

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11)

Publication number:

0 206 618
A2

(12)

EUROPEAN PATENT APPLICATION

(21)

Application number: **86304392.3**

(51)

Int. Cl.⁴: **E 01 B 9/48**

(22)

Date of filing: **09.06.86**

(30)

Priority: **19.06.85 GB 8515471**

(71)

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(43)

Date of publication of application: **30.12.86**
Bulletin 86/52

(72)

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(84)

Designated Contracting States: **AT BE CH DE GB IT LI**

(74)

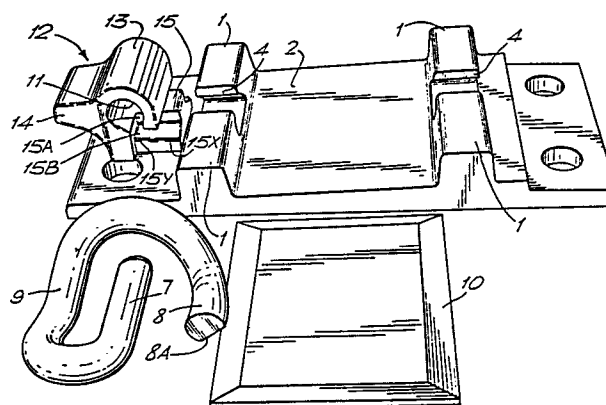
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(54)

Holding a railway rail down on a support member.

(57)

A conventional base plate has openings (4) in ribs (1) between which the rail stands, the openings (4) being wider at the bottom than at the top. An anchoring device (12) for a rail clip (7-9) has a portion (13) formed with a passageway (11), into which is driven a straight leg (7) of the clip, the leg pressing upwardly on the roof of the passageway (11). A portion (14) projects in one direction from one side of the portion (13) and a part (9) of the clip bears downwardly on it. A portion (15X) projects in the opposite direction from the opposite side of the portion 13 and it is part of a securing region (15) which is wider at the bottom than at the top and lies in the opening (4) and is passed upwardly against surfaces (5) of the base plate defining the opening (4). The part (8) of the clip bears downwardly on the upper surface of the rail flange (20B).



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1 HOLDING A RAILWAY RAIL DOWN ON A SUPPORT MEMBER

In the specification of United Kingdom Patent No. 1510224 there is disclosed an anchoring device comprising
5 a first portion which is formed with a substantially horizontal passageway and a second portion projecting sideways in one direction from one side of the first portion, the anchoring device being such that it may be included in an assembly comprising a support member for a
10 railway rail, a railway rail standing on the support member and having a flange at its foot projecting sideways in opposite directions from the central web of the rail, the anchoring device beside an edge of the flange, and a railway rail-fastening clip which has been
15 made by bending a metal bar and which has a substantially straight leg in said passageway, another part bearing downwardly on the upper surface of the rail flange and a further part bearing downwardly on said second portion of the anchoring device. Many of the anchoring devices
20 which have been incorporated in assemblies as described above incorporate a third portion projecting sideways in the opposite direction from the opposite side of the first portion. Such a device, with the third portion, is referred to below as an anchoring device of the type
25 defined .

There is also disclosed in the same specification an assembly comprising a support member for a railway rail, a railway rail standing on the support member, an anchoring device having a first portion formed with a
30 substantially horizontal passageway and having on one side of the first portion a second portion projecting in one direction away from the first portion and a railway rail-fastening clip which has been made by bending a metal bar and which has a substantially straight leg in
35 said passageway, another part bearing downwardly on the upper surface of the rail flange and a further part bearing downwardly on the second portion of the anchoring

1 device. Again the anchoring device can have the third
portion. Such an assembly, with the third portion, is
referred to below as an assembly of the type defined.

The third portion of the previously known
5 anchoring devices has a substantially rectangular
cross-section, with rounded corners, as seen in a
vertical section plane parallel to the axis of the
passageway. It helps to position the anchoring device in
a mould into which a sand/cement/water mixture is poured
10 to form a concrete railway sleeper incorporating four of
the anchoring devices, each with a long tail below the
passageway and projecting within the concrete, the length
of the tail being at least five times the width of the
passageway. The upper surface of the third portion lies
15 flush with the flat upper surface of the concrete and the
lower surface of the second portion lies on the upper
surface of the concrete.

