This invention relates to an overhead operating garage door construction, and has for its primary object the design and co-relation of a plurality of devices, whereby the door, upon reaching its closed position, will be automatically locked, but is capable of being manually released, and when the door approaches and finally reaches its fully open position, it will be retarded in its sliding action, thereby greatly increasing the silent action of the door and greatly reducing the shock to which parts of overhead operating types of door structures are subjected.

An object of the invention resides in the combination and co-relation of a manually operated releasing device and an automatically operated retarding device, the first functioning to hold the door in closed, locked position, and the latter functioning as a bumper, or retarding device, as the door reaches its final open position.

A feature of the invention resides in the novel design of the component parts of the retarding device, whereby the door will automatically be subjected to a yieldable, retarding action as the same approaches its final open position.

Another object of the invention resides in the inclined relation of the auxiliary track with the main track, and the arrangement of the bumper springs, whereby the door is not only subjected to a yieldable bumper action when approaching its final open position, but is also subjected to a retarding action.

With these and other objects in view, the invention will be better understood from the following detailed description, taken in conjunction with the accompanying drawing, wherein:

Figure 1 is a vertical sectional view of my improved door construction in closed position.

Figure 2 is a view similar to Figure 1, showing the door approaching its final open position.

Figure 3 is a large side elevation of the retarding device.

Figure 4 is a cross sectional view on line 4—4 of Figure 3.

Again referring to the drawing, illustrating one of the many constructions of my invention, the numeral 1 designates a door frame forming a door opening 2. The door 3 for closing the opening 2 consists of a plurality of panels 4 hinged together, as indicated at 5, and carrying guide rollers 6 operating along a guide track 7, that consists of a vertical portion 8 and a horizontal portion 9.

The door is raised by any suitable type of counterbalancing mechanism 10. The particular type illustrated includes a coil spring 11 having a flexible cable connection 12 with the door, the connection 12 passing around guide pulleys 13.

Associated in a novel combination with the door is a locking and releasing device 14 and a retarding device or bumper 15, the former functioning to lock and release the door when in its vertical closed position, and the latter functioning to automatically retard and absorb shocks as the door approaches and finally reaches its fully open position.

The locking and releasing device 14 consists of an attaching plate 16 having upstanding ears 17 to which is pivotally connected the intermediate portion of a lever 18. One end of the lever 18 carries a roller 19 having an axle 20 in direct vertical alignment with the pivot of the lever so that the roller may directly engage the top edge of the door, as shown in Figure 1, to prevent the rising thereof by the counterbalancing mechanism 10. A spring 21 automatically swings the roller to the position just mentioned and to assure accurate vertical alignment of the connected axle 20, the pivot of the lever 18, and the top edge of the door, an adjusting screw 22 is mounted in the lever, and this screw contacts with the plate 16.

As the spring 21 functions to automatically move the catch to locking position, manually operated means are provided for swinging the device 14 to an unlocking position, consisting of a cable 23 passing around guide pulleys 24 and terminating in a handle 25 by means of which the cable 23 may be subjected to a pull for swinging of the device 14 to an unlocking position.

The retarding device or bumper 15 consists of an auxiliary track 26 pivotally connected to the main track, as indicated at 27. The track surface 28 of this auxiliary track extends at an angle to the track surface 29 of the main track and to hold this auxiliary track at this inclination, there is provided a bumper spring 30 mounted around a bolt 31 that is carried by the main track and loosely mounted in the auxiliary track.

The door carries an auxiliary roller 32 which is adapted to ride upon the auxiliary track as the door approaches its final open position. Attention is called to the fact that the correlation of the inclined track surfaces 28 and 29 and the position of the auxiliary roller 32 is such that the roller 32 will gradually depress the auxiliary track as the roller slides along the track surface 28. This depressing of the auxiliary track compresses the spring 30 which thereby causes the spring 30 to function as a bumper spring and, further, increases frictional contact between the
roller 22 and the track surface 28, and between the guide roller 6 and the track surface 29. An important feature of the retarding device resides in the fact that the same is so designed as to perform two functions—act as a bumper, and act as a retarding device—thereby gradually reducing the speed of the traveling door when it approaches its final open position, and yieldedly absorbing shocks created by the door in the reaching of its final open position.

Of course, it is to be understood that the various structural details of the locking and releasing device and the structural details of the roller device or bumper may be changed in many ways. Therefore, my invention is not to be limited in any manner whatsoever except as set forth in the following claims.

What I claim is:

1. An overhead door structure of the character described comprising: a door frame forming a door opening, a door slidably mounted in relation to the door frame for movement to opening position and to closing position, guide rollers carried by the door, a guide track having its inside portion in engagement with said rollers for guiding the door in its movements, an auxiliary track section mounted on the outside portion of the guide track and yieldably held in inclined relation with respect to the associated guide track and to the direction of the door when moving to its opening position, and means carried by the door in a plane parallelizing that of the guide rollers thereon and disposed outside the guide track for riding engagement with said auxiliary track section whereby said guide rollers, because of their engagement with the guide track, will cause said means carried by the door to wedgily ride over the auxiliary track section and forcibly depress the same, thereby gradually retarding the door in its final opening movement.

