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(54) **DEVICE FOR SECURING CAGE OF ELEVATOR**

VORRICHTUNG ZUR SICHERUNG EINES AUFZUGSKÄFIGS

DISPOSITIF DE FIXATION D'UNE CABINE D'ASCENSEUR

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EP 1 538 122 B1

Description

TECHNICAL FIELD

[0001] The present invention relates to a self-propelled elevator in which a driving machine for causing a car and a counterweight to ascend and descend is mounted on the counterweight. In particular, the invention relates to an elevator car fixing device that fixes the car with respect to the counterweight in an elevator in which an operator gets on top of the car to perform maintenance operation on the driving machine.

BACKGROUND ART

[0002] Fig. 16 is a perspective view of a conventional self-propelled elevator as proposed, for example, in JP 9-124259 A. Fig. 17 is a diagram schematically illustrating this elevator apparatus. In Figs. 16 and 17, a car 2 and a counterweight 3 are arranged inside a hoistway of the elevator. The car 2 and the counterweight 3 ascend and descend within the hoistway while being guided by car-side guide rails 4 and counterweight-side guide rails 5 with a T-shaped sectional configuration, respectively.

[0003] Mounted on the counterweight 3 is a driving machine 7 for driving a rope 6 wrapped around it. The counterweight 3 is further equipped with a brake device 31 that holds the side surfaces of a flange protruding in the outer periphery of a sheave of the driving machine 7 by a spring pressure to effect braking.

[0004] Provided in an upper portion of the hoistway are a car-side rope fixing member 10 for fixing the portion of the rope 6 on the car 2 side and a weight-side rope fixing member 11 for fixing the portion of the rope 6 on the counterweight 3 side.

[0005] Installed at a predetermined position in a lower portion of the hoistway is an elevator control device 35 including a drive inverter for the driving machine 7 mounted on the counterweight 3.

[0006] Suspended inside the hoistway is an elevator cable 32 containing a power line for driving the driving machine 7 mounted on the counterweight 3, a brake drive line, a speed feedback encoder line for detecting speed and position, etc.

[0007] The elevator cable 32 is suspended between the control device 35 and the driving machine 7 by way of a building-side junction point 33 and a junction point 34 under the car 2.

[0008] The car 2 is suspended from the portion of the rope 6 between the car-side rope fixing member 10 and a return pulley 8. The car 2 is suspended by wrapping the rope 6 around a sash pulley 9 rotatably supported on a side surface of the car.

[0009] The counterweight 3 is suspended from the portion of the rope 6 between the counterweight-side rope fixing member 11 and the return pulley 8. The counterweight 3 is suspended by wrapping the rope 6 around the sheave of the driving machine 7.

[0010] When the driving machine 7 provided on the counterweight 3 is driven, the sheave rotates, and the car 2 and the counterweight 3 are caused to ascend and descend within the hoistway 1. When the car 2 descends, the counterweight 3 ascends, and when the car 2 ascends, the counterweight 3 descends.

[0011] In the elevator thus constructed, that is, in the so-called self-propelled elevator in which the driving machine 7 for causing the car 2 to ascend and descend is mounted on the counterweight 3, the operator gets on top of the car 2, and the car 2 is moved to a position where maintenance of the driving machine 7 is possible, that is, to the position where the car 2 passes the counterweight 3, the operator reaching out from the car 2 to inspect the driving machine 7.

[0012] Conventionally, there has been proposed a car fixing device for fixing the car to a stationary portion in the hoistway, such as a guide rail, as a device for mechanically preventing inadvertent movement of the car 2 during maintenance operation when the maintenance operation is thus to be performed on the driving machine 7 by reaching out from the top of the car 2.

[0013] Fig. 18 is a perspective view of a conventional car fixing device as disclosed, for example, in JP 2000-203774 A.

[0014] As shown in Fig. 18, there is provided on top of the car 2 an operating mechanism 50 having a lock bar 41 adapted to longitudinally advance and retreat and a bracket 42 for securing this lock bar 41 at a predetermined position. The lock bar 41 has an operating lever 43 protruding from a side surface portion thereof. When the operating lever 43 is removed from an operating lever insertion groove 42b of the bracket 42, and the lock bar 41 is moved toward a fixing mechanism 44 to insert the forward longitudinal end portion of the lock bar 41 into a lock bar insertion hole 44a of the fixing mechanism 44 which is provided on the guide rail, the car 2 is mechanically fixed in position. Thereafter, the operating lever 43 is inserted into an operating lever insertion groove 42a to thereby prevent the lock bar 41 from coming out of engagement with the fixing mechanism 44.

[0015] In this conventional elevator car fixing device, constructed as described above, the car 2 is fixed to a stationary portion in the hoistway, such as a guide rail. Thus, when the rope 6 becomes longer with age, the position of the driving machine 7 with respect to the car fixing position is lowered, which leads to a hindrance to maintenance operation.

[0016] The present invention has been made with a view toward solving the above problem in the prior art. It is an object of the present invention to provide an elevator car fixing device in which the car and the counterweight are fixed in position in a state they are connected together, so that the device is free from the influence of the expansion of the rope with age, making it possible to fix the position of the driving machine with respect to the car fixing position.

DISCLOSURE OF THE INVENTION

[0017] According to the present invention, there is provided an elevator car fixing device which is provided in an elevator, the elevator including: a rope arranged in a hoistway and wrapped around a return pulley arranged in an upper portion of the hoistway; a car suspended from one end of the rope; and a counterweight suspended from a portion of the rope between a counterweight-side rope fixing member, which is provided in the upper portion of the hoistway and to which the other end of the rope is fixed, and the return pulley, the counterweight being adapted to ascend when the car descends and to descend when the car ascends and equipped with a driving machine for causing the car to ascend and descend, the elevator car fixing device including an advancing/retreating member provided on one of the car and the counterweight and adapted to move toward and away from the other of the car and the counterweight, and a locking mechanism provided on the other of the car and the counterweight and adapted to be engaged with the advancing/retreating member when the advancing/retreating member advances to thereby lock the car and the counterweight with respect to each other in an ascent/descent direction. Thus, when the operator gets on top of the car to perform maintenance operation on the driving machine, any inadvertent motion of the car during the operation is mechanically inhibited, making it possible to perform the operation in a stable manner and with ease. The device is free from the influence of the expansion of the rope with age, making it possible to fix the position of the driving machine with respect to the car fixing position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a perspective view of an elevator, showing an elevator car fixing device according to Embodiment 1 of the present invention.
Fig. 2 is a diagram showing how an operator works on top of the car of the elevator of Fig. 1.
Fig. 3 is a schematic diagram schematically showing the elevator of Embodiment 1.
Fig. 4 is a schematic diagram illustrating how the operator performs maintenance operation, with the car and a counterweight being connected together.
Fig. 5 is a diagram for illustrating a connecting device according to Embodiment 1.
Fig. 6 is a diagram showing the connecting device of Fig. 5 in the connecting state.
Fig. 7 is a diagram for illustrating a connecting device according to Embodiment 2.
Fig. 8 is a diagram showing the connecting device of Fig. 7 in the connecting state.
Fig. 9 is a diagram for illustrating a connecting device according to Embodiment 3.
Fig. 10 is a diagram for illustrating a connecting device according to Embodiment 4.
Fig. 11 is a schematic diagram schematically showing an elevator according to Embodiment 5.
Fig. 12 is a schematic diagram illustrating how the operator performs maintenance operation, with the car and the counterweight being connected together.
Fig. 13 is a schematic diagram schematically showing an elevator according to Embodiment 6.
Fig. 14 is a schematic diagram illustrating how the operator performs maintenance operation, with the car and the counterweight being connected together.
Fig. 15 is a diagram showing the side surfaces, the top surface, the front surface, and the rear surface of a photoreceptor type detection switch.
Fig. 16 is a perspective view of a conventional self-propelled elevator.
Fig. 17 is a schematic view of a conventional elevator apparatus.
Fig. 18 is a perspective view of a conventional car fixing device.

BEST MODE FOR CARRYING OUT THE INVENTION

Embodiment 1

[0019] Fig. 1 is a perspective view of an elevator, showing an elevator car fixing device according to Embodiment 1 of the present invention. Further, Fig. 2 is a diagram showing how an operator works on top of the car of the elevator of Fig. 1. Fig. 3 is a schematic diagram schematically showing the elevator of this embodiment. Fig. 4 is a schematic diagram illustrating how the operator performs maintenance operation, with the car and a counterweight being connected together.

[0020] In the drawings, a car 2 and a counterweight 3 are arranged in a hoistway 1 of the elevator. The car 2 and the counterweight 3 ascend and descend inside the hoistway 1 while being guided by car-side guide rails 4 and weight-side guide rails 5 with a T-shaped sectional configuration, respectively. The counterweight 3 has a weight frame 3b formed by connecting together four frame members with a U-shaped section into a rectangular configuration, and a plurality of weights 3a accommodated in the weight frame 3b in different numbers for adjustment in weight. Further, mounted on the counterweight 3 is a driving machine 7 for causing the car 2 and the counterweight 3 to ascend and descend. As in the prior art, the counterweight 3 is equipped with a brake device, which is not shown here.

[0021] A return pulley 8 is provided in the upper portion of the hoistway 1. A rope 6 is wrapped around the return pulley 8, and dangles in the hoistway 1. One end portion of the rope 6 dangles first, and is then turned upwards to be fixed to a car-side rope fixing member 10 provided in the upper portion of the hoistway 1. Similarly, the other end portion of the rope 6 dangles first, and is then turned upwards to be fixed to a counterweight-side rope fixing member 11 provided in the upper portion of the hoistway

1.

[0022] The car 2 is suspended from the portion of the rope 6 between the car-side rope fixing member 10 and the return pulley 8. In suspending the car 2, the rope 6 is wrapped around a sash pulley 9 provided under the car. The counterweight 3 is suspended from the portion of the rope 6 between the counterweight-side rope fixing member 11 and the return pulley 8. In suspending the counterweight 3, the rope 6 is wrapped around a sheave 7a of the driving machine 7.

[0023] When the driving machine 7 provided on the counterweight 3 is driven, the sheave 7a rotates, and the car 2 and the counterweight 3 ascend and descend within the hoistway 1. When the car 2 descends, the counterweight 3 ascends, and when the car 2 ascends, the counterweight 3 descends.

[0024] In this embodiment, there is used a so-called 2:1 roping type elevator, in which the ratio of the movement distance of the car 2 to the movement length of the rope 6 is 2:1.

[0025] On the top surface of the car 2, there is provided a connecting device 12 for connecting the car 2 and the counterweight 3 with each other in the ascent/descent direction.

[0026] In the lower portion of the hoistway 1, there is installed a control device 35 for operating the elevator. As in the prior art, between the control device 35 and the driving machine 7, there is provided an elevator cable, which is not shown here.