The clip disclosed in the specification mentioned
above has become known as an "e-clip".

20 It is an object of the invention to use "e-clips"
or other resilient clips with existing base plates, known
as "K plates", which were designed to be fixed to railway
sleepers made of wood and to receive non-resilient
fastenings to hold down railway rails.

25 According to a first aspect of the present
invention, there is provided an anchoring device of the
type defined, characterised in that the third portion of
the anchoring device is part of a securing region of the
anchoring device and this securing region has an increase
30 in width of at least 40%, proceeding downwardly, and the
lowest point on the anchoring device is lower than the
bottom of the passageway by a distance which is less than
twice the maximum width of the passageway, whereby the
anchoring device may be included in a said assembly in
35 which the support member is a base plate which has an
opening in it, the opening having, proceeding downwardly,
an increase in width, the rail standing on one side of

1 the opening in the base plate and the first portion of
the anchoring device being on the opposite side of the
opening, the securing region of the anchoring device
being in the opening and being caused by the clip to be
5 pressed upwardly against surfaces on the base plate which
define the opening.

According to a second aspect of the invention,
there is provided an assembly of the type defined
characterised in that the third portion of the anchoring
10 device is part of a securing region of the anchoring
device and this securing region has an increase in width
of at least 40%, proceeding downwardly, and the lowest
point on the anchoring device is lower than the bottom
of the passageway by a distance which is less than twice
15 the maximum width of the passageway, and characterised in
that the support member is a base plate which has an
opening in it, the opening having, proceeding downwardly,
an increase in width, the rail standing on one side of
the opening in the base plate and the first portion of
20 the anchoring device being on the opposite side of the
opening, the securing region of the anchoring device
being in the opening and being caused by the clip to be
pressed upwardly against surfaces on the base plate which
define the opening.

25 The above-mentioned width of the securing region
of the anchoring device is in the examples described
below, with reference to the accompanying drawings, the
width measured parallel to the passageway in the first
portion and the width increases smoothly, proceeding
30 downwardly. Instead of that, the first-mentioned width
of the securing region could be the width measured
perpendicularly to the passageway and/or the width could
increase sharply in a single step so that the securing
region has one or two upwardly facing horizontal
35 shoulders. The opening in the base plate is in the
examples described below, with reference to the drawings,
formed in an upstanding rib extending across the top of

1 the base plate and the above-mentioned width of the
opening is the width measured parallel to the rib; this
width increases smoothly, proceeding downwardly. Instead
of that, the first-mentioned width of the opening could
5 be the width measured perpendicularly to the rib, if the
rib is provided, or parallel to the length of the plate
if no rib is provided and/or the width could increase
sharply in a single step so that one or two downwardly
facing horizontal shoulders is or are formed.

10 The increase in width of the securing region of
the anchoring member could be an increase by at least
60%, better still more than 80%. The securing region
could be substantially in the form of a letter L or an
inverted letter T or an inverted letter Y.

15 For a better understanding of the invention and to
show how it may be carried into effect, three examples in
accordance with it are described below with reference to
the accompanying drawings, in which:

Figures 1 to 3 show a side view, a plan view and
20 an end view from the right, respectively, of a
conventional railway base plate,

Figure 4 shows a perspective view of the same base
plate, a pad, a railway rail-fastening clip and an
anchoring device for anchoring the clip to the base
25 plate,

Figures 5 to 7 show views from three sides of a
modified version of the anchoring device,

Figure 8 shows an underneath plan view of the
anchoring device of Figures 5 to 7.

