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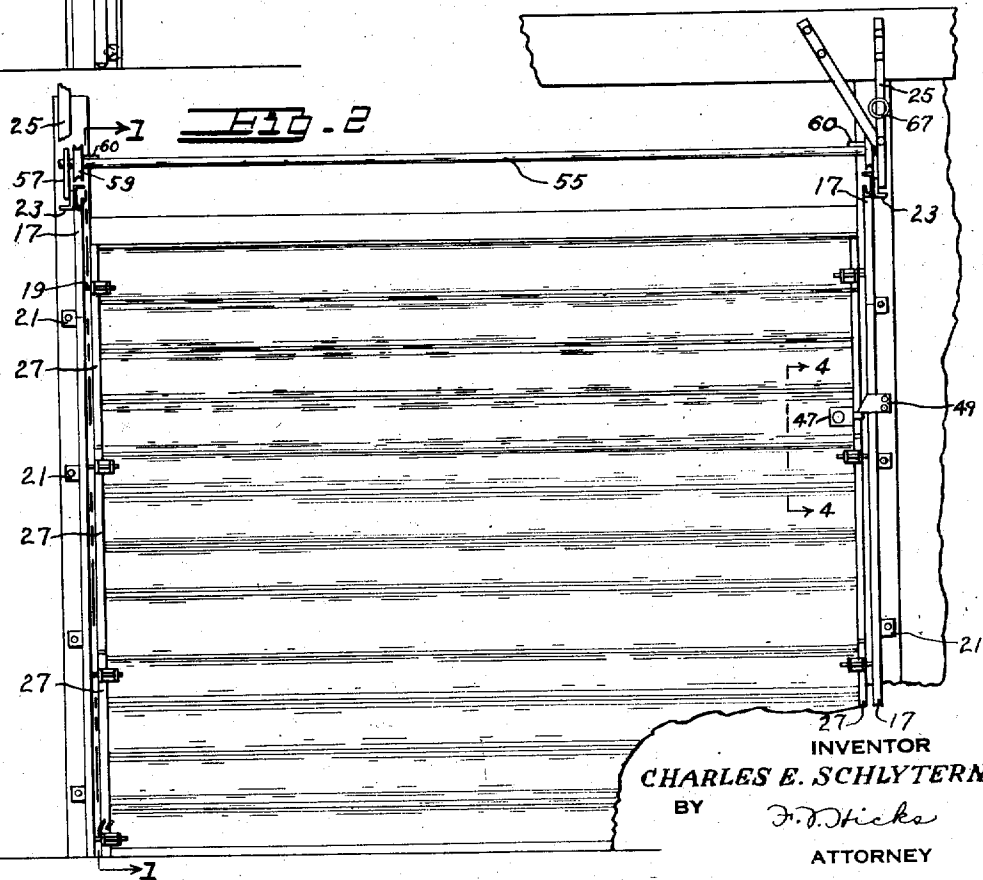
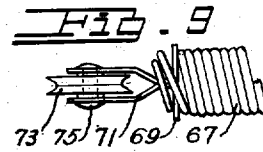
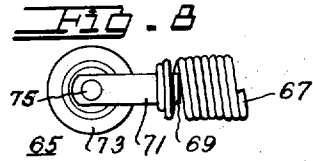
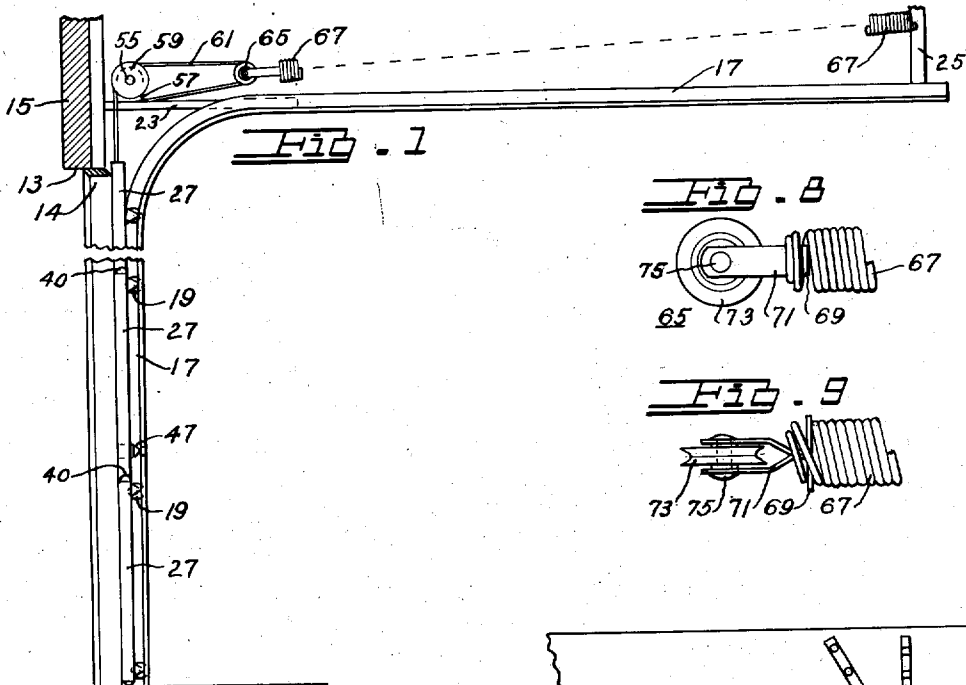
C. E. SCHLYTERN

