July 28, 1925. 1,547,210

J. GARRETT

CAR DOOR

Filed Dec. 9, 1924 4 Sheets-Sheet 1

Fig. 1.

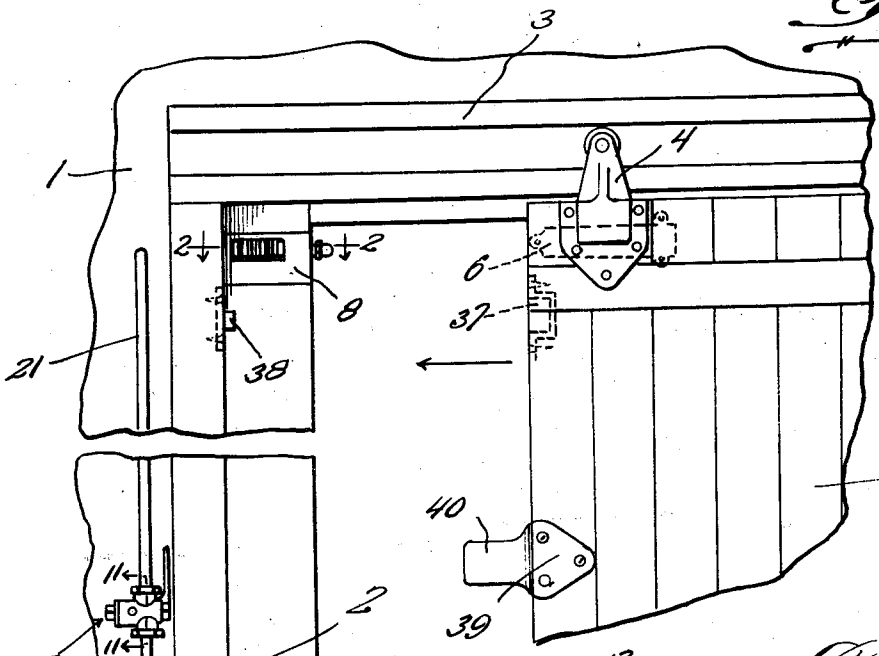


Fig. 2.

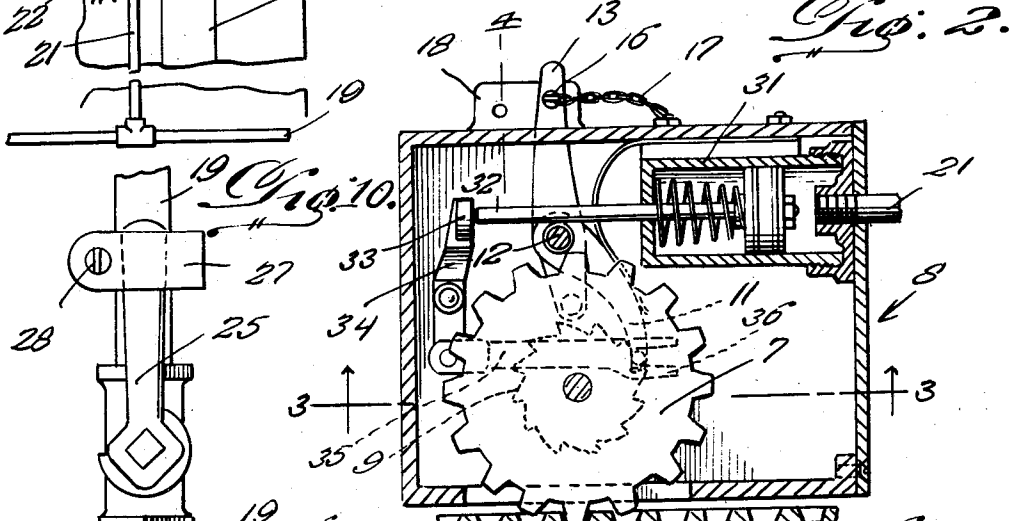
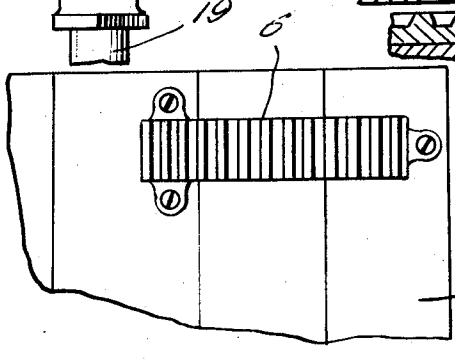


Fig. 10.



