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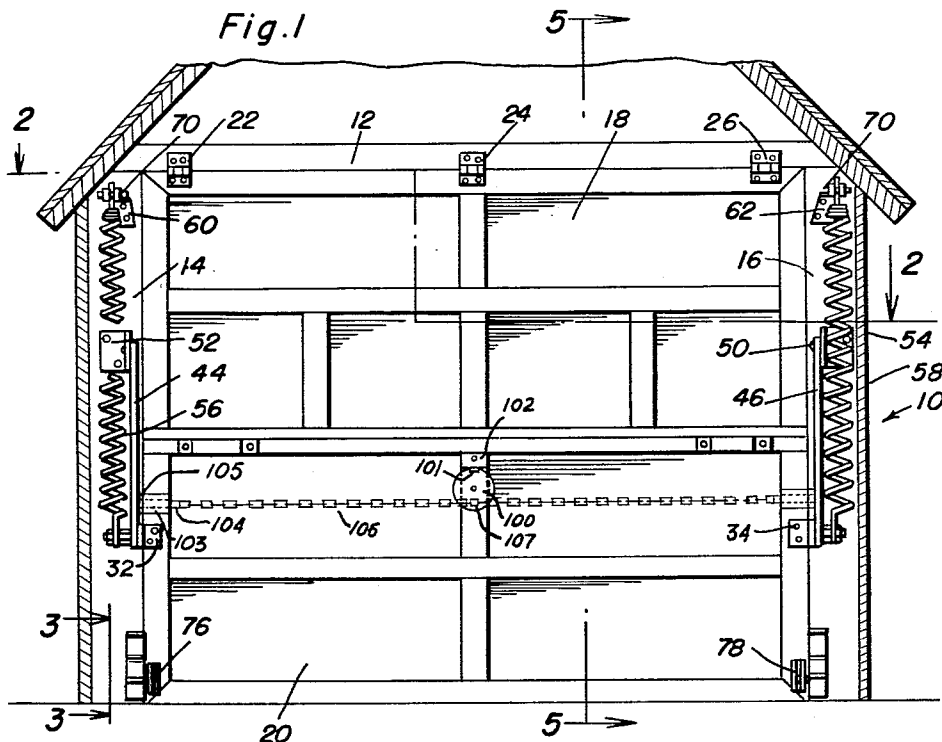
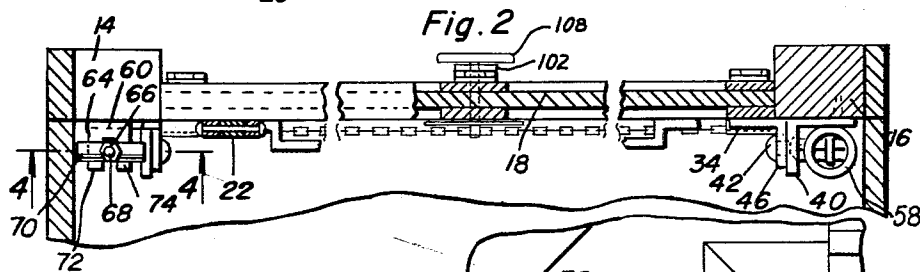
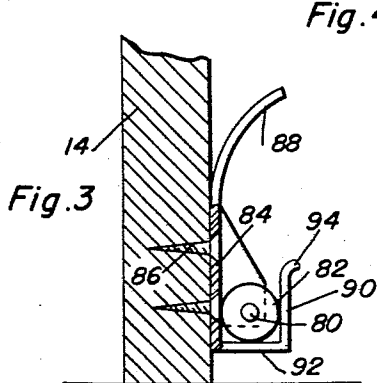
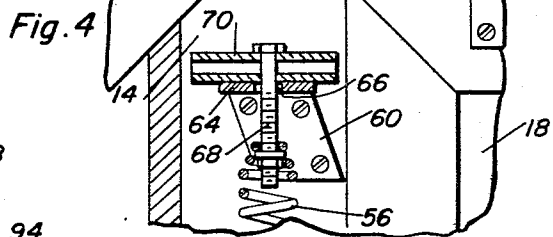
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3,092,173

