

Feb. 13, 1934.

A. FAZENDIN
DOOR OPERATING MECHANISM

1,946,577

Filed Aug. 27, 1931

3 Sheets-Sheet 1

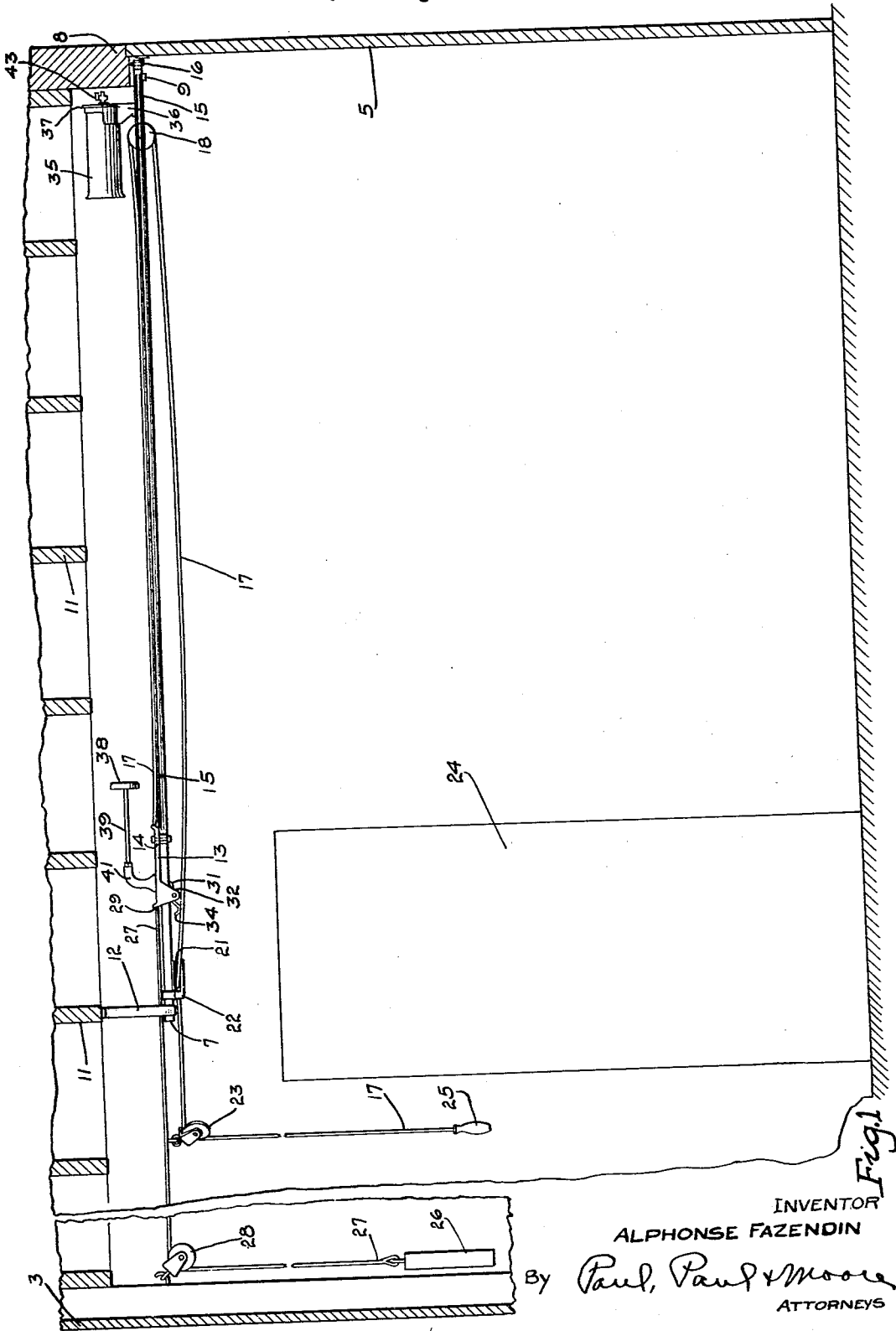


Fig. 1

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3 Sheets-Sheet 2

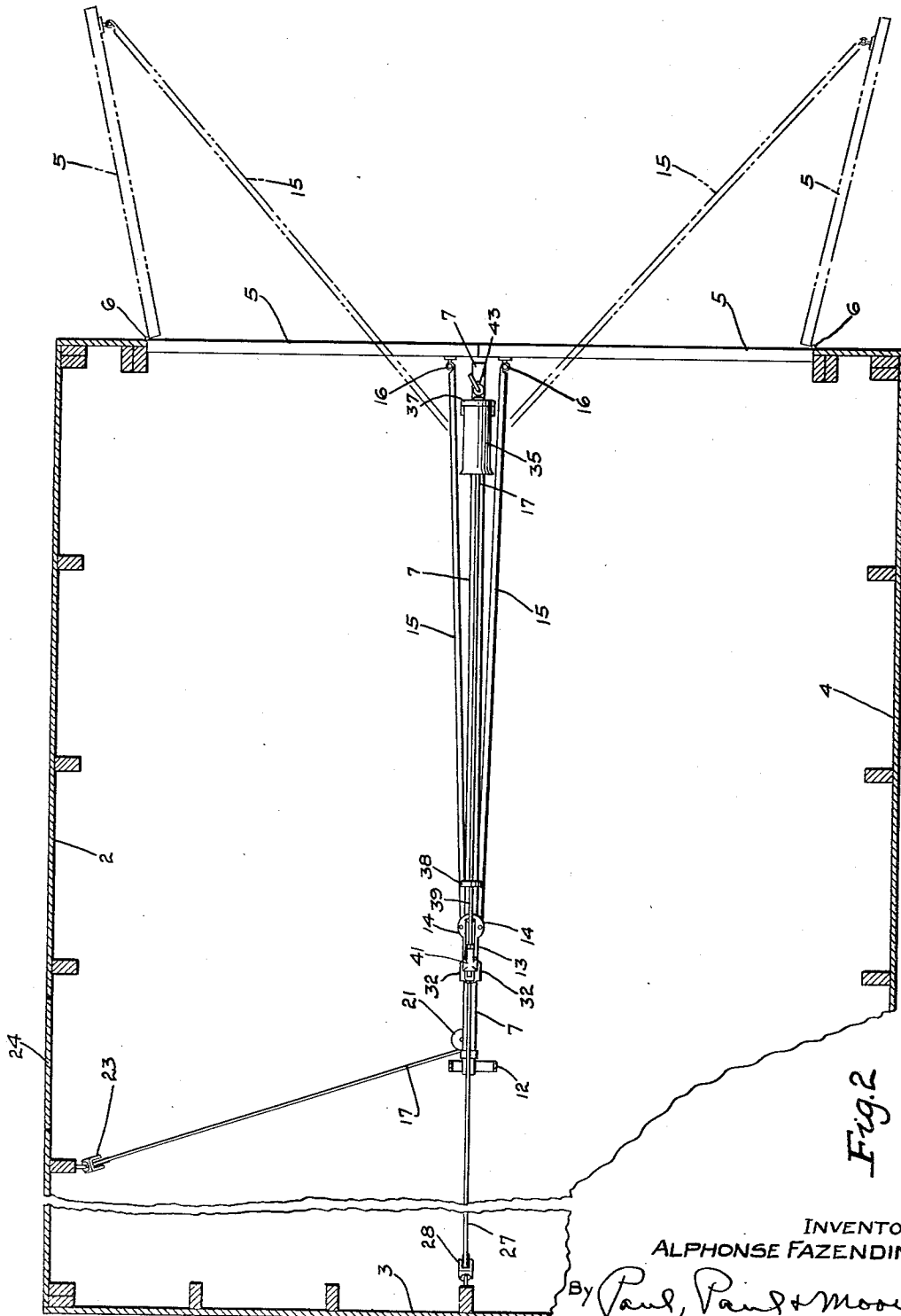


Fig. 2

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3 Sheets-Sheet 3

