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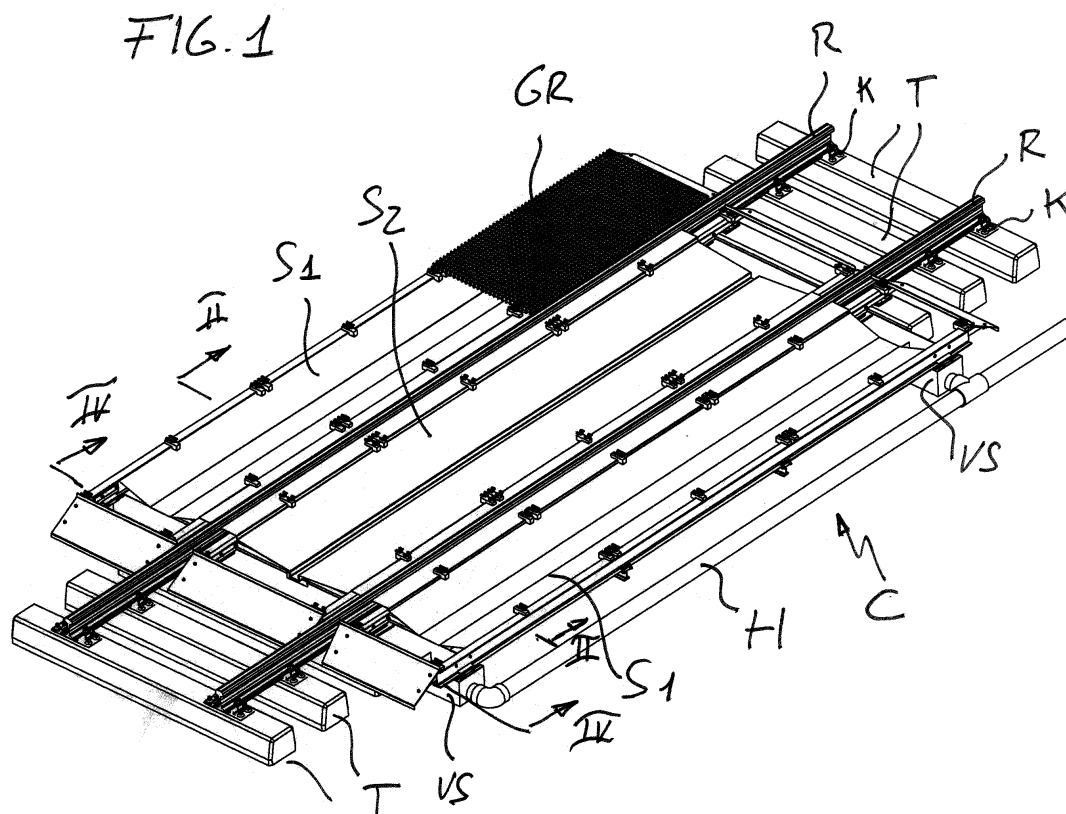
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(54) **Device for collecting liquids along railway tracks**

(57) A device for collecting liquids (C) along railway tracks comprising longitudinal tile-like elements (S1, S2) open at the respective ends, extending alongside the rails (R) and supported by these via attachments (K) of the 60 UNI 3551 type and the like. The collecting device (C) moreover includes a pair of collector channels (VS) set transverse to the rails underneath the open ends of the

tile-like elements (S1, S2), between respective pairs of contiguous sleepers (T) of the track, and communicating with an evacuation pipe (H) set alongside the track. The collecting device (C) does not require works of masonry for ditches and channels, can be easily recovered, and can be adapted to any type of track, sleeper, and corresponding attachments.



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Description

Field of the invention

[0001] The present invention relates in general to railway tracks and more in particular to a device that can be applied in selected areas of a railway track for collecting and evacuating liquids, such as for example oil and fuel that drips from the thermal engines of locomotives standing still, washing water and disinfectant fluids of railway vehicles, etc. The function of said collecting devices is to prevent contamination of the terrain by the liquids referred to along the railway track.

State of the prior art

[0002] Known from the European patent application No. EP-1574618A is a system for providing a slab for collection and evacuation of liquids along a railway track, which uses cantilever supports provided with respective attachments that can be connected to the rails of the track in an area corresponding to respective sleepers, and longitudinal tanks carried by said cantilever supports along the outer sides and between the inner sides of the rails. Said tanks, closed at the ends, are prearranged for discharging the liquids collected therein into a foundation underlying the track.

Summary of the invention

[0003] The object of the present invention is to provide a device for collecting liquids of the type defined above that does not require the construction of any foundation underneath the track for discharging the liquids collected.

[0004] A further object of the invention is to provide a device for collecting liquids along railway tracks prearranged for being applied to the rails even independently of the sleepers and the corresponding attachments for anchorage of the rails.

[0005] A further object of the invention is to provide a device for collecting liquids that can be easily applied to any existing type of track.

[0006] According to the invention, the above objects are basically achieved thanks to a device for collecting liquids along railway tracks characterized in that it comprises longitudinal tile-like elements open at the respective ends and extending alongside the rails, means for supporting said tile-like elements fixed to the flanges of the rails, collector channel means set transverse to the rails underneath said open ends of the tile-like elements, between respective pairs of contiguous sleepers, and an evacuation pipe set alongside the railway track and communicating with the aforesaid collector channel means.

