

[54] OVERHEAD DOOR ASSEMBLY
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 [51] Int. Cl. E05d 15/38
 [58] Field of Search 49/197, 199, 200, 203, 49/204

2,054,191 9/1936 Byrne 49/197
 2,718,036 9/1955 Strobel et al. 49/200
 3,421,260 1/1969 Dickinson 49/200 X

Primary Examiner—Kenneth Downey

[57] ABSTRACT

An overhead door assembly in which the top edge of the door travels in downwardly opening bow shaped tracks and horizontal transverse pivots on the sides of the door travel in vertical tracks. The top of the door is strengthened and overhangs the bottom which reduces water drip-off and icing at the bottom edge of the door.

[56] References Cited
 UNITED STATES PATENTS
 1,442,942 1/1923 Gullicksen 49/197 X

3 Claims, 8 Drawing Figures

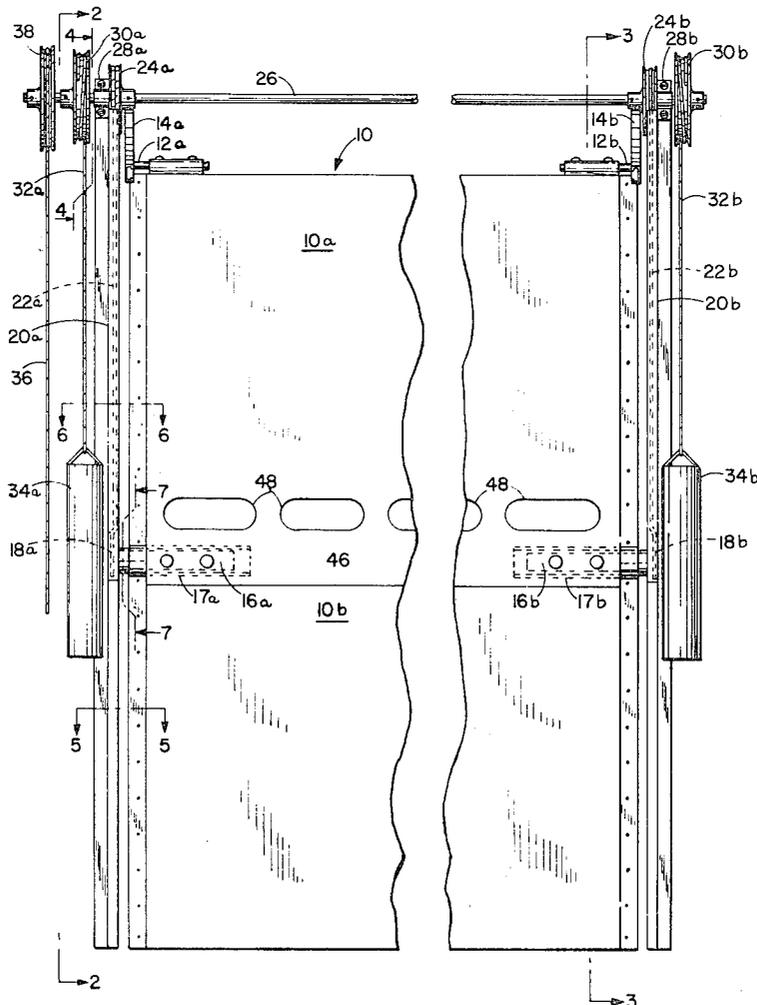


FIG. 1

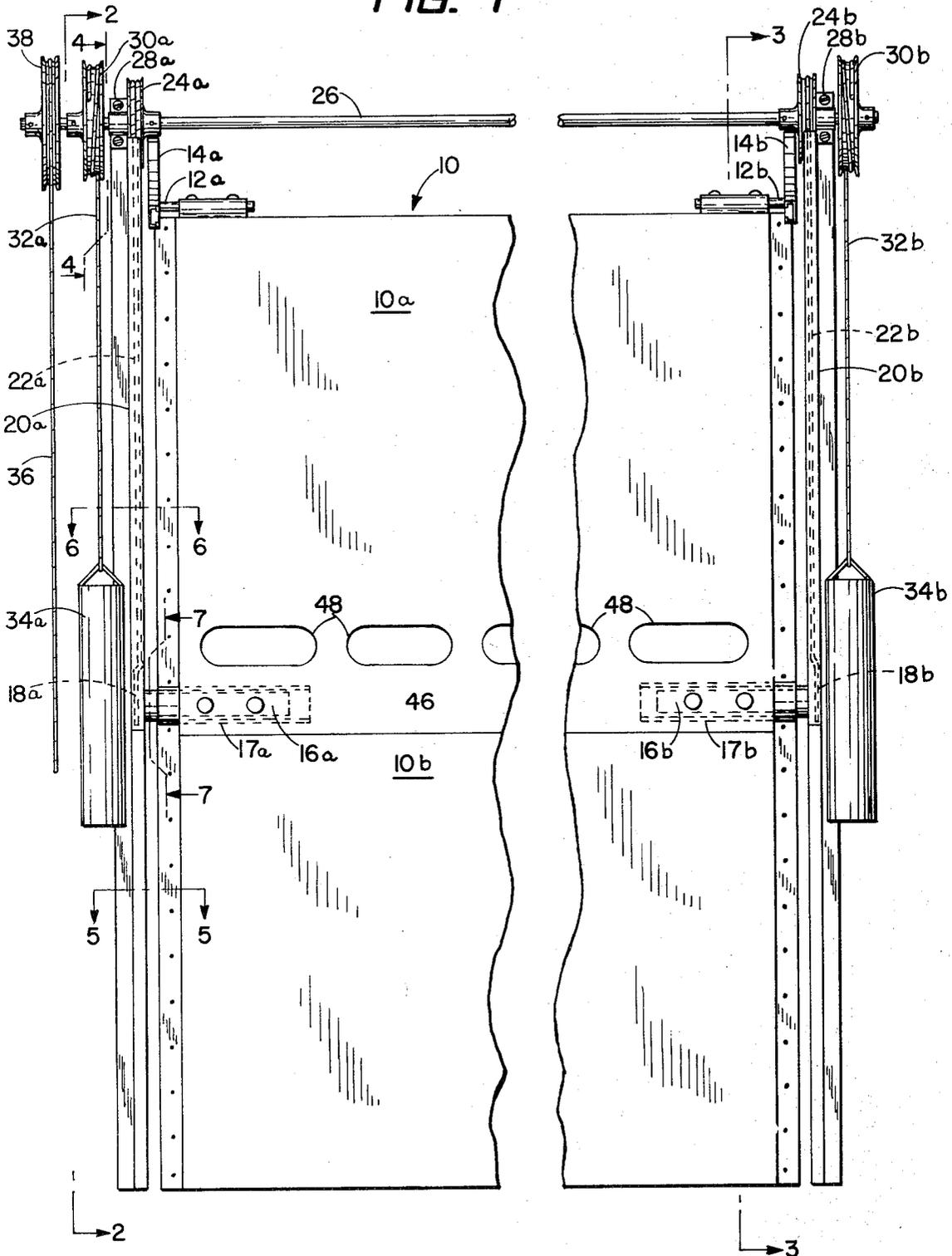


FIG. 2

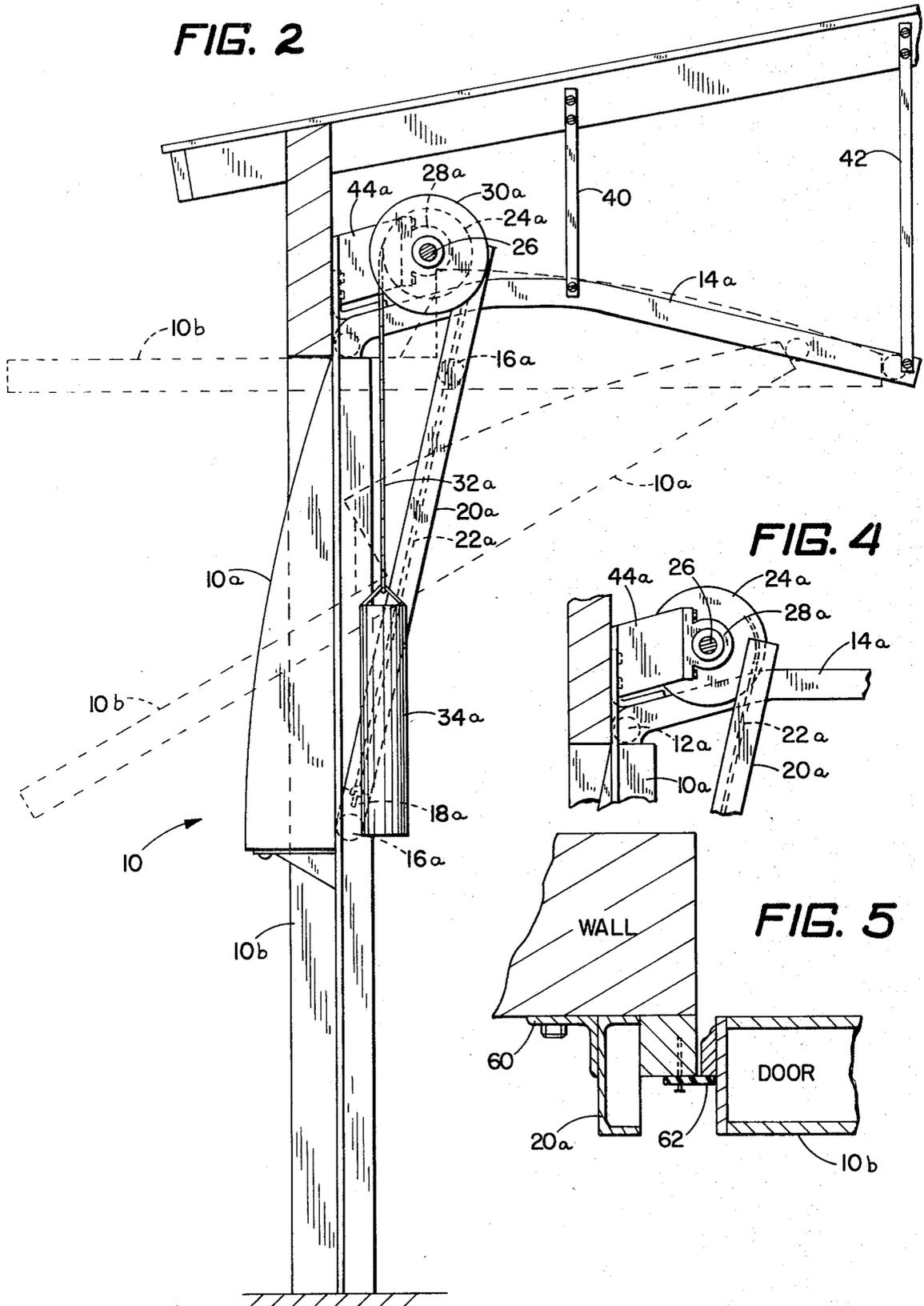


FIG. 4

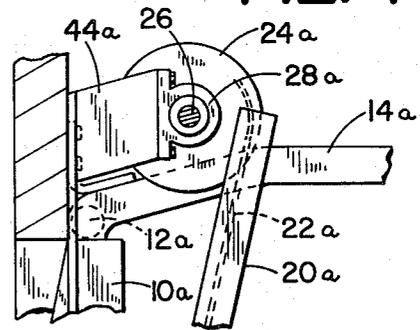
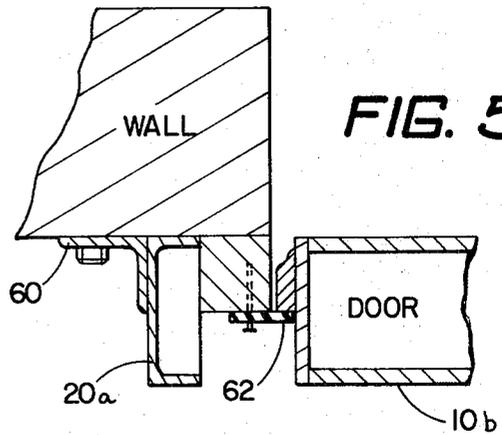


