

Elevator Hoistway

The present invention relates to an elevator hoistway for a multi-storied building which, to create a vertical
5 travel path for an elevator installation, extends through
/ at least one story floor, and has at least one hoistway
frame which bounds a hoistway penetration aperture in the
story floor.

10 Increasingly scarce and costly building land necessitates
high-density construction of residential units with
multiple stories. To use the residential space in this
situation, the difference in height of the individual
stories has to be overcome, which creates the problem of
15 vertical transportation. If vertical transportation is
provided by an elevator installation, there is generally
also only limited space available for the hoistway of the
elevator installation. Furthermore, installing an elevator
is associated with additional investments which make it
20 necessary for the building owner to consider the benefits
in relation to the costs before the residential space is
constructed.

Particularly the owners of one-family houses constructed
25 in this manner give precedence to low construction costs
and decide initially in favor of less residential space
which can then be adapted to changing residential needs
after its construction. Overcoming the vertical
differences between the stories is such a need which
30 changes during different phases of life. Whereas in
younger years vertical transportation by means of adequate

physical mobility is of little significance, with increasing age and/or the onset of impaired mobility the unrestricted use of multi-storied one-family houses is inevitably linked to an elevator installation. For the reasons mentioned above, when a one-family house is first constructed it is usual not to provide an elevator installation, and only to construct an elevator installation together with an elevator hoistway in or on the house at great cost when the need arises.

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From DE 42 23 017 A1 a means is known of reducing the substantial costs of corresponding constructional measures when elevator hoistways and elevators are installed post-constructionally in multi-storied prefabricated houses which is constructed from prefabricated space cells stacked on top of each other in which an elevator hoistway is precisely prefabricated floorwise in the individual space cells which, when space cells are stacked on top of and fastened to each other, forms a continuous elevator hoistway. Adjacent to longitudinal walling from space cell to space cell, and flush with it, there are in the floor and ceiling slabs of each space cell rectangular openings which in each case are bounded by a hoistway frame. Steel sections with wall cladding between them extend over three sides between the floor slab and the ceiling slab of a space cell, whereas on the fourth side an elevator door is provided.

By means of the standardized floorwise exact prefabrication of the elevator hoistway in individual modules, the cost of installing an elevator could be

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reduced, but here too, the decision in favor of an elevator installation and of the costs of constructing the hoistway, as well as the additional building space occupied by the elevator hoistway, still has to be taken
5 when the residential unit is constructed. As a result, the building owner is still confronted with high elevator-related costs when the house is planned.

The purpose of the invention is to propose an elevator
10 hoistway which can be formed post-constructionally in an existing multi-storied building by simple and inexpensive means.

According to the invention, in fulfillment of this task an
15 elevator hoistway with the characteristics stated in Claim 1 is proposed, which is particularly distinguished in that the aperture for penetration of the hoistway can be closed by means of a load-bearing floor structure.

20 The elevator hoistway components anticipatorily provided in the building structure reduce the cost of subsequent installation of an elevator installation, especially of an elevator hoistway, in an existing building. Should the need arise, only the load-bearing floor structure has to
25 be removed, and the penetration, or aperture, for passage of the hoistway through the story floor is created by the hoistway frame which is already in place. This makes the invention particularly suitable for use in one-family houses where, thanks to this load-bearing floor structure,
30 the volume of the elevator hoistway can be used as

residential space until the point in time at which the elevator is subsequently installed.

Practically unrestricted utilization of the hoistway volume is achieved with an embodiment of the invention in which the load-bearing floor structure is aligned flush with the story floor, thereby maintaining a continuous plane surface. A simple means of aligning the floor structure is provided by a further embodiment, in which the hoistway frame can be adjusted in the vertical direction to the thickness dimension of the respective story floor.

The hoistway frame can serve as a force-transmitting interface between the load-bearing floor structure or - where an elevator has been installed - the suspension and guide equipment on the one hand, for example, and the story floor on the other hand, if the hoistway frame has anchoring means with which it can be connected into the load-bearing structure of the story floor.