2. An overhead door structure of the character described comprising: a door frame forming a door opening, a door slidably mounted in relation to the door frame for movement to opening position and to closing position, guide rollers carried by the door, a guide track having its inside portion in engagement with said rollers for guiding the door in its movements, spring means connected to the door and normally acting to urge the same to its opening position, an auxiliary track section mounted on the outside portion of the guide track and yieldably held in inclined relation with respect to the associated guide track and to the direction of movement of the door when moving to its opening position, and means carried by the door in a plane parallelizing that of the guide rollers thereon and disposed outside the guide track for riding engagement with said auxiliary track section whereby said guide rollers, because of their engagement with the guide track, will cause said means carried by the door to wedgily ride over the auxiliary track section and forcibly depress the same, thereby gradually retarding the door in its final opening movement.

3. An overhead door structure of the character described comprising: a door frame forming a door opening, a door slidably mounted in relation to the door frame for movement to opening position and to closing position, guide rollers carried by the door, a guide track having its inside portion in engagement with said rollers for guiding the door in its movements, spring means connected to the door and normally acting to urge the same to its opening position, and means releasably engageable with the door for maintaining the same in its closing position against the normal action of said spring means, an auxiliary track section arranged on the outside portion of the guide track and yieldably held in inclined relation with respect to the associated guide track and to the direction of movement of the door when moving to its opening position, and an auxiliary roller carried by the door in a plane parallelizing that of the guide rollers thereon and disposed outside the guide track for riding engagement with said auxiliary track section whereby said guide rollers, because of their engagement with the guide track, will cause the auxiliary roller to wedgily ride over the auxiliary track and forcibly depress the same, thereby gradually retarding the door in its final opening movement against the action of the spring means when released by said releasable door engageable means.

4. An overhead door structure of the character described comprising: a door frame forming a door opening, a door slidably mounted in relation to the door frame for vertical movement to closing position and for horizontal movement to opening position, guide tracks having their inside portions in engagement with said rollers and having contiguous vertical and horizontal portions for guiding the door in its movements, counterbalancing means connected to the door and normally acting to urge the same into its horizontal opening position, means releasably engageable with the door for maintaining the same in its vertical closing position against the normal action of said counterbalancing means, an auxiliary track section arranged on the outside of the horizontal portion of each guide track and yieldably held in inclined relation with respect to said horizontal portion of the associated guide track and in the direction of movement of the door when moving to its opening position, and means carried by the door in a plane parallelizing that of the guide rollers thereon and disposed outside the guide tracks for riding engagement with said yieldably inclined auxiliary tracks whereby said guide rollers, because of their engagement with the guide tracks, will cause the auxiliary rollers to wedgily ride over the auxiliary tracks and forcibly depress the same, thereby gradually retarding the door in its final opening movement against the action of the counterbalancing means when released by said releasable door engageable means.

5. An overhead door structure of the character described comprising: a door frame forming a door opening, a door consisting of a plurality of hinged panels slidably mounted in relation to the door frame for vertical movement to closing position and for horizontal movement to opening position, guide rolls carried by the panels of said door, guide tracks having their outside portions in engagement with said rollers and having contiguous vertical and horizontal portions for guiding the door in its movements, counterbalancing means connected to the door and normally acting to urge the same into its horizontal position, means releasably engageable with the door for maintaining the same in its vertical closing position against the normal action of said counterbalancing means, an auxiliary track section arranged on the outside of the horizontal portion of each guide track and yieldably held in inclined relation with respect to said horizontal portion of the associated guide track and to the direction of the door when moving to its opening position, and auxiliary rollers carried
by said uppermost panel of the door in a plane paralleling that of the guide rollers thereon and disposed outside the guide tracks for riding engagement with said yieldably inclined auxiliary tracks whereby said guide rollers, because of their engagement with the guide tracks, will cause the auxiliary rollers to wedgingly ride over the auxiliary tracks and forcibly depress the same, thereby gradually retarding the door in its final opening movement against the action of the counterbalancing means when released by said releasable door engageable means.

6. An overhead door structure of the character described comprising: a door frame forming a door opening, a door consisting of a plurality of hinged panels slidably mounted in relation to the door frame for vertical movement to closing position and for horizontal movement to opening position, guide rollers carried by the panels of said door, guide tracks having their inside portions in engagement with said rollers and having contiguous vertical and horizontal portions for guiding the door in its movements, counterbalancing means connected to the door and normally acting to urge the same into its horizontal position, means releasably engageable with the door for maintaining the same in its vertical closing position against the normal action of said counterbalancing means, an auxiliary track section' arranged on the outside of the horizontal portion of each guide track and yieldably held in inclined relation with respect to said horizontal portion of the associated guide track and to the direction of the door when moving to its opening position, and auxiliary rollers carried by said uppermost panel of the door in a plane paralleling that of the guide rollers thereon and disposed outside the guide tracks for riding engagement with said yieldably inclined auxiliary tracks whereby said guide rollers, because of their engagement with the guide tracks, will cause the auxiliary rollers to wedgingly ride over the auxiliary tracks and forcibly depress the same, thereby gradually retarding the door in its final opening movement against the action of the counterbalancing means when released by said releasable door engageable means, and means associated with said auxiliary track sections for controlling the yielding action of the latter.

7. In a door structure, the combination with a door mounted for sliding movement and provided with guide rollers and a guide track therefor for guiding the door in its sliding movement, of a combined door retarding and shock absorbing device including an auxiliary track section arranged on the outside of the guide track adjacent its end portion and yieldably held in inclined relation with respect thereto, and means carried by the door in a plane paralleling that of the guide rollers thereon and disposed outside the guide track for riding into wedging engagement over said yieldable auxiliary track section, whereby said guide rollers, because of their engagement with the guide track, will cause said means carried by the door to wedgingly ride over the auxiliary track section and forcibly depress the same, thereby gradually retarding the door upon reaching the end of its closing movement.

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