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(54) **A ROLLER GUIDE ASSEMBLY, AN ELEVATOR SYSTEM, AN INSTALLATION METHOD FOR INSTALLING A ROLLER GUIDE ASSEMBLY AND A MAINTENANCE METHOD FOR MAINTAINING A ROLLER GUIDE ASSEMBLY**

(57) A roller guide assembly (1) for an elevator device. The roller guide assembly comprises a body (2) for mounting to a frame (4) of the elevator device, at least two roller wheels (5) mounted to the body (2), and an anti-tilt sliding guide shoe (6). The body (2) comprises a first body member (8), the first body member (8) comprising a first portion (9) having said first mounting means (3) for mounting the first body member (8) detachably to the frame (4), the first portion (9) further having second mounting means (10) for detachable attachment of a temporary sliding guide shoe (11) to be used for accurate positioning of the first body member (8) relative to the guide rail (R) during installing or maintenance, the temporary sliding shoe being removed after installation or maintenance and a second portion (13) which is perpendicular to the first portion (9) and having third mounting means (14) The body (2) comprises a second body member (15) to which the roller wheels (5) are mounted, the second body member (15) being detachably mountable by the third mounting means (14) to the second portion (13) of the first body member (8), the second body member (15) having fourth mounting means (16) for detachable mounting of the anti-tilt sliding guide shoe (6) onto the second body member. Installation and maintenance methods of the roller guide assembly (1) are included.

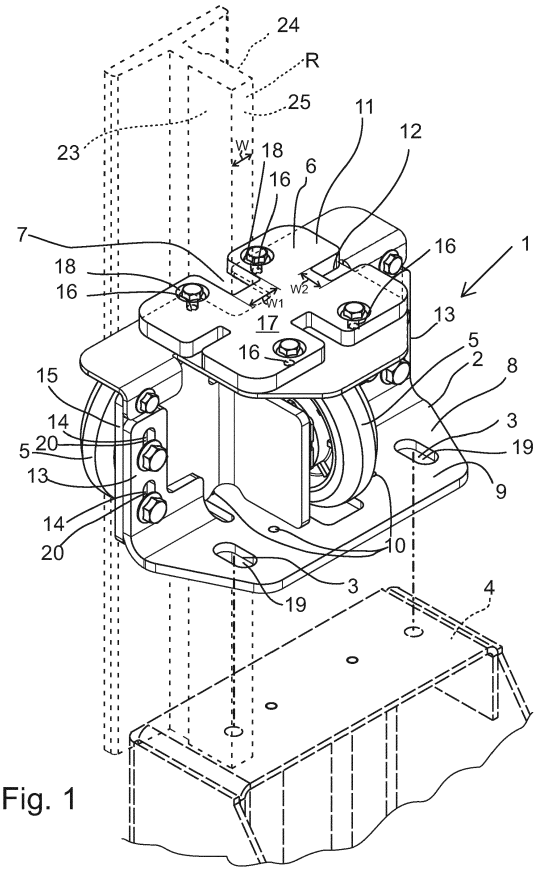

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a roller guide assembly arranged to guide an elevator device, such as an elevator car and/or counterweight, along a guide rail. Further, the invention relates an elevator system. Further, the invention relates to an installation method for installing the roller guide assembly to the frame of the elevator device. Further, the invention relates to a maintenance method of the roller guide assembly.

BACKGROUND OF THE INVENTION

[0002] Generally, an elevator device (car and counterweight) moves vertically up and down in an elevator shaft, guided either by roller guides or sliding guide shoes, or by both, engaging vertical guide rails. CN 202007069 U discloses a roller guide assembly comprising a body mountable to a frame of the elevator device. Roller wheels are mounted to the body. The roller wheels engage a vertical guide rail to be rolled on the guide rail. A sliding guide shoe is detachably mounted to the body. The sliding guide shoe comprises a slot to receive the guide rail. The sliding guide shoe delimits during use, tilting of the elevator device.

[0003] During normal use of the elevator and under normal situation, when the car is running and in balance, the sliding guide shoe does not touch the guide rail and the car is guided by the roller guide guides in which the roller wheels are preloaded towards the guide rail. When the car is stopped at the landing and a passenger steps from the landing to the car, the car will be unbalanced and the sliding guide shoe touches the guide rail and delimits tilting of the car. The known roller guide assembly has a complicated structure. Installation and maintenance of the known roller guide assemblies are laborious and time-consuming processes.

[0004] For elevators designed with roller guide shoes, during installation, temporary sliding guide shoes are fitted in a temporary location in the sling. The temporary sliding guide shoe aligns the sling to the guide rails and ensures that the car can be moved up and down the shaft at inspection speed. At the end of the installation, the roller guides are place in their final position to the sling and the temporary sliding guide shoes are removed. Great care needs to be taken that the roller wheels are positioned accurately in relation to the guide rails before the temporary sliding guide shoes are removed, as the car will tend to tilt and misalignment of the car relative to guide rails and landing doors can happen. Particularly with underslung car/sling designs, it is very important that the switch from the temporary sliding guide shoe to roller guide is managed very carefully because the car is at that point in an unstable condition. The car tends to tilt under the unbalance due to a fitter not standing exactly centrally on the car roof. Such installation process is time-consuming and laborious.

[0005] The roller wheels will need replacing during regular maintenance intervals. The current method is that the roller guide shoe needs temporary chocking to the guide rail, then each wheel is dismantled and replaced. This process is slow and laborious.

OBJECTIVE OF THE INVENTION

[0006] The objective of the invention is to alleviate the disadvantages mentioned above.

[0007] In particular, it is an objective of the present invention to provide a roller guide assembly which has a simple structure and is easy to install and maintain.

[0008] Further, it is an objective of the present invention to provide a rapid and time-saving installation method for installing the roller guide assembly to the frame of the elevator device.

[0009] Further, it is an objective of the present invention to provide a rapid and time-saving maintenance method for maintaining the roller guide assembly.

SUMMARY OF THE INVENTION

[0010] According to a first aspect, the present invention provides a roller guide assembly for an elevator device. The roller guide assembly comprises a body having first mounting means for mounting to a frame of the elevator device. The roller guide assembly comprises at least two roller wheels mounted to the body, the roller wheels engaging a vertical guide rail to be rolled on the guide rail. The roller guide assembly further comprises an anti-tilt sliding guide shoe to delimit, during use, tilting of the elevator device due to its unbalance, the anti-tilt sliding guide shoe being detachably mountable to the body. According to the invention the body comprises a first body member. The first body member comprises a first portion having said first mounting means for mounting the first body member detachably to the frame, the first portion further having second mounting means for detachable attachment of a temporary sliding guide shoe to be used for accurate positioning of the first body member relative to the guide rail during installing or maintenance, the temporary sliding shoe being removed after installation or maintenance. The first body member further comprises a second portion which is perpendicular to the first portion and having third mounting means. The body comprises a second body member to which the roller wheels are mounted, the second body member being detachably mountable by the third mounting means to the second portion of the first body member, the second body member having fourth mounting means for detachable mounting of the anti-tilt sliding guide shoe onto the second body member.

[0011] An advantage of the invention is that with a simple structure it enables rapid and time-saving installation and maintenance. The body being divided to two body members enables, during installation, that the temporary

sliding guide shoe fitted to the first body member can first be used to accurately align the frame to the guide rail, so that installing of the second body member having the roller wheels can be installed to engagement with the guide rail and an eventual unbalance does not tilt the elevator device during the installation of the second body member.