2,567,031

OVERHEAD DOOR

Filed Dec. 20, 1946

2 Sheets-Sheet 1



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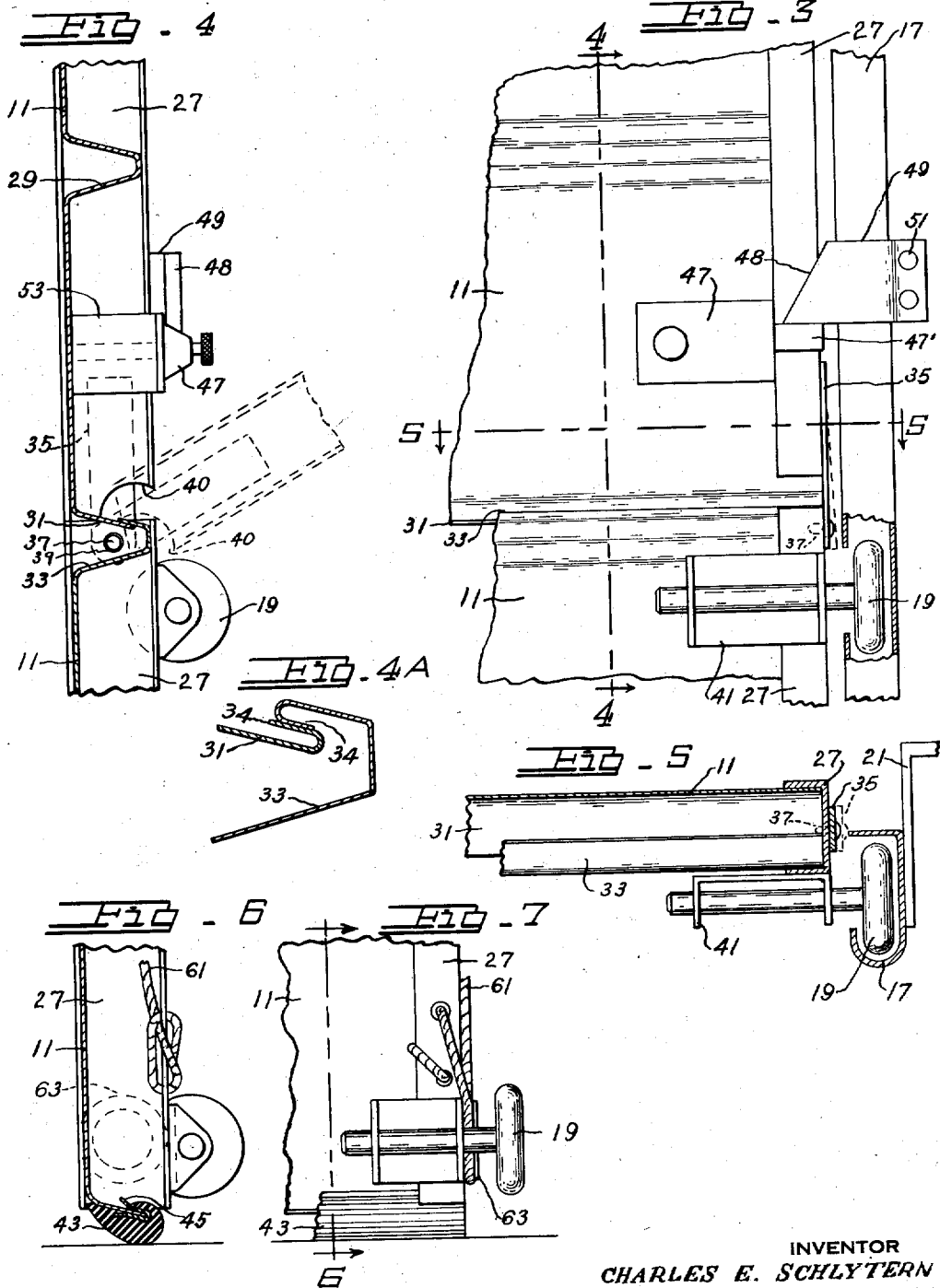
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UNITED STATES PATENT OFFICE