[0027] Fig. 5 is a diagram for illustrating the connecting device of this embodiment. Fig. 6 is a diagram showing the connecting device in the connecting state. The connecting device 12 has a lock bar 13 provided on the car 2 and serving as an advancing/retreating member 13 adapted to move toward and away from the counterweight 3, and a lock hole 3c which is provided in the counterweight 3 and into which the forward end portion of the lock bar 13 is inserted when the lock bar 13 advances. The lock hole 3c is formed in a weight frame 3b. The height of the lock hole 3c is determined such that, when the car 2 and the counterweight 3 are connected together, the driving machine 7 attains a height which facilitates the inspection thereof. The weight frame 3b is engaged with the lock bar 13 to constitute a locking mechanism for locking the car 2 and the counterweight 3 with respect to each other in the ascent/descent direction.

[0028] The lock bar 13 is slidably supported by a bracket 14 serving as a guide member provided on the car frame 2a. Two side surfaces of the bracket 14 have through-holes 14a. The lock bar 13 is passed through these two through-holes 14a, and is supported so as to be capable of moving toward and away from the counterweight 3. An operating lever 13a protrudes from the outer peripheral surface of the lock bar 13. This operating lever 13a is engaged with a U-shaped guide slit 14b formed in the bracket 14, and regulates the movement of the lock bar 13. When the operating lever 13a is engaged with a lateral groove at the advance end of the guide slit 14b, the lock bar 13 is secured in the connecting position. When the operating lever 13a is engaged with a lateral groove at the retreat end of the guide slit 14b, the lock bar 13 is secured in the retreat position.

[0029] As in this embodiment, in a so-called self-propelled elevator, in which the elevator driving machine 7 is mounted on the counterweight 3, the operator gets on top of the car 2, as shown in Figs. 2 and 4, when maintenance is to be performed on the driving machine 7, and moves close to the place where the car 2 and the counterweight 3 pass each other, reaching out from the car to perform maintenance on the driving machine 7.

[0030] When the car 2 and the counterweight 3 are to be connected together, the operator performs positioning on the car 2 and the counterweight 3. When the position has been reached where the positioning on the car 2 and the counterweight 3 is complete, the operating lever 13a is removed from the lateral groove at the retreat position, and the lock bar 13 is caused to advance, and inserted into the lock hole 3c, with the operating lever 13a being fixed to the lateral groove at the connecting position. By this operation, the car 2 and the counterweight 3 are mutually regulated in their movement in the ascent/descent direction.

[0031] The elevator car fixing device, constructed as described above, is provided in an elevator having: the rope 6 wrapped around the return pulley 8 and arranged in the hoistway 1, with the return pulley 8 being arranged in the upper portion of the elevator hoistway; the car 2 suspended from one end of the rope 6; and the counterweight 3 suspended from the portion of the rope 6 between the counterweight-side rope fixing member 11 in the upper portion of the hoistway 1, to which the other end of the rope 6 is fixed, and the return pulley 8, the counterweight 3 being adapted to ascend when the car 2 descends and to descend when the car 2 ascends, and equipped with the driving machine 7 for causing the car 2 to ascend and descend, wherein the car fixing device is equipped with the lock bar 13 provided on the car 2 and adapted to move toward and away from the counterweight 3, and the weight frame 3b adapted to be engaged with the lock bar 13 when the lock bar 13 provided on the car 2 advances, thereby mutually locking the car 2 and the counterweight 3 in the ascent/descent direction. Therefore, when the operator gets on top of the car 2 to perform maintenance on the driving machine 7, it is possible to mechanically prevent any inadvertent motion of the car 2 during the maintenance operation, making it possible to perform the operation in a stable manner and with ease. Further, the device is free from the influence of an expansion of the rope 6 with age, making it possible to always keep the position of the driving machine 7 with respect to the car fixing position fixed.

[0032] Further, the lock bar 13 is substantially formed as a bar extending in the advancing/retreating direction and slidably guided in the advancing/retreating direction by the bracket 14, and the weight frame 3b has the lock hole 3c into which the forward end portion of the lock bar

13 is inserted. Thus, it is possible to easily form the mechanism for mutually locking the car and the counterweight in the ascent/descent direction.

[0033] While in this embodiment the lock bar 13 is provided on the car 2 and the lock hole 3c is provided in the counterweight 3, conversely, it is also possible to provide the lock hole 3c in the car 2 and to provide the lock bar 13 on the counterweight 3.

Embodiment 2

[0034] Fig. 7 is a diagram for illustrating a connecting device according to Embodiment 2. Fig. 8 is a diagram showing the connecting device in the connecting state. The connecting device of this embodiment has a lock bar 16 mounted to the weight frame 3b and a lock member 17 provided on the car frame 2a. The lock bar 16 is formed as a substantially T-shaped member composed of a short base portion 16b and a long main body portion 16a connected to the center of the base portion 16b, with the base portion 16b being rotatably supported by a shrouding ring 18. The lock bar 16 rotates using the base portion 16b as a fulcrum, and horizontally moves between a retreat position, where the lock bar 16 is substantially parallel to the weight frame 3b, and a connecting position, where the lock bar 16 is substantially perpendicular to the weight frame 3b.

[0035] The lock member 17 provided on the car frame 2a has a lock groove 17a open horizontally outwards. At the position where positioning on the car 2 and the counterweight 3 is complete, rotation of the lock bar 16 toward the connecting position causes the main body portion 16a of the lock bar 16 to be engaged with the lock groove 17a of the lock member 17. The lock member 17 is engaged with the lock bar 16 to form a locking mechanism for mutually locking the car 2 and the counterweight 3 in the ascent/descent direction.

[0036] The lock bar 16 and the shrouding ring 18, mounted to the weight frame 3b, are provided so as to attain a height which allows easy inspection of the driving machine 7 when the position has been reached where the car 2 and the weight 3 are connected together.

[0037] In this elevator car fixing device, constructed as described above, when the operator gets on top of the car 2 to perform maintenance on the driving machine 7, the car 2 is fixed in position by connecting the car 2 with the counterweight 3, making it possible to mechanically prevent any inadvertent movement of the car during the maintenance operation.

Embodiment 3

[0038] Fig. 9 is a diagram for illustrating a connecting device according to Embodiment 3. In this embodiment, the car frame 2a is equipped with an accommodation confirming switch 20 for detecting that the lock bar 13 of the connecting device 12 is at an accommodation position. This accommodation confirming switch 20 is electrically connected to the control device 35 of the elevator. In addition to signals from other peripheral apparatuses, the control device 35 takes in a signal from the accommodation confirming switch 20, and forms a safety circuit for preventing the elevator from being driven when the lock bar 13 is not in the accommodation position. Otherwise, this embodiment is of the same construction as Embodiment 1.

[0039] In this elevator car fixing device, constructed as described above, the elevator cannot be operated if the lock bar 13 is not completely accommodated in the accommodation position. Thus, there is no fear of the elevator being operated without canceling the lock of the connecting device 12, making it possible to prevent damage to the relevant apparatuses, etc.

Embodiment 4

[0040] Fig. 10 is a diagram for illustrating a connecting device according to Embodiment 4. In this embodiment, there is stretched between the bracket 14 and the rear end of the lock bar 13 a tension spring 21 serving as an elastic member for urging the lock bar 13 in the advancing direction. Further, a roller 22 is provided at the forward end of the lock bar 13.

[0041] The weight frame 3b as the locking mechanism has a parallel surface 3d parallel to the ascent/descent direction and the lock hole 3c formed in this parallel surface 3d. Urged by the tension spring 21, the lock bar 13 brings the roller 22 into contact with the parallel surface 3d and causes the roller 22 to slide thereon. When it is matched in position with the lock hole 3, the forward end portion of the lock bar is inserted into the lock hole 3c.

[0042] Further, there is provided a retreat confirming switch 20 for detecting that the lock bar 13 is at a retreat position. This retreat confirming switch 20 is electrically connected to the elevator control apparatus 35. In addition to signals from other peripheral apparatuses, the control device 35 takes in a signal from the retreat confirming switch 20, minimizing the car ascent/descent speed when the lock bar 13 is not at the retreat position. Further, when the lock bar 13 is inserted into the lock hole 3c for locking, it stops the ascent/descent of the car. That is, the control device 35 constitutes an operation restricting means.

[0043] In this elevator car fixing device, constructed as described above, when, for example, the lock bar 13 is brought into contact with the parallel surface 3d of the weight frame 3b, with the counterweight 3 being slightly above the position to be attained through positioning, the lock bar 13 is urged toward the counterweight 3 by the force of the tension spring 21. When, in this state, the alignment between the counterweight 3 and the car 2 is pursued, the roller 22 slides on the parallel surface 3d, and the lock bar 13 automatically enters the lock hole 3c upon matching in position between the lock bar 13 and the lock hole 3c. Thus, the alignment operation is facilitated.

Embodiment 5

[0044] Fig. 11 is a schematic diagram schematically showing an elevator apparatus according to Embodiment 5. Fig. 12 is a schematic diagram showing how the operator performs maintenance operation, with the car and the counterweight being connected together. In the drawings, two return pulleys 8 are provided in the upper portion of the hoistway. The rope 6 is wrapped around the return pulleys 8, and dangles inside the hoistway 1. One end portion of the rope 6 first dangles, and is then turned upwards to be fixed to the counterweight-side rope fixing member 11 provided in the upper portion of the hoistway 1.

[0045] The counterweight 3 is suspended from the portion of the rope 6 between the counterweight-side rope fixing member 11 and the return pulleys 8. Further, mounted on the counterweight 3 is the driving machine 7 for causing the car 2 and the counterweight 3 to ascend and descend. The counterweight 3 is suspended by wrapping the rope 6 around the sheave 7a of the driving machine 7.

[0046] The other end portion of the rope 6 dangles downward similarly to be connected to the car 2, whereby the car 2 is suspended from the rope 6.

[0047] When the driving device 7 provided on the counterweight 3 is driven, the sheave 7a rotates, and the car 2 and the counterweight 3 ascend and descend within the hoistway 1. When the car 2 descends, the counterweight 3 ascends, and when the car 2 ascends, the counterweight 3 descends. On the top surface of the car 2, there is provided the connecting device 12 similar to that of Embodiment 1.

[0048] In this elevator car fixing device, constructed as described above, it is possible to apply the connecting device 12 also to a so-called 1:1 roping type self-propelled elevator, in which the ratio of the movement distance of the car 2 to the movement length of the rope 6 is 1:1.

Embodiment 6

[0049] Fig. 13 is a schematic diagram schematically showing an elevator according to Embodiment 6. Fig. 14 is a schematic diagram showing how the operator performs connecting operation, with positioning having being effected on the car and the counterweight. Fig. 15 is a diagram showing the side surfaces, the top surface, the front surface, and the rear surface of a photoreceptor type detection switch. In this embodiment, there is provided on top of the car 2 a photoreceptor type detection switch 24 which detects approach of an object by receiving a laser beam emitted therefrom. A reflection plate 25 is provided on the counterweight 3. The photoreceptor type detection switch 24 constitutes a positioning detection means which receives detection light emitted toward the reflection plate 25 to thereby detect positioning.

