According to a first aspect, there is provided a railway rail fastening apparatus comprising a baseplate for receiving a railway rail to be fastened thereto and baseplate securing elements to secure the baseplate to a baseplate seat area of a concrete railway foundation, the baseplate securing elements including first and second fastening assemblies configured for location on the concrete rail foundation on opposite sides of the baseplate seat area, each fastening assembly including clamping members configured such that a part of at least one of the clamping members can be arranged so as to overlie a portion of the baseplate, when the baseplate is supported by the concrete rail foundation and is located in the baseplate seat area thereof, each of the first and second fastening assemblies further including a fixing member having a first part configured for retention within the concrete rail foundation and a second part configured for location above the rail foundation and for engaging a respective clamping member; wherein, of the fixing members of the first and second fastening assemblies, only the fixing member of the second fastening assembly includes a screw-threaded fastener.

~~According to a first aspect of the present invention there is~~ Also provided is a railway rail fastening apparatus comprising a baseplate for receiving a railway rail to be fastened thereto and baseplate securing means for securing the baseplate to a baseplate seat area of a concrete railway foundation, the baseplate securing means comprising first and second fastening assemblies configured for location on the concrete rail foundation on opposite sides of the baseplate seat area, each fastening assembly comprising clamping means configured such that a part of the clamping means can be arranged so as to overlie part of the baseplate, when the baseplate is supported by the concrete rail foundation and is located in the baseplate seat area thereof, each of the first and second fastening assemblies further comprising fixing means having a first part configured for retention within the concrete rail foundation and a second part configured for location above the rail foundation and for engaging the said clamping means; wherein, of the fixing means of the first and second fastening assemblies, only the fixing means of the second fastening assembly consists of a screw-threaded fastener.

The fixing means of the first fastening assembly preferably has a bearing part having a planar load bearing face through which load is transmitted from the baseplate to the fixing means of the first fastening assembly when the apparatus is in use.

According to a second aspect, there is provided a railway rail fastening apparatus comprising a baseplate for receiving a railway rail to be fastened thereto and baseplate securing means for securing the baseplate to a baseplate seat area of a concrete railway foundation, the baseplate securing means comprising first and second fastening assemblies configured for location on the concrete rail foundation on opposite sides of the baseplate seat area, each fastening assembly comprising clamping means configured such that a part of the clamping means can be arranged so as to overlie part of the baseplate, when the baseplate is supported by the concrete rail foundation and is located in the baseplate seat area thereof, each of the first and second fastening assemblies further comprising fixing means having a first part configured for retention within the concrete rail foundation and a second part configured for location above the rail foundation and for engaging the said clamping means; wherein, of the fixing means of the first and second fastening assemblies, only the fixing means of the second fastening assembly includes a screw-threaded fastener.

~~According to a second aspect of the present invention~~ tThere is also provided railway rail fastening apparatus comprising a baseplate for receiving a railway rail to be fastened thereto, and baseplate securing means for securing the baseplate to a baseplate seat area of a concrete railway foundation, the baseplate securing means comprising first and second fastening assemblies configured for location on opposite sides of the baseplate seat area, each fastening assembly comprising clamping means configured such that an overhang part of the clamping means can be arranged so as to overlie part of the baseplate when the baseplate is supported by the concrete rail foundation and is located in the baseplate seat area thereof, wherein: the first fastening assembly further comprises fixing means having a first part configured for retention within the concrete rail foundation and a second part configured for location above the rail foundation which is adapted to retain the clamping means such that, when the apparatus is in use, a bearing part of the clamping means of the first fastening assembly is interposed between an upright face of the second part of the fixing means of the first fastening assembly and an upright end face of the baseplate; and there are interfaces between the bearing part of the clamping means and the upright end face of

the baseplate and between the bearing part of the clamping means and the upright face of the second part of the fixing means through which load is transmitted from the baseplate to the fixing means of the first fastening assembly when the apparatus is in use and these interfaces are planar.

