliding of a piston rod therethrough, which will be hereinafter described. The opposite end of said cylinder from said cylinder head 9 is preferably beveled at 12 and terminates in an annular neck portion 13 that is internally threaded at 14. A cylinder head 15 is provided with an externally threaded boss 16, the threads thereon being adapted to coöperate with the threads 14; said cylinder head 15 also being suitably apertured for the sliding of the piston rod therethrough. The piston rod 17 is longitudinally and axially disposed within said cylinder and of greater length thereof and carries a piston head 18 and a stop member 19, that is preferably of annular form, and adapted to abut against the shoulders 20 formed within the cylinder. Backing said piston head 18 is a coiled spring 21 interposed between said piston head 18 and said cylinder head 9, the normal tension of said spring being to force said piston head away from said cylinder head 9. Near one end of said piston rod 17 an annular beveled surface 22 is formed terminating in an abrupt shoulder 23, whereby a head member 24 is formed at the end of said piston rod.

Secured to the base plate is a guide-way 25 carrying a vertically slidable latch 26 that is provided with an end piece 27 having a beveled surface 28 corresponding substantially with the beveled surface 22 as to the angular disposition, whereby when the piston rod is moved to the left, as shown in Fig. 1, the end piece 27 will spring behind the shoulder 23 and prevent the movement of the piston rod to the left. As a means for moving the end piece from behind the shoulder 23, a stud 29 is secured to the latch 26 in any suitable manner, and by raising the stud 29 the end piece will be drawn free from the shoulder 23 and the piston rod is forced outward from said piston under the action of the spring 21. Hand means 30 are provided at the opposite end of said piston rod, from said head 24, drawing the shoulder into engagement with the end piece, as by moving the piston rod to the right, as shown in Fig. 1, until the end piece is forced behind the shoulder 23. The piston rod is adapted to be moved into an unlocked position by any form of fluid pressure, but preferably by compressed air that is forced against said piston head 18, and for admitting compressed air or the like into said cylinder a branch air pipe 31 is

adapted to be secured to said cylinder at any suitable point between the piston head and beveled end thereof.

It is of course obvious that a single air pipe for a series of doors would be sufficient with a branch pipe leading to each air lock.

In Fig. 2, 32 is a key member having a recessed or counter-sunk portion 33 at one end thereof adapted to receive the head member 24 of the piston rod 17; said key member being of sufficient length to extend transversely through a door member 34 and through the body member 6, suitable apertures 35 being provided in said door and body members that are adapted to register when the door member is in closed position and through the key member. The key member 32 may be connected to the door body by means of a chain 36 secured to the door body and to the key member by means of a ring 37 passed through a suitable aperture 38 at one end of said key. Apertures 39 are also formed through the door and body members in horizontal alinement with the stud 29 whereby when the piston is in such a position that the end piece 27 is behind the shoulder 23, a suitable instrument can be inserted through the door and body members for raising the end piece 26 and releasing the piston rod.

The operation of the device, as just described, is as follows: When it is desired to lock the car or other body member, the door member is moved into its closed position, bringing the apertures 35 and 39 into alinement, whereupon the key member 35 can be inserted through the apertures, bringing the counter-sunk portion 33 at the end of the key 32 into alinement with the head member 24 of the piston 17. The party then having charge of the car or other member, applies a suitable instrument through the apertures 39 to the stud 29 to lift the latch 26, removing the end piece 27 from the shoulder 23, whereupon the piston will be forced from the cylinder under the action of the spring 21 until its head 24 seats itself within the socket or counter-sunk portion 33. It can therefore be readily seen that after the parts are in the position as just described the horizontal movement of the key member relative to the door and body members is prevented, and also that the longitudinal movement of the door member relative to the body member is prevented by means of the key 32.

When it is desired to release the lock, the party having control of the air line of the car, which may be the engineer of a train, permits the air to enter the cylinder through the branch pipe 31 which forces back the piston head 18 against the action of the spring 21 until the end piece 27 is forced behind the shoulder 23 thereby drawing the head member 24 free from the key and holding the same free thereof. When the piston rod is released by the latch the annular shoulder 19 abuts against the shoulders 20 to limit the outward movement of the piston rod so that the same will not strike the key member with too great force, and the shoulder 19 also is prevented from striking the shoulder 20 as the air is driven within the beveled end of the piston and acts as a cushion to break the force with which the shoulder 19 strikes the shoulder 20. If it is desired to release the lock from the interior of the car, this can be accomplished by grasping the handle 30 on the piston rod so as to seat the end piece 27 behind the shoulder 23.