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OVERHEAD DOOR

Charles E. Schlytern, Detroit, Mich.

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4 Claims. (Cl. 160—232)

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This invention pertains to an improved overhead sectional door as well as to improved arrangements in its installation and accessories for use therein.

It is an object of my invention to provide a sectional overhead door having improved hinging means which may be easily connected to pivotally interconnect between the respective sections of the door to facilitate quick assembly on the job after convenient shipment in knocked-down condition.

A further object of the invention is to provide a multi-section overhead door that operates quietly with hitherto unknown ease, which is light and reliable in operation, and which is weathertight in closure.

It is also an object of my invention to provide an improved sectional overhead door which may be conveniently made entirely of metal.

It is a further object of my invention to provide a multi-section overhead door in which the section panels are made of sheet metal and have resilient cooperatively engageable weather sealing edges.

Another object of the invention is to provide an overhead door having an improved lock arrangement.

A further object of my invention is to provide an overhead sectional door with an improved evening and balancing arrangement.

Still another object of the invention is to provide an improved spring yoke sheave for use with such overhead door installations.

Further objects and advantages are within the scope of my invention, such as relate to the arrangement, operation and function of the related elements of the structure, to various details of construction and to combinations of parts, elements per se, and to economies of manufacture and numerous other features as will be apparent from a consideration of the specification in conjunction with the drawing disclosing specific embodiments of the invention, in which:

Fig. 1 is a side or edge elevational view showing a multi-sectional overhead door and installation in accordance with my invention;

Fig. 2 is a rear elevational view of the door;

Fig. 3 is an enlarged fragmentary detail view showing a portion of the door with a guide rail and lock;

Fig. 4 is a sectional view on line 4—4 on Fig. 3 and as also indicated on Fig. 2;

Fig. 4A shows a modified weather seal;

Fig. 5 is a sectional view taken horizontally, as indicated by line 5—5 on Fig. 3;

Figs. 6 and 7 are fragmentary sectional and

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elevational detail views at the bottom of the door;

Fig. 8 is a side elevational view of a spring yoke and sheave; and

Fig. 9 is an edge elevational view thereof.

