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(71) Applicant: **RS ENGINEERING Sp. z o.o.**
22-600 Tomaszów Lubelski (PL)

(72) Inventor: **RACZKIEWICZ, Krzysztof**
22-600 Tomaszów Lubelski (PL)

(74) Representative: **Malcherek, Piotr**
Rzecznicy Patentowi INVENT Sp. z o.o.
ul. Gen. Ch. de Gaulle'a 8
43-100 Tychy (PL)

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(54) **PALLET**

(57) Transportation pallet having a base (1) with a side beam (1a). First beams (3a) of a support (3) are attached to end parts of the side beam (1a) by means of first hinges and these first beams (3a) of the support (3) are foldable towards the base (1). End of each first beam (3a) of the support (3) is connected by means of a second

hinge (4) with a second beam (3b) of the support (3) and these second beams (3b) are foldable outwards the base (1). In addition, a backing stand beam (6) is attached by means of a third hinge to the base (1) at end parts of the side beam (1a), and said backing stand beams (6) are foldable towards the middle of the side beam (1a).

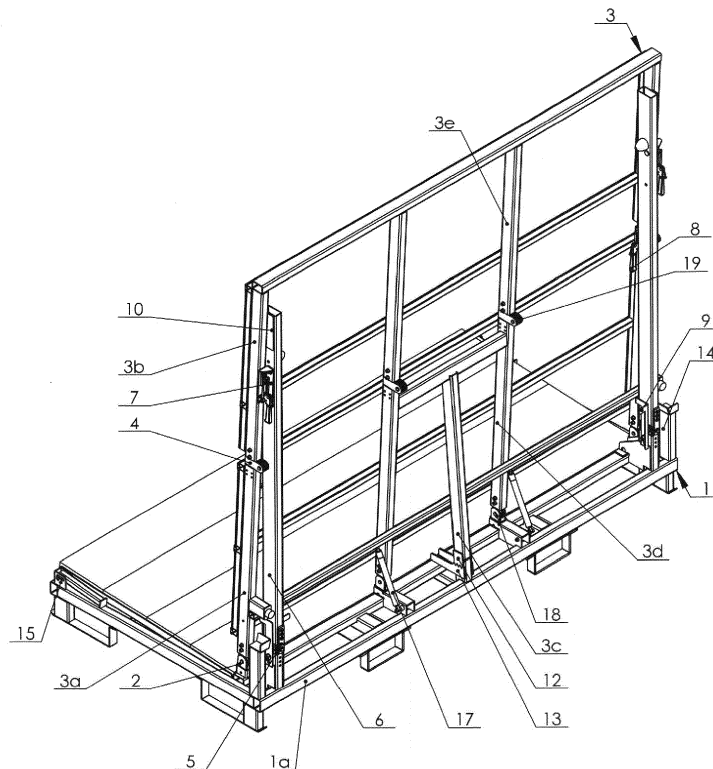


Fig. 1

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Description

[0001] The invention relates to a transportation pallet and more specifically to a pallet for transportation of boards or windows. The pallet is foldable, which enables transporting many empty pallets within a confined loading space.

[0002] Utility model application PL125189U discloses a standing rack designed for transportation of windows and having a structure made up of a base connected pivotally with a backing stand where the stand can be locked in vertical position by means of dedicated pins inserted into pivoting hinges. In addition, the standing rack has two brackets to support the base after having it folded onto the backing stand initially turned to the horizontal position, whilst positioning studs are used to fix positions of empty racks after having empty racks stacked to high heaps.

[0003] Patent application DE4135677A1 discloses a cargo carrier with a rectangular shape with four poles in corners, the pallet base and two open transverse sides as well as side walls. The right-hand side wall is made up of two parts, i.e. a top one and a bottom one that are pivotally connected and can rotate one against another around a common horizontal axis. Similarly, the left-hand side wall is also made up of two parts, i.e. a top one and a bottom one to enable rotation of them against a common horizontal axis. Both the bottom part of the right-hand side wall and the bottom part of the left-hand wall are each fixed to swivel about the axes on a holder.

[0004] Patent FR2757831B1 discloses a pallet that is made up of a platform supported on four legs and a foldable back frame. The frame is provided on one side of the platform and its two parts are extended vertically to support goods to be placed onto the pallet. Detachable hinges of frame type have sleeves to embrace a transverse bar that can be inserted to fix the frame in vertical position whilst the posts are furnished with lugs to enable easy handling.

[0005] Patent application JPH111231A discloses a pallet that has a right-hand side and a left-hand side posts pivotally attached to the base by means of hinges. These posts serve as supports for pinching members that are movable seated on these posts and can be locked by means of a pair of fixing devices. After placing a bay window under a vertical posture on the base, the pair of pinching members are moved to supporting positions, so the vertical edge parts of the bay window can be pinched.

[0006] Utility model application CN204137553U discloses a shelf for storage of glass parts, which comprises a base, wherein the base is defined by two longitudinal rods and two transverse rods and is of a frame type structure. Triangular supports are correspondingly and fixedly arranged on the two longitudinal rods, a cross beam is arranged between the tops of the triangular supports, and a plurality of sliding bodies which are capable of relatively sliding along the two transverse rods and the cross beam are arranged between the two triangular supports.

Each sliding body comprises a sliding beam arranged between the two transverse rods in a sliding mode and a sliding support, wherein the top end of the sliding support is arranged on the cross beam in a sliding mode, and the bottom end of the sliding support is fixedly connected with the corresponding sliding beam. The upper planes of the sliding beams are flush with the upper planes of the two longitudinal rods.

[0007] Patent application WO2017069496A1 discloses a cassette and a method of packaging a plurality of glass plates. The cassette comprises a bottom cover that serves as a support frame for bottom surfaces of the plurality of glass substrates, and a back cover connected to the bottom cover and designed to support the back surface of the cassette. The front surface, which faces the cassette, of the back frame is a vertical surface and the upper surface, which faces the cassette, of the bottom frame is a horizontal surface.