[0007] For fixing the supporting means of the tile-like elements to the flanges of the rails, various systems according to the invention may be envisaged.

[0008] In the case where attachments of the so-called K type (i.e., attachments according to 60 UNI 3551 stand-

ards, and the like) are used for fixing the rails to the sleepers, according to a first system the supporting means are applied directly or indirectly to the track bolts for anchorage to the flanges of the rails, or else to the screw spikes for anchorage of the attachments to the sleepers.

[0009] In the case, instead, where attachments of a different type are used for fixing between sleepers and rails, such as for example the ones referred to as "Pandrol" and "Vossloch", the fixing system may conveniently envisage use of K type attachments (as already mentioned, 60 UNI 3551 and the like) anchored to the flanges of the rails in the areas where the sleepers are absent, and use also in this case of the corresponding track bolts, or else the corresponding holes normally used for the screw spikes for anchorage to the sleepers, for supporting the tile-like elements of the collecting device.

[0010] In all cases, the installation of the device for collecting liquids according to the invention along already existing railway tracks is particularly simple and fast and does not involve the digging of any trench or the construction of any foundation underneath the track.

Brief description of the drawings

[0011] 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 of a device for collecting liquids along railway tracks according to a preferred embodiment of the invention;
- Figure 2 is a schematic cross-sectional view at a larger scale according to the line II-II of Figure 1;
- Figure 3 is a plan view from beneath of Figure 2;
- Figure 4 is a schematic cross-sectional view at a larger scale according to the line IV-IV of Figure 1;
- Figure 5 is a plan view from beneath of Figure 4;
- Figure 5a is a right-hand side view of Figure 4;
- Figure 6 shows at a larger scale and in partial cross section a detail of Figure 2;
- Figure 7 exemplifies operation of a detail of Figure 6;
- Figure 8 shows a variant of Figure 6; and
- Figure 9 is partial cross-sectional view at a larger scale of another detail of Figure 2.

Detailed description of the invention

[0012] An example of embodiment of the device for collecting liquids along railway tracks according to the invention is designated as a whole by C in Figure 1.

[0013] Said collecting device C is applied in a preselected area of a railway track, which includes, in a conventional way, a track formed by a pair of rails R fixed to sleepers T set at intervals apart via respective attachments K.

[0014] In the case of the example illustrated, the attachments K are of the 60 UNI 3551 type, i.e., of the so-called K model. It should, however, be pointed out that

the attachments could be different, for example of the "Pandrol" and "Vossloch" type, or of some other known type.

[0015] As is illustrated in detail in Figures 6 to 8, each attachment K usually comprises a base plate A provided with bosses for engagement of track bolts CH for locking to the flange of the rail R via plates P, as well as holes FE normally used for fixing to the sleeper T via respective screw spikes.

[0016] The above attachments K are used for supporting the collecting device C, basically according to two alternative systems.

[0017] In a first system, it is the attachments K themselves that fix the rail R to the sleepers T that are used also for supporting the collecting device C. In a second system, corresponding to the example illustrated in the drawings, for supporting the collecting device further auxiliary attachments K are used, anchored to the flanges of the rails R in areas where the sleepers T are absent. With this second arrangement, the attachments between rails R and sleepers T do not perform the function of supporting the collecting device C and can thus be of a type different from the attachments K, for example of the "Pandrol" and "Vossloch" type, and the like.

[0018] The ensuing description, with reference to the example of embodiment illustrated in the drawings, relates to the second system, where it is understood that, in the case of the first system, the arrangement is substantially analogous except for the fact that the attachments K used for supporting the collecting device C are the same that fix the rails R to the sleepers T.

[0019] To return now to Figure 1, the collecting device according to the invention is basically made up of the following components:

- a set of longitudinal tile-like elements including two outer tiles S1, situated along the outer sides of the rails R, and an inner tile-like element S2 situated between the inner sides of the rails R; the inner tile S2 can be single or double, i.e., made up by two distinct elements connected to one another at the centre, possibly in an elastic way; the tile-like elements S1, S2 constitute gutters having a generally V-shaped open cross section, as may be seen in Figures 2 and 4, and having a slight slope or inclination towards one end, or a double opposite inclination starting from a median area towards both ends; the above tile-like elements S1, S2 are supported by the attachments K with the modalities clarified in what follows, conveniently through transverse elements designated by IPE, set underneath the rails R parallel to the sleepers T and normally having a length greater than that of the sleepers T themselves so as to project along opposite sides of the line;
- one or more, preferably a pair, of collector channels VS set transverse to the rails R underneath the open ends of the tile-like elements S1, S2, between respective pairs of contiguous sleepers T, and fixed

underneath respective transverse elements IPE in the way represented in Figures 4 and 5; these collector channels receive the liquids conveyed by the tile-like elements S1, S2 and discharged into the collector channels themselves through the open ends of the tile-like elements; and

- at least one evacuation pipe H connected to one or both of the collector channels VS and set alongside the railway track for evacuation of the liquids collected therein.

[0020] The collecting device C can advantageously moreover include perforated treading surfaces or gratings GR set on top of the tile-like elements S1, S2, which are also supported by the attachments K, in the way clarified in what follows.