Referring more specifically to Figs. 1 and 2 of the drawings, I have illustratively disclosed an embodiment of my overhead door comprising a plurality of door sections or panels 11 arranged for closing a doorway 13 having door stop moulds 14 in any building wall 15, and in Fig. 1 the building wall and door stop mould is omitted on the side toward the observer to more clearly show the edge side of the door. In accordance with usual practice, a guide rail or track 17 is provided extending on both sides of the doorway for receiving rollers 19 extending from the ends of the door sections to guide and/or change the path of movement of the door sections as the door is opened or closed. The guide tracks 17 may be secured along the sides of the doorway on brackets 21 and the upper portion of each track may curve back to a horizontal overhead position wherein it is supported from the building structure by horizontal braces 23 and vertical hangers 25 in a well known manner. But if there is sufficient overhead space in the building for the door to clear the doorway by moving straight up without turning the tracks may continue straight up, as will be readily understood.

Each door section panel 11 is provided with a pair of end pieces 27 which are channel irons of lengths substantially the same as the widths of the respective section panels. The end pieces 27, being of channel iron, are of a substantially U-shape cross-section having a pair of spaced flanges joined by a web, and these end pieces are installed and secured with the open side over the end edge of each section panel. The section panel 11 of each section extends along and is secured to the inner side of one of the intumed flanges of the end pieces 27. Sheet metal is preferred for the section panels 11 and it may be attached to the front one of the intumed flanges of each end piece 27 in any suitable manner, as by welding or riveting, to provide an all metal door. For rigidity each sheet metal panel 11 is preferably provided with reversely bent folds 29 extending from end-to-end and of sufficient lateral deviation to approach the other or rearmost of the intumed flanges of the end pieces 27.

As Fig. 4 shows, the adjacent edges of section panels 11 (for example the bottom edge of one panel and the upper edge of the next lower panel) are provided with laterally bent and inclined seal strips 31 and 33 respectively arranged

so that these hold together resiliently to form a weather seal joint when the door is closed. The extreme edge of the seal strip 33 on the upper edge of a panel 11 has sufficient lateral deviation to go adjacent to the opposite flange of the end piece 27 where it is bent up and back to pass over the upper side of the inclined seal strip 31 from the bottom of the next higher section panel.

In this manner an effective weather seal is formed at all times when the door is closed. When in opening, the upper section panel 11 must turn relatively, as represented by the dotted lines in Fig. 4, free movement between the sections is provided for, as the upper seal strip 31 merely turns away from the lower seal strip 33, as shown by dotted lines. Fig. 4A shows the weather seal joint formed between backturned flaps 34. This provides extra resilience, allows for misalignment and assures even pressure along the entire length.

Pivotal snap-on hinge connections are provided for quickly joining the door sections 11. As may be seen more clearly in Figs. 3, 4 and 5, a pivot pin spring 35, which may be a flat leaf spring strip, is secured on and extends along the outer side of the web of each channel iron end piece 27. This attachment may be done by welding or in any other suitable manner. The resilient spring strip 35 is suitably elongated so that at one end it is disposed adjacent to the outside of the web of the next end piece 27. This extended end of the resilient strip 35 is provided with an inwardly directed projection or pin 37 which enters an aperture 39 suitably provided in the web of the adjacent end piece 27. Although the snap-on strip 35 is shown projecting down over the next end piece 27 below, it may as well extend up over the next end piece above. The door may be shipped in knock-down condition and it may conveniently be assembled on the job by pivotally joining the door sections through these quick snap-on connections. To permit each upper end piece rotating relative to the upper end of the end piece thereunder, as represented by dotted lines in Fig. 4, the lower end of each such end piece 27 may be provided with an open or cut out segment area 40 just sufficient for clearance, as shown. However, the clearance space 40 could be divided between the two adjacent ends of piece 27 or it could be entirely in the upper end of each end piece, as will be understood.