James Garrett,
Inventor

Fig. 5.

By Clarence A. O'Brien.
Attorney

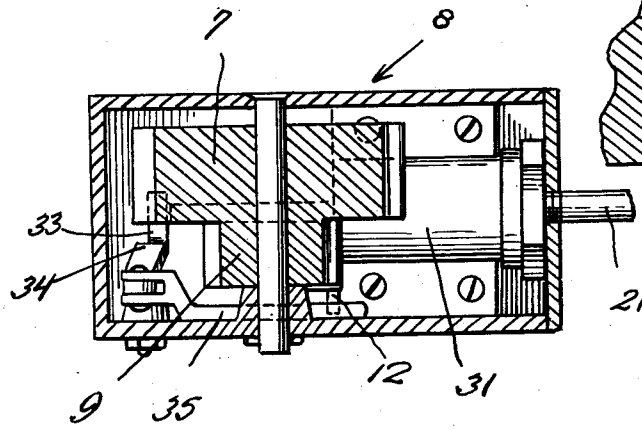
July 28, 1925. 1,547,210

J. GARRETT

CAR DOOR

Filed Dec. 9. 1924 4 Sheets-Sheet 2

Fig: 3.



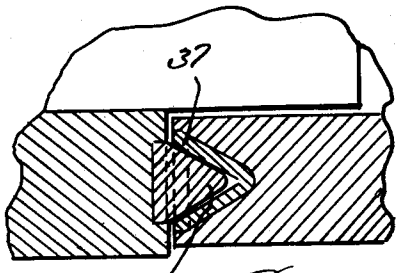


Fig: 6.

Fig: 7.

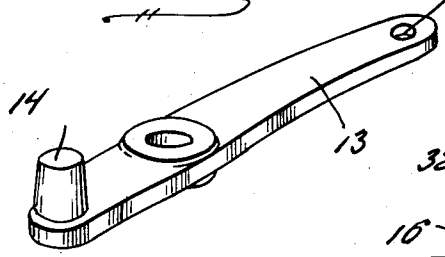


Fig: 4.

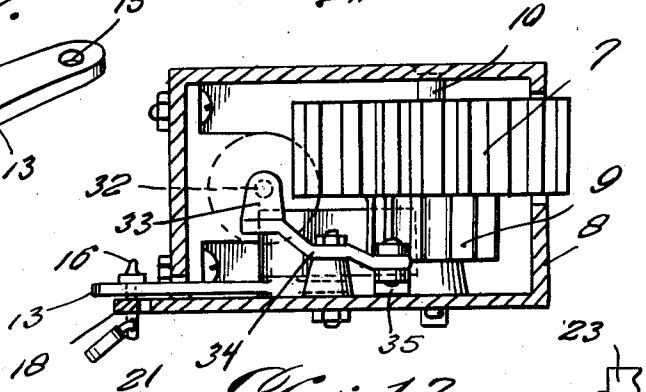


Fig: 8.

