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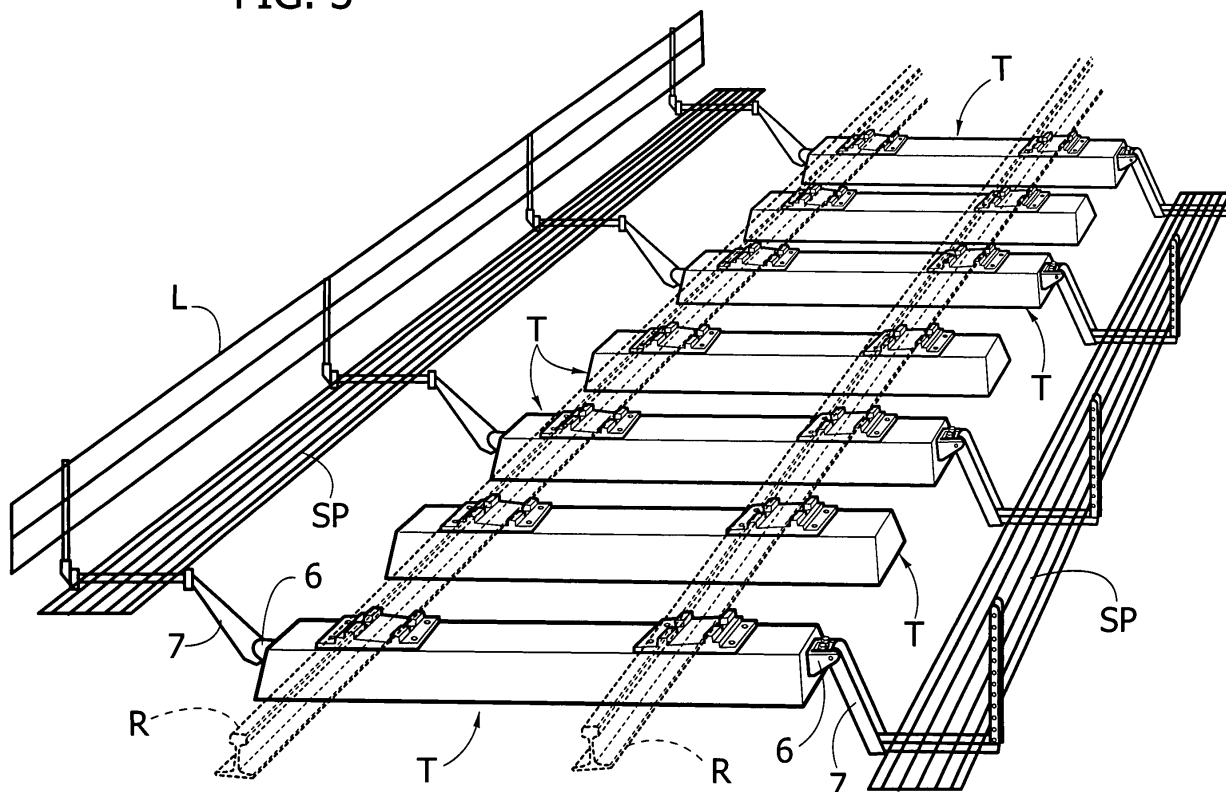
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(54) **Lateral extension device for railway tracks**

(57) A lateral extension device for railway tracks including sleepers (T) having at least one longitudinal cavity (C) that receives a bar (B, B1) fixed to the ends of the

sleeper (T) and projecting laterally thereto for attachment of at least one supporting bracket (6), connected to which is a supporting arm (7) of a service device (SP, L).

**FIG. 3**



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## Description

### Field of the invention

**[0001]** The present invention relates in general to railway tracks, said tracks including sleepers provided with attachments for the rails, and more in particular regards a lateral extension device for tracks.

### State of the prior art

**[0002]** Known from the European patent No. EP-1081286B1 is a device of the above sort, which includes a bracket having parts for attachment to the rail on opposite sides of the sleeper, a part for resting on the sleeper, and members for mechanical connection of the parts for attachment to the flange of the rail. The bracket is provided for supporting service systems alongside the track, such as for example platforms, barriers, etc.

**[0003]** The arrangement of this known extension device entails, in use, the reaction, on the attachments between sleepers and rails, of the load applied on the corresponding bracket. Said effect, which is altogether acceptable in the case of traditional attachments between rails and sleepers of the so-called "K" type, is instead unsuitable and unacceptable with the use of present-day attachments between rails and sleepers of the "Pandrol" and "Vossloch" type in so far as with attachments of this sort no counterthrust is allowed to the load exerted by the corresponding elastic clamping member.

### Summary of the invention

**[0004]** The object of the present invention is to provide a lateral extension device for railway tracks of the type defined above that does not lead to any reaction or in any case any type of undesirable effect in regard to the attachments between the rails of the railway track and the corresponding sleepers.

**[0005]** A further object of the invention is to provide a lateral extension device for railway tracks that is simple, sturdy, and inexpensive to produce.

**[0006]** With a view to achieving said purposes, the extension device according to the invention is mainly characterized in that:

- the sleepers have at least one through longitudinal cavity; and
- said at least one through cavity receives a bar or a respective bar that is fixed to the ends of the sleeper and projects laterally thereto for attachment of at least one supporting bracket.

**[0007]** Conveniently connected to the supporting bracket is a supporting arm of a service device, and the connection between the supporting arm and the supporting bracket conveniently consists in an articulation about an axis roughly parallel to the track. The supporting arm

articulated to the supporting bracket can moreover be equipped with an extension and/or with a foot for resting on the ground, both of which are conveniently adjustable.

### Brief description of the drawings

**[0008]** The invention will now be described in detail with reference to the annexed drawings, which are provided purely by way of non-limiting example and in which:

- Figure 1 is a schematic perspective view that shows four examples of types of sleepers for railway tracks that can be used in the lateral extension device according to the invention;
- Figure 2 is a partially exploded schematic view that shows an example of embodiment of the other components of the lateral extension device according to the invention;
- Figure 3 is a schematic perspective view that shows an example of application of the lateral extension device according to the invention;
- Figure 4 is a partial view in elevation at a larger scale of a first detail of Figure 3;
- Figure 5 is a view similar to that of Figure 4 of a second detail of Figure 3;
- Figure 6 shows at a larger scale a detail of Figure 5;
- Figure 7 is a plan view of Figure 6;
- Figure 8 is a front elevation of Figure 6;
- Figure 9 is a further enlargement of a part of Figure 6;
- Figure 10 is a schematic view in elevation that shows a further example of application of the extension device according to the invention; and
- Figure 11 shows a detail of Figure 10 at a larger scale.

