

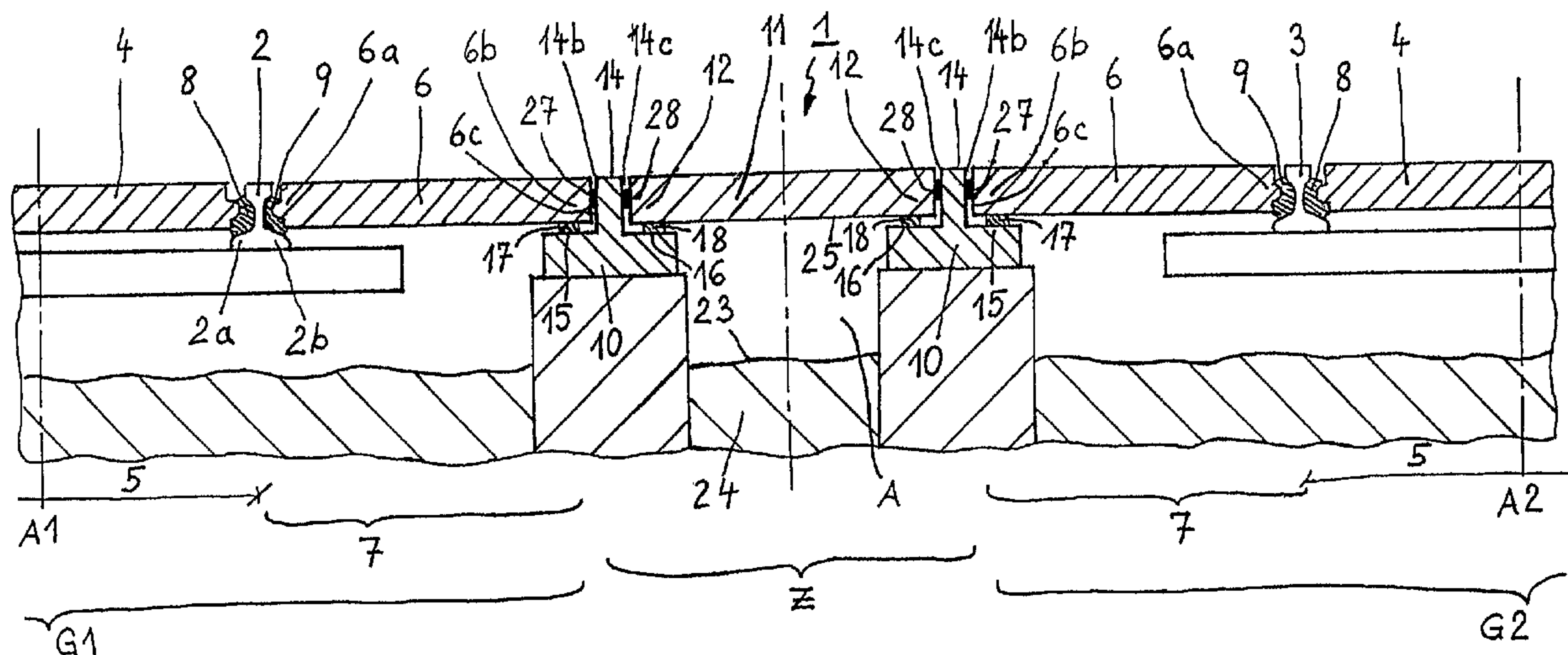


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(54) Title: MULTI-TRACK ROAD CROSSING



(57) Abrégé/Abstract:

A multi-track road crossing including a roadway positioned at the level of the rails, which roadway is formed by self-supporting slabs, wherein inner slabs (4) are provided which bridge the space between the rails (2, 3) of each track (G1, G2) and are supported on these rails (2, 3), and wherein outer slabs (6) are provided which are supported on the outer side of a rail (2, 3) of the track (G1, G2) by one of their sides (6a) and on a supporting body (10) arranged beside the track by the other one of their sides (6b). In the intermediate region (Z) between two tracks, the roadway is formed by self-supporting compensating slabs (11, 11a) which on both of their longitudinal rims (12) are supported on the supporting bodies (10, 10a) which also support the outer slabs (6) of the respective tracks (G1, G2). The compensating slabs (11, 11a) preferably are polymer concrete slabs, in particular made of polyester concrete.