[0021] In the case where the system that envisages the use of the same attachments K that fix the rails R to the sleepers T is used for supporting the collecting device C, the transverse elements IPE will be suppressed, except the ones for the collector channel VS or each collector channel VS.

[0022] With reference now to Figures 6 to 8, two different examples of connection between the attachments K and the tile-like elements S1, S2 will be described.

[0023] The transverse elements IPE are fixed underneath the attachments K via screw spikes 8 inserted through the holes FE, with the interposition of insulating bushings 9 that delimit gaps 10 and insulate the transverse elements IPE electrically from the railway track. The inner longitudinal edge of each tile-like element S1, i.e., the one adjacent to the respective rail R, rests, via a sectional guide element 4a and a sectional element made of elastic and electrically insulating material 5a, on the outer track bolts CH of the attachments K. The tile-like elements S1 thus rest on the transverse elements IPE, and the corresponding outer longitudinal edges (i.e., external with respect to the rails R) are further supported by said transverse elements IPE via vertical rests 11, in the way illustrated in Figure 9.

[0024] The edges of the tile-like element S2 or each tile-like element S2 adjacent to the rails R in turn rest, via respective sectional guide elements 4 and elastic and electrically insulating sectional elements 5, on further electrically insulating blocks 2a carried by brackets 2, which are in turn fixed to the inner track bolts CH of the attachments K.

[0025] The elastic and electrically insulating sectional elements 5 have flaps 6 projecting towards the rail R, the function of which is exemplified in Figure 7: when a wheel RU of a railway vehicle entrains gravel PP or other foreign bodies between the corresponding edge of the tile-like element F2 and the rail R, the flap 6 bends elastically thus preventing damage to the collecting device C.

[0026] According to the variant of Figure 8 the sectional guide elements 4 and 4a on which the respective edges of the tile-like elements S1, S2 rest, instead of resting directly or indirectly on the track bolts CH, rest on respec-

tive blocks of insulating material 12 fixed to the attachment K via the same screw spikes 8, which, through the holes FE, suspend the transverse elements IPE from the rails R.

[0027] The grated treading surfaces GR also rest on the sectional guide elements 4, 4a in the way represented in Figures 6 to 8, as well as on the supports 11 in the way represented in Figure 9.

[0028] It will emerge clearly from the foregoing description how the laying of the device for collecting liquids according to the invention can be performed in a simple and rational way, since the components thereof are all resting on or suspended from the attachments K, and no masonry work is required for the construction of ditches or channels. The collecting device can moreover be easily displaceable or else recovered and may be adapted to any type of track, sleeper and rail/sleeper attachment.

[0029] Of course, the details of construction and the embodiments may vary widely with respect to what has been described and illustrated herein, without thereby departing from the scope of the present invention as defined in the ensuing claims.

Claims

1. A device for collecting liquids (C) along railway tracks including sleepers (T) carrying the rails (R), **characterized in that** it comprises longitudinal tile-like elements (S1, S2) open at the respective ends and extending alongside the rails (R), means (K; 4, 5) for supporting said tile-like elements (S1, S2) fixed to the flanges of the rails (R), collector channel means (VS) set transverse to the rails (R) underneath said open ends of said tile-like elements (S1, S2), and an evacuation pipe (H) set alongside the railway track and communicating with said collector channel means (VS).
2. The device for collecting liquids according to Claim 1, **characterized in that** said supporting means include attachments (K) between rails (R) and sleepers (T) of the 60 UNI 3551 type and the like.
3. The device for collecting liquids according to Claim 2, **characterized in that** said attachments (K) are the same that connect the rails (R) to the sleepers (T) of the railway track.
4. The device for collecting liquids according to Claim 2, **characterized in that** said attachments (K) are distinct from the ones that connect the rails (R) to the sleepers (T) of the railway track and are fixed to the flanges of the rails (R) between pairs of contiguous sleepers (T).
5. The device for collecting liquids according to Claim 2, **characterized in that** said supporting means

moreover include supporting sectional elements (4, 4a) for the direct or indirect resting of the longitudinal edges of said tile-like elements (S1, S2) on the track bolts (CH) of said attachments (K).

6. The device for collecting liquids according to Claim 2, **characterized in that** said supporting means moreover include supporting sectional elements (4, 4a) for resting of the longitudinal edges of said tile-like elements (S1, S2) via screw spikes (8) of said attachments (K).
7. The device for collecting liquids according to Claim 5 or Claim 6, **characterized in that** said supporting means moreover include insulation members (5, 5a; 12) between said tile-like elements (S1, S2) and said attachments (K).
8. The device for collecting liquids according to one or more of the preceding claims, **characterized in that** it moreover comprises transverse elements (IPE) set crosswise underneath the rails (R) between pairs of contiguous sleepers (T) and fixed to said supporting means (K) for supporting said tile-like elements (S1, S2).
9. The device for collecting liquids according to Claim 6, **characterized in that** said insulating elements (5) have elastically deformable portions (6).
10. The device for collecting liquids according to one or more of the preceding claims, **characterized in that** it moreover comprises treading surfaces (GR) resting on said supporting means (K, 4, 5) on top of said tile-like elements (S1, S2).