30 Figure 9 shows an end view of part of an assembly
of a base plate, a pad, a clip, an anchoring device and a
rail,

Figure 10 shows a plan view of most of the part
shown in Figure 9, and

35 Figure 11 shows a side view of the same part.

The base plate shown in Figures 1 to 4 is a
conventional plate known as a "K plate". It is

1 rectangular and has two upstanding ribs 1 extending
across it between which there is a flat surface 2 which
has a gradient of about 1:40 when the lower flat surface
3 of the plate is horizontal. The plate is formed by
5 rolling steel and after the rolling process an opening 4
is formed in each rib, this opening extending the full
height of the rib and, in effect, dividing it into two
ribs which are aligned and have their ends spaced apart.
The opening 4 is at first of constant width, proceeding
10 downwardly from the top of the rib 1, this width being
measured parallel to the length of the rib, and then this
width increases progressively and smoothly, so that two
curved surfaces 5 define the opening 4 below the part
thereof which is of constant width. Thus the opening has
15 substantially the form of an inverted letter Y.
Conventionally, the foot of a railway rail stands on the
surface 2 between the two ribs 1 and the plate is fixed
to a wooden railway sleeper by suitable fastening devices
passing through holes 6. The rail has conventionally
20 been held down on the plate by outmoded non-resilient
fastening devices and it is now desired to discard them
but not the base plate and, without moving the base
plate, to hold the rail down using so-called "e clips".
Figure 4 shows a suitable assembly for this purpose.

25 Figure 4 shows the same base plate and an "e-clip"
according to U.K. Patent No. 1510224, the clip having a
substantially straight leg 7 and two parts 8 and 9 on
opposite sides of it, of which the part 8 has a flat and
inclined surface 8A on its under side, which bears
30 downwardly on the sloping upper surface of the flange of
a flange-footed railway rail when the latter stands on a
rubber pad 10 which is laid on the surface 2 of the base
plate.

The straight leg 7 of the clip is driven into a
35 straight and horizontal passageway 11 in an anchoring
device 12 made of malleable cast iron, the passageway 11
being open at both ends, although in principle it could

1 be closed at one end, and closed at the top. It is of
circular cross-section and the mouth of the passageway at
each end of the passageway is flared. On one side of the
portion 13 of the anchoring device which is formed with
5 the passageway, there is a projecting ledge 14 which
projects in one direction (to the left, considering
Figure 4) away from the portion 13 and the lower surface
of the part 9 of the clip bears downwardly on the upper
surface of this ledge 14. A securing region 15 of the
10 anchoring device has a part 15X which projects sideways
in the opposite direction (compared with the ledge 14)
from the opposite side of the portion 13 and a part 15Y
which lies below the passageway 11. The securing region
15 has a width, measured parallel to the passageway 11,
15 which, proceeding downwardly, is at first constant and
then increases progressively by more than 80%. The
securing region 15 has two sideways-projecting wings 15B
extending from the bottom of a vertical-sided part 15A
and has a cross-section substantially in the form of an
20 inverted letter Y. The lowest point on the anchoring
device is lower than the bottom of the passageway by an
amount which is less than twice the maximum width of the
passageway 11.

The anchoring device is so placed that its
25 securing region 15 lies in the opening 4 in one of the
ribs 1 of the base plate and when the straight leg 7 of
the clip is driven into the passageway 11 the straightleg
7 exerts an upward force on the roof of the passageway
11, which causes the upper surfaces of the wings on the
30 securing region 15 to press against the surfaces 5 in the
rib 1 of the base plate, whereby the anchoring device is
fixed in its desired position.

In the modified version of the anchoring device
shown in Figures 5 to 8, material is saved by reducing
35 the radial thickness of the part 13 of the anchoring
device in places, to x at one place, the result being
that at each end of the device there is a flange 16 and a

1 rib 17 runs along the top of the device. The portion 13
of the anchoring device is regarded as all that part
between the imaginary vertical planes A and B, in Figure
6, which are parallel to a vertical plane containing the
5 axis C of the passageway 11. The securing region 15 of
the anchoring device has a part 15A which lies in the
upper part, of constant width, of the opening 4 in the
rib 1 of the base plate and below the part 15A there is a
part of increasing width, proceeding downwardly,
10 consisting of two sideways-projecting wings 15B having
upper curved surfaces 15C which are pressed against the
surface 5 in the rib of the base plate. The width of the
portion 15 at the bottom of the wings 15B is about 90%
greater than the width of the part 15A.