[0008] Patent US5388532A discloses a pallet for moving and holding glass plates of various sizes, which include a rectangular floor framework, a front stanchion inserted into a front stanchion support disposed at each front corner of the floor framework. A rear stanchion is inserted into a rear stanchion support disposed at each rear corner of the floor framework. A rear framework is supported by the rear stanchions. Additionally a headrest is supported by the rear framework. Longitudinally extending floor beams are supported by the floor framework. An assembly of a bar and pin is designed for stepwise adjusting the levels of the front stanchions, the headrest, the distances between the floor beams. Additionally there is disclosed an assembly for transversely bringing down and pulling up the front stanchion and stanchion supports and assembly for transversely bringing down and pulling up the rear stanchion and stanchion support.

[0009] Patent US2009071381A1 discloses a pallet designed to hold at least one window frame. The pallet includes a base and movable sides pivotally attached to the base. The movable sides are positionable to be substantially perpendicular to the base and are configured to hold the window frame. Connectors attached to the base and the movable sides, respectively, prevent the first and second movable sides from moving away from each other. A method for using the pallet is also disclosed.

[0010] Patent application JPH11227771 discloses a carry pallet for carrying objects. The pallet includes a receiver with a roller for vertically mounting each opening member on a base panel of a pallet and includes a cushioning partition sheet. The partition sheet is disposed in between of opening members of the receiver base with a roller and bound with a belt to fix, thereby allowing a bare opening member without packing to be carried.

[0011] Patent application CN102363556A discloses a double-station frame for glass objects. It comprises a frame body for stacking glass slantwise, and is characterized in that the glass frame body is provided with a double-station stacking platform and a manual operation

platform is arranged in the middle of the double-station stacking platform.

[0012] Utility model application CN203753630U discloses a glass transportation device that comprises a support frame. Wheels are arranged at the bottom of the support frame, and a telescopic support is installed on the support frame and is of a U-shaped structure. The telescopic support comprises a leaning support. Additionally telescopic rods are arranged on two sides of the leaning support, while vertical rods are arranged on the support frame. The telescopic rods are installed in the vertical rods in an inner embedding mode.

[0013] Utility model application CN203753630U discloses a glass transportation fixing frame. The glass transportation fixing frame comprises a plurality of supporting rods and a horizontal bottom frame. The bottom frame is provided with two parallel side rods and fixedly connected with a guiding rod. The guiding rod is in sliding connection with fixing rods. Locating parts are arranged between the fixing rods and the guiding rod. The supporting rods are tubular, one ends of the supporting rods are connected to the side rods in a sliding mode, and the other ends of the supporting rods are connected with telescopic rods in an inserting mode. The free ends of the telescopic rods are connected to the fixing rods in a sliding mode. Fixing parts are arranged between the telescopic rods and the supporting rods. The supporting rods are connected with holding rods in a sliding mode.

[0014] The problem that is to be resolved consists in transportation of a plurality of products that represent fragile items, for instance glass panels or windows, that are to be placed on plurality of pallets and put into a confined transportation space, for instance semitrailers of trucks. After delivery to the destination site, empty pallets are returned and must take minimum space in a single, limited cargo space.

[0015] The invention relates to a pallet that is described in the preamble to the independent claim No. 1. The invention consists in that end of each first beam of the support is connected by means of a second hinge with second beam of the support foldable outwards of the base and each end part of the side beam of the base is attached by means of a third hinge to a backing stand beam, where said backing stand beams are foldable towards the middle of side beam.

[0016] Preferably a safeguarding mechanism is provided between the second beam of the support and the backing stand beam. In addition, a second safeguarding mechanism is provided between the first beam of the support and the second beam of the support. In addition, a locking mechanism is attached to the bottom end of the backing stand beam to fix position of that beam with respect to the base. Moreover, a first engagement is attached to the upper end of the backing stand beam and the said first engagement is engaged with a second engagement attached to the end part of the second beam of the support. Furthermore, a central beam of the support is fixed to the support and is arranged between the

first beams of the support and the bottom end of said central beam is provided with a third engagement that is engaged with a fourth engagement fixed to the base. One more beam extending towards the base is attached to the upper part of the support and said beam rests on the end of the backing stand beam. In addition a gas-filled damping device is provided between the base and the support. Fixed foot extending upwards and /or foldable foot are attached to corners of the base.

[0017] The beneficial effect of this invention is the possibility to safely transport and store goods with the possibility to fold empty pallets and move them inside a one confined cargo space, for instance a truck semitrailer. Application of safeguarding and locking mechanisms prevents from uncontrolled folding of the support. In addition, the engagements make the connections between individual members more rigid, which improves stability of the structure. It is important for pallets having large size of whole structure. Application of such engaging members increases friction surfaces, which enhances rigidity of the whole structure. Folded foot and / or foot extending upwards enable steady stacking of pallets one on another in rectangular heaps, which improves safety during transportation of empty pallets. Application of a gas-filled damper device also improves safety of pallets handling.

[0018] The invention according to its embodiments is presented in details on the attached drawings where:

Fig. 1 presents an isometric top view of the pallet according to the first embodiment of the invention and in the unfolded mode,

Fig. 2 is a front view of the pallet according to the first embodiment of the invention and in the unfolded mode,

Fig. 3 is a cross-section view of the pallet according to the first embodiment of the invention, taken at the A-A plane,

Fig. 4 is a cross-section view of the pallet according to the first embodiment of the invention, taken at the B-B plane,

Fig. 5 is an isometric top view of the pallet according to the first embodiment of the invention and after the second step of folding,

Fig. 6 is an isometric top view of the pallet according to the first embodiment of the invention and after the third step of folding,

Fig. 7 is an isometric top view of the completely folded pallet,

Fig. 8 is an isometric top view of the pallet according to the second embodiment of the invention in the

unfolded mode.