### Detailed description of the invention

**[0009]** Figures 1 to 4 are schematic illustrations of four examples of sleepers for railway tracks that can be used as first component of the lateral extension device according to the invention. These sleepers, referred to as "cable-duct sleepers", are designated as T1, T2, T3 and T4 and can be made of pre-stressed concrete, composite materials or steel, and have one or two (or even more) longitudinal through cavities C with circular, quadrangular or polygonal cross section. They are prearranged at the top for fixing retention plates P for attachments for the rails R (Figure 3) of a railway track. The attachments can be of the traditional K type or else, more conveniently, can be of the "Pandrol" or "Vossloch" type.

**[0010]** Sleepers of this sort will be provided not necessarily along the entire line, but only in the areas in which the use of lateral extension devices according to the invention is required.

**[0011]** With reference now to Figure 2, the second component of the lateral extension device consists in an assembly including at least one or two (or more) entirely or partially threaded bars, designed to be inserted within

the through cavity or through cavities C of the sleeper T, and a supporting mechanism carried by one end or each end of the at least one bar, projecting from the sleeper T.

[0012] In the case of the embodiment described in the drawings there are provided two bars B and B1 inserted through two respective cavities C of the sleeper T and both provided with threaded ends Bf fixed to the opposite ends of the sleeper T by means of nuts D, with the interposition of washers 2, cup springs 3, distribution plates 4, and corresponding protections made of elastomeric material 5.

[0013] The cup springs 3, set between the distribution plates 4 and the fixing nuts D, have the function of compensating for the typical inclination of the end or each end of the sleeper T with respect to the bars B, B1 inserted through the cavities C.

[0014] The threaded ends Bf of the bars B, B1 projecting from one end - in the case of the example represented - and also from the other end of the sleeper T function as fixing members, via further nuts D, of corresponding generally bracket-shaped supporting elements 6. It should be noted that the arrangement described herein could be limited to just one of the ends of the sleeper T.

[0015] Each bracket 6, the wall 6a of which is perforated for passage of the threaded ends Bf of the two bars B, B1 in turn supports a reaction arm 7 provided at the bottom with an adjustable extension 8. The reaction arm 7 is connected to the bracket 6 in an articulated way about a pin 9, which is set transverse to the sleeper T, i.e., parallel to the rail R.

[0016] The arm 7 can face downwards, as in the case of Figures 2 and 5 and the right-hand part of Figure 3, or else upwards as in the case of Figure 4 and in the left-hand part of Figure 3, or else again it can be generally horizontal, as in the case of the embodiment of Figure 10. Of course, various arrangements and combinations are possible, according to the conformation of the terrain alongside the railway track, possibly also different for the right-hand end and left-hand end of the sleepers T, as is precisely the case represented in Figure 3.

[0017] The reaction arm 7 is adjustable angularly with respect to the bracket 6 about the corresponding pin 9, by means of adjustment bolts 10 carried by said bracket 6 and reacting against an appendage 7a of the arm 7. In turn, the position of the extension 8 with respect to the reaction arm 7 can be adjusted via fixing bolts 11.

[0018] The extension 8 in turn bears a possible element S for support and connection of a service device, constituted, for example, by a platform SP and/or by a side barrier L, etc.: service devices that can typically be installed by means of the lateral extension device according to the invention can include treading surfaces and other platforms, protection and sound-absorbing walls, signalling devices, mains, auxiliary rails, barriers, etc.

[0019] The extension 8 can be provided with one or more adjustment holes g for fixing the supporting element S, where present.

[0020] The arrangement of the arm 7 inclined upwards

(Figures 2, 4 and left-hand part of Figure 3) and the one facing downwards (Figure 5 and right-hand part of Figure 3) enable positioning of the service device carried by the lateral extension device according to the invention, respectively above or beneath the plane of the rails R. The embodiment represented in Figure 10, where, as has been said, the arm 7 is substantially horizontal, enables positioning of the service device (for example, constituted by the platform SP) a little above or beneath the plane of the rails R. In this case, there can be conveniently associated to the arm 7 or to each arm 7 a vertical column 12 for resting on the ground, adjustable both in height via the telescopic arrangement (illustrated more clearly in Figure 11) and with respect to the arm 7, via a series of holes 13 with which the latter is equipped.

[0021] It will emerge clearly from the foregoing description that the lateral extension device according to the invention is simple and inexpensive to produce and lay down, and with the use of "cable duct" sleepers T it is particularly simple and convenient. Once the bar or bars B, B1 has/have been inserted through the cavity or cavities C of the sleeper T and then blocked against the ends of the sleeper T, the bracket or each bracket 6 is installed and locked via the nuts D, and then the reaction arm or each reaction arm 7 is installed with the possible extension 8, and finally angularly adjusted via the bolts 10 or else via the columns 12.

[0022] In the installed condition, the load applied to the lateral extension device according to the invention is transmitted directly to the sleepers T, without any effect on the attachments of the rails R.

[0023] Of course, the details of construction may vary widely with respect to what is described and illustrated herein, without thereby departing from the scope of the present invention as defined in the ensuing claims.

## Claims

1. A lateral extension device for railway tracks including sleepers (T) provided with attachments (P) for the rails (R), **characterized in that:**
  - said sleepers (T) have at least one through longitudinal cavity (C); and
  - said at least one cavity (C) receives a bar or a respective bar (B, B1) fixed to the ends of the sleeper (T) and projecting laterally thereto for attachment of at least one supporting bracket (6).
2. The device according to Claim 1, **characterized in that** connected to said supporting bracket (6) is a supporting arm (7) for a service device (SP, L).
3. The device according to Claim 2, **characterized in that** said supporting arm (7) is connected to said bracket (6) in an adjustable way.