The channel iron end pieces 27 also serve to support and carry the guide rollers 19. This is accomplished by a bracket 41 secured to the rear side of the rear flange of each such end piece, and so positioned that, as may be seen more clearly, in Figs. 3-7, the guide tracks or rails 17 being inclined to the rear of the door jamb, as shown in Fig. 1, the door when closing down closely approaches the inside or rear edges of the door stop jamb 14.

The lower edge of the door is provided with a heavy astragal or sealing strip 43 extending across under the door and under the lower ends of the two lower end pieces 27. This strip 43 is made of soft moulded rubber, or some similar material, so that it will serve as a weather seal under the door and also as a buffer to cushion the downward motion of the door as it closes. To mount and secure this astragal strip 43 it has an imbedded snap-on insert 45 and the lower edge of the bottom door section panel 11 is turned back to receive it thereon and hold it, as shown in Figs. 6 and 7.

A lock 47 is secured and carried on the rear or

inside of one of the door section panels 11, as may be seen in Figs. 1, 2, 3 and 4, so that as it descends to the door closed position its bolt is depressed by an inclined surface 48 on lock cam or strike 49 mounted stationarily by the side of the door. The lock strike 49 presenting the inclined surface may be a heavy metal strap passing over and secured on the inner side of one rail 17 of the track, as by welding thereto, or it may be extended further for attachment to the door jamb by screws 51. The lock 47 may be a conventional cylinder and latch type of lock mounted in a suitable position adjacent the lock cam on a block 53 on the inside of the door. The block and the door section panel are apertured suitably to permit a key to be inserted into the lock from outside the door and it may be keyed with the other doors in the building, and operated from either side. As the door reaches its closed position, the lock bolt or latch passes under the stationary lock cam 49 which locks the door down.

To provide well balanced easy operation of the door evenly at both sides, a cross-shaft 55 is provided extending across over the doorway and rotatively supported in two bearing brackets 57 which may be mounted on the horizontal track braces 23, or on the building structure. The shaft carries two idler pulleys 59 secured firmly thereon, as by keys or set screws 60, and disposed adjacent the end of the shaft and over the side edges of the door for passing sash cord cables 61 extending thereover and down to the bottom of the door where the ends of the cables are anchored by passing down around and wedging into holds 63 secured firmly on the outer sides of the webs of the lowermost section end pieces 27. The ends of the cables 61 then are anchored by lacing through apertures in the rear flanges of the bottom end pieces, as may be seen in Figs. 6 and 7.

From the idler pulleys 59 on the ends of the shaft 55 the cables 61 pass through floating sheaves 65 and then return to have the other ends anchored in the horizontal track braces 23 adjacent or at the shaft bearing brackets. The two floating spring sheaves 65 are attached to one end of two counterbalance springs 67, the other ends of which are anchored into the two vertical track hangers 25, or to any stationary object or structure. The counterbalancing springs 67 are suitably selected and so tensioned in installation that the weight of the door is practically supported by the springs in all positions. As the door turns up on the horizontal overhead portions of the tracks, the tension eases on the springs but as the door turns vertically and descends to closed position the tension of the springs increases and supports the door weight.

The improved multi-section door may be lifted manually as by use of the corrugations from either side, or it may be actuated automatically by any suitable motor operator.

Figs. 8 and 9 show an improved spring yoke sheave which is retained on the end of the spring 67 without fittings and yet engages the spring simply and securely and may be varied to adjust the spring tension. For this purpose I provide a cross-piece 69 of a length greater than the diameter of the spring and a pair of legs or clevis members 71 secured thereto, as by welding, and projecting therefrom and suitably spaced apart to receive the sheave cable wheel 73, supported on an axle pin 75 passing between the spaced ends of the clevis members. This sheave is easily attached to the end of the

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spring by merely turning the cross-piece 69 so that ends of the cross-piece enter and advance between adjacent turns of the spring, as shown.