[0050] As shown in Fig. 15, the photoreceptor type detection switch 24 has on its front side an emitting portion 24a and a light receiving portion 24b. A laser beam serving as the detection light emitted from the emitting portion 24a is received by the light receiving portion 24b. When the counterweight 3 has reached the position to be attained through positioning, the reflection plate 25 reflects the laser beam to the light receiving portion 24b.

[0051] A buzzer 26 is provided at the rear of the photoreceptor type detection switch 24. The buzzer 26 is operated to generate a beep based on a detection signal output when the photoreceptor type detection switch 24 receives detection light. The buzzer 26 constitutes an informing means for informing the operator of the completion of the positioning.

[0052] In this elevator car fixing device, constructed as described above, by keeping the photoreceptor type detection switch 24 ON, a beep is issued when the car 2 and the counterweight 3 are aligned with each other, thus facilitating the positioning operation.

[0053] While in this embodiment the buzzer 26 is used as the informing means, it is also possible to adopt, for example, an arrangement in which a lamp illuminates upon alignment.

INDUSTRIAL APPLICABILITY

[0054] According to the present invention, there is provided the elevator car fixing device that fixes the car with respect to the counterweight, which is suitable for use in the self-propelled elevator in which the driving machine for causing the car and the counterweight to ascend and descend is mounted on the counterweight, in particular, the elevator in which the operator gets on top of the car to perform maintenance operation on the driving machine.

Claims

1. An elevator car fixing device provided in an elevator, the elevator including:

a rope (6) arranged in a hoistway (1) and wrapped around a return pulley (8) arranged in an upper portion of the hoistway (1);
a car (2) suspended from one end of the rope (6); and
a counterweight (3) suspended from a portion of the rope (6) between a counterweight-side rope fixing member (11), which is provided in the upper portion of the hoistway (1) and to which the other end of the rope (6) is fixed, and the return pulley (8), the counterweight (3) being adapted to ascend when the car (2) descends and to descend when the car (2) ascends and equipped with a driving machine for causing the car (2) to ascend and descend,
the elevator car fixing device being **character-**

ized by comprising:
an advancing/retreating member (13, 16) provided on one of the car (2) and the counterweight (3) and adapted to move toward and away from the other of the car (2) and the counterweight (3); and
a locking mechanism (3b, 17) provided on the other of the car (2) and the counterweight (3) and adapted to be engaged with the advancing/retreating member (13, 16) when the advancing/retreating member (13, 16) advances to thereby lock the car (2) and the counterweight (3) with respect to each other in an ascent/descent direction.

2. An elevator car fixing device according to Claim 1, wherein the advancing/retreating member (13) is formed substantially as a bar extending in the advancing/retreating direction and slidably guided in an advancing/retreating direction by a guide member, and
wherein the locking mechanism (3b) has a lock hole (3c) into which a forward end portion of the advancing/retreating member (13) is inserted.

3. An elevator car fixing device according to Claim 2, further comprising an elastic member (21) urging the advancing/retreating member (13) in the advancing direction,
wherein the advancing/retreating member (13) has a roller (22) at the forward end portion,
the locking mechanism (3b) has a parallel surface (3d) that is parallel to the ascent/descent direction, and the lock hole (3c) formed in the parallel surface (3d), and
the advancing/retreating member (13) is urged by the elastic member (21) to cause the roller (22) to slide on the parallel surface (3d) while being held in contact with the parallel surface (3d), causing the forward end portion to be inserted into the lock hole (3c) when a position corresponding to the lock hole (3c) is reached.

4. An elevator car fixing device according to Claim 1, wherein the advancing/retreating member (16) is formed substantially as a bar and is provided so as to be rotatable within a horizontal plane while being axially supported at its rear end, and
the locking mechanism (17) has a lock groove (17a) with which a main body portion (16a) of the advancing/retreating member (16) is engaged.

5. An elevator car fixing device according to any one of Claims 1, 2, and 4, further comprising:

a retreat confirming switch (20) for detecting a retreat position of the advancing/retreating member (13); and
a safety circuit which operates based on a signal from the retreat confirming switch (20) and which inhibits a drive of the elevator when the advancing/retreating member (13) is not at the retreat position.

6. An elevator car fixing device according to any one of Claims 1 to 4, further comprising:

a retreat confirming switch (20) for detecting a retreat position of the advancing/retreating member (13); and
an operation restricting means which operates based on a signal from the retreat confirming switch (20), for minimizing an ascent/descent speed of the car (2) when the advancing/retreating member (13) is not at the retreat position.

7. An elevator car fixing device according to any one of Claims 1 through 6, further comprising:

a positioning detection means (24) for detecting positioning performed on the car (2) and the counterweight (3); and
an informing means (26) for informing an operator of completion of the positioning.

8. An elevator car fixing device according to Claim 7, wherein the positioning detection means (24) has a reflection plate (25) provided on one of the car (2) and the counterweight (3) and a photoreceptor type detection switch (24) provided on the other of the car (2) and the counterweight (3) and adapted to receive a detection light emitted toward the reflection plate (25) to detect the positioning.

9. An elevator car fixing device according to any one of Claims 1 through 8, wherein the advancing/retreating member (13) is provided on the car (2).

10. An elevator car fixing device according to any one of Claims 1 through 8, wherein the advancing/retreatingmember (16) is provided on the counterweight (3).

Patentansprüche

1. Einrichtung zum Festhalten einer Aufzugskabine, die in einem Aufzug vorgesehen ist, wobei der Aufzug aufweist:

ein Seil (6), das in einem Schacht (1) angeordnet ist und um eine Rückführrolle (8) gewickelt ist, die in einem oberen Abschnitt des Schachts (1) angeordnet ist,
eine Kabine (2), die an einem Ende des Seils (6) hängt, und

ein Gegengewicht (3), das an einem Abschnitt des Seils (6) zwischen einem Festhalteelement (11) für das Seil auf der Gegengewichtsseite, das im oberen Abschnitt des Schachts (1) vorgesehen ist und an dem das andere Ende des Seils (6) festgehalten wird, und der Rückführrolle (8) hängt, wobei das Gegengewicht (3) dafür angepasst ist, sich nach oben zu bewegen, wenn sich die Kabine (2) nach unten bewegt, und sich nach unten zu bewegen, wenn sich die Kabine (2) nach oben bewegt, und die mit einer Antriebsmaschine ausgestattet ist, um die Kabine (2) dazu zu bringen, sich nach oben und nach unten zu bewegen,
wobei die Einrichtung zum Festhalten der Aufzugskabine **dadurch gekennzeichnet ist, dass** sie aufweist:
ein Ausfahr-/Rückzugselement (13, 16), das entweder an der Kabine (2) oder dem Gegengewicht (3) vorgesehen ist und das dafür angepasst ist, sich zum jeweils anderen von der Kabine (2) und dem Gegengewicht (3) hin zu bewegen und sich von diesem zu entfernen, und
einen Arretiermechanismus (3b, 17), der am jeweils anderen von der Kabine (2) und dem Gegengewicht (3) vorgesehen ist und der dafür angepasst ist, mit dem Ausfahr-/Rückzugselement (13, 16) in Eingriff zu treten, wenn das Ausfahr-/Rückzugselement (13, 16) ausgefahren wird, um somit die Kabine (2) und das Gegengewicht (3) relativ zueinander in einer vertikalen Richtung zu arretieren.

2. Einrichtung zum Festhalten einer Aufzugskabine nach Anspruch 1, bei der das Ausfahr-/Rückzugselement (13) im Wesentlichen als eine Stange ausgebildet ist, die sich in der Ausfahr-/Rückzugsrichtung erstreckt und die in einer Ausfahr-/Rückzugsrichtung durch ein Führungselement verschiebbar geführt ist und
wobei der Arretiermechanismus (3b) ein Arretierloch (3c) aufweist, in das ein vorderer Endabschnitt des Ausfahr-/Rückzugselements (13) eingeführt wird.

3. Einrichtung zum Festhalten einer Aufzugskabine nach Anspruch 2, ferner mit einem elastischen Element (21), welches das Ausfahr-/Rückzugselement (13) in die Ausfahrrichtung vorspannt,
wobei das Ausfahr-/Rückzugselement (13) eine Rolle (22) am vorderen Endabschnitt aufweist,
wobei der Arretiermechanismus (3b) eine parallele Oberfläche (3d) aufweist, die parallel zu der vertikalen Richtung ist, und das Arretierloch (3c) auf der parallelen Oberfläche (3d) ausgebildet ist, und
wobei das Ausfahr-/Rückzugselement (13) durch das elastische Element (21) vorgespannt ist, um die Rolle (22) dazu zu bringen, sich auf der parallelen Oberfläche (3d) zu verschieben während sie in Kontakt mit der parallelen Oberfläche (3d) gehalten wird, was den vorderen Endabschnitt dazu bringt, dass er in das Arretierloch (3c) eingeführt wird, wenn eine Position, die dem Arretierloch (3c) entspricht, erreicht wird.

4. Einrichtung zum Festhalten einer Aufzugskabine nach Anspruch 1,
bei der das Ausfahr-/Rückzugselement (16) im Wesentlichen als eine Stange ausgebildet und so vorgesehen ist, dass sie in einer horizontalen Ebene drehbar ist während sie axial an ihrem hinteren Ende abgestützt ist und
der Arretiermechanismus (17) eine Arretiernut (17a) aufweist, mit der ein Hauptkörperabschnitt (16a) des Ausfahr-/Rückzugselements (16) in Eingriff tritt.

5. Einrichtung zum Festhalten einer Aufzugskabine nach einem der Ansprüche 1, 2 und 4, ferner mit:

einem Rückzugsbestätigungsschalter (20), um eine Rückzugsposition des Ausfahr-/Rückzugselements (13) zu detektieren, und
einem Sicherheitsschaltkreis, der aufgrund eines Signals von dem Rückzugsbestätigungsschalter (20) betrieben wird und der einen Antrieb des Aufzugs unterbindet, wenn das Ausfahr-/Rückzugselement (13) nicht in der Rückzugsposition ist.

6. Einrichtung zum Festhalten einer Aufzugskabine nach einem der Ansprüche 1 bis 4, ferner mit:

einem Rückzugsbestätigungsschalter (20) zum Detektieren einer Rückzugsposition des Ausfahr-/Rückzugselements (13) und
einem Betriebseinschränkmittel, das aufgrund eines Signals von dem Rückzugsbestätigungsschalter (20) betrieben wird, um eine vertikale Geschwindigkeit der Kabine (2) zu minimieren, wenn das Ausfahr-/Rückzugselement (13) nicht in der Rückzugsposition ist.

