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Gibson

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[54] ELEVATOR CAR WITH ELEMENTS COMBINING BOTH STRUCTURAL AND WIRING HOUSING FUNCTIONS

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[52] **U.S. Cl.** .....**187/1 R**

[51] **Int. Cl.** **B66b 9/00**

[58] **Field of Search**.....187/1, 52, 56

[56] **References Cited**

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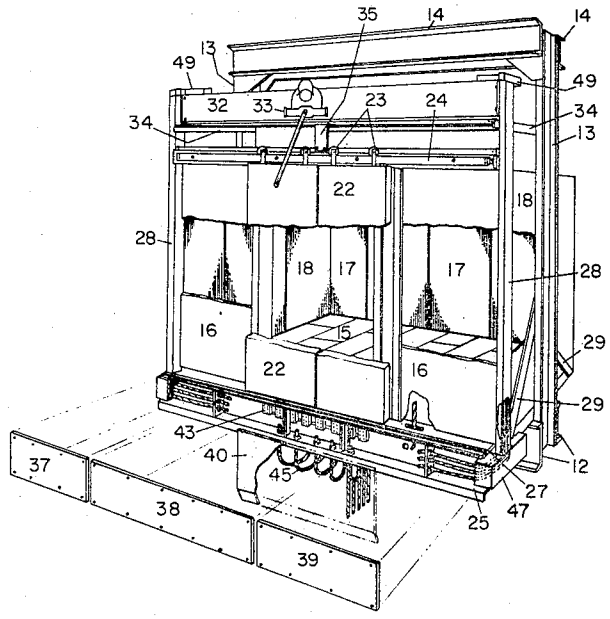
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[57] **ABSTRACT**

An elevator car in which the junction box and wiring raceways for the electrical conductors are integral with horizontal and vertical structural members.

5 Claims, 5 Drawing Figures



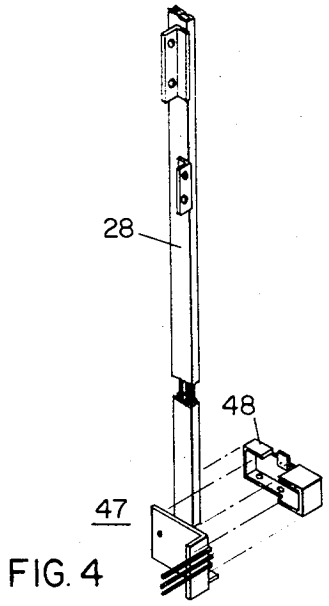


FIG. 4

FIG. 1

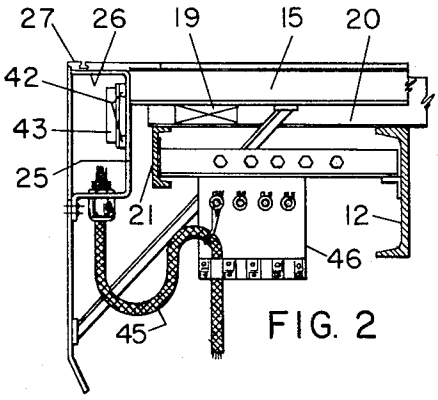


FIG. 2

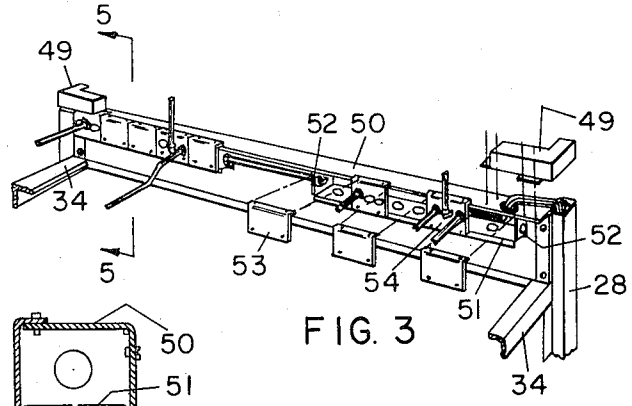


FIG. 3

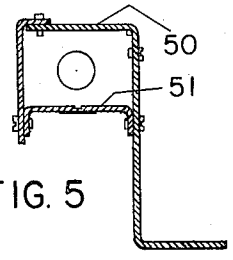


FIG. 5

ELEVATOR CAR WITH ELEMENTS COMBINING BOTH STRUCTURAL AND WIRING HOUSING FUNCTIONS

This invention relates to elevators and particularly to an arrangement for an elevator car in which structural elements of the car perform combined functions including their primary function of serving as a load sustaining element and a secondary function of serving as a housing for the electrical conductors of the car.

Elevator cars require electrical conductors for many items including lighting fixtures, as well as other electrical operating devices and equipment. The lighting fixture usually requires wiring to terminate in the ceiling of the passenger compartment of the car. The other devices and equipment are mounted at many various locations on the car and one or more electrical conductors must be distributed to each such location.

