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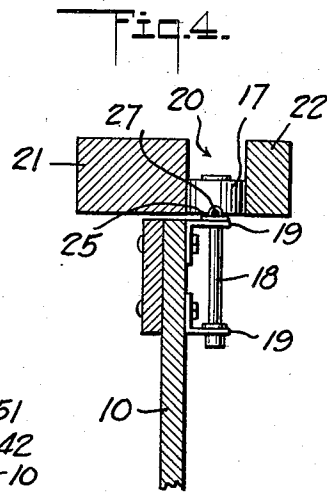
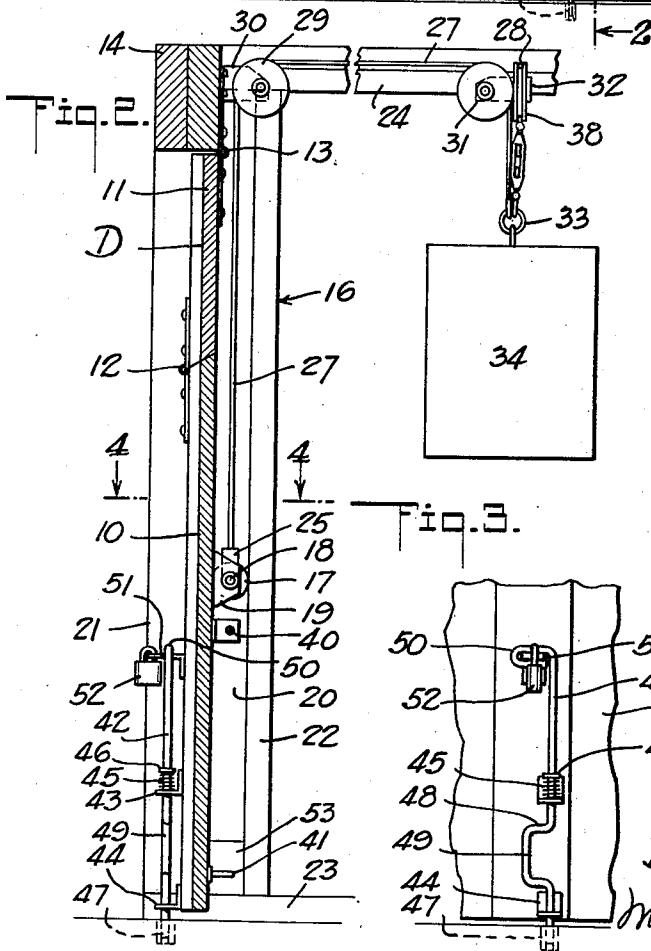
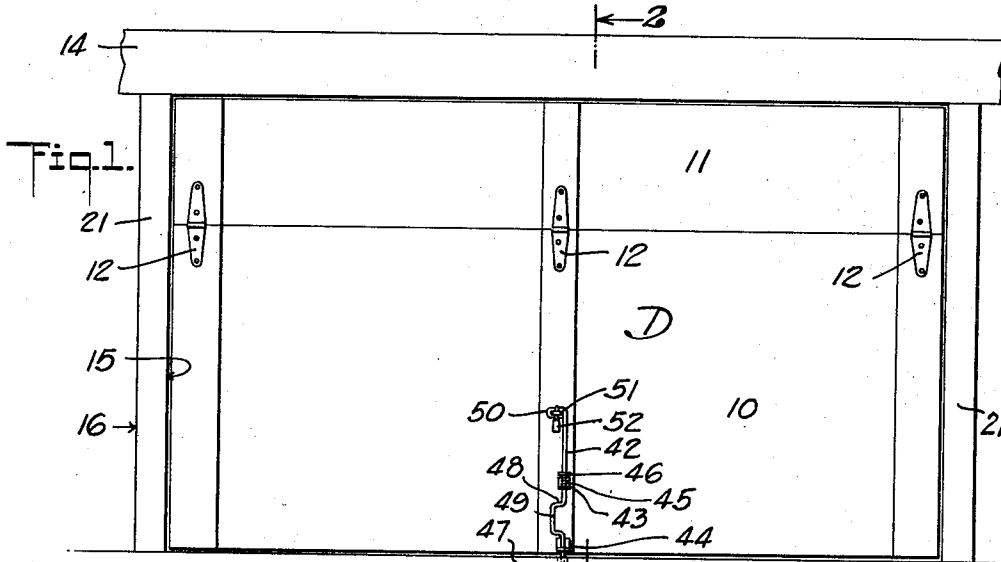
C. V. FRISK