It is apparent that within the scope of my invention modifications and different arrangements may be made other than herein disclosed, and the present disclosure is illustrative merely, the invention comprehending variations thereof.

What is claimed as the invention is:

1. A multi-section overhead door comprising, 10 a plurality of sheet metal door section panels of horizontally elongated conformation, a pair of end pieces for each door section, each end piece having a substantially channel shaped cross-section and being of a length substantially 15 the same as the vertical dimension of the corresponding panel, said end pieces being individually disposed and secured with the open side of the channel cross-section thereof over the opposite ends of the door section panels, snap-on pivot hinge means connected together for pivotally joining the ends of the end pieces in a relationship which may be quickly assembled or disassembled, the adjacent ends of the end 20 pieces being conformed to provide clearance space for relative rotation between the end pieces, guide means projecting from the end pieces of each door section, said snap-on pivot hinge means comprising an elongated resilient member secured on and extending along the outer side of the web of one end of each channel cross-section end piece, said resilient member being elongated suitably to extend along the outer side of the web of the adjacent end of an adjacent end piece, an inwardly extending pivot 25 projection carried on the extending end of each resilient member to be pressed resiliently against said next adjacent end piece, and each adjacent end piece having in the other end of its web a socket aperture for receiving the inwardly extending pivot projection of the resilient member of the adjacent end piece so that sections may be quickly and conveniently joined in a hinged relation by snapping together the resilient members and end pieces.

2. In a section for assembly into a door having a desired width and made up of a plurality of pivotally joined sections, a substantially rectangular panel sheet having a length equal to the width desired in the assembled door, a pair of channel cross-section end pieces disposed with the open sides over the ends of said panel sheet and the panel sheet being secured along the inner side of one flange of each end piece, said panel sheet being bent to provide reversely bent folds extending from end-to-end of sufficient lateral deviation to approach the opposite flange of each end piece thereon, each channel end piece providing a pivot snap-in aperture adjacent one end, a resilient snap-in pivot strip secured on the outer side of the web of each channel end piece on the end remote from the end having said snap-in aperture, each said pivot strip being elongated sufficiently to extend beyond its end piece and adjacent to the channel end piece of another section to be joined therewith, and the extended portion of each pivot strip having a pivot projection extending therefrom for con- 50

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veniently snapping into the aperture in the end of a channel end piece of an adjacent section and forming a pivotal junction therewith to provide a door by pivotally joining a plurality of such panels.

3. A multi-section overhead door comprising, a plurality of sheet metal door panels, an end piece secured on each end of each panel, means pivotally joining the ends of the end pieces together so that the panels are pivotally hinged 10 together, the upper edge of each door panel being bent to form a weather seal extending laterally away from the plane of the door panel then extending upwardly and back a shorter distance toward the plane of the door panel, and the 15 lower edge of each said door panel being bent to extend laterally from the door panel toward the same side as said upper edge is bent and extending to engage resiliently under the backwardly bent upper portion of the adjacent panel disposed thereunder for forming a weather seal between the hinged panels.

4. A multi-section overhead door comprising, a plurality of sheet metal door panels of horizontally elongated conformation, a pair of end pieces for each door panel, each said end piece having a substantially channel shaped cross-section and being of a length substantially the same as the vertical dimension of the corresponding panel, each said end piece being arranged with the open side of its cross-section over the end of its corresponding panel and with the inner side of one of its side flanges secured thereto, hinge means pivotally joining the ends 25 of said end pieces together so that the panels are hinged together to form a door, the upper edge of each door panel being bent laterally away from the plane of the door panel toward the opposite side flange of the end pieces and then extending upwardly and back a shorter distance toward the plane of the door panel, and the lower edge of each door panel being bent to extend laterally away from the door panel toward the same side as the upper edge is bent 30 and extending to engage resiliently under the backwardly bent upper edge of the cooperative adjacent panel disposed thereunder to form a weather seal therewith between the panels.

CHARLES E. SCHLYTERN.

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