A traveling cable suspended from the bottom of the car provides the connection between the conductors on the car and related equipment separate from the car. This cable usually terminates in a junction box which is mounted under the car platform and serves no purpose other than as an electrical housing unit. In this box are a plurality of terminal blocks to which the wires of the traveling cable are connected. This box is typically located behind the toe guard plate and the entire plate usually requires removal in order to reach the wiring in the box. The electrical conductors for the top of the car are distributed from this box through pipe risers, or conduit sections, which are separate from the car structure. These risers increase the weight of the car and as a result a heavier counterweight must be provided. Moreover, these separate pipe risers are affixed to the car at the job site and their provision, thus, is a part of the installation costs.

One suggestion for eliminating the need for the installation of pipe risers at job sites proposed to distribute conductors to the top of the car through a vertical wiring trough which was integral with the car operating panel box or through a separate vertical wiring trough external of the passenger compartment of the car. In both these arrangements a wiring trough was substituted for the pipe risers. Neither arrangement proposed that a vertical structural element of the car be employed to perform a dual function and distribute the conductors to the top of the car.

It is an object of this invention to decrease the cost of installing elevator cars.

It is another object to decrease the weight of elevator cars.

One of the features of the invention is the elimination of the separate junction box and the use of the space in a structural channel member as the junction box. This and the use of vertical structural members as wiring ducts or raceways to distribute electrical conductors from the junction box to the top of the car attains the foregoing objects because the need for separate pipe risers is avoided thereby eliminating the cost of installing them, as well as their weight.

Other objects, features and advantages of the invention will be evident to those skilled in the art from the foregoing and from the following description when considered in conjunction with the appended claims and the accompanying drawing, in which

FIG. 1 is a simplified partially exploded schematic of an elevator car constructed in accordance with the invention with parts broken away;

FIG. 2 is a simplified sectional view of part of the elevator car of FIG. 1;

FIG. 3 is a simplified partially exploded schematic of another part of the elevator car of FIG. 1;

FIG. 4 is a schematic of a vertical upright support of the elevator car of FIG. 1;

FIG. 5 is a sectional view of the part of the elevator car of FIG. 3 taken along line 5—5.

Referring now to FIG. 1 of the drawing, an elevator car frame, or sling, comprises plank beams 12, vertical members 13 and crosshead beams 14. Resiliently supported thereby on plank beams 12 is a passenger compartment comprising platform 15, front wall 16, rear wall 17 and side walls 18. The resilient mounting of the passenger compartment may be provided in any well known manner. One such employs rubber blocks 19 (FIG. 2) between platform 15 and platform supporting frame 20 which is mounted directly on plank beams 12 and a plurality of transverse channels 21 (FIG. 2).

A slidable door assembly 22 is supported by its rollers 23 on door track 24 in typical fashion. This assembly provides a closure for the opening in front wall 16 of the passenger compartment.

Suitably affixed to the front of platform 15, such as by welding, is a threshold channel beam 25. The side walls of this beam are located one above the other and its channel is disposed frontwardly. Top wall 26 (FIG. 2) serves as the support for platform threshold plate 27 which is suitably fastened thereto so as to be disposed in front of the opening in front wall 16.

Channel 25 extends across the width of the elevator car to meet upright support members 28 at each corner of the front of the car. Each of supports 28 extends upwardly in its respective corner to a position above the roof of the passenger compartment. Each is suitably affixed to the car sling as by being bolted to respective platform side braces 29 which themselves, in typical fashion, are bolted to platform support frame 20 and vertical members 13. In addition, uprights 28 are also affixed to the car sling at their upper ends as by being fastened in suitable manner to support angles 34 which are bolted to vertical members 13. Uprights 28 provide support for door track 24 and for mounting frame 32 upon which is mounted motor controlled door operating device 33 which moves door assembly 22 between its opened and closed positions. Strap 35 connected between mounting frame 32 and track 24 supports the latter at its midpoint.

A front wall comprising plates 37, 38 and 39 is removably fastened to channel 25, in any satisfactory manner, as is toe guard plate 40. This removable front wall together with channel 25 comprise a lower horizontal wiring duct for the elevator car. Fastened to the back wall of channel 25 in any suitable manner are mounting bars 42 (FIG. 2). Upon these bars are mounted a plurality of terminal blocks 43 (FIGS. 1 and 2). In accordance with the invention the location of terminal blocks 43 is limited to that portion of channel 25 which is disposed under the opening in front wall 16 of the passenger compartment. A separate portion of the plate means comprising the front wall of the lower horizontal wiring duct, namely plate 38, covers this

portion of the channel so that all the terminal blocks are rendered accessible by unfastening plate **38**.

As can be seen from FIGS. **1** and **2**, traveling cables **45** containing wires for connection between electrical equipment on the elevator car and other such equipment separate from the car is suspended in typical fashion from a cable hanger **46** mounted under car platform **15**. Traveling cables **45** after being connected to cable hanger **46**, which provides the physical support therefor, are inserted through apertures provided for them in the bottom wall of channel **25**. The separate wires in the cables are then connected to terminal blocks **43** from which a plurality of electrical conductors are distributed to other portions of the elevator car. Thus channel **25** with its removable front wall fastened thereto comprises a junction box, as well as a lower horizontal wiring duct, for housing the electrical conductors for the elevator car.