In a preferred embodiment according to the invention, the floor structure is constructed as an insertable frame and inserted into the hoistway frame as a prefabricated component. Beside simple insertion into and removal from the hoistway frame, this embodiment affords great freedom in relation to the construction and form of the floor structure. In addition, the insertable frame component opens up the possibility of supporting the floor structure swimming in the floor surface, to compensate stresses or

movements of the floor surfaces relative to the respective hoistway frames.

An especially preferred embodiment of the invention also
5 envisages a hoistway frame non-positively anchored in the story floor which creates in the hoistway a vertical supporting structure extending over the entire travel path which can be connected to the hoistway frame, and to which the load-bearing floor structure is detachably attached.
10 In addition to the load-bearing floor structure, the vertical supporting structure can also serve to have fastened to it, for example, hoistway doors and/or hoistway walls, shelves, or even prefabricated modules with an integrated floor capable of being linked to the
15 structure.

The latter is part of a flexible concept achieved by means of the vertical structure for temporary utilization of the building space planned for the elevator. Its utilization
20 can be adapted to the needs of the residents of the house as the residents' needs change over their lifetime. With corresponding integration into the elevator hoistway of domestic water supply, drainage, and electric power supply, a prefabricated module can be formed as a sanitary
25 unit which can be coupled to the vertical supporting structure and which contains, for example, a shower, toilet, and similar items.

Preferred embodiments of the invention are described by
30 reference to the drawings. They show:

- Fig. 1, diagrammatically a longitudinal section through an elevator hoistway frame according to the invention;
- Fig. 2, a first embodiment of a hoistway frame according to the invention with an insertable frame floor structure;
- Fig. 3, a partial sectional view of an embodiment of an adjustable hoistway frame with insertable frames according to the invention;
- Fig. 4, an embodiment of the elevator hoistway according to the invention in which the load-bearing floor structure is attached in a swiveling manner to a self-supporting vertical structure;
- Fig. 5, a sectional view along V-V in Figure 4;
- Fig. 6, a sectional view along VI-VI in Figure 4.

In the description relating to Figures 1 to 6 that follows, corresponding constructional elements are indicated with the same reference number. Figure 1 shows a longitudinal section through part of an elevator hoistway 1 according to the invention extending over three stories. The elevator hoistway 1 was already constructed over the respective stories I, II, III present in a building when the building was constructed, and so as to create a vertical travel path for an elevator installation which will be post-constructionally installed in the elevator hoistway 1. In anticipation of this, in story floor 2 and story floor 3 rectangular hoistway penetration apertures 4, 5 have been made which are aligned above each other and have the size of the desired cross-section of the hoistway and which are bounded by hoistway frames 7 permanently

fastened in the respective story floor structure in conventional manner by means of tie rods 6 or similar. Instead of the hoistway frames 7 being rectangular, they can also have a square, triangular, oval, or other
5 suitable shape as desired.

According to the invention, each hoistway penetration aperture 4, 5 is covered by a load-bearing cover 8, which is detachably fastened to the hoistway frames. Here, the
10 cuboid load-bearing floor cover 8 lies on rail sections 9 of the hoistway frame 7 which project into the elevator hoistway 1. The load-bearing floor cover 8 is formed suitably to close the hoistway penetration aperture 4, 5 in a largely sound- and heat-insulating manner; it remains
15 virtually as part of the story floor 2, 3 in the hoistway frame 7 and is only removed for subsequent installation of an elevator installation. The floor cover 8 is shown here in its simplest embodiment as a monolithic concrete cover, which is fitted at least with an installation loop 10 as
20 known, for example, from shaft covers. The suspension element of, for example, a lifting crane is hooked onto the installation loop, or loops, when the floor cover 8 is moved or removed. The floor cover 8 itself can either be inserted into the hoistway frame 7 prefabricated, or else
25 formed together with the story floor 2, 3 when the building is constructed. In the latter case, the hoistway frame 7 is inserted into the story floor, or more specifically, the concrete formwork, fixed in place, and joined to the reinforcement; correspondingly, to produce
30 the requisite load-bearing capacity of the concreted floor cover 8 it is given steel reinforcement, over the entirety

of which concrete is then poured. Alternative embodiments of load-bearing floor structures are known to the specialist. Selected individual preferred exemplary embodiments are presented below.