Abstract:**A Multi-Track Road Crossing**

A multi-track road crossing including a roadway positioned at the level of the rails, which roadway is formed by self-supporting slabs, wherein inner slabs (4) are provided which bridge the space between the rails (2, 3) of each track (G1, G2) and are supported on these rails (2, 3), and wherein outer slabs (6) are provided which are supported on the outer side of a rail (2, 3) of the track (G1, G2) by one of their sides (6a) and on a supporting body (10) arranged beside the track by the other one of their sides (6b). In the intermediate region (Z) between two tracks, the roadway is formed by self-supporting compensating slabs (11, 11a) which on both of their longitudinal rims (12) are supported on the supporting bodies (10, 10a) which also support the outer slabs (6) of the respective tracks (G1, G2). The compensating slabs (11, 11a) preferably are polymer concrete slabs, in particular made of polyester concrete.

The invention relates to a multi-track road crossing including a roadway located at the level of the rails, which roadway is formed at each track by self-supporting slabs elastically supported on the rail bases on at least one side, i.e. inner slabs bridging the space between the two rails of the respective track and supported on these two rails, and outer slabs each covering a strip-shaped region externally of the rails of the respective track and elastically supported on the externally pointing rail bases at their side facing these rails, and supported on supporting bodies laid beside the respective track on their side facing away from these rails, the roadway in the middle of the intermediate region between neighbouring tracks being formed by a filling.

In known multi-track road crossings of the initially mentioned type the roadway in the intermediate region between neighbouring tracks is formed by a filling in the form of an asphalt bituminous mixture roadway covering. Thus, the individual track portions are to be considered as separated by this intermediate region. This asphalt strip has a roadway grip behaviour different from that prevailing in the track region, where e.g. concrete slabs are laid, thus adding additional danger to the risks of a road portion which already bears various risks for road traffic. Moreover, the asphalt layer

tends to become crushed and fluted by the pressure of the wheels of heavy vehicles and to become faulty due to brittleness, and the asphalt covering rests on its own bed of crushed stone on the soil and does not follow level changes of the track. Moreover, during maintenance work carried out on the tracks, as a rule the asphalt covering must be torn up and then remade (e.g. because of a new or changed level, respectively), with negative consequences for road traffic because such asphalt work in this intermediate region mostly requires a partial or complete closing of this section of the road, and a further disadvantage resides in the fact that in most cases only small construction equipment can be used for the asphalt work or repair work can be carried out by hand only, respectively.

The invention has as its object to provide a multi-track road crossing in which the disadvantages of known level crossings as previously mentioned are avoided. The road crossing according to the invention is characterized in that the filling is formed by self-supporting compensating slabs which, at both of their longitudinal rims, are supported on the supporting bodies that also support the outer slabs.

The advantages of this design with compensating slabs consist in that equal roadway characteristics, in particular an equal grip behaviour of the roadway surface in the entire transition area, are provided and

problems of level cannot occur because the compensating slabs are supported on the same supporting bodies as the outer slabs. Even after extended periods of time there will be no changes in the levels of the slab surfaces relative to each other. For the purpose of maintenance work, the compensating slabs can be lifted off easily and without requiring much time, and their production and storage will be economically suitable since compensating slabs can be comparatively narrow. A major part of the distance between the tracks is covered by the outer slabs which can be made of uniform dimensions because of the use of compensating slabs. The compensating slabs may be lifted off at any time without any problems, and the space below the compensating slabs can be utilized to guide cables or the like therein.

