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(54) Anchorages for rail tracks.

(57) An adjustable rail anchorage assembly comprises a base sole plate with a laterally adjustable abutment member (11) to locate the bottom flange of the rail, an adjusting cam (12) having a circular bearing surface (45) to engage the abutment member and an eccentric connection with the sole plate. In the embodiment of Figures 1 to 7 there is a foot (10) welded to the sole plate and having an upstanding spigot (20) engaging in a socket (46) in the cam. A bolt (13) can be introduced through a slot (22) and has a nut (14) acting as a clamp on the cam. In the embodiment of Figures 8 to 11 the foot (50) has a socket (51) and the cam has a boss (52) fitting in the socket. In the embodiment of Figures 12 to 15 the abutment member has four spaced feet (61) which hold the shoulder (69) clear above the bottom flange (64) and permit small vertical movements of the rail.

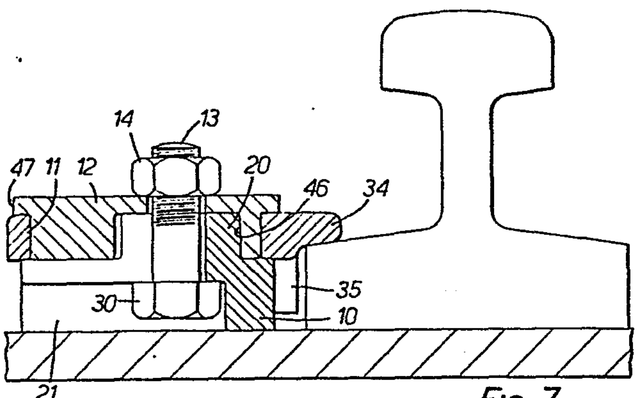

FIG. 7.

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"Anchorages for track rails"

This invention relates to adjustable anchorages for heavy duty track rails as used, for example, to support giant Goliath cranes or overhead gantry cranes in shipbuilding works, steel works, and the like.

It is necessary that these heavy duty track rails should be accurately laid out and as a practical matter this requires that the anchorages used to locate the rails should be adjustable. It is virtually impossible to fix a non-adjustable anchorage accurately in its proper position. Heavy duty track rails also require to be located not only against very heavy vertical loads, but also against very substantial lateral loads generated, for example, when a crane is in motion. Therefore, the adjustable anchorages must also be capable of resisting very heavy side loads.

The invention is based on an existing adjustable anchorage design as described in British Patent No. 867919. In that patent the rail is located by the engagement of a movable abutment member against the lateral edge of the bottom flange of the rail, the abutment member having a circular recess to receive a rotary cam, which has an eccentric hole fitting on a fixed bolt welded to the sole plate on which the track rail is supported. The cam is octagonal and can be turned by a spanner and then fixed by a clamping nut on the top of the bolt. This is an excellent method of adjustment but it suffers from some limitation in the maximum side load that can be supported. For example, in a particular case the bolt will shear off at a side load in excess of two tons. Accordingly it is an object of the invention to provide an improved anchorage which will afford a far greater lateral resisting load, but will also provide for full lateral adjustment.

A general objective of the invention moreover is to provide an improved adjustable rail anchorage assembly which will be capable of resisting lateral forces from the rail and will avoid the risk of damage or fracture to any of the component parts.

Thus, broadly stated from one aspect the invention provides an adjustable rail anchorage assembly comprising a base sole plate, an adjustable abutment member designed to engage and locate the bottom flange of the rail, an adjusting cam having a circular bearing surface to engage with a complementary circular bearing surface on the abutment member, and an eccentric pivotal connection with the sole plate, and a clamp to hold the cam in any desired position of adjustment, the anchorage being arranged to provide a clearance or overload gap in the force-transmitting connection between the rail and the sole plate, to reduce risk of fracture on overload.

In one form of the invention there are in effect two force-transmitting paths between the track rail and the sole plate, one heavy duty and one light duty, and the light duty path includes an overload gap.