15 The lowest point on the anchoring device is lower
than the bottom of the passageway 11 by an amount y which
is less than $1\frac{1}{2}$ times the maximum width w of the
passageway and is in fact about equal to the maximum
width of the passageway.

20 Recesses 18 and 19 contribute to a reduction in
cost of the device.

The base plate shown in Figures 9 to 11 is
substantially the same as that shown in Figures 1 to 3
but the holes 6 through it are of square cross-section.
25 The pad 10 is substantially the same as that shown in
Figure 4 and so is the clip but here there is a flat
surface 9A of flatiron shape on the under-side of the
part 9 of the clip, at the wider end of which there is a
vertical surface 9B on the clip which faces downwardly,
30 considering Figure 10, i.e. in the direction opposite to
that in which the leg 7 of the clip has been driven into
the passageway 11 in the anchoring device 12. On the
ledge 14 of the anchoring device 12 there is an upward
projection 14A at one end of which there is a vertical
35 surface 14B which faces in the opposite direction to the
surface 9B on the clip. When the leg 7 of the clip is
being driven into the passageway 11 in the anchoring

1 device 12, the part 9 of the clip slides over the
projection 14A until the surface 9B has gone past the
surface 14B and then the part 9 of the clip drops
slightly. Then the surface 14B directly confronts the
5 surface 9B so that movement of the clip in a direction
such that the leg 7 comes out of the passageway 11, due
to vibration or acts of vandalism or sabotage, is
prevented.

The edges 15E and 15F of the wings 15B are
10 inclined to the horizontal as seen in Figure 9 and the
parts 15A and 15B which are inserted in the opening 4 are
tapered from left to right, considering Figure 9, to
permit of easy insertion of these parts into the opening
4 but a tight fit of these parts when fully inserted in
15 the opening .

In other respects the anchoring device shown in
Figures 9 to 11 is in principle the same as that shown in
Figures 5 to 8. The rail 20, which is the same as that
in the assembly which is partly shown in Figure 4, is
20 symmetrical about a centre line 20A and a flange 20B
extending in opposite directions from the bottom of a
central web 20 at the top of which is a rail head 20D.

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CLAIMS:

1. An anchoring device (12) which is suitable for anchoring a railway rail-fastening clip (7,8,9), the device comprising a first portion (13) which is formed with a substantially horizontal passageway (11), a second portion (14) projecting sideways in one direction from one side of the first portion (13) and a third portion (15X) projecting sideways in the opposite direction from the opposite side of the first portion (13), the anchoring device (12) being such that it may be included in an assembly comprising a support member (1-6) for a railway rail, a railway rail (20) standing on the support member (1-6) and having a flange (20B) at its foot projecting sideways in opposite directions from the central web (20C) of the rail, the anchoring device (12) beside an edge of the flange (20B) and a railway rail-fastening clip (7,8,9) which has been made by bending a metal bar and which has a substantially straight leg (7) in said passageway (11), another part (8) bearing downwardly on the upper surface of the rail flange (20B) and a further part (9) bearing downwardly on said second portion (14) of the anchoring device (12), characterised in that the third portion (15X) of the anchoring device (12) is part of a securing region (15) of the anchoring device and this securing region (15) has an increase in width of at least 40%, proceeding downwardly, and the lowest point on the anchoring device (12) is lower than the bottom of the passageway (11) by a distance (y) which is less than twice the maximum width (w) of the passageway, whereby the anchoring device (12) may be included in a said assembly in which the support member (1-6) is a base plate which has an opening (4) in it, the opening (4) having, proceeding downwardly, an increase in width, the rail (20) standing on one side of the opening (4) in the base plate and the first portion (13) of the anchoring device (12) being on the opposite side of the opening (4), the securing region (15) of the

1 anchoring device (12) being in the opening (4) and being
caused by the clip (7,8,9) to be pressed upwardly against
surfaces (5) on the base plate which define the opening
(4).

