Nov. 2, 1937. O. C. JOHNSON 2,097,950

OVERHEAD DOOR

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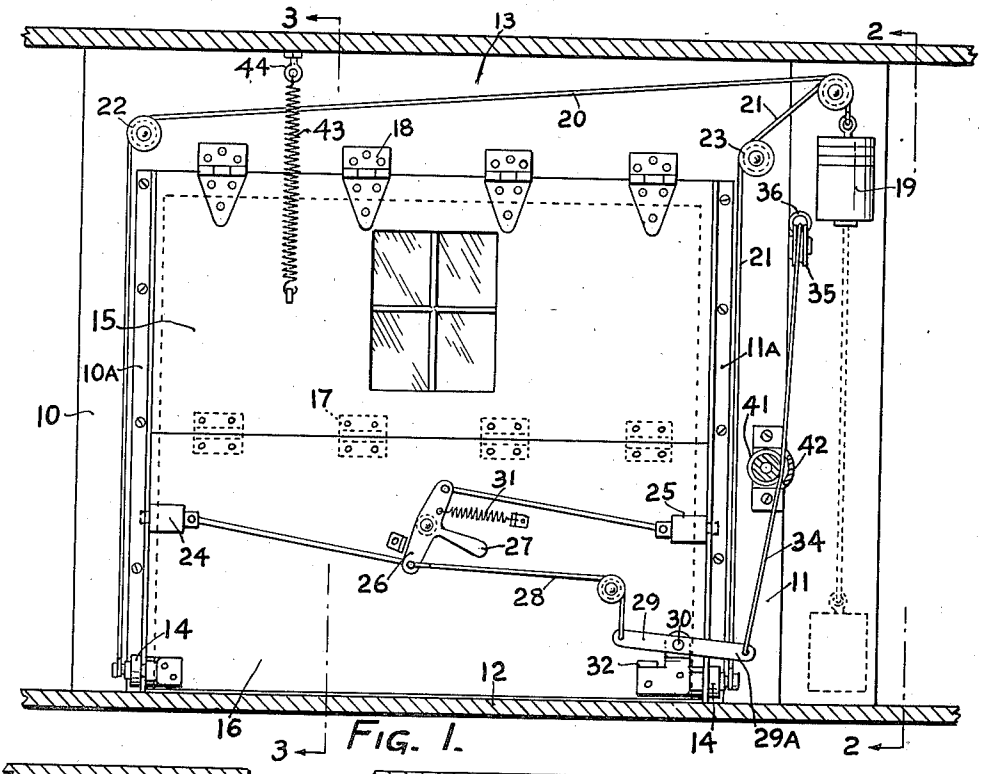


FIG. 1.

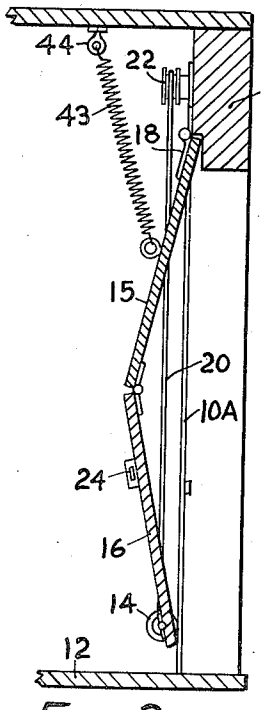


FIG. 3.