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The load-bearing floor structure can be formed from a floor slab 11 and a ceiling slab 12 matching the story floor 2, 3 and the ceiling surface on the underside of the story floor 2, 3, and heat and sound insulated by means of
10 an insulating layer 13 of conventional materials lying in between (Figure 3). The thickness of the insulating layer 13 is adapted to the respective thickness 14 of the story floor 2, 3. It is expedient for the floor slabs 11 and ceiling slabs 12 and the story floor 2, 3 to be
15 constructed from materials of a similar type so as to ensure an unobtrusive appearance which is as uniform as possible. Suitable materials are concrete, plaster, or similar slabs, and even slabs made of wood are suitable because they can be easily coated, particularly with
20 plaster.

Architecturally attractive is a load-bearing story structure which serves as a skylight by admitting light in that, for example, the floor slab 11 and ceiling slab 12
25 consist of transparent materials. If the hoistway frame 7 with light-admitting load-bearing floor structure is used as a luminaire, at least one source of light must be provided in the hoistway frame 7 toward the hoistway penetration aperture 4, 5. A means of electrical
30 connection which is led for this purpose through the building up to the hoistway frame 7 can, for example, also

be used to connect hoistway lighting if required when an elevator is installed.

The built embodiments of load-bearing floor structures as described can in each case either be assembled on the hoistway frame 7 in their individual component parts or assembled to an insertable frame 15 and as a prefabricated component suspended or inserted in the installed hoistway frame 16 which is partly shown in Fig. 2 and described by reference to Fig. 3. A prefabricated component of this type can, for example, be constructed as an aquarium which can withstand the weight of persons standing or walking on it.

The embodiment shown in Fig. 2 comprises in essence a rectangular hoistway frame 16 constructed of sheet metal, and a complementary insertable frame 15, which can be inserted in a vertical direction in the hoistway penetration aperture 4 bounded by the hoistway frame 16 and which, as mentioned above, forms the floor structure.

The hoistway frame 16 is fabricated from a strip of sheet metal whose length corresponds to the perimeter of the hoistway penetration aperture 4, 5 and to the cross-sectional area of the hoistway, and whose width is the same as the thickness 14 of the story floor 2, 3. The sheet-metal strip is bent, folded over at the edges, and joined in usual fashion. In the vicinity of the upper and lower edges of the frame formed by the sheet-metal strip, essentially at a right angle facing outward, i.e. to the story floor 2, 3, bent overlaps 20 stiffen the

frame fabrication 16 and form supporting surfaces for precise fastening of the hoistway frame 16 in the ceiling formwork, as well as for positionally accurate insertion of the insertable frame 15.

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An important characteristic are anchor hooks 21 evenly distributed over the outside of the frame perimeter, preferably in the area between the upper 18 and lower 19 edges of the frame, where they are permanently fastened and which serve to integrate the hoistway frame 16 into the reinforcement of the story floor. In the reinforced concrete construction, the anchor hooks 21 are embedded in concrete and together with the ceiling reinforcement serve to transmit the forces acting on the hoistway frame 16 into the hoistway floor 2, 3. If the house has a wooden or composite construction the hoistway frame 16 is supported on load-bearing structural elements, as for example beams, girders. Anchoring elements suitable for this purpose are known to the specialist and can be used at his discretion.

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As an interface between the building and the elevator that may have been installed, all important supporting and holding forces, whether those of the load-bearing floor structure or of the elevator installation itself, are transmitted via appropriately formed fastening and connecting elements into the hoistway frame 7, 16, 17, 71 and from there into the building structure.