[0019] The pallet according to the first embodiment of the invention has a width for instance of 1.2 m, length of 2.4 m and the total height in the unfolded mode of 2.1834 m. The base is covered with wooden planks. The first beam 3a of the support 3 is attached to each end of the side beam 1a by means of the first hinge 2, and is foldable towards the center of the base 1. A second beam 3b of the support 3 is attached to each first beam 3a of the support 3 by means of a second hinge 4, and is foldable outwards of the base 1. In turn, one backing stand beam 6 is attached to the base 1 nearby each end of the side beam 1a by means of a third hinge 5. Beams 6 are foldable towards the middle of side beam 1a. Between the second beam 3b of the support 3 and the backing stand beam 6 there is a safeguarding mechanism 7 designed as a lever handle. Similarly, between the first beams 3a of the support 3 and the second beams 3b of the support 3 there are second safeguarding mechanisms 8 designed as a lever handle. The bottom end of the backing stand beam 6 is provided with a locking mechanism 9 designed to lock position of that beam against the base 1. The top end of the backing stand beam 6 is provided with a first engagement 10 that engages with the second engagement 11 attached to the end part of the second beam 3b of the support 3. In the middle part of the side beam 1a there are attached two central support beams 3d of the support 3 by means of fourth hinges 18. The second support beams 3e of the support 3 are attached to the said beams 3d by means of fifth hinges 19. The support 3 comprises also a central beam 3c that is provided between the first beams 3a of the support 3 and that has the third engagement 12 provided at its bottom end and engaged with the fourth engagement 13 fixed to the base 1. The central beam 3c itself is T-shaped and two upper ends of the T bar are attached to top ends of the central support beams 3d of the support 3. Foot 14 extending upwards are mounted at corners of the base 1 at the side of the beams of the support 3 whilst foldable foot 15 are provided at the opposite side of the base 1. At least one gas-filled damping device 17 is mounted between the base 1 and the support 3. Specifically, the present embodiment of the invention has two said gas-filled damping devices 17, where one end of said devices is attached to the base 1 and the other ends of them are attached to bottom ends of the central support beams 3d of the support 3.

[0020] The invention according to the second embodiment has a width for instance of 1.2 m with the length of 1.5 m and the total height in the unfolded position of 2.1834 m. Its design is similar to the first embodiment with only minor differences. In this embodiment the invention does not have central support beam 3c which is substituted with one support beam 3d of the support 3 and one piece of the second support beam 3e of the support 3. In addition, a beam 16 extending towards the base 1 is fixed to the upper part of the support 3 and its

end rests on the end of the backing stand beam 6.

Key for figures:

5 [0021]

- 1 - base
- 1a - side beam
- 2 - first hinge
- 3 - support
- 3a - first support beam
- 3b - second support beam
- 3c - central support beam
- 3d - load-bearing beam of the support
- 3e - second load-bearing beam of the support
- 4 - second hinge
- 5 - third hinge
- 6 - backing stand beam
- 7 - safeguarding mechanism
- 8 - second safeguarding mechanism
- 9 - locking mechanism
- 10 - first engagement
- 11 - second engagement
- 12 - third engagement
- 13 - fourth engagement
- 14 - fixed foot
- 15 - folded foot
- 16 - beam
- 17 - gas-filled damping device
- 18 - fourth hinge
- 19 - fifth hinge

Claims

1. Transportation pallet having a base (1) with a side beam (1a), where first beams (3a) of a support (3) foldable towards the base (1) are attached to each end part of the said side beam (1a) by means of first hinges (2), **characterized in that** end of each first beam (3a) of the support (3) is connected by means of a second hinge (4) with second beam (3b) of the support (3) foldable outwards of the base (1) and each end part of the side beam (1a) of the base (1) is attached by means of a third hinge (5) to a backing stand beam (6), where said backing stand beams (6) are foldable towards the middle of side beam (1a).
2. Transportation pallet according to Claim 1, **characterized in that** a safeguarding mechanism (7) is provided between the second beam (3b) of the support (3) and the backing stand beam (6).
3. Transportation pallet according to Claim 1 or 2, **characterized in that** a second safeguarding mechanism (8) is provided between the first beam (3a) of the support (3) and the second beam (3b) of the support (3).

4. Transportation pallet according to one of the Claims 1 to 3, **characterized in that** a locking mechanism (9) is attached to the bottom end of the backing stand beam (6) and the locking mechanism is designed to fix position of said backing stand beam (6) with respect to the base (1). 5

5. Transportation pallet according to one of the Claims 1 to 4, **characterized in that** a first engagement (10) is attached to the upper end of the backing stand beam (6) and said first engagement is engaged with a second engagement (11) attached to the end part of the second beam (3b) of the support (3). 10

6. Transportation pallet according to one of the Claims 1 to 5, **characterized in that** a central beam (3c) of the support (3) is attached to the support (3) between the first beams (3a) of the support (3), where the bottom end of said central beam (3c) is provided with a third engagement (12) that is engaged with a fourth engagement (13) fixed to the base (1). 15 20

7. Transportation pallet according to one of the Claims 1 to 6, **characterized in that** a beam (16) is attached to the upper part of the support (3) and said beam (16) extends towards the base (1) and rests on the end of the backing stand beam (6). 25

8. Transportation pallet according to one of the Claims 1 to 7, **characterized in that** at least one gas-filled damping device (17) is provided between the base (1) and the support (3). 30

9. Transportation pallet according to one of the Claims 1 to 8, **characterized in that** foot are mounted in corners of the base (1). 35

10. Transportation pallet according to Claim 9, **characterized in that** the said foot are fixed members (14) and extend upwards. 40

11. Transportation pallet according the Claims 9 or 10, **characterized in that** the said foot are foldable members (15). 45