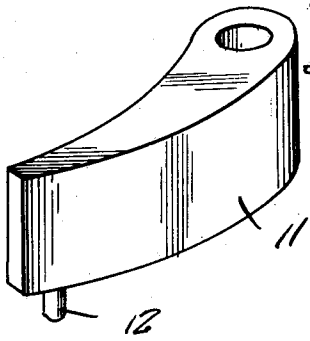
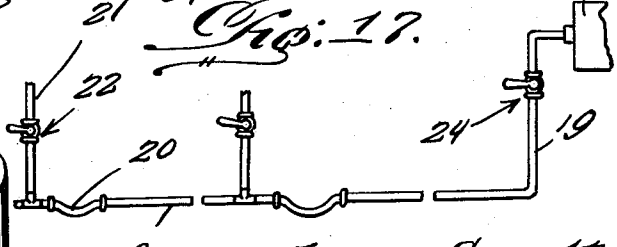


Fig: 17.



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July 28, 1925. 1,547,210

J. GARRETT

CAR DOOR

Filed Dec. 9. 1924 4 Sheets-Sheet 3

Fig. 12.

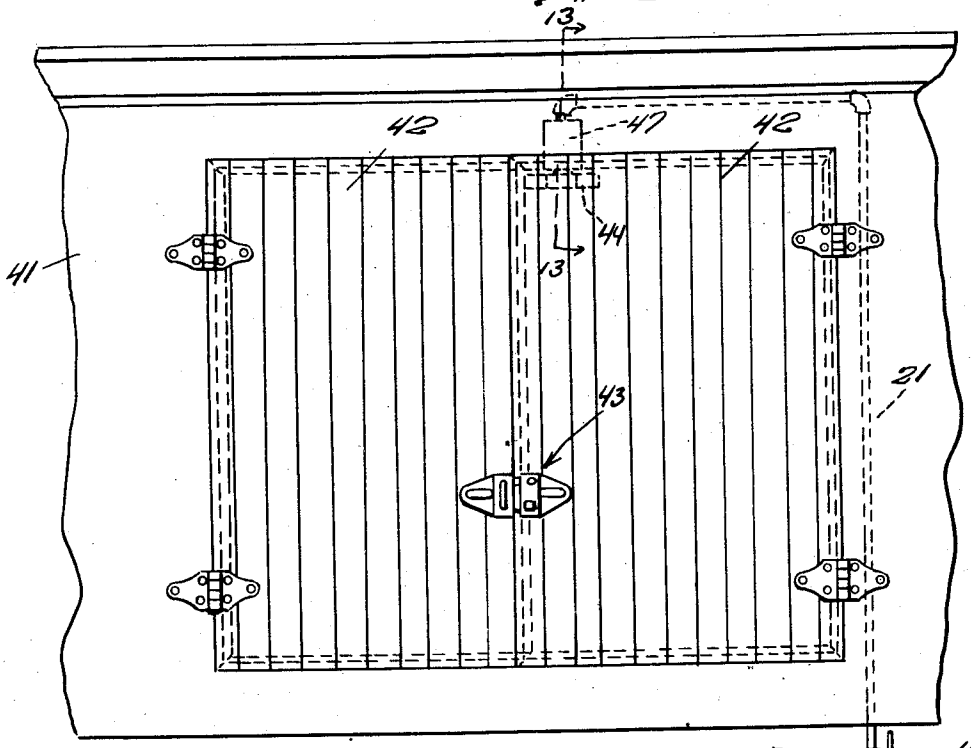


Fig. 18.