Furthermore, the supporting bodies supporting the compensating slabs can be superposed or positioned easily on the pedestals prepared for the latter of site-mixed concrete or concrete blocks, resulting in a good seating of the said compensating slabs. To prevent possible shifts of the supporting bodies as could possibly occur on account of high traffic loads it is, e.g., possible to interconnect oppositely arranged supporting bodies by means of spacers whereupon a good long-term stability of the positioning of these supporting bodies relative to each other can be

expected. The supporting bodies provided in the road crossing according to the invention advantageously comprise on their upper side a longitudinally extending rib which ends horizontally at the level of the rails or of the road covering, respectively, and which separates the supporting surfaces for the compensating slabs from the supporting surfaces for the outer slabs, whereby secure positioning of both of these types of slabs can be achieved. In a preferred embodiment of the supporting bodies, the longitudinally extending rib is configured such that the lateral surface of the rib facing the supporting surface for the compensating slabs extends obliquely in vertical direction and approaches the other rib side in the upward direction and that the edge surfaces of the compensating slabs extending along this rib extend also obliquely so as to correspond to the obliquely extending lateral surfaces of the longitudinally extending ribs of the supporting bodies, which facilitates both handling of the compensating slabs during installation thereof as well as adjustments of their positions.

The compensating slabs according to the invention may advantageously be formed of polymer concrete. They thus exhibit a high strength and do not require any metal frame (different from cement concrete slabs, e.g.), and thus can be produced without any problems in different dimensions, they have a good surface grip

behaviour and do not give rise to insulating problems, as may occur when using metal frame-reinforced cement concrete slabs.

The invention will now be explained in more detail with reference to examples schematically illustrated in the drawings.

In the drawings,

Fig. 1 shows a first embodiment of a multi-rail road crossing designed according to the invention in a cross-section according to line I-I of Fig. 2, the portion located between the individual tracks being illustrated in the middle of Fig. 1,

Fig. 2 is a top view onto the road crossing illustrated in Fig. 1, and

Fig. 3 is a different embodiment of such a road crossing in a cross-sectional illustration corresponding to Fig. 1.

In the road crossing 1 illustrated in Fig. 1, on the left-hand side thereof a portion of the track body of a track G1, and on the right-hand side a portion of the track body of a track G2 is illustrated. The entire track bodies result from a reflection of the parts illustrated about the respective central track plane A1 or A2, respectively, extending in the middle of the track body in the longitudinal direction of the track. The rails of the track G1 are denoted by 2, and those of the track G2 are denoted by 3. The roadway of this

road crossing is formed by self-supporting slabs in the region of the tracks G1 and G2, i.e. by inner slabs 4 bridging the space 5 between the two rails 2 and 3, respectively, of the respective track G1 and G2, respectively, and outer slabs 6 each covering a strip-shaped region 7 externally of the rails of the respective track. The inner slabs 4 rest on the inwardly pointing bases 2a and 3a, respectively, of the rails 2 and 3, respectively, with elastic bearings 8 interposed, and are retained against shifting by the webs of the rails 2 and 3, respectively. On their side 6a facing the rails 2 and 3, respectively, the outer slabs 6 are elastically supported on the outwardly arranged bases 2b and 3b, respectively, of the rails 2 and 3, respectively, with elastic bearings 9 inserted; at their side 6b facing away from the rails 2 and 3, respectively, the outer plates 6 are supported on supporting bodies 10 laid beside the respective track G1 or G2, respectively.

In the region Z located in the middle between the two tracks G1, G2, the roadway is formed by a filling in the form of compensating slabs 11 made of concrete. At both of their longitudinal rims 12, these compensating slabs 11 are supported on the supporting bodies 10 which also support the outer slabs 6. The supporting bodies 10 proper are mounted on pedestals 13 made of site-mixed concrete. On their upper side, the

