May 23, 1944. J. F. CAMPION 2,349,702

ROLL-UP DOOR

Filed Aug. 16, 1943

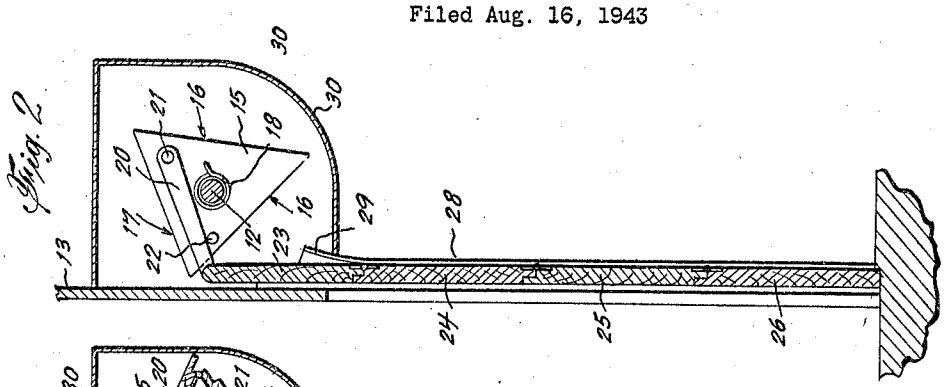


Fig. 2

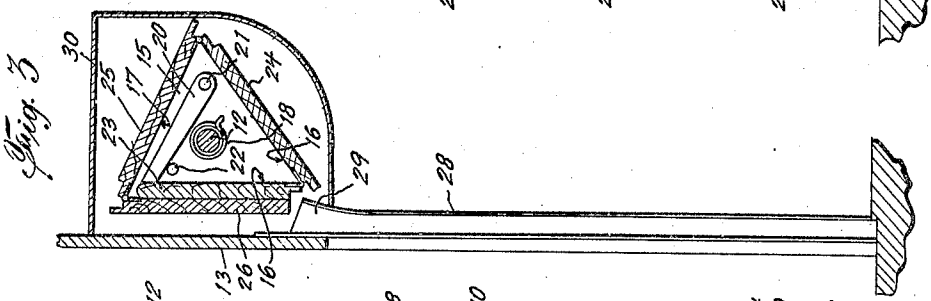


Fig. 3

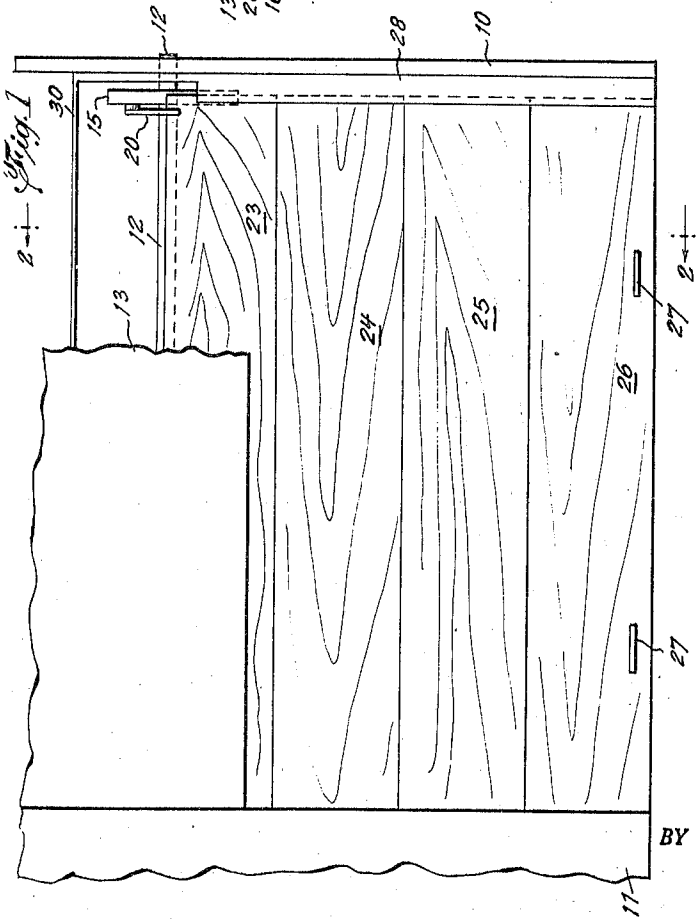


Fig. 1

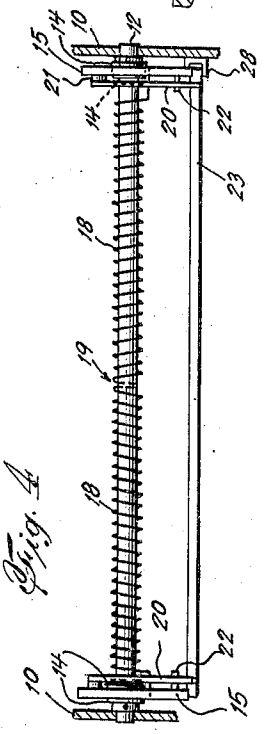


Fig. 4

INVENTOR.
James F. Campion
BY
F. Lederman
ATTORNEY

Patented May 23, 1944

2,349,702

UNITED STATES PATENT OFFICE

2,349,702

ROLL-UP DOOR

James F. Campion, Freeport, N. Y.

Application August 16, 1943, Serial No. 498,801

5 Claims. (Cl. 160—133)

This invention relates to doors and is particularly adaptable to doors for garages, greenhouses, as well as other applications, and aims to provide novel and practical means for the operation of opening or closing doors of the roll or panel type and for positioning the door at any level between the fully open or fully closed extremes.

With the above and other objects in view, the invention is fully set forth in the following description, wherein characters of reference refer to similarly numbered parts on the accompanying drawing. It is to be noted that the drawing is intended for the purpose of illustration only, and it is neither intended nor desired to limit the invention necessarily to the specific details of construction shown excepting insofar as they may be essential to the invention.

Referring briefly to the drawing, Fig. 1 is a fragmentary front elevational view of the door applied to the supporting frame of a building, with parts broken away and showing the door in closed position.

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 3 but showing the door in fully open position.

Fig. 4 is a plan view of Fig. 1.

Referring in detail to the drawing, the numerals 10 indicate the two vertical door frame members or walls forming part of the structure or building 11. A horizontal shaft 12 is supported in the walls 10 and means, not shown, is provided to maintain the shaft rigidly against rotation. The shaft 12 is positioned above the doorway behind an apron 13 forming part of the building structure.