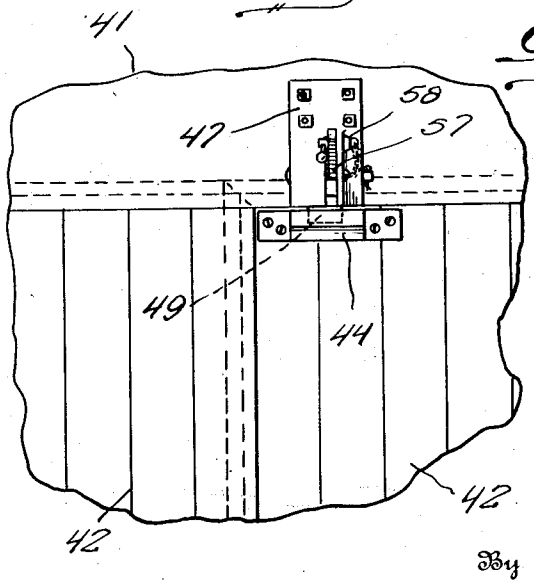
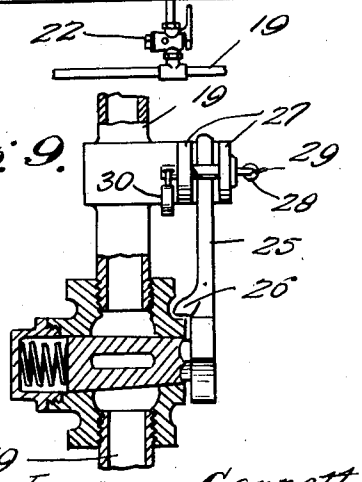


Fig. 9.



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July 28, 1925. 1,547,210

J. GARRETT

CAR DOOR

Filed Dec. 9, 1924 4 Sheets-Sheet 4

Fig. 13.

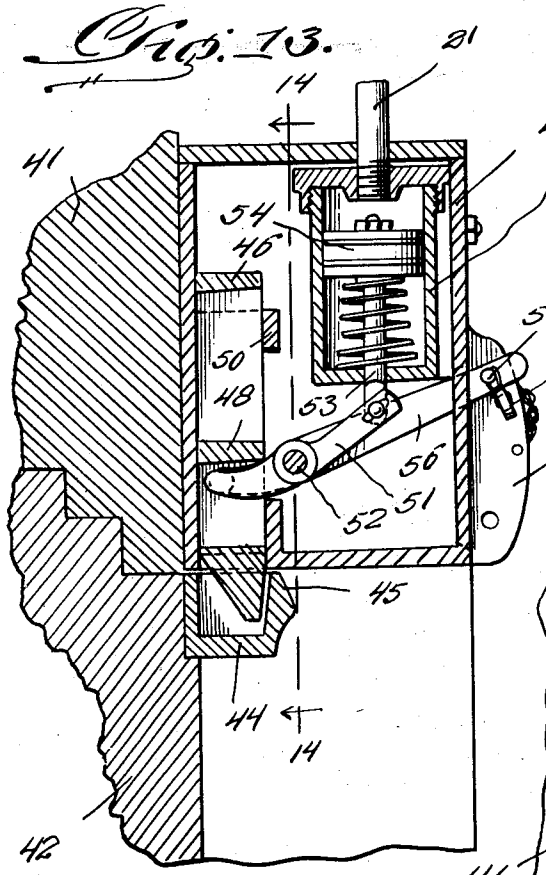


Fig. 15.

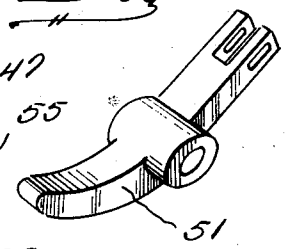


Fig. 14.