2,211,230

OVERHEAD DOOR

Filed Nov. 9, 1938

2 Sheets-Sheet 1



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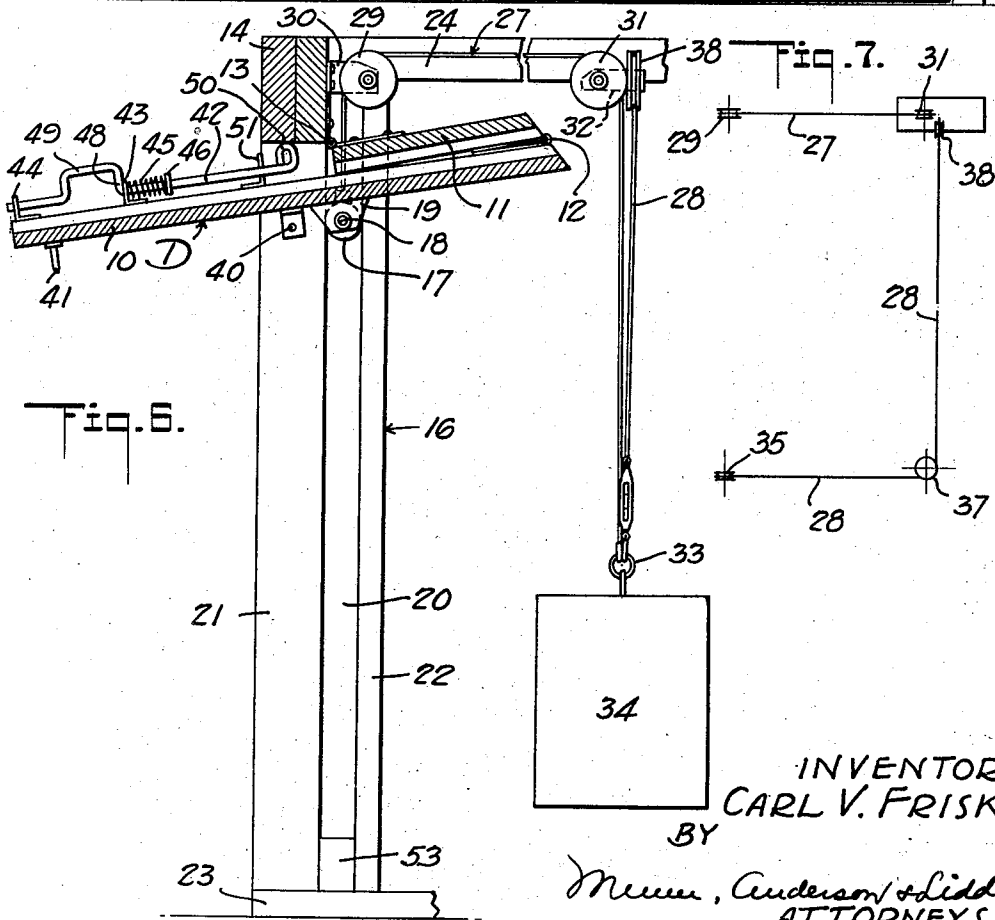
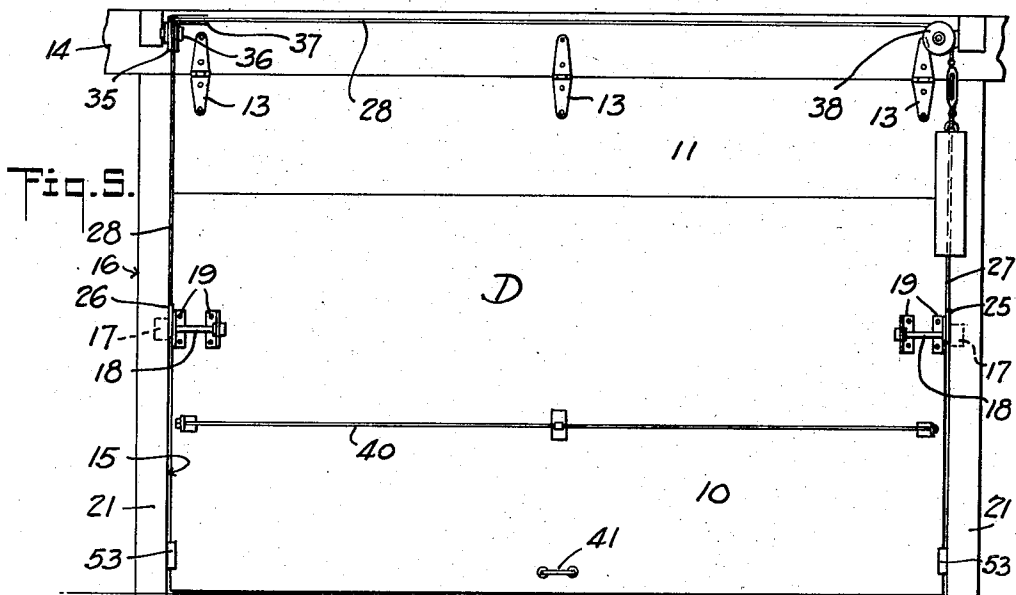
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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OVERHEAD DOOR

