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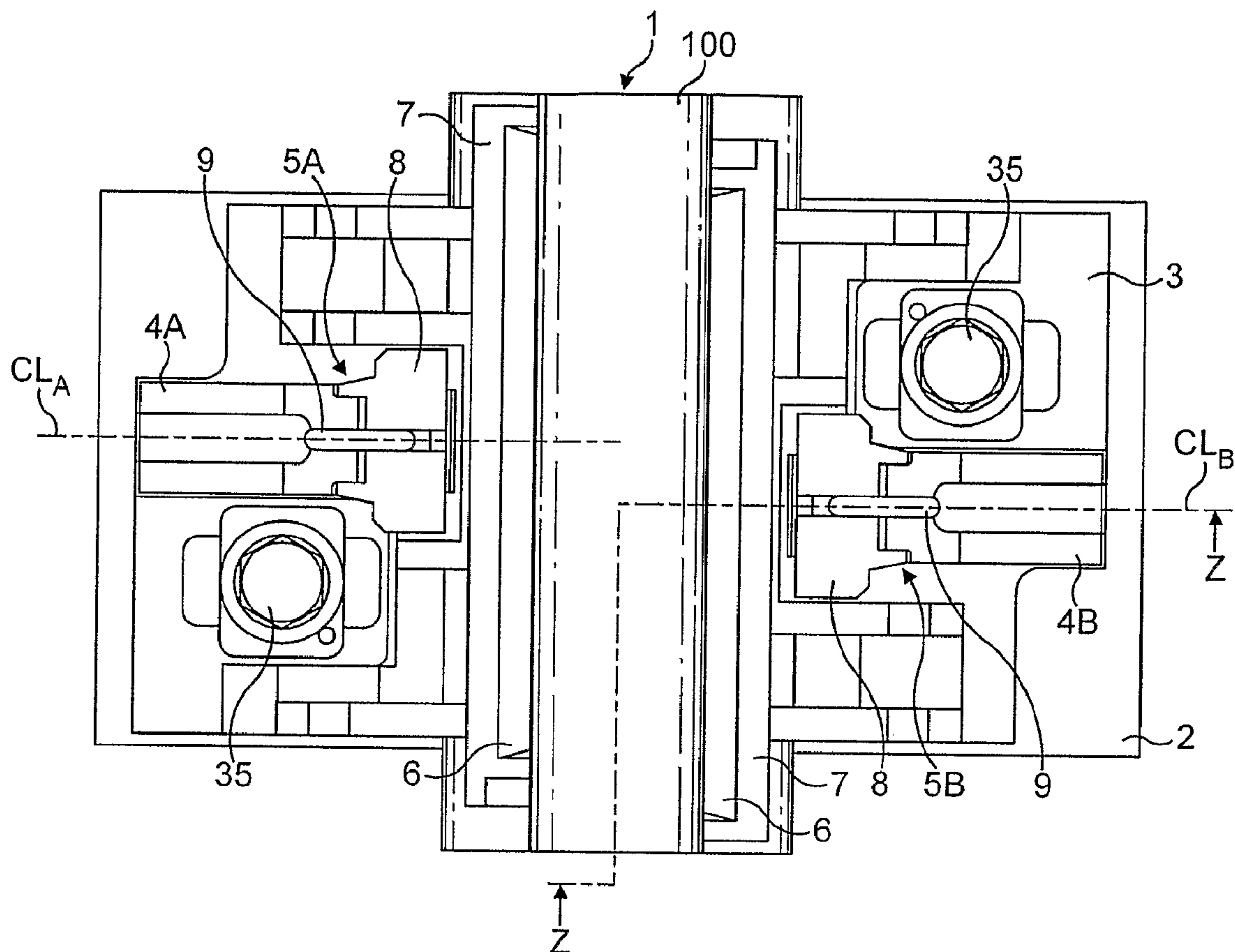
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(72) Inventeurs/Inventors:
COX, STEPHEN JOHN, GB;
POOLE, KEITH, GB;
GARWOOD, ANDREW, GB

(73) Propriétaire/Owner:
PANDROL LIMITED, GB

(74) Agent: SIM & MCBURNEY

(54) Titre : APPAREIL D'ATTACHE POUR RAIL SUSPENDU
(54) Title: SUSPENDED RAIL FASTENING APPARATUS



(57) Abrégé/Abstract:

Railway rail fastening apparatus, for suspending a railway rail (1) at discrete locations along its length above a rail foundation (2), comprises two rail suspending assemblies (4A, 4B) located when in use one on each side of the rail (1). Each assembly (4A, 4B)



(57) **Abrégé(suite)/Abstract(continued):**

comprises an elastic member (6) for supporting the head of the rail (1) on one side thereof and a bracket (7) for applying a lateral clamping force to the elastic member (6)). The rail suspending assembly (4A) on one side of the rail (1) is located such that the centre line (CL_A) of the assembly (4A) is offset with respect to that (CL_B) of the rail suspending assembly (4B) on the other side of the rail (1) by x mm along the longitudinal axis of the rail (1), where x is $50 \geq x > 0$ mm.

