

Nov. 3, 1936.

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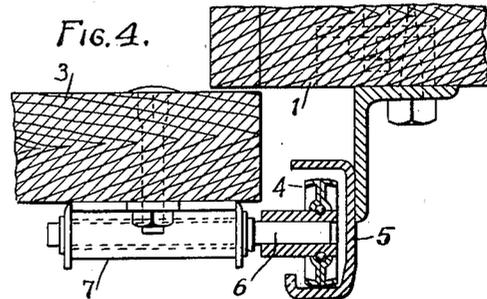
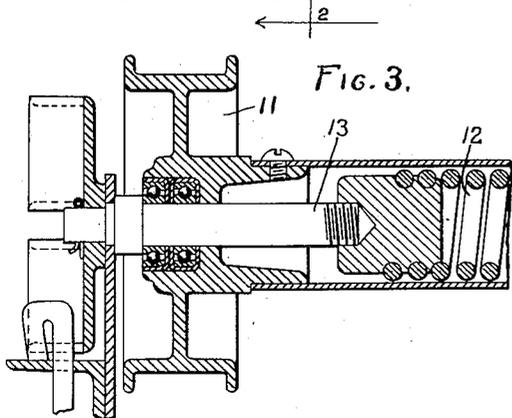
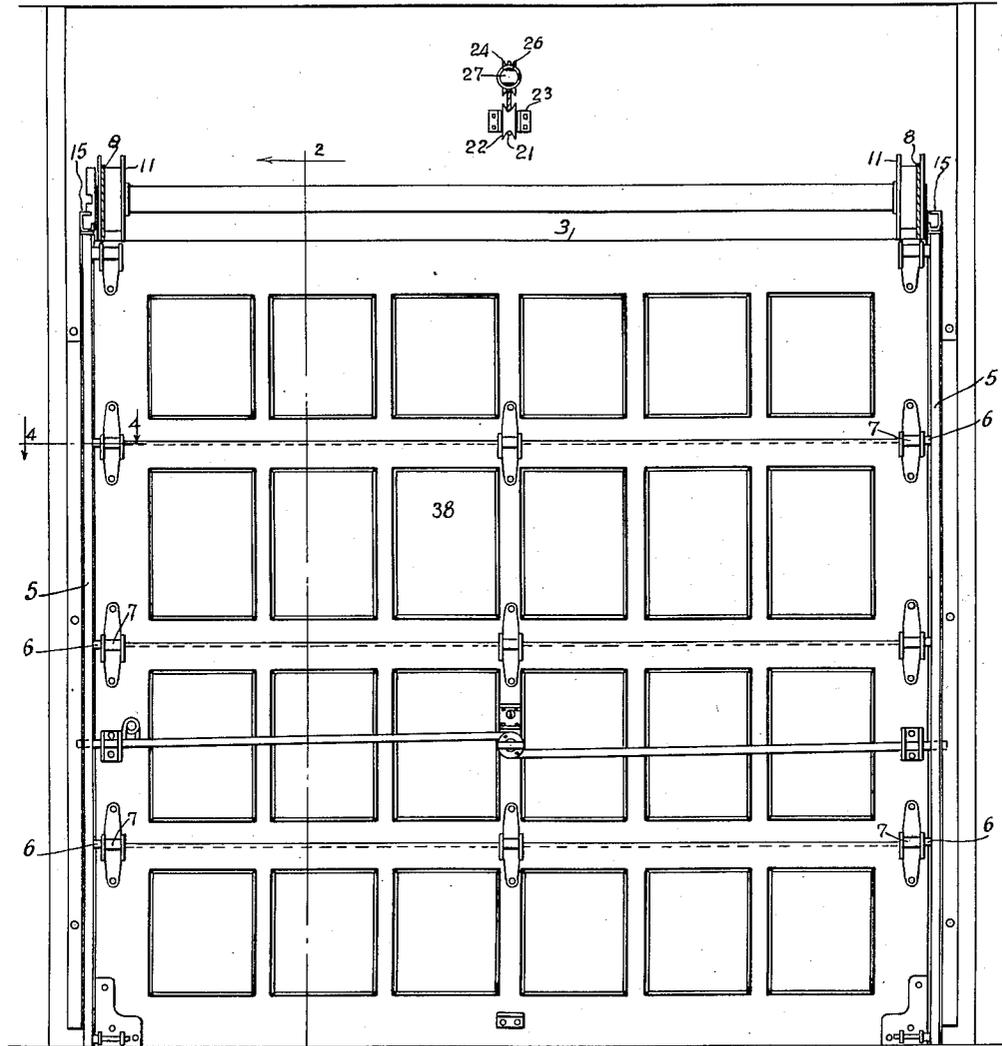
2,059,833

AUTOMATIC SAFETY OVERHEAD DOOR CLOSER

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6 Sheets-Sheet 1

FIG. 1.



