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(54) ADJUSTING DEVICE AND AN ASSEMBLY COMPRISING THE ADJUSTING DEVICE

EINSTELLVORRICHTUNG UND ANORDNUNG MIT DER EINSTELLVORRICHTUNG

DISPOSITIF DE RÉGLAGE ET ENSEMBLE COMPRENANT LE DISPOSITIF DE RÉGLAGE

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Description

[0001] According to a first aspect the present disclosure relates to an adjusting device for adjusting a structure relative to a support.

[0002] According to a second aspect the present disclosure relates to an assembly comprising the adjusting device according to the first aspect of the present disclosure, a structure and a support.

[0003] An adjusting device for adjusting a structure, such as a lamppost, relative to a support is known and used for maintaining the structure in a vertical direction. Positioning of the structure in a vertical direction may be relative cumbersome when a vertical alignment of the structure requires a relative accurate spatial positioning of the support. To overcome this drawback, supports have been developed comprising an adjustment device for adjusting a position of the structure relative to the support. These improved supports may comprises a receiving chamber wherein a part of said structure is received and wherein said structure is aligned and fixated relative to said receiving chamber by bolts that are provided in a wall of said receiving chamber and may be urged with an end face thereof against said structure. A drawback of these improved supports is that it is relatively cumbersome to position and fixate the elongate structure in a vertical direction. US 2013/0161474 A1 discloses a ground-anchored umbrella stand. US 2018/0013200 A1 discloses a wireless telecommunication antenna mount and control system.

[0004] An objective of the present disclosure is therefore to provide an adjusting device for positioning and fixating a structure, such as a lamppost, in an vertical direction relative to a support in a relative practical way.

[0005] This objective is achieved by the adjusting device according to claim 1. The adjusting device according to claim 1 comprises:

- a first carriage, a second carriage and an elongated base for translating said first carriage along said elongated base in a longitudinal direction relative to said elongated base and relative to said second carriage, wherein said first carriage and said second carriage are connected to said elongated base;
- a first coupling arrangement coupling said first carriage to said second carriage via a first abutment element, wherein said first abutment element is arranged for abutment against said structure or said support for said adjusting in an active position, wherein said first abutment element, in dependence of said translating of said first carriage relative to said elongated base and relative to said second carriage in said longitudinal direction, displaces in a direction transversal to said longitudinal direction for abutting said first abutment element against said structure or said support for said adjusting in said active position.

[0006] By providing the first carriage translatable along said elongated base and coupling the first carriage via a first coupling arrangement to the second carriage an adjusting action may be realised in a direction transversal to the longitudinal direction. This allows for realising an abutment in a relative practical manner of said first abutment element to either the support or the structure for instance by positioning the adjusting device in the passive position thereof in a space between the support and the structure and subsequently moving said first carriage in the longitudinal direction relative to the elongated base thereby displacing the first abutment element.

[0007] A further advantage of the adjusting device according to the present disclosure is that the movement of the first abutment element in the direction transversal to the longitudinal direction may be relatively accurate thereby allowing a relative accurate positioning of the structure relative to the support. Whereas the accuracy of the known adjusting device relies directly on the rotation of the bolts relative to the wall of the receiving chamber, the movement of the first abutment element is the result of movement of the first carriage in a direction different from the movement of the first support element thereby allowing for a ratio different from 1 between the movement of the first carriage in the longitudinal direction and the movement of the first abutment element in the transversal direction. In addition, a ratio different from 1 between the movement of the first carriage in the longitudinal direction and the movement of the first abutment element in the transversal direction is beneficial for realising a relative large force for position the structure relative to the support.

[0008] Within the context of the present disclosure an elongated structure is to be understood as a structure that has a significant larger extension in a first direction than in a direction transversal to said first direction. Examples of elongate structures are tubes or profiles having for instance an I or U shaped cross-section in said direction transversal to said first direction.

[0009] It is noted that within the context of the present disclosure positioning in a vertical direction is to be understood as a condition wherein said first direction of said elongated structure is brought in substantial alignment, preferably completely aligned, with said vertical direction. In other words, in a vertical position, said first direction extends substantially, preferably completely, in the same direction as said vertical direction.

[0010] The term adjusting in the context of the present disclosure should be understood comprising positioning and maintaining the position of the structure relative to the support. In order for maintaining the position of the structure relative to the support the adjusting device may be clamped between the structure and the support. As such the position of the structure relative to the support may be maintained by fixating the adjustment device between the support and the structure by translating said first carriage along said elongated base in said longitudinal direction relative to said elongated base and relative to said second carriage.

[0011] In this regard it is beneficial if said elongated base is provided with a first recess for partly receiving said first abutment element for reducing in a passive position of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction. This is beneficial for realizing a relative compact assembly according to the second aspect of the present disclosure. By reducing the width of the adjusting device in the passive position thereof a relative small space is required between the structure and the support for placing the adjusting device between the structure and the support before adjusting the support relative to the structure.

[0012] In an embodiment of the adjusting device according to the first aspect of the present disclosure said first abutment element is provided with a second recess for partly receiving said elongated base for reducing in a passive position of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction. This is beneficial for realizing a relative compact assembly according to the second aspect of the present disclosure. By reducing the width of the adjusting device in the passive position thereof a relative small space is required between the structure and the support for placing the adjusting device between the structure and the support before adjusting the support relative to the structure.

[0013] It is beneficial if in said passive position of said adjusting device said first recess and said second recess overlap, and wherein said first carriage, said second carriage and said first abutment element are aligned in said longitudinal direction. This is beneficial for realizing a relative compact assembly according to the second aspect of the present disclosure. By reducing the width of the adjusting device in the passive position thereof a relative small space is required between the structure and the support for placing the adjusting device between the structure and the support before adjusting the support relative to the structure.

[0014] In an embodiment of the adjusting device according to the first aspect of the present disclosure said first carriage and said second carriage surround said elongated base. This is beneficial for avoiding or at least significantly reducing the risk of said first carriage and said second carriage to separate from the elongated base. This is beneficial for realizing a relative robust adjusting device.

[0015] It is advantageous if said elongated base is provided with a screw thread and said first carriage is provided with a follower, wherein said follower cooperates with said screw thread for said translation of said first carriage in said longitudinal direction. This is advantageous for translating said first carriage in a relative robust and accurate manner along said elongated base when rotating said elongated base relative to said first carriage and said follower.

[0016] Preferably said second carriage is arranged to slide along said elongated base. This is beneficial for maintaining said second carriage, in use of the adjusting device, in a stationary position relative to said structure and said support thereby allowing for a relative accurate positioning of the adjusting device relative to the support and the structure.

[0017] In an embodiment of the adjusting device according to the first aspect of the present disclosure said first coupling arrangement comprises a first coupling organ for coupling said first abutment element to said first carriage and comprises a second coupling organ for coupling said first abutment element to said second carriage, preferably wherein one of said first coupling organ and said second coupling organ is rigidly connected to said first abutment element. This is advantageous for realising a ratio different from 1 between a displacement of the first carriage in the longitudinal direction and a displacement of the first abutment element in the transversal direction thereby allowing a relative accurate positioning of the structure relative to the support. A rigid connection of one of said first coupling organ and said second coupling organ to said first abutment element is beneficial for maintaining said first coupling arrangement in a predetermined orientation mode relative to the elongated base.

[0018] In a practical embodiment of the adjusting device according to the first aspect of the present disclosure said first carriage and said second carriage are arranged for being both in abutment with the other of said structure or said support for said adjusting.

[0019] The adjusting device according to appended claim 1 further comprises:

- a third carriage connected to said elongated base;
- a second coupling arrangement coupling said second carriage to said third carriage via a second abutment element, wherein said second abutment element is arranged for abutment against said structure or said support for said adjusting in said active position, wherein said second abutment element, in dependence of said translating of said first carriage relative to said elongated base and relative to said third carriage in said longitudinal direction, displaces in said direction transversal to said longitudinal direction for abutting said second abutment element against said structure or said support for said adjusting in said active position. This is beneficial for realising a relative stable adjusting of the structure relative to the support.

[0020] The first carriage is arranged for translation in said longitudinal direction relative to said second carriage and relative to said third carriage for allowing said first abutment element and said second abutment element to displace in said direction transversal to said longitudinal direction over a different distance. This is beneficial for allowing due to a translation in the longitudinal direction of the second carriage relative to the first carriage and the third carriage a displacement in the transversal di-

rection of the first abutment element different from a displacement in the transversal direction of the second abutment element for allowing an inner wall of the support to enclose, in the longitudinal direction, an acute angle with an outer wall of the structure. In other words, an elongated structure may be adjusted such that the first direction of the elongated structure may be tilted relative to an inner wall of the support.

[0021] It is advantageous if said elongated base is provided with a third recess for partly receiving said second abutment element for reducing in said passive condition of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction. This is beneficial for realizing a relative compact assembly according to the second aspect of the present disclosure. By reducing the width of the adjusting device in the passive position thereof a relative small space is required between the structure and the support for placing the adjusting device between the structure and the support before adjusting the support relative to the structure.

[0022] Preferably said second abutment element is provided with a fourth recess for partly receiving said elongated base for reducing in said passive condition of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction. This is beneficial for realizing a relative compact assembly according to the second aspect of the present disclosure. By reducing the width of the adjusting device in the passive position thereof a relative small space is required between the structure and the support for placing the adjusting device between the structure and the support before adjusting the support relative to the structure.

[0023] In an embodiment of the adjusting device according to the first aspect of the present disclosure in said passive position of said adjusting device said third recess and said fourth recess overlap and wherein said first carriage, said third carriage and said second abutment element are aligned in said longitudinal direction. This is beneficial for realizing a relative compact assembly according to the second aspect of the present disclosure. By reducing the width of the adjusting device in the passive position thereof a relative small space is required between the structure and the support for placing the adjusting device between the structure and the support before adjusting the support relative to the structure.

[0024] It is beneficial if said third carriage is arranged to slide along said elongated base. This is beneficial for maintaining said third carriage, in use of the adjusting device, in a stationary position relative to said structure and said support thereby allowing for a relative accurate positioning of the adjusting device relative to the support and the structure.

[0025] Further according to appended claim 1, the second coupling arrangement comprises a third coupling organ for coupling said second abutment element to said second carriage and comprises a fourth coupling organ for coupling said second abutment element to said third carriage. Preferably wherein one of said third coupling organ and said fourth coupling organ is rigidly connected to said second abutment element. This is advantageous for realising a ratio different from 1 between a displacement of the first carriage in the longitudinal direction and a displacement of the second abutment element in the transversal direction thereby allowing a relative accurate positioning of the structure relative to the support. A rigid connection of one of said third coupling organ and said fourth coupling organ to said second abutment element is beneficial for maintaining said second coupling arrangement in a predetermined orientation mode relative to said elongated base.

[0026] Preferably said third carriage surrounds said elongated base. This is beneficial for avoiding or at least significantly reducing the risk of said third carriage to separate from the elongated base. This is beneficial for realizing a relative robust adjusting device.

[0027] In an embodiment of the adjusting device according to the first aspect of the present disclosure said third carriage is arranged for being in abutment with the other of said structure or said support for said adjusting.

[0028] It is beneficial if said first carriage is translatable in said longitudinal direction relative to said elongated base by actuation of said elongated base. This is beneficial for allowing a user to operate said adjusting device at an end of said elongated base. This is beneficial for realizing an adjusting device that may be used in an advantageous way in a configuration wherein a relative limited space is available for operation of the adjusting device.

[0029] In a second aspect according to appended claim 13, the present disclosure relates to an assembly comprising the adjusting device according to the first aspect of the present disclosure, a structure and a support, wherein said adjusting device is provided such that said first abutment element is in said active position and in abutment with said structure or said support such that said structure is adjusted in a position relative to said support by said adjusting device. Embodiments of the assembly according to the second aspect of the present disclosure correspond to embodiments of the adjusting device according to the first aspect of the present disclosure. The advantages of the assembly according to the second aspect of the present disclosure correspond to the advantages of the adjusting device according to the first aspect of the present disclosure presented previously.