4. The device according to Claim 3, **characterized in that** said supporting arm is articulated to said bracket (6) about an axis (9) generally parallel to the rail (R).
5. The device according to any one of Claims 2 to 4, **characterized in that** said arm (7) is of adjustable length. 5
6. The device according to any one of Claims 2 to 5, **characterized in that** said arm (7) is inclined upwards. 10
7. The device according to any one of Claims 2 to 5, **characterized in that** said arm (7) is inclined downwards. 15
8. The device according to any one of Claims 2 to 5, **characterized in that** said arm (7) is substantially horizontal. 20
9. The device according to any one of Claims 2 to 8, **characterized in that** said arm (7) is provided with an adjustable extension (8).
10. The device according to any one of Claims 2 to 9, **characterized in that** said arm (7) is provided with an adjustable column (12) for resting on the ground. 25
11. The device according to any one of the preceding claims, **characterized in that** said bars (B, B1) are two in number and are inserted within two corresponding cavities (C) of the sleeper. 30

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FIG. 1

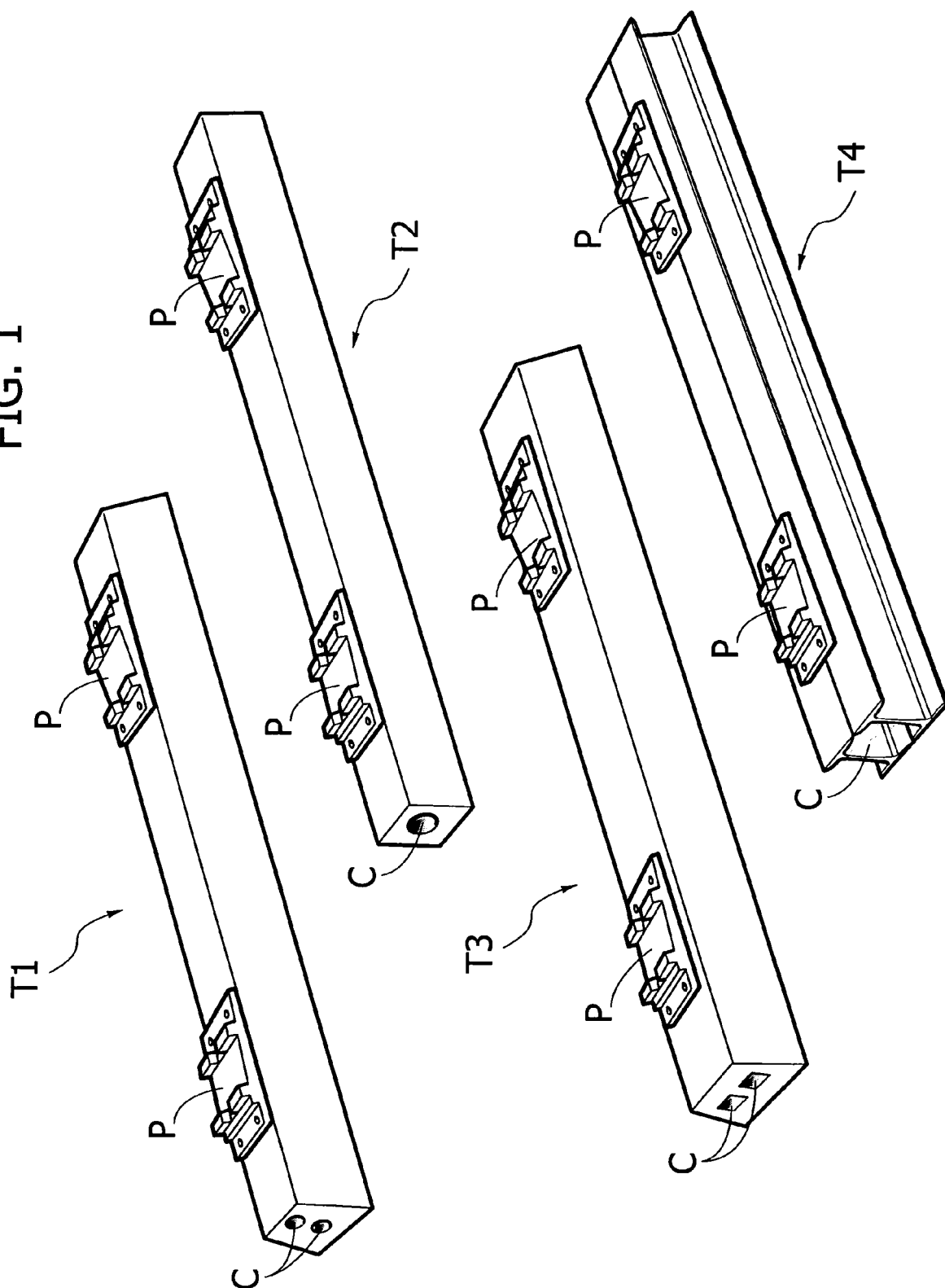


FIG. 2

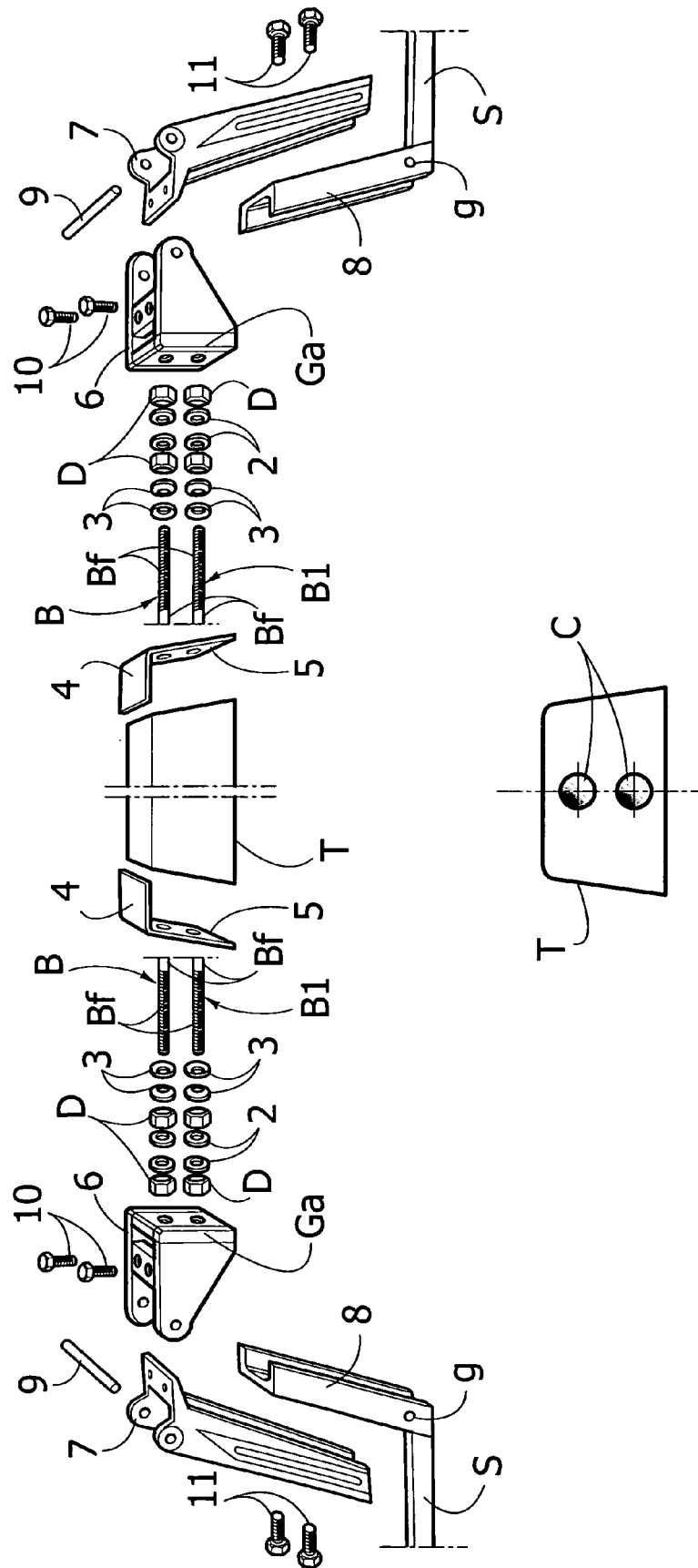
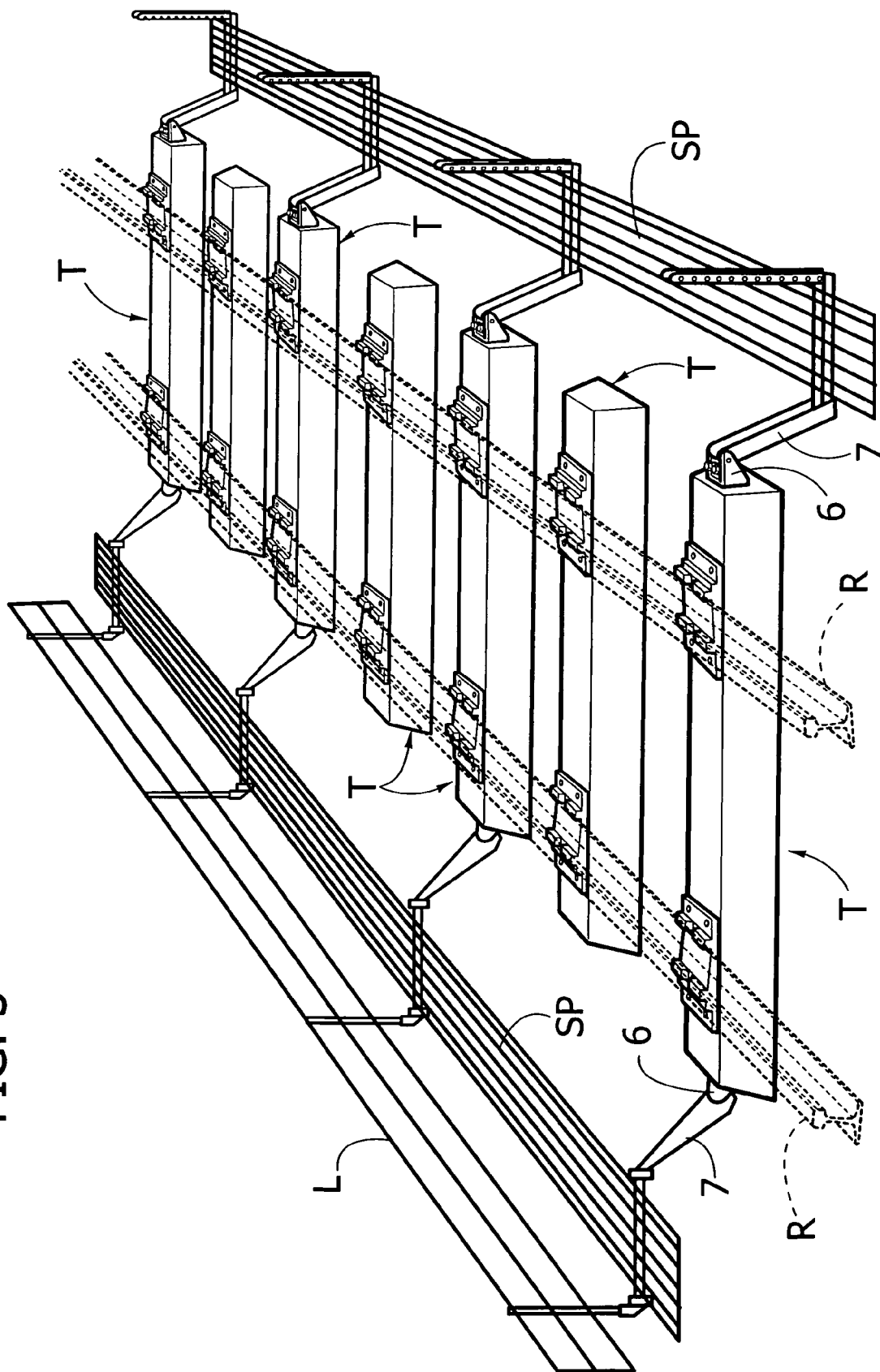