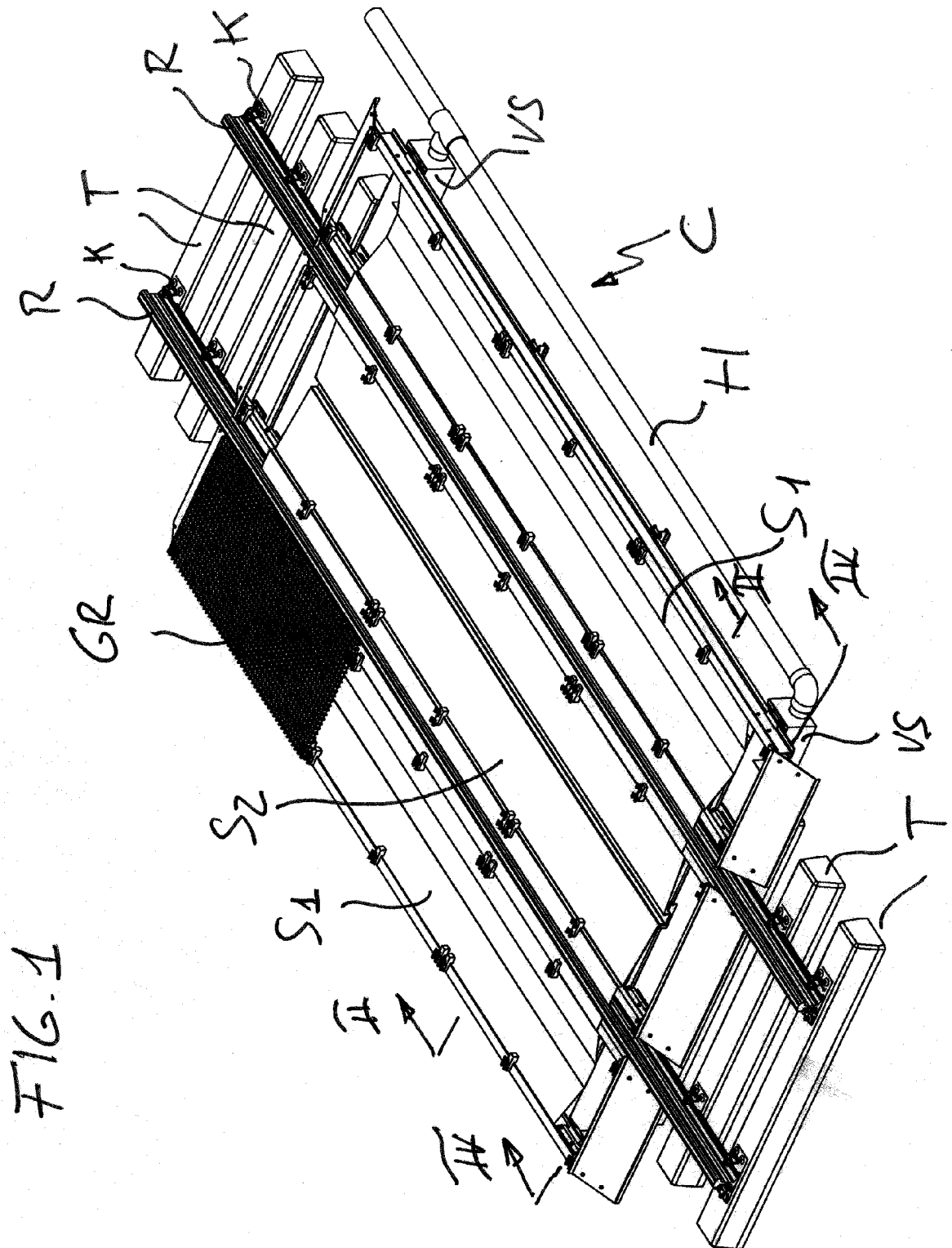


FIG. 2

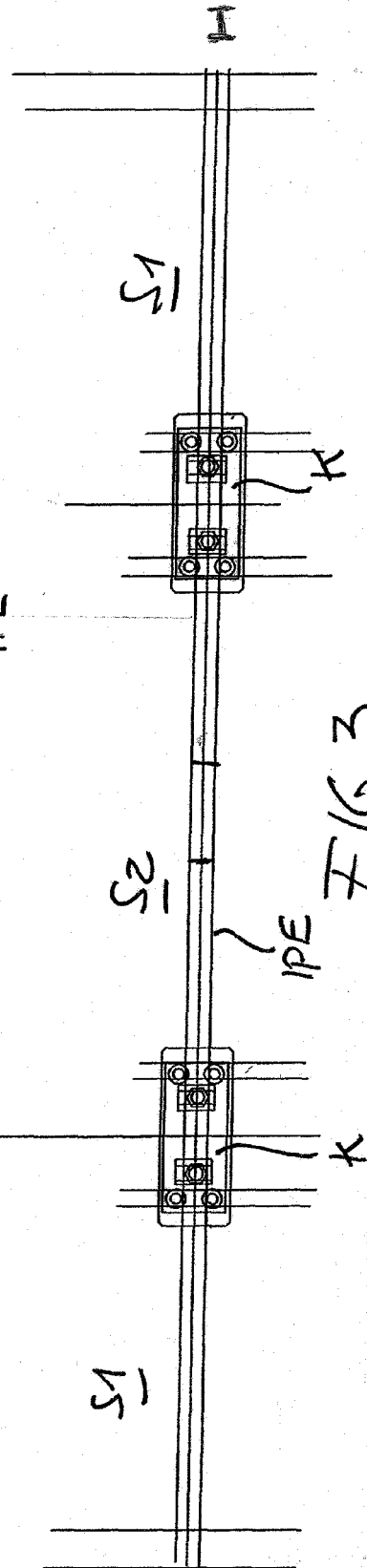