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(74) Agent: FENLON, Christine, Lesley; Haseltine Lake, Lincoln House, 300 High Holborn, London WC1V 7JH (GB).

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(71) Applicant (for all designated States except US): PAN-DROL LIMITED [GB/GB]; 63 Station Road, Surrey KT15 2AR (GB).

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(72) Inventors; and

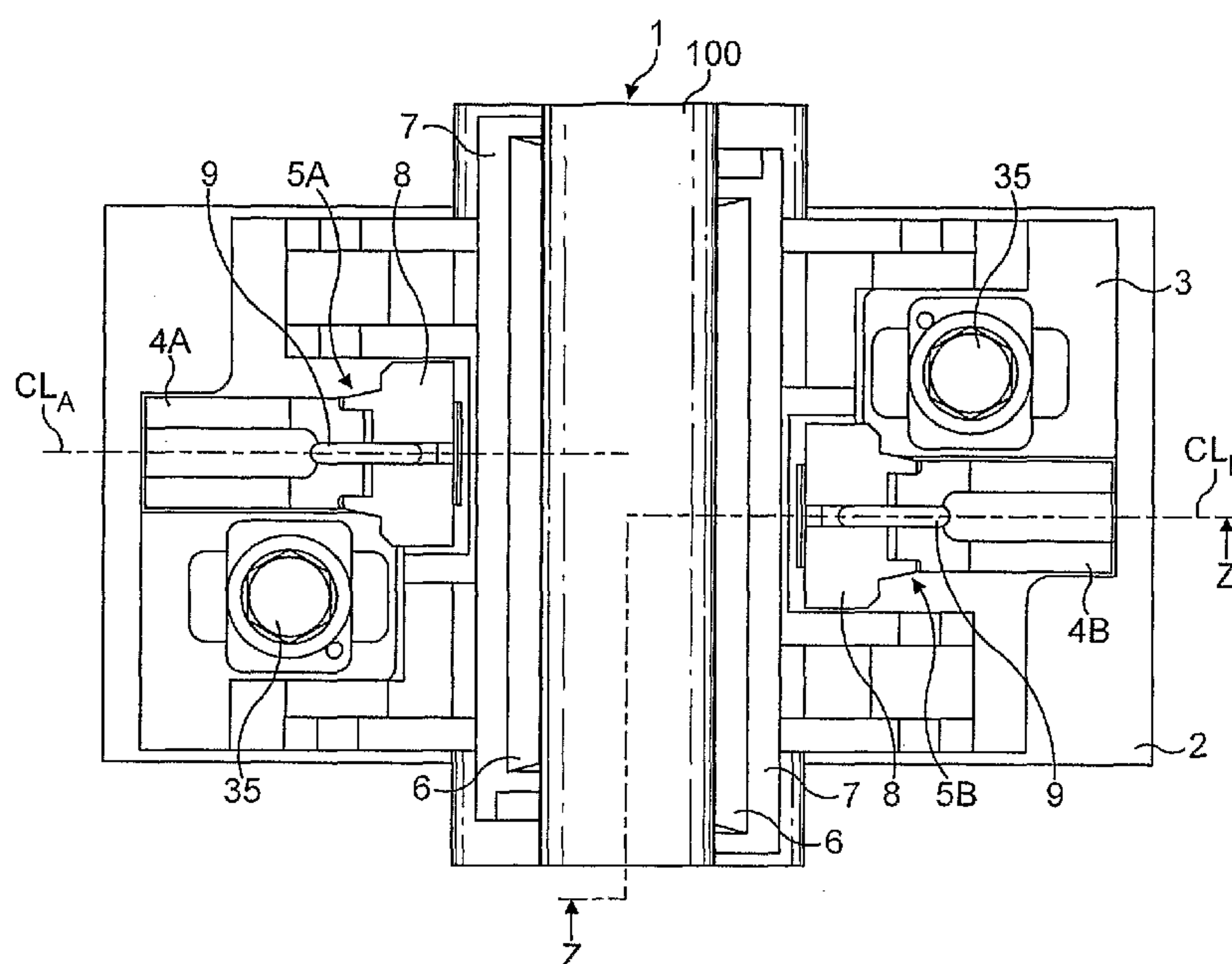
(75) Inventors/Applicants (for US only): COX, Stephen, John [GB/GB]; 5 Selwyn Avenue, Richmond, Surrey TW9 2HB (GB). POOLE, Keith [GB/GB]; 9 Mead Court, Knaphill, Woking, Surrey, GU21 2JP (GB). GARWOOD, Andrew [GB/GB]; 273 Brincliffe Edge Road, Brincliffe, Sheffield S11 9DD (GB).

