(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 815 833 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.08.2007 Bulletin 2007/32

(51) Int Cl.:
A61G 3/00 *(2006.01)*

(21) Application number: **06127258.9**

(22) Date of filing: **27.12.2006**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **06.02.2006 IT TO20060079**

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(54) **Convertible motor vehicle provided with a transport structure for a patient**

(57) A convertible motor vehicle (100) has a passenger compartment accommodating a driver seat and a passenger seat (105) and a trunk (103), where fastening members (110) are provided to support baggage retaining catches; a transport structure (101) for a patient is fittable within the motor vehicle (100) and is provided with a pair of rails (1, 2) for a stretcher (30); the rails (1, 2) are supported by front and rear supporting members (4, 17) and have a front portion which is arranged above a reclined backrest of the passenger side front seat (105) when the transport structure (101) is fitted; furthermore, again when the transport structure (101) is fitted, the rear supporting members (17) are releasably fastened to the fastening members (110).

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Description

[0001] The present invention relates to a convertible motor vehicle provided with a transport structure for a patient.

[0002] The present invention arises from the need to implement a transport structure for a patient, which is fittable on a vehicle which was granted type-approval for passenger transport, specifically on a motor vehicle which was granted type-approval for five people. In this manner, a vehicle employed for private use, for example to get to work, may exhibit, in case of need, the ability to transport a patient and perform a function similar to that of an ambulance.

[0003] Specifically, the need is felt to fit the transport structure in a simple and removable manner to be able to convert the ambulance back into a normal vehicle for passenger transport.

[0004] It is the object of the present invention to implement a convertible motor vehicle provided with a transport structure for a patient, which allows to meet the above-mentioned needs in a simple and cost-effective manner.

[0005] According to the present invention, a convertible motor vehicle is implemented, comprising:

- a passenger compartment accommodating a driver seat and a passenger seat;
- a trunk;
- fastening means arranged in a rear area of said trunk in a fixed position to support baggage retaining means;

characterised in that it comprises a transport structure for a patient fittable within the motor vehicle and comprising a pair of rails which are supported by supporting members and are adapted to support a stretcher; when said transport structure is fitted, a front portion of said rails being arranged above a reclined backrest of said passenger side front seat, and said supporting members comprising rear supporting members releasably fastened to said fastening means.

[0006] For a better understanding of the present invention, a preferred embodiment will now be described, by way of mere non limitative example, with reference to the accompanying drawings, in which:

- Figure 1 shows a partial and rear perspective view of a preferred embodiment of the convertible motor vehicle provided with a transport structure for a patient according to the present invention;
- Figure 2 is a partial bottom view of a frame of the transport structure in Figure 1;
- Figure 3 is a section of Figure 2 according to line III-III;
- Figure 4 is a side view of the frame in Figure 2;
- Figures from 5 to 9 are enlarged scale views of details associated to the frame in Figure 4; and
- Figures from 10 to 12 are views of enlarged details of a stretcher of the transport structure in Figure 1.

[0007] In Figure 1, numeral 100 shows, as a whole, a convertible motor vehicle comprising a trunk 103 and a passenger compartment 104, which accommodates a driver side front seat 106, a passenger side front seat 105, and a rear seat 107.

[0008] In Figure 1, the backrests of the seats 105 and 107 are reclined forward, whereas the passenger compartment 104 and the trunk 103 communicate with each other and accommodate a structure 101 for the transport of a patient. The structure 101 comprises two groups which respectively define a fixed system 40 and a mobile system 30.

[0009] The fixed system 40 (Figure 2) comprises two rails 1, 2, which are parallel and reciprocally transversely spaced apart by a track gauge which is adapted to accommodate the mobile system 30 running on the rails 1, 2 by means of wheels 50.

[0010] The rails 1, 2 are made of a cold-formed steel sheet (approximately 1 mm in thickness) having a "C"-shaped cross-section. Furthermore, the rails 1, 2 have a length of approximately 2.000 mm.

[0011] A rear end of the rails 1, 2 is adjacent to the rear end of the trunk 103 and, therefore, to the closing hatchback door (not shown) of the trunk 103, and has a diverging lead-in shape to facilitate the entrance of the wheels 50 of the mobile system 30.

[0012] The rails 1, 2 are connected to each other by means of four ties 7 (Figure 2) made of a cold-formed steel sheet (2 mm in thickness) having an "omega"-shaped cross-section (Figure 3). The four ties 7 are welded to the rails 1, 2.

[0013] Two horizontal axis hinges 3 connect a front portion and a rear portion of the rails 1, 2 to each other (Figure 4) in order to adapt the position of the fixed system 30 to the dimensions of the seats 105 and 107 when the seats 105 and 107 have the corresponding backrests reclined forward. As mentioned above, such backrests are reclined forward so as to take a horizontal position, when the fixed system 40 has to be fitted. Therefore, the front portion of the rails 1, 2 remains arranged above the reclined backrest of the seat 105.

[0014] In order to protect the seat, the front portion of the frame rests on the reclined backrest of the seat 105 by means of the interposition of a terry towelling having an appropriate hardness.

[0015] The frame formed by the rails 1, 2 and the ties 7 is supported by four legs which are connected to the supporting structure of the motor vehicle 100 at fixed positions and in a releasable manner.