In a particular preferred construction

the cam is pivotally mounted on a bolt, loosely connected to the sole plate, and lateral forces transmitted from the rail to the cam are absorbed by another heavy duty circular bearing member rigidly fixed to the sole plate.

In another form of the invention the anchorage assembly is arranged to permit small vertical lifting movement of the rail without restraint, and it is found that by doing so the anchorage is then capable of resisting extremely heavy lateral forces. Thus in another preferred construction the abutment member is arranged to engage the lateral edge of the bottom flange of the rail, and thus locate the rail horizontally, but affords a vertical clearance above the rail flange, thus allowing limited free vertical displacement of the rail.

From another aspect the invention consists in an adjustable rail anchorage comprising a movable rail abutment member designed to engage and locate the lateral flank or edge of the rail, a foot designed to be rigidly secured to a sole plate or other base mounting for the rail and having a rigid upward projecting spigot, or upward opening socket, an adjusting cam having one generally circular bearing surface to engage with a complementary circular bearing surface on the abutment, and a second eccentric circular bearing surface to engage with the periphery of the spigot or socket on the foot, such that rotation of the cam causes the abutment to move laterally with respect to the foot, and including also a clamp to hold the cam in any desired position of adjustment.

According to a preferred feature of the invention the clamp comprises a bolt secured to or located by the foot and passing through an aperture in the spigot or socket and also passing through an aperture in the cam and having a screw threaded or other clamp at its free end.

In a particular preferred construction the foot has an upstanding circular spigot and the cam has a corresponding circular socket on its underside. Preferably the foot is welded to the sole plate or other base support. Surprisingly it has been found that there are considerable advantages if the anchorage does not bear down on the rail, and according to another preferred feature of the invention the abutment has upright abutment surfaces to engage the lateral flank of the bottom flange of the rail, and an over-hanging shoulder positioned above and clear of the flange of the track rail.

In a particular preferred construction the clamping bolt is loosely mounted on the foot, and thus is in no danger of shearing off under extreme loads. Thus conveniently the foot includes a base flange which is spaced clear above the surface of the sole plate or other base support, and a slot through this base flange from its edge to the spigot allows a bolt to be introduced with its head below the flange, after the foot has been welded to the sole plate.

From another aspect the invention consists in an anchorage assembly for a track rail comprising an adjustable abutment member having a flat under-surface to engage a support on which the track rail rests, a vertical abutment surface to engage the edge or lateral flank of the track rail bottom flange, a circular recess or spigot to engage a complementary spigot or recess on an adjustable rotary cam, the cam having an opening to receive a bolt secured in position relative to the supporting surface, and a nut or other clamping device on the bolt to hold the cam in any position of adjustment, the anchorage being arranged not to bear down on the upper surface of the track rail flange.

Preferably the adjustable abutment has a part overhanging and spaced above the bottom flange of the track rail.

The invention may be performed in various ways and three specific embodiments with some possible modifications will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1 is a plan view of the foot of an adjustable anchorage according to the invention,

Figure 2 is a sectional side view through the side on the line II - II,

Figure 3 is a plan view of the movable abutment member,

Figure 4 is a side view of this member of Figure 3,

Figure 5 is a plan view of the rotary cam,

Figure 6 is a side view of the rotary cam of Figure 5,

Figure 7 is a sectional side elevation illustrating the complete assembly,

Figure 8 is a plan view of a footplate for a modified form of anchorage according to the invention,

Figure 9 is a sectional side view thereof,

Figure 10 is a plan view of a modified form of cam for use therewith,

Figure 11 is a sectional side view of the cam of Figure 10.

Figure 12 is a side elevation of the complete assembly of a third embodiment of the invention,

Figure 13 is a plan view of the adjustable abutment member,

Figure 14 is a plan view of the rotary cam, and

Figure 15 is a side view of the cam.