Near each end of the shaft 12, a pair of spaced collars, or flanged collars, 14, are secured to the shaft in any suitable manner such as, for instance, cotter pins passing through both collar and shaft, not shown. Between each pair of collars 14, a triangular sheave or flange 15 is rotatably mounted, two side edges 16 of these flanges being of equal length and the third side 17 being shorter than the others for reasons which will become apparent below. A pair of coiled springs 18 surround the shaft 12, each covering one-half the length thereof, having their mutually adjacent extremities anchored in the shaft at the middle of the latter at 19 and their other extremities in the flanges 15, the springs passing about the shaft in opposite helical directions.

Each flange 15 has an arm 20 pivotally mounted at one end at 21 on the inner face of the flange, the pivot lying near the intersection of the edge 17 with one of the edges 16. Near the intersection of the edge 17 with the other of the edges 16, a pin 22 extends from the same inner face of the flange. The upper edge of the uppermost door panel 23 is pivotally suspended from the extremities of the arms 20. It is apparent that when the door is fully opened, or lowered, the arms 20 will rest on the pins 22 as shown in Fig. 2.

The door comprises a number of horizontal panels 23, 24, 25, and 26, the number of course being optional, mutually hinged together by any suitable hinge means, and preferably having their mutually adjacent edges dovetailed, as shown in Fig. 2, for obvious reasons. The lowermost panel 26, and/or any other of the door panels, may be provided with any suitable handle means such as the slots 27 shown in Fig. 1.

Secured against the walls 10, in the path of the side edges of the door panels, may be vertical troughs 28, substantially U-shaped in cross-section, to serve as guides for the panels to maintain them in alignment when they are let down from the device. The upper ends 29 may be widened to provide enlarged mouths to guide the panels into the guide troughs from above, during descent of the panels.