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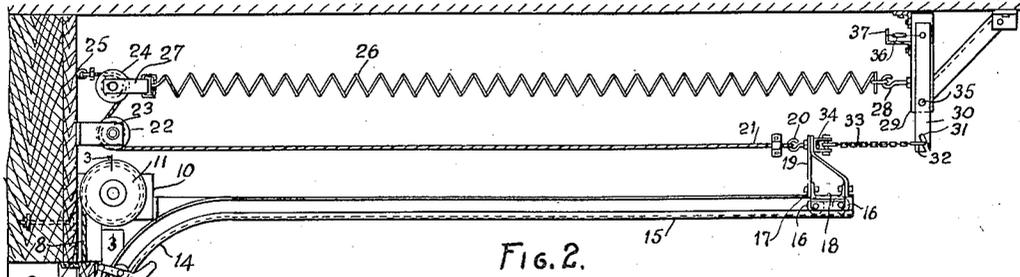


FIG. 2.

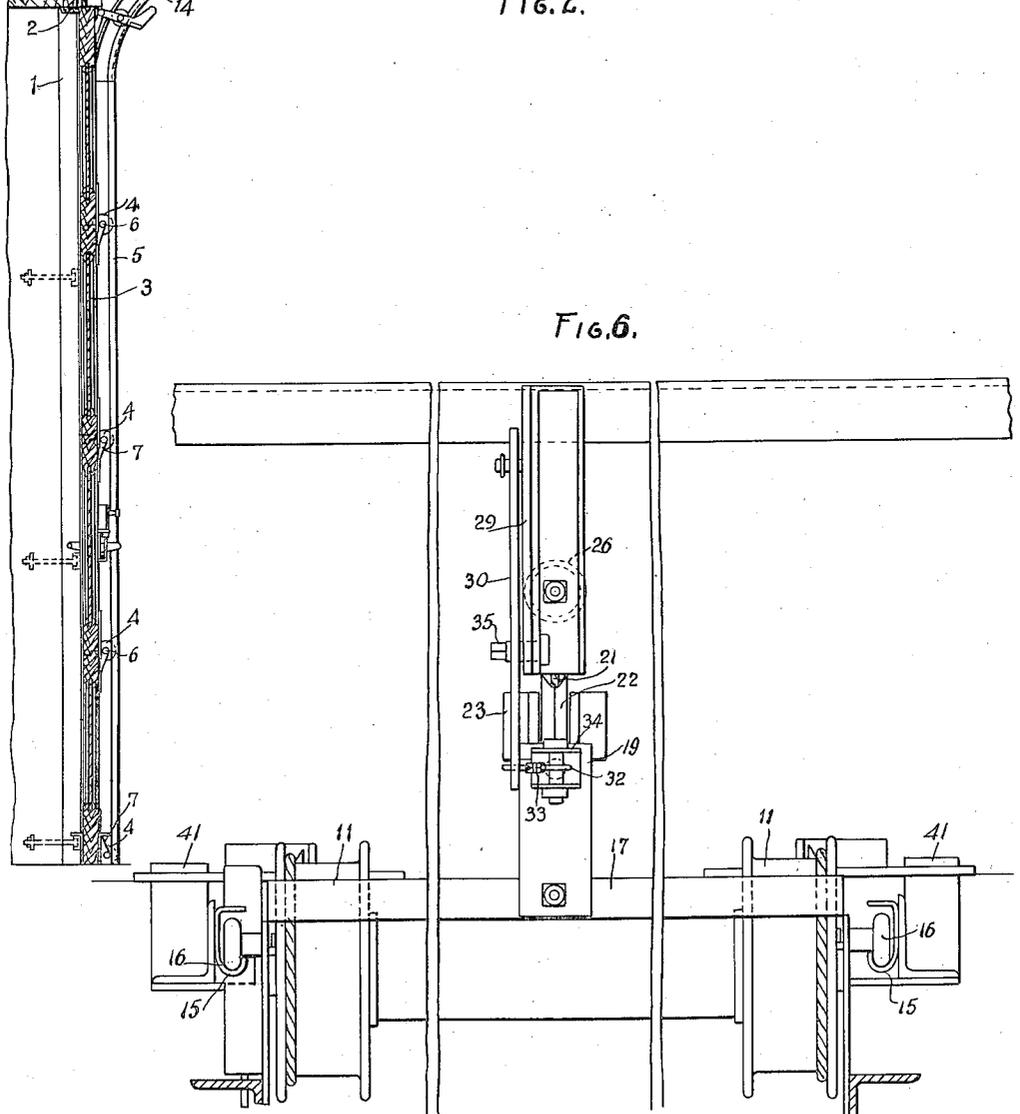