[0030] In this regard it is beneficial if said assembly comprises two adjusting devices wherein said two adjusting devices are provided at opposite sides of said structure such that said first abutment element of each of said two adjusting devices are in said active position and are both in abutment with said structure or are both in abutment with said support such that said structure is adjusted in a position relative to said support by said two adjusting devices. This is advantageous for realising an assembly wherein said structure may be adjusted relative to said structure in a relative accurate manner.

[0031] In an embodiment said assembly comprises two adjusting devices wherein said two adjusting devices are provided at opposite sides of said structure such that said first abutment element of each of said two adjusting devices are in said active position and in abutment with said structure or in abutment with said support such that said structure is adjusted in a position relative to said support by said two adjusting devices. This is advantageous for realising an assembly wherein said structure may be adjusted relative to said structure in a relative accurate manner.

[0032] It is beneficial if said second abutment element of said adjusting device is in said active position and in abutment with said structure or said support such that said structure is adjusted in a position relative to said support by said adjusting device. This is beneficial for realising a relative robust assembly and a relative accurate adjustment of the structure relative to the support.

[0033] In this regard it is advantageous if said assembly comprises two adjusting devices, wherein said two adjusting devices are provided at opposite sides of said structure such that said first abutment element and said second abutment element of each of said two adjusting devices are in said active position and are both in abutment with said structure or are both in abutment with said support such that said structure is adjusted in a position relative to said support by said two adjusting devices. This is beneficial for realising a relative robust assembly and a relative accurate adjustment of the structure relative to the support.

[0034] In an embodiment said assembly comprises two adjusting devices, wherein said two adjusting devices are provided at opposite sides of said structure such that said first abutment element and said second abutment element of each of said two adjusting devices are in said active position and in abutment with said structure or in abutment with said support such that said structure is adjusted in a position relative to said support by said two adjusting devices. This is beneficial for realising a relative robust assembly and a relative accurate adjustment of the structure relative to the support.

[0035] In an embodiment of the assembly according to the second aspect of the present disclosure, said adjusting device is provided below a ground surface, preferably is provided completely below said ground surface. This is of particular benefit for preventing objects, such as cars, impacting the adjusting device. By providing the adjusting device completely below the ground surface a damage of the adjusting device by an object hitting the adjusting device is avoided, or at least significantly reduced.

[0036] In an embodiment of the assembly according to the second aspect of the present disclosure, said assembly is provided below a ground surface, preferably is provided completely below said ground surface. This is of particular benefit for preventing objects, such as cars, impacting the assembly. By providing the assembly completely below the ground surface a damage of the assembly by an object hitting the structure is avoided, or at least significantly reduced.

[0037] It is advantageous if said structure is an elongate structure, preferably wherein said structure is a lamppost. A lamppost is a relative vulnerable elongate structure that should be maintained in a vertical direction. The present assembly is particularly attractive for positioning a lamppost in a relative short time period in a relative robust manner.

[0038] It is beneficial if said structure has a diameter in the range of 100 mm to 450 mm. This is beneficial for realizing a relative robust elongate structure.

[0039] In an embodiment of the assembly according to the second aspect of the present disclosure said structure has a length in a vertical direction in the range of 3 m to 16 m.

[0040] The present disclosure will now be explained by means of a description of a preferred embodiments of an adjusting device according to the first aspect of the present disclosure and embodiments of an assembly according to the second aspect of the present disclosure, in which reference is made to the following schematic figures, in which:

Fig. 1: an embodiment of a known adjusting device in a first position is shown;
Fig. 2: the embodiment of Fig. 1 in a second position is shown;
Fig. 3: the embodiment of Fig. 1 in a third position is shown;
Fig. 4: an assembly is shown;
Fig. 5: a cross-section of the assembly from Fig. 4 is shown;
Fig. 6: another assembly is shown;
Fig. 7: a cross-section of the assembly from Fig. 6 is shown;
Fig. 8: an embodiment of an adjusting device according to the present disclosure in a first position is shown;
Fig. 9: the embodiment of Fig. 8 in a second position is shown;
Fig. 10: the embodiment of Fig. 8 in a third position is shown;
Fig. 11: a further assembly according to the present disclosure is shown;
Fig. 12: a cross-section of the assembly from Fig. 11 is shown;
Fig. 13: a yet further assembly according to the present disclosure is shown;
Fig. 14: a cross-section of the assembly from Fig. 13 is shown.

[0041] Adjusting device 1 comprises an elongated base 7 formed as a round bar provided with a screw thread (not shown) on the curved outer surface of the round bar. At a first end, the elongated base 7 is provided with a head 35. Head 35 is formed as a hexagon allowing said head 35 to cooperate with a tool such as a wrench

(not shown) for actuation of the elongated base 7. Actuation of the elongated base 7 may comprise rotating the head 35 in a clockwise direction A or in a counter clockwise direction B thereby effecting a rotation of the elongated base 7 about a central axis C of said elongated base 7.

[0042] A first carriage 3 and a second carriage 5 are each provided with a receiving opening for passing said elongated base 7 respectively through said first carriage 3 and said second carriage 5. In other words, the first carriage 3 and the second carriage 5 each surround said elongated base 7. The first carriage 3 is provided with a follower (not shown) extending in said receiving opening. The follower is in engagement with said screw thread for said translation of said first carriage in longitudinal direction L upon rotation of the elongated base 7 about said central axis C relative to said first carriage 3. The second carriage 5 may translate relative to said first carriage 3 by maintaining said second carriage 5 substantially stationary in said longitudinal direction L during rotation of the elongated base 7 relative to the second carriage 5. For allowing the second carriage 5 to move relative to the first carriage 3, an inner wall of the second carriage 5 surrounding the receiving opening of the second carriage 5 is free from screw thread and is substantially even for allowing said second carriage 5 to slide along said elongated base 7.

[0043] The first carriage 3 and the second carriage 5 are mutually coupled via a first coupling arrangement 9. The first coupling arrangement 9 comprises a first abutment element 11 that is connected to the first carriage 3 through first coupling organs 23 and is connected to the second carriage 5 through second coupling organs 25. The figures show only a single first coupling organ 23 and a single second coupling organ 25 at a first side of the first abutment element 11 for providing a more clear view on the device 1. The first and second coupling organs 23 and 25 are formed as elongated strips each provided with through holes near opposite ends thereof for coupling the first and second coupling organs 23 and 25 to the first carriage 3 and the second carriage 5. One of the two through holes provide in each of the first coupling organs 23 is formed as a substantially rectangular opening for realizing a form locking connection with a first connection profile 37 provided on said first abutment element 11. The first and second coupling organs 23 and 25 are secured to the first abutment element 9, the first carriage 3 and the second carriage 5 by a washer and circlip combination 39.

[0044] For realising a relative small width in direction T, transversal to said longitudinal direction L, in a passive position of the adjusting device 1 shown in Fig. 3, the elongated base 7 is provided with a first recess 19 and the first abutment element 11 is provided with a second recess 21. In the passive position shown in Fig. 3 the first carriage 3, the second carriage 5 and the first abutment element 11 are aligned in the longitudinal direction L for allowing the adjusting device 1 to be applied in a relative small space between a support 105 and a structure 103.

[0045] Adjusting device 1 may be used to adjust and fixate a structure 103 in the form of a lamppost relative to a support 105 as is shown in assembly 101. The support 105 is positioned in the ground 45 such that said support 105 is completely below a ground surface 47. The lamppost 103 is positioned such in the support 105 that two adjusting devices 1 may be placed in a receiving space 41 of said support 105 on opposite sides of said lamppost 103. By actuating the heads 35 of the adjusting devices 1 in the clockwise direction B the first carriage is moved in said longitudinal direction L towards said head 35 and thereby causing said first abutment element 11 to move in said transversal direction T. The head 35 is actuated until said first abutment element 11 is in abutment with an inner wall of said support 105 surrounding said receiving space 41 and said first carriage 3 and said second carriage 5 are in abutment with an outer wall of said lamppost 103 thereby adjusting and fixating the lamppost 103 relative to said support 105.

[0046] Assembly 201 differs mainly from assembly 101 in that the inner wall of the support 105 surrounding the receiving space 41 in longitudinal direction L is substantially parallel to an outer wall of the lamppost 103.

[0047] Adjusting device 301 differs mainly from adjusting device 1 in that a third carriage 313 and a second coupling arrangement 315 are provided. Elements of adjusting device 301 that are similar to elements of adjusting device 1 are provided with a reference number equal to the reference number of the element in adjusting device 1 raised by 300. The third carriage 313 is provided with a receiving opening for passing said elongated base 307 through said third carriage 313. In other words, the third carriage 313 surrounds said elongated base 307 as do the first carriage 303 and the second carriage 305. The third carriage 313 may translate relative to said first carriage 303 by maintaining said third carriage 313 substantially stationary in said longitudinal direction L during rotation of the elongated base 307 relative to the third carriage 313. The second carriage 305 may translate in said longitudinal direction L relative to said first carriage 303 and said third carriage 313. For allowing the second carriage 305 to move relative to the first carriage 303, an inner wall of the second carriage 305 surrounding the receiving opening of the second carriage 305 is free from screw thread and is substantially even for allowing said second carriage 305 to slide along said elongated base 307.

[0048] The third carriage 313 and the second carriage 315 are mutually coupled via a second coupling arrangement 315. The second coupling arrangement 315 comprises a second abutment element 317 that is connected to the second carriage 305 through third coupling organs 331 and is connected to the third carriage 313 through fourth coupling organs 333. The figures show only a single third coupling organ 331 and a single fourth coupling organ 333 at a first side of the second abutment element 317 for providing a more clear view on the device 301.

The third and fourth coupling organs 331 and 333 are formed as elongated strips each provided with through holes near opposite ends thereof for coupling the third and fourth coupling organs 331 and 333 to the third carriage 313 and the second carriage 305. One of the two through holes provide in each of the third coupling organs 331 is formed as a substantially rectangular opening for realizing a form locking connection with a first connection profile 343 provided on said second abutment element 317. The third coupling organs 331 are secured to the second abutment element 317 and the second carriage 305 by washer and circlip combinations 339 and 349. The fourth coupling organs 333 are secured to the second abutment element 317 and the third carriage 313 by a washer and circlip combination 349.

[0049] For realising a relative small width in direction T, transversal to said longitudinal direction L, in a position of the adjusting device 301 shown in Fig. 10, the elongated base 307 is provided with a third recess 327 and the second abutment element 317 is provided with a fourth recess 329. In the passive position shown in Fig. 10 the first carriage 303, the second carriage 305, the third carriage 313, the first abutment element 311 and the second abutment element 313 are aligned in the longitudinal direction L for realising the adjusting device 301 to be applied in a relative small space between a support 105 and a structure 103.

[0050] Adjusting device 301 may be used to adjust and fixate a structure 103 in the form of a lamppost relative to a support 105 as is shown in assembly 401. The support 105 is positioned in the ground 45 such that said support 105 is completely below a ground surface 47. The lamppost 103 is positioned such in the support 105 that two of said adjusting devices 301 may be placed in a receiving space 41 of said support 105 on opposite sides of said lamppost 103. By actuating the heads 335 of the adjusting devices 301 in the clockwise direction B the first carriage 303 is moved in said longitudinal direction L towards said head 335 and thereby causing said first abutment element 311 and said second abutment element 317 to move in said transversal direction T. The head 335 is actuated until said first abutment element 311 and said second abutment element 313 are in abutment with an inner wall of said support 105 surrounding said receiving space 41 and said first carriage 303, said second carriage 305 and said third carriage 313 are in abutment with an outer wall of said lamppost 103 thereby adjusting and fixating the lamppost 103 relative to said support 105. By a translation in said longitudinal direction L of said second carriage 305 relative to said first carriage 303 and said third carriage 313 a displacement in said transversal direction T of said first abutment element 311 differs from a displacment in said transversal direction T of said second abutment element 317 for allowing that said inner wall of the support 105 surrounding the receiving space 41 in said longitudinal direction L encloses an acute angle with said outer wall of the lamppost 103.

