Aug. 3, 1965 F. D. CROSSWELL 3,198,242

UPWARDLY ACTING DOOR AND SEAL MEANS THEREFOR

Filed Sept. 5, 1961 3 Sheets-Sheet 1

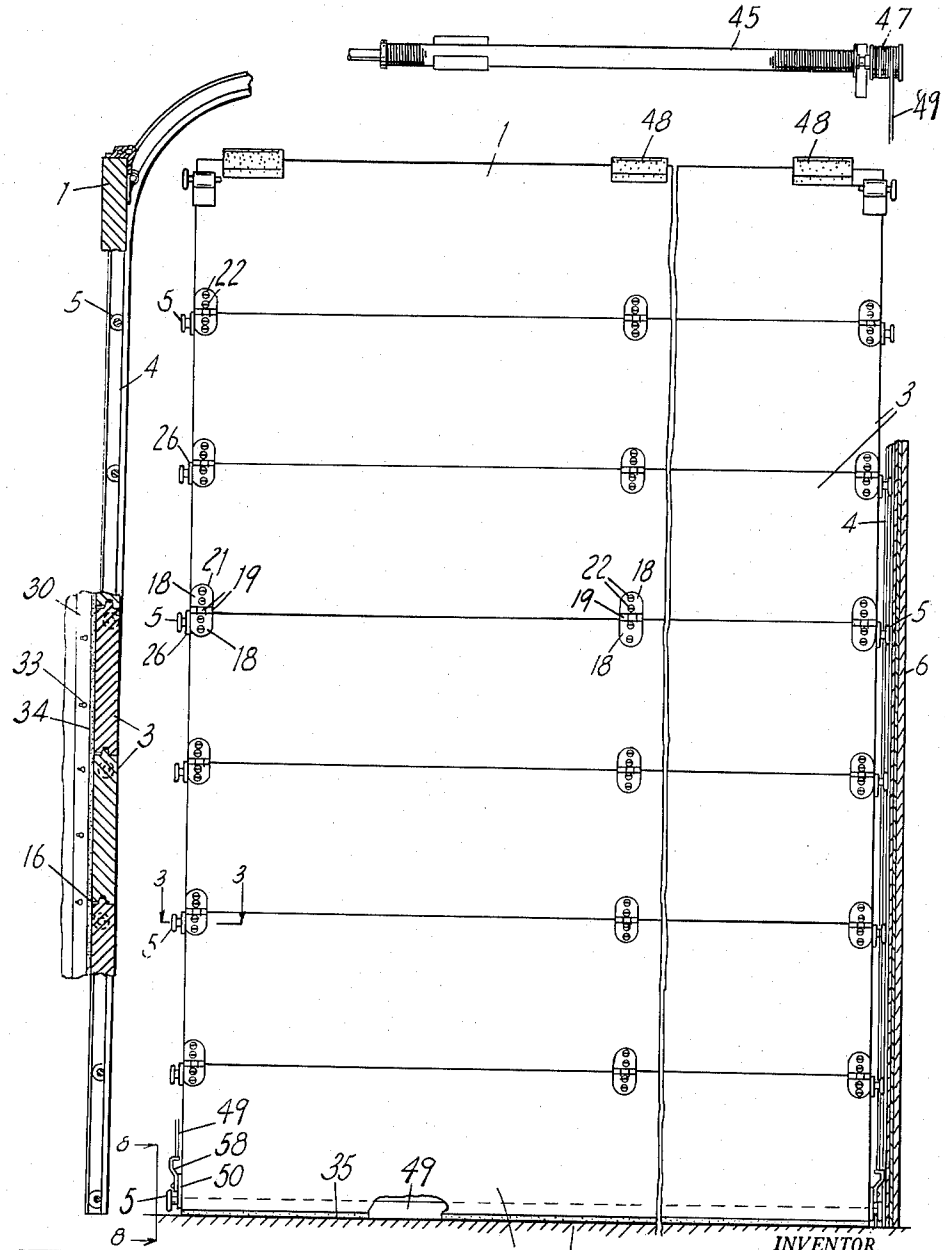

Fig. 2 Fig. 1

INVENTOR.
Flay D. Crosswell
BY
ATTORNEY.