FIG. 6.

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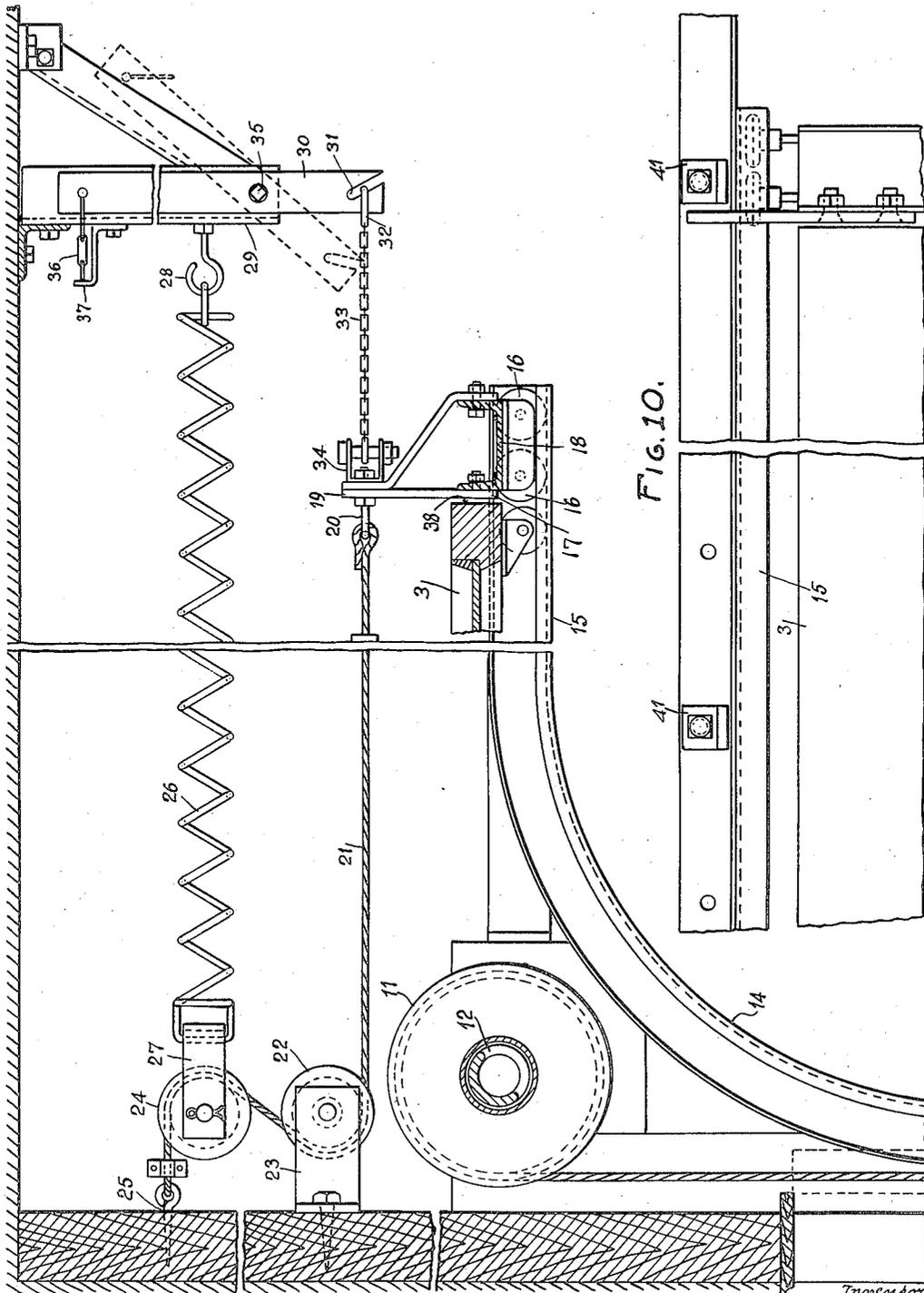


FIG. 5.