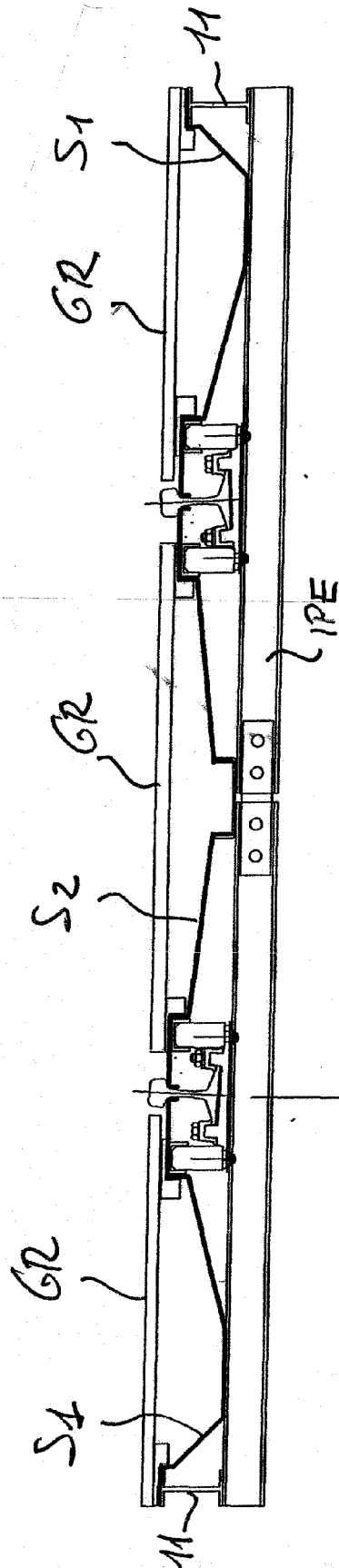