[0012] In an embodiment of the roller guide assembly, the anti-tilt sliding guide shoe comprises a first slot to receive the guide rail therein, the first slot having a first width designed to form a loose fit relative to the guide rail.

[0013] In an embodiment of the roller guide assembly, the temporary sliding guide shoe comprises a second slot, the second slot having a second width designed to form a sliding fit relative to the guide rail.

[0014] In an embodiment of the roller guide assembly, the anti-tilt sliding guide shoe and the temporary sliding guide shoe are formed to be in one integrated monolithic uniform piece of plate-like material forming a shoe member comprising the first slot and the second slot, and a fifth mounting means adapted for selectively attaching the shoe member to the second mounting means or to the fourth mounting means.

[0015] In an embodiment of the roller guide assembly, the first slot and second slot are arranged in the shoe member at an angle of 90° in relation to each other.

[0016] In an embodiment of the roller guide assembly, the second mounting means and the fourth mounting means comprise bolt holes for bolted joints, the bolt holes being arranged in a square or rectangular pattern, and that the fifth mounting means of the shoe member comprises bolt holes for bolted joints, the bolt holes being arranged in a same square or rectangular pattern to match with said square or rectangular pattern of the bolt holes of the second mounting means and the fourth mounting means.

[0017] In an embodiment of the roller guide assembly, the shoe member is made of plastics.

[0018] In an embodiment of the roller guide assembly, the first mounting means comprises horizontal first long holes for first bolted joints, the first long holes providing adjustment of the distance position of the first body member relative to the guide rail.

[0019] In an embodiment of the roller guide assembly, the third mounting means comprises vertical second long holes for second bolted joints, the second long holes providing a fixed position of the second body member relative to the first body member laterally in relation to the longitudinal direction of the second long holes and vertical adjustment of the second body member relative to the first body member in the longitudinal vertical direction of the second long holes.

[0020] In an embodiment of the roller guide assembly, the elevator system comprises a roller guide assembly according to any one of the claims to, the frame being a sling of the car and/or a frame of the counterweight.

[0021] According to a second aspect, the present invention provides an installation method for installing a roller guide assembly according to the first aspect to the frame of the elevator device. According to the invention the method comprises steps of:

a) mounting the temporary sliding guide shoe detachably onto the first portion of the first body member by the second mounting means to form a first subassembly,

b) mounting the first subassembly detachably to the frame by the first mounting means so that the second slot mates to the guide rail with sliding fit to maintain alignment of the frame accurately in relation to the guide rail R during installation of a second subassembly formed of the second body member and the roller wheels,

c) mounting the second subassembly detachably to the second portion of the first body member by the third mounting means, so that the roller wheels engage the guide rail to be rolled on the guide rail and the temporary sliding guide shoe is between the second assembly and the first portion,

d) detaching and removing the temporary sliding guide shoe from the first portion, and

e) mounting the anti-tilt sliding guide shoe detachably onto the second body member, so that the first slot mates to the guide rail with loose fit to delimit, during use, tilting of the elevator device due its unbalance.

[0022] In an embodiment of the installation method, the anti-tilt sliding guide shoe and the temporary sliding guide shoe being formed to be in one integrated monolithic uniform piece of plate-like material forming a shoe member comprising the first slot and the second slot, and a fifth mounting means being adapted for selectively attaching the shoe member to the second mounting means or to the fourth mounting means, in the method, in steps b) to d) the shoe member is used to act as the temporary sliding guide shoe and in step e) the same shoe member is used to act as the anti-tilt sliding guide shoe.

[0023] In an embodiment of the installation method, in step c) the second subassembly formed of the second body member and the roller wheels is mounted to the second portion at a first position to provide a space for the temporary sliding guide shoe, and after step d) the second assembly is displaced to a second position to eliminate said space.

[0024] In an embodiment of the installation method, the third mounting means comprising vertical second long holes for second bolted joints the second long holes providing a fixed position of the second body member relative to the first body member laterally in relation to the longitudinal direction of the second long holes and vertical adjustment of the second body member relative to the first body member in the longitudinal vertical direction of the second long holes, in the method in steps b) and c) the second bolted joints are arranged and tightened at upper ends of the second long holes to provide

a space for the temporary sliding guide shoe, and after step d) the second bolted joints are arranged and tightened at lower ends of the second long holes to eliminate said space for providing a low structure of the roller guide assembly.

[0025] According to a third aspect, the present invention provides a maintenance method for maintaining a roller guide assembly according to the first aspect. According to the invention the method comprises steps of:

A) mounting the temporary sliding guide shoe onto the first portion of the first body member by the second mounting means, so that the second slot mates to the guide rail with sliding fit to maintain alignment of the frame accurately in relation to the guide rail R during maintenance,
B) dismantling and removing a roller wheel that needs to be replaced from the second body member,
C) installing an intact roller wheel to replace the removed roller wheel, and
D) detaching and removing the temporary sliding guide shoe from the first portion.

[0026] In an embodiment of the maintenance method, before step A) the method comprises a step of detaching and removing the anti-tilt sliding guide shoe from the second body member, the anti-tilt sliding guide shoe being integrated in the same shoe member as the temporary sliding guide shoe, and using the shoe member as a temporary sliding guide shoe in steps A) to D), and after step D) the method comprises a step of mounting the same shoe member back to the second body member for using it as the anti-tilt sliding guide shoe.

[0027] In an embodiment of the maintenance method, before step A) the second body member is displaced vertically from a lower position to an upper position in relation to the first portion to give space for the temporary sliding guide shoe to enable its mounting to the first portion by the second mounting means.

[0028] It is to be understood that the aspects and embodiments of the invention described above may be used in any combination with each other. Several of the aspects and embodiments may be combined together to form a further embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The accompanying drawings, which are included to provide a further understanding of the invention and constitute a part of this specification, illustrate embodiments of the invention and together with the description help to explain the principles of the invention. In the drawings:

Figure 1 shows an axonometric view of a roller guide assembly according to one embodiment of the invention,

Figures 2 to 6 illustrate steps of an installation method according to one embodiment of the invention,

Figure 7 shows an elevator system wherein four roller guide assemblies according to the invention are installed to the sling of the elevator car, and

Figure 8 shows an elevator system wherein four roller guide assemblies according to the invention are installed to the frame of the counterweight.

DETAILED DESCRIPTION OF THE INVENTION

[0030] Figure 1 shows a roller guide assembly 1 for an elevator device.

[0031] The roller guide assembly 1 comprises a body 2 having first mounting means 3 for mounting to a frame 4 of the elevator device. Frame 4 is schematically shown drawn with dashed lined. The roller guide assembly 1 of this embodiment comprises three roller wheels 5 mounted to the body 2. The roller wheels orthogonally engage with a vertical guide rail R (drawn with dashed line), so that two roller wheels 5 engage with parallel guide surfaces 23, 24 of the guide rail R on its opposite sides. These two roller wheels 5 have their planes of rotation in a common vertical plane. One roller wheel 5 engages with the frontal guide surface 25 of the guide rail R. Although the exemplary embodiments show roller guide assemblies having three roller wheels 5, it should be noted that the roller guide assembly 1 according to the invention may include any number of roller wheels supported to the body 2 according to the principles of the invention.

[0032] The roller guide assembly 1 further comprises an anti-tilt sliding guide shoe 6 to delimit, during use, tilting of the elevator device due to its unbalance which may be caused e.g. by a passenger entering the car from a landing. The anti-tilt sliding guide shoe 6 is detachably mountable to the body 2. The anti-tilt sliding guide shoe 6 comprises a first slot 7 to receive the guide rail R therein. The first slot 7 has a first width W1 designed to form a loose fit relative to the guide rail. Preferably, for the provision of the loose fit, the first width W1 is 1 - 3 mm greater than the width W of the guide rail R.