7. Einrichtung zum Festhalten einer Aufzugskabine nach einem der Ansprüche 1 bis 6, ferner mit:

einen Positionsdetektionsmittel (24) zum Detektieren der Positionierung, die für die Kabine (2) und das Gegengewicht (3) ausgeführt wird und einem Informiermittel (26), um einen Benutzer über die Vollendung der Positionierung zu informieren.

8. Einrichtung zum Festhalten einer Aufzugskabine nach Anspruch 7, bei der das Positionsdetektionsmittel (24) eine Reflexionsplatte (25), die an der Kabine (2) oder dem Gegengewicht (3) vorgesehen ist, und einen Detektionsschalter vom Photorezeptortyp

(24) aufweist, der am jeweils anderen von der Kabine (2) und dem Gegengewicht (3) vorgesehen ist und der dafür angepasst ist, ein Detektionslicht, das zu der Reflexionsplatte (25) hin ausgesandt wird, zu empfangen, um die Positionierung zu detektieren.

9. Einrichtung zum Festhalten einer Aufzugskabine nach einem der Ansprüche 1 bis 8, bei der das Ausfahr-/Rückzugselement (13) an der Kabine (2) vorgesehen ist.

10. Einrichtung zum Festhalten einer Aufzugskabine nach einem der Ansprüche 1 bis 8, bei der das Ausfahr-/Rückzugselement (16) am Gegengewicht (3) vorgesehen ist.

Revendications

1. Dispositif de fixation de cabine d'ascenseur disposé dans un ascenseur, l'ascenseur incluant :

un câble (6) agencé dans une cage d'ascenseur (1) et enroulé autour d'une poulie de retour (8) agencée dans une partie supérieure de la cage d'ascenseur (1) ;
une cabine (2) suspendue à une extrémité du câble (6) ; et
un contrepoids (3) suspendu à une partie du câble (6) entre un élément de fixation de câble côté contrepoids (11), qui est disposé dans la partie supérieure de la cage d'ascenseur (1) et auquel l'autre extrémité du câble (6) est fixée, et la poulie de retour (8), le contrepoids (3) étant conçu pour monter lorsque la cabine (2) descend et pour descendre lorsque la cabine (2) monte et est équipé d'une machine d'entraînement pour amener la cabine (2) à monter et à descendre,
le dispositif de fixation de cabine d'ascenseur étant **caractérisé en ce qu'**il comprend :
un élément d'avance / retrait (13, 16) disposé sur l'un de la cabine (2) et du contrepoids (3) et conçu pour se rapprocher et s'éloigner de l'autre de la cabine (2) et du contrepoids (3) ; et
un mécanisme de verrouillage (3b, 17) disposé sur l'autre de la cabine (2) et du contrepoids (3) et conçu pour être en prise avec l'élément d'avance / retrait (13, 16) lorsque l'élément d'avance / retrait (13, 16) avance pour verrouiller de ce fait la cabine (2) et le contrepoids (3) l'un par rapport à l'autre dans une direction de montée / descente.

2. Dispositif de fixation de cabine d'ascenseur selon la revendication 1,
dans lequel l'élément d'avance / retrait (13) est formé sensiblement comme une barre s'étendant dans la direction d'avance / retrait et est guidé de manière coulissante dans une direction d'avance / retrait par un élément de guidage, et
dans lequel le mécanisme de verrouillage (3b) a un trou de verrouillage (3c) dans lequel une partie d'extrémité avant de l'élément d'avance / retrait (13) est insérée.

3. Dispositif de fixation de cabine d'ascenseur selon la revendication 2, comprenant en outre un élément élastique (21) poussant l'élément d'avance / retrait (13) dans la direction d'avance,
dans lequel l'élément d'avance / retrait (13) a un rouleau (22) au niveau de la partie d'extrémité avant,
le mécanisme de verrouillage (3b) a une surface parallèle (3d) qui est parallèle à la direction de montée / descente, et au trou de verrouillage (3c) formé dans la surface parallèle (3d), et
l'élément d'avance / retrait (13) est poussé par l'élément élastique (21) pour amener le rouleau (22) à coulisser sur la surface parallèle (3d) tout en étant maintenu en contact avec la surface parallèle (3d), amenant la partie d'extrémité avant à être insérée dans le trou de verrouillage (3c) quand une position correspondant au trou de verrouillage (3c) est atteinte.

4. Dispositif de fixation de cabine d'ascenseur selon la revendication 1,
dans lequel l'élément d'avance / retrait (16) est formé sensiblement comme une barre et est disposé de façon à être rotatif dans un plan horizontal tout en étant supporté axialement à son extrémité arrière, et le mécanisme de verrouillage (17) a une rainure de verrouillage (17a) avec laquelle une partie formant corps principal (16a) de l'élément d'avance / retrait (16) est en prise.

5. Dispositif de fixation de cabine d'ascenseur selon l'une quelconque des revendications 1, 2 et 4, comprenant en outre :

un commutateur de confirmation de retrait (20) pour détecter une position de retrait de l'élément d'avance / retrait (13) ; et
un circuit de sécurité qui fonctionne sur base d'un signal en provenance du commutateur de confirmation de retrait (20) et qui interdit un entraînement de l'ascenseur lorsque l'élément d'avance / retrait (13) n'est pas dans la position de retrait.

6. Dispositif de fixation de cabine d'ascenseur selon l'une quelconque des revendications 1 à 4, comprenant en outre :

un commutateur de confirmation de retrait (20) pour détecter une position de retrait de l'élément d'avance / retrait (13) ; et

un moyen de limitation de fonctionnement qui fonctionne sur base d'un signal en provenance du commutateur de confirmation de retrait (20), pour minimiser une vitesse de montée / descente de la cabine (2) lorsque l'élément d'avance / retrait (13) n'est pas dans la position de retrait.

7. Dispositif de fixation de cabine d'ascenseur selon l'une quelconque des revendications 1 à 6, comprenant en outre :

un moyen de détection de positionnement (24) pour détecter un positionnement effectué sur la cabine (2) et le contrepoids (3) ; et
un moyen d'information (26) pour informer un opérateur de l'achèvement du positionnement.

8. Dispositif de fixation de cabine d'ascenseur selon la revendication 7, dans lequel le moyen de détection de positionnement (24) a une plaque réfléchissante (25) disposée sur l'un de la cabine (2) et du contrepoids (3) et un commutateur de détection de type récepteur photosensible (24) disposé sur l'autre de la cabine (2) et du contrepoids (3) et conçu pour recevoir une lumière de détection émise vers la plaque réfléchissante (25) pour détecter le positionnement.

9. Dispositif de fixation de cabine d'ascenseur selon l'une quelconque des revendications 1 à 8, dans lequel l'élément d'avance / retrait (13) est disposé sur la cabine (2).

10. Dispositif de fixation de cabine d'ascenseur selon l'une quelconque des revendications 1 à 8, dans lequel l'élément d'avance / retrait (16) est disposé sur le contrepoids (3).