Any upward vertical loading applied to the baseplate in the first or second aspect of the invention is first transmitted through the clamping means of the first/second fastening assembly, rather than directly into the fixing means, thereby reducing the risk of damaging the fixing means and preferably restricting the extent of any unforeseen damage to the clamping means alone, which is a separate, replaceable part. This is particularly advantageous when the fixing means of the first fastening assembly is a cast-in shoulder.

The clamping means may be made of plastics material. The resilience of plastics material gives the clamping means some flexibility, which can further reduce the effect of any upward vertical loading applied to the baseplate.

The apparatus may further comprise at least one additional clamping means for the first fastening assembly having an overhang part at a different height to the first-mentioned clamping means for installation in the apparatus in place of the first-mentioned clamping means.

The clamping means of the first fastening assembly may comprise a clamping part, a first intermediate portion for location between the clamping part and an interior portion of the second part of the fixing means and a second intermediate portion for location between the clamping part and the baseplate. At least one additional clamping part may be provided, having an overhang part at a different height to the first-mentioned clamping part, for installation in the apparatus in place of the first-mentioned clamping means. In this case, the apparatus may also further comprise at least one additional second intermediate portion, at least one dimension of which differs from that of the first-mentioned second intermediate portion, for installation in the apparatus in place of the first-mentioned second intermediate portion.

The fixing means of the first fastening assembly preferably consists of a shoulder.

According to a third aspect, there is provided a railway rail fastening apparatus comprising: a baseplate with first and second spaced apart ends, and with a central rail receiving region between the ends; first and second different fixing members each of which is carried by the baseplate adjacent to a respective end, the fixing members extend laterally from the baseplate, relative to the rail receiving region, wherein a height adjusting clamp is carried by only one of the fixing members, and where a different clamp is carried by the other fixing member and where the clamps each carry a rail clip guiding ramp; wherein the height adjusting clamp is selected from a plurality of similarly shaped clamps where the members of the plurality each have a different height adjusting parameter.

Claims

1. Railway rail fastening apparatus comprising a baseplate (20) for receiving a railway rail (10) to be fastened thereto and baseplate securing means (30; 40) for securing the baseplate (20) to a baseplate seat area (2) of a concrete railway foundation (1), the baseplate securing means (30; 40) comprising first and second fastening assemblies (30; 40) configured for location on the concrete rail foundation (1) on opposite sides of the baseplate seat area (2), each fastening assembly (30; 40) comprising clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$; 45) configured such that a part (36, 36_1-36_N; 46) of the clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$; 45) can be arranged so as to overlie part (27) of the baseplate (20), when the baseplate (20) is supported by the concrete rail foundation (1) and is located in the baseplate seat area (2) thereof, each of the first and second fastening assemblies (30; 40) further comprising fixing means (31; 41) having a first part (32; 42) configured for retention within the concrete rail foundation (1) and a second part (33; 43) configured for location above the rail foundation (1) and for engaging the said clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$; 45);

wherein, of the fixing means (31; 41) of the first and second fastening assemblies (30; 40), only the fixing means (41) of the second fastening assembly (40) consists of a screw-threaded fastener.

2. Apparatus as claimed in claim 1, wherein the fixing means (31) of the first fastening assembly (30) has a bearing part (34) having a planar load bearing face (34a) through which load is transmitted from the baseplate (20) to the fixing means (31) of the first fastening assembly (30) when the apparatus is in use.

3. Apparatus as claimed in claim 1, wherein:

a bearing part (37) of the clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$) of the first fastening assembly (30) is interposed between an upright face (34a) of the second part (33) of the fixing means (31) of the first fastening assembly (30) and an upright end face (26A, 27A) of the baseplate (20); and

there are interfaces between the bearing part (37) of the clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$) and the upright end face (26A, 27A) of the baseplate (20) and between the bearing part (37) of the clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$) and the upright face (34a) of the second part (33) of the fixing means (31) through which load is transmitted from the baseplate (20) to the fixing means (31) of

the first fastening assembly (30) when the apparatus is in use and these interfaces are planar.