[0016] With specific reference to Figure 4, two front legs 4 are hinged to the rails 1, 2 by means of horizontal axis hinges 20, so that the legs 4 may be closed along the rails 1, 2 when the fixed system 40 is not installed.

[0017] With reference to Figure 5, when the fixed system 40 is installed, the rear ends of the legs 4 respectively

engage with a bracket 8 and a bracket 10, which are releasably fastened to the longitudinal guides A of the front seats, specifically the guides A of the seat 105.

[0018] The brackets 8, 10 are made of a cold-formed steel sheet (2 mm in thickness) and are designed so as to be fastened to the guides A by means of screws (not shown), without the guides A having to be modified, preferably by means of the interposition of corresponding additional plates 9 (Figure 6) and 11 (Figure 5).

[0019] With reference to Figure 7, the legs 4 have a hollow rectangular cross-section (approximately 60 mm by 30 mm, with a thickness of 2 mm) and are clamped in the brackets 8, 10 with a coupling of the bayonet type, with a slight interference. Specifically, each leg 4 is coupled to the corresponding bracket 8, 10 by aligning on a corresponding clutching member 12, which comprises a lower parallelepipedal portion accommodated in fixed position in a seat carried on the bracket 8, 10, and an upper portion 12d tapered upward to facilitate the coupling to the leg 4.

[0020] With reference to Figure 4, the rear portion of the frame is supported by two rear vertical appendixes 6 which are made of two steel tube slugs (with a diameter of 30 mm and a length of 125 mm, approximately) and are inserted in seats defined by corresponding tubular members 17. The tubular members 17 define the rear legs of the fixed system 40 along with the appendixes 6, and are welded to a sheet plate support 13 substantially having an "L"-shaped side profile.

[0021] With reference to Figures 8 and 9, the support 13 has a substantially horizontal base wall and a substantially vertical rear wall which rests against a striker plate, also referred to as "suitcase protection band" (schematically shown by a dot-and-dash line in Figure 9), which rearwardly defines the trunk 103 and has a curved profile with forward facing concavity, as seen in plan.

[0022] The support 13 is connected in fixed position in the trunk 103 by employing fastening means 110 (schematically shown in Figure 9) which are already provided as a normal production equipment in fixed position in a rear area of the trunk 103 to connect the baggage retaining catches (not shown): in other words, after decoupling such retaining catches it is possible to fit the support 13 by fastening the support 13 to the fastening means 110, for example by means of screws (not shown). Two spacers 14, 15 are interposed between the rear wall of the support 13 and the fastening means 110: specifically, the spacers 14, 15 are defined by steel sleeves welded to the rear wall of the support 13 and are engaged in an undisclosed manner by the screws which fasten the support 13 to the fastening means 110.

[0023] With reference to Figure 1, the mobile system 30 is defined by a stretcher which comprises tubes 21 (Figure 10) having a circular cross-section (30 mm diameter and 1 mm in thickness).

[0024] With reference to Figures 11 and 12, the stretcher 30 is foldable when not in use: in this regard, the stretcher 30 is provided with a transversal hinge axis so as to provide reduced dimensions and make the stretcher storable in the trunk 103. With reference to Figure 11, the hinge axis is comprised of two pairs of brackets 23 which are welded to the tubes 21, shaped so as to form in section a inverted "U" and trigged astride of the ends of the tubes 21. A bushing is inserted between the legs of the U and is engaged by a hinge pin (not shown).

[0025] With reference to Figure 10, the tubes 21 have a rectilinear longitudinal axis and are connected to each other by means of two welded crossbars 22 which are defined by corresponding straps (3 mm in thickness) having a rib-shaped form, to accommodate the figures of a human body.

[0026] With reference to Figure 12, the stretcher 30 is provided at its end with four wheels 50 for running on the rails 1, 2. In order to carry out the fastening of the wheels 50, four inverted "U"-shaped brackets 24 are provided which are made in a similar manner to the above-described brackets 23.

[0027] Two pins (not shown) are provided in order to constrain the stretcher 30 to the fixed system 40. The pins are carried on the left rail 2 by means of a U-bolt (not shown) and are driven by corresponding springs to serve as a brake on the rear and front wheels on the left side of the stretcher 30.

[0028] From the above, it is apparent that the fastening of the fixed system 40 is releasable and, therefore, allows to convert the motor vehicle 100 either into an ambulance or into a vehicle for passenger transport in a flexible and rapid manner without requiring modifications to the supporting structure of the motor vehicle 100.

[0029] It is finally clear that modifications and variations may be made to the motor vehicle 100 described and illustrated here, without however departing from the protective scope of the present invention as defined in the accompanying claims.

[0030] Specifically, the sizes of the various components of the fixed system 40 and the stretcher 30 may be different to adapt to different types of motor vehicles.

Claims

1. A convertible motor vehicle (100), comprising:

- a passenger compartment accommodating a driver seat and a passenger seat (105);
- a trunk (103);
- fastening means (110) arranged in a rear area of said trunk (103) in a fixed position to support baggage retaining means;

characterised in that it comprises a transport structure (101) for a patient fittable within the motor vehicle (100) and comprising a pair of rails (1, 2) which are supported by supporting members (4, 17) and

are adapted to support a stretcher (30); when said transport structure (101) is fitted, a front portion of said rails (1, 2) being arranged above a reclined backrest of said passenger side front seat (105), and said supporting members (4, 17) comprising rear supporting members (17) releasably fastened to said fastening means (110).