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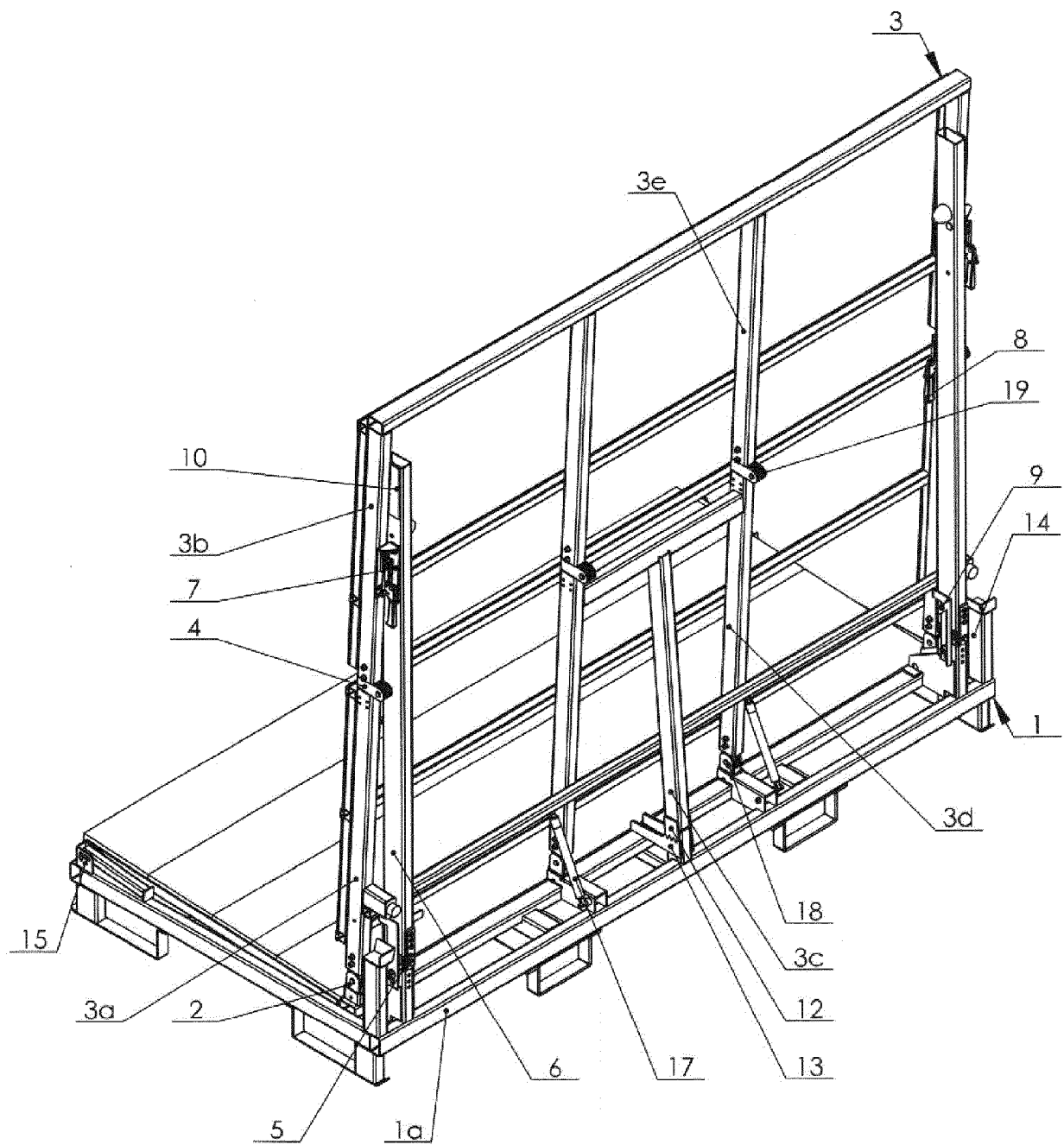