[0051] Assembly 501 differs mainly from assembly 401 in that the inner wall of the support 105 surrounding the receiving space 41 in longitudinal direction L is substantially parallel to an outer wall of the lamppost 103.

Claims

1. Adjusting device (301) for adjusting a structure (103), preferably an elongated structure such as a lamppost, relative to a support (105), said adjusting device (301) comprising:

- a first carriage (303), a second carriage (305), a third carriage (313) and an elongated base (307) for translating said first carriage along said elongated base (307) in a longitudinal direction (L) relative to said elongated base (307) and relative to said second carriage (305), wherein said first carriage (303), said second carriage (305) and said third carriage (313) are connected to said elongated base (307);
- a first coupling arrangement (309) coupling said first carriage (303) to said second carriage (305) via a first abutment element (311), wherein said first abutment element (311) is arranged for abutment against said structure (103) or said support (105) for said adjusting in an active position, wherein said first abutment element (311), in dependence of said translating of said first carriage (303) relative to said elongated base (307) and relative to said second carriage (305) in said longitudinal direction (L), displaces in a direction (T) transversal to said longitudinal direction (L) for abutting said first abutment element (311) against said structure (103) or said support (105) for said adjusting in said active position;
- a second coupling arrangement (315) coupling said second carriage (305) to said third carriage (313) via a second abutment element (317), wherein said second abutment element (317) is arranged for abutment against said structure (103) or said support (105) for said adjusting in said active position, wherein said second abutment element (317), in dependence of said translating of said first carriage (303) relative to said elongated base (307) and relative to said third carriage (313) in said longitudinal direction (L), displaces in said direction (T) transversal to said longitudinal direction (L) for abutting said second abutment element (317) against said structure (103) or said support (105) for said adjusting in said active position, wherein said second coupling arrangement (315) comprises a third coupling organ (331) for coupling said second abutment element (317) to said second carriage (305) and comprises a fourth coupling organ (333) for coupling said second abutment el-

ement (317) to said third carriage (313);

wherein said first carriage (303) is arranged for translation in said longitudinal direction (L) relative to said second carriage (305) and relative to said third carriage (313) and wherein said second carriage (305) is arranged for translation in said longitudinal direction (L) relative to said first carriage (303) and said third carriage (313) for allowing said first abutment element (311) and said second abutment element (317) to displace in said direction transversal to said longitudinal direction (L) over a different distance.

2. Adjusting device (301) according to claim 1, wherein said elongated base (307) is provided with a first recess (319) for partly receiving said first abutment element for reducing in a passive position of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction (L).

3. Adjusting device (301) according to claim 1 or 2, wherein said first abutment element (311) is provided with a second recess (321) for partly receiving said elongated base (307) for reducing in a passive position of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction (L).

4. Adjusting device (301) according to claim 2 and 3, wherein in said passive position of said adjusting device said first recess and said second recess overlap, and wherein said first carriage, said second carriage and said first abutment element are aligned in said longitudinal direction.

5. Adjusting device (301) according to any one of the preceding claims, wherein said third carriage (313) is arranged to translate relative to said first carriage (303) by maintaining said third carriage (313) substantially stationary in said longitudinal direction (L) during rotation of said elongated base (307) relative to said third carriage (313)..

6. Adjusting device (301) according to any one of the preceding claims, wherein said elongated base (307) is provided with a third recess (327) for partly receiving said second abutment element for reducing in said passive position of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction (L).

7. Adjusting device (301) according to any one of the preceding claims, wherein said second abutment element (317) is provided with a fourth recess (329) for partly receiving said elongated base (307) for reducing in said passive position of said adjusting device a width of said adjusting device in said direction transversal to said longitudinal direction (L).

8. Adjusting device (301) according to claims 4 and 6, wherein in said passive position of said adjusting device said third recess and said fourth recess overlap and wherein said first carriage, said third carriage and said second abutment element are aligned in said longitudinal direction.

9. Adjusting device (301) according to any one of the preceding claims, wherein said third carriage is arranged to slide along said elongated base.

10. Adjusting device (301) according to any one of the preceding claims, wherein one of said third coupling organ and said fourth coupling organ is rigidly connected to said second abutment element.

11. Adjusting device (301) according to any one of the preceding claims, wherein said third carriage surrounds said elongated base.

12. Adjusting device (301) according to any one of the preceding claims, wherein said third carriage (313) is arranged for being in abutment with the other of said structure or said support for said adjusting.

13. An assembly (401, 501) comprising the adjusting device (301) according to any one of the preceding claims, a structure (103) and a support (105), wherein said adjusting device (301) is provided such that said first abutment element is in said active position and in abutment with said structure or said support such that said structure is adjusted in a position relative to said support (105) by said adjusting device.

14. An assembly (401, 501) according to claim 13, wherein said structure has a length in a vertical direction in the range of 3 m to 16 m.

15. An assembly according to claim 13 or 14, wherein said assembly comprises two adjusting devices (301), wherein said two adjusting devices (301) are provided at opposite sides of said structure such that said first abutment element and said second abutment element of each of said two adjusting devices are in said active position and in abutment with said structure or in abutment with said support such that said structure is adjusted in a position relative to said support by said two adjusting devices.

Patentansprüche

1. Verstellvorrichtung (301) zum Verstellen einer Struktur (103), vorzugsweise einer länglichen Struktur wie eines Lichtmasts, bezüglich einer Stütze (105), wobei die Verstellvorrichtung (301) Folgendes umfasst:

- einen ersten Schlitten (303), einen zweiten Schlitten (305), einen dritten Schlitten (313) und eine längliche Basis (307) zum Translatieren des ersten Schlittens entlang der länglichen Basis (307) in einer Längsrichtung (L) bezüglich der länglichen Basis (307) und bezüglich des zweiten Schlittens (305), wobei der erste Schlitten (303), der zweite Schlitten (305) und der dritte Schlitten (313) mit der länglichen Basis (307) verbunden sind,
- eine erste Koppelanordnung (309), die den ersten Schlitten (303) über ein erstes Anlageelement (311) an den zweiten Schlitten (305) koppelt, wobei das erste Anlageelement (311) zum Anliegen an der Struktur (103) oder der Stütze (105) für das Verstellen in einer aktiven Position angeordnet ist, wobei sich das erste Anlageelement (311) in Abhängigkeit von der Translation des ersten Schlittens (303) bezüglich der länglichen Basis (307) und bezüglich des zweiten Schlittens (305) in der Längsrichtung (L) in einer quer zu der Längsrichtung (L) verlaufenden Richtung (T) verschiebt, um das erste Anlageelement (311) für das Verstellen in der aktiven Position an der Struktur (103) oder der Stütze (105) anzulegen,
- eine zweite Koppelanordnung (315), die den zweiten Schlitten (305) über ein zweites Anlageelement (317) an den dritten Schlitten (313) koppelt, wobei das zweite Anlageelement (317) zum Anliegen an der Struktur (103) oder der Stütze (105) für das Verstellen in der aktiven Position angeordnet ist, wobei sich das zweite Anlageelement (317) in Abhängigkeit von der Translation des ersten Schlittens (303) bezüglich der länglichen Basis (307) und bezüglich des dritten Schlittens (313) in der Längsrichtung (L) in einer quer zu der Längsrichtung (L) verlaufenden Richtung (T) verschiebt, um das zweite Anlageelement (317) für das Verstellen in der aktiven Position an der Struktur (103) oder der Stütze (105) anzulegen, wobei die zweite Koppelanordnung (315) ein drittes Koppelglied (331) umfasst, um das zweite Anlageelement (317) an den zweiten Schlitten (305) zu koppeln, und ein viertes Koppelglied (333) umfasst, um das zweite Anlageelement (317) an den dritten Schlitten (313) zu koppeln,

wobei der erste Schlitten (303) zur Translation in der Längsrichtung (L) bezüglich des zweiten Schlittens (305) und bezüglich des dritten Schlittens (313) angeordnet ist und wobei der zweite Schlitten (305) zur Translation in der Längsrichtung (L) bezüglich des ersten Schlittens (303) und bezüglich des dritten Schlittens (313) angeordnet ist, damit sich das erste Anlageelement (311) und das zweite Anlageelement (317) in der quer zu der Längsrichtung (L) verlaufenden Richtung über eine unterschiedliche Strecke verschieben können.

2. Verstellvorrichtung (301) nach Anspruch 1, wobei die längliche Basis (307) mit einer ersten Aussparung (319) zur partiellen Aufnahme des ersten Anlageelements versehen ist, um in einer passiven Position der Verstellvorrichtung eine Breite der Verstellvorrichtung in der quer zu der Längsrichtung (L) verlaufenden Richtung zu reduzieren.

3. Verstellvorrichtung (301) nach Anspruch 1 oder 2, wobei das erste Anlageelement (311) mit einer zweiten Aussparung (321) zur partiellen Aufnahme der länglichen Basis (307) versehen ist, um in einer passiven Position der Verstellvorrichtung eine Breite der Verstellvorrichtung in der quer zu der Längsrichtung (L) verlaufenden Richtung zu reduzieren.

4. Verstellvorrichtung (301) nach Anspruch 2 und 3, wobei sich die erste Aussparung und die zweite Aussparung in der passiven Position der Verstellvorrichtung überlappen und der erste Schlitten, der zweite Schlitten und das erste Anlageelement in der Längsrichtung aufeinander ausgerichtet sind.

5. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei der dritte Schlitten (313) dazu angeordnet ist, bezüglich des ersten Schlittens (303) zu translatieren, indem der dritte Schlitten (313) während der Drehung der länglichen Basis (307) bezüglich des dritten Schlittens (313) im Wesentlichen feststehend in der Längsrichtung (L) gehalten wird.

6. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei die längliche Basis (307) mit einer dritten Aussparung (327) zur partiellen Aufnahme des zweiten Anlageelements versehen ist, um in der passiven Position der Verstellvorrichtung eine Breite der Verstellvorrichtung in der quer zu der Längsrichtung (L) verlaufenden Richtung zu reduzieren.

7. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei das zweite Anlageelement (317) mit einer vierten Aussparung (329) zur partiellen Aufnahme der länglichen Basis (307) versehen ist, um in der passiven Position der Verstellvorrichtung eine Breite der Verstellvorrichtung in der quer zu der Längsrichtung (L) verlaufenden Richtung zu reduzieren.

8. Verstellvorrichtung (301) nach Ansprüchen 4 und 6, wobei sich die dritte Aussparung und die vierte Aussparung in der passiven Position der Verstellvorrichtung überlappen und wobei der erste Schlitten, der dritte Schlitten und das zweite Anlageelement in der

Längsrichtung aufeinander ausgerichtet sind.

9. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei der dritte Schlitten dazu angeordnet ist, entlang der länglichen Basis zu gleiten.

10. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei das dritte Koppelglied oder das vierte Koppelglied starr mit dem zweiten Anlageelement verbunden ist.

11. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei der dritte Schlitten die längliche Basis umgibt.

12. Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, wobei der dritte Schlitten (313) dazu angeordnet ist, zum Verstellen an der jeweils anderen der Struktur oder der Stütze anzuliegen.

13. Anordnung (401, 501), umfassend die Verstellvorrichtung (301) nach einem der vorhergehenden Ansprüche, eine Struktur (103) und eine Stütze (105), wobei die Verstellvorrichtung (301) so vorgesehen ist, dass das erste Anlageelement in der aktiven Position ist und an der Struktur oder der Stütze anliegt, so dass die Struktur mittels der Verstellvorrichtung in einer Position bezüglich der Stütze (105) verstellt wird.

14. Anordnung (401, 501) nach Anspruch 13, wobei die Struktur in einer vertikalen Richtung eine Länge im Bereich von 3 m bis 16 m hat.

15. Anordnung nach Anspruch 13 oder 14, wobei die Anordnung zwei Verstellvorrichtungen (301) umfasst, wobei die beiden Verstellvorrichtungen (301) an gegenüberliegenden Seiten der Struktur vorgesehen sind, so dass das erste Anlageelement und das zweite Anlageelement jeder der beiden Verstellvorrichtungen in der aktiven Position sind und an der Struktur anliegen oder an der Stütze anliegen, so dass die Struktur mittels der beiden Verstellvorrichtungen in einer Position bezüglich der Stütze verstellt wird.