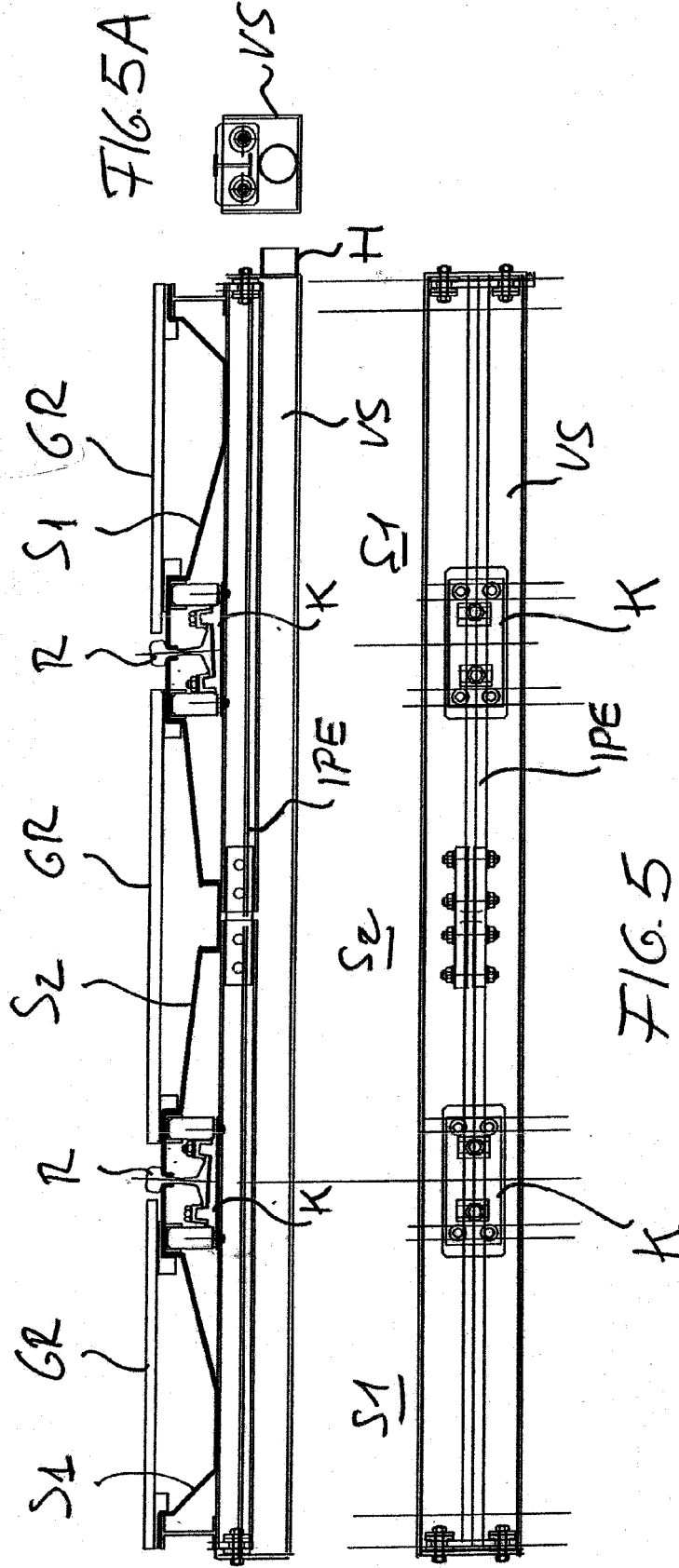
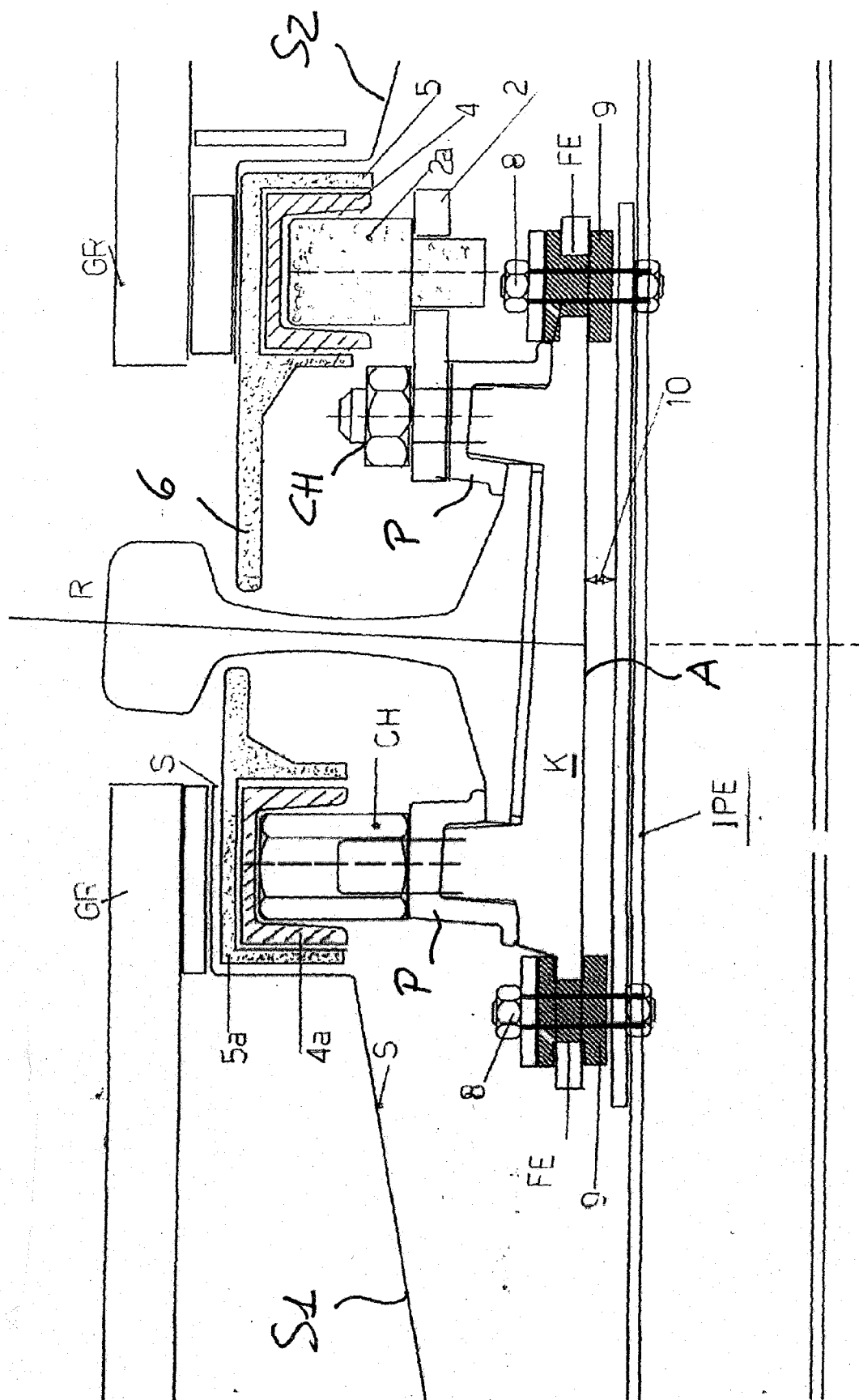