4. Apparatus as claimed in any preceding claim, wherein the said clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$; 45) are made of plastics material.

5. Apparatus as claimed in any preceding claim, further comprising at least one additional clamping means (35) for the first fastening assembly having a part (36) for overlying the baseplate (20) located at a different height to that part (36) of the first-mentioned clamping means (35) for installation in the apparatus in place of the first-mentioned clamping means (35).

6. Apparatus as claimed in any one of claims 1 to 4, wherein the clamping means (35, 35_1-35_N, 35A, $35B_1$-$35B_N$) of the first fastening assembly (30) comprises a clamping part (35, 35_1-35_N), a first intermediate portion (35A) for location between the clamping part (35, 35_1-35_N) and an interior portion of the second part of the fixing means (31), and a second intermediate portion ($35B_1$-$35B_N$) for location between the clamping part (35, 35_1-35_N) and the baseplate (20).

7. Apparatus as claimed in claim 6, further comprising at least one additional clamping part (35_1-35_N) for the first fastening assembly (30) having a part (36_1-36_N) for overlying the baseplate (20) located at a different height to that part (36_1-36_N) of the first-mentioned clamping part (35_1-35_N) for installation in the apparatus in place of the first-mentioned clamping part (35_1-35_N).

8. Apparatus as claimed in claim 7, further comprising at least one additional second intermediate portion ($35B_1$-$35B_N$), at least one dimension of which differs from that of the first-mentioned second intermediate portion ($35B_1$-$35B_N$), for installation in the apparatus in place of the first-mentioned second intermediate portion ($35B_1$-$35B_N$).

9. Apparatus as claimed in any preceding claim, wherein the fixing means (31) of the first fastening assembly (30) consists of a shoulder.

Claims

1. A railway rail fastening apparatus comprising a baseplate for receiving a railway rail to be fastened thereto and baseplate securing elements to secure the baseplate to a baseplate seat area of a concrete railway foundation, the baseplate securing elements including first and second fastening assemblies configured for location on the concrete rail foundation on opposite sides of the baseplate seat area, each fastening assembly including clamping members configured such that a part of at least one of the clamping members can be arranged so as to overlie a portion of the baseplate, when the baseplate is supported by the concrete rail foundation and is located in the baseplate seat area thereof, each of the first and second fastening assemblies further including a fixing member having a first part configured for retention within the concrete rail foundation and a second part configured for location above the rail foundation and for engaging a respective clamping member;

wherein, of the fixing members of the first and second fastening assemblies, only the fixing member of the second fastening assembly includes a screw-threaded fastener.

2. Apparatus as in claim 1, wherein the fixing member of the first fastening assembly has a bearing part with a planar load bearing face through which load is transmitted from the baseplate to the fixing member of the first fastening assembly when the apparatus is in use.

3. Apparatus as claimed in claim 1, wherein:

a bearing part of the clamping member of the first fastening assembly is interposed between an upright face of the second part of the fixing member of the first fastening assembly and an upright end face of the baseplate; and

there are interfaces between the bearing part of the clamping member and the upright end face of the baseplate and between the bearing part of the clamping member and the upright face of the second part of the fixing member through which load is transmitted from the baseplate to the fixing member of the first fastening assembly when the apparatus is in use and these interfaces are planar.

4. Apparatus as in claim 1, wherein the said clamping members are made of plastic material.

5. Apparatus as in claim 1, further comprising at least one additional clamping member for the first fastening assembly having a part for overlying the baseplate located at a different height relative to a corresponding part of said clamping member with said additional clamping member installable in the apparatus in place of said clamping member.