Referring first to the construction illustrated in Figures 1 to 7, the anchorage in this example comprises a footplate 10, a movable abutment member 11, a cam ring 12, a bolt 13 and a clamping nut 14. The footplate 10 is a generally flat steel plate of any desired shape with an upstanding circular integral spigot 20. The underside of the plate is formed with a rebate or undercut slot 21, which provides two overhanging lips 22, the slot extending up to the centre of the spigot. The footplate is rigidly secured to the sole plate 25 on which the track rail 26 is carried and is welded to the sole plate, for example along its edges 27,28, as illustrated. In use a clamping bolt 13 is introduced with its head 30 lying in the slot 21 below the overhanging lips 22 and the main stem of the bolt projecting upwards through the spigot 20 along the centreline 23.

The movable anchorage member 11 has a circular opening or socket 33 and a forward projecting shoulder 34 with two downwardly projecting lugs 35. The lugs are designed to engage the edge, see Figure 7, of the bottom flange of the track rail and the shoulder 34 is deliberately positioned clear and above this bottom flange so that no contact will occur. This has the important result that the abutment member and other parts of the anchorage will not be rocked out of the proper position.

Co-operating with and between the footplate and the abutment member is the rotary cam 12, illustrated in Figures 5 and 6. This has a flat top plate 44 and a downward projecting circular boss 45 with an eccentric circular recess 46 designed to fit over the spigot 20 on the footplate. The external surface of the boss 45 is circular and designed to fit loosely into the circular opening 33 in the abutment. The top flange of the cam projects outwards beyond the boss 45, as shown at 47, and this part of the cam is octagonal as seen in plan and can therefore be engaged by a suitable spanner. The top plate of the cam also has an opening 48, which is central with the recess 46 to allow the clamping bolt to pass through.

When assembled, as shown in Figure 7, the clamping nut 14 is positioned on the top of the bolt above the cam and after the cam has been turned to move the abutment, as required to locate the track rail, the nut 14 is tightened down to hold the cam fixed. In this position it will be seen that heavy lateral loads applied by the track rail to the abutment 11 will be transferred via the circular surface of the socket 46 directly to the spigot 20 and hence to the footplate and the sole plate, without applying any appreciable load to the bolt 13. Full non-stepping continuous adjustment is possible and the heavy duty load carrying feature applies throughout the range. To obtain an increased range of adjustment the abutment member may have abutment lugs at different radial positions on 2,3 or 4 sides so that by turning the abutment member into the appropriate attitude a different range of adjustment is obtained.

In the alternative design illustrated in

Figures 8 to 11, the footplate 50 is provided with a socket 51 in place of the upstanding spigot 20, and the rotary cam has a downwardly projecting boss 52 to fit in the recess 51. In other respects this embodiment is similar to that previously described.

It will be appreciated that if the track rail applies a heavy lateral force to the footplate 50, the reaction is transmitted via the socket 51 engaging with the boss 52 on the cam, and as in the first example there is no reaction transmitted by the bolt 13.

In the third example illustrated in Figures 12 to 15 the anchorage assembly comprises an abutment member in the form of a heavy metal casting 60 which has four spaced legs or feet 61 at its four bottom corners forming a partly enclosed central zone with a circular opening 62 in the top flange of the member. The two front feet 61 have vertical front wall surfaces 63 which are designed to engage against the edge of the bottom flange 64 of the track rail 65. The feet 61 rest on the metal sole plate 66 which also supports the track rail and a bolt 67 is secured, for example by welding 68, to this same sole plate projecting upwards through the circular opening 62. A rotary cam 70 has a circular boss or spigot 71 designed to fit loosely in the circular opening 62 and a smaller circular bore 72 to fit over the bolt 67. An octagonal flange 73 allows the cam to be turned by a spanner and, since the opening 72 is located by the bolt 67, this rotation of the cam causes the abutment member 60 to move bodily towards and away from the track rail thus providing for the needed lateral adjustment. When adjusted the cam 70 is fixed by a clamping nut 75 on the top end of the bolt 67. The abutment member 60 has a flange 69 which overhangs the bottom flange 64 of the track rail, but is spaced clear above it. This eliminates any holding down forces and surprisingly it is found that such an anchorage is in practice more reliable and trouble free than anchorages with solid clamping ears or springs designed to bear down on the bottom flange of the track rail. It will be noted that the four legs 61 of the abutment member hold it upright and prevent any rocking or twisting which might have a harmful effect on the performance of the anchorage. The bolt 67 may be welded to the plate 66, as illustrated, or it may pass through the plate to an anchorage beneath.