OVERHEAD DOOR

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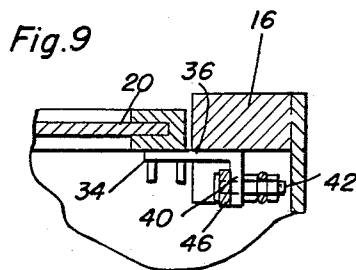


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OVERHEAD DOOR

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2 Claims. (Cl. 160—191)

This invention relates generally to overhead door mechanisms and has for its primary object the provision of improvements in door constructions wherein a neat appearing, yet sturdy door assembly is formed.

Another object of this invention is to provide an improved overhead door construction incorporating upper and lower door panels hingedly secured together in such a manner that the panels fold up upon themselves when closed and wherein the door may be adjusted either to automatically swing upwardly when released from its closed position, to swing upwardly only under the influence of manual pressure, or to be substantially completely counter-balanced whereby only a slight amount of pressure will swing the door either open or closed.

Still another object of this invention is to provide an improved overhead door in conformity with the foregoing objects wherein guide latch members are provided on the door support for cooperation with rollers provided on the lower panel of the door to maintain the door in closed position and prevent inward swinging of the lower edge of the lower panel thereof.

Other objects of the invention are to provide a compact door control mechanism of the class described; to have a novel chain control on a door closure lock; and to provide a door control made from a minimum of parts which are adapted to have a long service life with a minimum of parts.

These, together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an inside vertical section of a building provided with a door, shown in elevation, constructed in accordance with this invention;

FIGURE 2 is a horizontal section taken substantially along the plane of section line 2—2 in FIGURE 1 showing details of construction on an enlarged scale;

FIGURE 3 is an enlarged vertical section taken along the plane of section line 3—3 of FIGURE 1 showing details of the guide latch mechanism;

FIGURE 4 is a sectional view taken through the spring tension adjusting mechanism;

FIGURE 5 is a vertical section taken substantially along the plane of section line 5—5 of FIGURE 1;

FIGURE 6 is a side elevational view of the door assembly immediately after its release from the closed position;

FIGURE 7 is a view similar to FIGURE 6 and showing the door in fully opened position;

FIGURE 8 is a vertical section taken substantially along the plane of section line 8—8 in FIGURE 5; and

FIGURE 9 is an enlarged horizontal section taken substantially along the plane of section line 9—9 in FIGURE 8.

Referring now more particularly to the drawings, reference numeral 10 indicates a structure such as a garage

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or the like which is provided with an entrance at one end bounded by the upper frame member 12 and the vertical side frame members 14 and 16. The door assembly which forms this invention comprises an upper panel portion and a lower panel 20, the details of which form no part of this invention.

The upper door panel 18 is hingedly secured to the frame member 12 of the garage along the upper edge of this door panel by means of any suitable hinge means as for example the three separate hinge assemblies 22, 24 and 26 as illustrated. In lieu of these separate hinge members, a continuous hinge assembly may be provided, it being sufficient only that some hinge means be provided between the upper edge of the panel 18 and the support member 12.

The upper edge of the lower panel member 20 is hingedly secured to the lower edge of the upper panel 18 by means of a hinge member 28 and in this respect it is to be noted that the attaching plates 29 of the hinge member 28 are secured to the opposed edges of the door panels such that when the door is closed, the hinge 28 will be visible from the outside. Also, it will be noted that the pintle 30 of the hinge 28 is offset laterally from the inner surface of the door the purpose of which will be presently apparent.