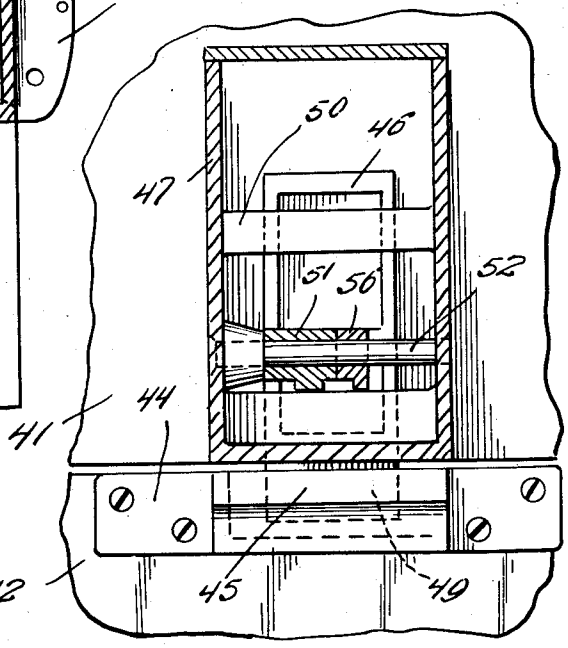
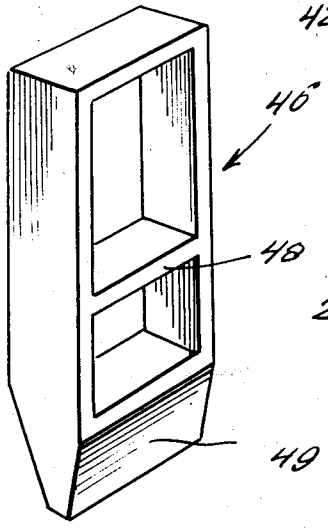


Fig. 16.



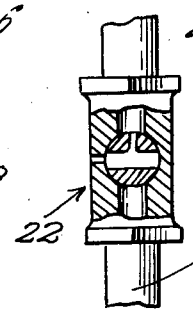


Fig. 11.

James Garrett,
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By Clarence A. O'Brien.
Attorney

Patented July 28, 1925. 1,547,210

UNITED STATES PATENT OFFICE.

JAMES GARRETT, OF MADISON, WISCONSIN.

CAR DOOR.

Application filed December 9, 1924. Serial No. 754,877.

To all whom it may concern:

Be it known that I, JAMES GARRETT, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Car Doors, of which the following is a specification.

This invention relates broadly to an improved car door having more specific reference to the type of doors used upon freight cars.

More specifically, the invention relates to novel means for locking the door in closed position, together with an auxiliary air device or system, constructed for permitting the locking means to be released and controlled from the engineer's cab.

In carrying out the invention, I propose to provide an air system, which embodies an auxiliary air conducting pipe for a conduit, which is made up of a horizontal pipe for each car, these horizontal pipes being coupled together, and there being an individual pipe in which a valve is located, for controlling the passage of air into a cylinder located in the car, and arranged to operate a release device, to permit opening of the door. In other words, I provide an air pipe, which, when the air is on, serves to automatically operate releasing means which is in association with the door locking means.

As will be seen later, the present invention is embodied in two different forms of slightly varying design, one embodiment being for a sliding door, and the other embodiment being for hinged closures or doors of the kind used upon refrigerator cars.

The various features and advantages derived from their use will become apparent as the description goes on.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a side elevation of a fragment of a freight car, showing the body, sliding door mounting, etc., together with the improved invention.

Figure 2 is an enlarged detail section, taken substantially on the plane of the line 2—2 of Figure 1, showing the mechanism constituting the locking and releasing device.

Figure 3 is a section through the casing and mechanism, the same being taken approximately on the line 3—3 of Figure 2.

Figure 4 is a transverse vertical section, taken on the plane of the line 4—4 of Figure 2.

Figure 5 is an elevational view of one corner of the sliding door, showing the rack and bar with which it is equipped.

Figure 6 is another detail view of means provided for frustrating prying of the door.

Figure 7 is a detail perspective view of one of the parts of the releasing device.

Figure 8 is a detail perspective view of a pawl.

Figure 9 is a detail view, partly in elevation, and partly in section of the engineer's control valve,

Figure 10 is a side elevation of said control valve.

Figure 11 is an enlarged detail sectional view, taken on the plane of the line 11—11 of Figure 1.

Figure 12 is an elevational view of a different embodiment of the invention to be used in conjunction with hingedly mounted refrigerator car doors.

Figure 13 is an enlarged detail sectional view, taken substantially on the plane of the line 13—13 of Figure 12.

Figure 14 is a section, taken approximately on the line 14—14 of Figure 13.

Figure 15 is a perspective view, of a different form of pawl.