The panels are somewhat longer than the distance between the flanges 15, so that when the latter turn about the shaft 12 in a direction to wind up the panels, the panels successively, beginning with the uppermost, are brought into contact with and rest upon the edges of the flanges 15. The springs 18 are wound up during descent of the door and unwound during its ascent. The springs are so designed and adjusted at the installation of the device, that at any position between and including the fully open and fully closed positions, the tension of the spring will balance the weight of the panels hanging down, so that very little effort is required to either raise or lower the door.

Assuming that the door is closed, as shown in Figs. 1 and 2, and its opening is begun, the flanges 15 will turn in a clockwise direction (Fig. 2), and panel 23 will rest against the flange edges 16 at the left. Continued rotation of the flanges in the same direction will position the panel 24 on the other flange edges 16, the panel 25 on the edges 17, and finally the panel 26 will be superimposed on the panel 23, as seen in Fig. 3. In order to permit the panel 25, when so positioned, to extend beyond the outer surface of the panel 23 a sufficient distance to enable the panel

26 to be positioned flush against the panel 23, as shown, the sides 17 of the triangular flanges 15 are shorter than the other sides 16, as previously stated. When the door is fully wound up, the tension of the springs 18 is practically zero, so that the panels remain stationary in their positions shown in Fig. 3 and in balance. In closing the door, as soon as the panel 26 begins to descend the spring being to acquire tension, and this tension is sufficient to maintain the door in any position between the fully opened or closed extremes, as well as in the said extreme closed position.

A hood 30 may be provided to cover the mechanism of the device. No means has been shown for locking the door in closed position to prevent its raising by unauthorized persons, but such means may obviously be provided if desired. Nor has any handle means been shown to facilitate grasping of the lowest panel 26 to close the door, but here also any suitable means, such as a strap or loop depending from the front face of this panel or the lower edge thereof, not shown, might be provided.

Obviously, modifications in form and structure may be made without departing from the spirit or scope of the invention.

I claim:

1. In combination, a door comprising a plurality of panels mutually hinged together, a shaft rigidly mounted above the doorway and having a pair of spaced identical triangular flanges rotatably mounted thereon with each side of one of said triangles lying in the same plane as one side of the other of said triangles, the length of said panels exceeding the distance between said flanges, means pivotally secured partly on said flanges and partly on the uppermost of said panels suspending said uppermost panel from said flanges, said flanges being rotatable to wind said panels thereabout with the inner surfaces of the panels lying against the edges of said flanges.

2. The combination set forth in claim 1, having a pair of coiled springs surrounding said shaft and wound in opposite directions about the same, the mutually adjacent ends of said springs being anchored in said shaft and the other ends thereof being anchored in said flanges.

3. In combination, a door comprising a plurality of panels mutually hinged together, a shaft rigidly mounted above the doorway and having a pair of identical spaced triangular flanges rotatably mounted thereon with each side of one of said flanges lying in the same plane as one side of the other of said flanges, arms having one end pivotally secured to the inner surfaces of said respective flanges near one corner thereof and each extending substantially parallel with an edge of the adjacent flange to a point beyond the opposite edge thereof, the free ends of said arms being pivotally secured to the upper edge of the uppermost of said panels, a pin on the inner surface of each flange serving as a limit stop to said arms to prevent swinging of said arms to the center of the flange, the length of said panels exceeding the distance between said flanges, said flanges being rotatable to wind said panels thereabout with the inner surfaces of the panels lying against the edges of the flanges.

4. The combination set forth in claim 3, wherein the sides of said flanges being parallel to said arms are shorter than the other sides by slightly more than the thickness of a panel, whereby when said panels are wound on said flanges the second from the uppermost of said panels projects beyond the remote apex of said short side sufficiently for the third from the uppermost of said panels to lie flush against said uppermost panel.

5. The combination set forth in claim 3, having a pair of coiled springs surrounding said shaft and wound in opposite directions thereabout, the mutually adjacent ends of said springs being anchored in said shaft and the other ends thereof being anchored in said flanges.

JAMES F. CAMPION.