Aug. 3, 1965 F. D. CROSSWELL 3,198,242

UPWARDLY ACTING DOOR AND SEAL MEANS THEREFOR

Filed Sept. 5, 1961 3 Sheets-Sheet 2

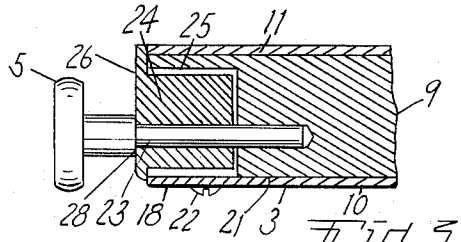

Fig. 5.

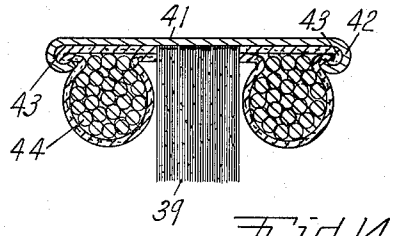

Fig. 14.

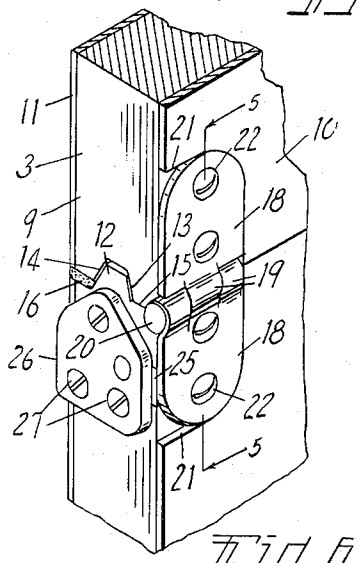

Fig. 6.

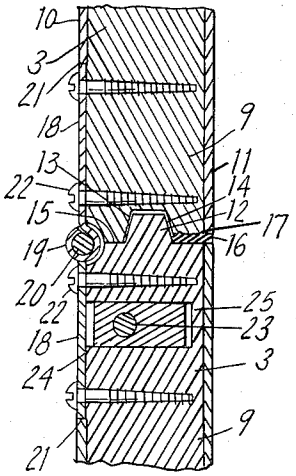

Fig. 5.

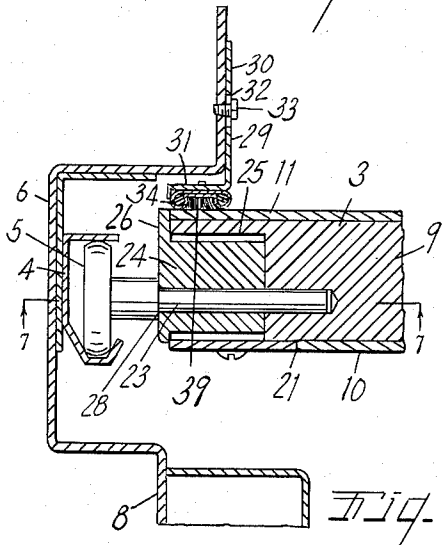

Fig. 4.

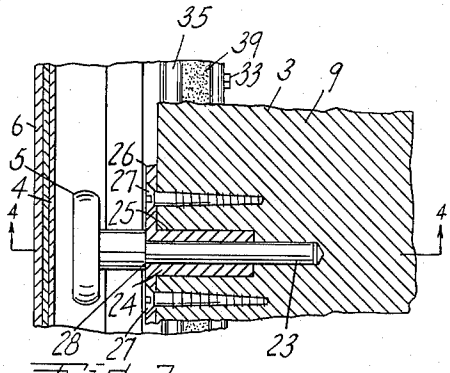

Fig. 7.

INVENTOR.
Flay D. Crosswell
BY
Otto Earl
ATTORNEY.

Aug. 3, 1965 F. D. CROSSWELL 3,198,242

UPWARDLY ACTING DOOR AND SEAL MEANS THEREFOR

Filed Sept. 5, 1961 3 Sheets-Sheet 3

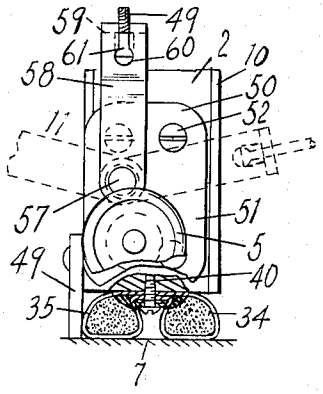

Fig. 8.