CLAIMS

1. An adjustable rail anchorage assembly comprising a base sole plate, an adjustable abutment member (11) designed to engage and locate the bottom flange of the rail, an adjusting cam (12) having a circular bearing surface (45) to engage with a complementary circular bearing surface (33) on the abutment member, and an eccentric pivotal connection (46,20) with the sole plate, and a clamp (14) to hold the cam in any desired position of adjustment, characterised in that the anchorage is arranged to provide a clearance or overload gap in the force-transmitting connection between the rail and the sole plate, to reduce risk of fracture on overload.

2. An anchorage assembly according to Claim 1, characterised in that the cam(12) is pivotally mounted on a bolt (13), loosely connected to the sole plate, and lateral forces transmitted from the rail to the cam are absorbed by another heavy duty circular bearing member (20) rigidly fixed to the sole plate.

3. An anchorage assembly according to Claim 1, characterised in that the abutment member is arranged to engage the lateral edge (63) of the

bottom flange (64) of the rail, and thus locate the rail horizontally, but affords a vertical clearance above the rail flange, thus allowing limited free vertical displacement of the rail.

4. An adjustable rail anchorage comprising a movable rail abutment member (11) designed to engage and locate the lateral flank or edge of the rail, characterised by a foot (10) designed to be rigidly secured to a sole plate or other base mounting for the rail and having a rigid upward projecting spigot (20) or upward opening socket (51), an adjusting cam (12) having one generally circular bearing surface (45) to engage with a complementary circular bearing surface (33) on the abutment, and a second eccentric circular bearing surface (46,52) to engage with the periphery of the spigot (20) or socket (51) on the foot, such that rotation of the cam (12) causes the abutment (11) to move laterally with respect to the foot (10),and including also a clamp (13,14), to hold the cam in any desired position of adjustment.

5. An adjustable anchorage according to Claim 4, characterised in that the clamp comprises a bolt (13) secured to or located by the foot (10) and passing through an aperture in the spigot (20) or socket (51) and also passing through an aperture

in the cam (12) and having a screw threaded or other clamp (14) at its free end.

6. An anchorage according to Claim 4 or Claim 5, characterised in that the foot (10) has an upstanding circular spigot (20) and the cam (12) has a corresponding circular socket (46) on its underside.

7. An anchorage according to any of the preceding Claims 4 to 6, characterised in that the foot (10) is welded to the sole plate or other base support.

8. An anchorage according to any of the preceding Claims 4 to 7, characterised in that the abutment (60) has upright abutment surfaces (63) to engage the lateral flank of the bottom flange (64) of the rail (65),and an over-hanging shoulder (69) positioned above and clear of the flange of the track rail.

9. An anchorage according to any of Claims 5 to 8, characterised in that the clamping bolt (13) is loosely mounted on the foot (10).

10. An anchorage according to Claim 9, characterised in that the foot (10) includes a base flange (22) which is spaced clear above the surface of the sole plate or other base support, and a slot (21) through this base flange from its edge to the

spigot (20) allows a bolt (13) to be introduced with its head (30) below the flange (22), after the foot has been welded to the sole plate.