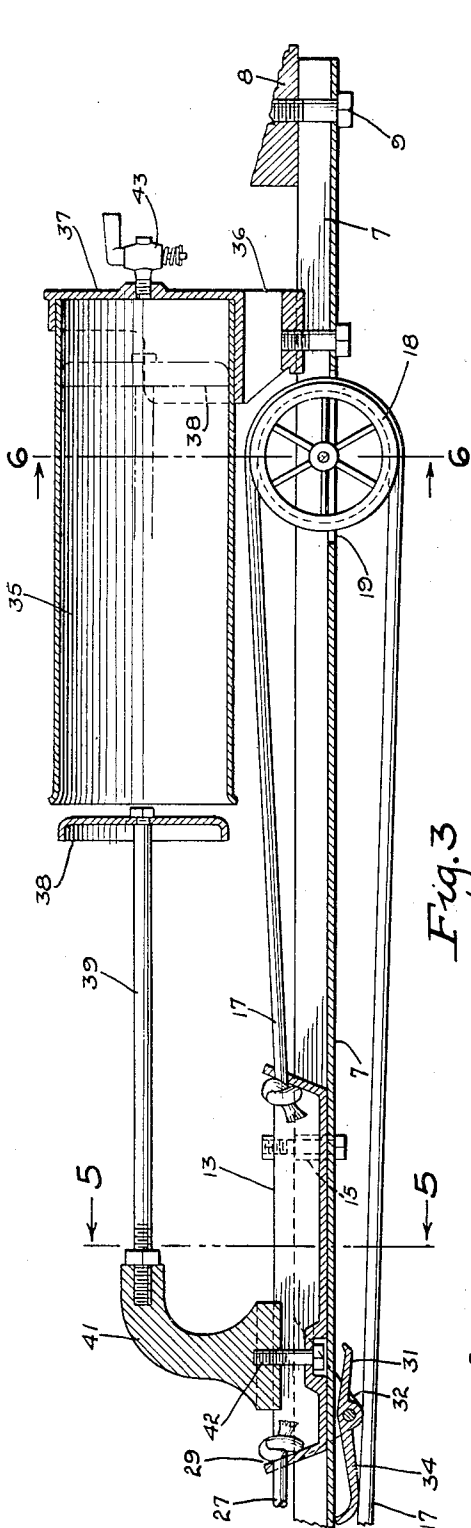


Fig. 3

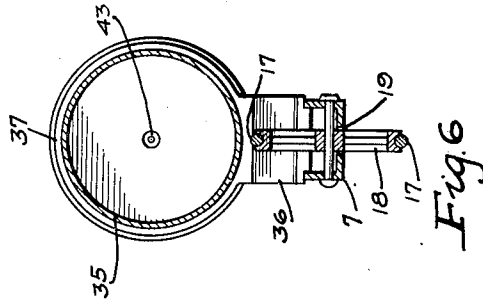


Fig. 6

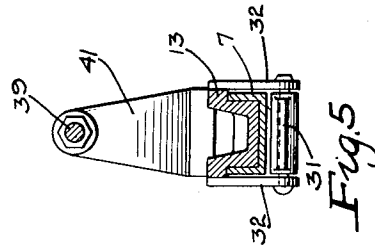


Fig. 5

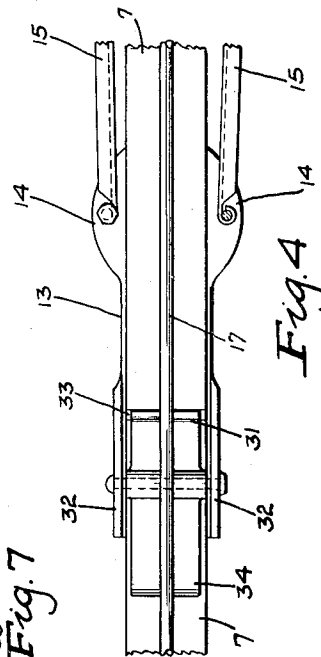


Fig. 4

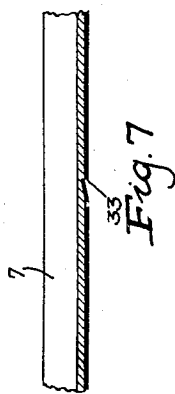


Fig. 7

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UNITED STATES PATENT OFFICE

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DOOR OPERATING MECHANISM

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5 Claims. (Cl. 268—67)

This invention relates to new and useful improvements in mechanisms for opening and closing doors, and more particularly to a door operating mechanism for garage doors.