[0033] The body 2 comprises a first body member 8. The first body member 8 comprises a first portion 9 having the first mounting means 3 for mounting the first body member 8 detachably to the frame 4. The first mounting means 3 comprise horizontal first long holes 19 for first bolted joints BJ-1 (see Figure 2) The first long holes 19 provide adjustment of the horizontal position of the first body member 8 relative to the guide rail R.

[0034] The first portion 9 of the first body member 8 further has second mounting means 10 for detachable attachment of a temporary sliding guide shoe 11 (which is not shown in Figure 1 in this position) to be used for accurate positioning of the first body member 8 relative to the guide rail R during installing or maintenance. The

temporary sliding guide shoe 11 comprises a second slot 12. The second slot has a second width W2 designed to form a sliding fit relative to the guide rail R. In Figure 1 the temporary sliding shoe 11 has been removed from the second mounting means 10.

[0035] In the shown embodiment the anti-tilt sliding guide shoe 6 and the temporary sliding guide shoe 11 are formed to be in one integrated monolithic uniform piece of plate-like plastics material forming a shoe member 17. The shoe member 17 may be made of e.g. polyamide, ultra-high-molecular-weight polyethylene, polytetrafluoroethylene or thermoplastic polyurethane. The shoe member 17 comprises the first slot 7 and the second slot 12. The shoe member 17 comprises fifth mounting means 18 adapted for selectively attaching the shoe member 17 to the second mounting means 10 or to the fourth mounting means 16. The first slot 7 and second slot 12 are arranged in the shoe member 17 at an angle of 90° in relation to each other. Thereby, depending on whether the shoe member 17 is used as a temporary sliding guide shoe 11 or as anti-tilt sliding guide shoe 6 its orientation is turned 90° between these different uses. The second mounting means 10 and the fourth mounting means 16 comprise bolt holes for bolted joints. These bolt holes are preferably arranged in a square or rectangular pattern. The fifth mounting means 18 of the shoe member 17 comprises bolt holes for bolted joints. These bolt holes are arranged in a same square or rectangular pattern to match with said square or rectangular pattern of bolt holes of the second mounting means 10 and the fourth mounting means 16.

[0036] Use of the temporary sliding shoe 11 during installation process is disclosed in more detail with reference to Figures 2 and 3.

[0037] Referring to Figure 1, the first body member 8 further comprises a second portion 13 which is perpendicular to the horizontal first portion 9. The second portion 13 has third mounting means 14. The body 2 comprises a second body member 15 to which the roller wheels 5 are mounted. The second body member 15 is detachably mountable by the third mounting means 14 to the second portion 13 of the first body member 8. The second body member 15 has fourth mounting means 16 for detachable mounting of the anti-tilt sliding guide shoe 6 onto the second body member 15.

[0038] The third mounting means 14 comprises vertical second long holes 20 for second bolted joints BJ-2 (see Figures 3 to 5). The vertical second long holes 20 provide a fixed position of the second body member 15 relative to the first body member 8 laterally in relation to the longitudinal direction of the second long holes. In addition, the vertical second long holes 20 provide a possibility to vertically adjust the second body member 15 relative to the first body member 8 in the longitudinal vertical direction of the second long holes 20.

[0039] Figures 2 to 6 illustrate some steps of the installation method for installing a roller guide assembly 1 of Figure 1 to the frame 4 of the elevator device which may be a car and/or a counterweight.

[0040] In the installation method, in step a) the temporary sliding guide shoe 11 is detachably mounted onto the first portion 9 of the first body member 8 by the second mounting means 10 to form a first subassembly A1. In the method step b) this first subassembly A1 is detachably mounted to the frame 4 by the first mounting means 3, so that the second slot 12 mates to the guide rail R with sliding fit to maintain alignment of the frame 4 accurately in relation to the guide rail R during installation of a second subassembly A2 formed of the second body member 15 and the roller wheels 5.

[0041] Figure 3 illustrates the method step c) wherein the second subassembly A2 is detachably mounted to the second portion 13 of the first body member 8 by the third mounting means 14, so that the roller wheels 5 engage the guide rail R to be rolled on the guide rail and the temporary sliding guide shoe 11 is between the second assembly and the first portion 9. As the anti-tilt sliding guide shoe 6 and the temporary sliding guide shoe 11 are integrated into same shoe member 17 comprising the first slot 7 and the second slot 12, and having a fifth mounting means 18 being adapted for selectively attaching the shoe member 17 to the second mounting means 10 or to the fourth mounting means 16, in the disclosed method steps b) and c) the shoe member 17 is used to act as the temporary sliding guide shoe 11, the second slot 12 being mating the guide rail R with sliding fit. The shoe member 17 is mounted to the second mounting means 10 of the first portion 9 of the first body member 8 by bolted joints.

[0042] As can be seen in Figure 3, in method step c) the second subassembly A2 formed of the second body member 15 and the roller wheels 5 is mounted to the second portion 13 at a first position I (upper position) to provide a space for the temporary sliding guide shoe 11. As the third mounting means 14 comprises vertical second long holes 20 for second bolted joints BJ-2, the second long holes 20 providing a fixed position of the second body member 15 relative to the first body member 8 laterally in relation to the longitudinal direction of the second long holes and vertical adjustment of the second body member 15 relative to the first body member 8 in the longitudinal vertical direction of the second long holes, in the method steps b) and c) the second bolted joints BJ-2 are arranged and tightened at upper ends of the second long holes 20 to provide said space for the temporary sliding guide shoe 11.

[0043] In Figure 4 is illustrated a method step d) wherein the temporary sliding guide shoe 11 is detached and removed from the first portion 9. In Figure 4 the second subassembly A2 is still at the first position I (upper position).

[0044] Figure 5 illustrates that after step d) the second subassembly A2 is displaced to a second position II (lower position) to eliminate the space previously reserved for the temporary sliding guide shoe 11. The second bolted joints BJ-2 are arranged and tightened at lower ends

of the second long holes 20, so that low structure of the roller guide assembly 1 is achieved.

[0045] Figure 6 illustrates method step e) wherein the anti-tilt sliding guide shoe 6 is detachably mounted onto the second body member 15, so that the shoe member 17 is used to act as the anti-tilt sliding guide shoe 6 in a position wherein the first slot 7 mates to the guide rail R. As the first slot 7 mates the guide rail R with loose fit, it does not touch the guide rail under normal running of the elevator device, but delimits tilting of the elevator device due its eventual unbalance.

[0046] For maintaining a roller guide assembly 1 of Figure 1, the maintenance method may begin by a step A0) wherein the anti-tilt sliding guide shoe 6 is detached and removed from the second body member 15. Thereafter, the second body member 15 is displaced vertically from a lower second position II to an upper first position I in relation to the first portion 9 to give space for the temporary sliding guide shoe 11 to enable its mounting to the first portion 9 by the second mounting means 10. The anti-tilt sliding guide shoe 6 being integrated in the same shoe member 17 as the temporary sliding guide shoe 11, the shoe member 17 is next used as a temporary sliding guide shoe 11 in step A) wherein the temporary sliding guide shoe 11 is mounted onto the first portion 9 of the first body member 8 by the second mounting means 10, so that the second slot 12 mates to the guide rail R with sliding fit to maintain alignment of the frame 4 accurately in relation to the guide rail R during maintenance. After that, in step B) a roller wheel 5 that needs to be replaced is dismantled and removed from the second body member 15. In the subsequent step C) an intact roller wheel 5 is installed to replace the removed roller wheel. After that, in step D) the temporary sliding guide shoe 11 is detached and removed from the first portion 9. Thereafter, the second body member 15 is displaced vertically from the upper first position I to a lower second position II in relation to the first portion 9 to eliminate the space which was previously reserved for the temporary sliding guide shoe 11. Finally, after step D) the method may comprise a step E) wherein the same shoe member 17 is which was used as a temporary sliding guide shoe 11 in previous steps, is mounted back to the second body member 15 for using it as the anti-tilt sliding guide shoe 6.