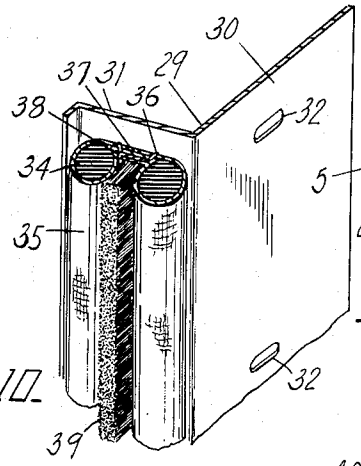

Fig. 10.

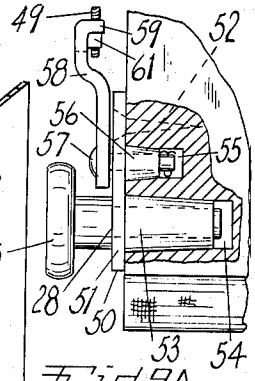

Fig. 9A

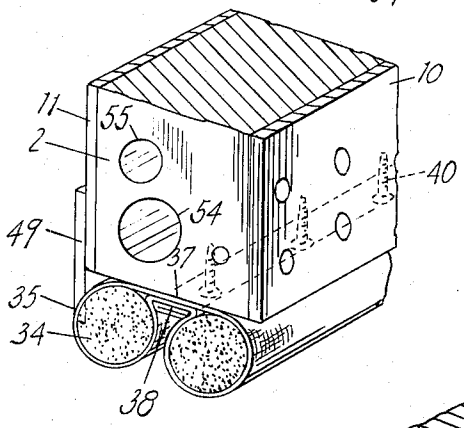

Fig. 9.

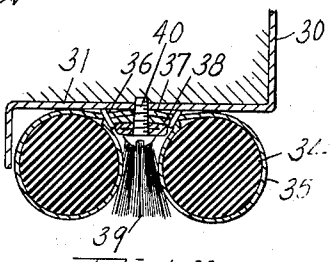

Fig. 11.

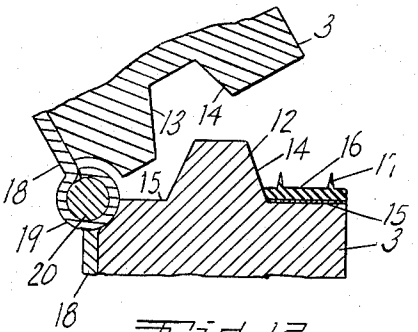

Fig. 12.

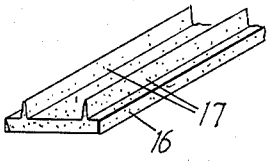

Fig. 13.

INVENTOR.
Floyd D. Crosswell
BY
Otto Earl
ATTORNEY.

United States Patent Office 3,198,242 Patented Aug. 3, 1965

3,198,242

UPWARDLY ACTING DOOR AND SEAL MEANS THEREFOR

Flay Downs Crosswell, Hartford City, Ind., assignor to Overhead Door Corporation, Hartford City, Ind., a corporation of Indiana

Filed Sept. 5, 1961, Ser. No. 135,988
2 Claims. (Cl. 160—190)

This invention relates to upwardly acting doors. The main objects of this invention are:

First, to provide an upwardly acting door comprising a plurality of hingedly connected section and which presents substantially smooth inner surface when the door is in closed position.

Second, to provide an upwardly acting door having the above characteristics in which the joints between the sections are effectively sealed when the door is in closed position.

Third, to provide jamb seal means which while highly effective from the sealing standpoint do not materially add to the force necessary to close and open the closure.

Fourth, to provide sealing units which may be readily attached at units to closure jambs or frames or to the closure in operative relation to jambs or sills.

Fifth, to provide a door assembly in which the track engaging rollers are mounted at the ends of the sections and closely adjacent to the hinge connections therefor.

Sixth, to provide means for connecting a counterbalancing cable to the door without removing the door from its supporting and guiding tracks.