2. A motor vehicle according to claim 1, **characterised in that** said rear supporting members (17) are releasably fastened to said fastening means (110) instead of said retaining means when said transport structure is fitted.

3. A motor vehicle according to claim 1 or 2, **characterised in that** said supporting members (4, 17) comprise front supporting members (4) which are releasably fastened to fixed guiding means (A) of said passenger side front seat (105) when said transport structure is fitted.

4. A motor vehicle according to claim 3, **characterised in that** it comprises two brackets (8, 10) releasably fastened to said guiding means (A); said front supporting members (4) being coupled to said brackets (8, 10) by means of a bayonet coupling.

5. A motor vehicle according to any of the preceding claims, **characterised in that** said rear supporting members (17) are fastened to a plate support (13) having an L-shaped side profile and comprising a substantially vertical rear wall abuttingly arranged against a striker plate rearwardly defining said trunk (103).

FIG. 1

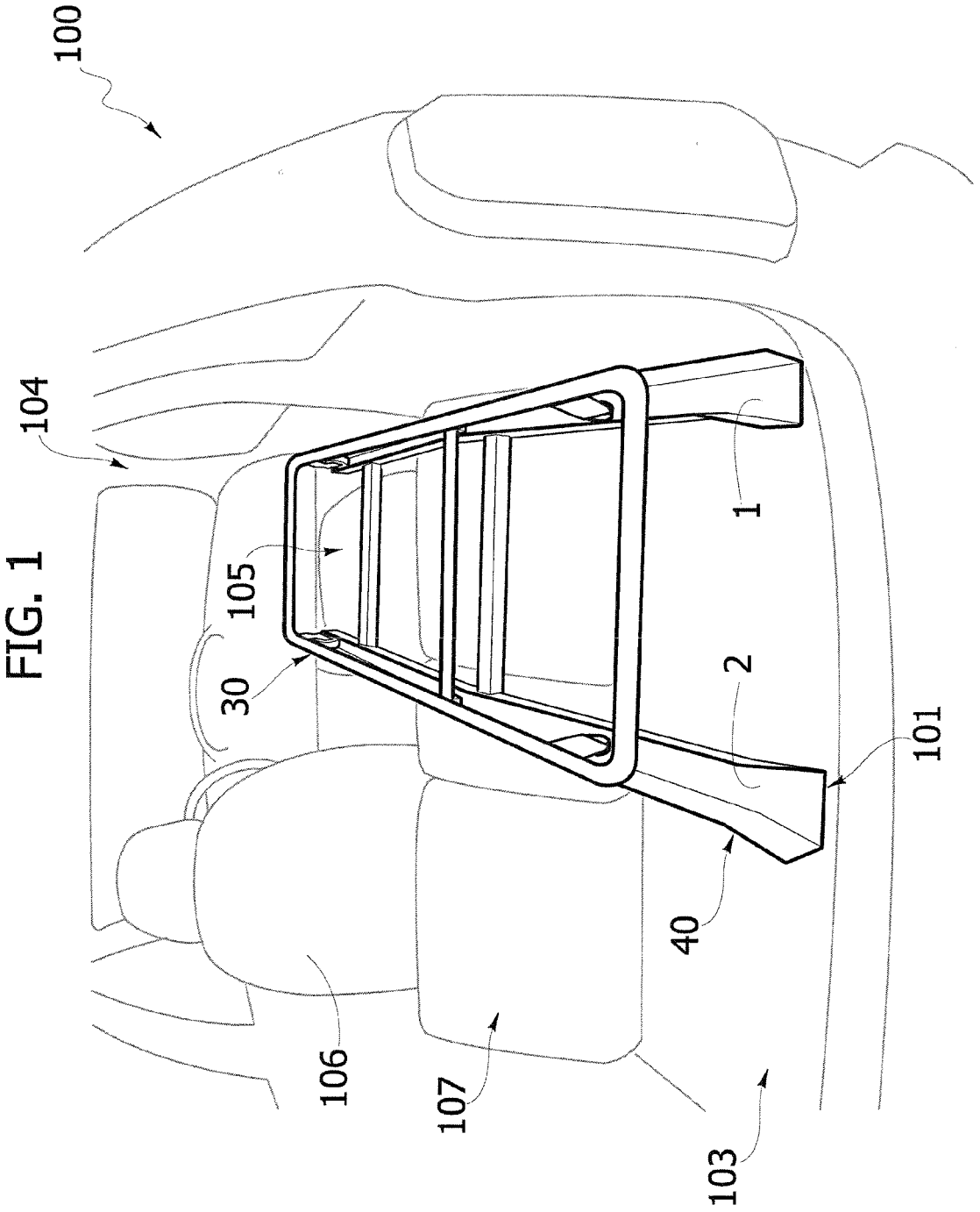

FIG. 2

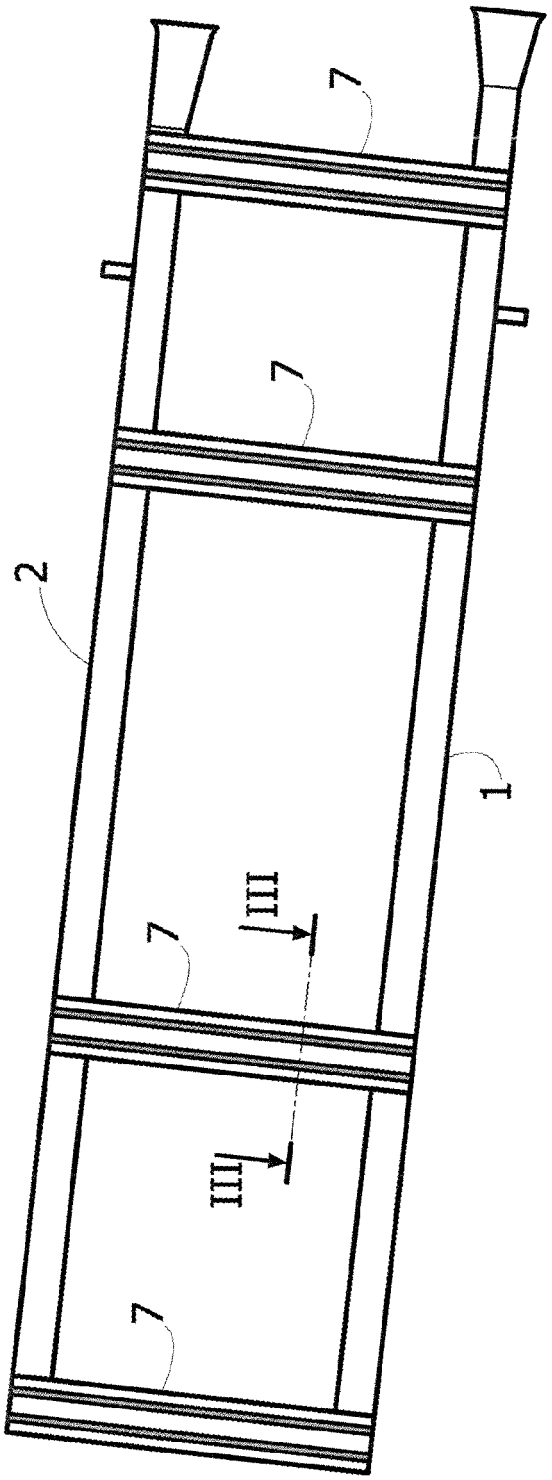

FIG. 3

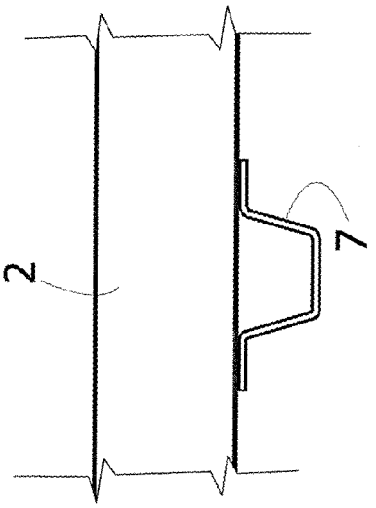

FIG. 4

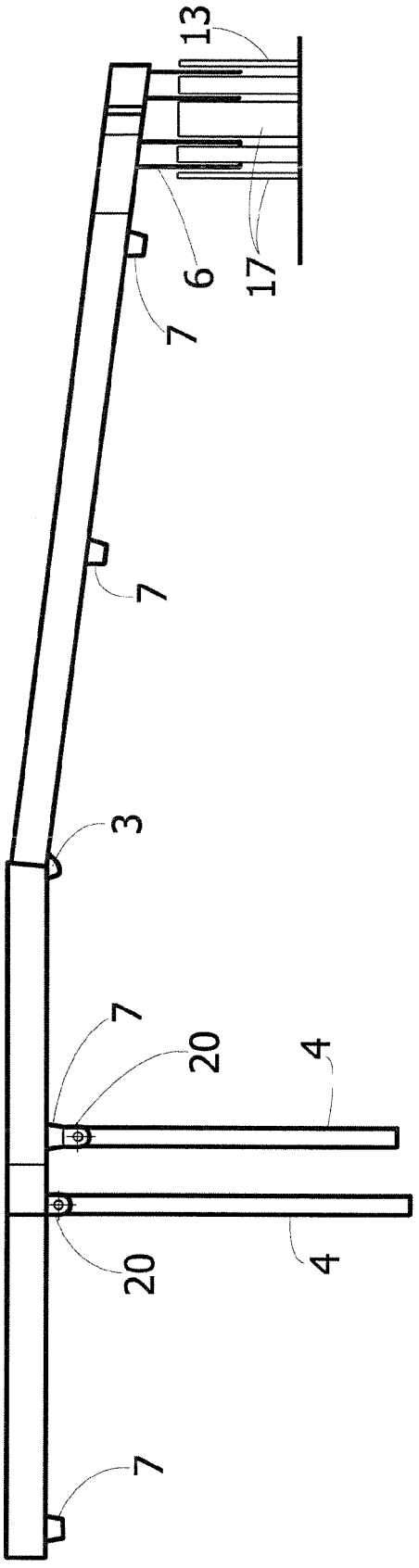

FIG. 5

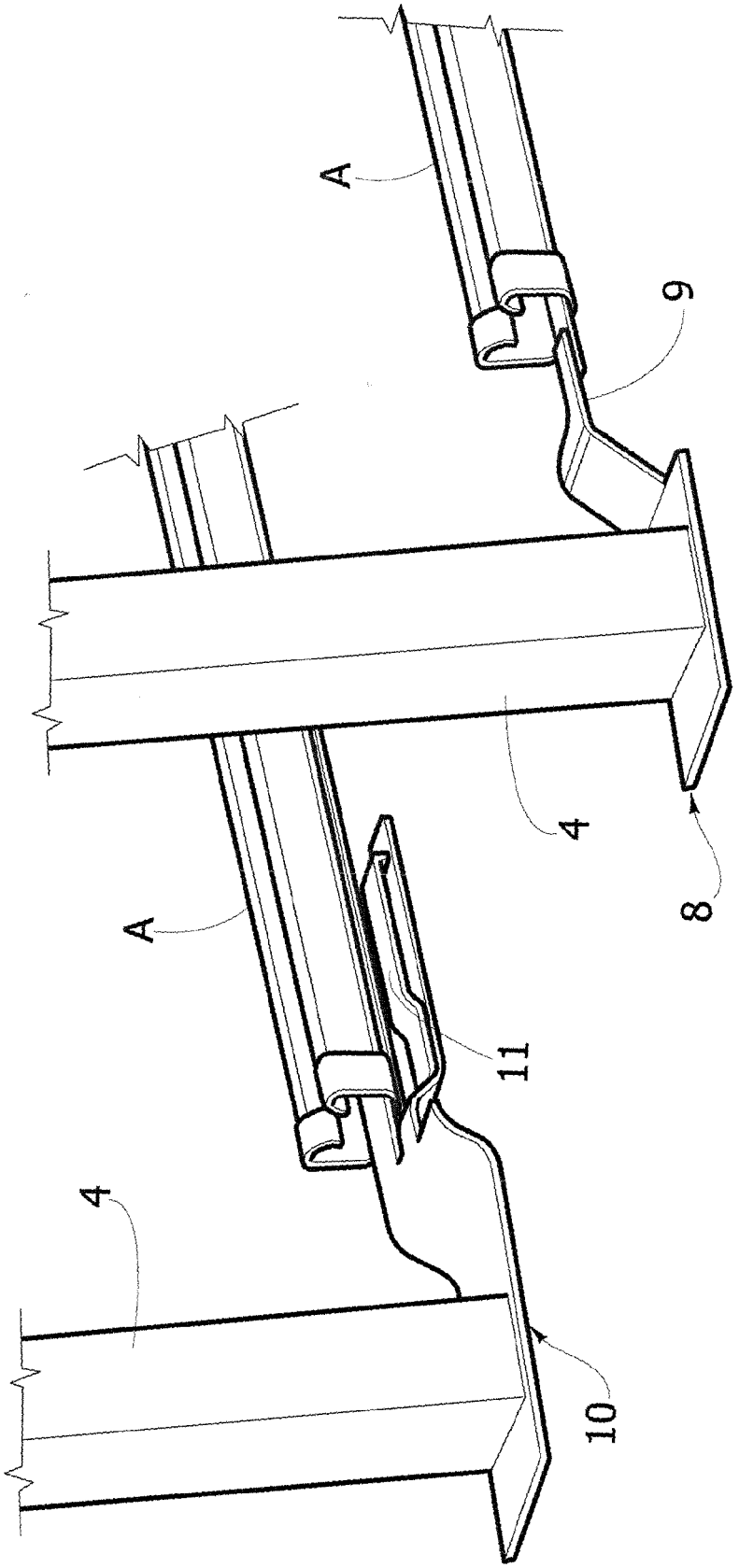

FIG. 6

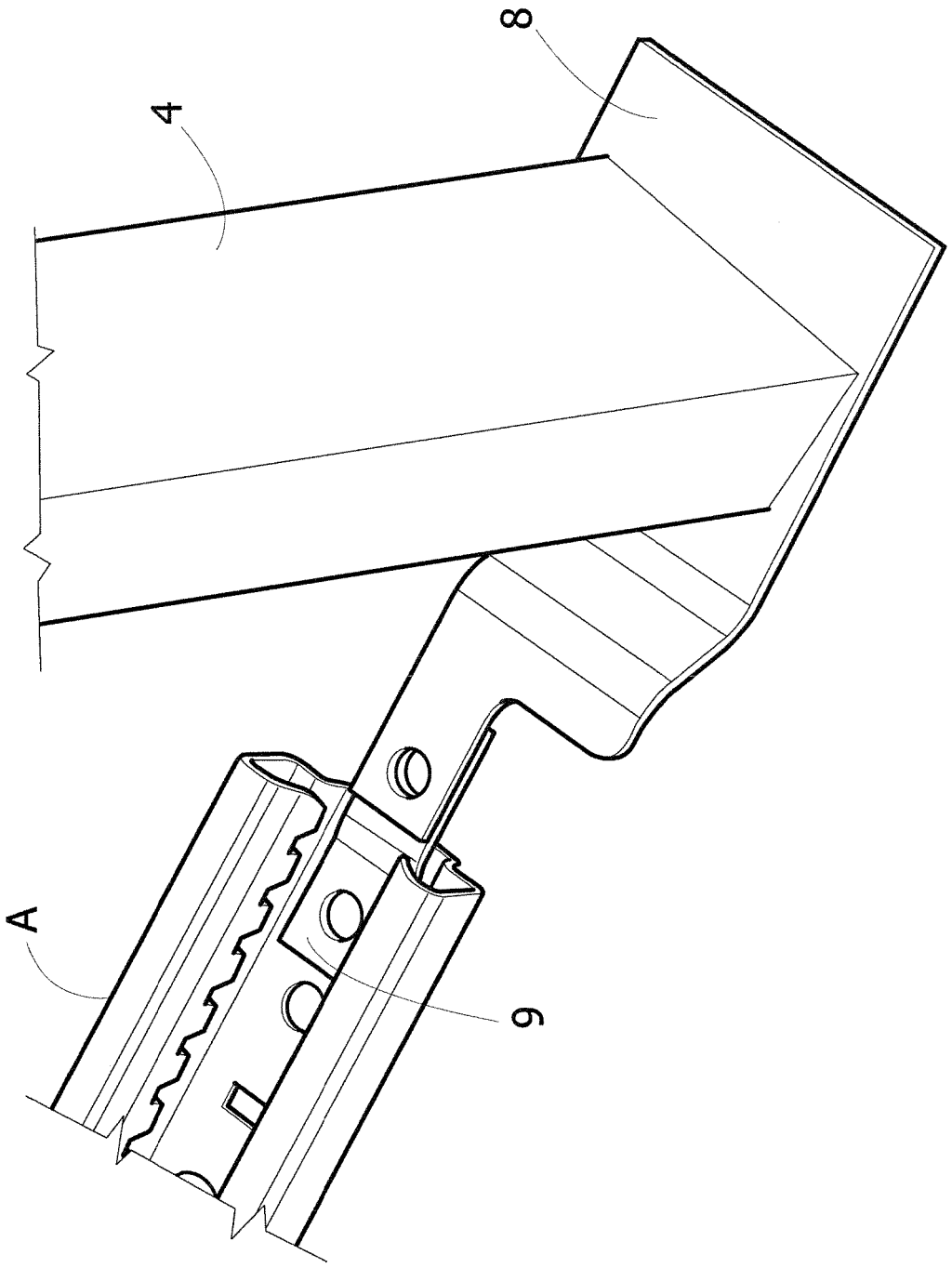