5 2. An assembly comprising a support member (1-6)
for a railway rail, a railway rail (20) standing on the
support member (1-6), an anchoring device (12) having a
first portion (13) formed with a substantially horizontal
passageway (11), having on one side of the first portion
10 (13) a second portion (14) projecting in one direction
away from the first portion (13) and having on the
opposite side of the first portion (13) a third portion
(15X) projecting in the opposite direction away from the
first portion (13), and a railway rail-fastening clip
15 (7-9) which has been made by bending a metal bar and
which has a substantially straight leg (7) in said
passageway (11), another part (8) bearing downwardly on
the upper surface of the rail flange (20B) and a further
part (9) bearing downwardly on the second portion (14) of
20 the anchoring device (12), characterised in that the third
portion (15X) of the anchoring device (12) is part of a
securing region (15) of the anchoring device and this
securing region has an increase in width of at least 40%,
proceeding downwardly, and the lowest point on the
25 anchoring device (12) is lower than the bottom of the
passageway (11) by a distance (y) which is less than
twice the maximum width (w) of the passageway, and
characterised in that the support member (1-6) is a base
plate which has an opening (4) in it, the opening (4)
30 having, proceeding downwardly, an increase in width, the
rail (20) standing on one side of the opening (4) in the
base plate and the first portion (13) of the anchoring
device (12) being on the opposite side of the opening
(4), the securing region (15) of the anchoring device
35 (12) being in the said opening (4) and being caused by
the clip (7,8,9) to be pressed upwardly against surfaces
(5) on the base plate which define the opening (4).

1 3. A device according to claim 1 or an assembly
according to claim 2 characterised in that the width of
the securing region (15) of the anchoring device (12)
which increases, proceeding downwardly, is the width
5 measured parallel to the passageway (11) in the first
portion (13).

 4. A device or an assembly according to any
preceding claim characterised in that the width of the
securing region (15) of the anchoring device (12) which
10 increases, proceeding downwardly, increases smoothly.

 5. A device or an assembly according to claim 4
characterised in that said width of the securing region
(15) increases by virtue of there being two
sideways-projecting wings (15B) in the securing region
15 (15).

 6. A device or an assembly according to claim 5
characterised in that the upper surfaces (15C) of the
wings (15B) are smoothly curved.

 7. A device or an assembly according to claim 5
20 or 6 characterised in that above the wings (15B) there is
a part (15A) of the securing region (15) which is of
constant width, proceeding downwardly.

 8. A device or an assembly according to any
preceding claim characterised in that the securing region
25 (15) of the anchoring device (12) is substantially in the
form of an inverted letter Y.

 9. A device according to any preceding claim
characterised in that the second portion (14) of the
anchoring device (12) is formed on its upper side with a
30 substantially vertical surface (14B) which can co-operate
with a substantially vertical surface (9B) on the
underside of the said further part (9) of the clip (7 to
9) to prevent such movement of the clip that the
substantially straight leg (7) thereof comes out of the
35 passageway (11) in the anchoring device (12).

 10. An assembly according to any one of claims 1
to 8 characterised in that the second portion (14) of the
anchoring device (12) is formed on its upper side with a

1 substantially vertical surface (14B) and the under side
of said further part (9) of the clip (7 to 9) is formed
with a substantially vertical surface (9B) which faces
said surface (14B) to prevent such movement of the clip
5 that the substantially straight leg (7) thereof comes out
of the passageway (11) in the anchoring device (12).