FIG. 10.

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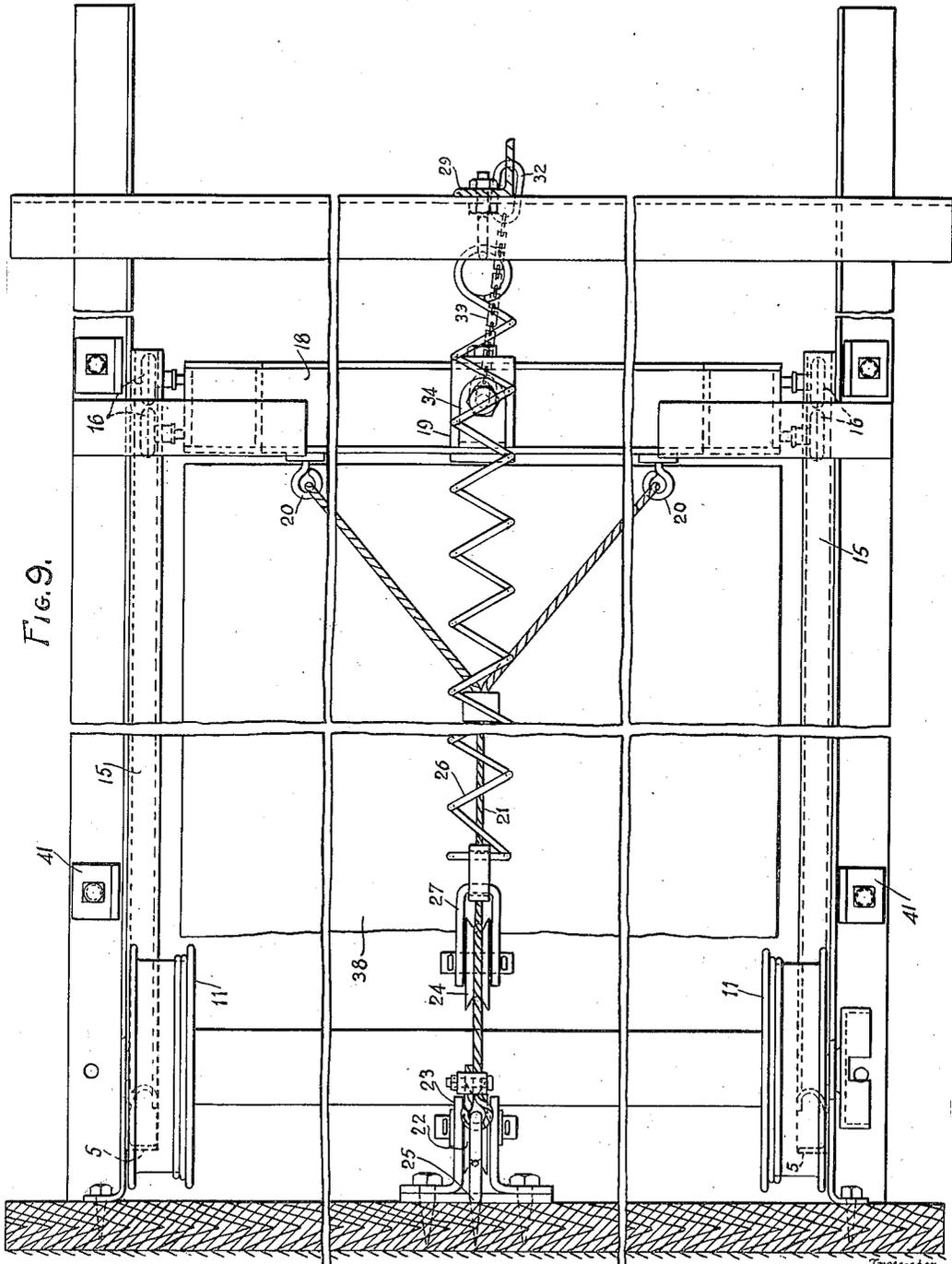
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AUTOMATIC SAFETY OVERHEAD DOOR CLOSER

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

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AUTOMATIC SAFETY OVERHEAD DOOR CLOSER

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Application February 27, 1935, Serial No. 8,515

11 Claims. (Cl. 20—20)

My invention relates to overhead doors, and in particular to a counterbalanced overhead door which may be easily raised or lowered by hand, and is so constructed that it will remain in any desired position between fully open and fully closed position.