supporting bodies 10 comprise a longitudinally extending rib 14 separating the supporting surface 15 provided for the outer slabs 6 from the supporting surface 16 provided for the compensating slabs 11. On these two supporting surfaces 15, 16, elastic ledges 17, 18 are arranged on which the outer slabs 6 and the compensating slabs 11 rest. Advantageously, elastic ledges 27, 28 are also provided between the lateral surfaces 14b, 14c of the ribs 14 and the lateral surfaces 11a of the compensating slabs 11 and also the lateral surfaces 6c of the outer slabs 6. Such ledges preferably are made of elastomer material. Optionally, the outer slabs 6 and/or the compensating slabs 11 may also directly rest on the supporting bodies 10; mounting on elastic ledges is, however, preferred. The compensating slabs 11 preferably are made of polymer concrete, polyester concrete being particularly advantageous.

A further embodiment of the road crossing is illustrated in Fig. 3. In this embodiment, the supporting bodies 10a are mounted on pedestals made of concrete blocks 13a and interconnected by means of spacers 19. This results in an exact positioning of the supporting bodies 10a relative to each other. Furthermore, as illustrated, to secure the concrete blocks against dislocation thereof, these concrete blocks 13a may additionally be fixed in their positions

relative to each other by spacers 20, and this embodiment is particularly important if extreme traffic loads occur. In this embodiment, the supporting bodies 10a have longitudinally extending ribs 14a whose lateral surfaces 21 facing the compensating slabs 11a extend obliquely. The edge surfaces 22 of the compensating slabs 11a extend also obliquely, corresponding to the lateral surfaces 21 of the ribs 14a. In this embodiment, the compensating slabs 11a rest directly on the supporting bodies 10a; if desired, here, too, mounting on interposed elastic ledges (not shown) is possible.

Space A below the compensating slabs 11 or 11a and illustrated in Figs. 1 and 3, which is laterally delimited by the supporting bodies 10 or 10a, respectively, the associated pedestals 13 or 13a, respectively, and the surface 23 of the soil 24 and the lower side 25 of the slab is available for laying cables, pipes or the like therein. In Fig. 2, apertures 26 recessed in the compensating slabs 11 or 11a, respectively, are indicated which facilitate transporting and laying of the compensating slabs or dismounting thereof, respectively, by means of lifting devices for maintenance purposes.

Claims:

1. A multi-track road crossing including a roadway positioned at the level of the rails, each rail having an internally and an externally extending rail base, which
5 roadway is formed at each track (G1, G2) by self-supporting slabs (4, 6) elastically supported on at least one side on the rail bases, comprising inner slabs (4) bridging the space (5) between the two rails (2, 3) of the respective track (G1, G2) and supported on these two rails, and outer slabs
10 (6) each covering a strip-shaped region externally of the rails of the respective track and elastically supported on the externally extending rail bases at their side (6a) facing these rails and on their side (6b) facing away from these rails being supported on supporting bodies (10) laid
15 beside the respective track (G1, G2), and said roadway is formed by a filling in the middle of the intermediate area (Z) between neighbouring tracks, characterized in that the filling is formed by self-supporting compensating slabs (11, 11a) which on both of their longitudinal rims (12) are
20 supported on the supporting bodies (10, 10a) which also support the outer slabs (6).
2. A multi-track road crossing according to claim 1, characterized in that the supporting bodies (10, 10a) are mounted on pedestals (13, 13a) of site-mixed concrete or
25 of concrete blocks.
3. A multi-track road crossing according to claim 1 or 2, characterized in that oppositely arranged supporting bodies (10a) are interconnected by spacers (19).
4. A multi-track road crossing according to any one of
30 claims 1 to 3, characterized in that on their upper side, the supporting bodies (10, 10a) comprise a longitudinally extending rib (14, 14a) which separates a supporting surface

(15) for the outer slabs (6) from a supporting surface (16) for the compensating slabs (11).

5. A multi-track road crossing according to claim 4, characterized in that the longitudinally extending ribs
5 (14a) comprise lateral surfaces (21) facing the supporting surfaces for the compensating slabs (11a), said lateral surfaces (21) extend obliquely and approaches the other rib side in the upward direction and that the edge surfaces (22) of the compensating slabs (11a) extending along these ribs
10 (14a) extend also obliquely, corresponding to the obliquely extending lateral surfaces (21) of the longitudinally extending ribs (14a) of the supporting bodies (10a).