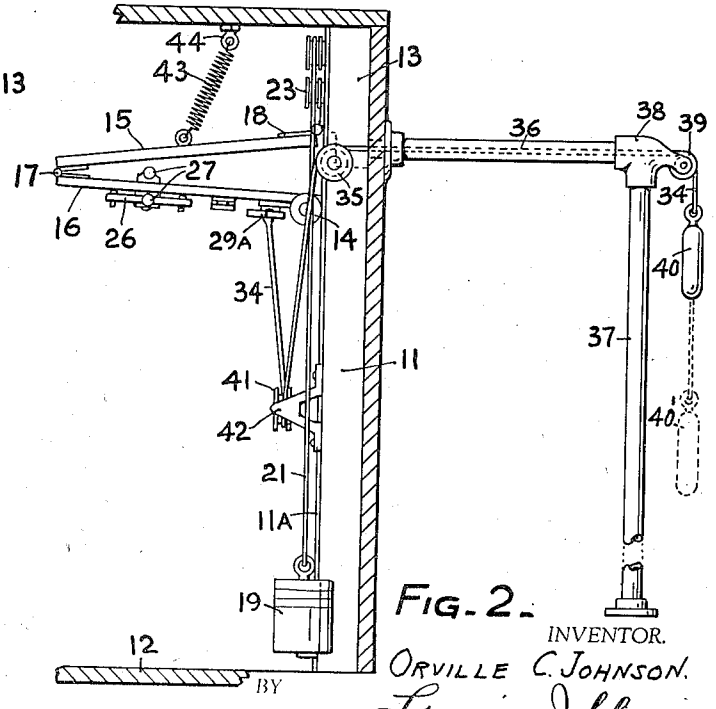


FIG. 2.

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OVERHEAD DOOR

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4 Claims. (Cl. 268—74)

My invention pertains to simple collapsible door means provided with improved remote manually operated controls therefor, particularly as applied to a counter-balanced overhead door for garages or the like smaller closure needs without requiring the installation of guide tracks. Such sectionalized door preferably comprises a pair of pivotally interconnected panels of which the lower panel is foldable toward the upper panel, one edge of the latter panel being hingedly suspended from the doorway lintel to allow of freely swinging the closed door away from its jambs into opened position, and vice versa.

One end of a single manipulative pull cord or cable is attached to the lower panel and the other cord end is herein equipped with a depending grip agency or hand hold located exteriorly beyond the doorway and which suspended hand hold allows a driver to actuate said door while remaining seated in an automotive vehicle.

The present remote control is so arranged that an adroit downward pull applied upon said hand hold by such driver will cause my counter-balanced door to be quickly opened, the upward momentum imparted to the swinging door being sufficient to carry through into its fully raised or relatively folded position. By virtue of a novel pulley system, my centralized hand hold is made to automatically return into its initial uppermost position during the latter half of such door opening movement. When a similar downward jerk is subsequently exerted upon such returned hand hold, the door may be closed in a like manner, the downward momentum being then relied upon to carry the panels onward against their jambs. Prior to reaching full door closure, the hand hold will again be replaced into its uppermost position and prepared to subject the door to another opening movement. The vertical hand hold travel required to bring about the cited functions is purposely kept comparatively short so as to fall within a convenient reach range or arm stroke of a seated car driver.

The primary object of my invention is to provide for an overhead door structure of the character indicated, particularly one adapted to be opened or closed from a single distant hand hold or the like operative pull means that can conveniently be actuated by a seated driver without being obliged to step out of his car in inclement weather to either open or close such door and in which the raised panels will be automatically upheld when reaching their fully opened position.

Disclosed herein are also other novel features of structure including the use of a door opening spring, counterbalancing means, together with a door latching mechanism that is releasably associated with my pull cord, all of which aspects will hereinafter be more explicitly set forth. Reference is had to the accompanying one sheet of drawings which are illustrative of a preferred embodiment as applied to a garage door, and in which:

Fig. 1 illustrates an elevational view of a closed overhead door assembly as seen from the inside of the doorway.

Fig. 2 is a cross-sectional view along 2—2 of Fig. 1 with the linked door panels raised into their open position.

Fig. 3 represents a view along 3—3 of Fig. 1 to show the relative position of the unlatched panels upon leaving the door jambs.

Referring now in detail to said assembly, this comprises a pair of interiorly rabbeted door jambs 10 and 11 that are erected upon a sill 12 and subtended by a suitable deck beam or lintel 13. My overhead door preferably includes an upper panel 15 and a mated lower panel 16 of which adjoining edges are linked by the use of exteriorly disposed hinges such as 17. The free upper panel edge may be suspended from the lintel by interiorly disposed hinges such as 18. For present purposes, both panels are intended to be accurately hung in such doorway and the hinges aligned to work with a minimum of frictional drag.

