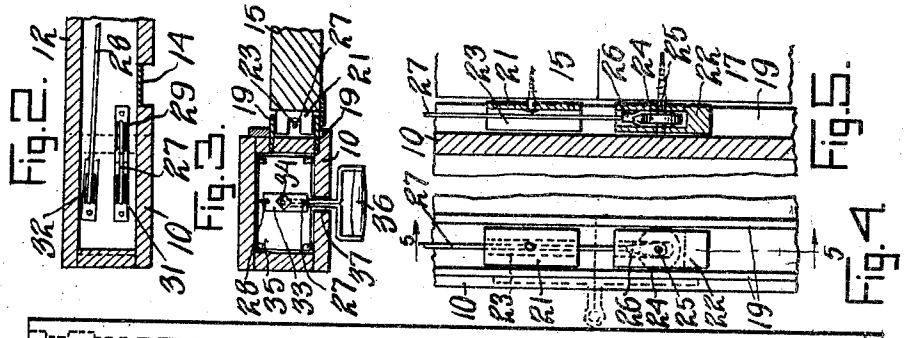
June 6, 1933. M. E. CRUME 1,912,829

DOOR

Filed Oct. 2, 1930 2 Sheets-Sheet 1



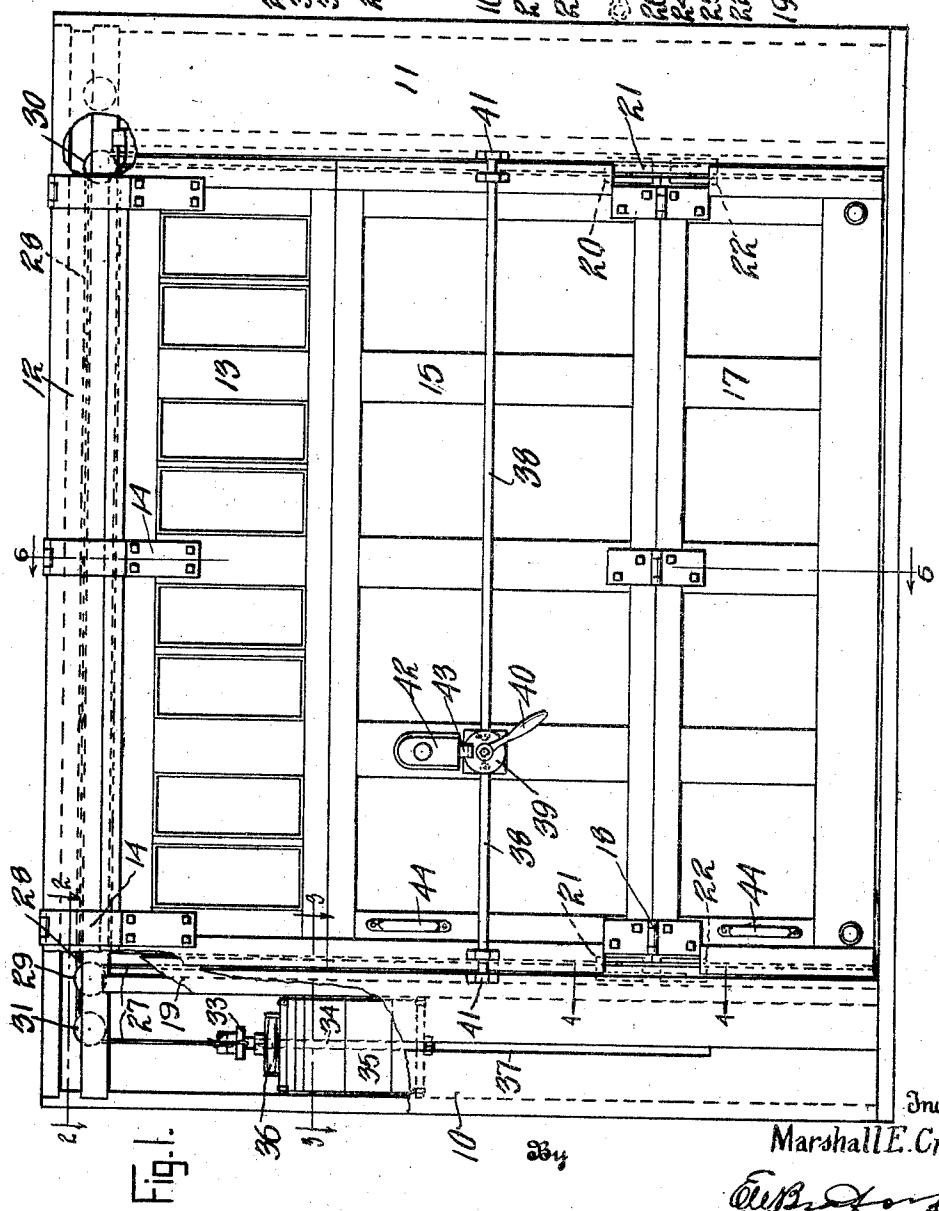


Fig. 1.