Seventh, to provide a coupling connection for a counterbalancing cable to an upwardly acting door which minimizes the stress on the cable at the point of its connection to the door.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

FIG. 1 is a fragmentary inside elevational view of an upwardly acting door comprising a plurality of sections embodying my invention, a fragment of the track at one end of the closure being conventionally shown.

FIG. 2 is a fragmentary vertical section showing the relationship of the sections to a track, a portion only of the jamb being shown.

FIG. 3 is an enlarged fragmentary view partially in section on a line 3—3 of FIG. 1.

FIG. 4 is an enlarged fragmentary vertical view partially in section on a line corresponding to line 4—4 of FIG. 7.

FIG. 5 is a fragmentary view in vertical section on a line corresponding to line 5—5 of FIG. 6.

FIG. 6 is a fragmentary perspective view illustrating the relationship of adjacent sections and the hinge connections therefor and the support for the track engaging rollers.

FIG. 7 is a fragmentary view in section on a line corresponding to line 7—7 of FIG. 4.

FIG. 8 is a fragmentary end elevational view illustrating the bottom portion of the door in closed position relative to the sill, which is conventionally shown, and illustrating the connections for one counterbalancing cable to the door, the adjustment of the connecting means being indicated by dotted lines, certain portions being broken away to show structural details.

FIG. 9 is a fragmentary perspective view with the bottom roller supporting and cable anchoring bracket removed.

FIG. 9A is a fragmentary view partially in section, further illustrating structural features of the cable connecting bracket.

FIG. 10 is a fragmentary perspective view of a jamb seal unit embodying my invention.

FIG. 11 is an enlarged fragmentary view corresponding to that of FIG. 4, illustrating structural details of the jamb seal unit.

FIG. 12 is an enlarged fragmentary vertical section corresponding to FIG. 5, with one of the sections of the pair in tilted relation to the other, and illustrating structural details of the adjacent edges of the sections and the seal therefor.

FIG.13 is a fragmentary perspective view of the seal member illustrated in FIG. 12.

FIG. 14 is a fragmentary cross-sectional view of a modified form or embodiment of the jamb seal unit.

I have illustrated a commercial embodiment of my invention in an upwardly acting door comprising a plurality of sections. Structures embodying my invention are particularly desirable where it is important that there should be no parts projecting inwardly to any substantial extent from the inner side of the closure for use, for example, in enclosed trucks, trailers, railway cars and the like where contents are likely to shift into engagement with the closure, and further where effective sealing of the sections in relation to each other and to the jamb or frame is an important factor, and in that connection a door which requires little effort in opening and closing.

The embodiment of my invention illustrated comprises a plurality of sections including top section 1, bottom section 2, and intermediate sections 3. These are substantial duplicates so far as their meeting edges are concerned and therefore I have only illustrated in detail the relationship of a pair of the sections. The closure is slidably mounted on rails designated generally by the numeral 4 with which the rollers 5 coact.

A door jamb 6 is conventionally illustrated in FIG. 2, but a cross section thereof is illustrated in FIG. 4 with the track 4 mounted thereon and with which the rollers 5 coact. A sill is conventionally illustrated at 7, see FIGS. 1 and 8. A portion of a wall is illustrated at 8 in FIG. 4. In the embodiment of my invention illustrated in FIGS. 3, 4, 5 and 6, the door sections comprise body members 9, inner sheet metal facing panels 10, and outer panels 11. The body members 9 are in practice formed of different stock or materials, multiply stock or insulating materials, but is only conventionally illustrated. These panels have upwardly projecting longitudinally extended tapered rib-like portions 12 on their upper edges and cooperating downwardly facing longitudinal grooves 13 on their lower edges, these parts being designed so that they nest when the sections are in closed position, as is illustrated in FIGS. 5 and 6. It will be noted that there are shoulder-like portions 14 and 15 on the inner sides of the rib and groove. Resilient seal members 16 are mounted on the shoulders 15, these being provided with upwardly projecting longitudinally extending lips or flanges 17, see FIG. 12. These lips or flanges are such that they are readily collapsed when the sections are in alignment as in closed position, see FIG. 5.