A partial cutaway drawing of an embodiment of a hoistway frame 17 with insertable frame 15 which is adjustable to the respective thickness 14 of the story floor 2, 3 is

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shown in Figure 3. Except for the adjustable height of its frame 17, the shape of the hoistway frame 17 and the insertable frame 15 correspond to those of the embodiment shown in Figure 2. On the plane defined by the hoistway frame 17 in the hoistway penetration aperture 4, 5 it is split horizontally into two parts comprising a frame section 23 for anchorage in the story floor 2, 3 and a frame section 22 to compensate the thickness 14 of the story floor 2, 3. The two frame sections 22, 23 engage each other in an interlocking manner along at least two parallel sides of the hoistway frame 17, in other words are hooked into each other. Within an adjustment range 24 given by the construction they can be moved relative to each other in a vertical direction, and thereby adjusted to the thickness 14 of the respective story floor 2, 3. Set/clamping screws 25 secure the positions of the adjusted frame sections relative to each other.

The two frame sections 22, 23 are composed of bent sheet-metal parts. The frame section 22 forms a u-shaped fold to accept a fastening anchor in the form of a toothed metal plate 27. The toothed metal plate 27 is inserted in the fold 26 and fastened there by, for example, rivets 28 or screwed connections, and has convergent teeth 29 which face toward the story floor 2, 3 and are anchored in cured concrete. Drilled holes 30 in the teeth 29 make integration into the reinforcing steel of the supporting structure possible. Additional vertically aligned apertures or drilled holes 32 through the fold 26 which projects horizontally into the hoistway penetration aperture 4, 5 are provided, for example, to fasten the

ceiling slab 12, spacing elements being inserted in between if necessary. The fold 26 also acts as a vertical stop for hoistway wall elements 31 which are inserted between the individual story floors after the insertable
5 frame 15 is removed and which are fastened in the apertures and drilled holes 32 of the folds 26 with, for example, screwed connections as described further below. To align the wall elements, shims or adjusting screws can also be provided between the under edge of the wall and
10 the fold 26.

Running at right angles to the fold 26 on both sides are a lower web 33 and an upper web 34 which together form a vertical frame plate of the frame section 23. The lower
15 web 33 in particular serves as formwork when constructing the story floor 2, 3 and forms the boundary of the side face of the hoistway penetration aperture 4, 5 on the building side. The free end 35 of the lower web 33 is bent over at a right angle to the outer side of the hoistway
20 frame 17 and thereby ensures that there is a clean boundary to the hoistway penetration aperture 4, 5 and a secure seating for the hoistway frame 17. The free end of the upper web 34 is bent over at 180° into a vertically aligned fold 36, which is open at the bottom and into
25 which the free lower web of the compensating frame section 23, which is bent into a fold 37 of complementary shape open at the top, engages. In the area immediately below the highest point of the fold 36, the upper web 34 is formed into a bead 38 projecting toward the hoistway
30 penetration aperture 4, 5 which compensates for dimensional inaccuracies and prevents the insertable frame

15 from jamming while being inserted, or becoming permanently seized in place.

The overlaps 39, 40 of the mutually engaged folds 36, 37
5 of the frame sections 22, 23 determine the adjustment range 24 for the height of the hoistway frame. At the height of the edge of the overlap 39 there are set screws 25 which are screwed from the folded sheet of the frame section 22 lying opposite through threaded holes 41 and
10 grip the overlap 39 of the other frame section 23. Instead of the set screws 25 there can equally well be screwed connections passing right through, which engage in the vertically oriented oval holes formed in the overlaps 39, 40. The upper end of the compensating frame section 22 is
15 bent outward at a right angle to form an edge 42. The insertable frame 15 can lie on the edge 42.

The insertable frame 15 is also composed of four pieces of sheet-metal section 43 each of which forms a frame section
20 of the insertable frame 15 which is dimensioned to be complementary to the hoistway frame 17, and in particular to the hoistway penetration aperture 4, 5 formed by the compensating frame section 22. The surface framed by the insertable frame 15 is covered by means of a floor slab 11
25 which itself is screw-fastened to, and flush with, the insertable frame 15 with the aid of appropriately formed holes.