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(54) Title: SUSPENDED RAIL FASTENING APPARATUS



(57) Abstract: Railway rail fastening apparatus, for suspending a railway rail (1) at discrete locations along its length above a rail foundation (2), comprises two rail suspending assemblies (4A, 4B) located when in use one on each side of the rail (1). Each assembly (4A, 4B) comprises an elastic member (6) for supporting the head of the rail (1) on one side thereof and a bracket (7) for applying a lateral clamping force to the elastic member (6). The rail suspending assembly (4A) on one side of the rail (1) is located such that the centre line (CL_A) of the assembly (4A) is offset with respect to that (CL_B) of the rail suspending assembly (4B) on the other side of the rail (1) by x mm along the longitudinal axis of the rail (1), where $50 \geq x > 0$ mm.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SUSPENDED RAIL FASTENING APPARATUS

The present invention relates to railway rail fastening apparatus for suspending a railway rail above a rail
5 foundation.

EP 0758418B discloses railway rail fastening apparatus for suspending a railway rail at discrete locations along its length above a rail foundation. As shown in Figures 1A and 1B of the accompanying drawings, this apparatus
10 comprises a baseplate 3' having a rail seat region 20' above which a railway rail 1 is suspended when the apparatus is in use and two shoulders 4' located one on each side of the rail seat region 20'. The apparatus further comprises two rail suspending assemblies 5' located
15 when in use one on each side of the rail 1, each assembly 5' comprising an elastic member 6' for supporting the head 100 of the rail 1 on one side thereof, a bracket 7' for applying a lateral clamping force to the elastic member 6', a wedge member 8' located when in use between associated
20 one of the shoulders 4' and the bracket 7' for maintaining the lateral clamping force, and a clip 9' for securing the wedge member 8' on the shoulder 4'.

An important factor in such a suspended railway rail apparatus is the degree to which the apparatus resists
25 longitudinal creep of the railway rail therethrough. Although the performance of the apparatus disclosed in EP 0758418B is very good in this regard, improved performance would be an advantage.

According to an embodiment of the present invention
30 there is provided railway rail fastening apparatus for suspending a railway rail at discrete locations along its length above a rail foundation, the apparatus comprising: two rail suspending assemblies located when in use one on each side of the rail, each assembly comprising an elastic

member for supporting the head of the rail on one side thereof and a bracket for applying a lateral clamping force to the elastic member; wherein the rail suspending assembly on one side of the rail seat region is located such that
5 the centre line of the assembly is offset with respect to that of the rail suspending assembly on the other side of the rail by x mm along the longitudinal axis of the rail, where x is $50 \geq x > 0$ mm.

The apparatus may further comprise two shoulders,
10 located one on each side of a rail seat region of the rail foundation, above which the railway rail is suspended when the apparatus in use, each rail suspending assembly further comprising a wedge member located when in use between an associated one of the shoulders and the bracket of that
15 assembly, thereby to maintain the said lateral clamping force. In this case, the rail suspending assembly and shoulder on one side of the rail seat region are located such that the centre line of the assembly and shoulder is offset with respect to that of the rail suspending assembly
20 and shoulder on the other side of the rail seat region by x mm along the longitudinal axis of the rail, where x is $50 \geq x > 0$ mm.

Desirably, x is $30 \geq x > 0$ mm, and preferably x is $30 \geq x \geq 10$ mm.

25 Even more desirably, x is $25 \geq x > 0$ mm, more preferably x is $25 \geq x \geq 10$ mm, and even more preferably $x = 25$ mm.

Surprisingly, providing a longitudinal offset of a limited distance between the centre line of the rail suspending assembly on one side of the rail seat region
30 with respect to that of the rail suspending assembly on the other side of the rail seat region provides improved resistance to creep of the rail. For example, if there is no offset at all, the longitudinal resistance to creep is 14.76 kN for a particular assembly, whereas an offset of
35 25 mm provides increased resistance to creep of 16.95 kN, but at an offset of 90 mm creep resistance is negligible.

Reference will now be made, by way of example, to the

accompanying drawings, in which:

Figures 1A and 1B (described above) show plan and part cross-sectional views respectively of conventional suspended rail fastening apparatus; and

5 Figures 2A to 2D show respective plan, part cross-sectional, side and perspective views of a railway rail fastening apparatus embodying the present invention.

Apparatus embodying the present invention comprises two shoulders 4A, 4B located one on each side of a rail seat region 20 of a rail foundation 2. A railway rail 1 is suspended above the rail seat region 20 by means of two rail suspending assemblies 5A, 5B located one on each side of the rail 1, each assembly 5A, 5B comprising an elastic member 6 made of rubber or similar material for supporting the head 100 of the rail 1 on one side thereof, a bracket 7 for applying a lateral clamping force to the elastic member 6, and a wedge member 8 located when in use between an associated one of the shoulders 4A, 4B and bracket 7 for maintaining the lateral clamping force. The wedge member 8, which preferably has a serrated face which engages with a serrated face on a rail-facing surface of the associated shoulder 4A, 4B is held in place within the assembly 5 by means of a clip 9. The clip 9 comprises an approximately U-shaped bar of round cross-section which, in use, lies in a substantially vertical plane. Figure 2A shows that a centre line CL_A of the rail suspending assembly 5A and shoulder 4A on one side of the rail 1 is offset along the longitudinal axis of the rail 1 from the centre line CL_B of the rail suspending assembly 5B and shoulder 4B on the other side of the rail 1.