Revendications

1. Dispositif de réglage (301) pour régler une structure (103), de préférence une structure allongée telle qu'un lampadaire, par rapport à un support (105), ledit dispositif de réglage (301) comprenant :

- un premier chariot (303), un deuxième chariot (305), un troisième chariot (313) et une base allongée (307) pour translater ledit premier chariot le long de ladite base allongée (307) dans une direction longitudinale (L) par rapport à ladite base allongée (307) et par rapport audit deuxième chariot (305), où ledit premier chariot (303), ledit deuxième chariot (305) et ledit troisième chariot (313) sont reliés à ladite base allongée (307) ;
- un premier agencement d'accouplement (309) couplant ledit premier chariot (303) audit deuxième chariot (305) via un premier élément de butée (311), où ledit premier élément de butée (311) est agencé pour venir en butée contre ladite structure (103) ou ledit support (105) pour ledit réglage dans une position active, où ledit premier élément de butée (311), en fonction de ladite translation dudit premier chariot (303) par rapport à ladite base allongée (307) et par rapport audit deuxième chariot (305) dans ladite direction longitudinale (L), se déplace dans une direction (T) transversale à ladite direction longitudinale (L) pour amener ledit premier élément de butée (311) en butée contre ladite structure (103) ou ledit support (105) pour ledit réglage dans ladite position active ;
- un deuxième agencement d'accouplement (315) couplant ledit deuxième chariot (305) audit troisième chariot (313) via un deuxième élément de butée (317), où ledit deuxième élément de butée (317) est agencé pour venir en butée contre ladite structure (103) ou ledit support (105) pour ledit réglage dans ladite position active, où ledit deuxième élément de butée (317), en fonction de ladite translation dudit premier chariot (303) par rapport à ladite base allongée (307) et par rapport audit troisième chariot (313) dans ladite direction longitudinale (L), se déplace dans ladite direction (T) transversale à ladite direction longitudinale (L) pour amener ledit deuxième élément de butée (317) en butée contre ladite structure (103) ou ledit support (105) pour ledit réglage dans ladite position active, où ledit deuxième agencement d'accouplement (315) comprend un troisième organe d'accouplement (331) pour coupler ledit deuxième élément de butée (317) audit deuxième chariot (305) et comprend un quatrième organe d'accouplement (333) pour coupler ledit deuxième élément de butée (317) audit troisième chariot (313) ;

dans lequel ledit premier chariot (303) est agencé pour une translation dans ladite direction longitudinale (L) par rapport audit deuxième chariot (305) et par rapport audit troisième chariot (313) et dans lequel ledit deuxième chariot (305) est agencé pour une translation dans ladite direction longitudinale (L) par rapport audit premier chariot (303) et audit troisième chariot (313) pour permettre audit premier élé-

ment de butée (311) et audit deuxième élément de butée (317) de se déplacer dans ladite direction transversale à ladite direction longitudinale (L) sur une distance différente.

2. Dispositif de réglage (301) selon la revendication 1, dans lequel ladite base allongée (307) est pourvue d'un premier évidement (319) pour recevoir en partie ledit premier élément de butée afin de réduire dans une position passive dudit dispositif de réglage une largeur dudit dispositif de réglage dans ladite direction transversale à ladite direction longitudinale (L).

3. Dispositif de réglage (301) selon la revendication 1 ou 2, dans lequel ledit premier élément de butée (311) est pourvu d'un deuxième évidement (321) pour recevoir en partie ladite base allongée (307) afin de réduire dans une position passive dudit dispositif de réglage une largeur dudit dispositif de réglage dans ladite direction transversale à ladite direction longitudinale (L).

4. Dispositif de réglage (301) selon la revendication 2 et 3, dans lequel dans ladite position passive dudit dispositif de réglage ledit premier évidement et ledit deuxième évidement se chevauchent, et dans lequel ledit premier chariot, ledit deuxième chariot et ledit premier élément de butée sont alignés dans ladite direction longitudinale.

5. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel ledit troisième chariot (313) est agencé pour effectuer une translation par rapport audit premier chariot (303) en maintenant ledit troisième chariot (313) sensiblement immobile dans ladite direction longitudinale (L) pendant la rotation de ladite base allongée (307) par rapport audit troisième chariot (313).

6. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel ladite base allongée (307) est pourvue d'un troisième évidement (327) pour recevoir en partie ledit deuxième élément de butée afin de réduire dans ladite position passive dudit dispositif de réglage une largeur dudit dispositif de réglage dans ladite direction transversale à ladite direction longitudinale (L).

7. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel ledit deuxième élément de butée (317) est pourvu d'un quatrième évidement (329) pour recevoir en partie ladite base allongée (307) afin de réduire dans ladite position passive dudit dispositif de réglage une largeur dudit dispositif de réglage dans ladite direction transversale à ladite direction longitudinale (L).

8. Dispositif de réglage (301) selon les revendications 4 et 6, dans lequel dans ladite position passive dudit dispositif de réglage ledit troisième évidement et ledit quatrième évidement se chevauchent et dans lequel ledit premier chariot, ledit troisième chariot et ledit deuxième élément de butée sont alignés dans ladite direction longitudinale.

9. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel ledit troisième chariot est agencé pour coulisser le long de ladite base allongée.

10. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel l'un dudit troisième organe d'accouplement et dudit quatrième organe d'accouplement est relié rigidement audit deuxième élément de butée.

11. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel ledit troisième chariot entoure ladite base allongée.

12. Dispositif de réglage (301) selon l'une quelconque des revendications précédentes, dans lequel ledit troisième chariot (313) est agencé pour être en butée avec l'autre de ladite structure et dudit support pour ledit réglage.

13. Ensemble (401, 501) comprenant le dispositif de réglage (301) selon l'une quelconque des revendications précédentes, une structure (103) et un support (105), dans lequel ledit dispositif de réglage (301) est prévu de sorte que ledit premier élément de butée soit dans ladite position active et en butée avec ladite structure ou ledit support de sorte que ladite structure soit réglée dans une position par rapport audit support (105) par ledit dispositif de réglage.

14. Ensemble (401, 501) selon la revendication 13, dans lequel ladite structure a une longueur dans une direction verticale se trouvant dans la plage allant de 3 m à 16 m.

15. Ensemble selon la revendication 13 ou 14, dans lequel ledit ensemble comprend deux dispositifs de réglage (301), dans lequel lesdits deux dispositifs de réglage (301) sont prévus au niveau de côtés opposés de ladite structure de sorte que ledit premier élément de butée et ledit deuxième élément de butée de chacun desdits deux dispositifs de réglage soit dans ladite position active et en butée avec ladite structure ou en butée avec ledit support de sorte que ladite structure soit réglée dans une position par rapport audit support par lesdits deux dispositifs de réglage.