FIG. 5



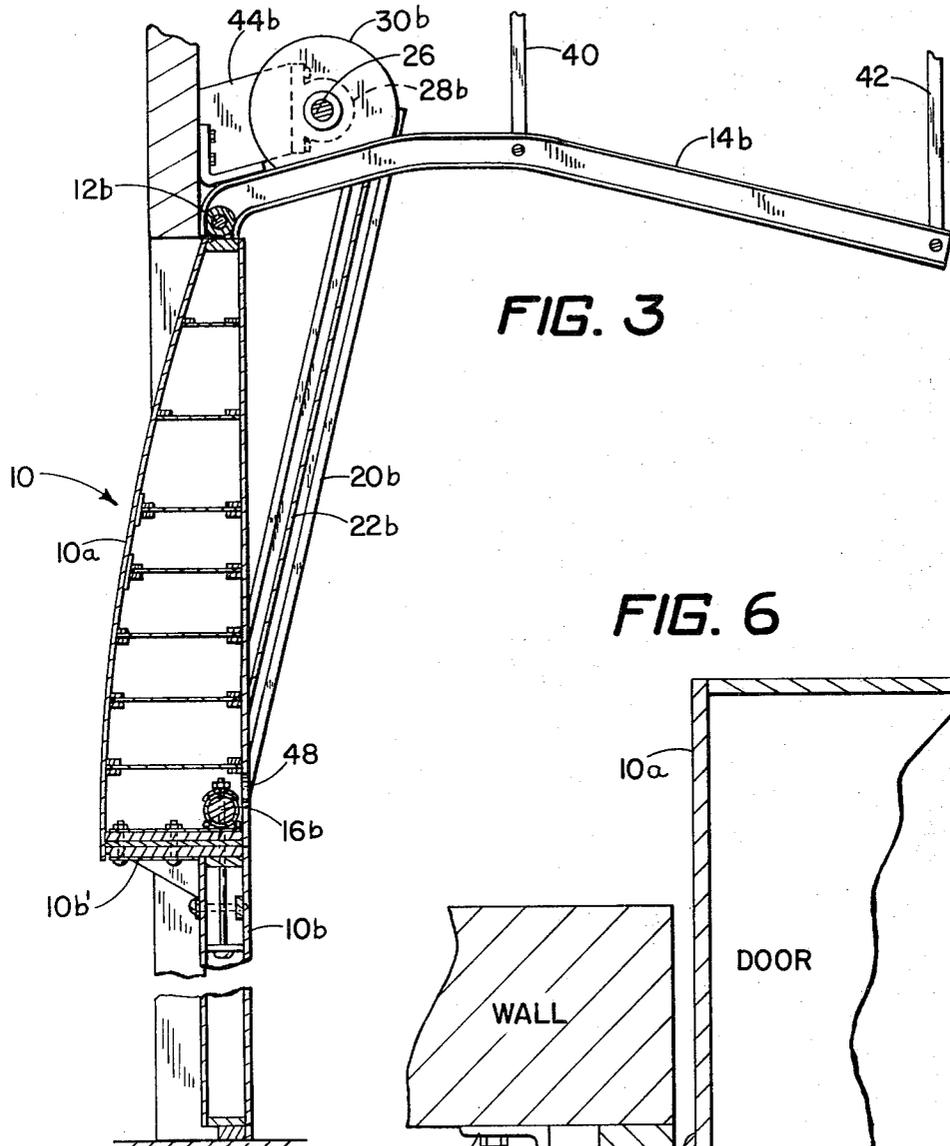


FIG. 3

FIG. 6

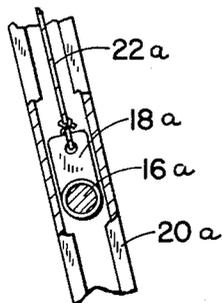
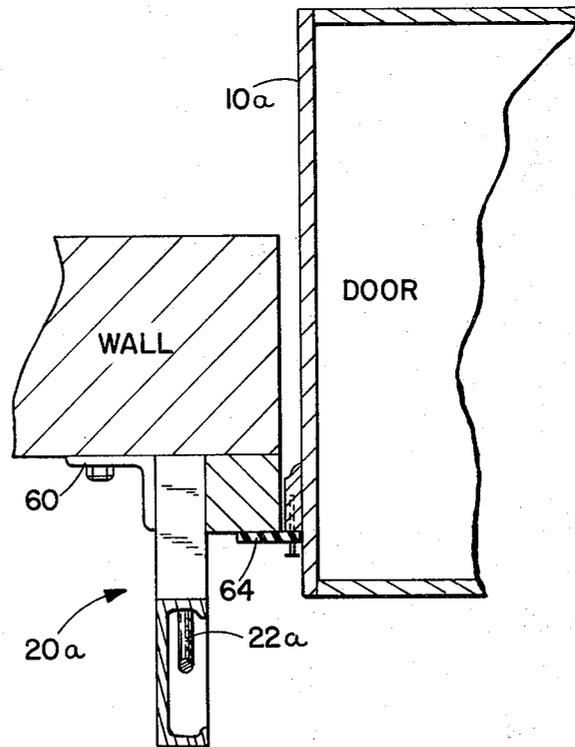
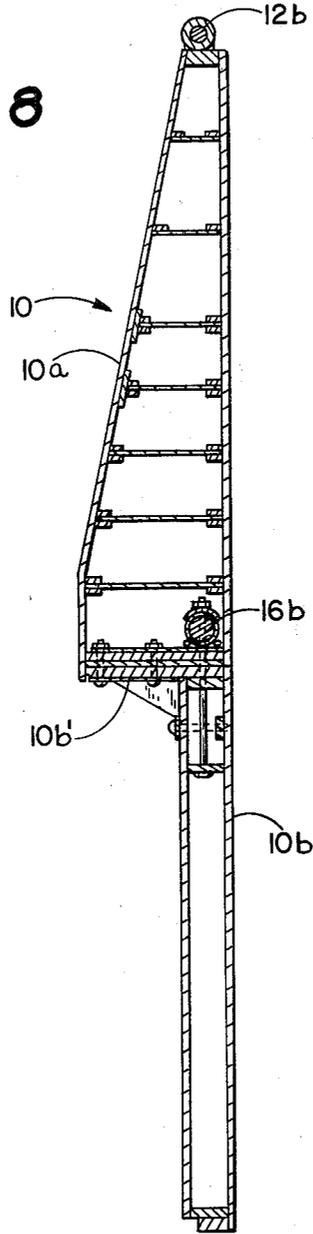


FIG. 7

FIG. 8



OVERHEAD DOOR ASSEMBLY

FIELD OF THE INVENTION

The invention concerns an overhead door assembly of the type in which the top edge of the door rolls inward on overhead tracks and pivots and slides upward on side tracks.

PRIOR ART

The prior art is relatively well developed. Two examples are U.S. Pat. Nos. 1,706,442 and 2,141,515, both of which disclose overhead doors.

Neither these patents nor others known discuss the problem in cold regions of the collection and freezing of water along the bottom edges of the door. The door then has to be pried open, a difficult job which often results in damage to the door. The top portion of the door of the present invention is substantially thicker than the bottom, and the exterior surface of the top portion overhangs that of the bottom by a substantial amount. Therefore drip-off from the top portion is away from the bottom edge of the door, which remains relatively dry. In other words, the top portion of the door acts as an umbrella for the bottom. However, if a small amount of ice should form along the bottom edge of the door, the door may be pried up vertically because it is designed to travel substantially vertically during the first few inches of travel during opening. Ice is easier to overcome by prying the door vertically rather than horizontally.

Summary: The invention concerns an overhead door assembly including a door having a structurally reinforced top portion which is thicker than the bottom and overhangs the bottom. Rollers are mounted at the top edge of the door and travel in arcuate or bow-shaped tracks (sometimes called program tracks or overhead tracks) mounted inside and over the door opening. The overhead tracks are mounted substantially horizontally and the bow opens downward. The program tracks control the path of travel of the top edge of the door.

The door rotates about pivots mounted in the sides of the door in a transverse axis about which the door is substantially balanced. The pivots include members which slide in vertical tracks (sometimes called side tracks or pivot tracks) mounted at the sides of the door opening. As the door is opened, the pivots travel upward and inward in the side tracks and the door rotates about the pivots. The top portions of the side tracks slope inward and the bottom portions of the side tracks are supported on the floor and substantially carry the entire weight of the door.

The door assembly also includes means for counterbalancing the door for ease in raising and lowering the door.

In a preferred embodiment the top overhanging portion of the door has a curved outer surface which is stressed for strength. In another embodiment the top portion is triangular in cross section. The door may be built in two sections, an upper and a lower, especially if the door is relatively large. The two sections can then be assembled at the site. The lower section of the door is bolted to the bottom of the top section.