6. Apparatus as in claim 1, wherein the clamping member of the first fastening assembly comprises a clamping part, a first intermediate portion for location between the clamping part and an interior portion of the second part of the respective fixing member, and a second intermediate portion for location between the clamping part and the baseplate.

7. Apparatus as in claim 1, further comprising at least one additional clamping part for the first fastening assembly having a region that overlays the baseplate located at a different height to the corresponding part of the said clamping part for installation in the apparatus in place of the said clamping part.

8. Apparatus as in claim 7, further comprising at least one additional second intermediate portion, at least one dimension of which differs from that of said second intermediate portion, for installation in the apparatus in place of said second intermediate portion.

9. Apparatus as in claim 1 wherein the fixing member of the first fastening assembly comprises a shoulder.

10. A railway rail fastening apparatus comprising a baseplate for receiving a railway rail to be fastened thereto and baseplate securing means for securing the baseplate to a baseplate seat area of a concrete railway foundation, the baseplate securing means comprising first and second fastening assemblies configured for location on the concrete rail foundation on opposite sides of the baseplate seat area, each fastening assembly comprising clamping means configured such that a part of the clamping means can be arranged so as to overlie part of the baseplate, when the baseplate is supported by the concrete rail foundation and is located in the baseplate seat area thereof, each of the first and second fastening assemblies further comprising fixing means having a first part configured for retention within the concrete rail foundation and a second part configured for location above the rail foundation and for engaging the said clamping means;

wherein, of the fixing means of the first and second fastening assemblies, only the fixing means of the second fastening assembly includes a screw-threaded fastener.

11. Apparatus as in claim 10, wherein the fixing means of the first fastening assembly has a bearing part having a planar load bearing face through which load is transmitted from the baseplate to the fixing means of the first fastening assembly when the apparatus is in use.

12. Apparatus as in claim 10, wherein:

a bearing part of the clamping means of the first fastening assembly is interposed between an upright face of the second part of the fixing means of the first fastening assembly and an upright end face of the baseplate; and

there are interfaces between the bearing part of the clamping means and the upright end face of the baseplate and between the bearing part of the clamping means and the upright face of the second part of the fixing means through which load is transmitted from the baseplate to the fixing means of the first fastening assembly when the apparatus is in use and these interfaces are planar.

13. Apparatus as in claim 10, wherein the said clamping means are formed of plastic material.

14. Apparatus as in claim 10, further comprising at least one additional clamping means for the first fastening assembly having a part for overlying the baseplate located at a different height to that part of the first-mentioned clamping means for installation in the apparatus in place of the first-mentioned clamping means.

15. Apparatus as in claim 10, wherein the clamping means of the first fastening assembly comprises a clamping part, a first intermediate portion for location between the clamping part and an interior portion of the second part of the fixing means, and a second intermediate portion for location between the clamping part and the baseplate.

16. Apparatus as in claim 15, further comprising at least one additional clamping part for the first fastening assembly having a part for overlying the baseplate located at a different

height to that part of the first-mentioned clamping part for installation in the apparatus in place of the first-mentioned clamping part.

17. Apparatus as in claim 16, further comprising at least one additional second intermediate portion, at least one dimension of which differs from that of the first-mentioned second intermediate portion, for installation in the apparatus in place of the first-mentioned second intermediate portion.

18. Apparatus as in claim 10, wherein the fixing means of the first fastening assembly includes a shoulder.

19. A railway rail fastening apparatus comprising:

a baseplate with first and second spaced apart ends, and with a central rail receiving region between the ends;

first and second different fixing members each of which is carried by the baseplate adjacent to a respective end, the fixing members extend laterally from the baseplate, relative to the rail receiving region, wherein a height adjusting clamp is carried by only one of the fixing members, and where a different clamp is carried by the other fixing member and where the clamps each carry a rail clip guiding ramp;

wherein the height adjusting clamp is selected from a plurality of similarly shaped clamps where the members of the plurality each have a different height adjusting parameter.