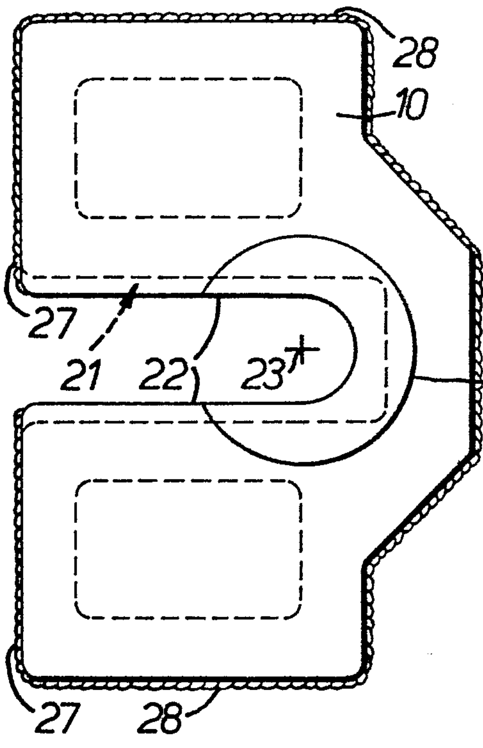


FIG. 1.

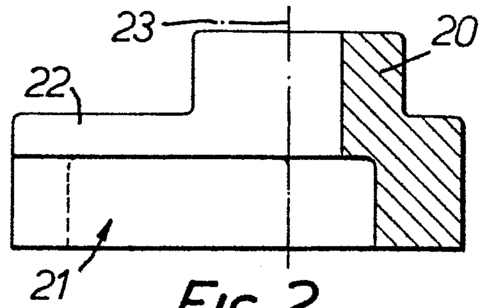


FIG. 2.

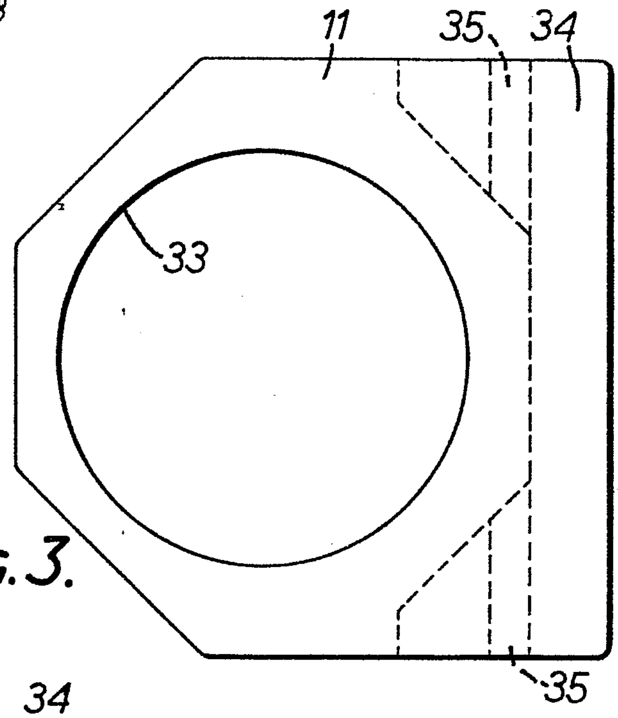


FIG. 3.

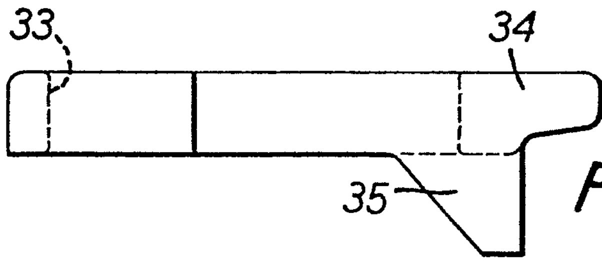


FIG. 4.