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DOOR

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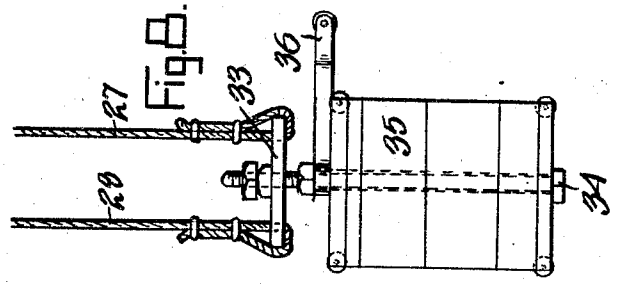


Fig. 8.

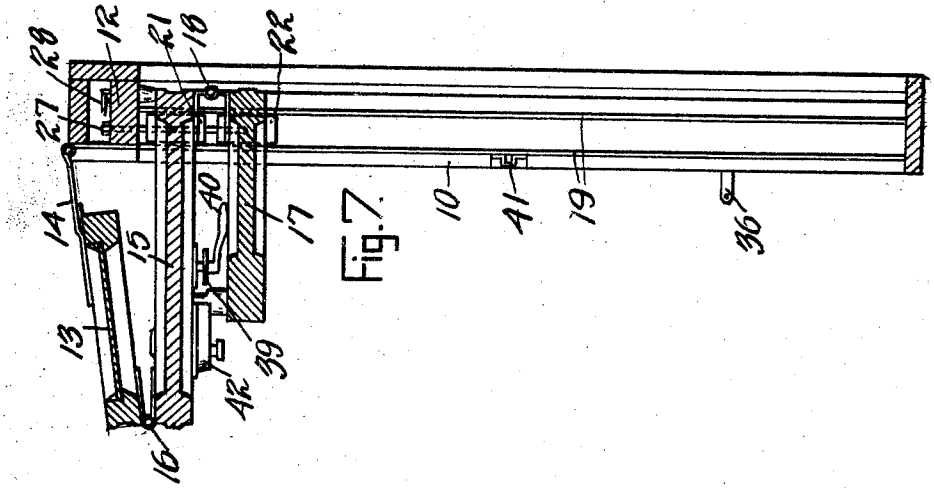


Fig. 7.

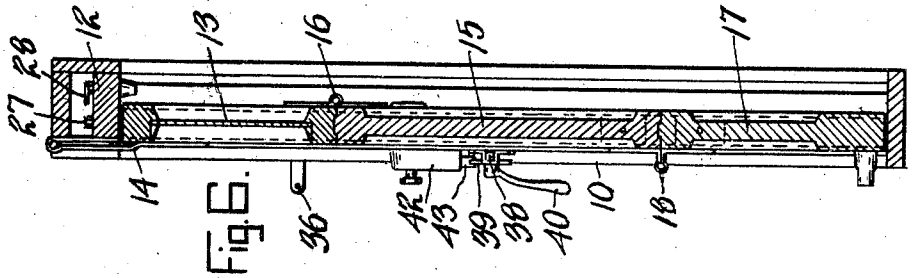


Fig. 6.

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UNITED STATES PATENT OFFICE

MARSHALL E. CRUME, OF PERU, INDIANA, ASSIGNOR TO MIAMI MANUFACTURING COMPANY, OF PERU, INDIANA, A CORPORATION OF INDIANA

DOOR

Application filed October 2, 1930. Serial No. 486,007.

This invention relates to vertically opening doors designed for garages, warehouses and such like buildings, composed of a multiple of sections hinged together on horizontally disposed hinges with the upper section hinged to the top of the door frame, whereby as the door opens the sections fold upwardly adjacent to the top of said door frame; and it consists in various improvements in the details of construction and arrangement of parts whereby the door sections and the door as an entirety are mounted and counterbalanced in a manner to insure free and easy operation by hand, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is an elevation of the inside of the door in closed position with parts broken away to disclose the details,

Figure 2, a detail section on the line 2—2 of Figure 1, showing the pulley arrangement,

Figure 3, a detail section on the line 3—3 of Figure 1 showing the mounting of the balance weight,

Figure 4, a vertical section on the line 4—4 of Figure 1 showing the mounting of the swivel blocks,

Figure 5, a similar view on the line 5—5 of Figure 4,

Figure 6, a vertical section on the line 6—6 of Figure 1,

Figure 7, a similar view with the door raised, and

Figure 8, a detail view of the balance weight and its connections.