6. A multi-track road crossing according to any one of
15 claims 1 to 5, characterized in that the compensating slabs (11, 11a) are formed of polymer concrete.

7. A multi-track road crossing according to claim 6, characterized in that the compensating slabs (11, 11a) are formed of polyester concrete.

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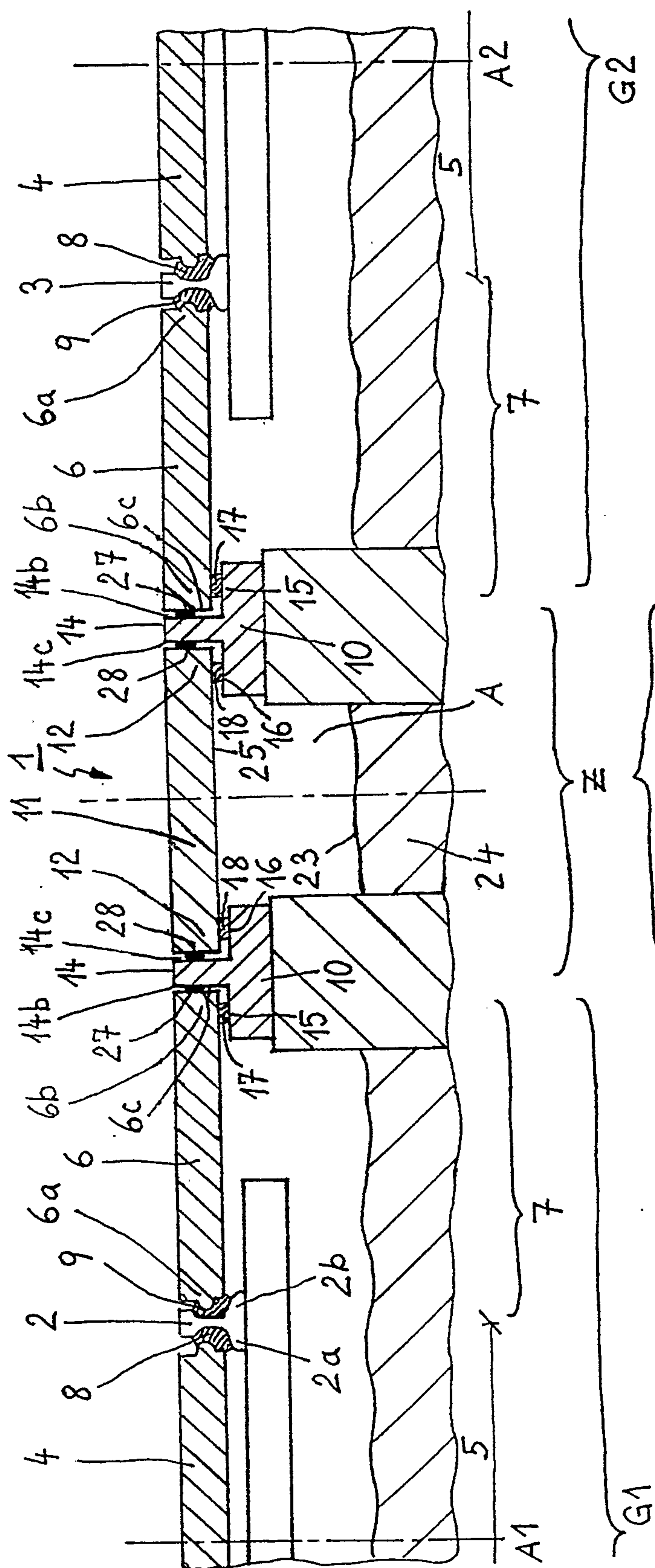