My door may be substantially counterbalanced in any suitable manner, for instance by the use of an adjustable drop weight 19 carried by companion cables such as 20 and 21 which respectively run over the pulleys 22 and 23 for attachment to opposite bottom edge regions of the lower panel 16, preferably to the overhanging pintles of reversely mounted guide rollers such as 14, which respectively run on separate metal strips 10A and 11A disposed alongside the rabbeted jambs.

As a structural refinement, the interior surface of my door may be provided with oppositely disposed latches such as 24 and 25. The retractable tongues thereof may be rod interconnected to a common equalizer lever 26 whose centralized trunnion extends through the lower panel and may be provided with duplex actuating handles such as 27 that permit of selective manual operation from either panel side. If desired, the exterior handle may be equipped with a key lock.

Said equalizer lever cooperates with the roller guided cable 28 which is also attached to a horizontal lever bar 29 disposed interiorly in substantial parallelism with the bottom edge of the lower panel. This balanced bar is medially fulcrumed at 30 and its outwardly extended lever end 29A overlies the inner face of the jamb 11. A return tension spring 31 normally thrusts said bar away from the stop lug 32. Whenever the lever end 29A is lifted, the resulting pull upon the guided cable 28 stretches the spring 31 and brings about a simultaneous release of the plural door latches

24 and 25 from beneath their respective jamb strips 10A and 10B.

The remote control means whereby my door may be opened or closed from a distance, resides in the use of a single chain, cord or pliant pull cable 34 of which one end is preferably but not necessarily secured to the lever end 29A. Said cable is then carried over the upper guide pulley 35 and outwardly to the garage exterior as shown, without requiring inordinate head room above my doorway lintel. As a protective cable housing, I may resort to an elevated horizontal pipe section 36 that extends some distance forwardly of the doorway and whose overhanging end may be supported by a stanchion 37. The interconnecting elbow fitting 38 may be equipped with a housing pulley 39 over which is run the remote end of the cable 34. A suspended hand hold 40 is fastened to a depending end of said cable and this grip agency is sufficiently weighted to keep the cable taut.

Assuming the door to be closed as in Fig. 1, then by pulling down upon the grip 40, the door may be raised into its opened Fig. 2 position. In such event, said hand hold would drop closely contiguous to the sill level and hence would not remain within convenient reach of a seated car driver.

In order to obviate such inherently long travel on part of the hand hold and to gain other advantages, the present cable gear is made to operate in an improved manner by the use of an intermediate or cable reversing pulley 41 of which the cable receiving groove may lie in a substantially coplanar relation to the doorway. The spindle thereof may be carried by the jamb 11 about midway of its effective length, said reversing pulley being interposed between the lever 29 and the upper guide pulley 35 in the Fig. 1 manner. A pulley guard 42 maintains operative engagement with the pulley 41 should the cable become inadvertently slackened, it being pointed out that in my system, the cable 34 is solely wrapped about said pulley while the lower door panel is impelled toward its fully raised position.

By virtue of such reversing pulley, the travel of the hand hold 40 is confined between its full-lined upper position and the lowermost dotted position 40', respectively arranged to fall within convenient reach of a seated driver when his car is stopped in proper location just beyond the entrance to the garage doorway. The fully counterbalanced door being mounted to freely turn about its hinge mountings, a steady vigorous jerk or prolonged yank exerted downwardly upon said raised hand hold, will initially unlatch the closed door and start to fold the panels toward their collapsed opened position.