Figures 2A to 2D illustrate an embodiment in which the shoulders 4 hook in to a baseplate 3 which is secured to the rail foundation 2 by two offset bolts 35. This is advantageous, since such a baseplate may be retro-fitted to an existing rail foundation already having two offset bolt-receiving holes. However, it is also advantageous to employ an embodiment of the invention in a new rail

installation, with or without a baseplate.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. Railway rail fastening apparatus for suspending a
5 railway rail at discrete locations along its length
above a rail foundation, the apparatus comprising:

two rail suspending assemblies located when in use
one on each side of the rail, each assembly comprising
an elastic member for supporting the head of the rail on
10 one side thereof, and a bracket for applying a lateral
clamping force to the elastic member and a wedge member
for maintaining the said lateral clamping force;

wherein the rail suspending assembly on one side of
the rail seat region is located such that the centre
15 line of the assembly is offset with respect to that of
the rail suspending assembly on the other side of the
rail by x mm along the longitudinal axis of the rail,
where x is $50 \geq x \geq 10$.

20 2. Apparatus as claimed in claim 1, further comprising
two shoulders, located one on each side of a rail seat
region of the rail foundation, above which the railway
rail is suspended when the apparatus in use, the wedge
members being respectively located when in use between
25 an associated one of the shoulders and the bracket of
that assembly;

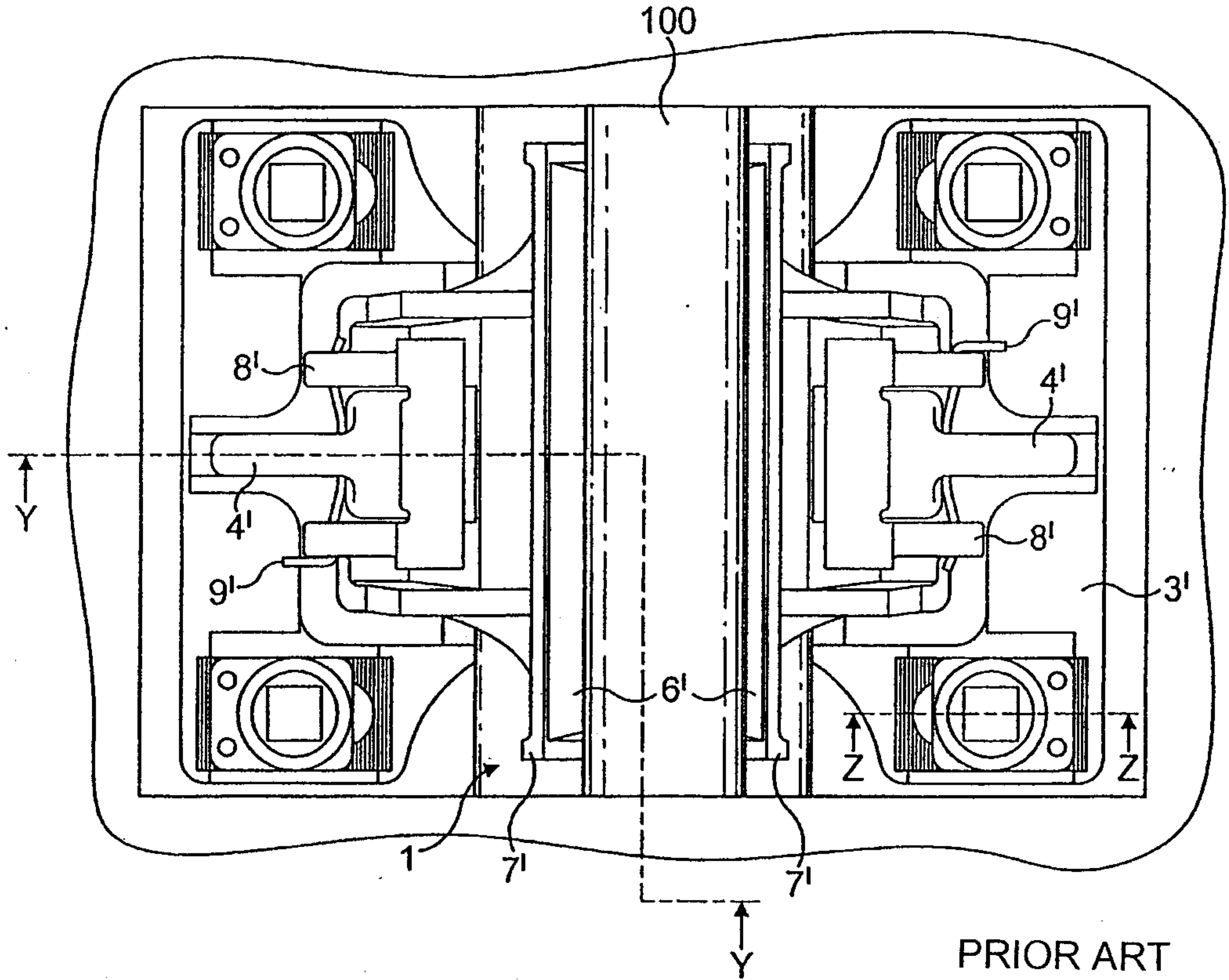
wherein the rail suspending assembly and shoulder
on one side of the rail seat region are located such
that the centre line of the assembly and shoulder is
30 offset with respect to that of the rail suspending
assembly and shoulder on the other side of the rail seat
region by x mm along the longitudinal axis of the rail,
where x is $50 \geq x \geq 10$.