Fig. 1

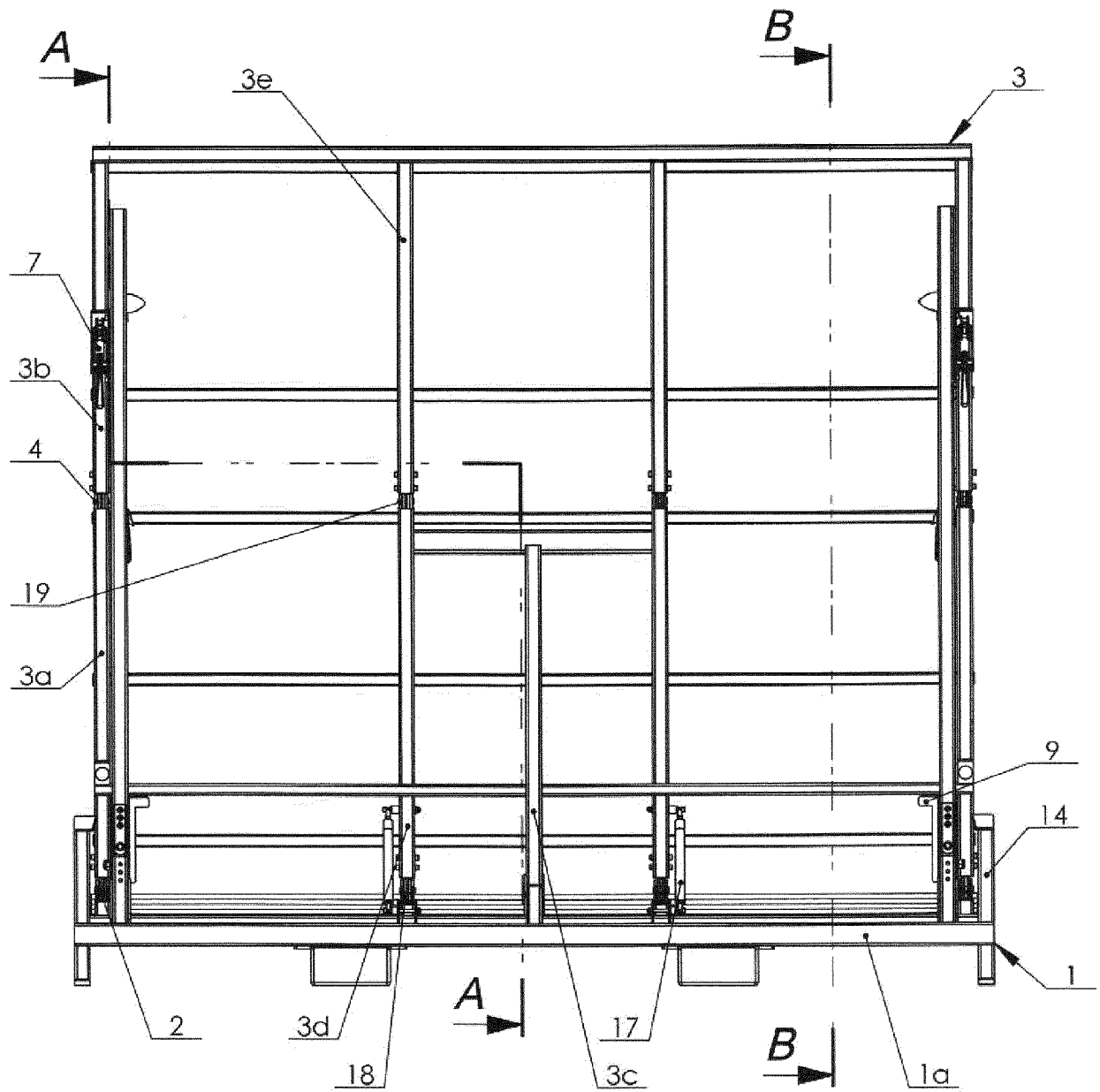


Fig. 2

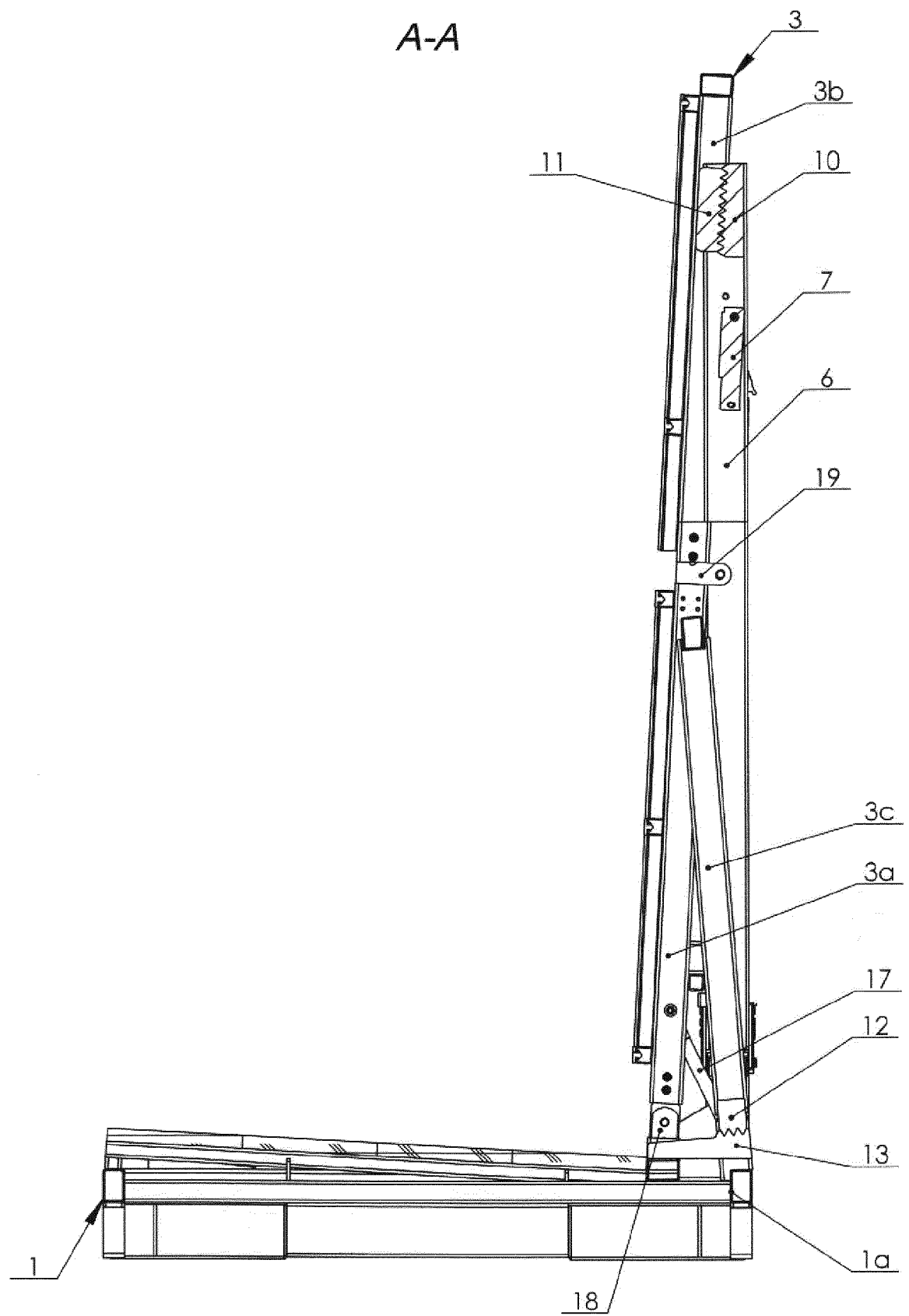


Fig. 3

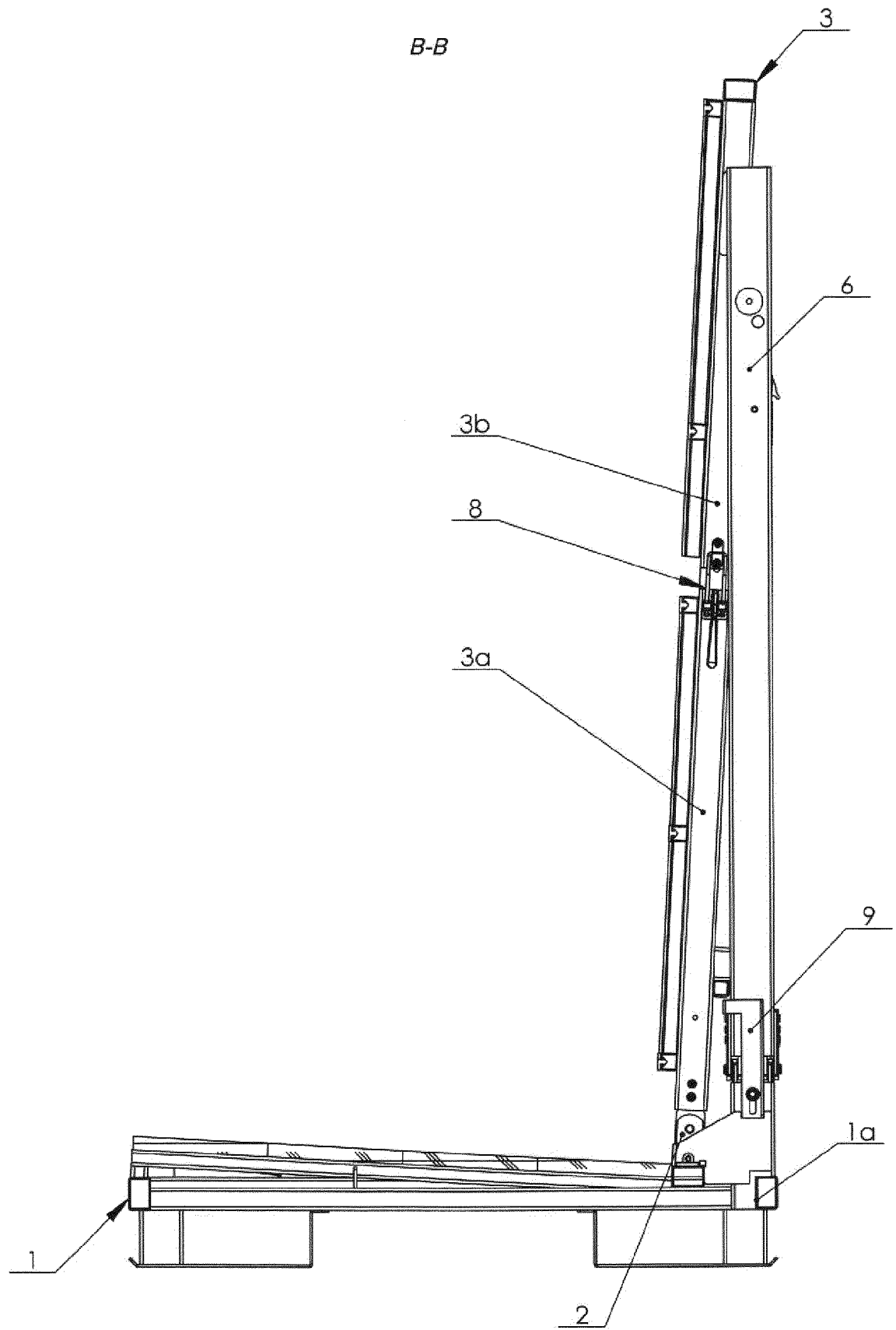