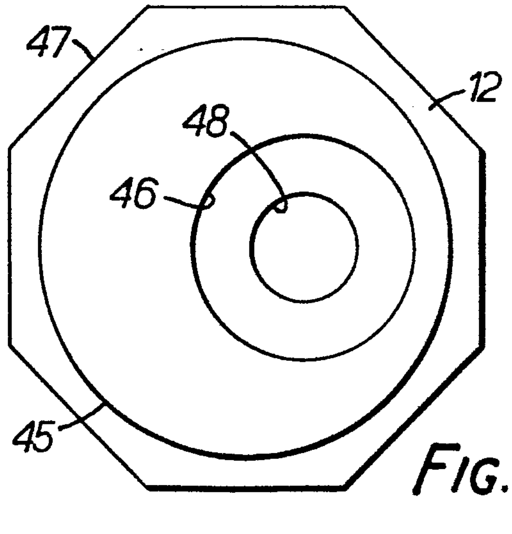
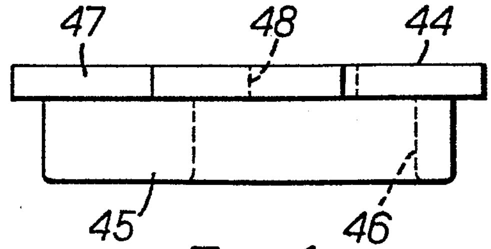


FIG. 5.



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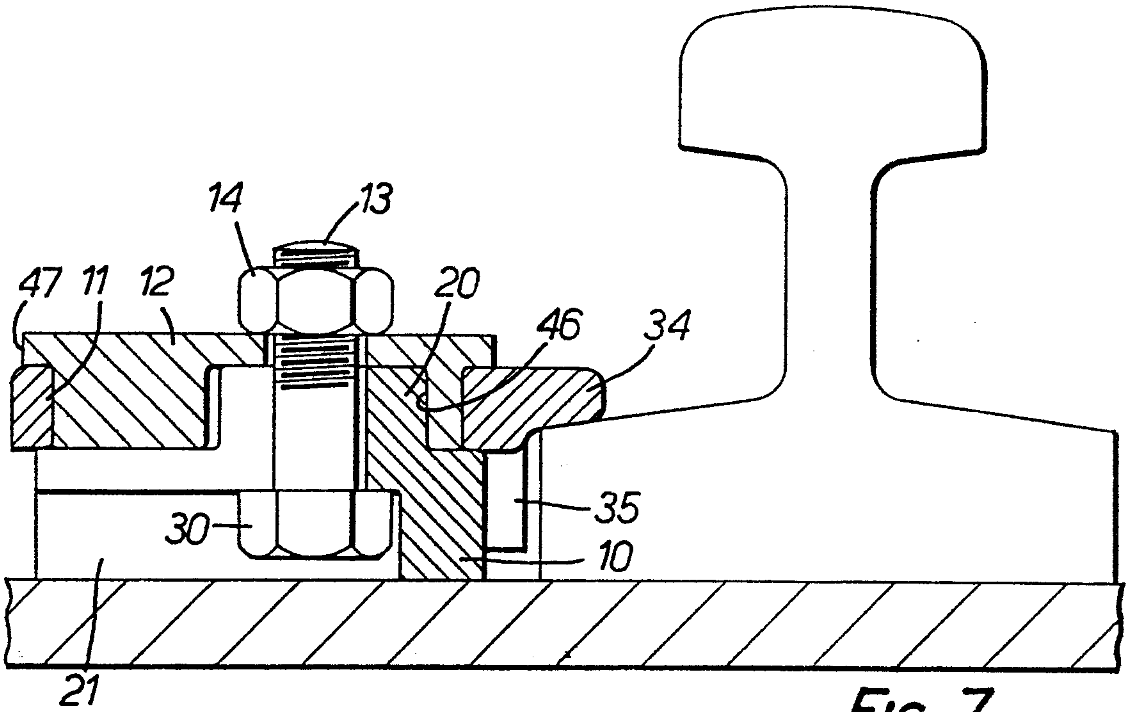

FIG. 7.