FIG. 3



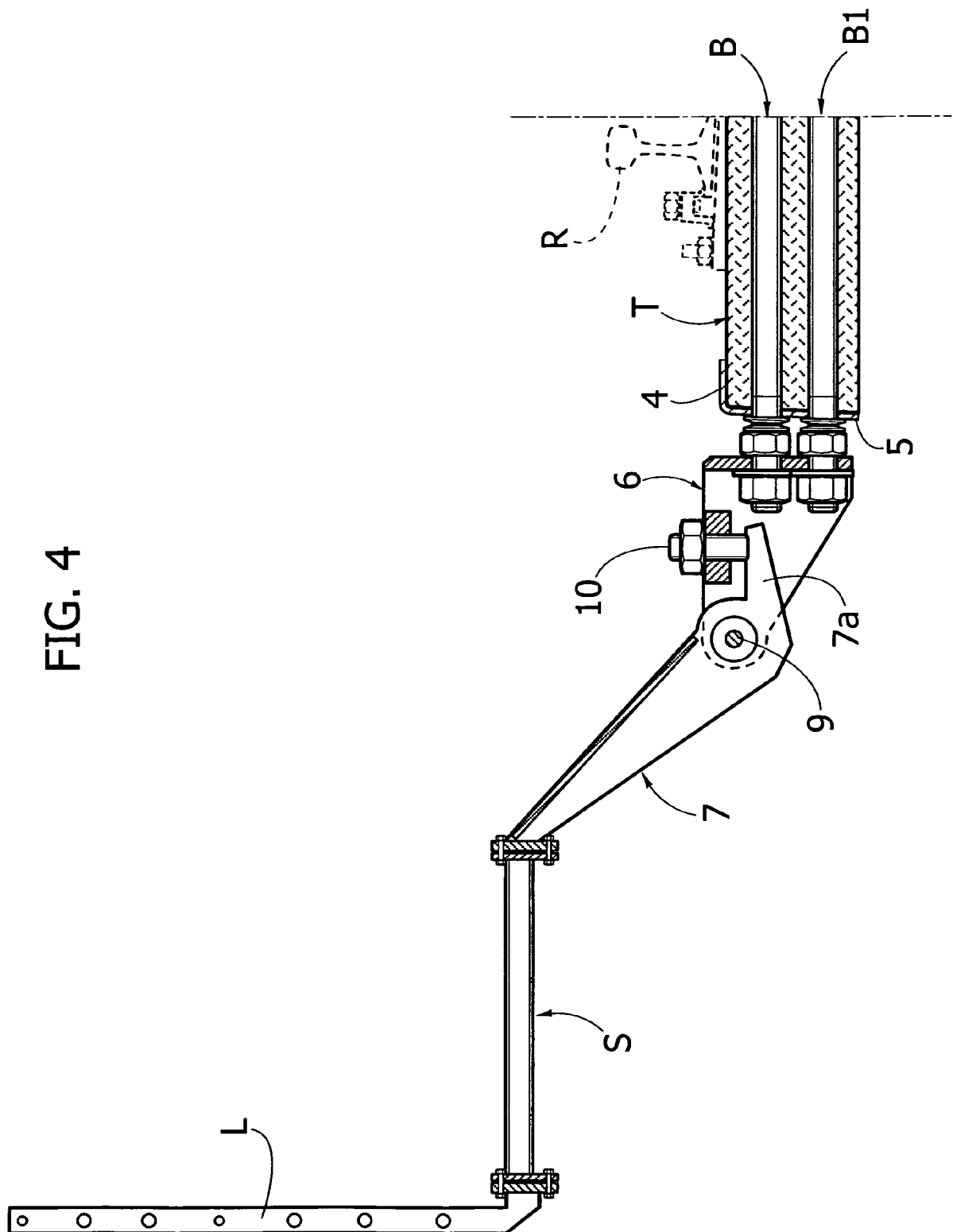




FIG. 5

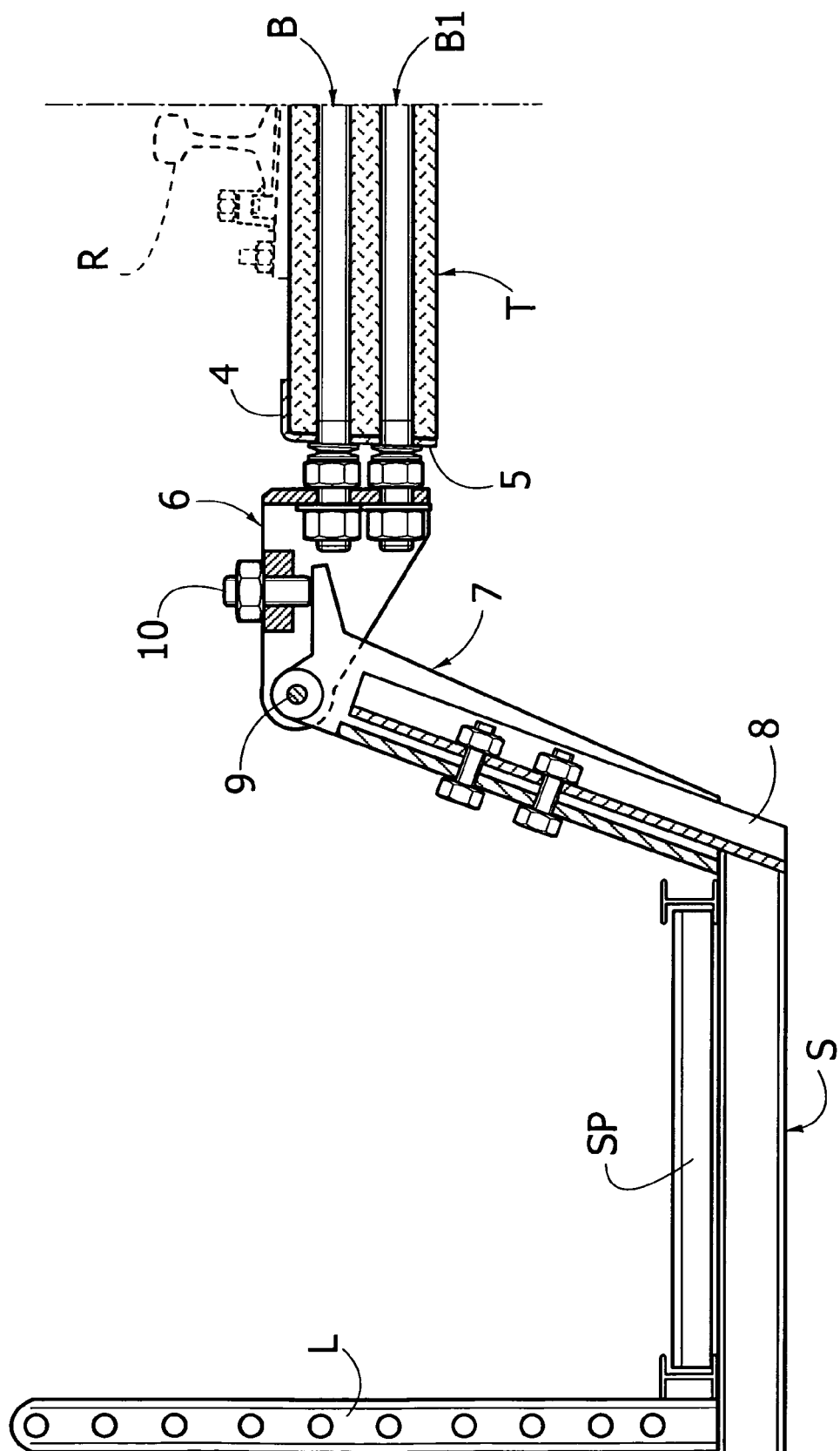


FIG. 6