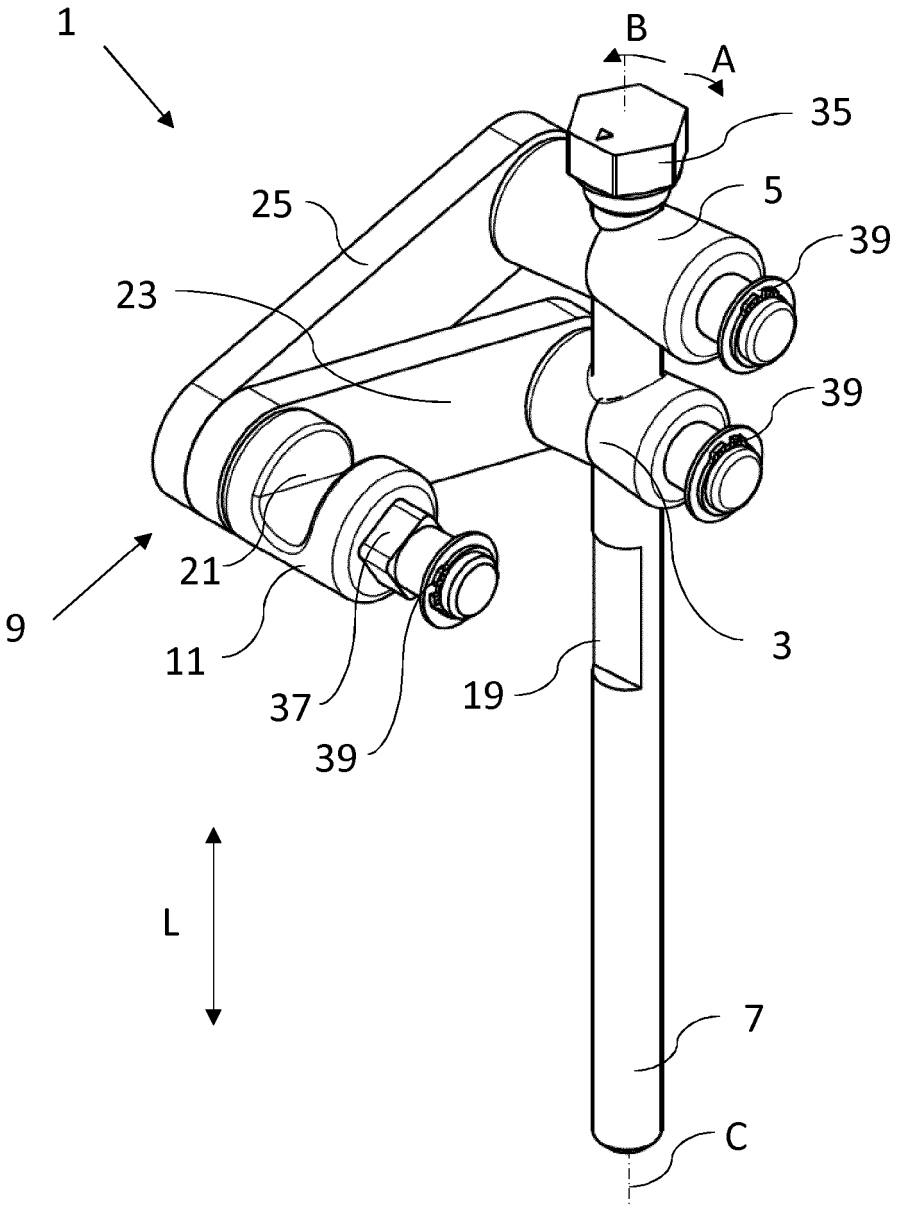

Fig. 1

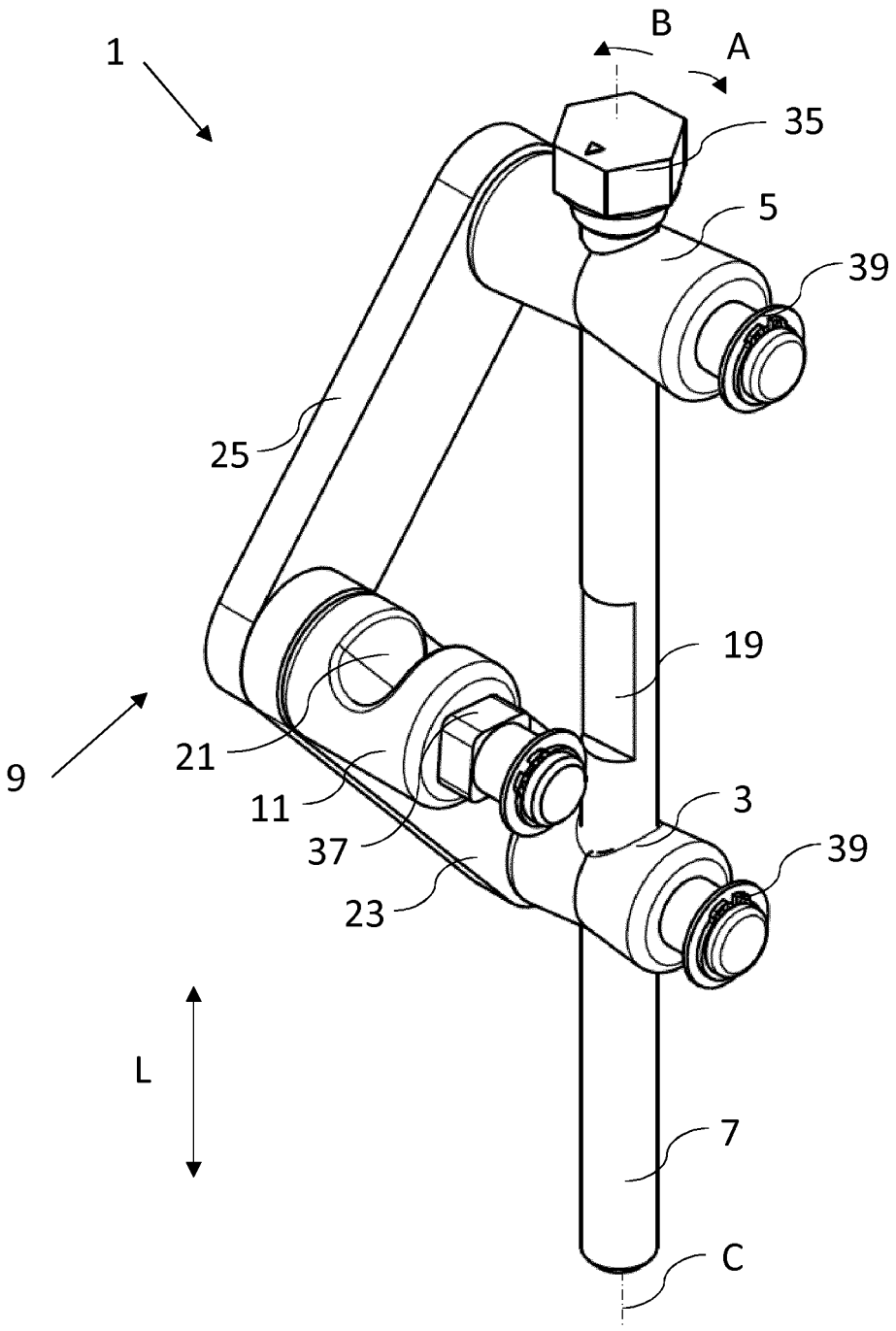

Fig. 2

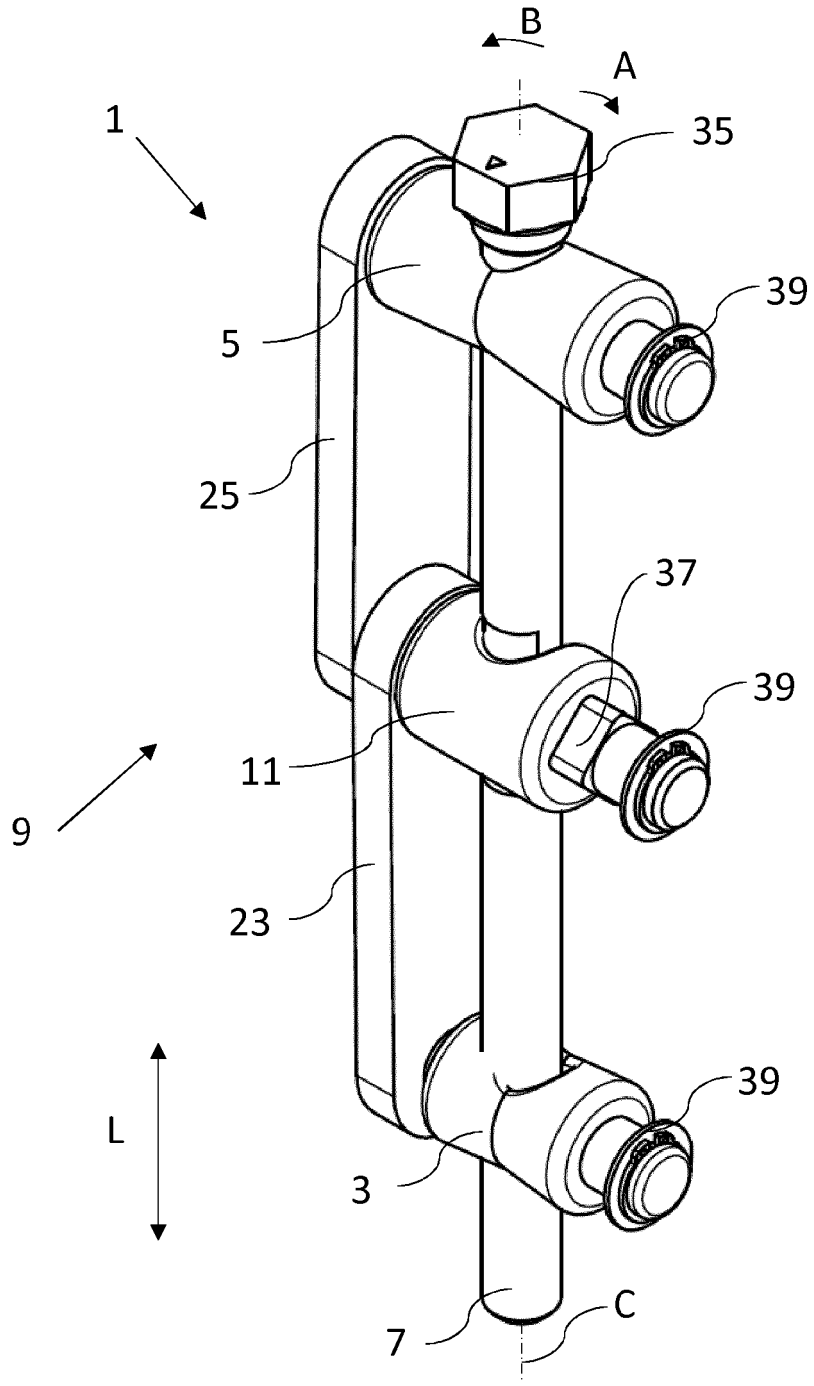

Fig. 3

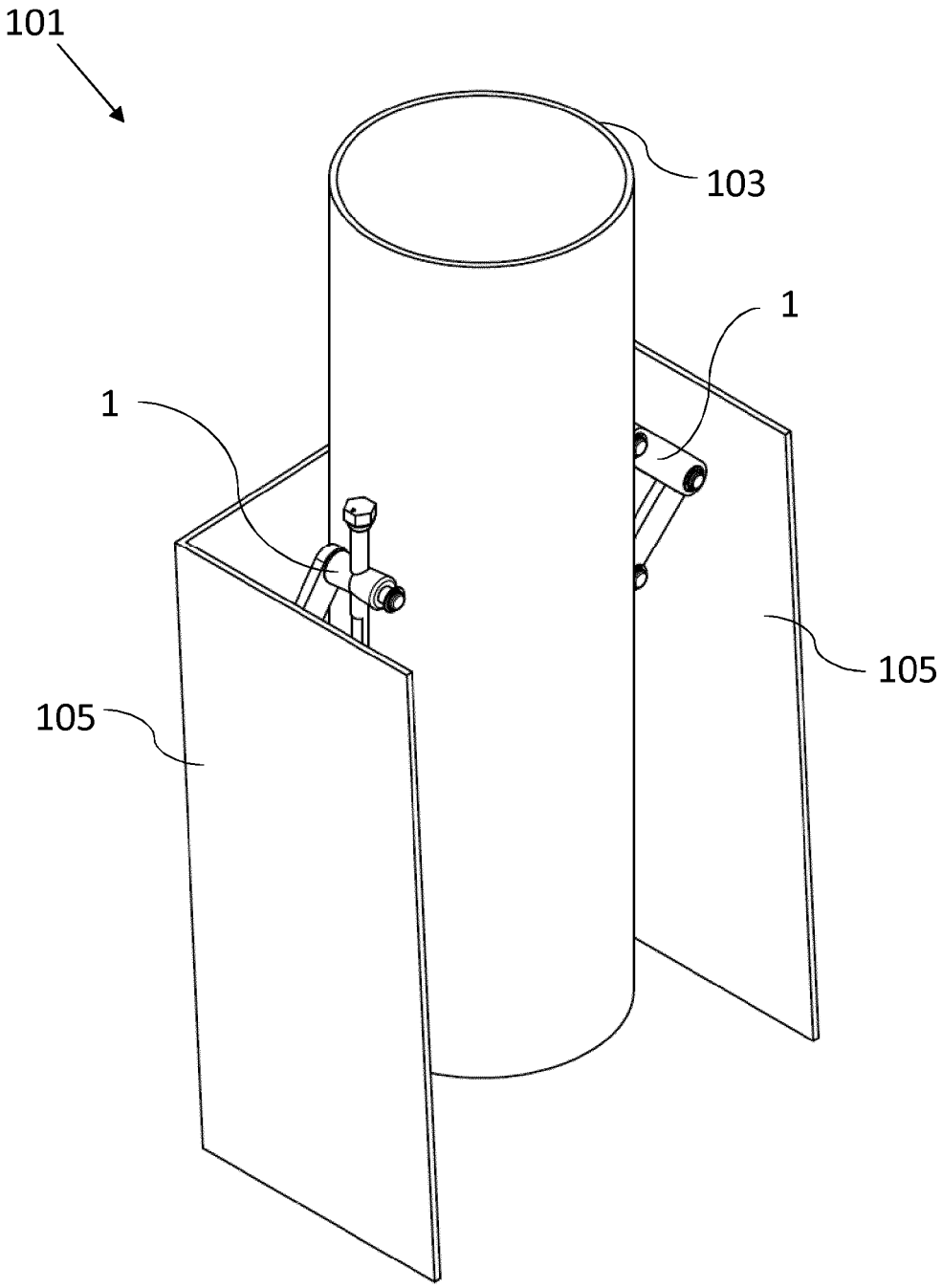

Fig. 4

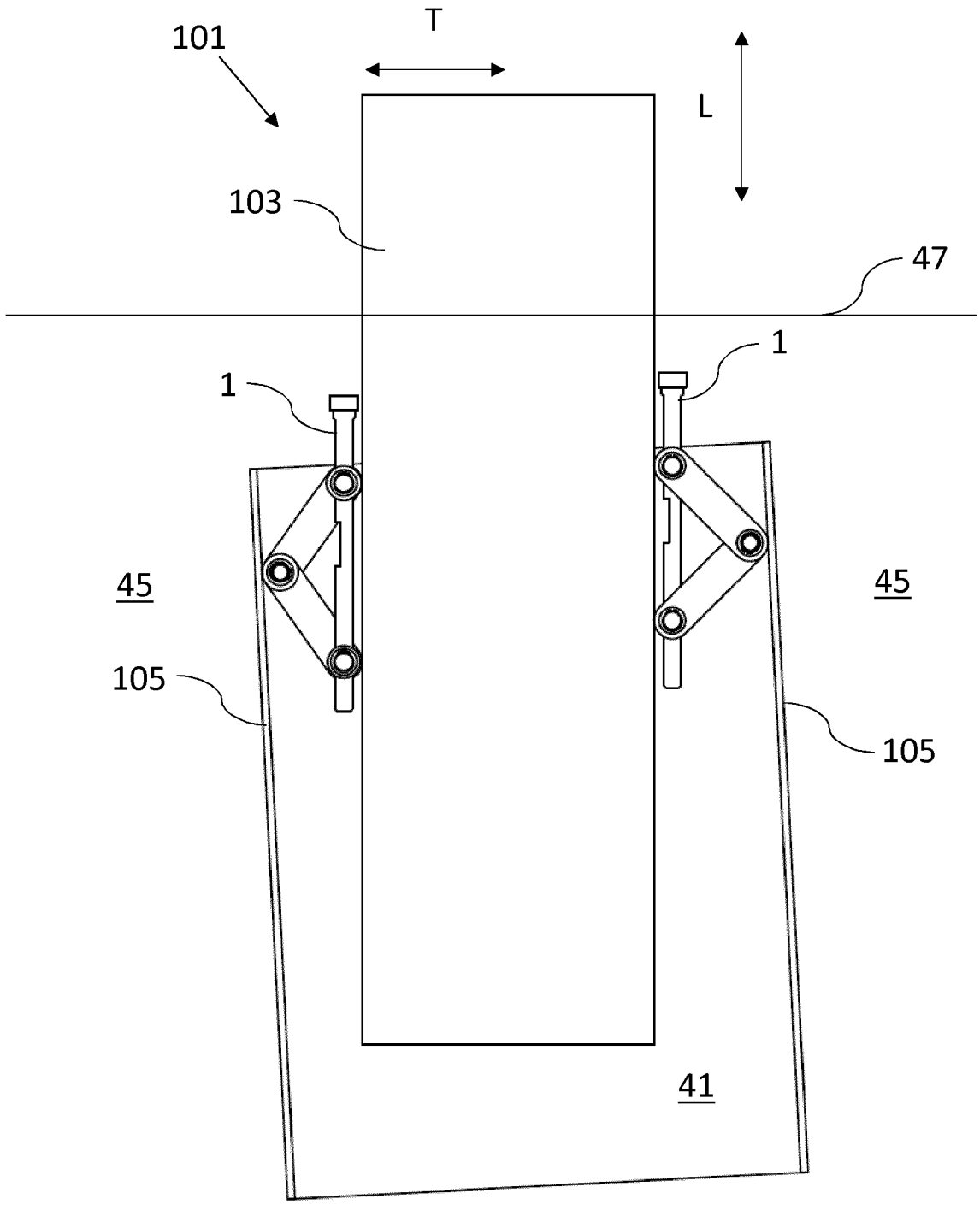

