Oct. 1, 1963 B. W. TUCKER, JR 3,105,272

CLOSURE MEANS FOR ELEVATORS

Original Filed July 30, 1958

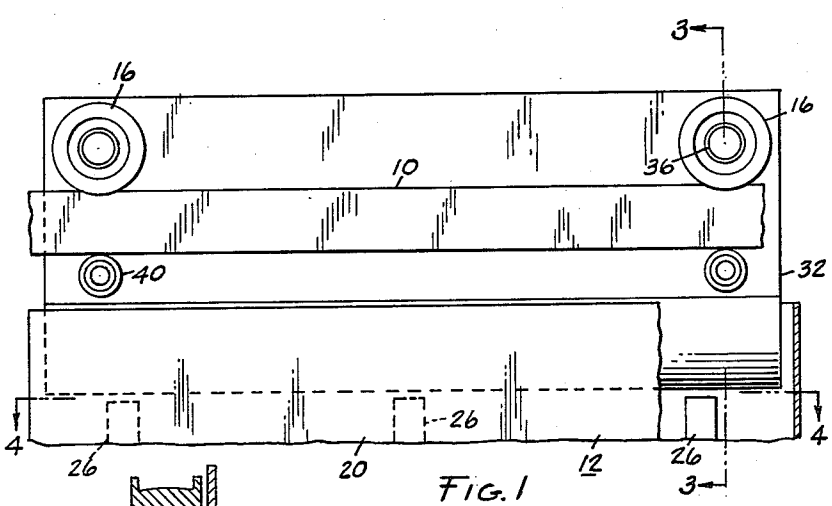
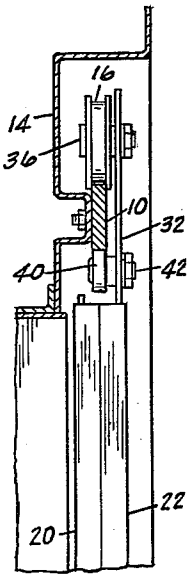


FIG. 1



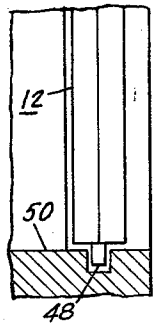


FIG. 2

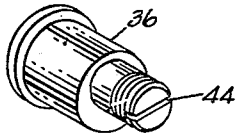


FIG. 5

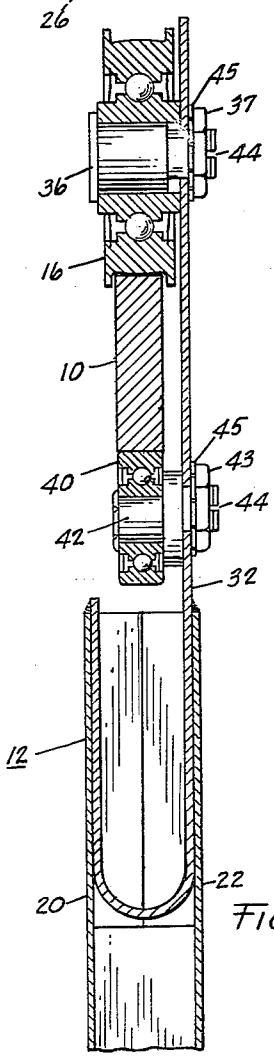


FIG. 3

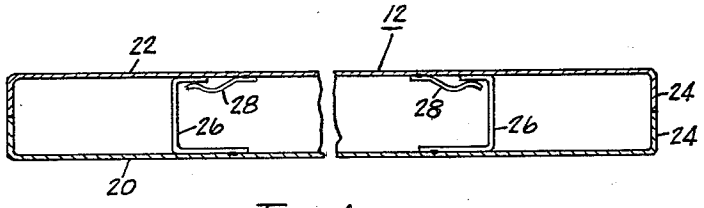


FIG. 4

BENJAMIN WHITEHEAD TUCKER, JR. INVENTOR

BY A. J. De Angelis ATTORNEY

United States Patent Office 3,105,272 Patented Oct. 1, 1963

3,105,272

CLOSURE MEANS FOR ELEVATORS

Benjamin Whitehead Tucker, Jr., South Orange, N.J., assignor to Otis Elevator Company, New York, N.Y., a corporation of New Jersey

Original application July 30, 1958, Ser. No. 752,092, now Patent No. 3,065,826, dated Nov. 27, 1962. Divided and this application Nov. 4, 1960, Ser. No. 67,271

1 Claim. (Cl. 20—19)

This invention relates to horizontally sliding doors and more particularly to such doors for elevator entranceways, and is a division of application Serial Number 752,092, filed July 30, 1958, now Patent No. 3,065,826, issued November 27, 1962.