In order to distribute the electrical conductors to other areas of the car, primarily the top thereof, upright supports **28** are hollow members and include an extended foot portion **47** with removable cover **48**. The section of each foot portion **47** which extends transversely of the elevator car is loosely fitted into channel **25** to permit relative motion therebetween. This provides a floating connection between the lower horizontal wiring duct which moves with elevator platform **15** in relationship to the car sling and the vertical wiring ducts in uprights **28** which are affixed to the car sling. The vertical ducts distribute the electrical conductors they receive from the lower horizontal duct to the front corners of the top of the elevator car above the roof of its passenger compartment. Each of these vertical ducts terminates in an upper horizontal wiring duct formed in the door operating device mounting frame **32**. These upper horizontal ducts may take various forms but in the disclosed constructed embodiment they include a partial enclosure **49** (FIG. **3**) which is secured to the upper leg **50** (FIGS. **3** and **5**) of the Z-shaped member of the mounting frame. When so secured, this partial enclosure houses and protects the electrical conductors carried by its associated upright member **28** after they leave the upright member at the top of the car. From each partial enclosure **49** the electrical conductors pass through an aperture formed in upper leg **50** of the Z-shaped member of the mounting frame into the rest of the associated upper horizontal duct for distribution from the front corner at which the conductors arrive at the top of the car toward the opposite front corner.

In addition to partial enclosure **49** and that portion of upper leg **50** which cooperates with it, each of the upper horizontal wiring ducts comprises an elongated horizontal plate **51** (FIGS. **3** and **5**) which is of substantially the same width as upper leg **50** of the Z-shaped member of mounting frame **32**. To complete these ducts they are enclosed with suitable end plates **52** mounted thereon in any satisfactory manner and either blank cover plates **53** or knockout plates **54**. Conduit is connected to the various knockout plates for distribution of the electrical conductors toward the rear of the car. It also may be used to provide connection between the two wiring ducts formed in the mounting frame if so desired.

From the foregoing it can be seen that an elevator car constructed in accordance with the foregoing disclosure includes elements which combine structural functions with electrical conductor housing functions. In this way the need for separate wiring ducts constructed entirely of members which perform no structural function has been avoided. As a result, elevator cars constructed according to the disclosed embodiment are lighter in weight than those constructed with such separate wiring ducts.

Various modifications to the above disclosed arrangement are possible without departing from the spirit of the invention. The preceding disclosure, therefore, is to be considered illustrative only and not limiting in any sense.

What is claimed is:

1. In an elevator car having a plurality of electrical conductors and a passenger compartment including a platform, four walls and a roof, a slidable door assembly closing an opening in the front wall of said compartment, a track supporting said door assembly, a motor controlled door operating device for moving said door assembly between open and closed positions, a mounting frame supporting said door operating device, a car sling supporting said passenger compartment, said platform being resiliently supported by said sling, a threshold plate for said platform in front of said opening, a threshold channel having a top, a bottom and a back wall, said channel being affixed to said platform, supporting said threshold plate on its top wall portion and extending across the front of said platform to at least one front corner thereof, an individual upright support extending upwardly from each of the two front corners of said platform affixed to said sling and extending above the roof of said passenger compartment, said upright supports providing support for said track and said mounting frame, the improvement including a front wall for said threshold channel removably fastened to said channel, said channel with said front wall connected thereto comprising a horizontal wiring duct for housing said electrical conductors, and that at least one of said upright supports is a hollow member comprising a vertical wiring duct, said vertical wiring duct being loosely connected to said horizontal wiring duct permitting relative motion therebetween, said vertical wiring duct receiving at least a portion of said electrical conductors from said horizontal wiring duct and distributing them to one front corner of the top of said car above the roof of said passenger compartment.

2. In an elevator car according to claim **1**, wherein said removable wall portion includes plate means removably fastened to said threshold channel, a separately removable portion of said plate means covering only that portion of the channel which is disposed under said opening and wherein a plurality of terminal blocks for connecting said electrical conductors thereto are mounted in said channel only in that portion disposed under said opening whereby all terminal blocks are rendered accessible by unfastening said separately removable portion of said plate means from said channel.

3. In an elevator car according to claim **2**, wherein said door operating device mounting frame includes a top of car horizontally disposed wiring duct connected to said vertical wiring duct for receiving the electrical conductors carried thereby and distributing them from the one front corner of the top of said car toward the other front corner thereof.

4. In an elevator car according to claim 3, wherein said channel extends across the front of said platform to each front corner thereof, and both said upright supports are hollow members comprising vertical wiring ducts, each connected to said horizontal wiring duct for receiving separate portions of said electrical conductors and distributing them to both front corners of the top of said car above the roof of said passenger compartment.

5. In an elevator car according to claim 4, wherein said door operating device mounting frame includes a top of car horizontally disposed wiring duct connected to each of said vertical wiring ducts for receiving the electrical conductors carried thereby and distributing them from the respective front corner at which they arrive at the top of said car toward the opposite front corner.

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