The connecting hinges for the closure sections are of the leaf type comprising leaves 18, coacting knuckles 19, and pivots 20. The inner panels 10 have recesses 21 therein adapted to desirably fittingly receive the hinge leaves, as is illustrated in FIGS 5 and 6. It will be understood that where closures are of a substantial width it is desirable to provide intermediate hinges as well as hinges adjacent the edges of the door, as is illustrated in FIG. 1. These hinge leaves are fixedly secured to the closure sections as by means of the screws 22.

In the embodiment illustrated, the spindles 23 of the

rollers 5 are supportedly engaged with and carried by the spindle support members 24 disposed in recesses 25 which open at the ends of the sections and desirably also at the inner edges thereof for convenience in manufacturing and assembling. These recesses 25 are overlapped and closed by one of the hinge leaves. The recesses are of noncircular cross section and the members 24 have parallel top and bottom sides and are fittingly engaged in the recesses, as is clearly illustrated in FIGS. 5 and 7. These spindle support members have attaching flanges 26 which are disposed in lapping relation to the ends of the sections and secured thereto as by means of the screws 27.

The spindles 23 are provided with shoulders 28 which abut or are in thrust engagement with the ends of the bearings. The roller 6 being in engagement with the track as illustrated in FIG. 4 effectively prevents the lateral shifting or edgewise shifting of the door as its opened or closed, or subjected to racking stresses in use in a motor vehicle, for example.

The jamb seals, designated generally by the numeral 29, include support members 30 having laterally projecting springably resilient flanges 31, desirably of angular cross section as illsutrated in FIGS. 10 and 11. These support members have laterally disposed slots 32 therein receiving the attaching screws 33. The flanges 31 are desirably spaced from the jamb to permit adjustment thereof relative to the closure. The seal units comprise the elongated laterally spaced springably resilient flexible seal members 34, desirably of rubber or rubber-like synthetic material and of cylindrical section, as is conventionally illustrated in the drawings, and the supporting strip 35 of flexible sheet material which is wrapped around the seal members 34 and secured at 36 on the inner sides thereof to support the seal members 34 in laterally spaced relation and provide an attaching web 37.

When use for jamb seals, an intermediate seal member is desirably provided, this comprising a base strip designated by the numeral 38 and fibers or filaments 39 projecting therefrom and of such length they engage the jamb when the members 34 are in engagement therewith. This seal unit is secured to the support as by means of screws 40 spaced longitudinally thereof.

When the seal unit is mounted on the bottom of a door section to coact with the sill as is illustrated in FIGS. 8 and 9, the intermediate seal member is desirably omitted for the reason that if the fibers or filaments of the intermediate seal member became frozen to the sill they would be likely to be pulled out on the opening of the closure.

The guard member 49 is a strip of flexibly resilient material and extends from edge to edge of the bottom section of the door in depending relation thereto and at the outer side of the sill engaging members 34. Its lower edge is in engagement with the sill when the door is in closed position as shown in FIG. 8, in which position it serves as a guard for the seal members 34. This prevents the entrance of water or the forming of ice which might adhere the seal members to the sill, resulting in their being fractured with the opening of the door. The guard member is made of flexibly resilient material so that it maintains its place, but yields in the event of an operator inserting some type of tool or pry to open the door, and it does add to the sill seal, although the primary purpose is as stated.

It should be understood that under certain conditions the seal unit is mounted directly on the jamb rather than on the support member 30. The support member is desirable as it provides means for adjusting the seal relative to the closure, and in practice there is likely to be substantial structural variation even in the matter of specified tolerances. With the seal mounted on the support member 30, adjustment can be made not only on the initial installation but to compensate for wear, warping, and to vary the amount of sealing thrust.

In the embodiment shown in FIG. 14, the seal unit is mounted on a supporting strip 41 having inturned flanges 42 on its edges which are clampingly engaged with edge portions 43 of the flexible supporting strip. This figure also conventionally illustrates the resilient seal members 44 as being of cellulose or spongy material.

It is desired to point out that the spindles for the rollers may be nonrotatably engaged in the spindle supports 24 and the rollers rotatably engaged in the spindles. However, both forms of track engaging rollers are old in the art, but the shoulders on the outer ends of the spindles disposed in thrust bearing engagement with the outer end of the spindle bearing member is an important and novel feature of the applicant's invention.