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Application November 9, 1938, Serial No. 239,651

2 Claims. (Cl. 20—20)

This invention relates generally to closures, and more particularly to doors of the overhead type, such as are employed for garages and other building structures.

5 An object of this invention is to provide an overhead door which is structurally characterized in such manner that the door will remain in any position to which it is adjusted, by being maintained in a state of substantially perfect balance
10 in all positions from fully closed to fully open position, in which latter the door will be disposed substantially horizontally at the top of the door opening, so as to provide maximum head-
15 room, all while enabling the door to be manually moved to any position with but negligible effort on the part of the operator.

Another object of the invention is to provide a fully balanced overhead door, the mounting of which is such that the door will be positively
20 guided in its movements, and will be maintained in perfect alinement against any and all stresses which may be present, the door being adapted for installation in any type of structure without re-
25 quiring special designing to accommodate the door, and being simple in construction, comparatively inexpensive to manufacture and readily installed.

A further object of the invention is to provide an overhead door embodying a locking mecha-
30 nism of simple and superior construction, which is readily manipulatable to securely lock the door closed and is structurally characterized to be utilized as a handle in moving the door.

With these and other objects in view, the invention consists in the combination and arrange-
35 ments of elements as set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings,

40 Figure 1 is a view showing in outside elevation one form of overhead door embodying this invention;

Figure 2 is an enlarged vertical sectional view taken on the line 2—2 of Figure 1 and showing the door in fully closed position;

45 Figure 3 is a detail view in elevation, of the locking mechanism embodied in the invention;

Figure 4 is an enlarged fragmentary sectional view taken on the line 4—4 of Figure 2;

50 Figure 5 is a view of the overhead door in inside elevation;

Figure 6 is a view similar to Figure 2 but showing the door in fully opened position;

55 Figure 7 is a diagrammatic plan view of the arrangement of pulley and cable mechanism used

in conjunction with a weight to counterbalance the door.

Referring specifically to the drawings, the invention comprises a door D composed of a lower main section 10 and an upper secondary section 5 hingedly connected along one longitudinal edge to the section 10 by hinges 12, and hingedly connected along its other longitudinal edge by hinges 13 to the horizontal header 14 defining the top of a door opening 15 in a building structure 16. 10 The door sections are thus mounted in the door opening for pivotal movement about two horizontal axes defined by the hinges 12 and 13, to occupy the closed position shown in Figure 2 wherein the sections are alined vertically and to 15 occupy the fully opened position shown in Figure 6, wherein the sections are in folded relationship with the section 11 overlying the section 10 approximately horizontally at the top of the door opening. 20

In order to control movements of the sections to occupy the aforesaid positions, guide rollers 17 are mounted on shafts 18 supported by pairs of brackets 19 fixed to the section 10 at a pre-
25 calculated center of gravity location between the hinges 12 and the free edge of the section, and at the opposite edges of the door, as clearly shown in Figure 5.