FIG. 7

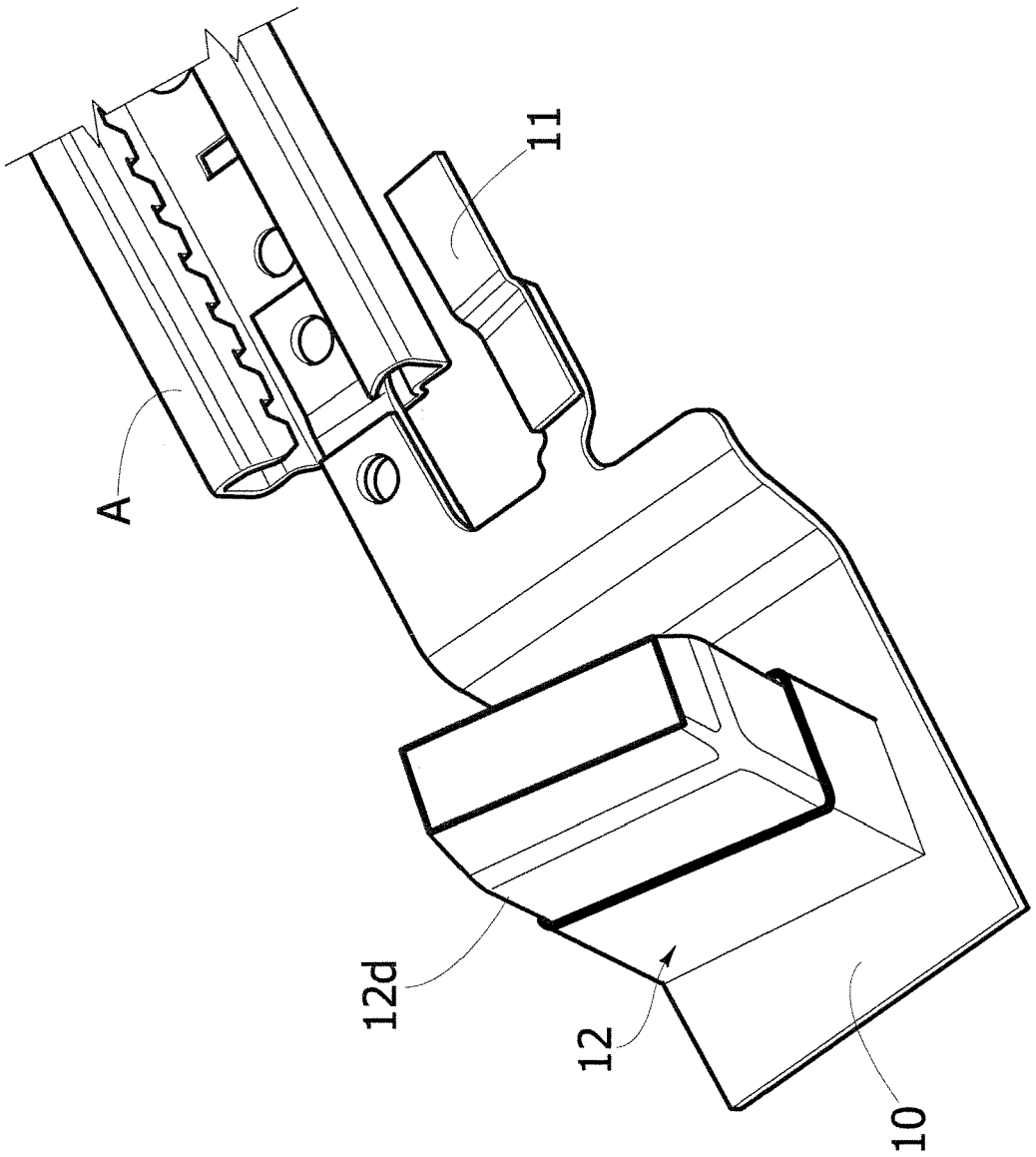

FIG. 8

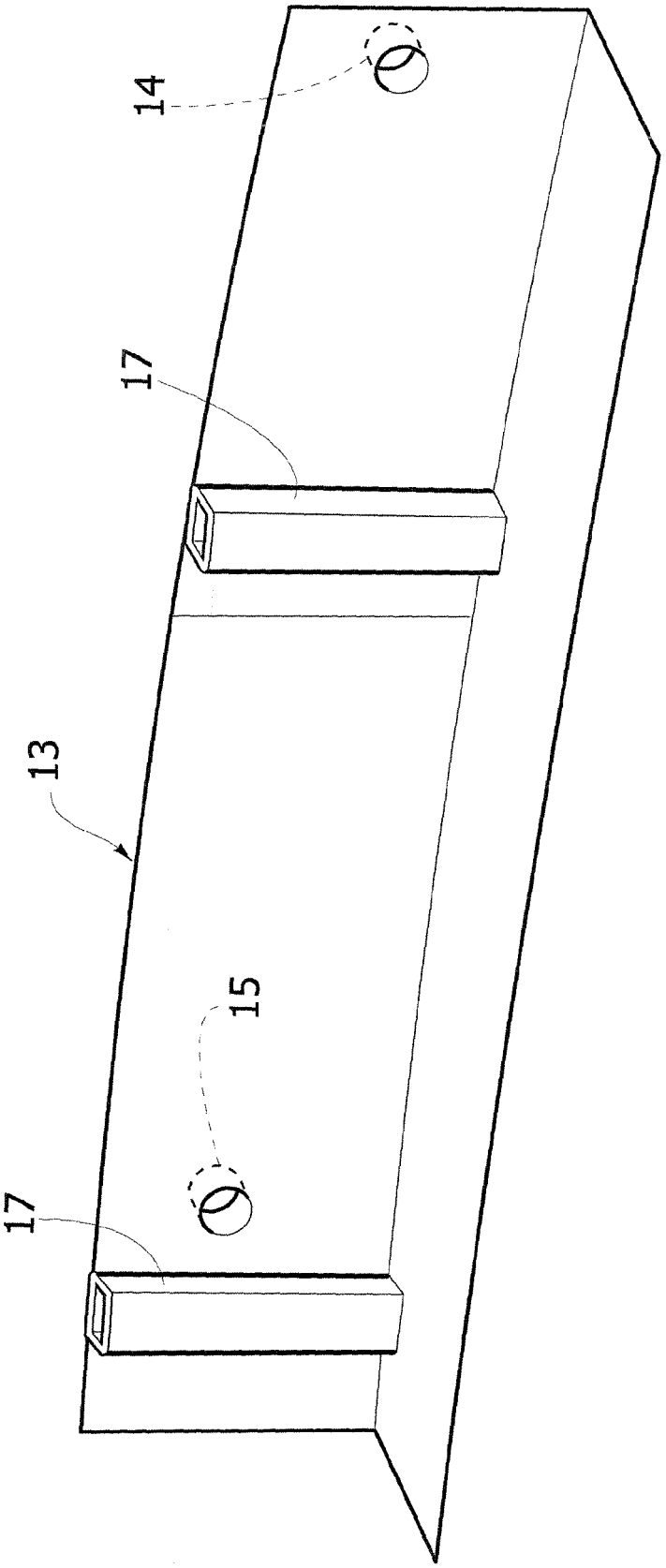

FIG. 9

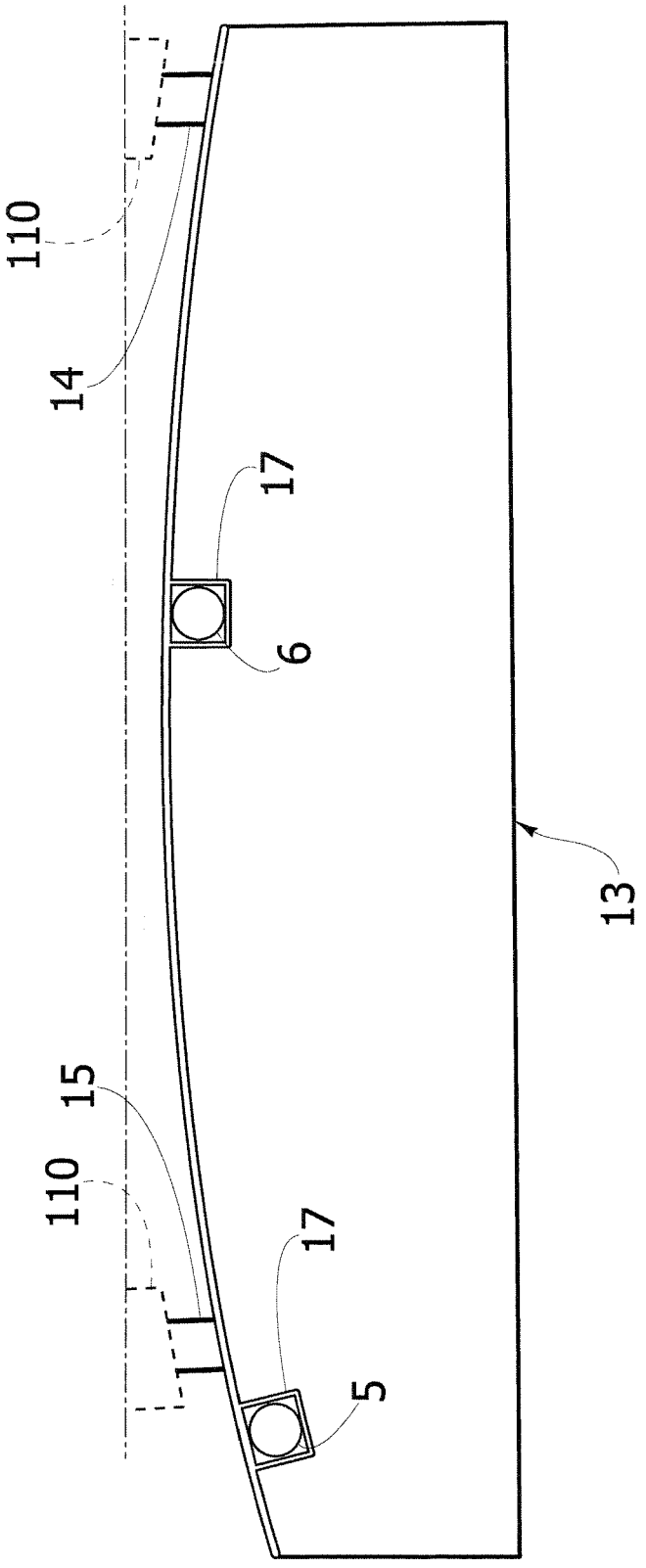

FIG. 10

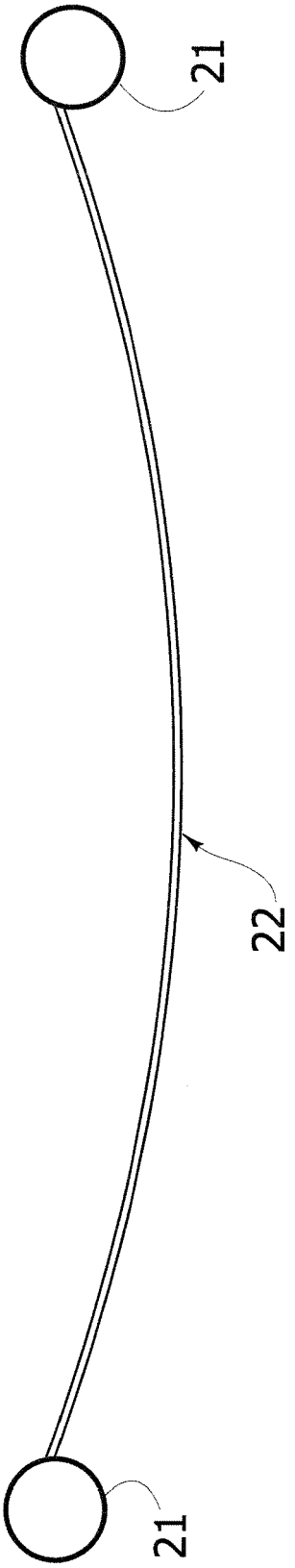

FIG. 11

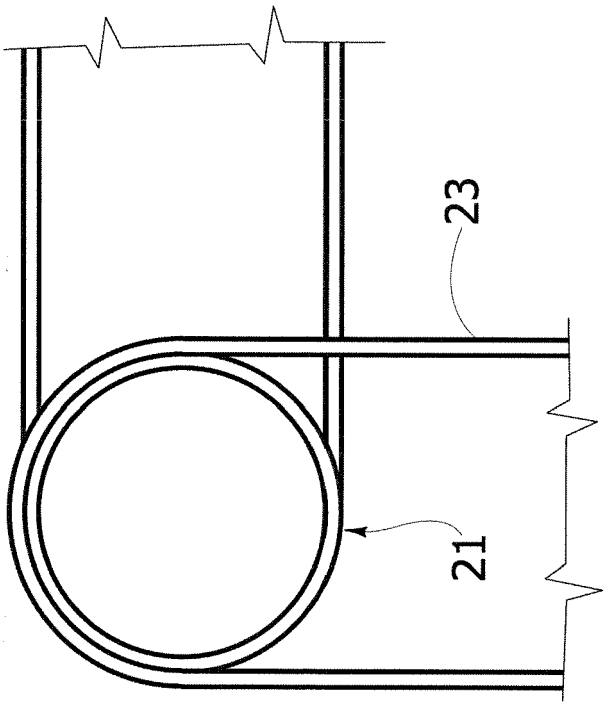

FIG. 12