In the accompanying drawing the spring actuated counterbalance means is designated generally by the numeral 45. The cable 49, commonly of twisted wire, is wound upon the drum 47 and is connected to the bottom door section 2 by anchoring means illustrated in FIGS. 8 and 9A, this particular cable anchoring means having the advantages of minimizing the stress upon the cable and also to facilitate the connection for the cable to the door in installing and in the event that a cable should be broken.

In the embodiment illustrated, this anchoring means comprises or includes a combined spindle supporting bracket and cable anchoring member designated generally by the numeral 50 and including an anchoring plate 51 provided with holes to receive the screws 52, the member 50 having an inwardly projecting bearing 53 disposed in the bore 54 provided therefor. There is also a bore 55 which is adapted to receive the coupling socket 56 for the coupling pin 57 of the cable anchoring member 58, so that this member is swingable transversely of the door section, as is indicated in FIG. 8, thereby permitting engagement of the cable with it and also relieving the cable of any twisting stress as the door is opened and closed. The member 58 is provided with an inwardly projecting lug 59 and has a keyhole slot 60 therein through which the cable may be inserted or removed, the cable being provided with an anchoring collar 61 on its lower end.

The lower door section is provided with bores 54 and 55, as stated, positioned to receive the spindle member 53 and the bore 56 for the coupling spindle 57. The lower roller 5 is the same as the other rollers which have been described. With the door positioned between the tracks the cable may be attached without removing the door from the tracks, which is an advantage both in the original installations and in the event that a cable should be broken or become defective.

I have illustrated and described by invention in a highly desirable embodiment thereof. I have not attempted to illustrate various modifications and adaptations as it is believed that this disclosure will enable those skilled in the art to embody and adapt my invention as may be desired.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. An upwardly acting door assembly comprising side frame members, tracks including upright portions of facing channel cross section disposed at the inner sides of the door frame side members in facing relation to each other, a door comprising a plurality of pivotally connected sections, track engaging rollers disposed at the ends of said sections, counterbalance means including a cable, a combined spindle supporting bracket and cable anchoring member disposed on the end of the lower door section and comprising a plate-like body portion having an inwardly projecting roller spindle bearing and an inwardly projecting cable coupling socket disposed above said spindle bearing, a track engaging roller having a spindle disposed in said spindle bearing, and a cable coupling member provided with a spindle engaged in said cable coupling socket and terminatnig at its outer end in a laterally projecting lug and having a keyhole slot

therein extending into said lug, said cable having a terminal portion detachably engaged with said keyhole slot, said cable coupling member being swingable laterally relative to said lower door section and to said track.

2. An upwardly acting door assembly comprising side frame members, tracks including upright portions of facing channel cross section disposed at the inner sides of the door frame side members in facing relation to each other, a door comprising a plurality of pivotally connected sections, track engaging rollers disposed to project at the ends of said sections, counterbalance means including a cable, a combined spindle supporting bracket and cable anchoring member mounted on the end of one door section and having an inwardly projecting roller spindle bearing and an inwardly projecting cable coupling socket disposed above said spindle bearing, a track engaging roller having a spindle disposed in said spindle bearing, said spindle having a shoulder thereon supporting said track engaging roller in outwardly spaced relation to the bracket, and a cable coupling member provided with a spindle engaged in said cable coupling member socket and having a cable receiving opening at its outer end with

which said cable is detachably engageable, said cable coupling member being swingable laterally relative to said door section to which it is attached and to said track.

References Cited by the Examiner

UNITED STATES PATENTS

788,761	5/05	Erwood	160—190 X
1,925,574	9/33	Scott	160—191
2,045,060	6/36	Wheatley	160—209
2,227,571	1/41	Clark	160—209
2,274,216	2/42	Sanders	160—190
2,495,672	1/50	Dautrick	160—191
2,523,929	9/50	Taylor	160—190
2,793,690	5/57	Stroup	160—201
2,831,537	4/58	Ritter	160—201
2,871,932	2/59	Stroup	160—209 X

HARRISON R. MOSELEY, *Primary Examiner.*

LAWRENCE CHARLES, BENJAMIN BENDETT, CHARLES E. O'CONNELL, *Examiners.*