It has been found that by skillful manipulation, a moderately sized garage door possessing a proper weight distribution may readily be impelled and thereby incite sufficient momentum in the moving parts to neatly carry such swinging door into its fully opened position. The location of my reversing pulley 41 is such that the onward door swing will cause the cable 34 to partially loop itself around said pulley in the Figure 2 manner, which in turn brings about a raising of the hand hold and finally lifts the same into its uppermost position when the door has been fully opened. A dexterous manipulation of the present instrumentalities calls for a timely release of the hand hold somewhat prior to reaching its dotted reverse position 40', which allows the accumulated momentum to unimpededly carry the door upwardly as intended. When opened, the folded lower panel 16 lies directly beneath the upper panel 15, the door sections then being relatively inclined and having an acute angle therebetween of which the hinge pintle 17 forms its apex. The door is automatically retained in such open position because of a normal thrust component imposed upon the strip 11A by the guide roller 14. As herein arranged, a deliberate downward panel pull exerted by the cable 34 serves to initiate a door closure movement.

In order to facilitate the opening of my aligned door panels, it is preferred to work with a comparatively long starting spring 43. The respective spring ends may be attached between a stationary roof prop 44 and the upper panel, as in Fig. 3. The purpose of such inclined spring is to relatively tilt the linked panels out of alignment immediately after the door latches have been released, which affords an adequate leverage on part of the pull in the cable 34 to unobstructedly start folding the panels.

After having been fully opened, the door may be closed by again similarly jerking downwardly upon the now raised hand hold, as will be evident from the Fig. 2 assembly. The lever bar end 29A will then lie in an elevated relation to the reversing pulley 41 so that the resulting sustained downward pull exerted upon the door end of the attached cable 34 will bring about a positive drop in both panels and again set up the required momentum in the falling door to carry these parts onwardly against the jamb as in Fig. 1. The initial drop of the panel 16 carries the lever end 29A and its associated pull cable end toward the reversing pulley 41; after said cable end descends below such pulley, the hand hold will lift toward its topmost position.

A proper door closing impulse suffices to automatically engage the latches and at the same time restore the original tension in the starting spring 43. The fully closed door may be kept locked by the handle key. While unlocked, such door may either be opened by the hand hold 40 or be manually shifted between its extreme positions by directly taking hold of the lower door panel.

To recapitulate, in the present exemplification the linked panels are designed to swing inwardly of the doorway and my centralized hand hold is carried into its topmost position both when the door is open or closed, and hence kept ready to actuate the panels by the exertion of a downward pull thereon. Should it be desired to close the door, such pull first releases the latch whereupon the starting spring initiates a relative tilt between the linked panels which are then carried into their respective collapsed or open position. A successive pull carries the door into closure position where it is automatically latched against being opened by windage or the like. The use of but a single door actuating cable attached solely to the lower panel 16, obviates operative confusion as compared to conventional long travel, twin ropes that are respectively connected to a pair of foldable door panels.

It will be observed that the cable 34 is not fixedly fastened to the perimeter of the reversing pulley 41, instead my cable only becomes looped around said pulley when the foldable lower panel is substantially raised toward its open position. To initiate the action herein contemplated, the swinging bottom edge of the opened lower panel 16 is made to carry its attached cable end upwardly therewith into an extreme raised position located directly above such pulley, an intermediate cable

length being brought in partial looped engagement with the reversing pulley after the raised lower panel reaches its midtravel altitude. In the fully raised position of my foldable door, its guide roller 14 lies contiguous to a pintle of the upper panel hinges 18 so as to automatically uphold the collapsed panels in stabilized non-dropping relationship with respect to the door sill. As a result, the bottom edge of the lower panel is placed in proper location to be jerked downwardly, which in turn carries both panels against the door jamb.

By opening the panels inwardly of the doorway, the upturned panel will not become loaded in the event the door should be left open during a heavy snow fall. It is thought the foregoing disclosure will make evident to those skilled in this art, the advantages afforded by my improved overhead door devices, it being understood that I reserve the right to incorporate equivalent door actuating means in my illustrative embodiment and that certain of the structural features need not necessarily be combined with others, all without departing from the spirit and scope of my invention heretofore described and more particularly defined in the appended claims.