In an elevator installation an entranceway is provided at each floor of a building where it is desired to provide access to the elevator hoistway. An elevator car travelling in such hoistway has a corresponding entranceway which, when the car stops at a floor landing, is positioned opposite to the hoistway entranceway to provide access to the car interior.

It is common practice to equip each of these entranceways with a horizontally sliding door composed of metal panels, which panels usually enclose a hollow central core space, and to suspend the door from a horizontally positioned overhead track by a hanger bracket attached to the top of the door, which bracket has two or more main rollers riding on the top surface of the track. Optionally, upthrust rollers may be provided with a slight running clearance to the lower surface of the track for the purpose of confining the assembly to close contact with the track and to prevent tilting or canting of the door. The bottom of the door is slidably confined in a groove formed in the top surface of the doorway threshold plate.

Each "hollow metal" door is of similar construction and consists of a metal front panel and a metal back panel, the extreme vertical edges of which are bent into flange shapes for mating engagement midway between the panels. When welded into abutting relation, these flange sections form the vertical side surfaces of the door. Welded between the front and back panels along their upper extremities is a U-shaped channel member, having a horizontal web and upwardly extending flanges. Immediately beneath the horizontal web and attached to its bottom surface, as by welding, is a reinforcing bar for distributing the weight load and reinforcing the web portion. This bar as well as the horizontal web are drilled and tapped to receive bolts by which the hanger bracket is attached to the top surface of the door. Lock washers secure the bolts in position. A filler bar is welded within the U-shaped channel member to provide a bearing surface for the under side of the hanger bracket. Shims are positioned between the hanger bracket and filler bar to align properly the door with the overhead track and bottom door guide. Each door is suspended from its overhead track by means of a pair of main rollers which engage the top surface of the track and which are rotatably mounted on the upper portion of the hanger bracket by means of studs. A pair of upthrust rollers are also rotatably mounted on the hanger bracket by means of studs in position to engage the bottom surface of the overhead track directly beneath the main rollers. The overhead track is secured to the elevator cab structure or the building superstructure, as the case may be. The bottom of each door is slidably confined in a groove formed in the top surface of its doorway threshold plate. Such prior art "hollow metal" doors and their suspending assemblies are shown and described in more detail

in my aforementioned co-pending application No. 752,092 with particular reference to FIGURES 1 through 3.

Traditionally, the doors and brackets have been drilled and tapped, where necessary, in the factory and have then been brought into final assembly at the installation site. Because the plane of the vertical face of the hanger bracket must be parallel to the plane of the vertical door surface and the door must be mounted at the correct height and in horizontal alignment with the overhead track and doorway threshold plate, if the door is to operate properly, and because the manner of manufacture and assembly has often made this difficult to achieve, it is not uncommon for the assembly and hanging of the sliding doors to consume a disproportionate amount of highly experienced field erection effort.

It is therefore an object of this invention to provide a sliding door assembly which is adaptable to erection with a minimum of effort by relatively unskilled personnel.

It is a further object of this invention to provide a sliding door and its hanger devices which are of simplified construction and which are assembled with the requisite degree of parallelism in the factory where the tools and fixtures for achieving the desired results are superior to those commonly available at the installation site.

These and other desirable characteristics of the invention can best be understood from the following description of a preferred embodiment of the invention which is made in conjunction with the drawings in which:

FIGURE 1 is a fragmentary, front elevational, schematic view of the upper portion of a sliding elevator door, having incorporated therein the door suspending device of the present invention;

FIGURE 2 is a fragmentary, side elevational, schematic view of the sliding door of FIGURE 1 positioned in an entranceway;

FIGURE 3 is an enlarged view taken along the line 3—3 of FIGURE 1;

FIGURE 4 is a fragmentary view taken along the line 4—4 of FIGURE 1; and

FIGURE 5 is a perspective view of one of the eccentric studs of FIGURE 1.