3. Apparatus as claimed in claim 1 or 2, wherein x is $30 \geq x \geq 10$.

5 4. Apparatus as claimed in claim 3, wherein x is $25 \geq x \geq 10$.

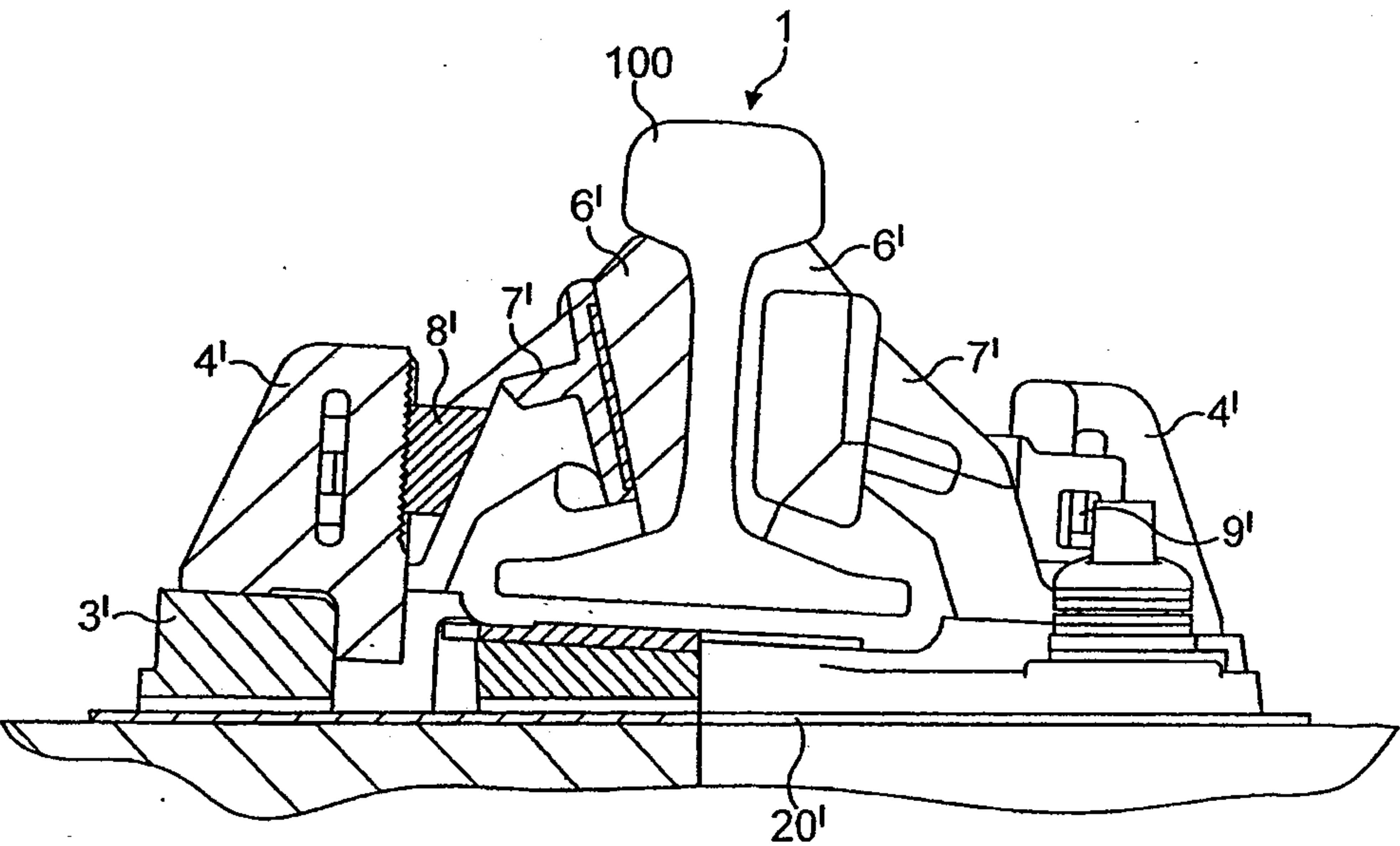
5. Apparatus as claimed in claim 1 or 2, wherein x is approximately 25mm.