The above device, as just described, is the preferred embodiment of the invention, but it is obvious that the same is not limited in use to a construction wherein the door member is adapted to slide relative to the body member. Therefore a modified form of construction has been shown in Figs. 3 and 4, in which 40 and 41 represent a style of door such as is used upon refrigerators, 42 representing the body of a refrigerator and 43 the hinges for the doors 40 and 41. A handle 44 is secured to the door in the usual manner, such as by extending the same transversely through the door to provide a pivotal section 45 that is formed integral with an extended handle portion 46 on the interior of the refrigerator or the like. It is of course obvious that the pivotal section 45 might be made separate and the handle portions 44 and 46 secured thereto, said pivotal section extending transversely through one of the doors whereby a movement of either handle will move the other handle. The extended handle portion 46 is provided with a suitable counter-sunk portion 47 at one end thereof, which is adapted to be brought in horizontal alinement with the head member of the piston 17 when the doors are in closed position. The base plate and cylinder thereon are secured to the refrigerator body 42 and a guide member 48 is also secured to said body portion into which the handle portion 46 is adapted to be guided and to limit the downward movement of the handle portion 46, whereby the counter-sunk portion at the end thereof is brought into horizontal alinement with the head member 24. An aperture 49 corresponding to the aperture 39 is formed through the refrigerator body in order that the lock may be sprung. The operation of this device is as follows: Assuming that the handle 44 is in a vertical position relative to the door, said doors can be swung outward on their hinges as the bolt head will not then engage the handle portion 46, and when it is desired to lock said doors, the same having been closed, the handle is turned so as to bring the counter-sunk portion 47 into horizontal alinement

with the head member 24, whereupon the lock is sprung by moving the latch 27 and the head member is forced into the counter-sunk portion 47, thereby preventing the turning of the handle. This, as can readily be seen, will prevent the outward movement of either door.

I do not wish to be understood that the invention is limited to the two door constructions herein shown, as it is obvious that the general principal of the invention is applicable to any form of door, and while the preferred embodiment of the invention is herein shown, except as to minor details, it is of course understood that various changes might be made without departing from the broad general spirit.

I claim:

1. In a locking and releasing device for a door, the combination of a cylinder, a piston rod having a piston thereon slidably mounted within said cylinder, means for normally forcing one end of said piston rod outward from said cylinder, means for admitting a compressed fluid substance into said cylinder, and a key member adapted to engage said door and having a recessed portion into which one end of said piston rod is adapted to extend, substantially as described.

2. In a locking and releasing device for a door, the combination of a cylinder connected with a fluid supply, a piston rod within said cylinder having a piston thereon, means for normally pressing one end of said piston rod outward from said cylinder, and means independent of said piston rod, adapted to engage said door and one end of said piston rod whereby the movement of said door is prevented, substantially as described.

3. In a locking and releasing device for a door, the combination of a cylinder having a piston rod and a piston therein, said piston rod being of greater length than said cylinder, means for normally forcing one end of said piston rod outward from said cylinder, means for admitting a fluid substance within said cylinder, and a key member adapted to extend through said door and having a counter-sunk portion into which one end of said piston rod is adapted to extend, and means for holding said piston rod free from said key, substantially as described.

4. In a locking and releasing device, the combination of a cylinder adapted to be secured to a body member, a piston rod therein having a piston, said piston rod being of greater length than said cylinder, a spring interposed between said piston and one end of said cylinder to normally force one end of said piston rod therefrom, a head member secured to said piston rod, and a key member adapted to extend transversely through said door and body member and having a recess therein into which the head member on said piston rod is adapted to project, whereby the door member is prevented from moving relative to said body member, substantially as described.

5. In a locking and releasing device, the combination of a cylinder adapted to be secured to a body member, a piston rod having a piston thereon slidably mounted within said cylinder, a head member and a shoulder on said piston rod, a spring interposed between said piston and one end of said cylinder to normally force said head member away from said cylinder, a latch in operative position with relation to said cylinder and adapted to engage the shoulder on said piston rod to firmly hold said head member toward said cylinder when said spring is compressed, and a key member adapted to extend transversely through said door and body member having a suitable cut away portion into which said head member is adapted to project, whereby the lateral or longituinal displacement of the door member relative to the body member is prevented, and means for engaging said latch member exterior of the door, substantially as described.

6. A locking and releasing device for doors, comprising a cylinder adapted to be secured to a body member and having a fluid supply pipe connected therewith, a piston rod slidably mounted within said cylinder and having a piston thereon, a spring within said cylinder and interposed between said piston and one end of said cylinder for normally forcing one end of said piston from said cylinder, a head member formed integral with said piston, a shoulder on said piston, means exterior of said cylinder for engaging said shoulder to normally hold said spring under compression, a key member adapted to extend transversely through said door and body member when said door member is in a closed position, and a recess formed in said key member at one end thereof and into which the head member on said piston is adapted to extend, whereby a lateral or longitudinal movement of said door member relative to said body member is prevented, and means on said piston for manually withdrawing said head member from said key member, substantially as described.

7. In a locking and releasing device, the combination of a cylinder adapted to be secured to a body member, a piston rod slidably mounted within said cylinder and having a piston thereon, a spring interposed between said piston and one end of said cylinder for normally pressing one end of said piston rod away from said cylinder, a fluid supply pipe secured to said cylinder and in communication with the interior thereof, a shoulder formed on said piston exterior of said cylinder, a latch adapted to engage said shoulder to hold said piston rod in an re-

locked position, a key member adapted to extend transversely through registering apertures formed in said door and body members and having a recessed portion in horizontal alinement with the end of said piston rod, registering apertures through said door and body members in alinement with said latch, whereby said latch may be released and the end of said piston rod engage said key member, substantially as and for the purposes described.

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