Figure 16 is a detail perspective view of a locking bolt.

Figure 17 is a diagrammatic view of piping, forming a part of the air system, used in conjunction with this invention.

Figure 18 is an inside view of the locking means seen in Figures 12, 13, etc.

Inasmuch as the invention embodies two different embodiments, I believe it well to describe these separately, in the order that they appear in the drawings. For instance, the first embodiment will be found to be disclosed completely in Figures 1 to 8 inclusive. The other embodiment is set out in Figures 12 to 16 inclusive, and also in Figure 18, I will therefore first direct attention more particularly to Figures 1 to 8 inclusive.

Confining attention more particularly to the views specified, it will be seen that the reference character 1 designates generally the body of a freight car, provided in one side with the usual door opening, surrounded by the door frame 2. At the top of the door frame is a suitable guide for hanger

means 3, upon which the roller of a bracket 4 is slidably mounted. The bracket and roller are carried by the sliding door 5. This structure is conventional and constitutes no part of the invention.

In carrying out the invention, I provide a rack bar 6, on the inner face of the sliding door, at the top thereof, as indicated in Figures 1 and 5. The teeth of the rack bar are adapted to mesh with the teeth of a rotatably mounted pinion 7, arranged within a casing 8, mounted in the door frame, as indicated.

The casing may be of rectangular design, and in the present instance, it is formed in the front face with a slot, through which the peripheral teeth of the pinion 7 protrude to permit them to mesh with the rack bar, as more plainly seen in Figure 2.

As better illustrated in Figure 4, the pinion 7 is equipped with an integral ratchet wheel 9, the pinion and ratchet being freely rotatable on the horizontal shaft 10, extending crosswise of the casing. Acting in association with the ratchet wheel is a pivotally mounted pawl 11, which is loosely mounted for rotation upon the shaft 12, within said casing. As shown in Figure 8, this pawl is provided on one side with a projecting pin 12, which serves a purpose to be hereinafter described. I would direct attention at this time to the fact that a manually moved lever 13 is pivotally mounted between its ends upon the aforesaid shaft 12. As shown in Figure 7, this lever is provided with a lateral lug 14, of conical form. This lug is intended to engage beneath the pawl for moving the same in a direction to disengage its points from the ratchet teeth, to permit retrograde movement of the pinion. The lever 13 extends outwardly through a slot in one wall of the casing and the outer end thereof is provided with an aperture 15, to which a pin 16 or chain 17 is adapted to pass. The pin, in turn, may be electrically secured in one of the apertures in the gear 18 on the outside of the casing. If desired, the retaining lever 13 may be arranged in the ineffective position seen in Figure 2. It is obvious, however that by removing the pin 16 and swinging the free end of the lever in a direction toward the left, the conical portion 14 thereon will engage the under curved side of the pawl 11, to disengage the free end thereof from the ratchet teeth. Thus, the pawl can be moved against the action of its retaining spring, to permit reverse rotation of the pinion 7, which is necessary to open the door 5. With the lever 13 in the position shown in Figure 2, however, the pinion can only rotate in a direction from right to left, and if the parts are thus positioned, the door can be slid to closed position, as is obvious. The means just described may be broadly referred to as the manually operated means for releasing the locking means, consisting in the present instance of the rotatable pinion, ratchet, pawl, and the rack bar with which the teeth of the pinion mesh. Inasmuch as the locking means is confined within the interior of the car, the manually operable releasing means is only accessible from the inside. It is desirable to provide means for permitting the door to be released from the outside and the means in the present instance preferably comprises an auxiliary air system, which I have especially devised for use in connection with the improved locking means.