FIG. 3

FIG. 4



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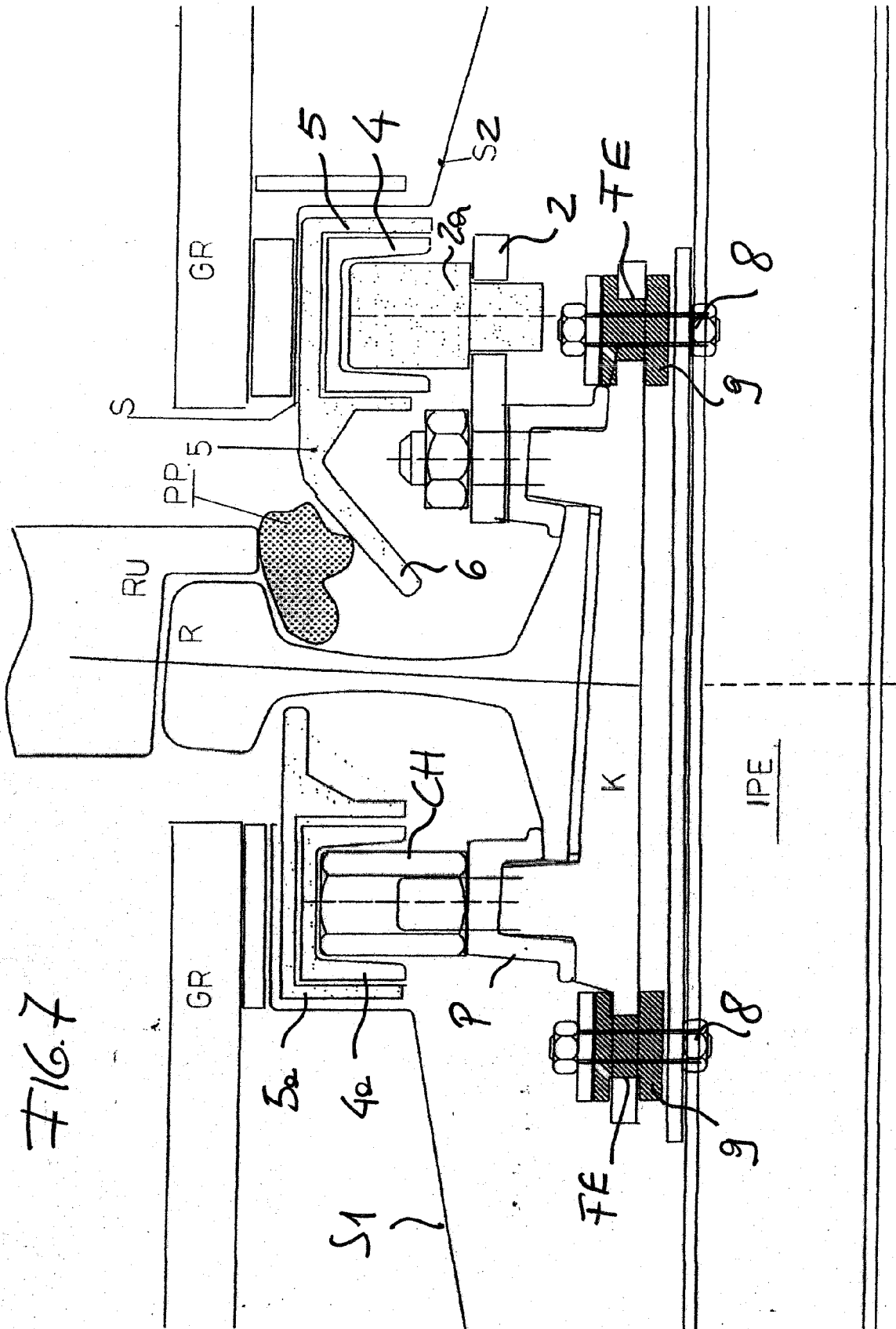
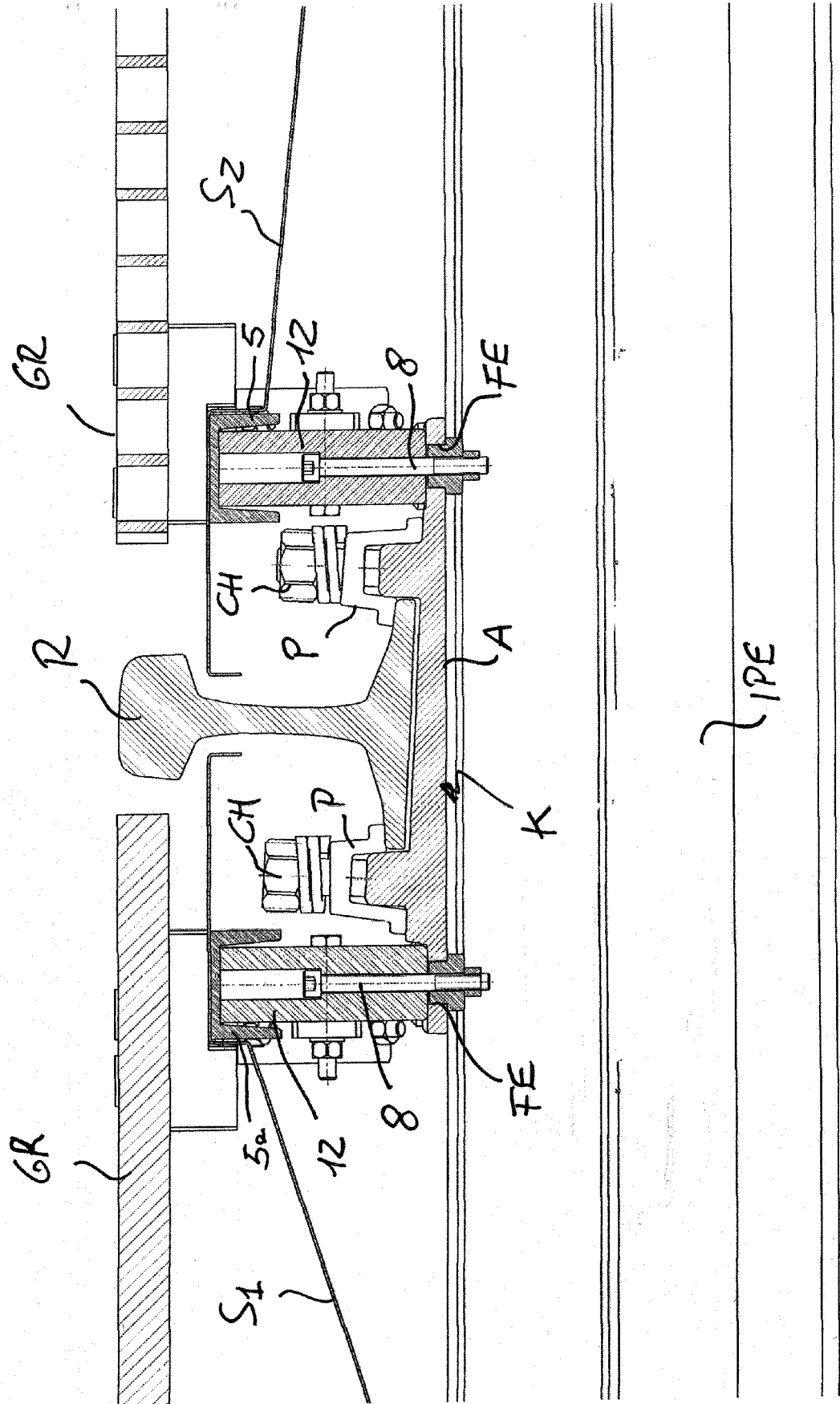