FIG. 1

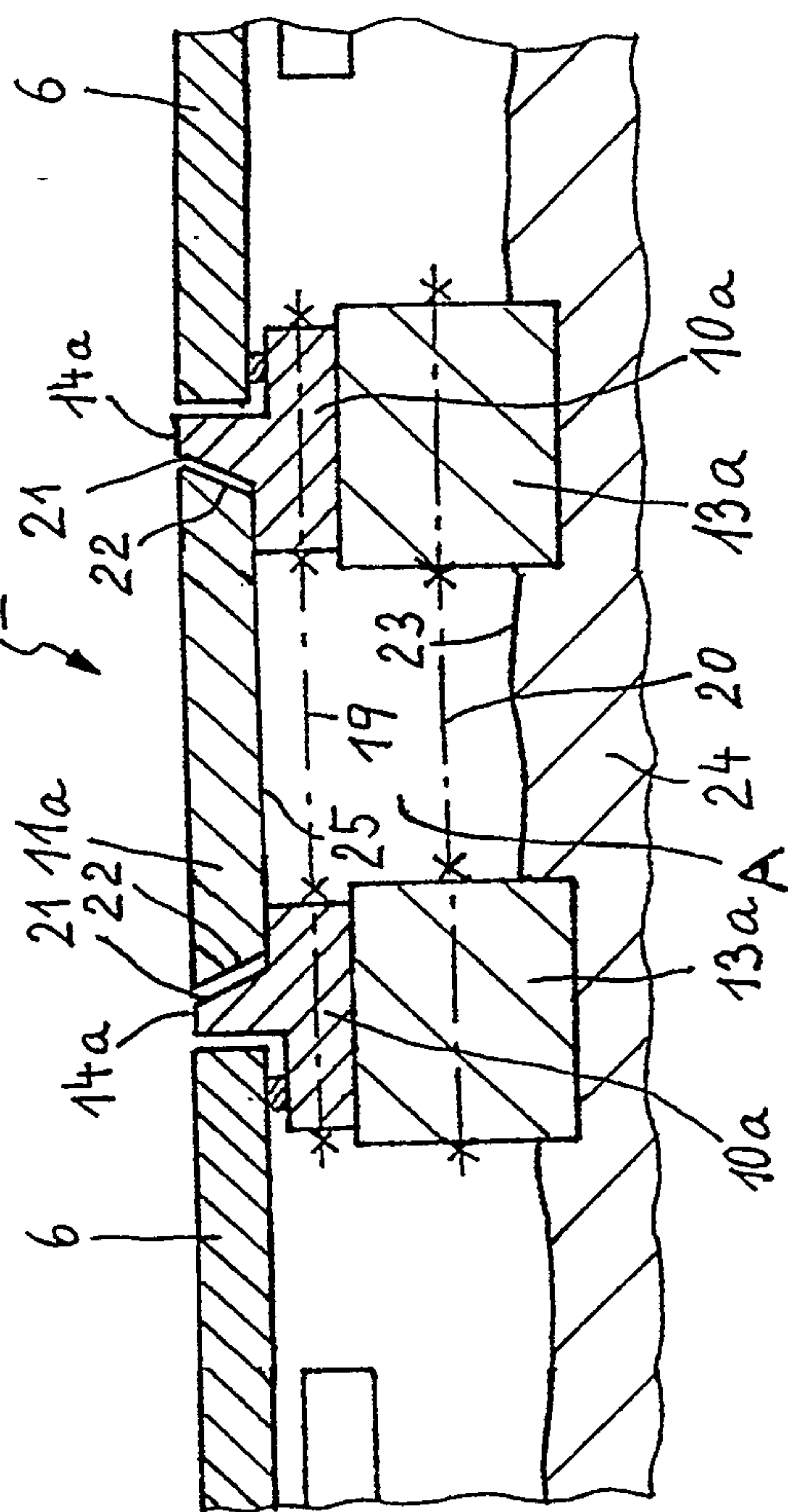


FIG. 3