I claim:

1. In combination with a doorway including complementary jambs and a bridging lintel, an overhead door closing said doorway and comprising linked upper and lower panels having a free marginal upper panel edge hingedly suspended from the lintel to allow of unobstructedly swinging the respective panels away from said jambs into a relatively folded open position, counterbalancing means cooperating with said door, a guide pulley located contiguous to the lintel, a single cable for manually actuating said door in opposed swing directions, said cable having one end attached to the bottom edge region of the lower panel and being run over said guide pulley for manipulation at the other cable end, and a reversing pulley interposed between said guide pulley and the sill level of said doorway, said door when swung into its fully opened position serving to carry the attached cable end therewith to initiate a loop in a medial cable portion about said reversing pulley prior to reaching such open position and which bottom edge of the lower panel is brought contiguous to said free marginal upper panel edge whereby to uphold the folded panels in stabilized non-dropping relationship with respect to the door sill.

2. In combination with a doorway including complementary jambs and a bridging lintel, an overhead door closing said doorway and comprising linked upper and lower panels having a free marginal upper panel edge hingedly suspended from the lintel to allow of unobstructedly swinging the respective panels away from said jambs into a relatively folded open position, counterbalancing means cooperating with said door, a guide pulley located contiguous to the lintel and disposed to rotate about an axis lying in substantial parallelism with the plane of said doorway, a single cable for manually actuating said door in opposed swing directions, said cable having one end attached contiguous to the bottom edge region of the lower panel and thence run over said guide pulley to extend forwardly of the doorway entrance, the other cable end being upheld and having a depending terminal arranged to shiftably suspend a grip agency thereon, and a reversing pulley of which the spindle extends in a substantially perpendicular relation to the aforesaid axis and is located intermediate said guide pulley and the sill level of the doorway, said grip agency being lowered from a certain initial elevation with respect to the sill level and returned thereto when the door is swung between its respective extreme positions and which bottom edge of the lower panel thrusts against the jambs in stabilized relation to uphold the door panels in their folded open position.

3. In combination with a doorway including complementary jambs and a bridging lintel, an overhead door closing said doorway and comprising linked upper and lower panels having a free marginal upper panel edge hingedly suspended from the lintel to allow of unobstructedly swinging the respective panels away from said jambs into a relatively folded open position, counterbalancing means cooperating with said door, a guide pulley located contiguous to the lintel, a single manipulative cable actuating said door, said cable having one end attached to the bottom edge region of the lower panel and thence carried over said guide pulley, the other cable end providing for a shiftably guided depending grippable length by which to releasably yank the cable longitudinally in a direction away from its attached end through a finite stroke having an inner and an outer terminal region respectively located at different elevations from the sill level of the doorway, and a reversing pulley located intermediate the guide pulley and said sill level, said grippable length when jerked downwardly serving to initiate a door movement that stores sufficient momentum in the swinging door to impel itself onward and which grippable length upon being released when reaching its outer terminal region allows the impelled door to unimpededly continue toward its open position wherein the bottom edge of the lower panel thrusts normally against said jambs to automatically uphold the folded panels with respect to the door sill.

4. In combination with a doorway including complementary jambs and a bridging lintel, an overhead door closing flatwise against said jambs and comprising linked upper and lower panels having a free marginal upper panel edge hingedly suspended from the lintel to allow of unobstructedly swinging the respective aligned panels away from said jambs into a relatively collapsed position, counterbalancing means cooperating with said door, a guide pulley located contiguous to the lintel, a reversing pulley located between said guide pulley and the sill level of the doorway, a single manipulative cable for actuating said door in opposed directions, said cable having one end attached solely to the bottom edge region of the lower panel and being extended over said guide pulley with the other end of said cable providing for a longitudinally shiftable grip length by which to jerk the cable in a direction away from its attached end through a finite stroke and which cable when jerked initiates a door movement that stores sufficient momentum in the swinging door to impel itself onward into one of its extreme swing positions wherein the panels are relatively collapsed and automatically upheld with respect to the doorway sill, said grip length being released when reaching its outer stroke end to allow the impelled door to unimpededly continue onward into said one extreme position and which grip length is returned into its inner stroke end when the door reaches its closure position.

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