As can be seen in Fig. 3, the rectangular insertable frame
30 15 forms a vertical apron 45 laterally adjoining which in each case is an edged sheet 50 having two steps formed of

a first horizontal web 46 and a second horizontal web 47 and a first vertical web 48 and a second vertical web 49. The first horizontal web 46 determines the distance 51 from the first vertical web 48 to the apron 45, which is at least equal to the width of the fold 36. Further, the first horizontal web 46 is provided with a pattern of holes 52 which are threaded to accept screws screwed into them to fasten the floor slab 11. At the height of the upper edge of the apron 45, the first vertical web 48 joins the second horizontal web 47; the two together form the supporting surface onto which the floor slab 11 is fastened. Commencing at the second horizontal web 47 the second vertical web 49 has a length corresponding to the thickness 54 of the floor slab 11, flush with whose tread surface 55 it terminates in a horizontal flange 56. The horizontal flange 56 acts in conjunction with a supporting flange 57 parallel to it which is formed by a prolongation of the second horizontal web 47. The space between the horizontal flange 56 and the supporting flange 57 can serve, for example, to accommodate the edging of a floor covering laid on the story floor 2, 3 taking the form of, for example, carpeting or parquetry. In this embodiment, the insertable frame 15 is supported in a swimming manner and in consequence is able to follow settling and stretching movements of the floor covering relative to the story floor and thereby avoid the occurrence of stresses. This swimming support of the insertable frame 15 also ensures that no steps occur in the floor covering lying over its edges.

Starting from an exposed, non-positively anchored hoistway frame 7, 16, 17 as shown in Figures 1 and 4, hoistway walls 31, 58 can be inserted into, or mounted on, the hoistway frame 17 thereby forming the boundary of the elevator hoistway 1 between the story floors 2, 3. The hoistway walls 31, 58 can already be inserted, preferably as prefabricated building elements, when the building is constructed and serve as room separators, or general space separators, or else only be put into place when an elevator is installed post-constructionally. It is also possible to insert only single walls 31, 58 to correspond with the desired interior architecture of the building. As shown in Fig. 1, it is also possible for corresponding walls 58 to be fitted with a door which in case of need can serve as a hoistway door 74 (Fig. 4) allowing access to an elevator car or corresponding transportation equipment of the elevator installation. In both cases, the load-bearing floor structures 8, 15 provided according to the invention on each story I, II, III permit temporary non-elevator-specific utilization of the cross-sectional surface of the hoistway, or section of the elevator hoistway, on each floor.

Fig. 4 shows an embodiment of the elevator hoistway 59 according to the invention having a self-supporting vertical structure 60 extending over three stories I, II, III comprising a left-hand guiderail 61 and a right-hand guiderail 62 which are preferably joined by an upper transverse strut 63 and a lower transverse strut 64 and to which a floor element 65 is attached at the height of each story. The floor element 65 comprises in essence a floor

slab 11 of either monolithic or sandwich construction, or consisting essentially of a left-hand beam and a right-hand beam which are joined by a rear and a front lateral beam to form a frame and clad with suitable slabs. The
5 longitudinal beams can consist of rectangular tubes into each of which a telescopic extension is movably inserted and which can be screw-fastened through oval holes to the longitudinal beams in many different positions.

10 The floor element 65, and particularly the left-hand and right-hand longitudinal beams, are fastened in a swiveling manner to the left-hand guiderail 61 and the right-hand guiderail 62 at attachment points 66, 67. Fastening
15 elements used for this purpose can be screws, bolts, secured pins, or similar. A specialist with knowledge of the invention may select another suitable structure known to him.

The floor element 65 attached in a swiveling manner is
20 supported and held in its horizontally installed position by supporting struts 68, 69 attached to the left-hand guiderail 61 and right-hand guiderail 62. The supporting struts 68, 69 themselves are connected in a swiveling manner, for example, to the floor element 65 and the
25 guiderails 61, 62 respectively.

Here, the supporting struts 68, 69 are constructed as adjustable tubes with right-hand/left-hand thread, so that by corresponding turning of the adjustable tubes about
30 their longitudinal axis, the floor element 65 in its installed position can be raised or lowered and aligned

flush with the respective floor level. Alternatives to this constructional embodiment of supporting struts 68, 69 are known to the specialist; in fulfillment of the above function these can be used without detriment to the invention.