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PRIOR ART

FIG. 1A



PRIOR ART

FIG. 1B

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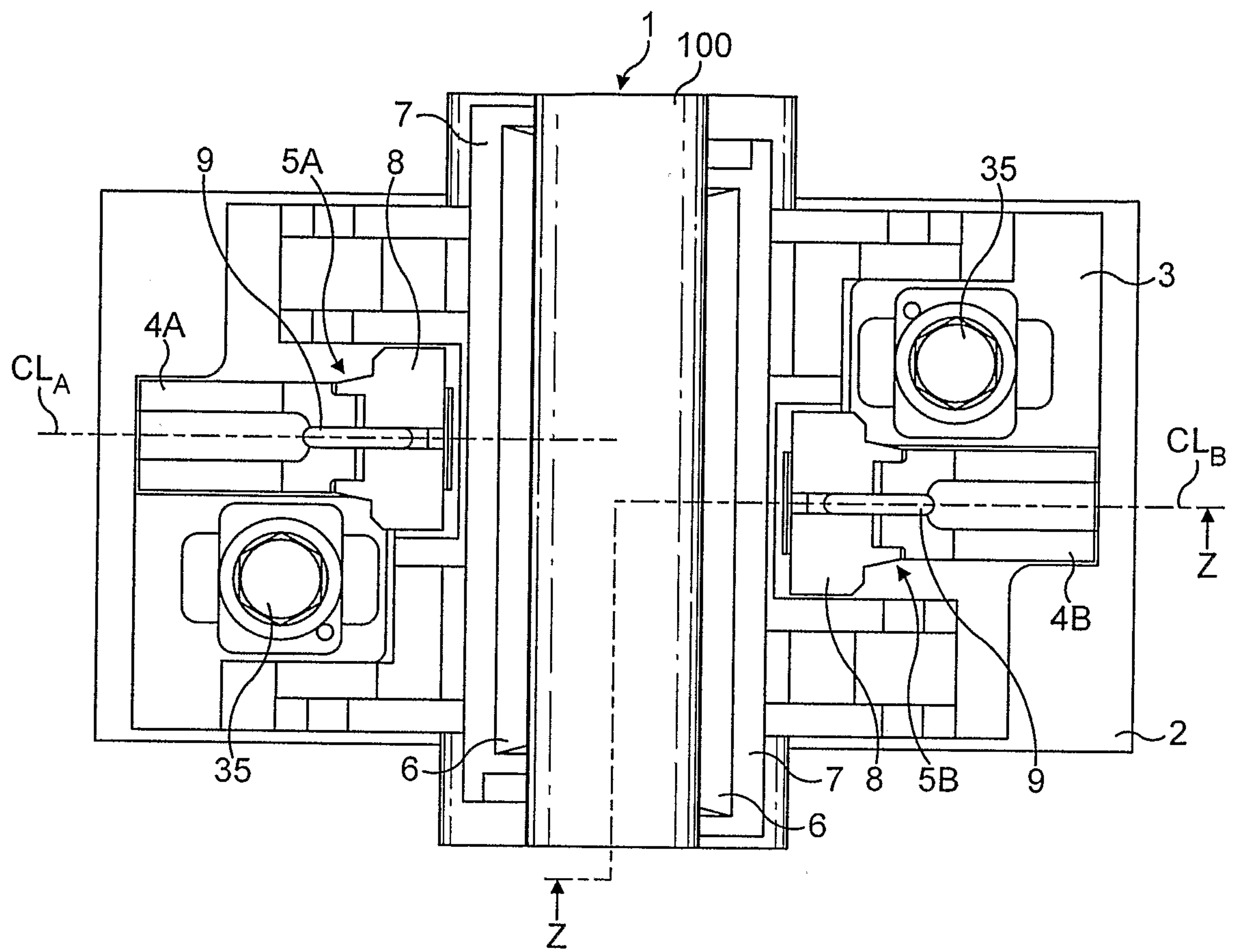