While the air system could be constructed otherwise, it preferably comprises an auxiliary air supply conduit, which extends from one end of the train to the other. The conduit is actually made up of a series of horizontal pipes 19 (see Figure 17), there being a pipe for each car. The pipes are coupled together, in any convenient way, by appropriate couplings 20. Extending upwardly from each pipe 19 is a vertical pipe 21, in which a hand operated valve or cock 22 is located. This supply conduit is connected, at one end, to the usual main reservoir 23, and it extends through the engineer's cab, in any appropriate manner, and in the cab a control valve 24 is located. While on this control valve, I would direct attention to Figures 9 and 10, wherein I have illustrated the valve in detail. The valve itself may comprise the usual coupling, and rotary turn plug, the latter being provided with an operating handle 25, with an indicator 26. The free end of the handle 25 is intended to be confined between a pair of spaced parallel ears 27, which are provided with openings, through which a locking pin 28, on a chain 29 is passed. The free end of the locking pin is apertured, and an appropriate seal 30 is connected thereto. The seal serves, in the usual way, to indicate unauthorized tampering with the control valve. As has been before stated, and as will be seen later, all of the cars in the line may be controlled from this so-called engineer's control valve. The so-called air system also embodies and air cylinder 31, located in each casing 8. The vertical valved pipe 21 supply air to the cylinder. In each cylinder is a spring conduit plunger, the stem 32 of which extends through one end of the cylinder, and engages the laterally directed free ends 33, of a pivotally mounted arm 34. This arm is connected at its lower end to a horizontally disposed part 35, the free end of which is forked, as indicated at 36. The arms of the fork straddle the aforesaid pin projection 12, on the pawl 11, as shown in dotted lines in Figure 2. With this arrangement, it will be seen that as the air is introduced through the pipe 21 into the cyl-

inder 31, the piston or plunger will be moved in a direction from right to left and its rod 32 will push against the arm 34, to rock it about its central pivot, in a manner to force the part 35 in an opposite direction from left to right. In so doing, the forked end of the last named member will disengage the pawl 11, from the ratchet, to permit rotation of the pinion 7, in a direction from left to right. Thus, in addition to the manually operable release means controlled from the interior of the car, I provide automatic air controlled means operated from the engineer's cab for disengaging the pawl and permitting rotation of the pinion 7 in a direction to permit opening of the door. Directing attention to Figure 1, it will be seen that the vertical edge of the sliding door is provided with a V-shaped pocket 37, into which the V-shaped lug 38 is adapted to be received (also see Figure 6). These details serve to maintain the rack bar in effective mesh, with the pinion, and prevent prying open the door. If desired, the door 5 may be equipped with a plate 39, (see Figure 1), having a tongue 40 to extend across the valve operating handle 22, to prevent movement of the latter in a predetermined direction.