Fig. 5

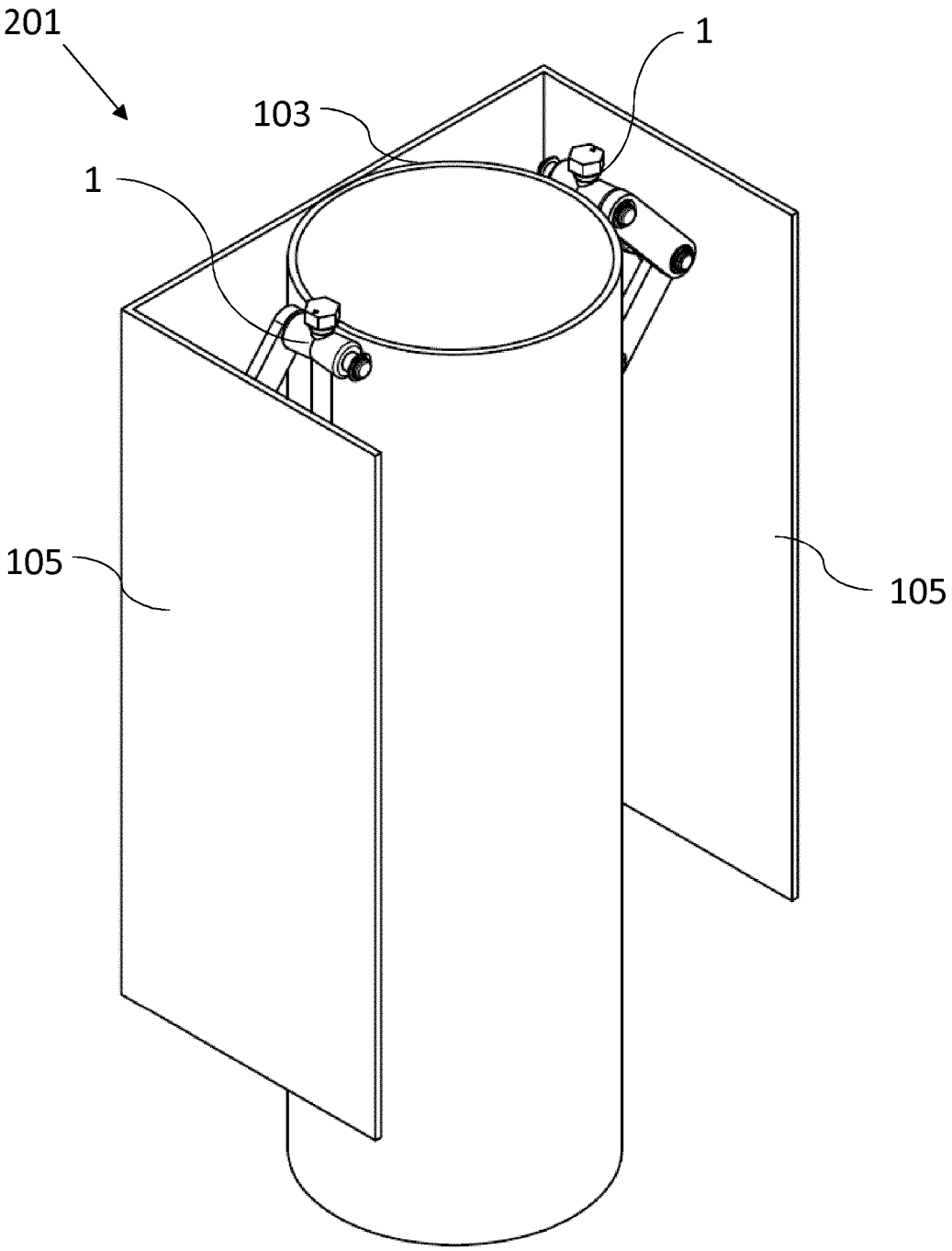

Fig. 6

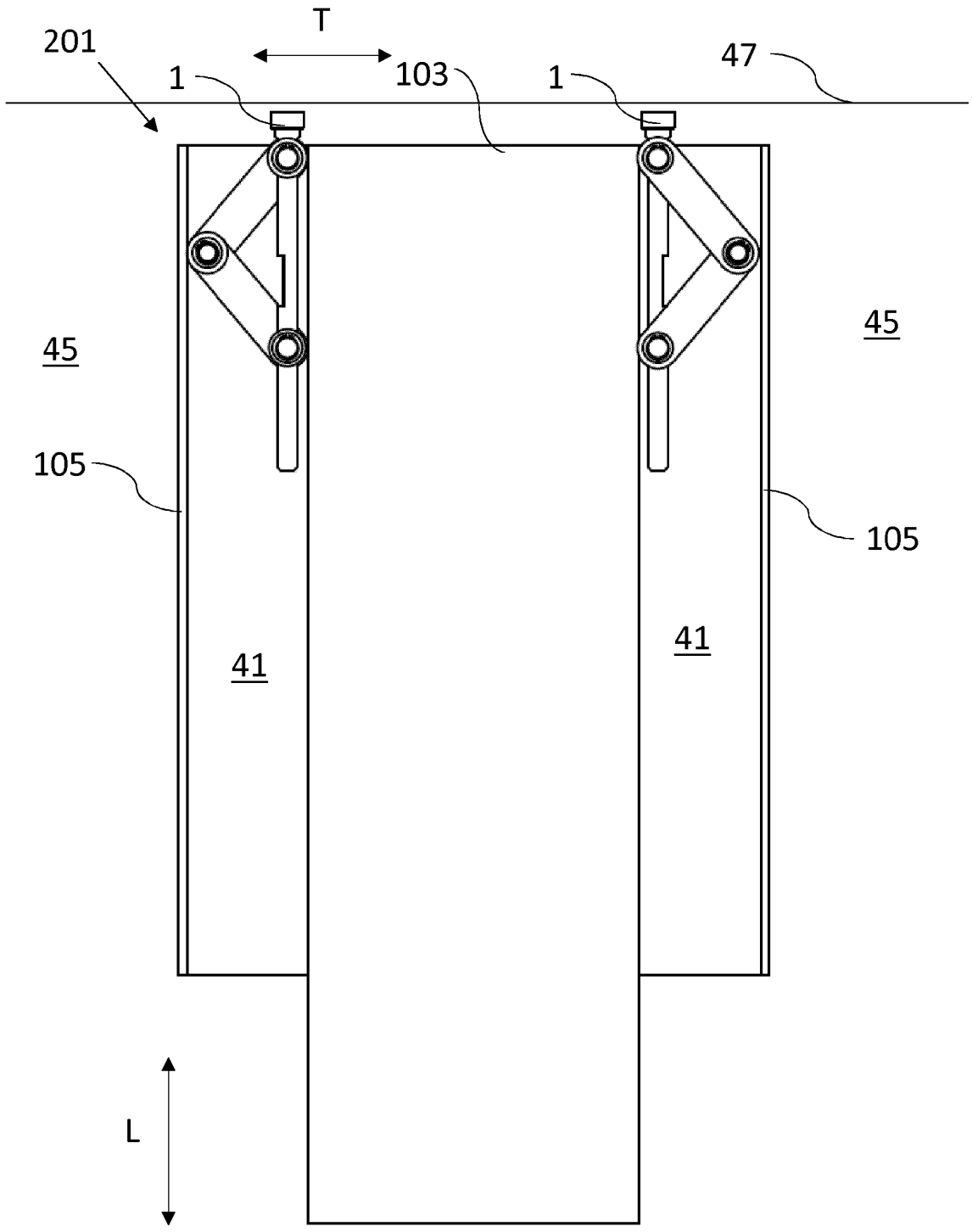

Fig. 7

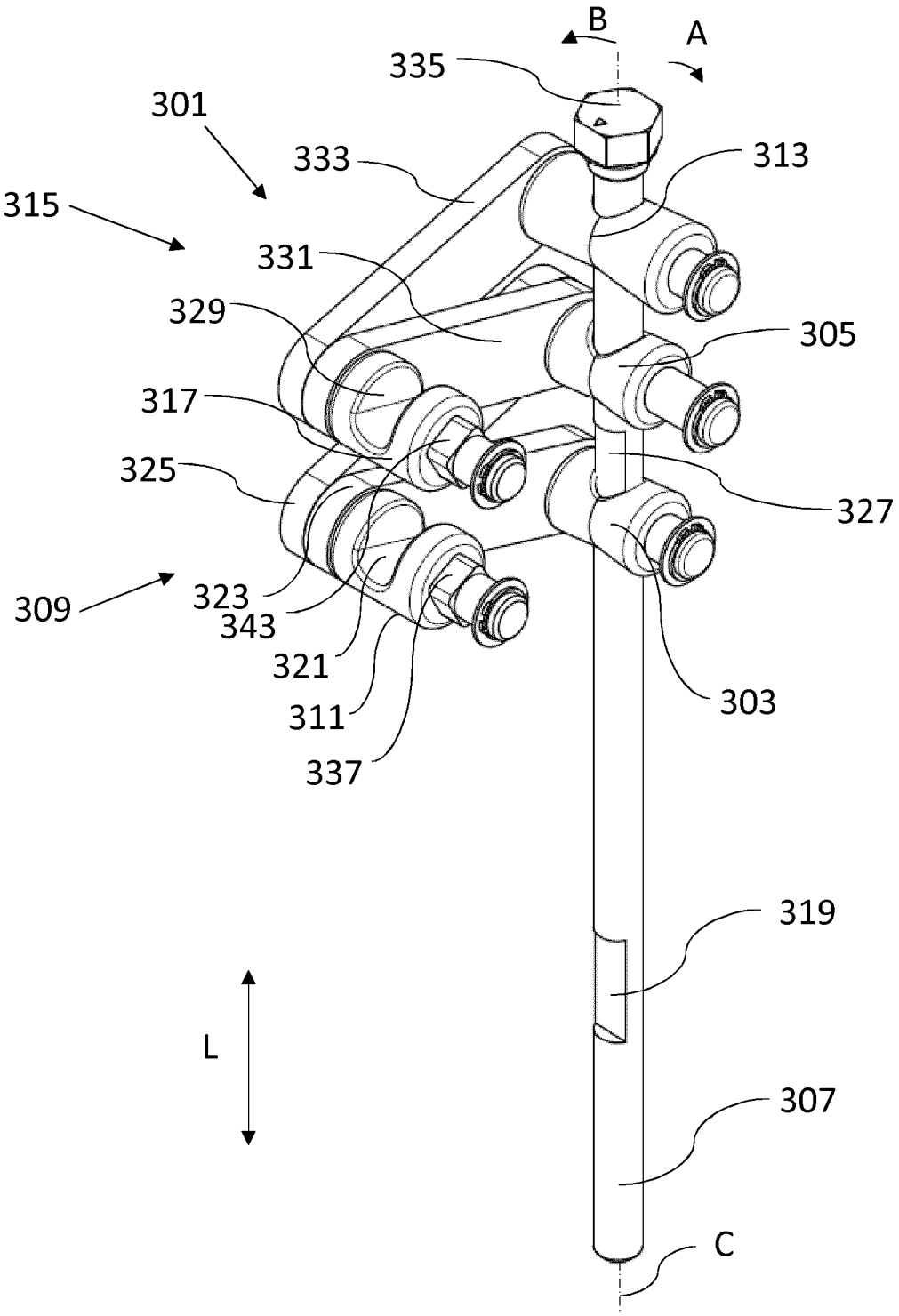
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Fig. 8