5 An object of the invention is to provide a simple and inexpensive door operating mechanism which may be readily installed in a garage and connected with the usual doors thereof, and said mechanism having means for holding the doors in
10 open position for a time interval, at the end of which the doors will be automatically closed, thereby allowing the motorist ample time to drive his car out of the garage, after which he may continue on his way without having to get out and
15 manually close the doors.

A further object is to provide a door operating mechanism comprising a fixed rail having a slide mounted thereon and operatively connected with the doors, and means being provided at a
20 convenient location within the garage whereby said mechanism may be operated to open the doors, and said mechanism also comprising a timing device adapted to be rendered operative when the doors are opened to hold the latter
25 in open position for a predetermined time so as to allow the motorist to drive his car out of the garage and continue on his way without stopping to manually close the doors, and at the expiration of said time interval, said timing device is rendered inoperative and said slide released whereby the latter will be moved in
30 a direction to automatically close the doors.

Features of the invention reside in the novel construction of the timing device which comprises
35 a fixed cylinder and a plunger connected to the slide; in the means provided for operating the slide; in the means provided for locking the slide to the rail when in door-closing position, whereby the doors cannot be opened from the exterior of
40 the garage, and, in the simple and inexpensive construction of the entire door operating mechanism whereby the latter may be manufactured at a very small cost.

Other objects of the invention will appear as
45 the description thereof proceeds.

In the accompanying drawings forming a part of this specification,

50 **Figure 1** is a vertical sectional view showing a portion of a garage with the invention embodied in the construction thereof;

Figure 2 is a sectional plan view of a garage showing the manner of connecting the door operating mechanism with the doors thereof;

55 **Figure 3** is an enlarged detail sectional view showing the timing mechanism;

Figure 4 is a bottom view of the rail showing the slide mounted thereon and the means for locking the slide to the rail;

Figure 5 is a cross sectional view on the line 5—5 of **Figure 3**; and

Figure 6 is a cross sectional view on the line 6—6 of **Figure 3**.

In the selected embodiment of the invention here shown, there is illustrated for purposes of disclosure, a garage comprising the usual walls
65 2, 3, and 4 and a pair of doors 5 mounted to swing on suitable hinges 6, so that the doors may be swung outwardly to the dotted line positions shown in **Figure 2**.

The novel door operating mechanism herein
70 disclosed comprises a rail 7 extending from the forward intermediate portion of the garage in a rearward direction, as shown in **Figures 1** and **2**. The forward end of the rail is suitably secured to the usual header 8 of the door opening by such
75 means as a bolt 9, and the opposite end of the rail may be supported from one of the joists 11 by a suitable hanger 12. The rail 7 is preferably of channel cross section, as best shown in **Figures 5** and **6**, and the rail is preferably inverted as
80 shown.

A slide 13 is mounted to slide backwardly and forwardly upon the rail 7 and is preferably shaped cross-sectionally as shown in **Figure 5**, so that it will substantially fit the contour of the inner faces
85 of the rail. The slide is provided at its forward end with outwardly flared portions 14—14 to which a pair of arms 15—15 are pivotally connected, the opposite ends of which are pivotally connected to the doors 5—5, as indicated at 16—16
90 in **Figure 2**. By thus connecting the doors with the slide, when the latter is moved forwardly from the position shown in **Figure 2**, the arms 15—15 will swing the doors outwardly to their open positions as indicated by the dotted lines
95 in **Figure 2**.