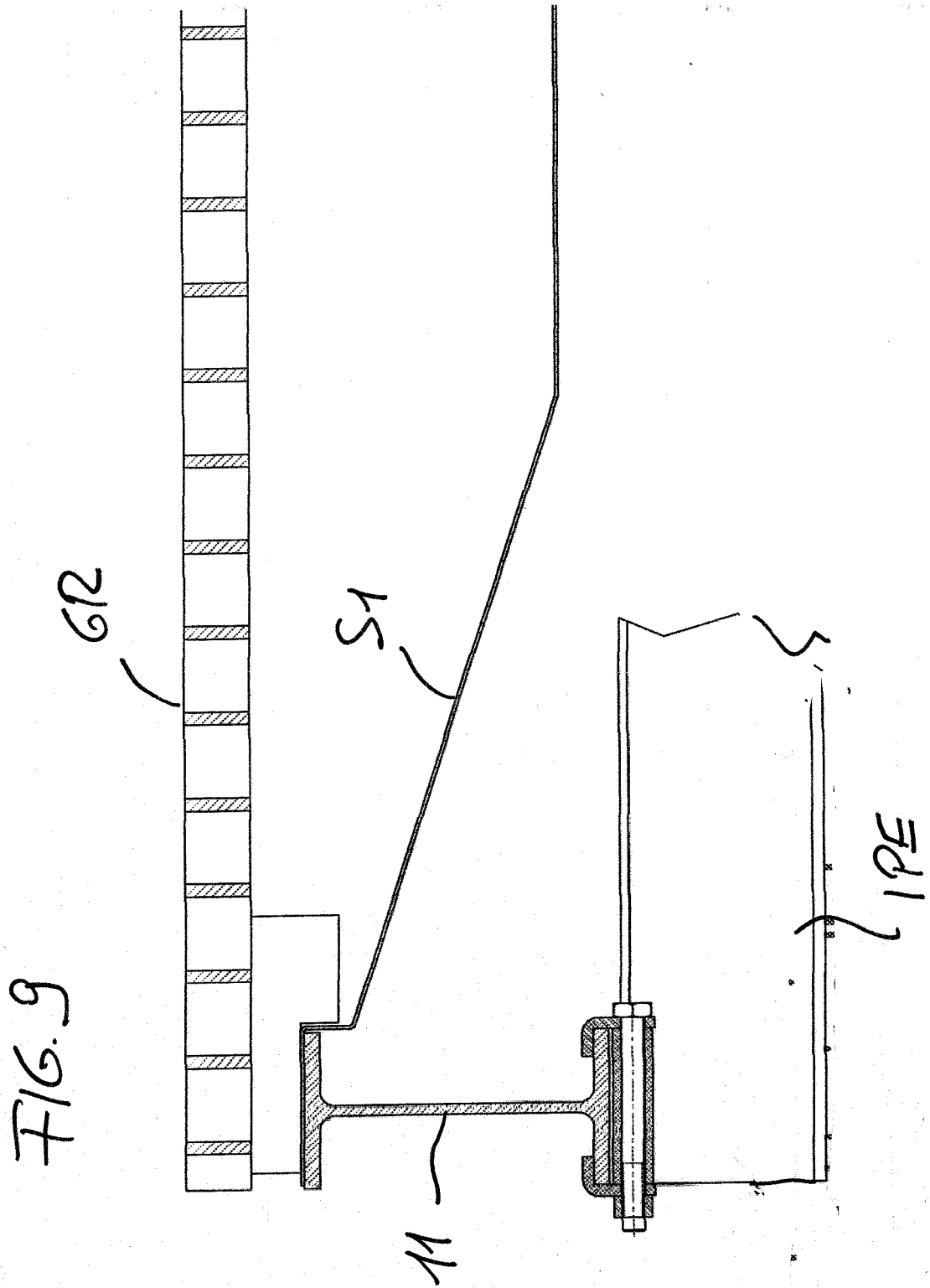


FIG. 8





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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