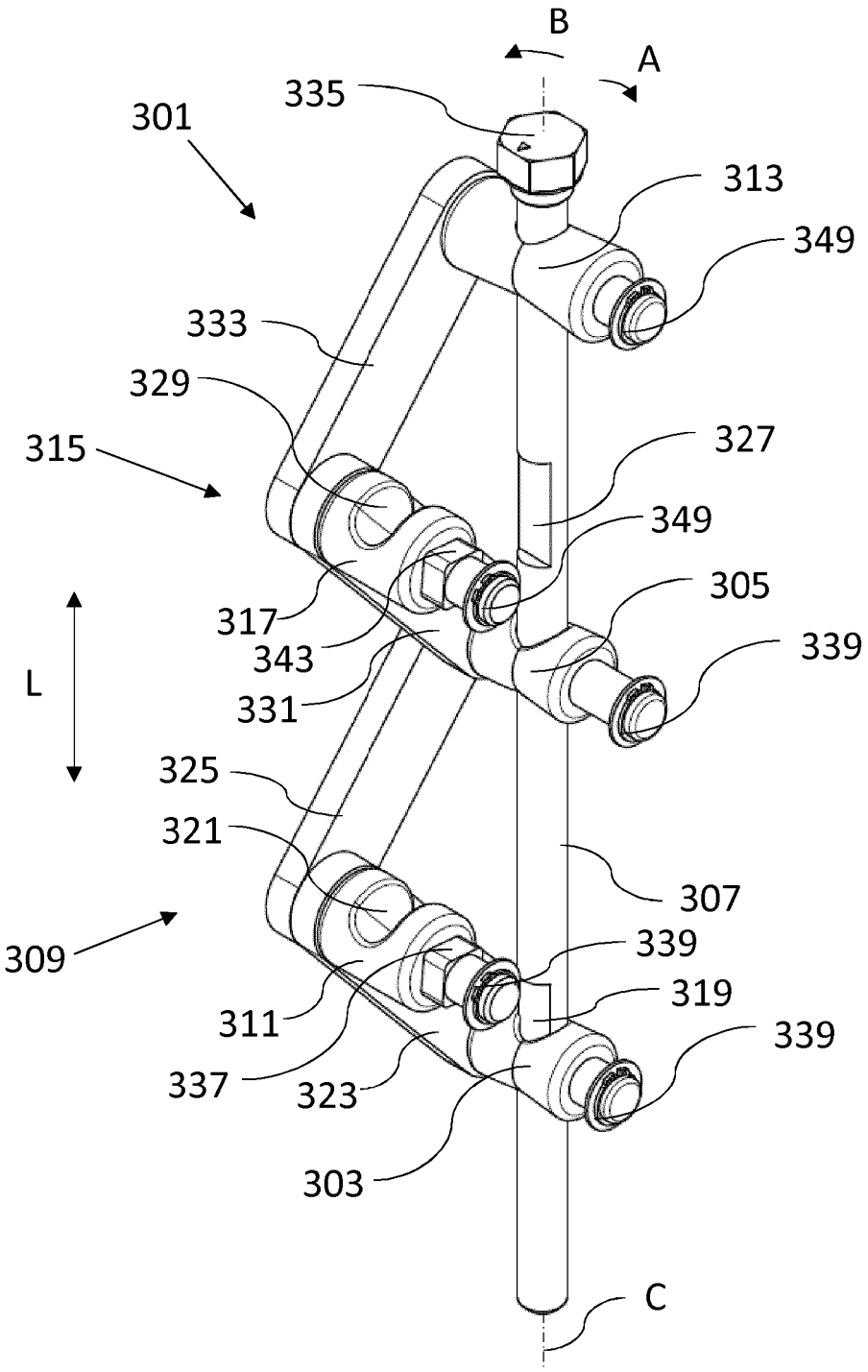
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Fig. 9

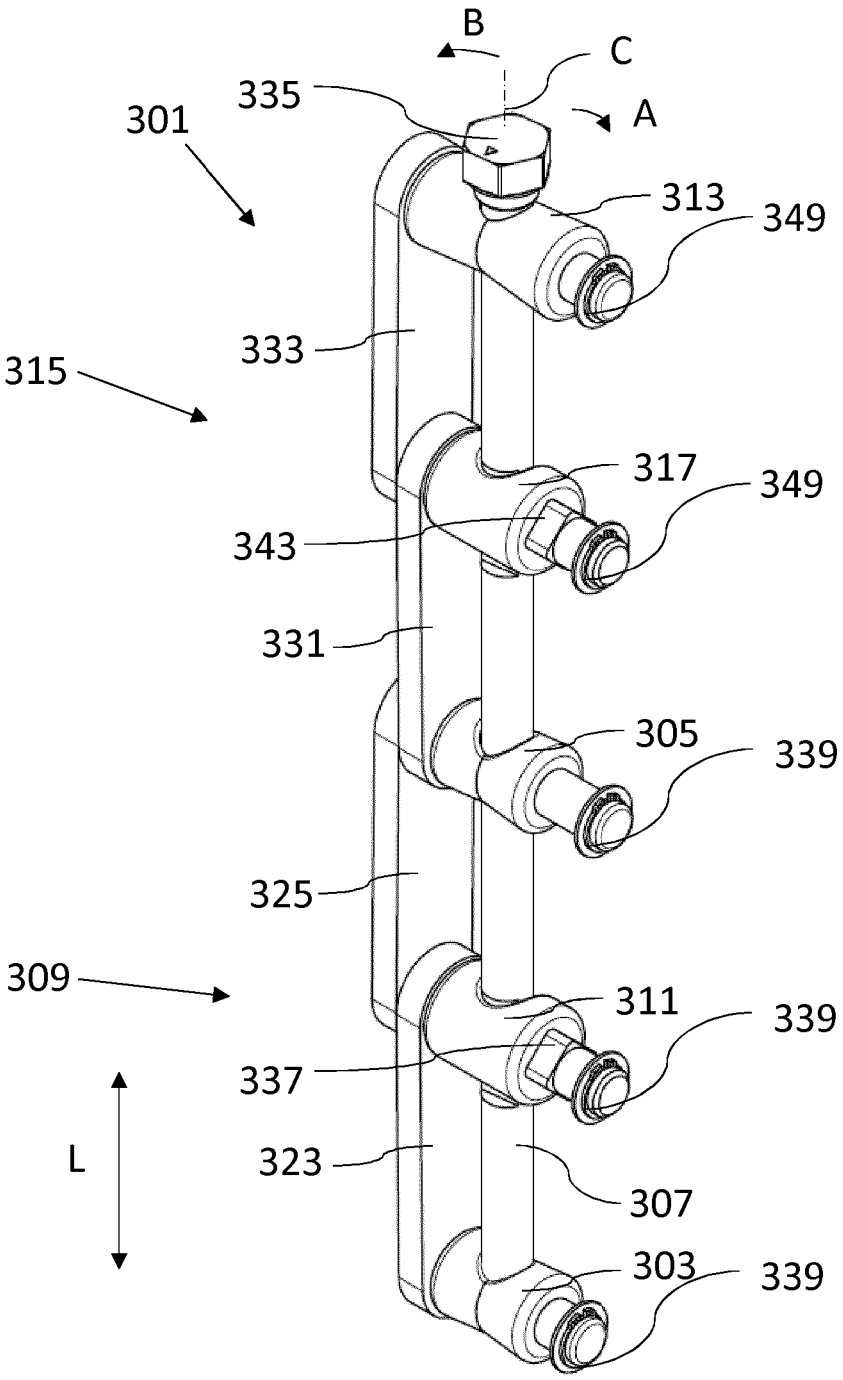
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Fig. 10