FIG. 2A

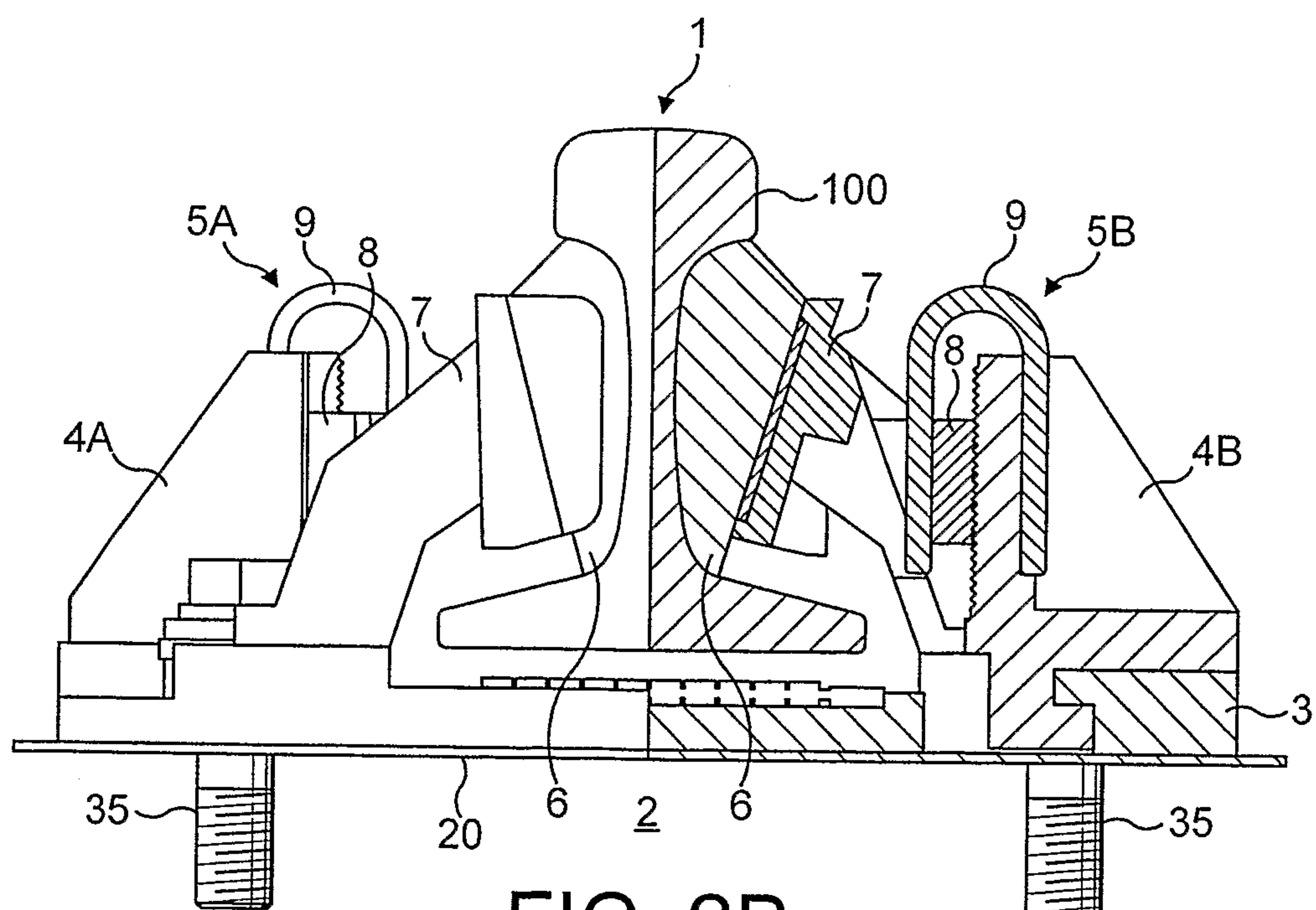


FIG. 2B

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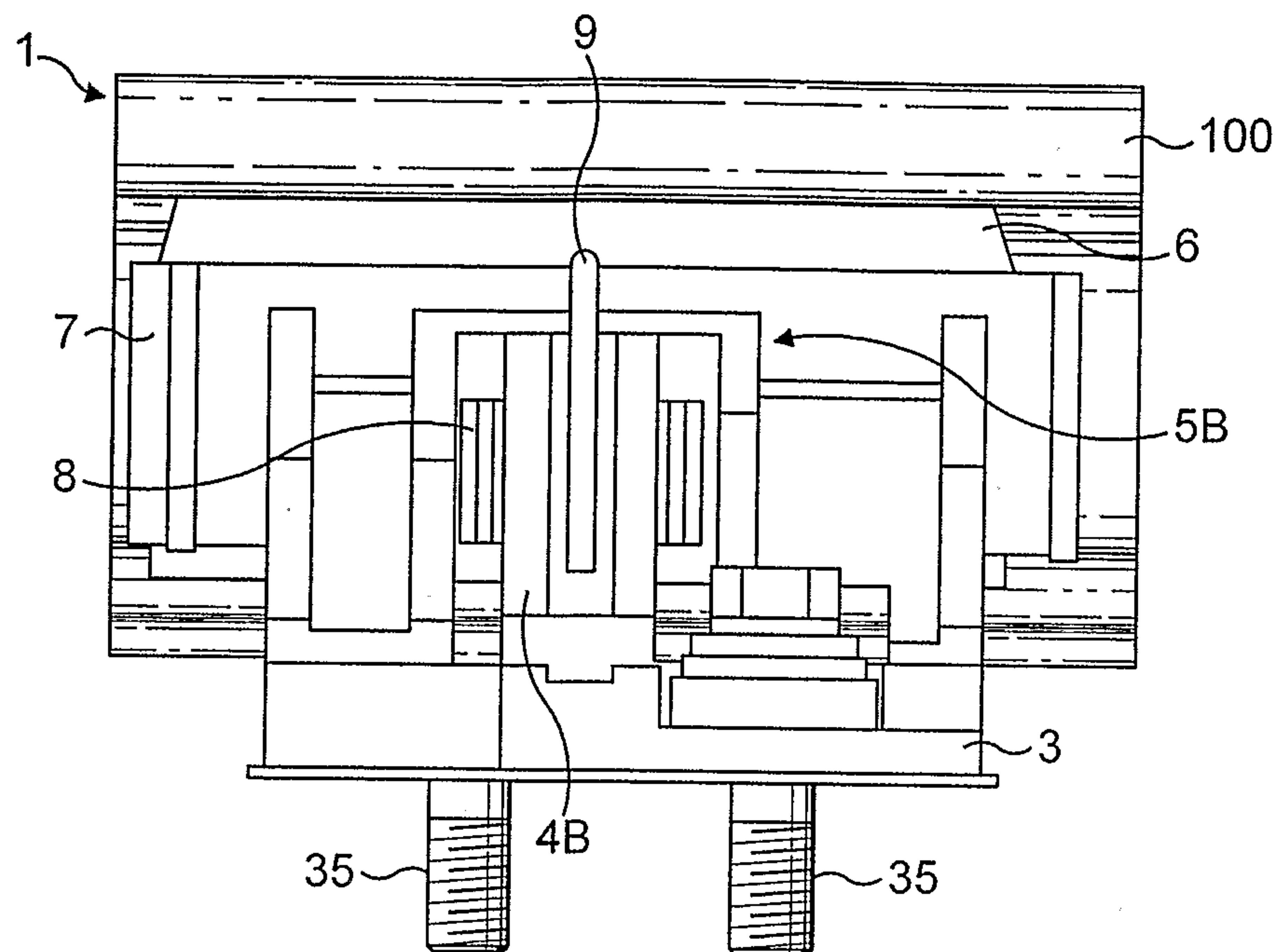