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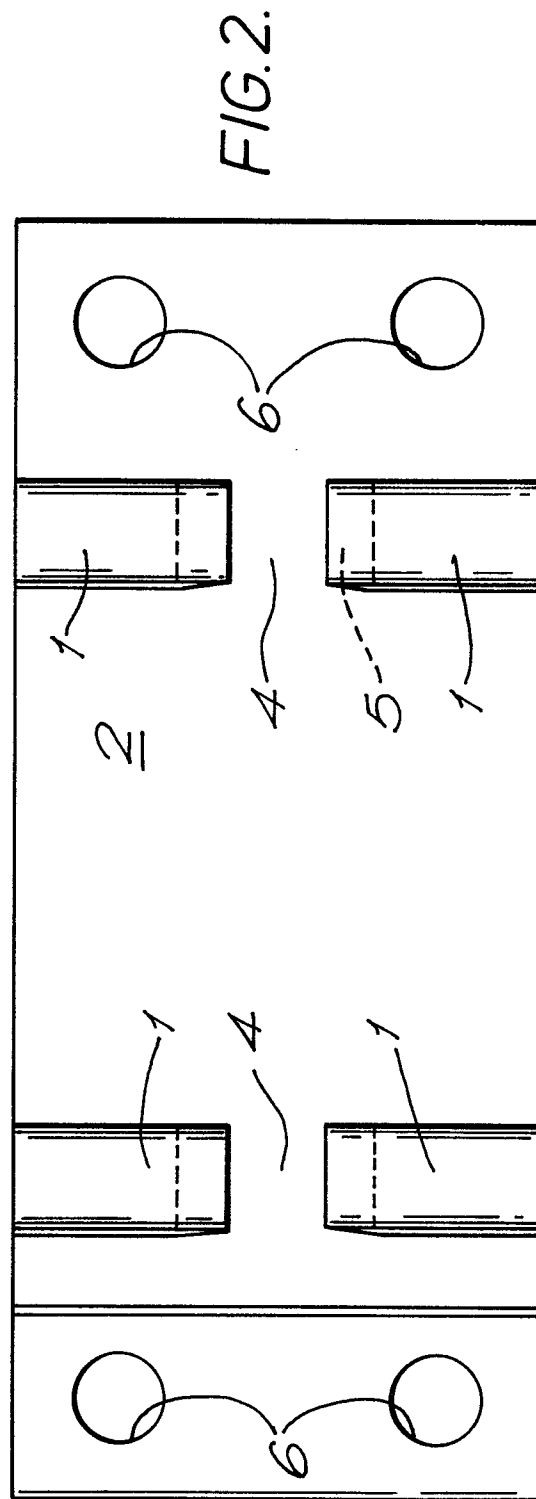