[0047] Figures 7 and 8 illustrate an elevator system comprising a car 21 (Figure 7) and a counterweight 22 (Figure 8). The system comprises four roller guide assemblies 1 as described with reference to Figure 1 mounted to the frame 4 (i.e. sling) of the car 23 and to frame 4 of the counterweight 22.

[0048] Although the invention has been the described in conjunction with a certain type of roller guide assembly, it should be understood that the invention is not limited to any certain type of roller guide assembly. While the present inventions have been described in connection with a number of exemplary embodiments, and implementations, the present inventions are not so limited, but rather cover various modifications, and equivalent arrangements, which fall within the purview of prospective claims.

Claims

1. A roller guide assembly (1) for an elevator device, the roller guide assembly comprising

   - a body (2) having first mounting means (3) for mounting to a frame (4) of the elevator device,
   - at least two roller wheels (5) mounted to the body (2), the roller wheels engaging a vertical guide rail (R) to be rolled on the guide rail, and
   - an anti-tilt sliding guide shoe (6) to delimit, during use, tilting of the elevator device due to its unbalance, the anti-tilt sliding guide shoe (6) being detachably mountable to the body (2),

   characterized in that the body (2) comprises

   - a first body member (8), the first body member (8) comprising

     -- a first portion (9) having said first mounting means (3) for mounting the first body member (8) detachably to the frame (4), the first portion (9) further having second mounting means (10) for detachable attachment of a temporary sliding guide shoe (11) to be used for accurate positioning of the first body member (8) relative to the guide rail (R) during installing or maintenance, the temporary sliding shoe being removed after installation or maintenance and
     -- a second portion (13) which is perpendicular to the first portion (9) and having third mounting means (14),

   - a second body member (15) to which the roller wheels (5) are mounted, the second body member (15) being detachably mountable by the third mounting means (14) to the second portion (13) of the first body member (8), the second body member (15) having fourth mounting means (16) for detachable mounting of the anti-tilt sliding guide shoe (6) onto the second body member.

2. A roller guide assembly according to claim 1, **characterized in that** the anti-tilt sliding guide shoe (6) comprises a first slot (7) to receive the guide rail (R) therein, the first slot (7) having a first width (W1) designed to form a loose fit relative to the guide rail.

3. A roller guide assembly according to claim 2, **characterized in that** the temporary sliding guide shoe (11) comprises a second slot (12), the second slot

having a second width (W2) designed to form a sliding fit relative to the guide rail (R).

4. A roller guide assembly according to claim 3, **characterized in that** the anti-tilt sliding guide shoe (6) and the temporary sliding guide shoe (11) are formed to be in one integrated monolithic uniform piece of plate-like material forming a shoe member (17) comprising the first slot (7) and the second slot (12), and a fifth mounting means (18) adapted for selectively attaching the shoe member (17) to the second mounting means (10) or to the fourth mounting means (16).

5. A roller guide assembly according to claim 4, **characterized in that** the first slot (7) and second slot (12) are arranged in the shoe member (17) at an angle of 90° in relation to each other.

6. A roller guide assembly according to claim 4 or 5, **characterized in that** the second mounting means (10) and the fourth mounting means (16) comprise bolt holes for bolted joints, the bolt holes being arranged in a square or rectangular pattern, and that the fifth mounting means (18) of the shoe member (17) comprises bolt holes for bolted joints, the bolt holes being arranged in a same square or rectangular pattern to match with said square or rectangular pattern of bolt holes of the second mounting means and the fourth mounting means.

7. A roller guide assembly according to any one of the claims 4 to 6, **characterized in that** the shoe member (17) is made of plastics.

8. A roller guide assembly according any one of the claims 1 to 7, **characterized in that** the first mounting means (3) comprises horizontal first long holes (19) for first bolted joints (BJ-1), the first long holes (19) providing adjustment of the distance position of the first body member (8) relative to the guide rail (R).

9. A roller guide assembly according to any one of the claims 1 to 8, **characterized in that** the third mounting means (14) comprises vertical second long holes (20) for second bolted joints (BJ-2), the second long holes providing a fixed position of the second body member (15) relative to the first body member (8) laterally in relation to the longitudinal direction of the second long holes and vertical adjustment of the second body member (15) relative to the first body member (8) in the longitudinal vertical direction of the second long holes.

10. An elevator system, comprising a car (21) and/or a counterweight (22), **characterized in that** the elevator system comprises a roller guide assembly (1) according to any one of the claims 1 to 9, the frame (4) being a sling of the car (21) and/or a frame of the counterweight (22).

11. An installation method for installing a roller guide assembly (1) according to any one of the claims 1 to 9 to the frame (4) of the elevator device, **characterized in that** the method comprises steps of:

a) mounting the temporary sliding guide shoe (11) detachably onto the first portion (9) of the first body member (8) by the second mounting means (10) to form a first subassembly (A1),
b) mounting the first subassembly (A1) detachably to the frame (4) by the first mounting means (3) so that the second slot (12) mates to the guide rail (R) with sliding fit to maintain alignment of the frame (4) accurately in relation to the guide rail (R) during installation of a second subassembly (A2) formed of the second body member (15) and the roller wheels (5),
c) mounting the second subassembly (A2) detachably to the second portion (13) of the first body member (8) by the third mounting means (14), so that the roller wheels (5) engage the guide rail (R) to be rolled on the guide rail and the temporary sliding guide shoe (11) is between the second assembly and the first portion (9),
d) detaching and removing the temporary sliding guide shoe (11) from the first portion (9), and
e) mounting the anti-tilt sliding guide shoe (6) detachably onto the second body member (15), so that the first slot (7) mates to the guide rail (R) with loose fit to delimit, during use, tilting of the elevator device due its unbalance.

12. An installation method according to claim 11, **characterized in that** the anti-tilt sliding guide shoe (6) and the temporary sliding guide shoe (11) being formed to be in one integrated monolithic uniform piece of plate-like material forming a shoe member (17) comprising the first slot (7) and the second slot (12), and a fifth mounting means (18) being adapted for selectively attaching the shoe member (17) to the second mounting means (10) or to the fourth mounting means (16), in the method in steps b) to d) the shoe member (17) is used to act as the temporary sliding guide shoe (11) and in step e) the shoe member (17) is used to act as the anti-tilt sliding guide shoe (6).

13. An installation method according to claim 11 or 12, **characterized in that** in step c) the second subassembly (A2) formed of the second body member (15) and the roller wheels (5) is mounted to the second portion (13) at a first position (I) to provide a space for the temporary sliding guide shoe (11), and after step d) the second assembly is displaced to a second position (II) to eliminate said space.