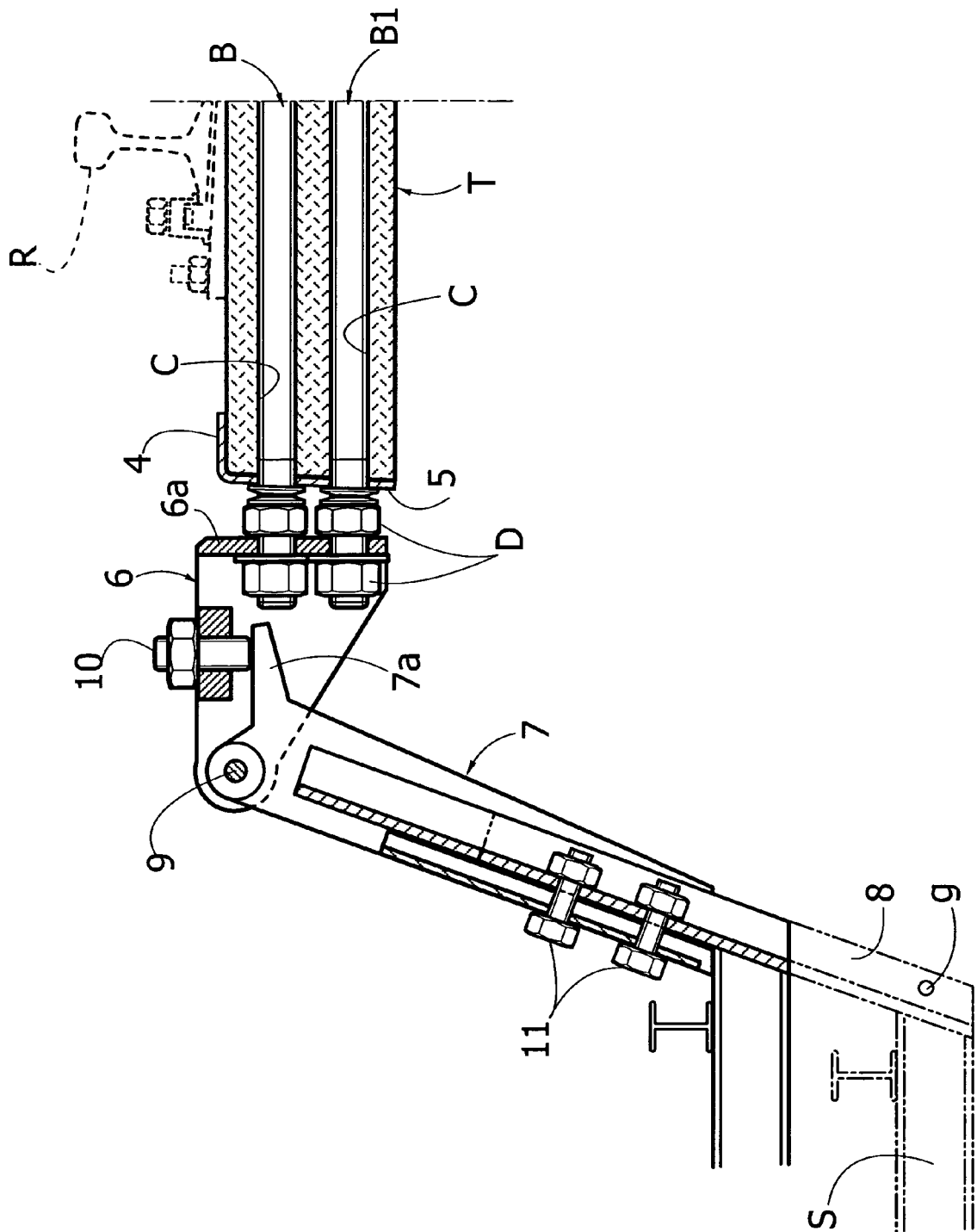


FIG. 7

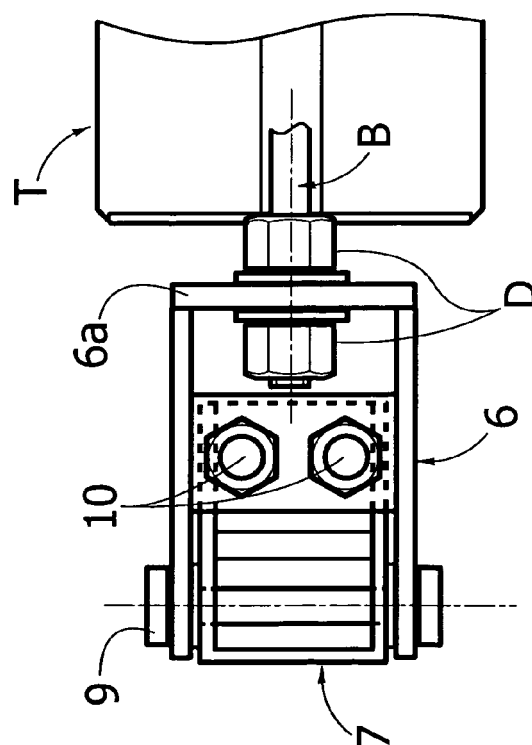


FIG. 8

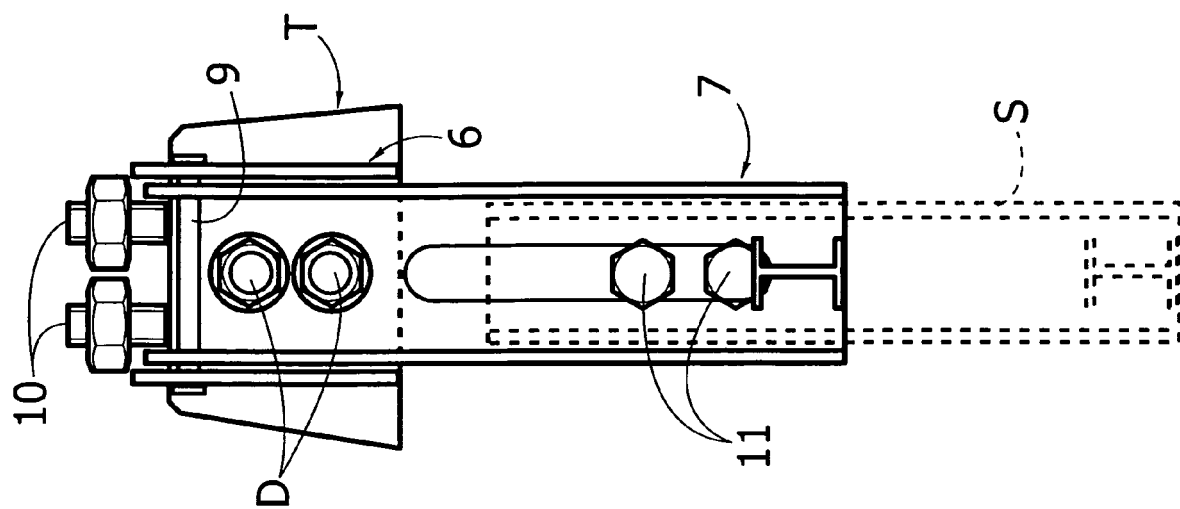