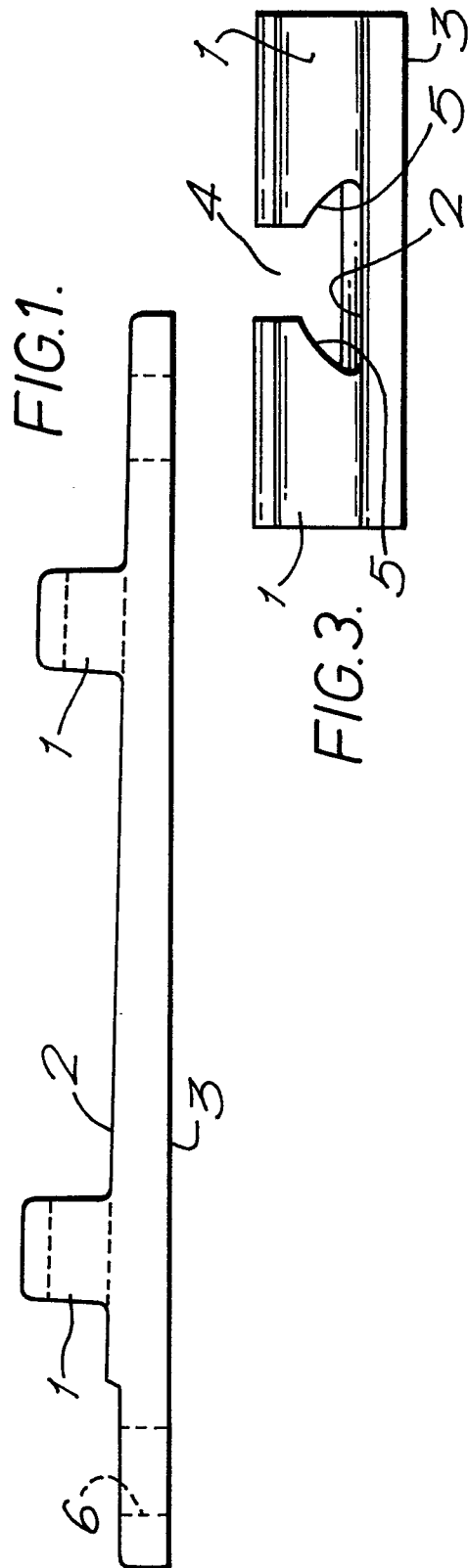
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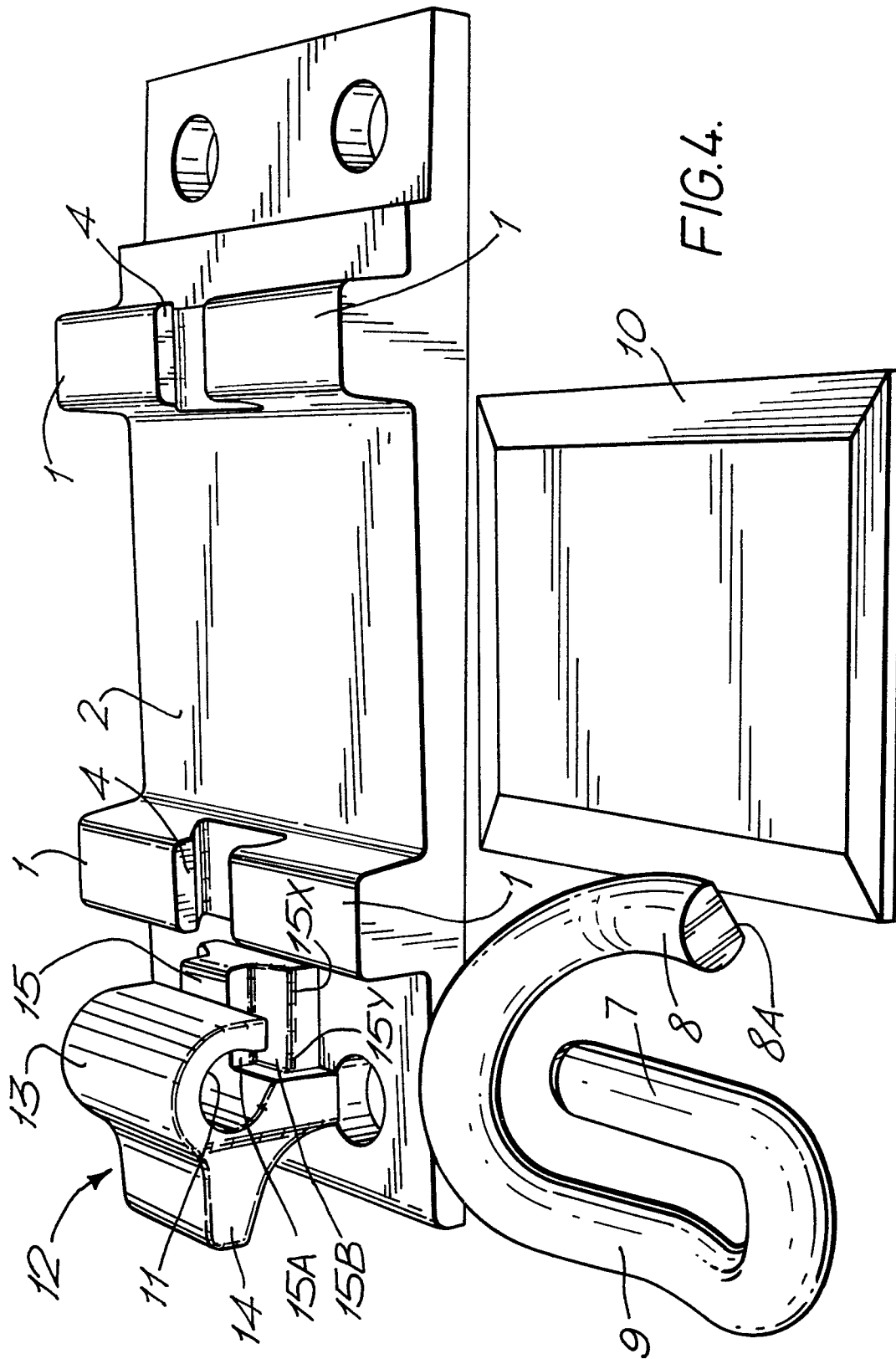