The rollers 17 work in vertical guideways 20 defined by the vertical side members or studs 21 30 forming the sides of the door opening 15, and other members 22 extending from the bottom plate 23 to the top plates 24 at the inner side of the members 21, to the end that the confined vertical motion of the rollers in the guideways 35 will effect such relative hinging movement of the door sections 10 and 11 about the hinges 12 and 13 as will fold or unfold the sections according as opening or closing movement of the door is effected. 40

Connected to the shafts 18 by links 25 and 26 are flexible cables 27 and 28, the cable 27 being trained over a pulley 29 journaled in a bracket 30 fixed to the header 14, and over a second pulley 31 journaled in a bracket 32 fixed to the top plates 45 24. The cable 27 depends from the pulley 31 and is connected by an eye 33 to a weight 34.

The cable 28 is trained over a pulley 35 journaled in a bracket 36 also fixed to the header 14, and over pulleys 37 and 38 journaled respectively 50 in a bracket 39 and the aforesaid bracket 32. The cable 28 depends from the pulley 38 and is also connected to the eye 33, whereby the weight 34 will constantly exert an upward pull equally upon both sides of the door sufficiently to sub- 55

stantially counterbalance the weight of the door. Thus the door will tend to remain in any position to which it is manually adjusted, and will require but negligible effort on the part of the operator to change its position. The locations of the aforesaid pulleys and cables are such as to be entirely clear of the door opening, and so as to suspend the weight 34 adjacent a side wall of the garage.

The main section 10 of the door is braced with a suitable tie rod 40 and is provided with a handle 41 by which the door can be raised or lowered from its inner side. Mounted on the outer side of the section 10 medially between the ends of the door is a locking mechanism composed of a locking bolt 42 axially slidable and rotatably mounted in brackets 43 and 44 fixed to the door section. A coil spring 45 is mounted on the bolt between the bracket 43 and a collar 46 fixed to the bolt to normally urge the latter to unlocked or retracted position with respect to a keeper 47 in the form of a metal tube embedded in the garage floor. A portion of the bolt is laterally offset to form a stop 48 definitely limiting the unlocked position of the bolt, and providing a handle 49 by which the door can be manipulated.

At its upper end the bolt is provided with an eye 50 adapted to receive an ear 51 on the section 10 when the bolt occupies its locking position, the ear having a suitable opening for the hasp of a padlock 52 to confine the eye against disengagement from the ear and thus maintain the bolt in locking position.

From a consideration of Figures 2, 3 and 6, it will be clear that to unlock the door after removing the padlock 52, it is only necessary to rotate the bolt by the handle 49 sufficiently to clear the eye 50 from the ear 51 so as to render the spring 45 free to move the bolt axially out of engagement with the keeper 46 and thus permit the door to be raised by the handle 49. To lock the door closed, the above operation is reversed, and the padlock 52 re-applied to the ear 51. Thus the bolt 42 performs not only its locking function, but also provides a convenient handle by which it can be manipulated in the manner above described.

The movement of the door to closed position is definitely limited by stops 53 projecting from the studs 21 adjacent the floor of the garage and disposed to be engaged by the section 10 as shown in Figures 2 and 5.

What is claimed is:

1. An overhead door comprising hingedly connected upper and lower door sections; means hingedly connecting the upper door section to a building structure for relative movement of said sections about two horizontal axes; guiding means operatively associated with the lower door section for co-action with the hinged connections in folding the sections one upon the other in a substantially horizontal position in the fully raised position of the door, and in unfolding the sections to a position of vertical alinement in the fully lowered position of the door; said guiding means including an operative connection to the door section, at locations to maintain the locus of the center of gravity of the door substantially parallel to a vertical plane irrespective of the position of the door; two cables connected at one of their ends to the ends of the lower door section substantially in vertical alinement with said center of gravity; pulleys over which said cables are trained; and a single counterweight to which the other ends of the cables are connected at a single location, whereby manual actuation of the door to raise or lower same can be effected from any point between the ends of the door without slackening either cable, to thereby prevent tilting and binding of the door in the building structure.

2. In an overhead door of the type composed of a plurality of hingedly connected sections one of which is hingedly connected to a supporting structure and the other of which is pivotally guided vertically for folding and unfolding movements of the sections according as they are raised or lowered, a plurality of flexible cables; means adapted to connect one end of the cables to the ends of the other door section at the points of pivotal guiding thereof; means guiding the cables in predetermined paths; a single counterweight; and means connecting the other end of the cables to the counterweight at one and the same point, whereby manual actuation of the door to raise or lower same can be effected from any point between the ends of the door without slackening either cable, to thereby prevent tilting and binding of the door in the supporting structure.

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