Fixedly secured to the outer surface of the lower panel 20 are a pair of L-shaped bracket members 32 and 34, each of which includes a leg portion 36 secured at its free end as by fasteners 38 to one side edge of the lower panel 20 and each of which also includes an outstanding leg portion 40 which is apertured for the reception of a pivot bolt member 42. As will be seen most clearly in FIGURES 8 and 9, the leg portions 36 extend laterally beyond the side edges of the lower door panel 20 and overlie in part the side frame members 14 and 16 previously mentioned. Thus, the brackets 32 and 34 provided stop means which bear against the side members 14 and 16 when the door is in a fully closed position.

The brackets 32 and 34 also serve to anchor the lower ends of the guide arms 44 and 46 through the medium of the pivot pins 42. The upper ends of the guide arms 44 and 46 are provided with elongated slots 48 through which pivot pins, or bolts 50 project which are in turn carried by the bracket members 52 and 54 which are secured to the vertical frame members. The elongated slot 48 in the guide arms 44 and 46 provide a slight lost motion connection between these guide arms and the brackets 52 and 54, the purpose of which will be presently apparent.

In addition to the two previously mentioned functions, the brackets 32 and 34 also serve to provide an anchor for one end of the tension spring members 56 and 58 which are rigidly secured at their upper ends to the bracket members 60 and 62 by means of the mechanism which is shown most clearly in FIGURES 2 and 4. Both brackets 60 and 62 are the same and the bracket 60, for example, is provided with a horizontally extending leg portion 64 provided with an inwardly directed notch 66 through which the tension adjusting bolt 68 projects. Carried at the head end of this bolt is a pivot bar member 70 which extends transversely thereof and which may be, as shown, constructed from a short length of pipe and which is adapted to overlie the horizontal leg portion 64 of the bracket. The outer ends of the notched or bifur-

cated portions of the horizontal leg 64 are provided with upturned or vertical extensions 72 and 74 which prevent disengagement of the bar 70 from the bracket such that during opening and closing of the door, provide a bearing surface against which the bar 70 will engage.

Provided on the lower corners of the panel 20 are U-shaped brace members 76 and 78 which carry axle pin members 80 upon which the roller members 82 are journaled. It is to be noted that the rollers 82 are displaced laterally from the opposite side edges of the lower panel and that they will therefore provide stop means limiting the outward swing of the door at that point. To prevent inward swinging of the door at the lower edge of the lower panel, the side frame members 14 and 16 are each provided with a guide bracket member as illustrated in FIGURE 3. Each receiving bracket includes an inner leg member 84 secured to the corresponding frame member as by means of fasteners 86 and which is provided with an arcuately deformed upper end portion 88 in the manner shown. An outer leg 90 is connected to a bight 92 to the lower end of the inner leg 84 and extends in parallelism with the lower portion thereof so as to provide in conjunction therewith a latching recess within which the roller members 82 are received. To facilitate entrance of the roller members into the latch guide, the upper edge of the outer leg 90 may be angularly offset as indicated by the reference character 94.

As an additional feature of the invention, the door of the invention has a novel lock means provided therefor. This lock means comprises a pivotally positioned control plate 100 on the lower panel 20 which plate has a recess provided in the periphery thereof into which the bolt 101 of a lock 102 can be engaged for retaining the control plate 100 in a fixed position. This bolt 101 can be suitably retracted by use of a key engaging the lock 102 from the outer side of the door when it is desired to unlock the door from the outside thereof. The door lock mechanism comprises a pair of latches 103 secured to opposite lateral portions of the door panel 20 and with each latch 103 having a bolt or keeper 104 resiliently urged laterally outwardly thereof at all times. These bolts, or similar members 104, engage with conventional anchor brackets, or similar means, 105 on the vertical door frame members for retaining the door in a closed position and for automatically taking such closed position by a spring-snap action of the lock means when the door is moved or swung to its closed position. The pair of latches 103 are connected to the center control plate 100 and retaining means therefor by means of a chain 106 that extends between such latches and is connected to the control plate 100 by means of a suitable retainer loop or strap 107. Thus by unlocking the bolt 101 and turning a control handle 108 on the outside of the door, the plate 100 can be moved through a sufficient arc for retracting both of the latches 103 when it is desired to open the door from the outside. However, from the inside, one may merely pull upon the chain 106 to release the latches 103 so that the door can be easily unlocked and opened from any portion thereof.