The overhead type of door is constructed in any practical size to fit an existing opening. When the size of the door does not exceed 150 square feet, the door is usually operated by hand and is commonly termed the "push-up" type. When the door is built in larger sizes than 150 square feet, it is usually equipped with a spur gear reduction system operated by an endless chain, and is commonly termed a "chain gear" door. Both types of doors are counterbalanced, and the invention is equally applicable to either type.

The particular object of the present invention is to provide a normally inoperative mechanical means for closing the door positively, which means is brought into operation upon the failure of a connecting part that holds this operating means inoperative. This failure will take place as in the case of a fire. It is the object to provide this means for forcibly closing the balanced overhead door when the abnormal condition arises.

It is a further object to provide a means for forcibly and rapidly closing an overhead type of door in case of any other emergency when such forcible closure may be governed at the discretion of the operator located at a remote distance from said door.

It is a further object to provide such a means which can be furnished as an attachment to existing overhead doors of any make, and they will thereby be equipped to close in case of fire by the automatic operation of the door-closing means of this invention.

Referring to the drawings:

Figure 1 is an inside front elevation of an overhead door.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a detail side elevation of the application of this invention to the top of an overhead door.

Figure 6 is a rear elevation thereof.

Figure 7 is a top plan view of the mechanism of Figure 5.

Figure 8 is a view similar to to Figure 5 but a modification thereof.

Figure 9 is a top plan view of Figure 8.

Figure 10 is a top plan view of one side of the carriage, rail and stop.

Referring to the drawings in detail, the numeral 1 designates the side of a door frame and 2 the top. The numeral 3 designates an overhead type of door having a plurality of articulated sections. This door is guided by the rollers 4 in the track 5. The rollers are carried upon the pintle pin 6, mounted in the sleeve 7, on the face of the door 3.

The bottom of the door is connected to a cable 8 winding on drums 11, which is actuated by a spring 12 that is connected to the pipe shaft at one end and to a stationary support 13 at the other end. The purpose of this spring is to act as a counterweight spring to counterbalance the door so it can be easily raised and lowered.

The track 5 is provided with an arcuate overhead portion 14 and a horizontal overhead portion 15. There is a similar track on each side of the door. Mounted in this track, in the horizontal portion 15, is a traveling trolley comprising the wheels 16, mounted in the bracket 17, which in turn is connected to the transverse angle iron member 18. This transverse angle iron member 18 carries 3 brackets 19. The bracket 19 carries on its forward face eyes 20, which are connected to a Y connection of cable 21 that passes around a pulley 22 mounted on the bracket 23 on the wall of the building. This cable as it passes around the pulley 22 passes around a floating pulley 24, and thence is anchored in the building at 25.

An auxiliary spring for forcing the door, when open, down into closed position is designated 26. One end is connected to the floating pulley 24 by the strap 27, and the other end is connected to a hook 28. The hook 28 is mounted upon a bracket 29, which is carried on the building. The bracket 29 also carries a slotted member 30. The slot 31 in this member is engaged by a hook or loop 32, which in turn is connected to the chain 33, to an anchor 34 on the bracket 19. The member 30 is pivoted on the bracket 29 at 35. It is restrained against pivotal movement by the fusible link 36, connecting it to the bracket 37 on the support 29.

In operation, if the temperature rises sufficiently to fuse the link 36 and permit it to break, the arm 30 swings on the pivot 35 and releases the hook 32 and cable 33. As the frame 19 and associated mechanism engage with the door, indicated at 38, it will force the door downwardly into closing position, overcoming the balance of the spring 12. The energy released, which has been stored in the auxiliary spring 26, furnishes the motive power for forcing the door into closed position.

Referring to Figure 8, which is a modification of Figure 5, the fusible link may be anchored at 39 and connected by the chain 40 to the upper end of the swinging member 30. This

link 36 may therefore be located at any place where there is a likelihood of the quickest action, in the case of an undue rise of temperature necessitating the closing of the door.