Directing attention now to the other embodiment of the invention, as seen in Figures 12, 13 and 14, etc., it will be seen that a refrigerator car body is represented by the reference character 41. In this form of car, a pair of hingedly mounted doors 42 are provided, one door overlapping the other, in the usual way. Appropriate locking means 43 is provided for the overlapping end. In this form of the invention, overlapping sections of the door is provided on its inner side and adjacent its top with a keeper, in the form of a socket 34. This keeper is disposed on a horizontal plane, and the upper portion of the inner face thereof is bevelled as indicated at 45, (see Figure 13). Adapted to be seated in this keeper is a sliding locking bolt 46, mounted for sliding movement within the casing 47, mounted on the door frame or car body, as shown in the last named figure. The locking bolt 46 is of elongated rectangular design, being frame like, in design with a central transverse partition 48, forming an abutment. The lower end of the bolt is bevelled as at 49, to provide a nose for reception in the keeper. Appropriate retaining bars or guides 50, are mounted in the casing. Like the first form of the invention described, both manual and air controlled means is provided, for releasing the locking bolt. The air release means, in the present instance, comprises a lever 51, which is pivoted between its ends on the pin 52, the free end of the lever projecting into the locking bolt and engaging the abutment 48. The opposite end of the lever is bifurcated and pivotally connected to the stem 53 of the spring pressed plunger 54, slidable in the cylinder 55. Air is supplied in this cylinder, by means of the pipe 21. Obviously, as air enters the cylinder through the last named pipe, and the plunger is moved downwardly, the lever 51 is rocked about its pivot and the nose or free end thereof is engaged in the abutment 48, lifting up on the sliding locking bolt and disengaging it from the keeper 44 and permitting opening of the hinged door. In addition to the air operated means I provide the manually operated arm 56, which is pivoted between its ends on the foresaid pin 52, the free end thereof being engaged with the abutment 48, and the opposite outer end thereof passing through a slot in the casing 47, and cooperating with the apertured end 57, so that it may be selectively held in a stationary position. As in the other form of the invention, a locking pin 58 is provided for this purpose, and if desired, a seal 59 may be used. In both instances, the pistons are returned to inoperative position by means of springs surrounding the stems thereof and confined within the air cylinders. Any air that is left in the cylinder will be scattered therefrom and returned through the pipe 31. In order to release this air, the valve 22 may be of the special design seen in Figure 11. As illustrated, I simply provide a two way rotary plug, and an air escape port in the valve casing. When the major or large port of the plug is turned crosswise, as seen in this figure, the air from the main supply pipe is prevented from passing into the aforesaid air cylinder. However, by disposing the small right angular ports, in alignment with the passage as seen, surplus air can escape from the cylinder through the small aligned ports, in an obvious manner. In both forms of the invention, as the closure of door is moved to closed position, the locking means automatically locks it in such position, and the door cannot be opened unless the release means is operated. In one instance, the manual release means may be operated from the interior of the car for permitting opening of the door, and in the other instance the air can be turned on for simultaneously releasing all of the locking devices in the various cars from which the train is made up. If, at any time, it is desired to prevent the passage of air into any one of the cars, the valve 22 in the respective pipe 21 can be turned off. Under normal conditions, however, all of the valves 22 will remain open, so that when the main control valve is opened, all of the doors will be released, to permit them to be manually moved to open position.

I believe that after carefully considering

the detailed description, in conjunction with the drawings, persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the construction and method of operation. In view of this, a more lengthy description of the invention is thought unnecessary.

While I have shown and described the preferred embodiment of the invention and the particular arrangement of details, I wish it to be understood that any changes coming within the field of invention claimed may be resorted to, if desired.

I claim:

1. In a structure of the class described, a casing, a shaft extending crosswise of the casing, a pinion mounted upon said shaft, a ratchet wheel carried by said pinion, said casing having a slot at one side thereof through which the teeth on said pinion project, a pivotally mounted dog arranged in said casing and cooperable with said ratchet wheel for compelling rotation of the pinion in one direction, a manually moved strip mounted adjacent said pawl and having means on one end for disengaging said pawl from said ratchet, an air cylinder mounted in said casing, a plunger slidably mounted in said cylinder, the rod of said plunger extending through one end of the cylinder, an arm pivotally mounted in said cylinder, said rod being engageable with said arm for moving it upon its pivot, and a connection between the opposite end of said arm and the aforesaid dog for disengaging the dog from the ratchet when the piston is moved in a predetermined direction in said cylinder.

2. In a structure of the class described, a casing adapted to be mounted on a relatively stationary part, a keeper adapted to be mounted upon the relatively movable part, a locking bolt slidably mounted in said casing and adapted for reception within said keeper, a cylinder mounted in said casing, a plunger slidably mounted in said cylinder, a spring for moving said plunger in one direction, the stem of said plunger extending slidably through one end of said cylinder, an air pipe connected with the other end of the cylinder for moving the plunger in an opposite direction, a pivotally mounted lever, said plunger rod being pivoted to one end of said lever, the opposite end of the lever being engaged with said locking bolt, for disengaging the latter from said keeper, and an additional hand operated lever pivotally mounted in said casing and engaging with said locking bolt.

In testimony whereof I affix my signature.

JAMES GARRETT.

Witness:

FRED FOREMAN.