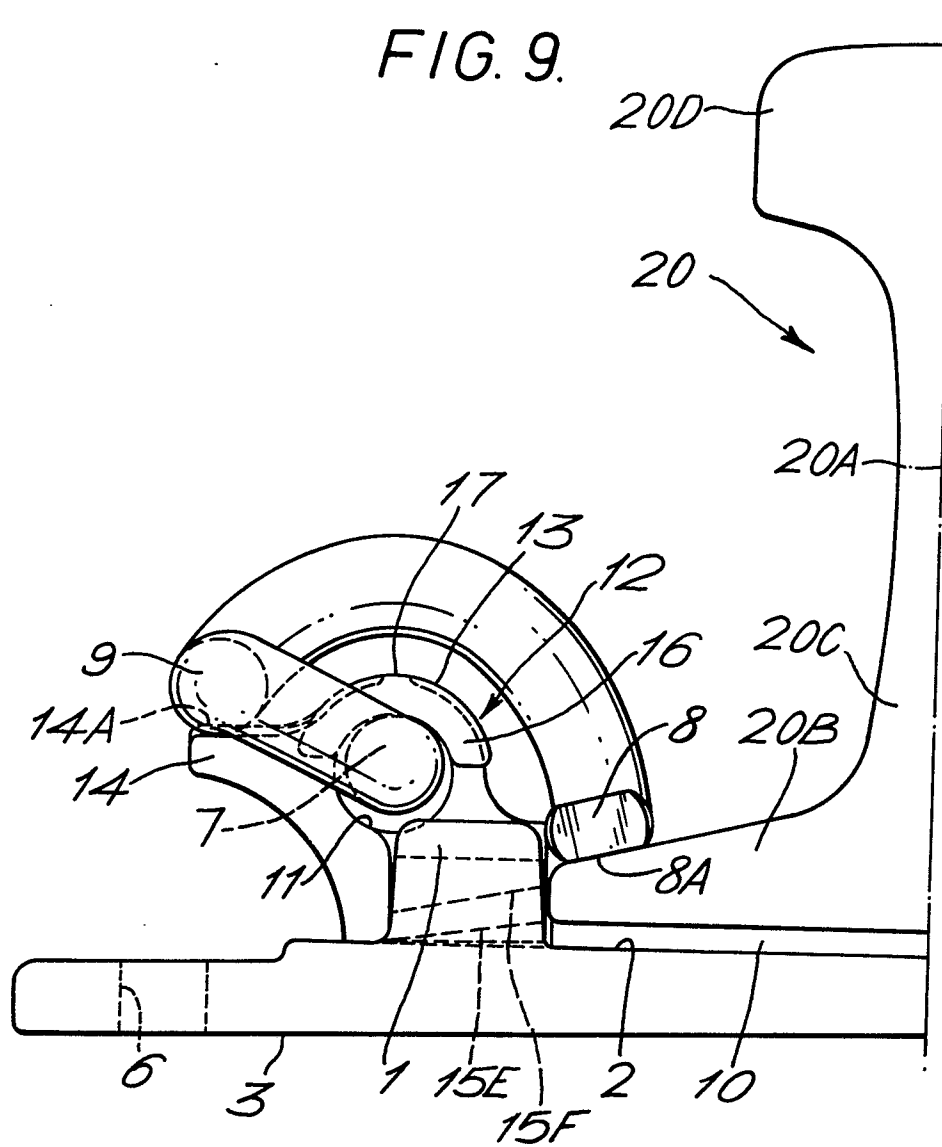


FIG. 9.



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