5 The cable 21 is preferably mounted centrally of the door so that the carriage 18 on the trolleys 16 will travel evenly on the brackets 15 and actuate the door 38 evenly. This is assisted by the Y connection of the cable. By suitable regulation of the tension of the spring 26, and by properly locating the stops 41, the door can be given a sufficient impetus downwardly to cause it to come to rest easily on the floor. In the event the door has any tendency to bounce up 15 off the floor, this is taken care of by the adjustments just described. A spring lock may be provided on the door which will catch and hold the door in a closed position.

20 I claim as new and desire to secure by Letters Patent, is:

1. In an overhead door, means for guiding the door vertically and horizontally, and resilient means normally inoperative adapted when released to force the door horizontally and downwardly into a closed position from its open position.

2. In combination, an articulated overhead door, a guiding track therefor, means to counterbalance said door, and normally inoperative means made operative by fusing of a fusible link mounted on said track engageable with said door adapted upon becoming operative to move the door and overcome said counterbalancing means.

3. In combination in an overhead door, of spaced guiding tracks therefor, a carriage supported by and moving upon said tracks and adapted to engage one end of the door, yielding means normally inoperative adapted to actuate said carriage, and fusible link means adapted to normally maintain said carriage inoperative.

4. In combination in an overhead door, of spaced guiding tracks therefor, a carriage supported by and moving upon said tracks and adapted to engage one end of the door, yielding means normally inoperative adapted to actuate said carriage, fusible link means adapted to normally maintain said carriage inoperative, and a counterbalancing means normally operative for maintaining said door in any position but sufficiently strong to resist the movement of said carriage.

5. In combination in an overhead door, of a door and spaced tracks comprising vertical and horizontal portions, a carriage mounted on said spaced horizontal tracks extending from track to track, a cable connected to said carriage on one side, yielding means for moving said cable, a second cable on the other side of the carriage holding it against movement, and fusible means adapted when fused to release the second cable to permit the carriage to move the door.

6. In combination, an overhead articulated door, counterbalancing means therefor comprising a spring connected thereto, track means for guiding the door vertically and horizontally, a carriage mounted on said track means normally held inoperative by means controlled by a fusible link and adapted upon fusing of the link to engage said door yielding means for moving said

carriage to move said door and overcome the counterbalancing means.

7. In combination, an overhead articulated door, counterbalancing means therefor comprising a spring connected thereto, track means for guiding the door vertically and horizontally, a carriage mounted on said track means adapted to engage said door yielding means for moving said carriage to move said door and overcome the counterbalancing means, means to maintain normally said carriage in its inoperative position, and means for releasing said last mentioned means when a predetermined temperature is accomplished at a predetermined point adjacent the door.

8. In combination in an overhead door, of a track, a trolley mounted on opposite tracks, a carriage connecting said trolleys and mounted thereon, a cable connected to said carriage at one end and to an anchorage at the other end, yielding means adapted to maintain said cable in taut condition, means for anchoring the other end of said yielding means, means to restrain the movement of said carriage by said yielding means, and a fusible link anchor for said restraining means.

9. In combination in an overhead door, of a track, a trolley mounted on opposite tracks, a carriage connecting said trolleys and mounted thereon, a cable connected to said carriage at one end and to an anchorage at the other end, yielding means adapted to maintain said cable in taut condition, means for anchoring the other end of said yielding means, means to restrain the movement of said carriage by said yielding means, a fusible link anchor for said restraining means, and means of pivotally mounting said restraining means so that upon rupture of the link it will rotate on its pivot and release the carriage to be operated by said yielding means.

10. In combination in an overhead door, of vertically and horizontally spaced tracks, means for guiding an articulated door thereon, a carriage mounted on said tracks traveling thereon in engagement with the end of the door, a cable connected to said carriage and to an anchorage, yielding means for maintaining said cable under tension, means connecting said yielding means to the anchorage and to said cable, a second cable connected to said carriage and to a swinging retainer, a swinging retainer, and a fusible link for maintaining said swinging retainer against movement.

11. In combination in an overhead door, of vertically and horizontally spaced tracks, means for guiding an articulated door thereon, a carriage mounted on said tracks traveling thereon in engagement with the end of the door, a cable connected to said carriage and to an anchorage, yielding means for maintaining said cable under tension, means connecting said yielding means to the anchorage and to said cable, a second cable connected to said carriage and to a swinging retainer, a swinging retainer, a fusible link for maintaining said swinging retainer against movement, and a cable connected to said door at one end and to the swinging wound drum at the other, whereby said door is counterbalanced until the counterbalancing is overcome by the movement of the carriage against the door.

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