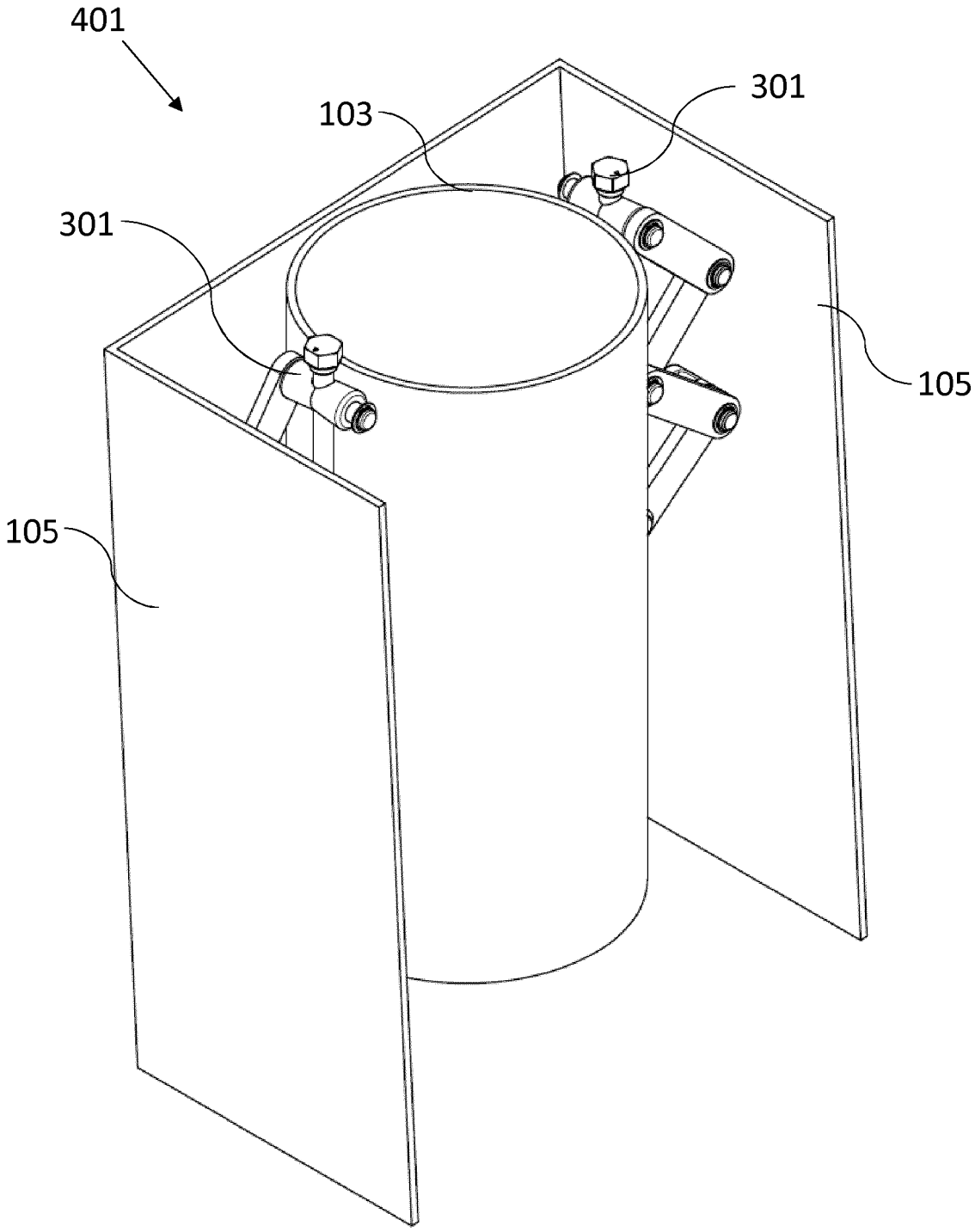

Fig. 11

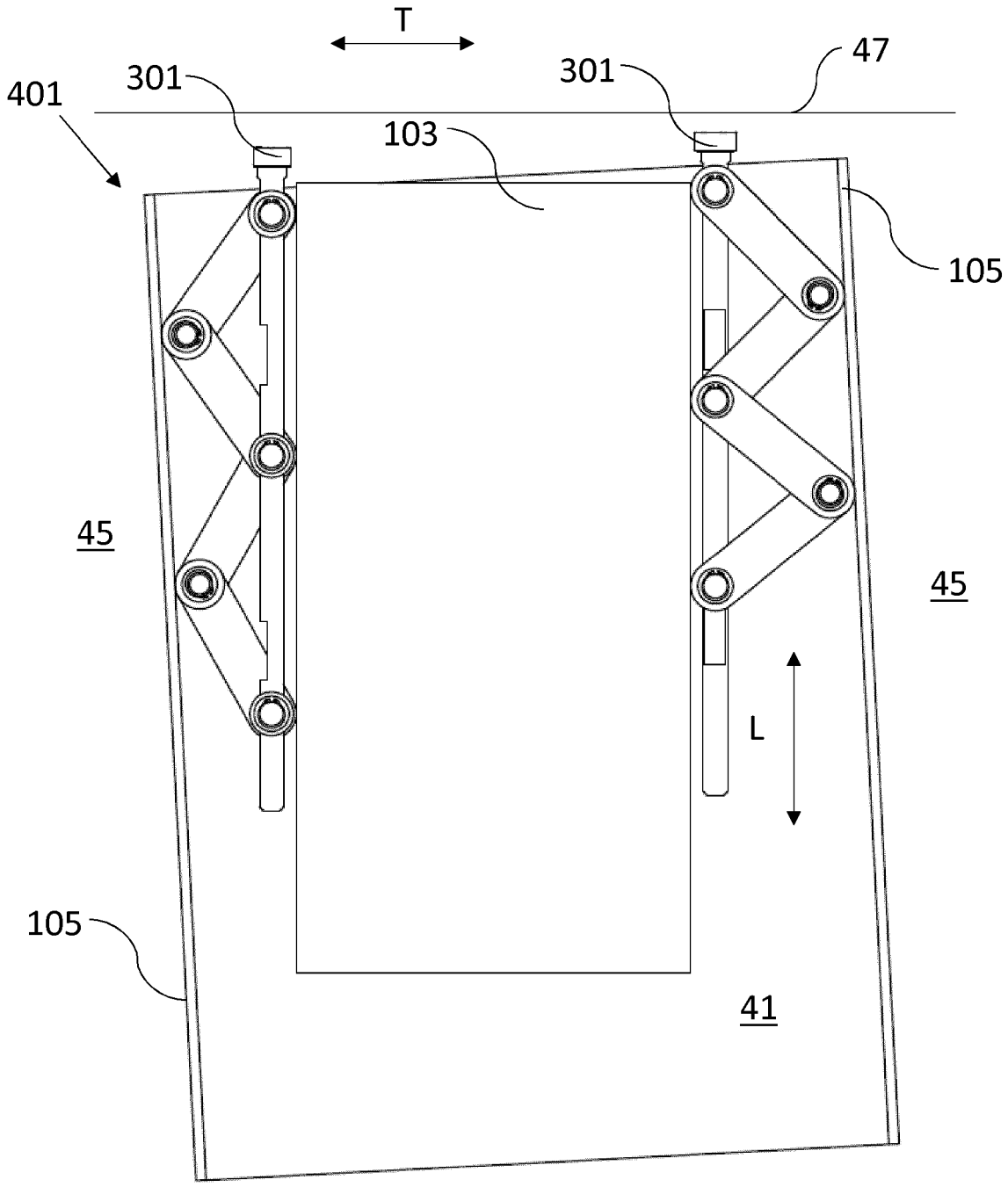

Fig. 12

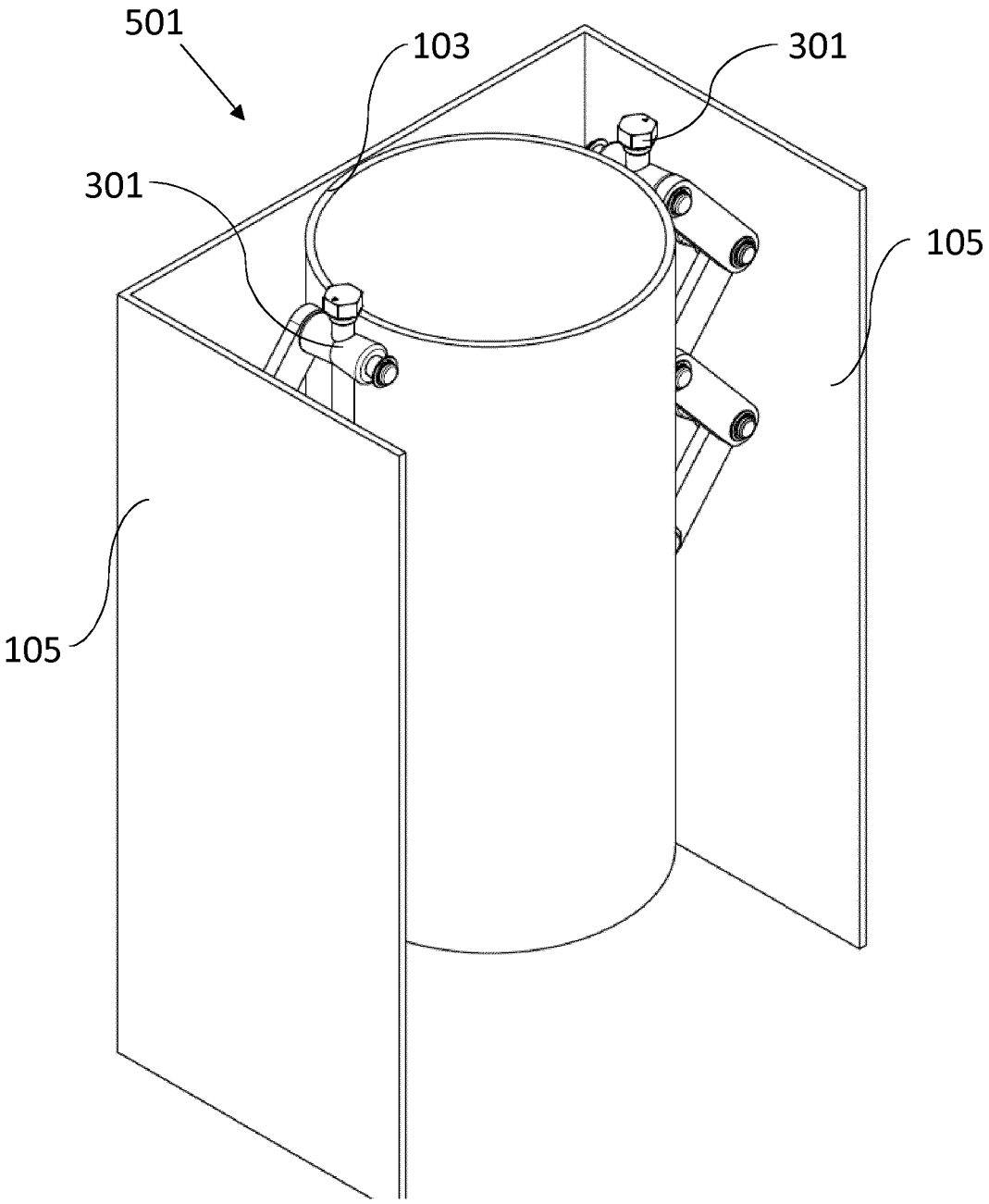

Fig. 13

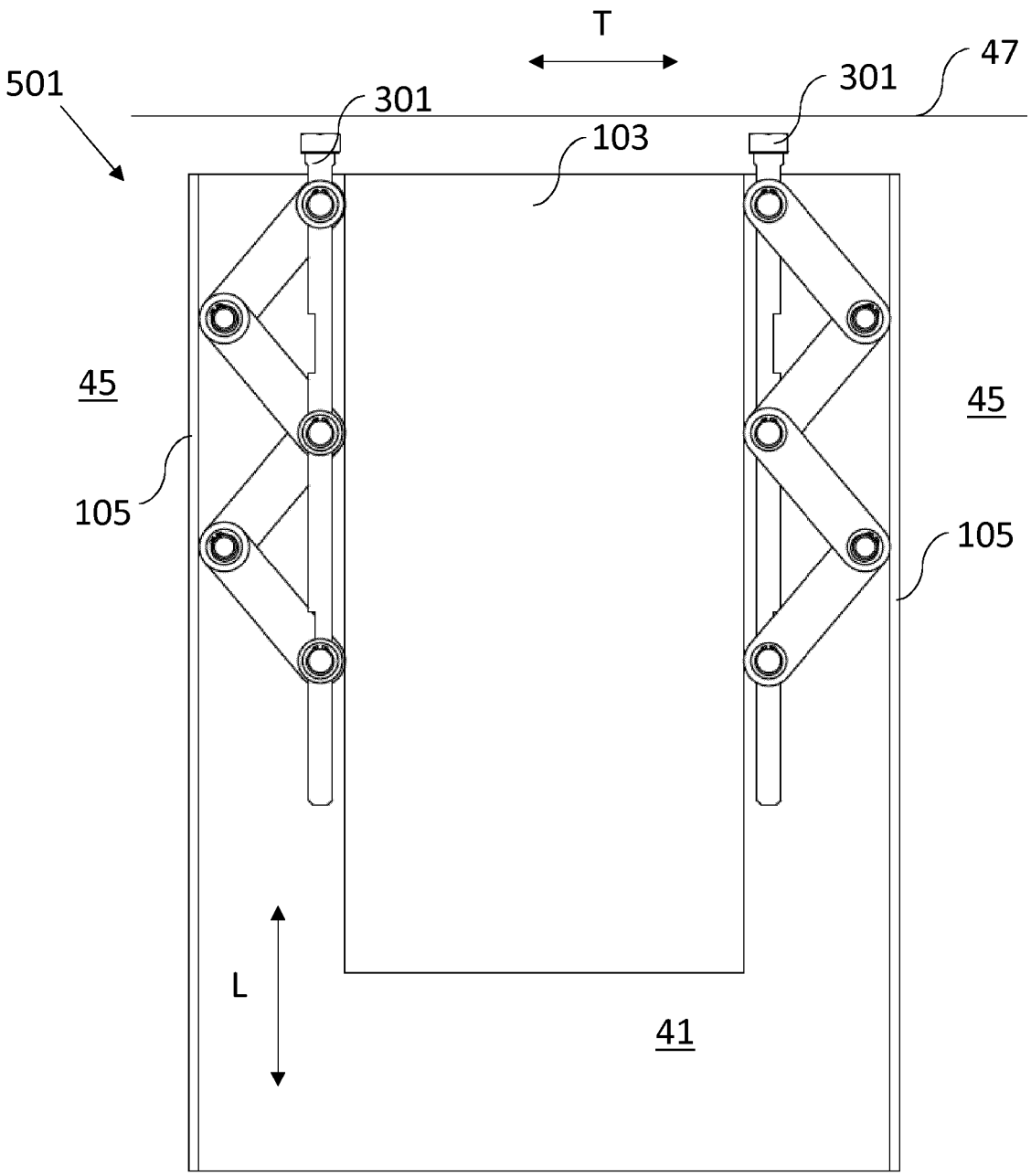

Fig. 14

REFERENCES CITED IN THE DESCRIPTION

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