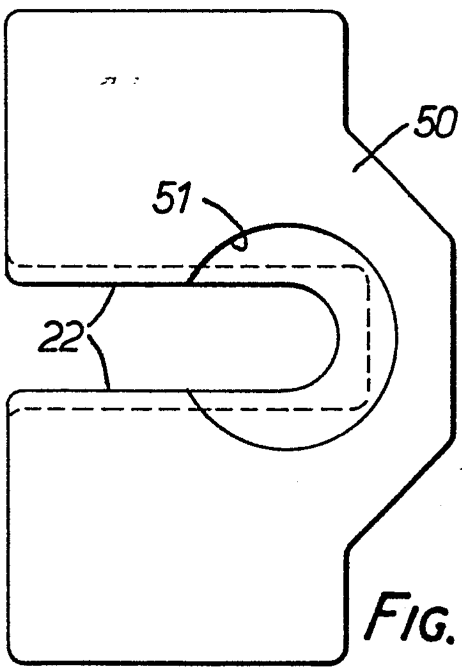

FIG. 8.

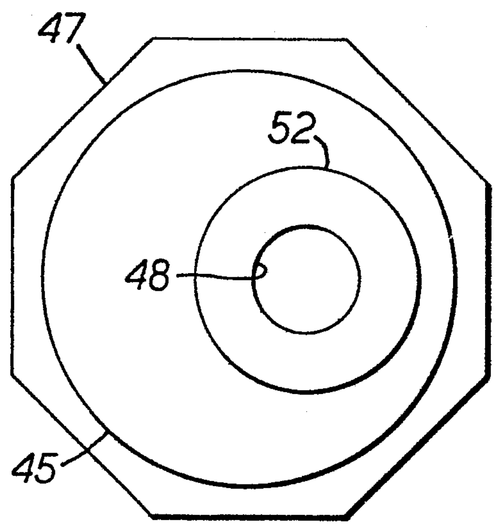

FIG. 10.

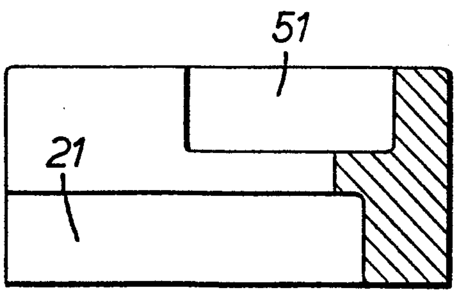

FIG. 9.

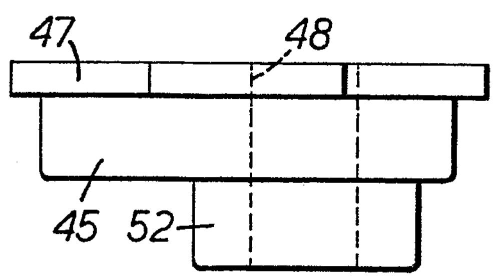

FIG. 11.