FIG. 2C

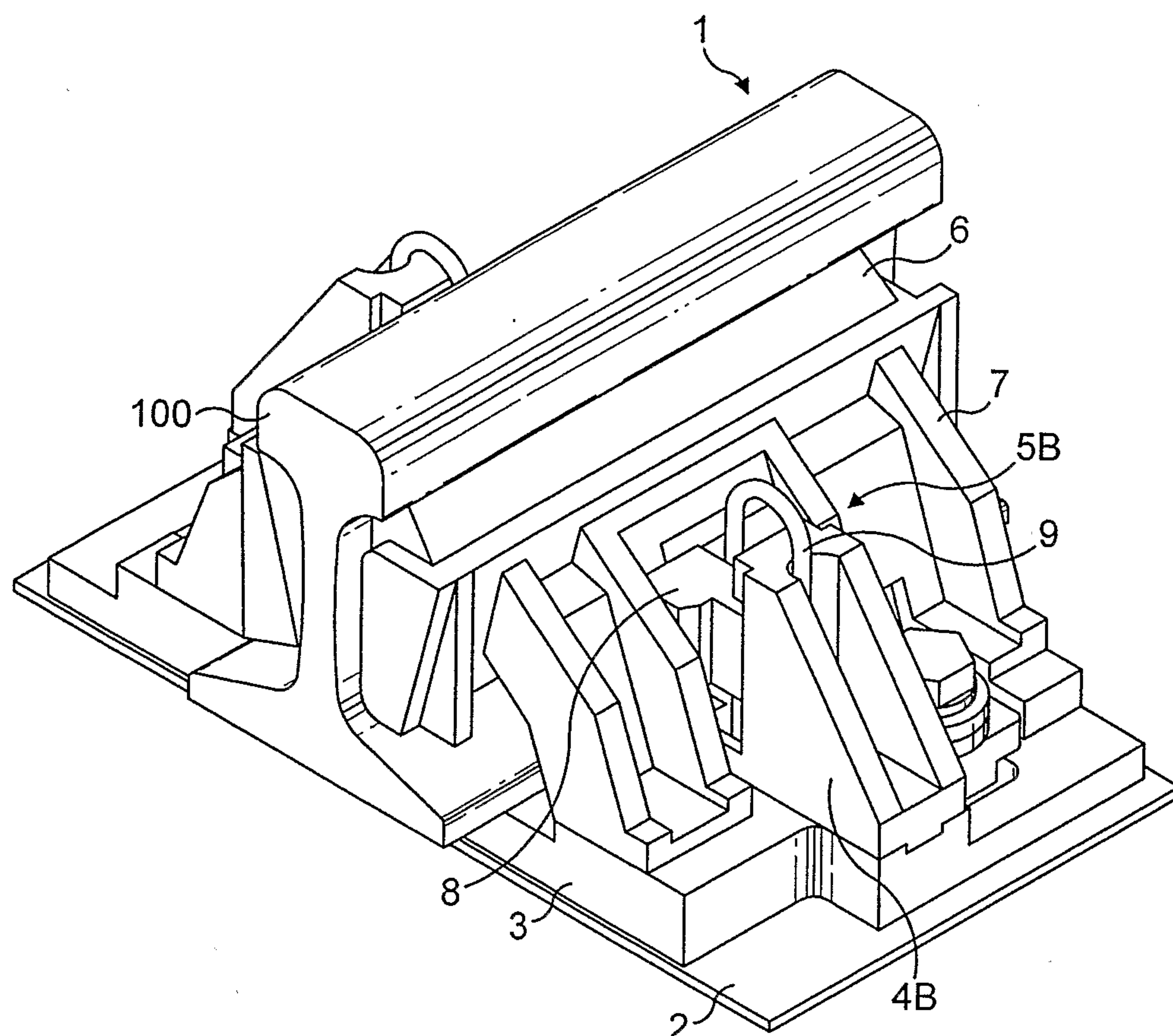


FIG. 2D