The vertical structure 60 described so far can be introduced into the elevator hoistway 59 already provided in the building as a pre-assembled component with the floor element not yet swiveled into horizontal position; it should preferably be fastened to the hoistway frame 71 and supported exclusively by force-transmitting fastening elements, for example screws 70. Finally, the swiveled load-bearing floor elements 65 permit the elevator hoistway 59 to be temporarily used for a different purpose, e.g. as residential space, until such time as an elevator may be post-constructively installed.

A cladded elevator hoistway 59 is shown in outline in Figure 4. There, by way of example, arranged on the vertical structure 60 are the hoistway wall cladding 72, and between the two guiderails a wall 73 with hoistway doors 74 which fulfill the requirements of DIN 4109. For accurate positioning of the hoistway wall cladding 72, the hoistway frames 71 are fitted with corresponding means of holding it. For example, as already described in relation to Figures 1 and 3, grooves and/or slots or similar are formed in the upper 18 and lower frame edge 19 or in the insertable frame 15.

In the first story I the elevator hoistway 59 is used as a storeroom 75. As shown in Figure 5, in the area of the elevator hoistway 59 above this, and separated from it by the load-bearing floor element 65, in the second story II
5 opposite the guiderails 61, 62 and attached to the hoistway frame 71 over the height of the elevator hoistway 59, there are two supporting rails 77, 78 on which shelves 79 rest in known manner, and further shelving modules are so mounted that this area can be used as a so-called walk-
10 in cupboard 76. In the uppermost story III a sanitary cell 80 in the form of a prefabricated and pre-assembled module with integral floor element 65 is fastened to the vertical structure 60. Here too, the requisite integration of this sanitary cell 80 into the infrastructure of the
15 residential house is by means of the hoistway frame 71. In the building, connections for domestic water supply and drainage and for the supply of electric current are led up to and into the hoistway frame 71. These can also be installed in the elevator hoistway 59 itself.

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The hoistway frame 71 forms a standardized interface for connecting the vertical structure 60 with the sanitary cell 80 and has the connecting elements needed for this purpose. There is walk-in access to the sanitary cell 80
25 from the corresponding story III via a hoistway door 74. As shown in Fig. 6, the sanitary cell 80 is equipped with a shower 81, a toilet 82, and a washbasin 83. The sanitary cell 80 is isolated from the elevator hoistway in a watertight manner. For this purpose it can take the form
30 of a plastic construction. The sanitary cell 80 in the embodiment according to Fig. 6 is ventilated into the open

air via a ventilation chimney 85 installed through the building cover 84. A fan 86 built into the ventilation chimney 85 actively supports the ventilation.

5 Should the need for installation of an elevator arise, the sanitary cell 80 can be disconnected from the hoistway frame 71 and the vertical structure 60 and removed from the elevator hoistway 59. The sanitary connection is shut off, whereas advantage is again taken of the possibility
10 of electrical connection for the elevator-specific utilization of the elevator hoistway 59. The vertical structure 60 itself then serves as a support and guidance structure of the elevator for a drive and an elevator car which can be moved by the drive along the guiderails 61,
15 62.

Instead of the temporary change in use of the vertical structure 60 described above, it can also be used as an interface for various leisure installations such as, for
20 example, a climbing wall, fitness apparatus, etc. Furthermore, in the elevator hoistway 59 anticipatorily installed in a residential house, a system of shelves circulating according to the paternoster system can be provided, the guiderails 61, 62 serving to guide the shelf
25 loop.



Patent Claims

1. Elevator hoistway (1;59) for a multistoried building
which, to create a vertical travel path for an elevator
5 installation, extends through at least one story floor
(2;3) and has at least one hoistway frame (7;16;17;71)
which bounds a hoistway penetration aperture (4;5) in
the story floor (2;3),
characterized in that
10 a load-bearing floor structure (8;15;65) is detachably
connected to the hoistway frame (7;16;17;71) which
covers the hoistway penetration aperture (4;5).
2. Elevator hoistway (1;59) according to Claim 1,
15 characterized in that
the load-bearing floor structure (8;15;65) is aligned
flush with the story floor (2;3).
3. Elevator hoistway (1;59) according to Claim 1,
20 characterized in that
the hoistway frame (7;16;17;71) can be adjusted in the
vertical direction to the thickness (14) dimension of
the respective story floor (2;3).
- 25 4. Elevator hoistway (1;59) according to one of Claims 1 to
3, characterized in that
the hoistway frame (7;16;17;71) has anchoring means
(6;21;27) to transmit forces acting on it into the
supporting structure of the story floor (2,3).