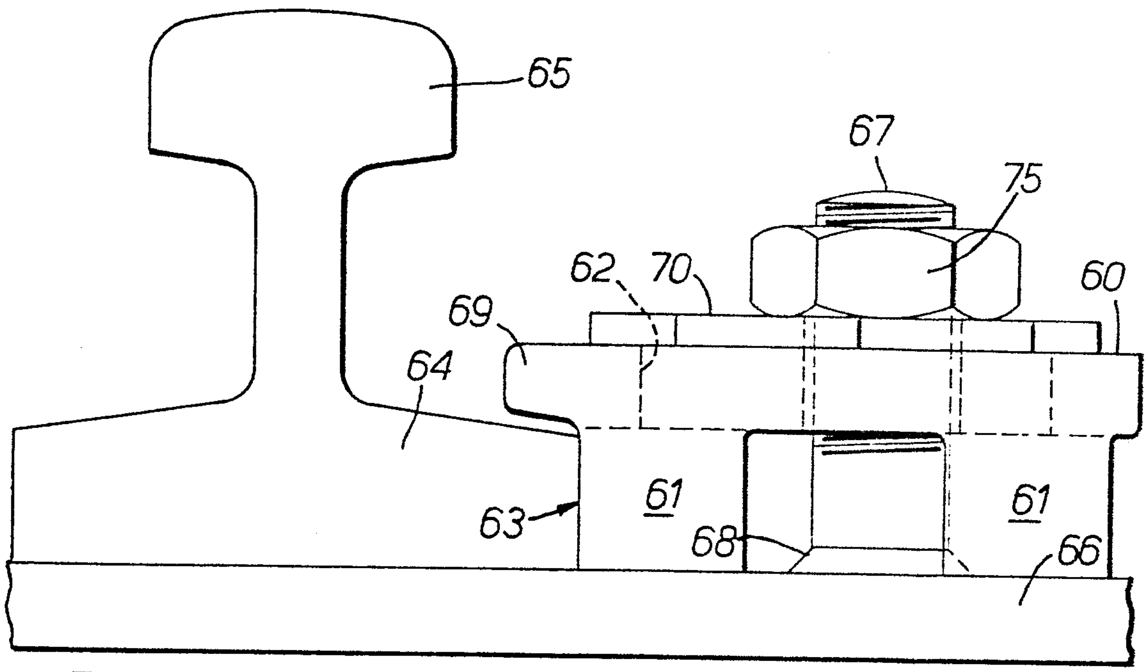

FIG. 12.

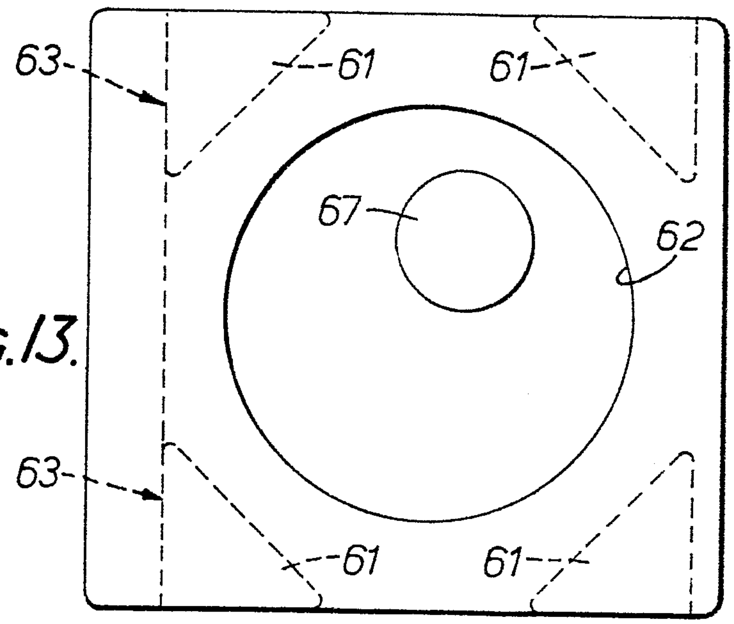

FIG. 13.

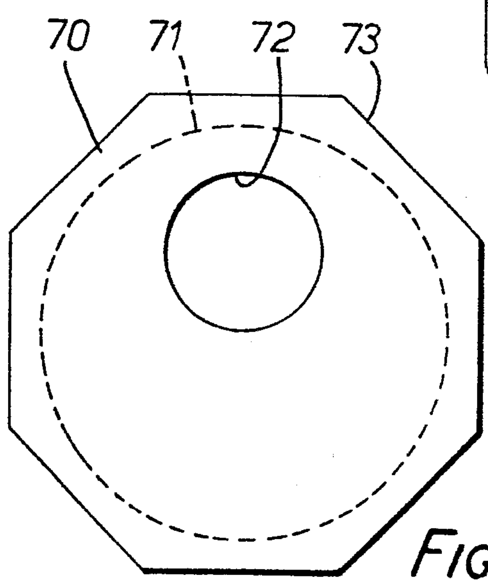

FIG. 14.

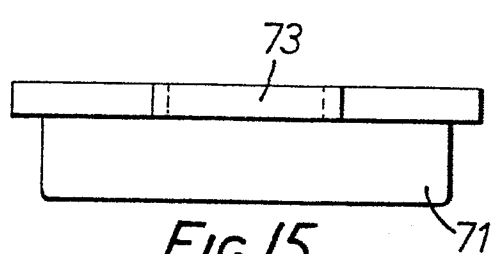

FIG. 15.