In operation, reference is made most particularly to FIGURES 5 and 7 wherein the door is shown respectively in closed position, initially open position or fully open position respectively. It will be noted that due to the offset relationship of the pintle 30 with a line connecting the bars 70 and the pins 42 when the door is in the closed position, an over-center relationship will exist which will maintain the door panels in closed position. With sufficient initial tension on the coil spring members 56 and 58, as soon as the door panels are manually moved, as for example, by any suitable handle mechanism, to a position which reverses the over-center relationship of the pintle 30 with respect to the members 70 and 42, the door panels will automatically swing upwardly toward their open position. The springs 56 and 58 can also be adjusted such as to provide relatively little initial tension which would require slight manual pressure to swing

the door to the open position. Also, the initial tension of the coil springs can be adjusted such that the weight of the door panel is substantially counterbalanced whereby very little manual pressure will be required to swing the door either upwardly or downwardly.

The purpose of the elongated slot 48 in the guide arms 44 and 46 is to permit the shifting of these arms with relation to the pivot pins 50 as illustrated between FIGURES 5 and 6 of the drawings during initial opening of the door and obviate any binding in this pivotal connection at that crucial portion of swinging movement of the door. Also, the elongated slot permits the door assembly to readily adapt itself to slight inaccuracies in installation thereof in obviating the necessity for precisely aligning the guide arm mounting brackets 52 and 54.

This application is a continuation-in-part of my prior application Serial No. 447,074, now abandoned.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. In an overhead door construction, a supporting frame, an upper door panel hinged along its upper edge to said supporting frame, a lower door panel hinged along its upper edge to the lower edge of said upper door panel, said door panel presenting inner and outer surfaces, and the hinged connection between the door panels being disposed on the outer side of said panels, bracket ears projecting inwardly from the inner sides of said lower door panels and extending laterally beyond the side of said panels, pivot pins, an elongated guide arm at each side edge of said supporting frame and pivotally secured at one end by a pivot pin to the adjacent side edge, a second set of pivot pins extending through said bracket ears and the other ends of the guide arms for pivotally connecting the latter to said lower door panel, said first named ends of said guide arms being slotted where said first-named pivot pins engage therewith for lost motion connection therebetween, and a tension spring connected to each one of said second pivot pins and extending therefrom to points of connection with the top of said supporting frame, said guide arms moving over a dead center position as said door is moved from a closed to an open position, said spring being so positioned and the door construction being constructed and arranged so that said springs counterbalance the weight of said door panels and lift upwardly thereon at all times.

2. In an overhead door construction, a supporting frame, an upper door panel hinged along its upper edge to said supporting frame, a lower door panel hinged along its upper edge to the lower edge of said upper door panel, said door panel presenting inner and outer surfaces, and the hinged connection between the door panels being disposed on the outer side of said panels, bracket ears projecting inwardly from the inner sides of said lower door panels and extending laterally beyond the side of said panels, an elongated guide arm at each side edge of said supporting frame for said door, a pivotal connection between one end of each guide arm and the adjacent side edge, pivot pins extending through said bracket ears and the other ends of the guide arms for pivotally connecting the latter to said lower door panel, said one ends of said guide arms being slotted where said pivotal connections engage therewith for lost motion connection therebetween, a tension spring connected to each one of said pivot pins and extending therefrom to points of connection with the top of said supporting frame, said guide arms moving over a dead center position as said door is moved from a closed to an open position, said spring being so positioned

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and the door construction being constructed and arranged so that said springs counterbalance the weight of said door panels and lift upwardly thereon at all times; and lock means carried by said lower panel on the inner surface thereof and including a control plate journaled on said lower panel, a pair of latch means, and a chain connecting said latch means to said control plate, said chain being movable at any point thereof to move said control plate and provide unlocking action simultaneously for said latch means.

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