FIG. 1

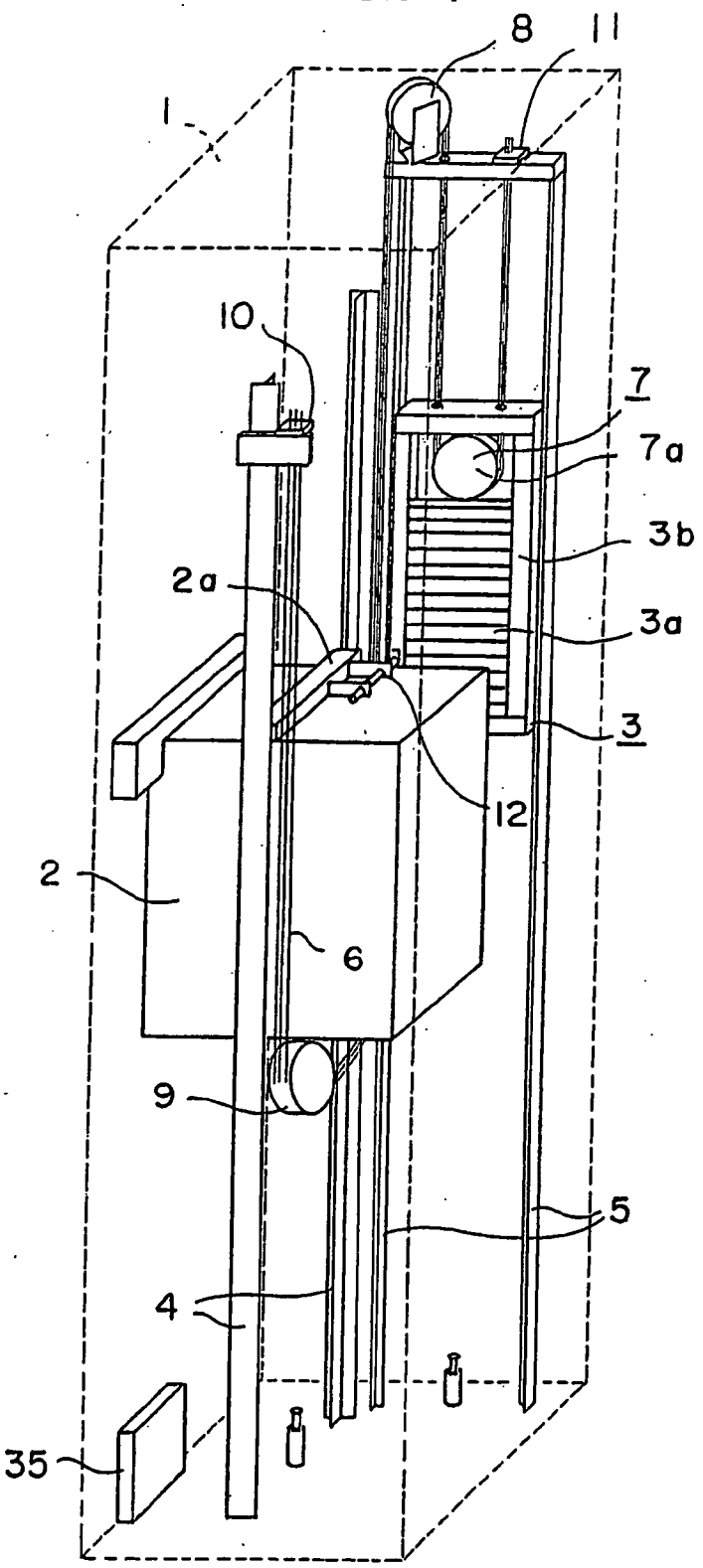


FIG. 2

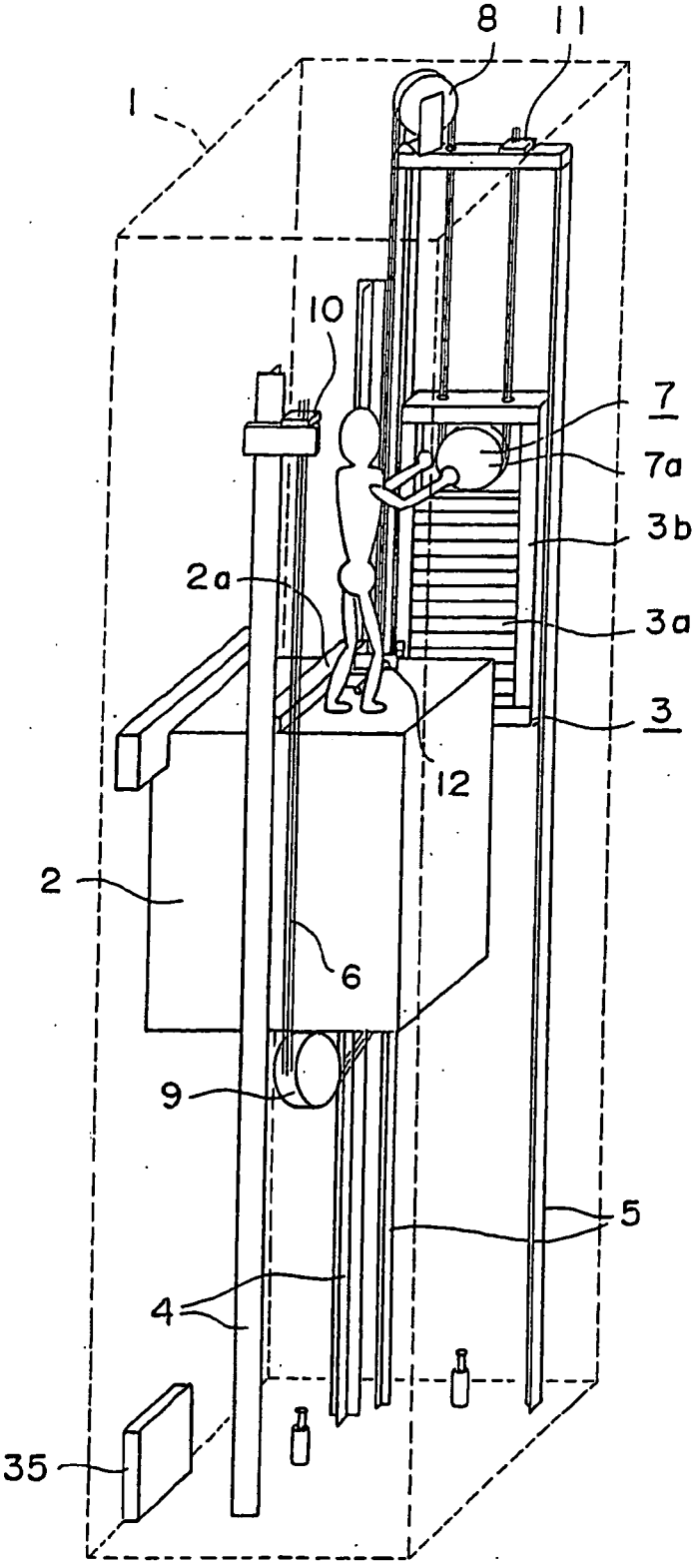


FIG. 3

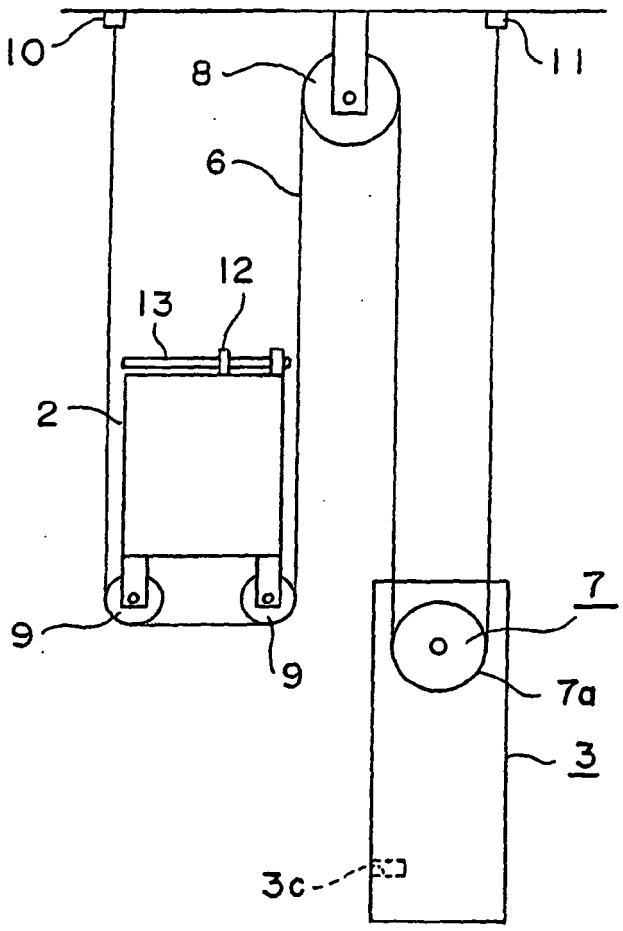


FIG. 4

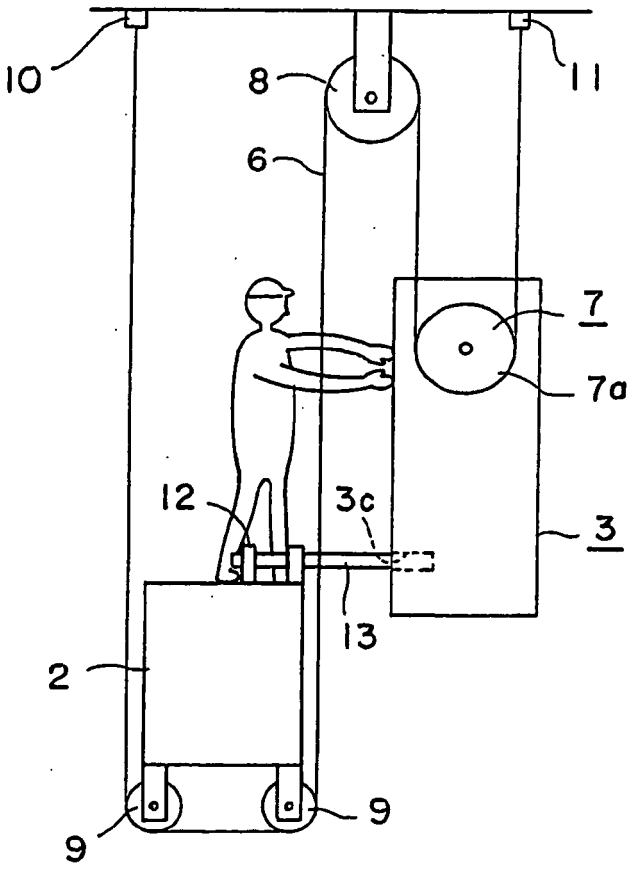


FIG. 5

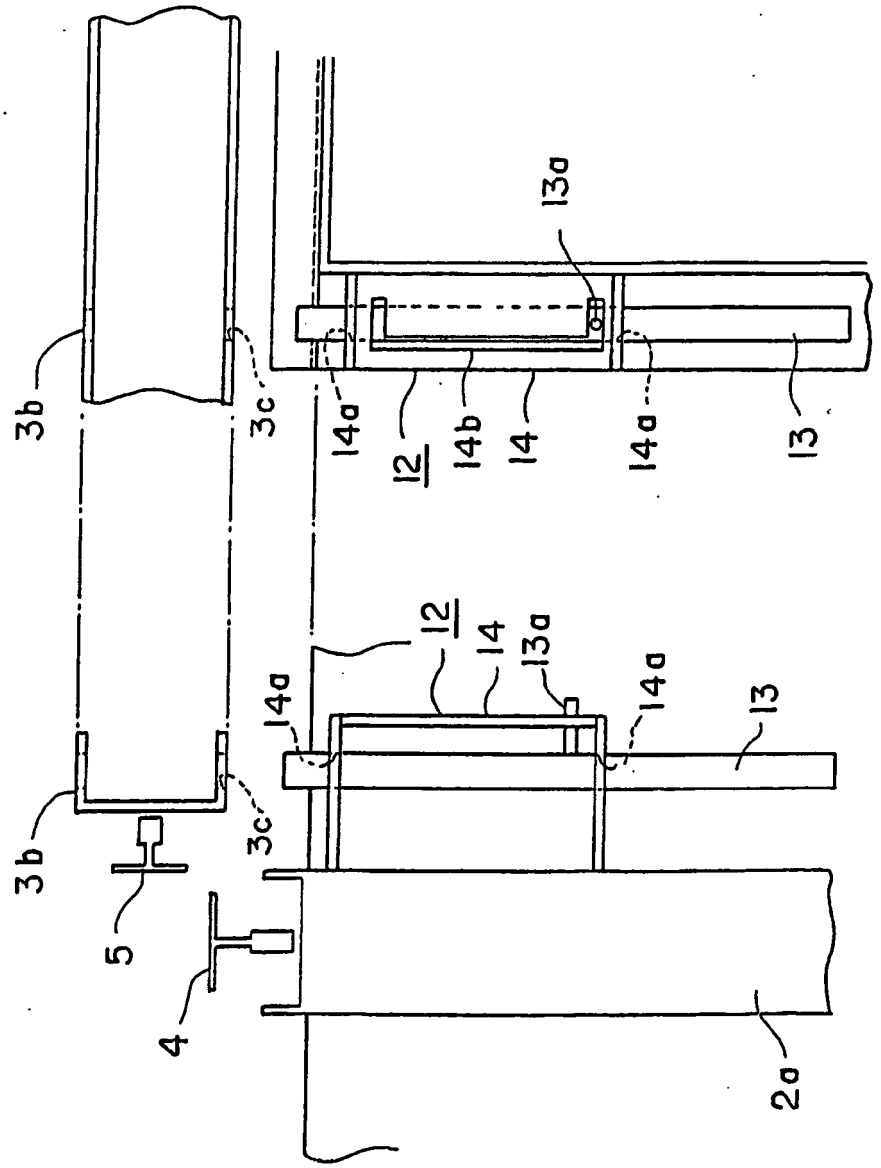


FIG. 6