Fig. 4

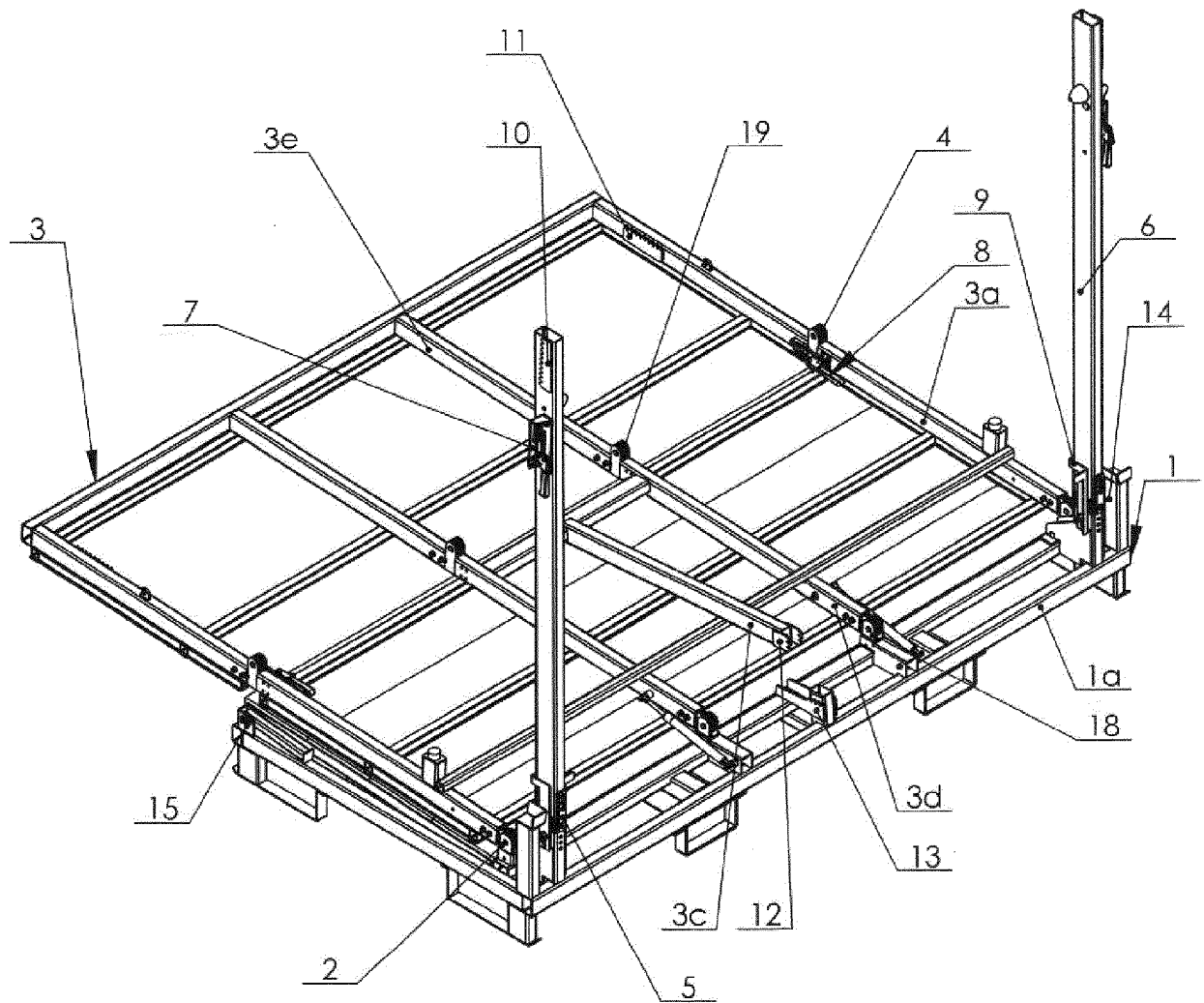


Fig. 5

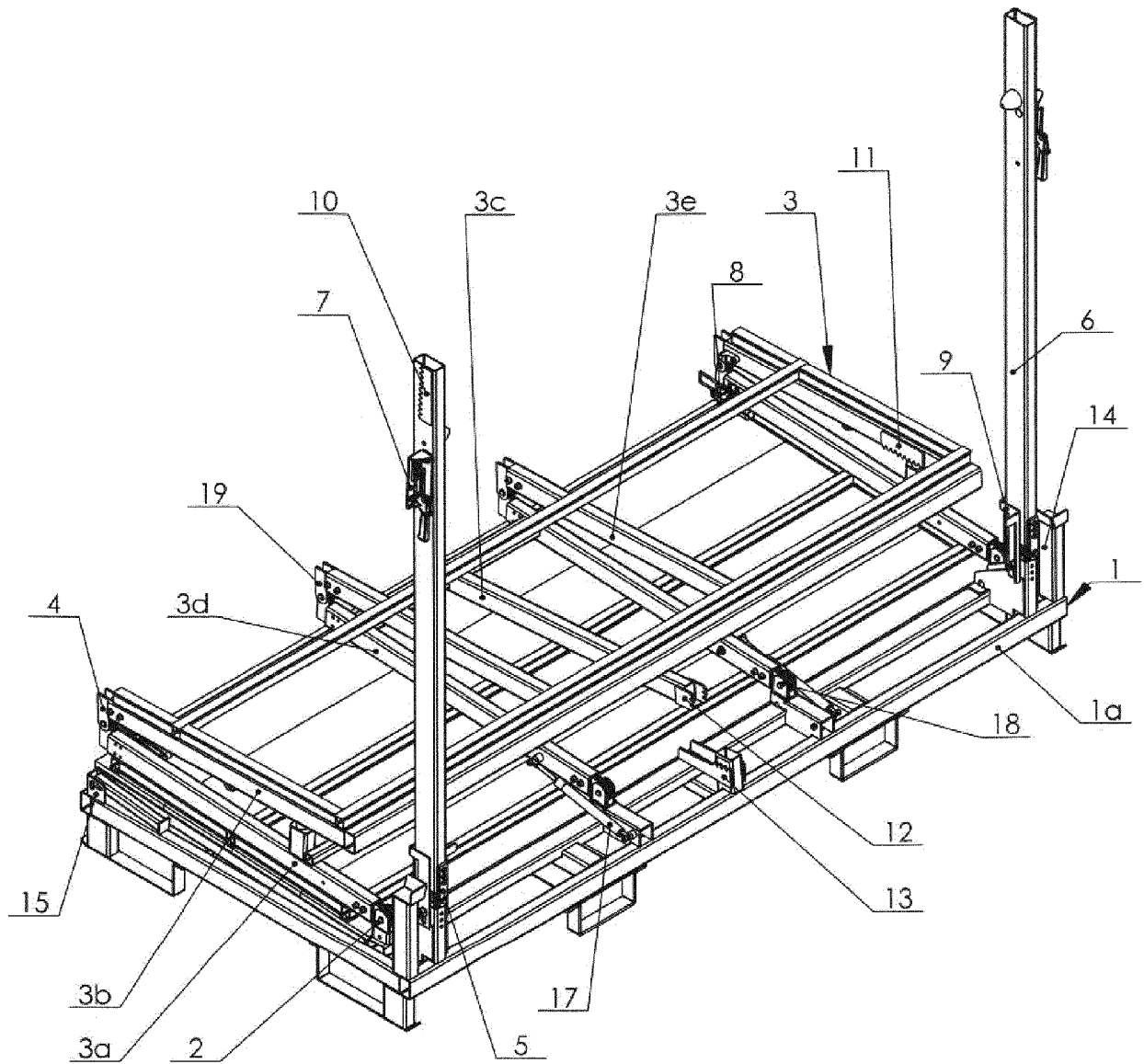


Fig. 6