FIG. 9

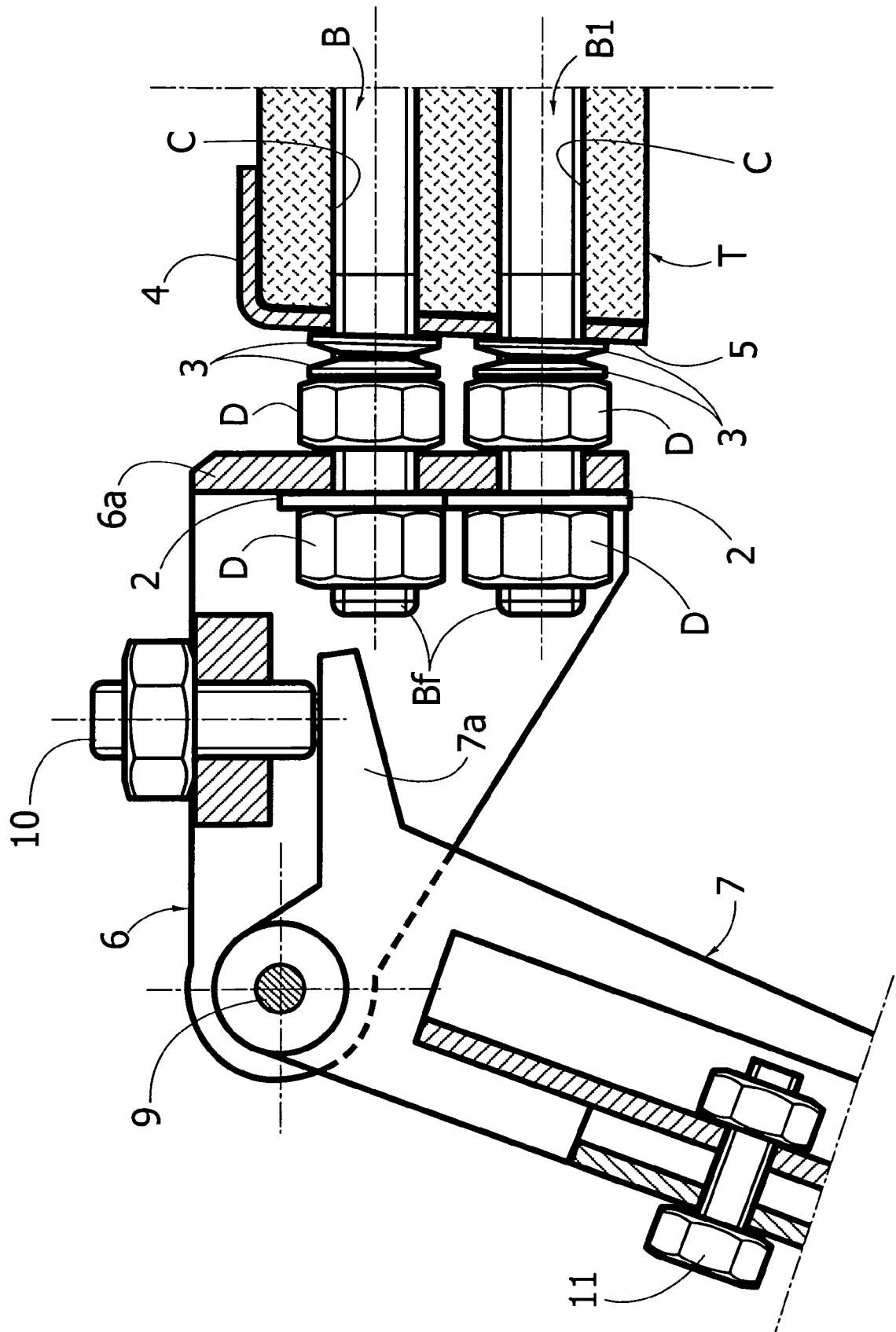


FIG. 10

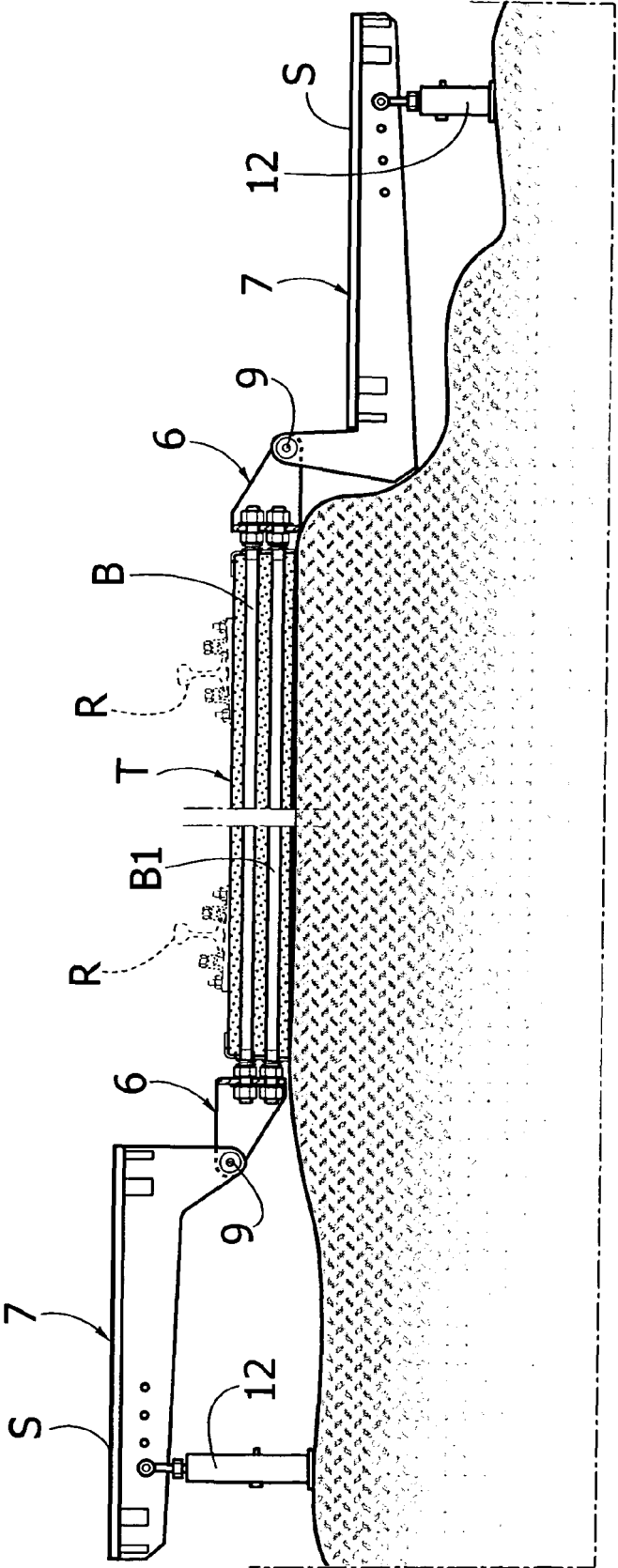