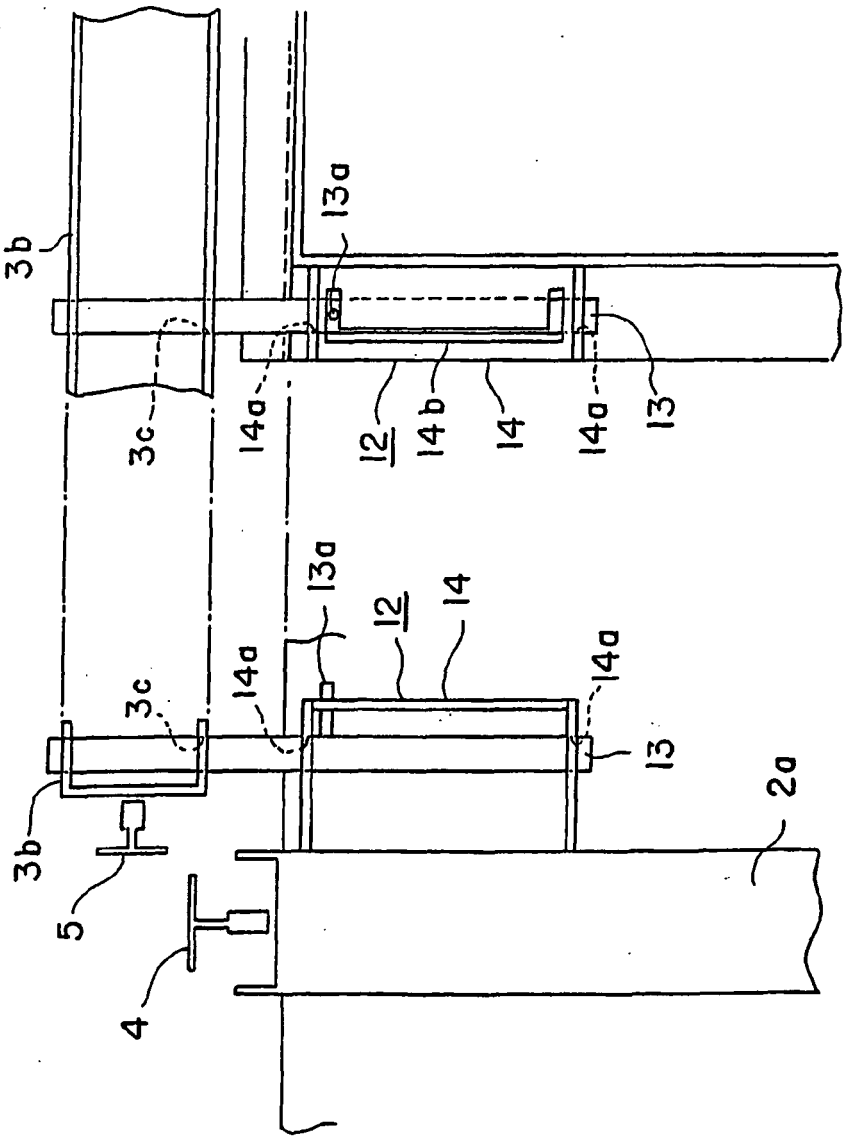


FIG. 7

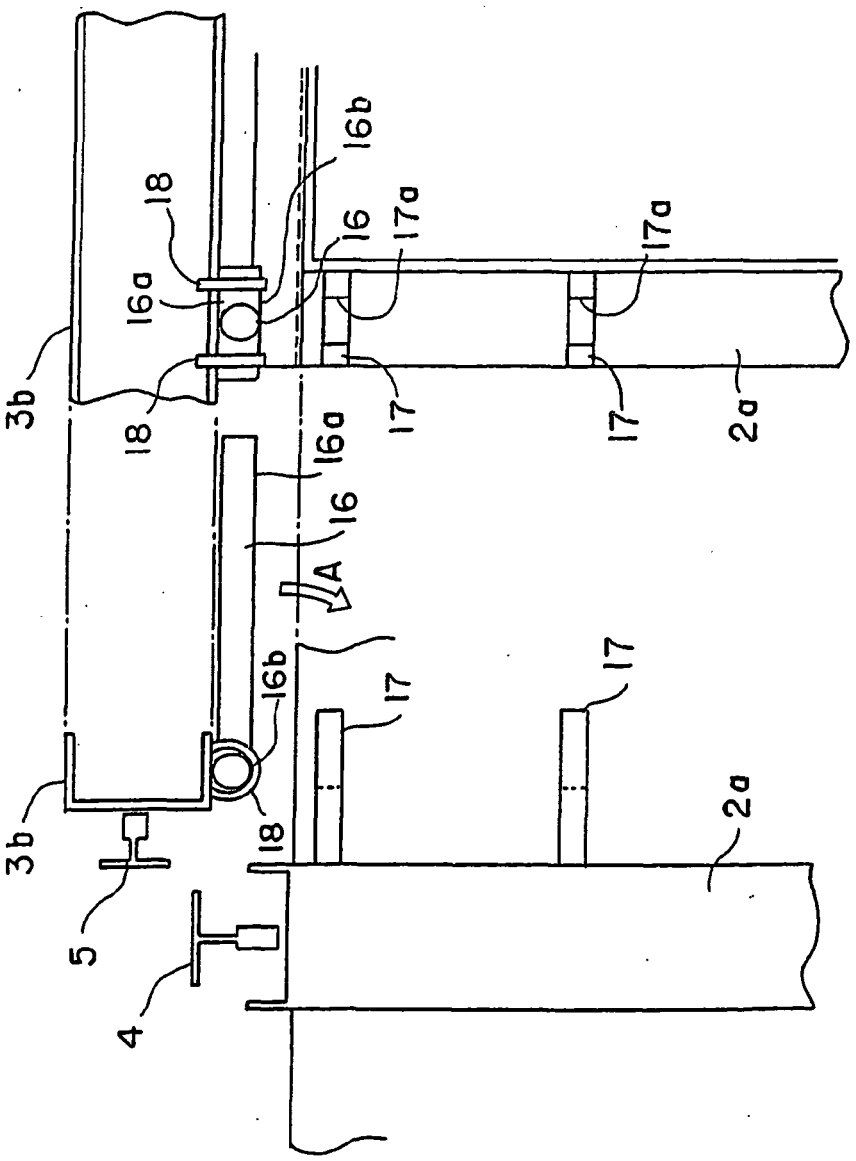


FIG. 8

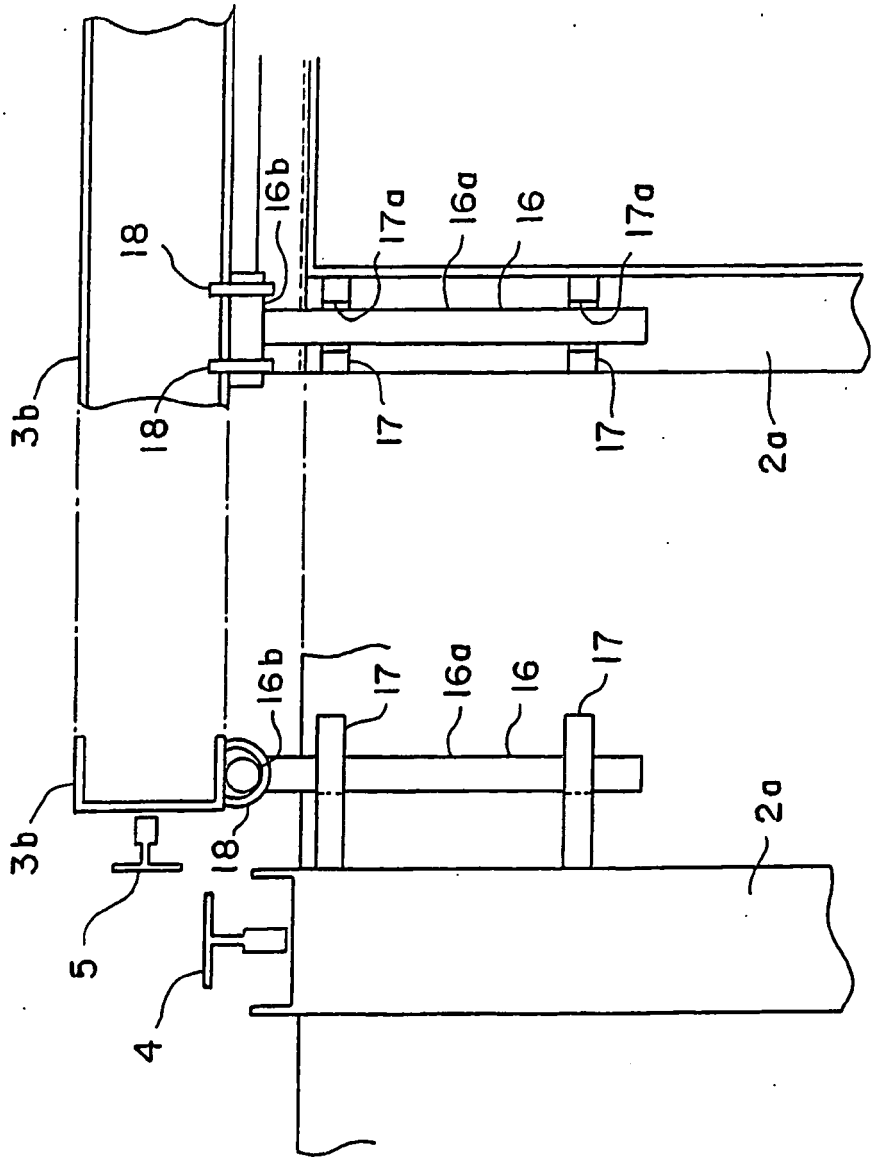


FIG. 9

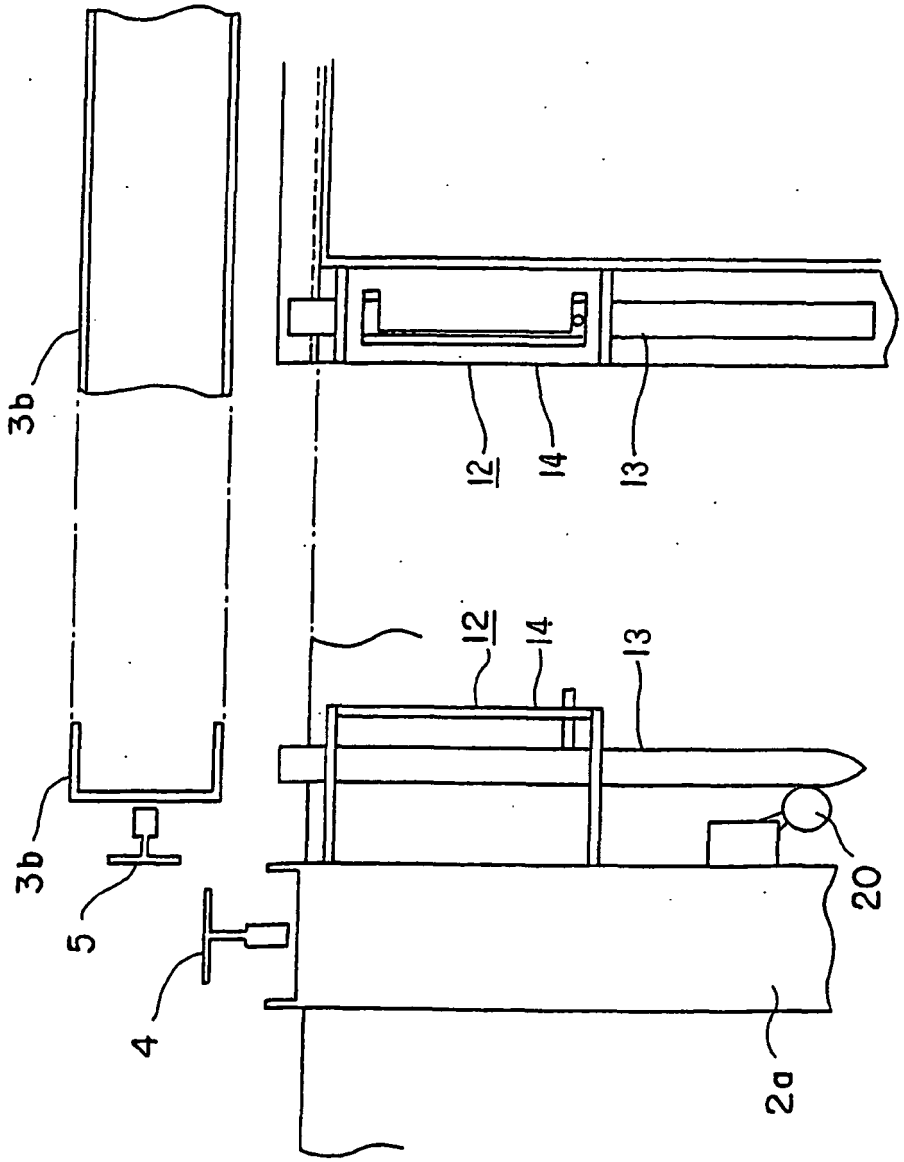


FIG.10

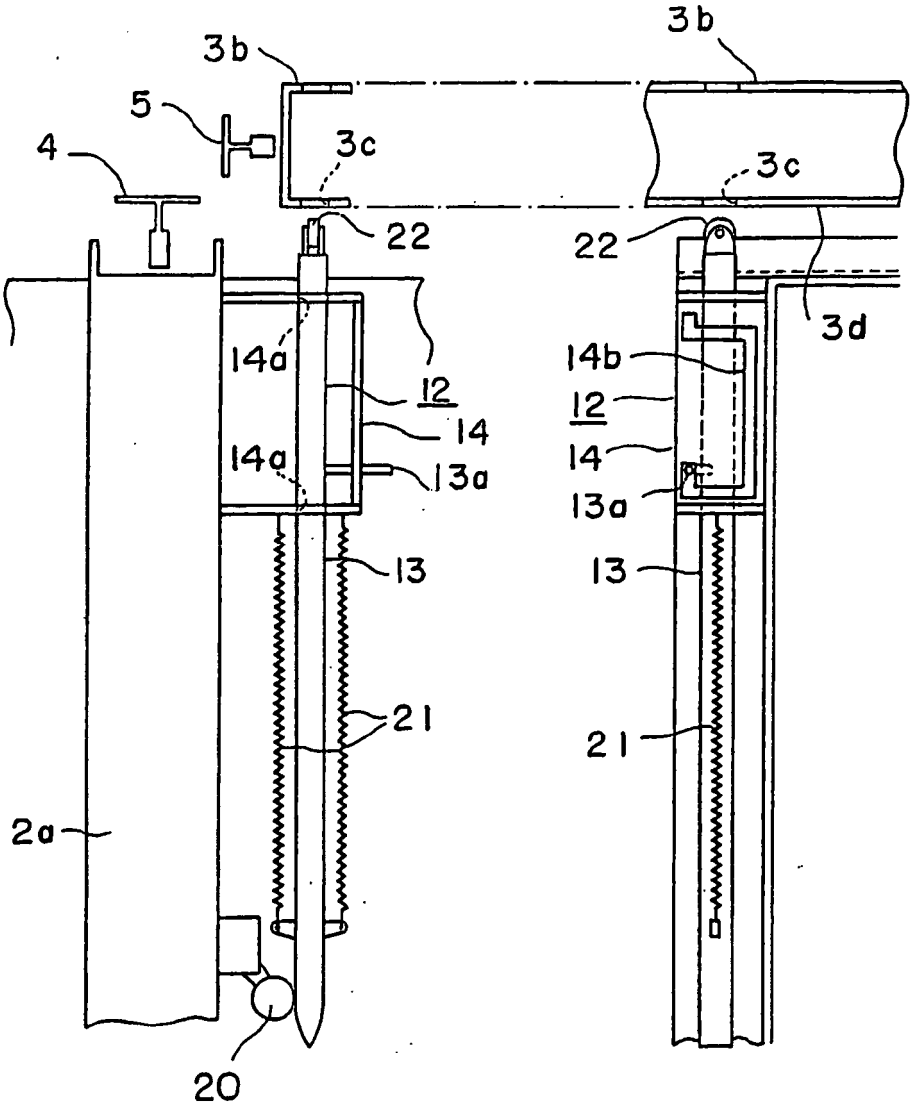

3b
3b
5
4
3c
3c
22
22
3d
14a
14b