Referring to the drawings, an overhead track 10 is disposed across the elevator entranceway above the top of elevator door 12 in the conventional manner and is suitably secured to structure, generally designated 14, forming the entranceway. Door 12 is suspended from track 10 by main rollers 16 for sidewise movement, and consists of a metal front panel 20 and a metal back panel 22, each panel having flanges 24 formed along its extreme vertical side edge for mating engagement midway between the panels to form the body portion of the door. When welded into butted relationship, these flange sections form the vertical side edge surfaces of the door. Three vertically disposed channel members 26 welded to the inside surface of front panel 20 interlock with strip fastening clips 28 welded to the inside surface of back panel 22 and serve to reinforce the door internally. The top or supporting portion of each door consists of a metal plate 32, having substantially a J cross-sectional shape, the lower curved portion of which is welded between the front and back panels 20 and 22 to form the top edge surface of the door. The upper vertical portion of plate 32 is substantially in the plane of back panel 22 and extends upwardly above the top surface of the overhead track. Plate 32 extends horizontally almost the width of the door.

Main rollers 16 of conventional roller bearing construction are adjustably secured to the top portion 32 of the door by means of eccentric studs 36 cooperating with nuts 37. A pair of upthrust rollers 40 also of conven-

tional roller bearing construction are also adjustably secured to the top portion 32 of the door by means of eccentric studs 42 cooperating with nuts 43, and are adjusted for a slight running clearance with the bottom surface of the track to prevent canting of the door. Slots 44 formed in one end of studs 36, 42 facilitate adjustment of rollers 16 and 40. Lock washers 45 secure studs 36 and 42 in position. The bottom of the door has secured thereto a pendulant rectangular guide member 48 which is slidably confined in a groove formed in the top surface of doorway threshold plate 50.

Unlike the prior art apparatus previously described, the apparatus of the present invention minimizes installation effort. The doors of the subject invention may be assembled at the factory where the tools and fixtures are superior to those commonly available at the installation site. Also, the main rollers 16, upthrust rollers 40 and their respective eccentric studs 36 and 42 may be mounted on the door at the factory and the entire assembly shipped, as a unit, to the installation site. At the installation site, all that need be done by an installer to install the door in the elevator entranceway is to turn eccentric studs 36 and 42 to increase the vertical distance between main rollers 16 and upthrust rollers 40 sufficiently to suspend the door from its overhead track 10, and then simply turn the eccentric studs until the door is in horizontal alignment with the overhead track 10 and doorway threshold plate 50, and rollers 40 barely engage the bottom surface of the track. This door assembly also dispenses with the necessity of using a considerable amount of hardware to install a door, namely the door suspending apparatus of the previously described prior art device, which apparatus includes: shims, bolts, lock washers, a reenforcing bar, a filler bar, a U-shaped channel member and a hanger bracket.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown on the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

In an elevator entranceway adapted to be closed by a door horizontally movable on an overhead supporting track of a given width rigidly affixed to the entranceway structure and extending horizontally above the entrance

opening, said track having substantially smooth upper and lower guide surfaces, a door comprising vertically disposed front and back panels of rectangular configuration, each of said panels having its bottom and two vertical side edges formed as flanges, said front and back panel flanges being contiguous and affixed to its conjugate flange throughout their length, a vertically extending curved support member having substantially a J-shaped cross-sectional configuration, the lower curved portion of said support member being positioned between and rigidly affixed to the inner surfaces of said front and back panels along their top extremities with the straight portion of said support member extending vertically above the top surface of the door in a plane contiguous to and parallel to the plane of one of said panels, a pair of door supporting rollers of a given radius, a pair of up-thrust rollers of a given radius, said vertically extending portion of said support member having formed therein near each of its end extremities, a pair of stud receiving apertures one above and one below the levels corresponding to the height of the upper and lower guide surfaces respectively of said track, said apertures being displaced vertically one from the other by a dimension only slightly greater than the width of said track plus the combined radii of one of said door supporting rollers and one of said up-thrust rollers, a plurality of studs one each being rigidly mounted in each aperture, said door supporting rollers being mounted on the upper level studs and positioned to bear on the upper level surface of said track, said up-thrust rollers being positioned on the lower level studs and being positioned in contiguous relation to the lower surface of said track, each of said studs having a mounting portion and a roller supporting portion, said mounting portion being eccentrically positioned with respect to its roller supporting portion whereby the position of each stud supported roller with respect to the top of the door can be varied by rotating the respective stud in its mounting in the aperture.

References Cited in the file of this patent

UNITED STATES PATENTS

856,299	Ricker	June 11, 1907
1,329,326	Parsons	Jan. 27, 1920
2,574,496	Pomeroy et al.	Nov. 13, 1951

FOREIGN PATENTS

677,175	Germany	June 20, 1939