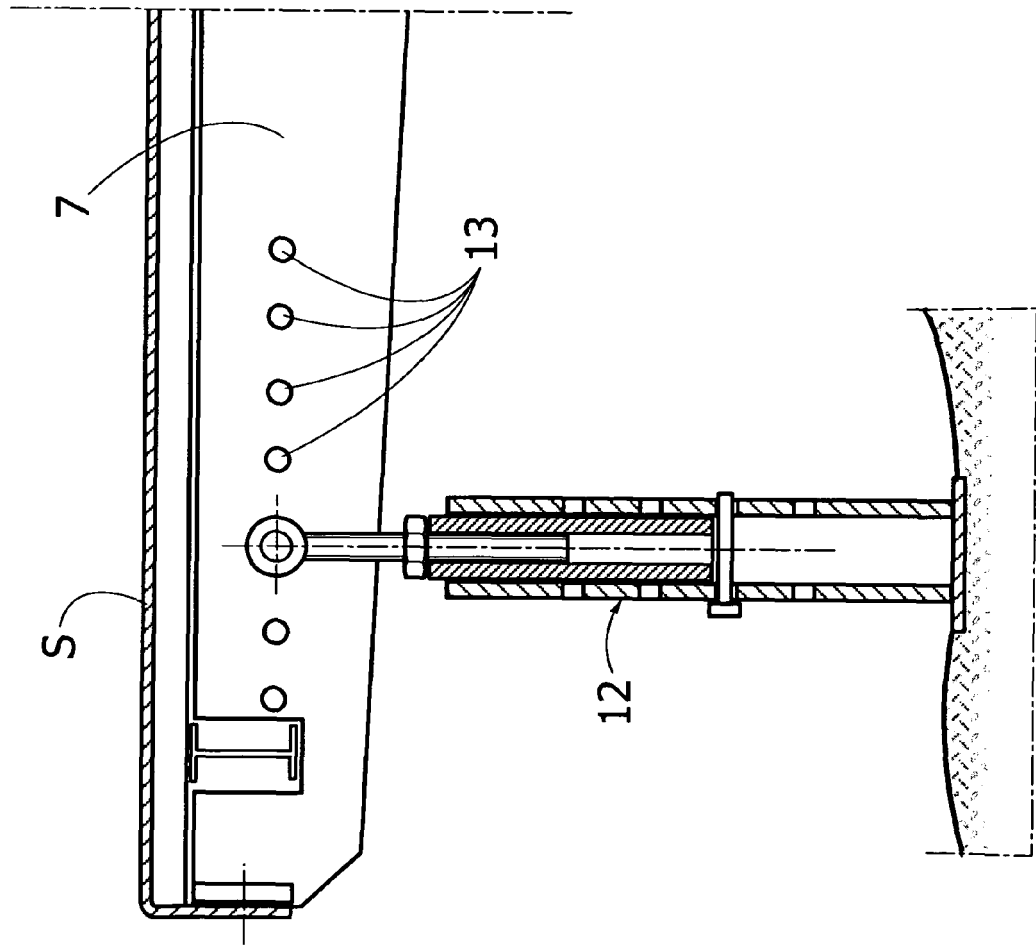


FIG. 11



**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- EP 1081286 B1 [0002]