The overhead tracks are arcuate or bow-shaped and open downward. Each track has four portions, an outer portion which slopes nearly vertically upward; a first intermediate portion, adjacent the outer portion, which

slopes upward, but not as steeply as the outer portion; a second intermediate portion, adjacent the first intermediate portion, which is relatively horizontal; and an inner portion, adjacent the second intermediate portion, which slopes downward. The shape of the program tracks accommodates the peculiar contour of the door. As the door swings and travels inward the upper edge of the door eventually travels downward in order to accommodate the thick portion of the door in the head-space area.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an interior front view of the door assembly;

FIG. 2 is a side view of the door assembly;

FIG. 3 is a sectional view of FIG. 1 from the cutting plane 3—3, showing the construction of a preferred door;

FIG. 4 is a sectional view of FIG. 1 from the cutting plane 4—4, showing the cable drum;

FIG. 5 is a sectional view of FIG. 1 from the cutting plane 5—5, showing a side track and the position of the door with respect to the wall;

FIG. 6 is a sectional view of FIG. 1 from the cutting plane 6—6, showing the track and the drum cable within the track;

FIG. 7 is a sectional view of FIG. 1 from the cutting plane 7—7, showing a slide member which is a part of a pivot and how it is positioned within a side track; and

FIG. 8 is a sectional view of a door with an upper portion which is generally triangular shaped in cross-section.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to FIG. 1, the door assembly includes a door 10 having an upper section 10a and a lower section 10b. The top edge of the door is guided by rollers 12a and 12b bolted thereto which roll in overhead tracks 14a and 14b respectively. Tracks 14a and 14b are mounted over the door opening and extend inwardly. Door 10 rotates about pivots 16a and 16b located in the sides of door 10 near the junction of the top and bottom portions of door 10. Pivots 16a and 16b substantially support the entire weight of door 10. The inner ends of pivots 16a and 16b are journaled in bearings 17a and 17b mounted in door 10. The outer ends of pivots 16a and 16b are securely attached to slide plates 18a and 18b respectively which slide up and down in side tracks 20a and 20b respectively. Side tracks 20a and 20b are also called pivot tracks. Cables 22a and 22b are used to raise and lower the door. The lower ends of cables 22a and 22b are tied to the top portions of slide plates 16a and 16b respectively. The upper ends of cables 22a and 22b pass over cable drums 24a and 24b respectively. Drums 24a and 24b are mounted over the door opening on a horizontal shaft 26, called an equalizer shaft. Shaft 26 rotates in bearings 28a and 28b located just outwardly from cable drums 24a and 24b. The door 10 is counter balanced by means of pulleys 30a and 30b mounted on equalizer shaft 26, ropes 32a and 32b passing over pulleys 30a and 30b, and counterweights 34a and 34b tied to the lower ends of ropes 32a and 32b. The door is opened by pulling on the lower end of a rope 36 which passes over a pulley 38 mounted on the left end of shaft 26.

The shapes of overhead track **14a** and side track **20a** are shown more clearly in FIG. 2. Track **14a** is arcuate or bow-shaped with the opening downward. The slope of the outer end of track **14a**, on the left, is nearly vertical for a short distance of several inches. The next portion of track **14a** slopes upward to the right. The middle portion of track **14a** is practically horizontal and the innermost portion of track **14a** slopes downward. The outermost portion of track **14a** is firmly attached to the wall structure just above the door opening. Track **14** is supported along its length by struts **40** and **42** which are securely attached to the roof rafters. Bearing **28a** is bolted to the right end of a bracket **44**, the left end of which is bolted to the wall structure above the door opening.

Door **10** can be seen in section in FIG. 3. Top section **10a** is substantially thicker than bottom section **10b** and as shown has a generally curved outer surface. Curving the outer surface stresses it and increases the structural strength of the door which is especially desirable when the door is in the elevated generally horizontal position. The upper portion **10a** of door **10** is stiffened by a set of horizontal trusses or members **10c** which are glued or otherwise fastened between the inner and outer surfaces.