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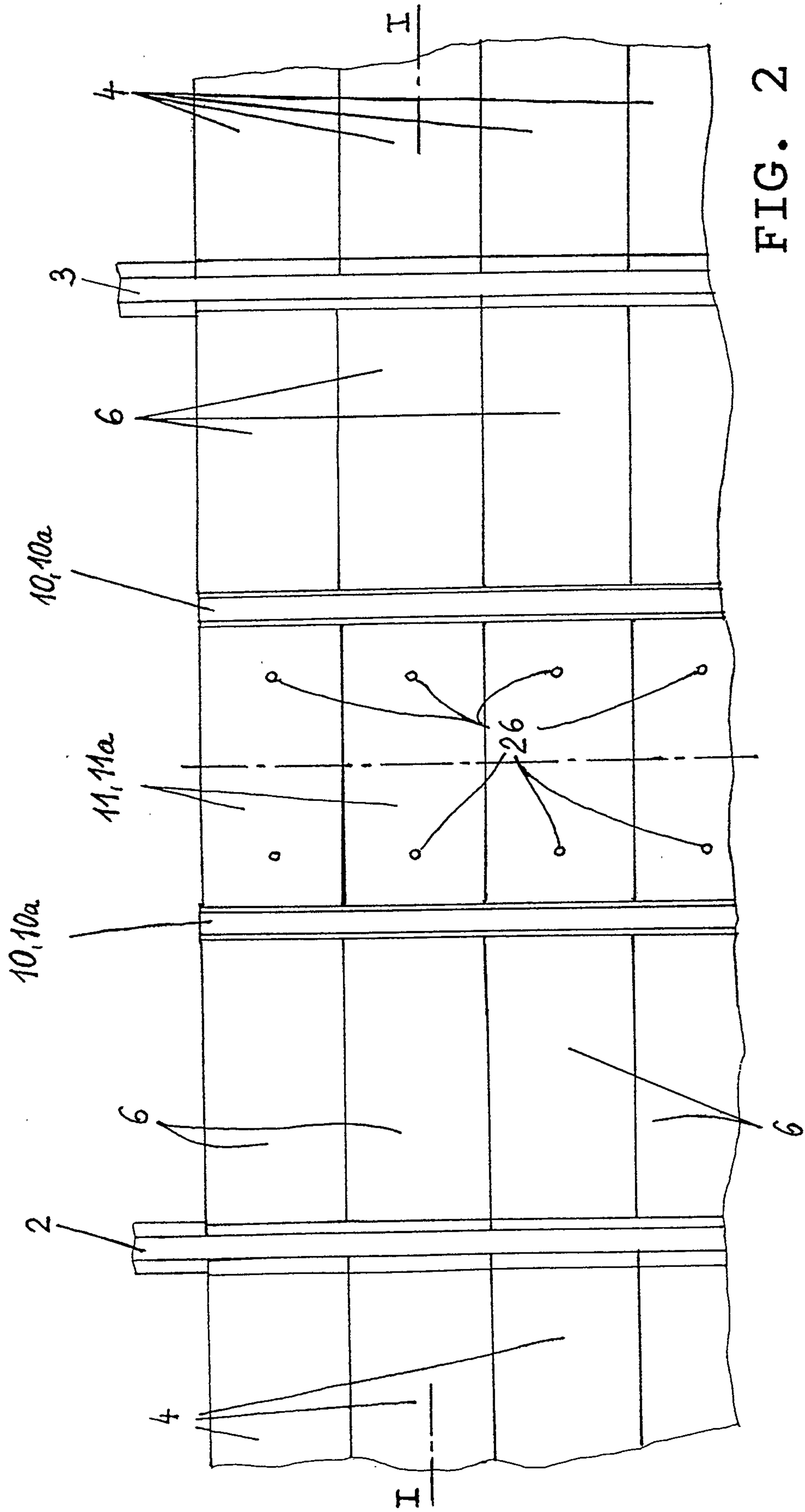


FIG. 2