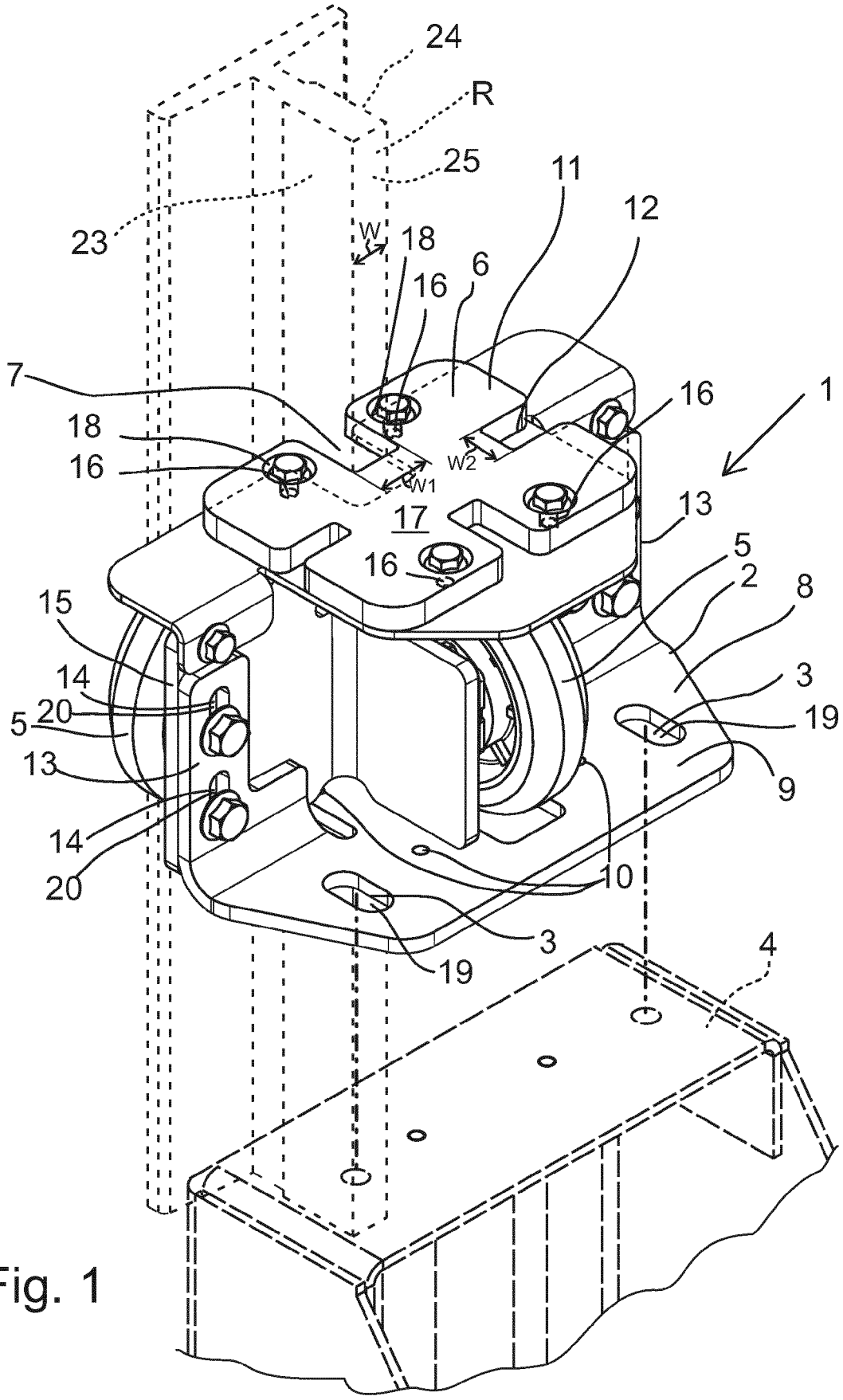
14. An installation method according to any one of the claims 11 to 13, **characterized in that** the third mounting means (14) comprising vertical second long holes (20) for second bolted joints (BJ-2), the second long holes (20) providing a fixed position of the second body member (15) relative to the first body member (8) laterally in relation to the longitudinal direction of the second long holes and vertical adjustment of the second body member (15) relative to the first body member (8) in the longitudinal vertical direction of the second long holes, in the method in steps b) and c) the second bolted joints (BJ-2) are arranged and tightened at upper ends of the second long holes (20) to provide a space for the temporary sliding guide shoe (11), and after step d) the second bolted joints (BJ-2) are arranged and tightened at lower ends of the second long holes (20) to eliminate said space for providing a low structure of the roller guide assembly (1).

15. A maintenance method for maintaining a roller guide assembly (1) according to any one of the claims 1 to 9, **characterized in that** the method comprises steps of:

A) mounting the temporary sliding guide shoe (11) onto the first portion (9) of the first body member (8) by the second mounting means (10), so that the second slot (12) mates to the guide rail (R) with sliding fit to maintain alignment of the frame (4) accurately in relation to the guide rail (R) during maintenance,
B) dismantling and removing a roller wheel (5) that needs to be replaced from the second body member (15),
C) installing an intact roller wheel (5) to replace the removed roller wheel, and
D) detaching and removing the temporary sliding guide shoe (11) from the first portion (9).

16. A maintenance method according to claim 15, **characterized** in that
before step A) the method comprises a step A0) of detaching and removing the anti-tilt sliding guide shoe (6) from the second body member (15), the anti-tilt sliding guide shoe (6) being integrated in the same shoe member (17) as the temporary sliding guide shoe (11), and using the shoe member (17) as a temporary sliding guide shoe in steps a) to d), and
after step D) the method comprises a step E) of mounting the same shoe member (17) back to the second body member (15) for using it as the anti-tilt sliding guide shoe (6).