12
12
14
14
14a
13a
13a
13
13
21
21
2a
20

FIG.11

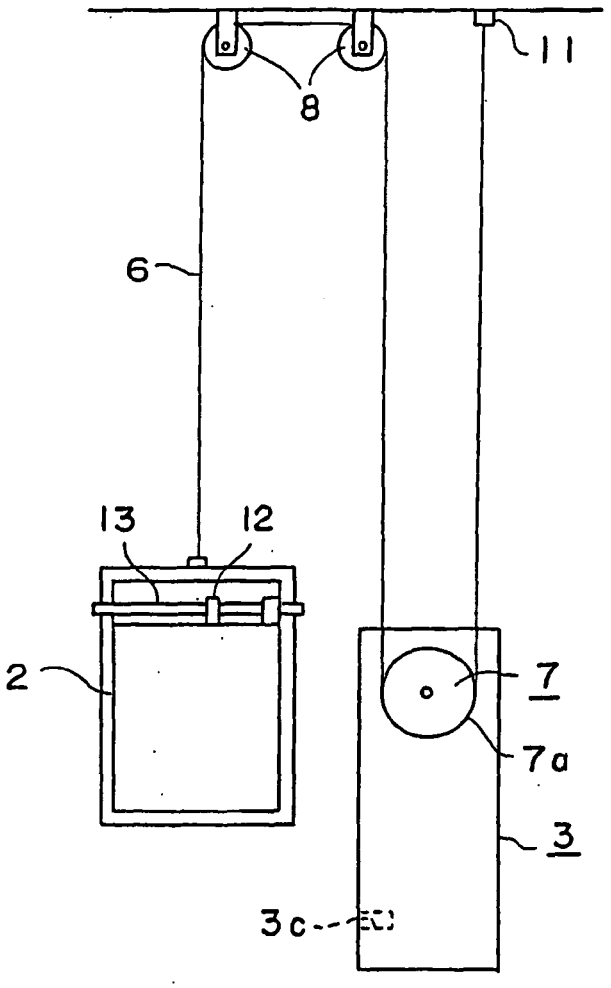


FIG.12

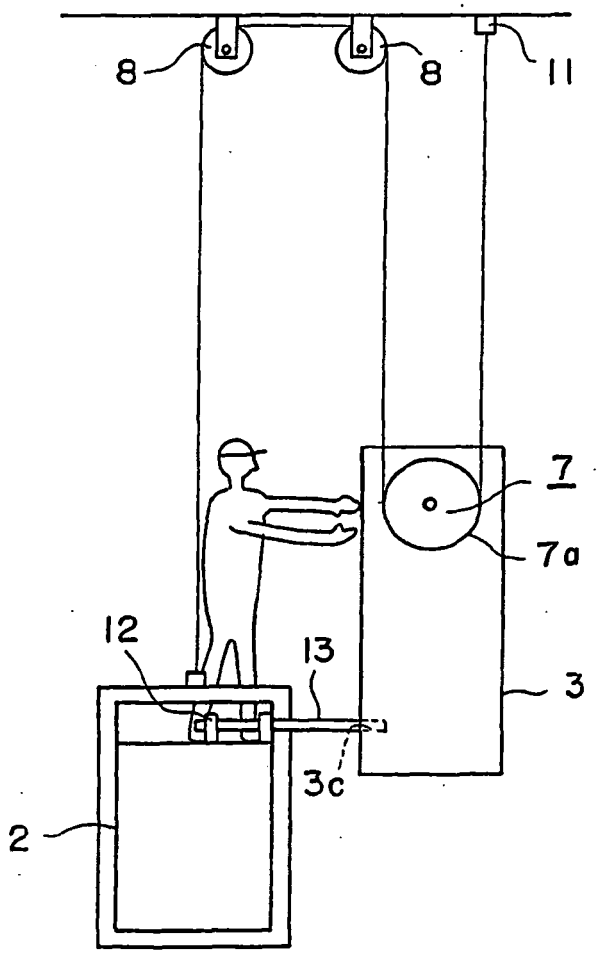


FIG.13

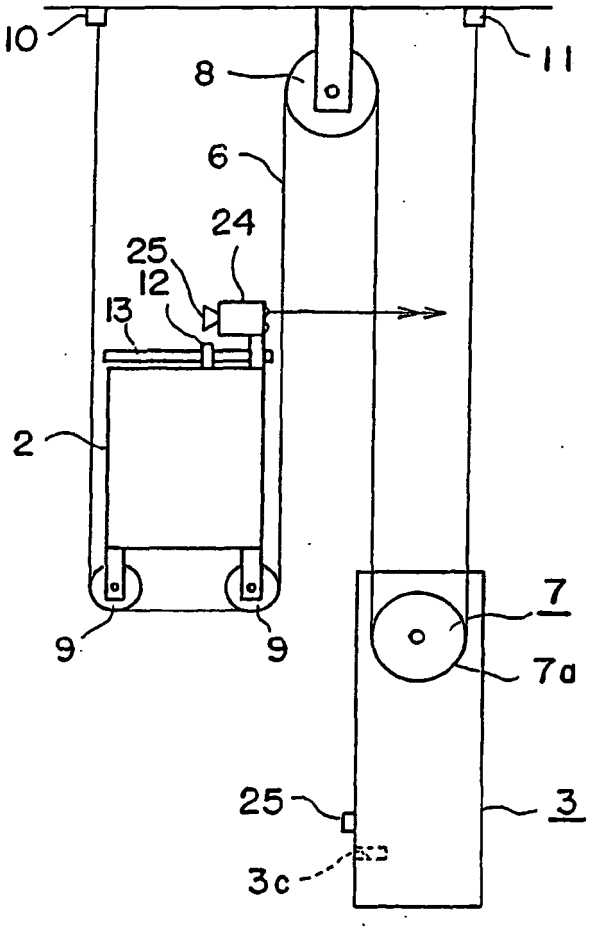


FIG. 14

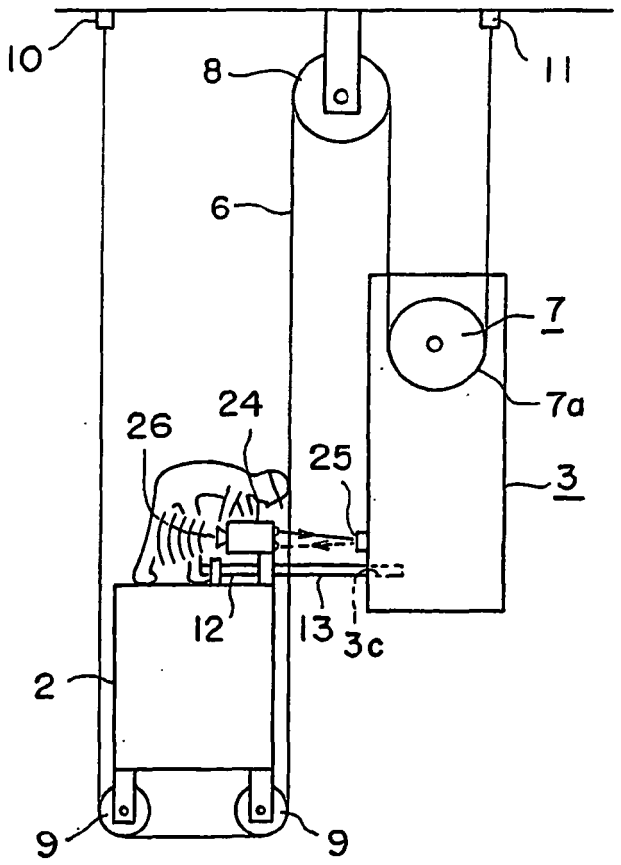


FIG.15