The means for operating the slide 13 is clearly shown in **Figures 1, 2, and 3**. To move the slide in a forward direction to open the doors, a suitable flexible element or cable 17 has one end
100 secured to the slide 13 and extends forwardly therefrom and has a running connection with a sheave 18 provided at the forward end of the rail 7. This sheave is preferably mounted in an elongated aperture 19 provided in the bottom web of the rail 7 so that the sheave will be substantially
105 alined with the rail 7. From the sheave 18, the cable 17 extends to the rear end of the rail and passes over a sheave 21 suitably secured to the rail by such means as a bracket 22, and prefer-
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ably horizontally disposed so that the cable may pass from the sheave 21 to a suitable pulley 23 secured to a wall of the garage at a location convenient to the operator, when he enters the garage through the usual slide door 24, which may be provided adjacent the rear portion of the garage as best shown in Figure 2. From the pulley 23, the end of the cable extends downwardly and is provided with a suitable hand grip 25 whereby the operator may conveniently actuate the cable 17. By means of this cable, when the operator or motorist enters the garage, he will grasp the hand grip 25 or cable 17 and pull it downwardly, whereby the slide will be moved forwardly upon the rail 7, thereby causing the doors 5-5 to be swung to open positions, as indicated by the dotted lines in Figure 2.

The means here shown for moving the slide in a direction to close the doors consists of a suitable weight 26 suspended from a cable 27 passing over a pulley 28, preferably attached to the rear wall 3 of the garage, as shown in Figures 2 and 3. From this pulley, the cable 27 extends forwardly and is suitably secured to the rear end of the slide 13, as indicated at 29 in Figure 3. The weight 26 constantly tends to move the slide 13 in a direction to close the doors, whereby a force is constantly exerted upon the doors to move them into their normal closed positions, as shown in full lines in Figure 2.

A feature of this invention resides in the means provided for locking the slide 13 to the rail 7, so as to prevent any one from opening the doors from the exterior of the garage. Such means is here shown as comprising a dog 31 pivotally supported between a pair of depending flanges 32 provided upon the slide 13. This dog is adapted to engage a small shoulder or notch 33 provided in the bottom of the rail 7, as best shown in Figure 7, when the slide reaches its door-closing position, shown in Figure 1. The dog 31 has an end portion 34 preferably shaped as shown in Figures 1 and 3, and adapted to be engaged by the lower run of the cable 17 when the latter is pulled taut in the initial operation of actuating the slide 13. When this cable is pulled taut, it will swing the end portion 34 of the dog upwardly from the position shown in Figure 1 to that shown in Figure 3, whereby the dog will disengage the notch 33 so that the slide may be moved forwardly to open the doors. By thus actuating the dog 31 with the cable 17, the initial pull exerted upon the cable to open the doors will move the dog out of engagement with the notch 33 so as to permit the slide to be moved forwardly. When the slide is moved from the position shown in Figure 3 to that shown in Figure 1, by the action of the weight 26, the dog 31 will automatically drop into the notch 33 to lock the doors in their closed positions. This results because of the cable 17 being sufficiently slack to permit gravity to actuate the dog 31.

Another important feature of this invention resides in the novel timing mechanism provided for temporarily retaining the doors in their open positions, after having been moved to such positions by manipulation of the cable 17.

Such means is best shown in Figure 3, and comprises a cylinder 35 mounted in fixed relation with respect to the rail 7 adjacent the forward end thereof. Preferably, the cylinder 35 is mounted directly upon the rail 7 by means of a suitable bracket 36 which also forms the head 37 of the one end of the cylinder. The opposite end of the cylinder is open and is adapted to receive a suitable piston 38 secured to one end of a rod 39, the opposite end of which is fixed to a bracket 41 suitably secured to the slide 13 by such means as a bolt 42. The piston 38 is axially aligned with the cylinder 35 and moves with the slide as will be clearly understood by reference to Figure 1. A small pet cock or valve 43 is mounted in the head 37 of the cylinder 35 and provides means for regulating the timing mechanism so as to vary the length of time the doors are held open.