17. A maintenance method according to claim 15 or 16, **characterized in that** before step a) the second body member (15) is displaced vertically from a lower position to an upper position in relation to the first portion (9) to give space for the temporary sliding guide shoe (11) to enable its mounting to the first portion (9) by the second mounting means (10).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W2
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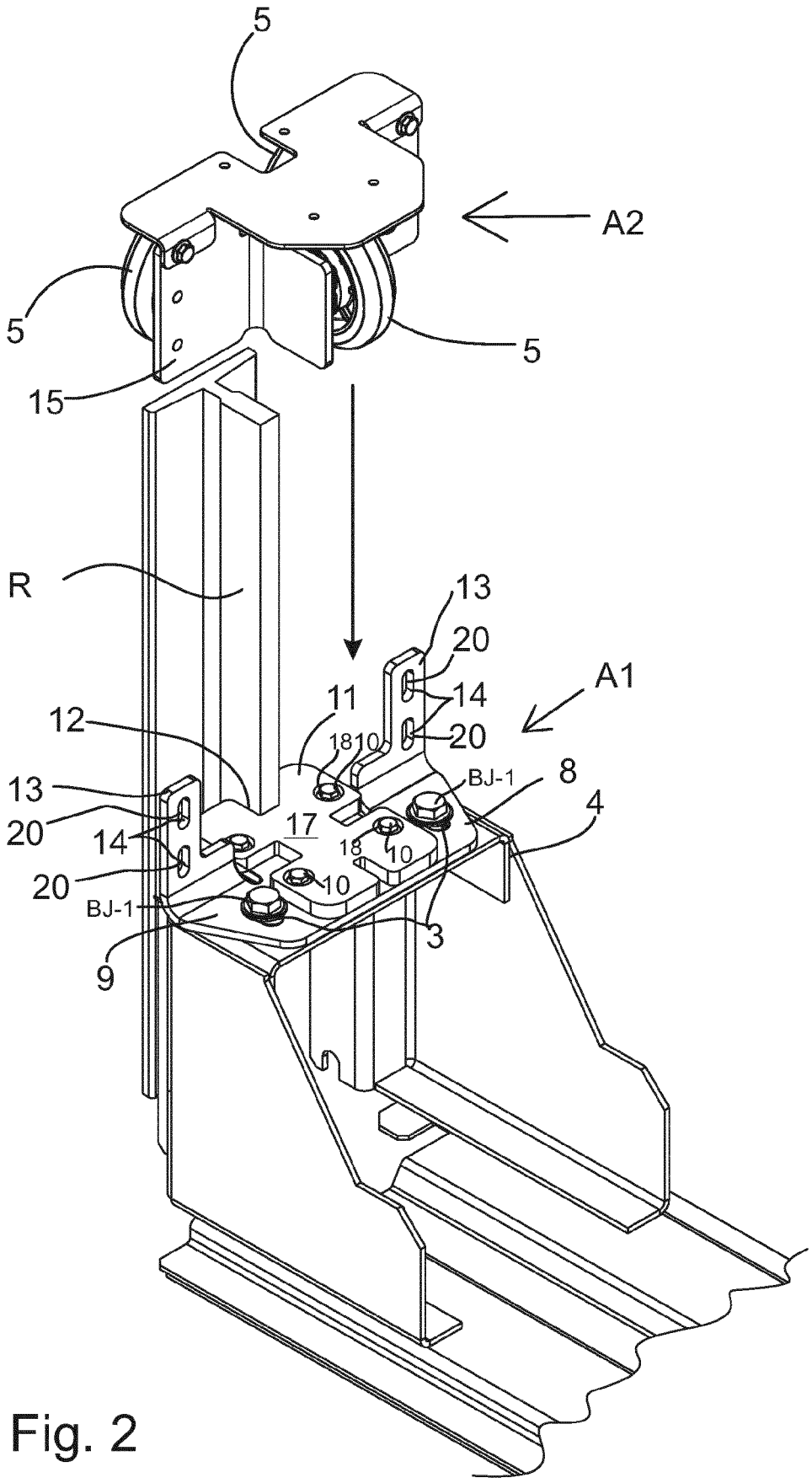
Fig. 1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A1
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BJ-1
3
9