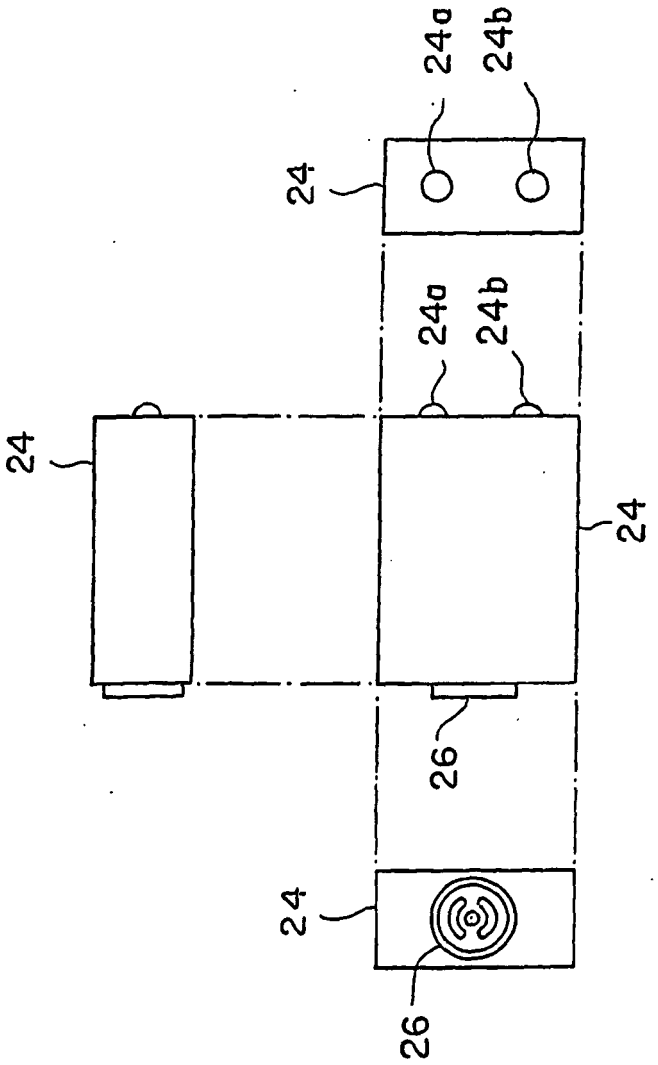


FIG.16

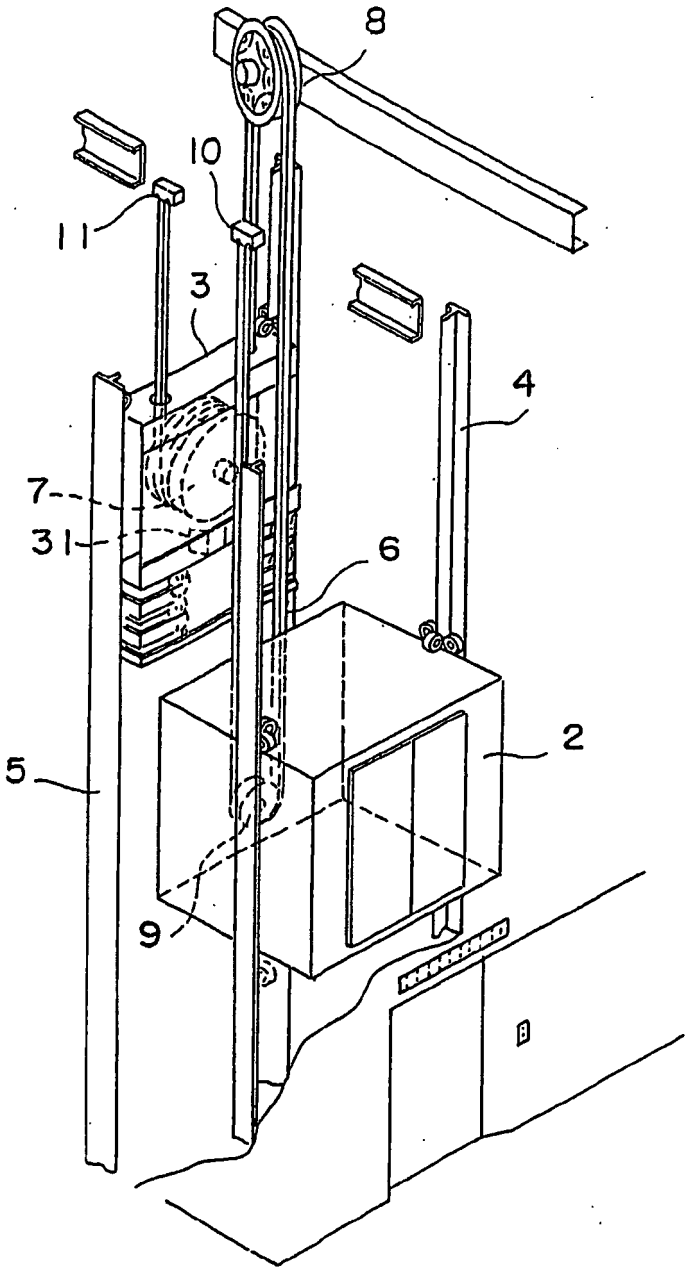


FIG.17

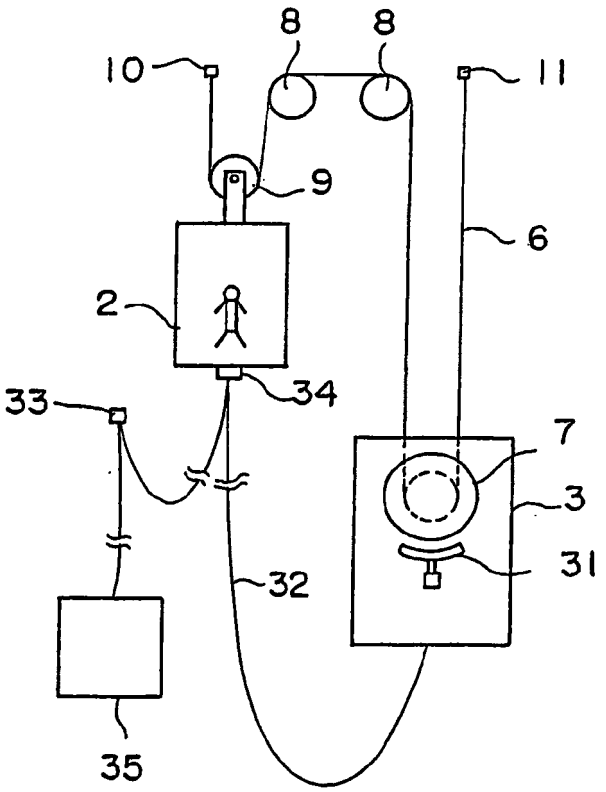
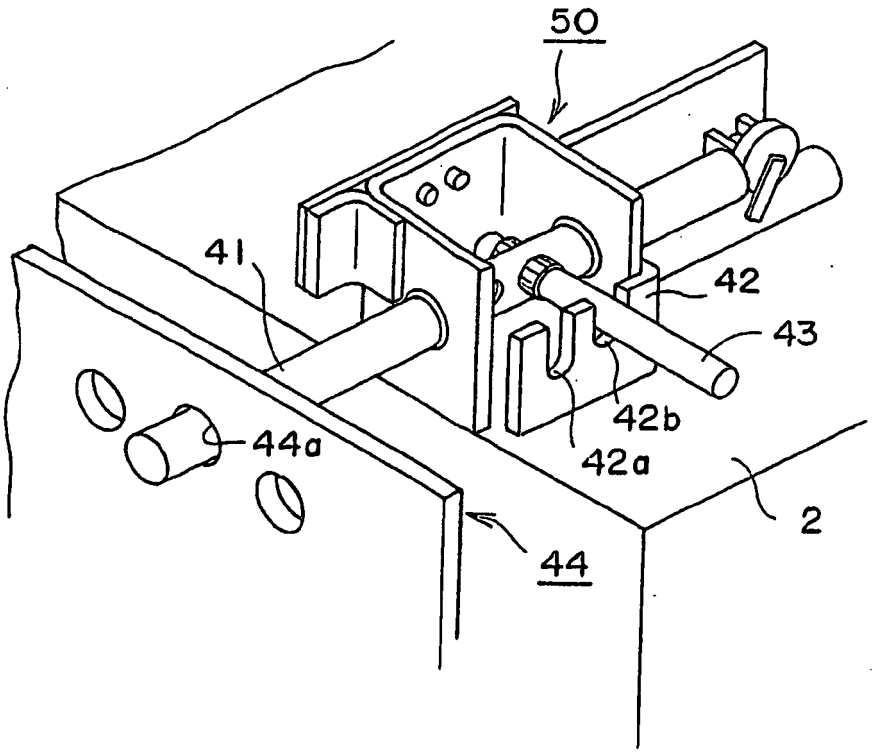


FIG.18



REFERENCES CITED IN THE DESCRIPTION

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