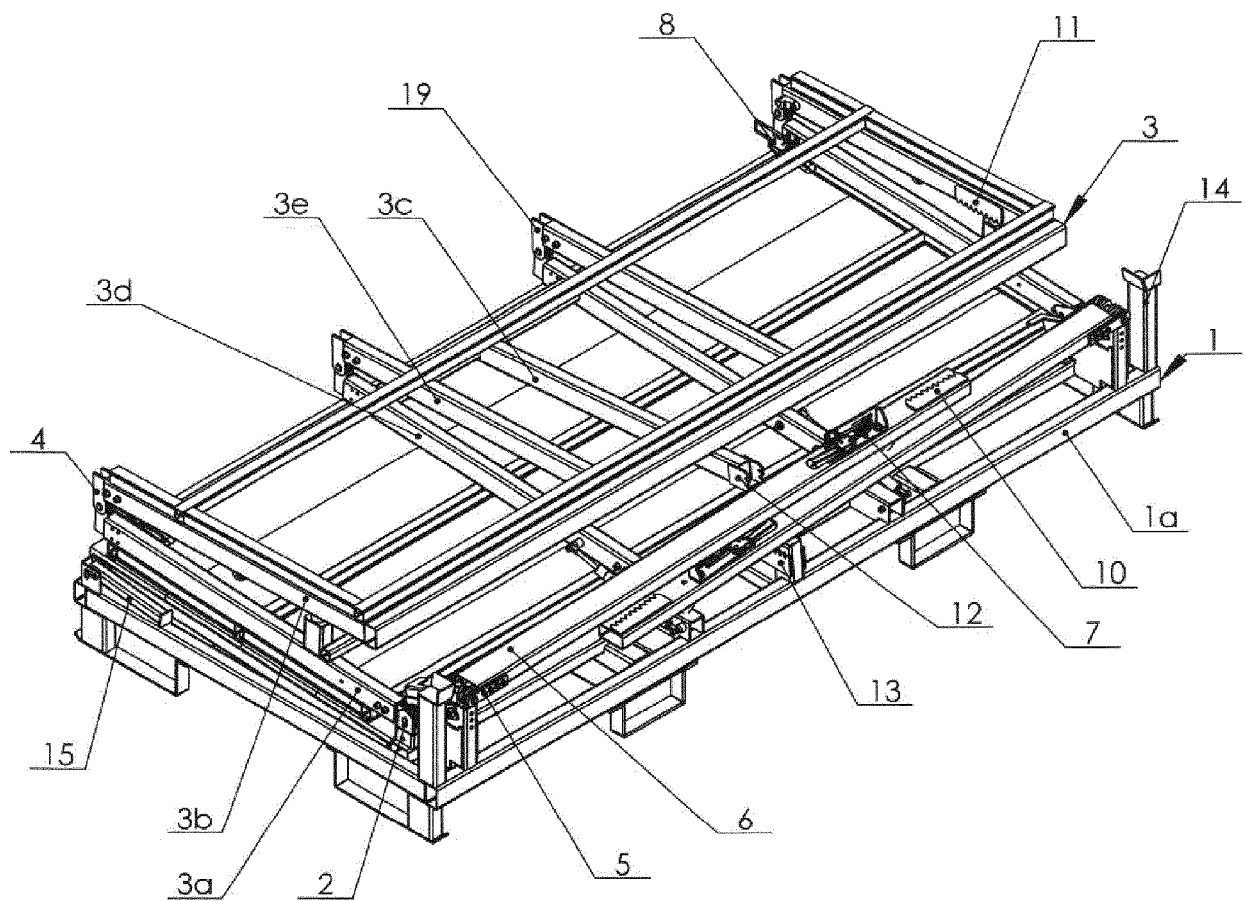


Fig. 7

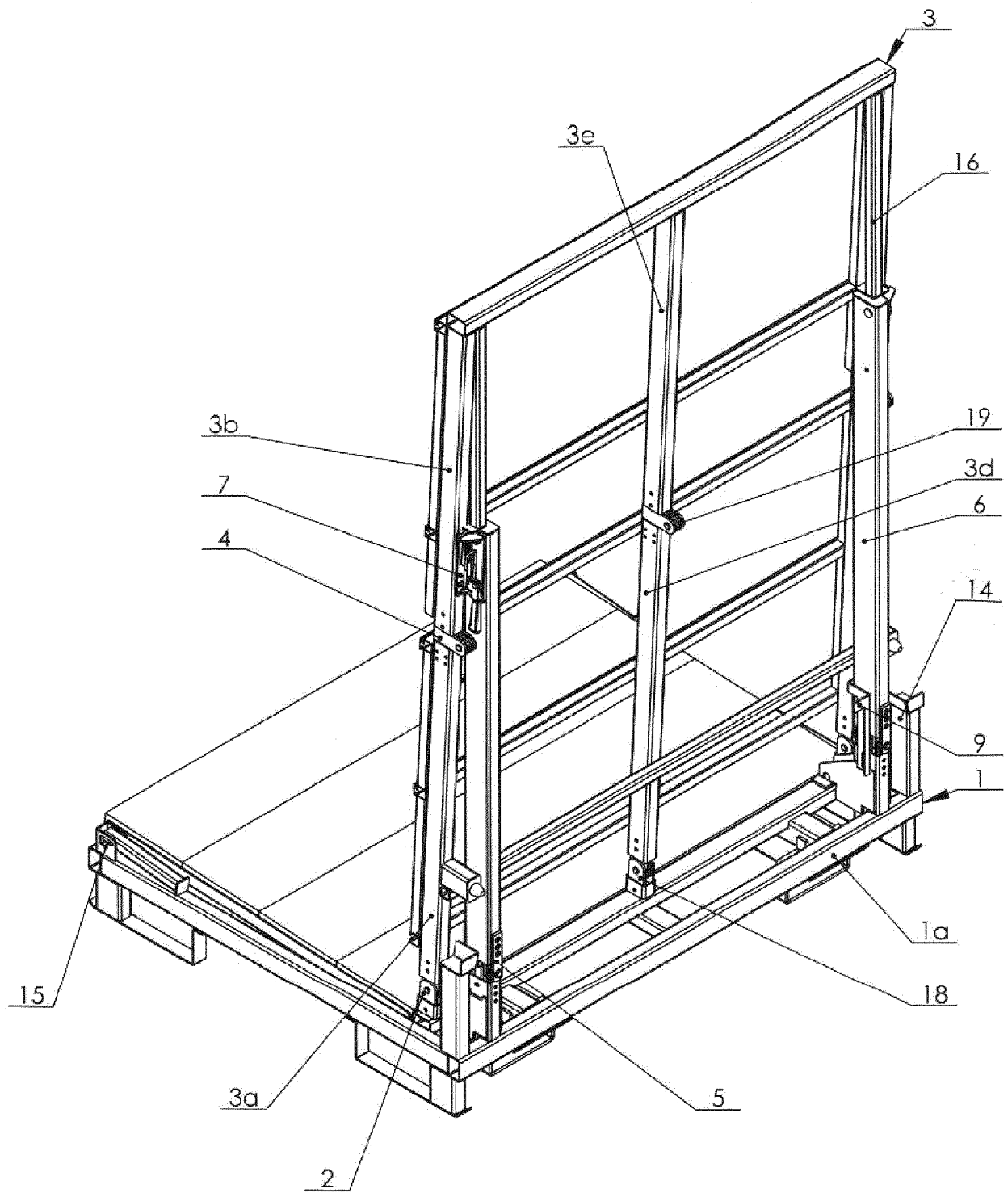


Fig. 8



EUROPEAN SEARCH REPORT

Application Number
EP 18 21 4847

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 July 2019	Examiner Fitterer, Johann
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