Fig. 2

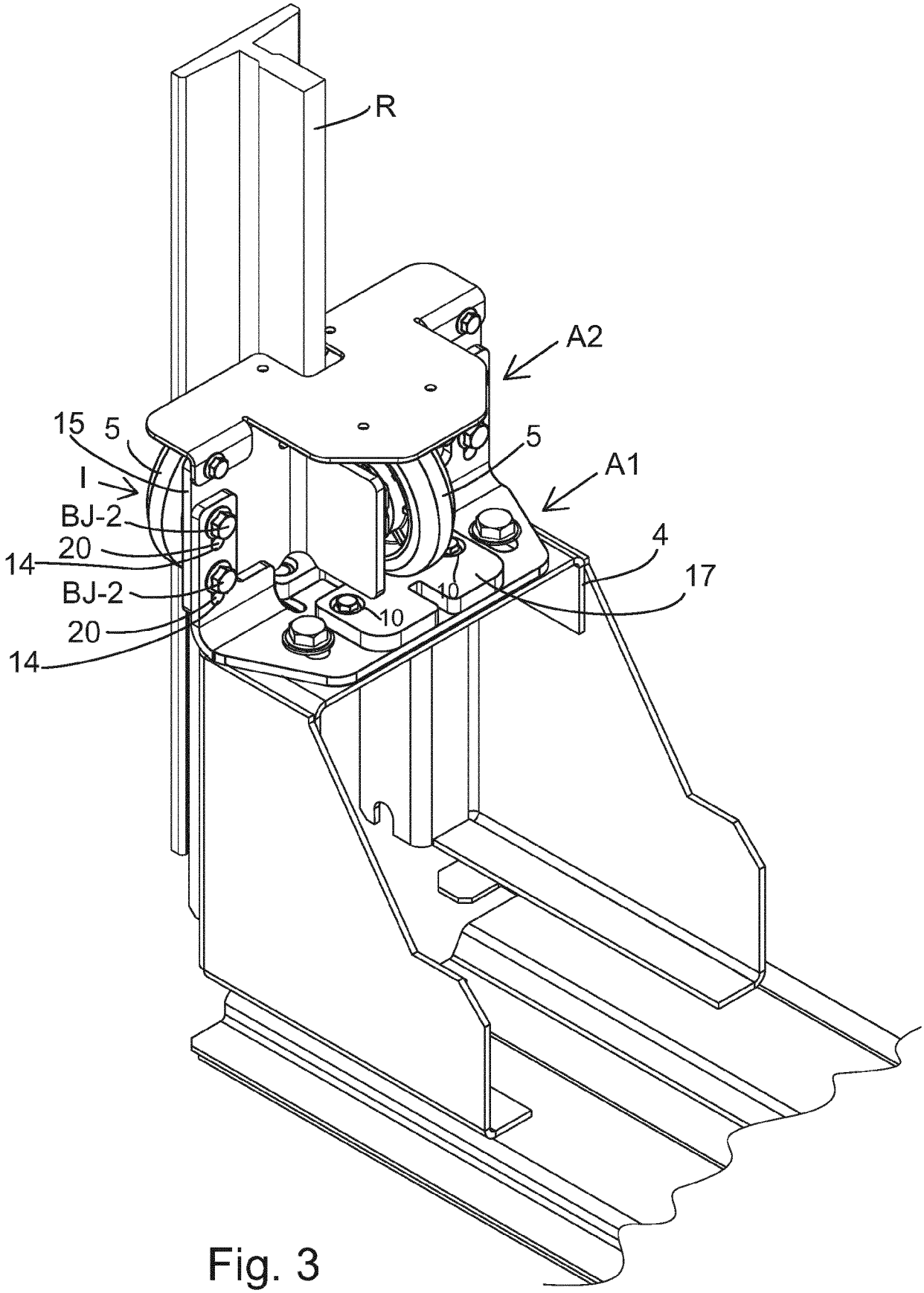

Fig. 3

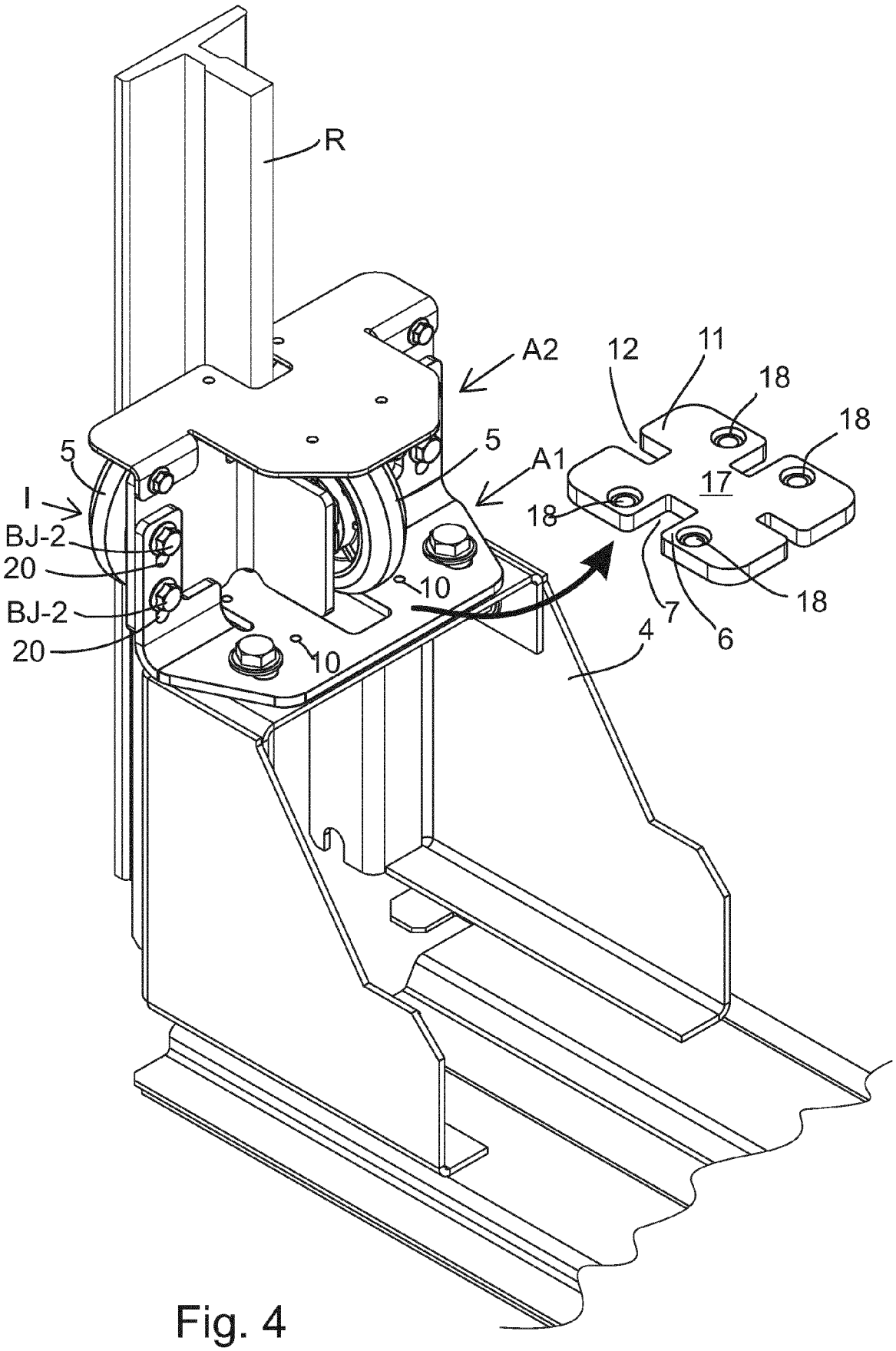

Fig. 4

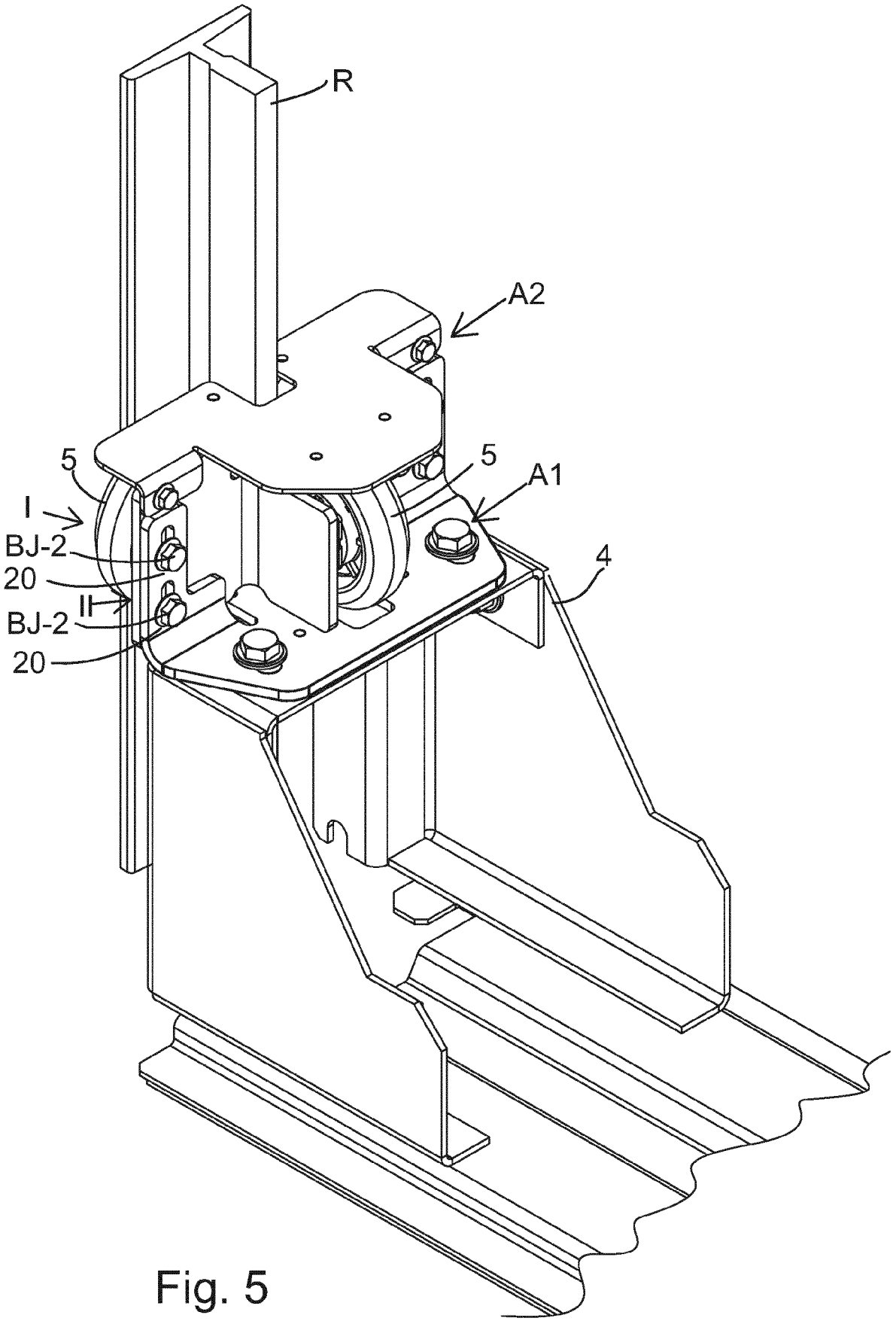

Fig. 5

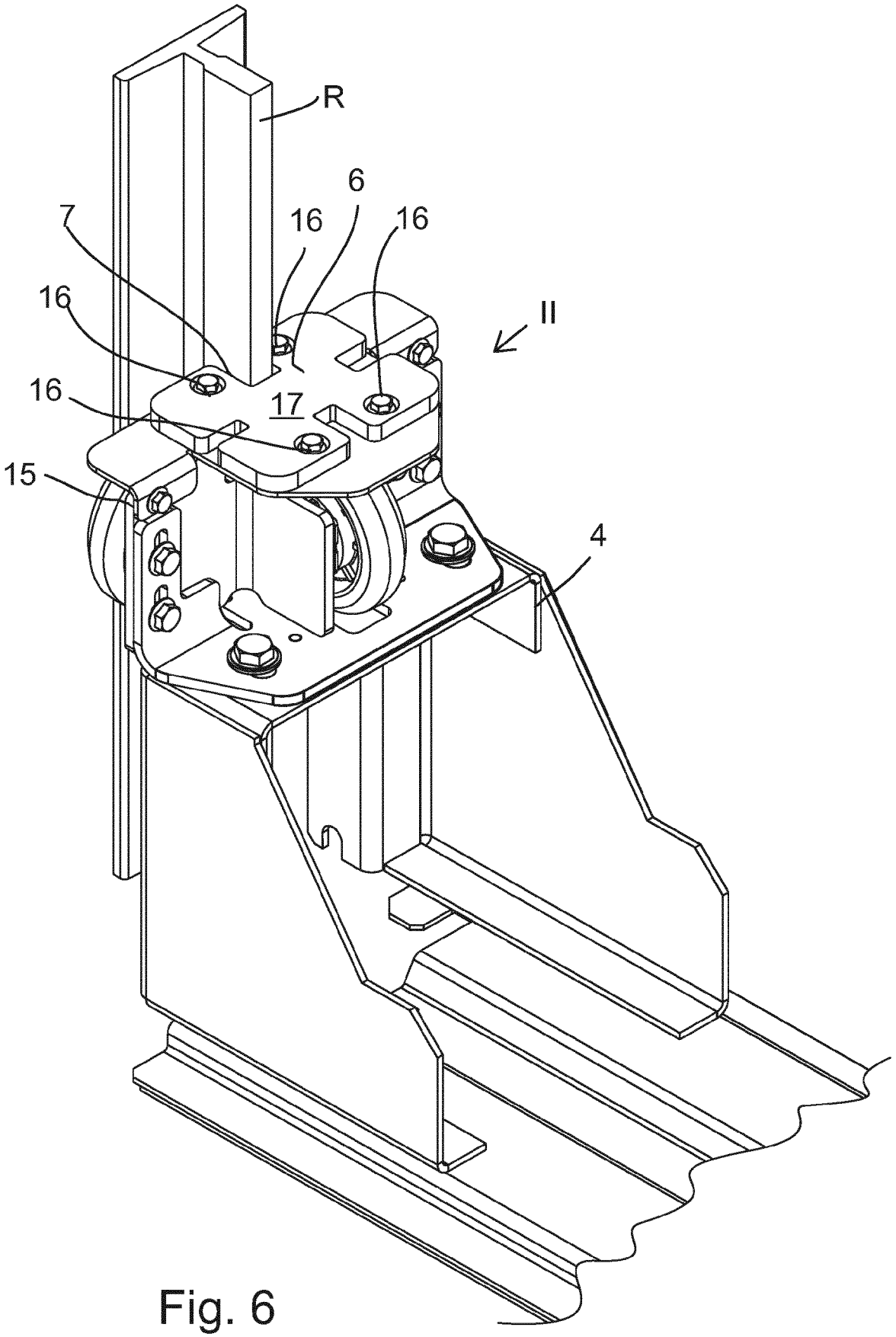

Fig. 6

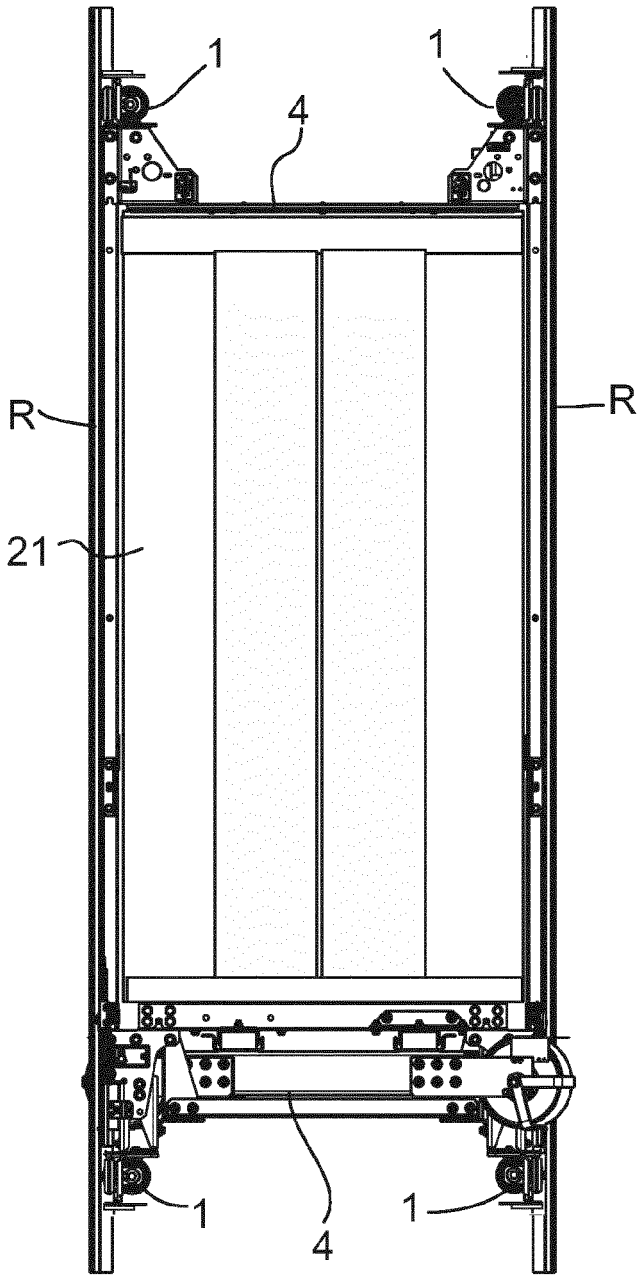

Fig. 7

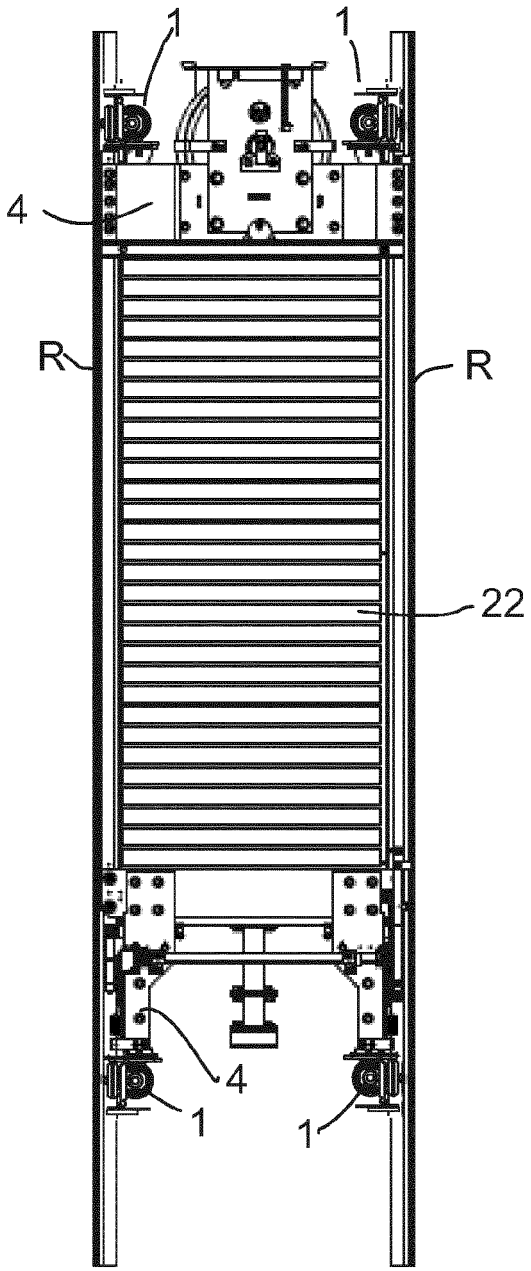

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 17 20 8311

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

B66B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 July 2018	Lohse, Georg

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EPO FORM 1503 03.82 (P04C01)

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05-07-2018

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