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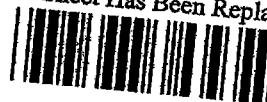
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5. Elevator hoistway (1) according to one of Claims 1 to 4,
characterized in that
the load-bearing floor structure is assembled into an
insertable frame (15) and can be inserted into the
5 hoistway frame (7,16,17)
6. Elevator hoistway (59) according to Claim 1,
characterized in that
the load-bearing floor structure (65) is detachably
10 connected to a vertical supporting structure (60)
extending over the travel path and supported on the
hoistway frame (71).
7. Elevator hoistway (59) according to Claim 6,
15 characterized in that the load-bearing floor structure
(65) is attached in a swiveling manner to the vertical
supporting structure (60).
8. Elevator hoistway (59) according to Claim 6,
20 characterized in that the load-bearing floor structure
(65) is part of a space cell (80) which is at least
partially enclosed and which is detachably fastened to
the vertical supporting structure (60).
- 25 9. Elevator hoistway (1;59) according to Claim 1 or 6,
characterized in that the hoistway frame (7;16;17;71)
has connecting/installation devices for hoistway walls
(31,58;73,77).

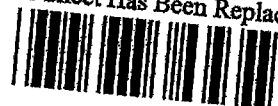
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List of Reference Numbers

1. Elevator hoistway
2. Story floor
- 5 3. Story floor
4. Hoistway penetration aperture
5. Hoistway penetration aperture
6. Tie rod
7. Hoistway frame
- 10 8. Floor cover
9. Rail section
10. Installation loop
11. Floor slab
12. Ceiling slab
- 15 13. Insulating layer
14. Thickness of story floor
15. Insertable frame
16. Hoistway frame
17. Hoistway frame, adjustable
- 20 18. Upper frame edge
19. Lower frame edge
20. Overlap
21. Anchor hook
22. Frame section, compensation
- 25 23. Frame section, anchoring
24. Adjustment range
25. Set/clamping screw
26. Fold
27. Toothed metal plate
- 30 28. Rivet
29. Tooth

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- 30. Drilled hole
- 31. Hoistway wall element
- 32. Drilled hole / aperture
- 33. Lower web
- 5 34. Upper web
- 35. Free end
- 36. Fold
- 37. Fold
- 38. Bead
- 10 39. Overlap
- 40. Overlap
- 41. Threaded hole
- 42. Edge
- 43. Sheet-metal section
- 15 44. Upper edge of frame
- 45. Apron
- 46. First horizontal web
- 47. Second horizontal web
- 48. First vertical web
- 20 49. Second vertical web
- 50. Edged sheet
- 51. Distance
- 52. Pattern of holes
- 53. Upper edge of apron
- 25 54. Thickness, floor slab
- 55. Tread surface
- 56. Horizontal flange
- 57. Supporting flange
- 58. Hoistway door wall
- 30 59. Elevator hoistway
- 60. Vertical structure

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- 61. Left-hand guiderail
- 62. Right-hand guiderail
- 63. Upper transverse strut
- 64. Lower transverse strut
- 5 65. Floor element
- 66. Attachment point
- 67. Attachment point
- 68. Supporting strut
- 69. Supporting strut
- 10 70. Screw
- 71. Hoistway frame
- 72. Hoistway wall cladding
- 73. Hoistway door wall
- 74. Hoistway door
- 15 75. Storeroom
- 76. Walk-in cupboard
- 77. Supporting rail
- 78. Supporting rail
- 79. Shelves
- 20 80. Sanitary cell
- 81. Shower
- 82. Toilet
- 83. Washbasin
- 84. Building cover
- 25 85. Ventilation chimney
- 86. Fan

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