The top portion of door **10** overhangs the bottom portion by a substantial amount and because of this, drip-off from the top section **10a** is well away from the bottom edge of bottom section **10b**. As shown in FIG. 3, the top of bottom section **10b** has a flange **10b'** for bolting to the bottom of top section **10a**. The top and bottom sections are bolted or otherwise joined along a joint **46**. Relatively small doors are bolted together and transported as one piece. If a door is relatively large it is transported in two sections and assembled at the site. Access holes **48** along the lower edge of the top section of door **10** facilitate bolting together the top and bottom sections of the door. Bearing **17b** is held in place with a clamping arrangement **19**. The outer covering of door **10** may be of wood, metal, or fiberglass. It can be seen in FIG. 3 that the upper portion of side track **20b** slopes inwardly, the lower portion is substantially vertical. Referring to FIG. 5, track **20a** is welded on or otherwise securely attached to an angle iron **60** which is bolted to the wall. A closure strip **62** is securely fastened to the wall and extends in a vertical direction. Closure strip **62** covers or seals the gap between the lower door section and the wall. Referring briefly to FIG. 3 a closure strip **64** is securely fastened to the upper portion **10a** of the door and seals the gap between the upper door section and the wall.

In operation rope **36** is pulled downward to open the door. This causes pulley **38** which is mounted on shaft **36** to turn. As shaft **36** turns, pulleys **30a** and **30b** and pulleys **24a** and **24b** turn. As pulleys **30a** and **30b** turn, counterweights **34a** and **34b** are lowered. Cable drums **24a** and **24b** begin taking up cables **22a** and **22b**. Door **10** begins moving upward and begins rotating about pivots **16a** and **16b**, which are also moving upward. During the first few inches of travel, the rollers **12a** and **12b** travel nearly vertically in tracks **14a** and **14b**. Pivots **16a** and **16b** begin moving upwardly and inwardly along the upper portions of side tracks **20a** and **20b**. As the door continues to open, the pivots travel upward and inward in the side tracks and the rollers move first

upward and then downward in the overhead tracks. Referring briefly to FIG. 2, the door **10** is shown in the half open and fully open positions by the dashed or phantom outlines. The overhead tracks **14a** and **14b** are bowed as shown to accommodate the relatively thick upper portion of the door. It is seen that in order for the door to eventually reach a horizontal position, the upper edge of the door must eventually travel downward. This it does during its travel in the inner portion of the tracks **14a** and **14b**.

FIG. 8 shows another embodiment of door **10** in which the upper portion **10a** is triangular-shaped in cross-section instead of having a curved, stressed outer surface. This embodiment can be used if less structural strength is required.

A single preferred embodiment of the invention has been shown. Modifications to this embodiment and other equivalent embodiments may be devised by those skilled in the art without departing from the spirit and scope of the invention. Therefore the invention is to be limited only by the following claims.

what is claimed is:

1. An improved overhead door assembly for retarding the buildup of snow and rain at its base when closed and stowable in a compact manner when opened, comprising:

- a. a door having top and bottom portions and a generally planar inner surface, said bottom portion being of generally constant thickness and said top portion being generally thicker than said bottom portion to form a discontinuity in the door outer surface and to provide an overhang across the entire door width which shelters the door base from the accumulation of snow and rain;
- b. a pair of low-shaped overhead tracks for mounting inside and over a door opening, each of said tracks bowing downwardly and having a front portion nearest the door opening which slopes upward and away from the door opening, and a rear end portion furthest removed from the door opening which slopes downward and away from the door opening, said tracks accommodating said door in a stable generally horizontal overhead open position;
- c. means attached to the top of said door for traveling in said overhead tracks as the door is opened and closed;
- d. a pair of side tracks for mounting at the sides of the door opening, each of said side tracks having a generally vertical bottom portion and a top portion which slopes upwardly and away from said bottom portion to slidably guide said door to a generally horizontal overhead open position;
- e. means for pivoting said door about a transverse axis, said pivoting means traveling in the side tracks;
- f. means for counter balancing said door to ease its movement from the open to the closed position.

2. The improved door assembly of claim 1 wherein said door top portion includes an outer surface which is curved to provide a stressed shell structure for increased compression strength.

3. The improved door assembly of claim 1 wherein the top portion of said door is generally triangular-shaped in cross-section.

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