In the operation of this novel door operating mechanism, the doors are swung to their open positions, indicated by the dotted lines in Figure 2, by means of the cable 17. As the doors approach their wide open positions, the piston 38 enters the cylinder 35 so that when the doors reach their open positions, the piston will be positioned adjacent to the forward end of the cylinder, as indicated by the dotted lines in Figure 3. The walls of the piston 38 are constructed of a suitable flexible material so that when the piston is traveling forwardly or into the cylinder 35, the air entrapped within the cylinder will escape between the walls of the piston and cylinder so as to prevent an excessive pressure from building up between the piston and the head 37. As soon, however, as the piston reaches the limit of its forward movement, the operator will release his grasp upon the cable 17, whereupon the weight 26 will immediately begin to act to move the slide in the opposite direction. Such movement of the slide 13 will cause the piston 38 to be withdrawn from the cylinder 35, thereby causing a vacuum to build up within the cylinder between the piston 38 and head 37 with the result that movement of the piston within the cylinder is greatly retarded, resulting in the doors being retained in substantially wide open position for a timed interval before the weight 26 can complete the closing thereof. By adjusting the valve 43, the interval at which the doors are temporarily held in open position may be varied as, for example, by adjusting the valve 43 to permit a very small quantity of air to enter the cylinder, the travel of the piston will be greatly retarded, thereby causing the doors to remain open for a comparatively long period. On the other hand, if the valve is opened to permit a relatively greater quantity of air to enter the cylinder, the piston will travel at a relatively higher speed, whereupon the doors will be held open a comparatively shorter length of time before the weight can complete the closing thereof.

In the drawings, I have shown the slide 13 as being adapted to be operated by means of the cable 17 and weight 26. It is to be understood, however, that other applicable means may be provided for operating the slide without departing from the scope of the invention.

I claim as my invention:

1. The combination with a pair of doors adapted for swinging movement, of a mechanism for closing said doors after a timed interval, said mechanism comprising an overhead rail of channel cross-section, said rail being disposed with its side flanges projecting upwardly, a member mounted for sliding movement on and between said flanges and carrying a plunger, means operatively connecting the member to the doors, means constantly urging the member in a direction to close the doors, a cylinder secured to the rail in axial alinement with said plunger and adapted to receive the latter only when the doors are in wide open position, whereby the initial closing movement of said doors will be retarded,

and a cable having one end secured to said member and having running connections with suitable sheaves provided on said rail whereby the member may be manually operated to open the doors.

2. The combination with a pair of doors adapted for swinging movement, of a mechanism for closing said doors after a timed interval, said mechanism comprising a rail having a slide mounted thereon and operatively connected with the doors, means constantly urging said slide in a direction to close the doors, a cylinder secured to the rail adjacent to one end thereof, a plunger secured to the slide and positioned above the rail and adapted to be received in the cylinder, when the doors are in open position to thereby retard their initial closing movement, and means for locking the slide against movement when the doors are in closed position.

3. The combination with a pair of doors adapted for swinging movement, of a mechanism for closing said doors after a timed interval, said mechanism comprising an overhead rail of channel cross-section, said rail being disposed with its side flanges projecting upwardly, a member mounted for sliding movement on and between said flanges and carrying a plunger, means for operatively connecting said member to the doors, means constantly urging the member in a direction to close the doors, a cylinder secured to the rail in axial alinement with said plunger and adapted to receive the latter only when the doors are in wide open position, whereby the initial closing movement of said doors will be retarded, a latch carried by the member for locking the latter to the rail, and a flexible element having one end secured to the member and by which said member may be operated in a direction to open

the door, said latch having an extension positioned in the path of the element, whereby when a pull is exerted upon the element, said latch will automatically be moved into inoperative position by said element to thereby permit the member to be actuated.

4. The combination with a pair of doors adapted for swinging movement, of a mechanism for locking said doors in open position for a timed interval, said mechanism comprising an overhead rail, a member mounted for sliding movement on said rail and carrying a plunger, means operatively connecting the member to the doors, means constantly urging the member in a direction to close the doors, a cylinder secured to the rail in axial alinement with said plunger and adapted to receive the latter only when the doors are in wide open position, whereby the initial closing movement of said doors will be retarded, and a cable having one end secured to said member, whereby the latter may be manually operated to open the doors.

5. The combination with a building having a doorway provided with a pair of doors mounted for swinging movement, of an overhead rail, a member mounted to slide on said rail and having arms connecting it with said doors whereby the doors are adapted for simultaneous movement, a cylinder fixedly mounted at one end of said rail, a plunger movable with said slide and positioned to be received in said cylinder only when the doors are opened to permit the passage of a vehicle through the doorway, whereby said cylinder and plunger will temporarily lock the doors in open positions, and means for manually actuating said member to open the doors.

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