In the drawings 10 and 11 represent vertical rectangular columns which may be and preferably are made interchangeable. They are connected at their upper ends by a hollow rectangular beam 12 from which the door sections are hung. The top section 13 is hinged to the inner top edge of the beam 12 by means of long strap hinges 14 which permit the section 13 to swing clear of the beam when in open position. The intermediate section 15 is attached to the top section 13 by means of hinges 16 located on the outside of the sections. The bottom section 17 is connected to the inside edge of the section 15 by hinges 18. It will be readily seen in Figure 7 that the sections fold one on the other when open.

The inner surfaces of columns 10 and 11 each supports a channel comprising a pair of metal straps 19 and 20 respectively which act as guides for the folding sections of the door.

Adjacent the abutting edges of the sections 15 and 17 and on the sides thereof are mounted swivel blocks 21 and 22 respectively, which serve as weather strips or guards at these points. The blocks 21 are slotted their entire length at 23 for a purpose to be explained later, while the blocks 22 are channeled to receive rollers 24 mounted on shaft 25 which rollers relieve the friction caused by the weight of the doors.

Stirrups 26 are carried by the shafts 25 and have cables 27 and 28 attached thereto. These cables pass upward through the slots 23 in the blocks 21, then upward through the channels 19 and 20 respectively, over pulleys 29 and 30 in the beam 12, then horizontally through the beam to similar pulleys 31 and 32 located directly over the center of the column 10. The cables then enter the top of the column and are attached to the ends of a plate 33 which has a central opening through which extends the threaded end of a bolt 34 upon which the sectional counterweight 35 is secured. The upper and lower ends of the weight 35 are preferably provided with anti-friction rollers or ball-bearings 45 at the corners, as shown (see Figure 8) to insure free movement and prevent binding or undue friction in operation.

A convenient means to operate the door is provided in a hand grip 36 which is attached to the bolt 34 between the plate 33 and weight 35. The stem of the hand grip extends through a slot 37 in the front of the column 10 in a convenient location.

The doors may be locked in their closed position by means of a pair of bars 38 pivoted at their inner ends to a circular notched

plate 39 mounted on the inside of the door section 15. A handle 40 is secured to the plate 39 which when thrown to the left in Figure 1 retracts the bars from retainers 41 mounted in the columns 10 and 11, thus permitting the doors to be swung open. A lock 42 is mounted adjacent the plate 39 and has a bolt 43 adapted to enter the notch in said plate when the doors are closed. Handles 44 are provided on the sections 15 and 17 to facilitate opening the doors.

The operation of my device is as follows: The doors are shown closed in Figures 1 and 6 of the drawings. After unlocking the doors by swinging the handle 40, the operator grasps the handles 44 and breaks the alignment of the door sections which automatically causes the door to move upward and the hand-hold 36 to move downward within reaching distance of the operator who can then grasp said hand-hold and use it in completing the opening operation if desired. However, the door can easily be entirely opened by grasping the handles 44 as it is so balanced that as soon as the alignment is broken a slight pressure upward causes the door to rise and the sections to fold, thus making it unnecessary to use the handle 36, although it may be employed whenever desired or found convenient. In closing the door, however, the hand-hold 36 is used which raises the weight, enables the sections to move down and to be turned into alignment by the handles 44 and locked.

It will be obvious to those skilled in the art, that various changes may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:

1. A door for garages etc., comprising a frame composed of a pair of hollow columns having guide rails mounted on their inner edges, a hollow beam connecting the tops of said columns, a door panel hinged to the top edge of said beam and adapted to seat beneath said beam when closed, a second door panel hinged to the first panel on the opposite edge thereof, a third door panel hinged to said second panel on the opposite edge thereof, swiveled guide blocks secured to the sides of said second and third panels adjacent their meeting edges, cables secured within the block of said third section and passing through slots in the blocks of said second section, anti-friction rollers mounted within said blocks, a counterweight in one of said columns, a bolt supporting said counterweight, equalizing means for said cables carried by said bolt, and a hand operating device carried by said bolt and extending through a slot in said column, substantially as set forth.

2. A door for garages, etc., comprising a frame composed of side columns, a beam connecting the tops of said columns, a door panel hinged to the top inner edge of said beam and adapted to seat beneath said beam and between said columns when closed, a second door panel hinged to the lower edge of said first panel with said hinge on the outer edge thereof, a third door panel hinged to the lower edge of said second panel with said hinge on the inner edge thereof, swiveled guide blocks secured to the sides of said second and third panels adjacent their meeting edges, cables secured to the swivel of said block on said third panel and passing freely through slots in the blocks on said second section, and a hand operating device secured to the ends of said cables for operating said door, substantially as set forth.

In witness whereof, I have hereunto set my hand at Peru, Indiana, this thirtieth day of September, A. D. nineteen hundred and thirty.

MARSHALL E. CRUME.