~~Base plate for fastening a rail to a fixed bottom support, and fastener for a rail~~

Support plate for securing a rail to a solid foundation and securing a rail

The invention relates to a base plate for fastening a rail to a fixed bottom support, the base plate being made of a plastics material and a stiffening structure which is formed by ribs and by depressions present between the ribs being formed or moulded in the underside of the base plate, which underside is associated with the fixed bottom support.

As well as this, the invention relates to a fastener for a rail, which fastener is produced by using a base plate of this kind.

Known in practice is a rail fastening system offered under the name "ECF" in which the rail stands on the supporting surface of a base plate made of steel. At its longitudinal sides which are aligned in the longitudinal direction of the rail which is to be fastened in place, the supporting surface is bounded by respective ribs against which the foot of the rail is guided laterally when in the fully installed state. The rib also acts as a mounting for a clamping bolt whose head seats by positive-fit in a receptacle formed or moulded in the rib and whose shank passes through the central loop of a W-shaped clamping clip in the direction pointing away from the upper side of the base plate. By means of a nut which is screwed onto the clamping bolt, the clamping clip is then braced against the base plate in such a way that a sufficiently high hold-down force is exerted on the given side of the foot of the rail by the free ends of the resilient arms of the clamping clip.

Claims

1. A fastener~~Base plate~~ for fastening a rail ~~(S)~~ to a fixed bottom support~~ (2), the~~ comprising a base plate and an intermediate layer of an elastic material arranged between the base plate and the fixed bottom support, wherein the base plate comprises ~~being made of~~ a plastics material and a stiffening structure ~~(3s)~~ which is formed by ribs ~~(3t)~~ and by depressions ~~(3u)~~ present between the ribs ~~(3t)~~ being formed or moulded in an~~the~~ underside ~~(U)~~ of the base plate~~ (3)~~, wherein the~~which~~ underside ~~(U)~~ is associated with the fixed bottom support~~ (2)~~, wherein~~characterised in that~~ the depressions of the stiffening structure ~~(3s)~~ are closed off by a filling material~~ (T)~~.

2. The fastener~~Base plate~~ according to claim 1, wherein~~characterised in that~~ the filling material completely fills the depressions ~~(3u)~~ of the stiffening structure~~ (3s)~~.

3. The fastener~~Base plate~~ according to claim 1,~~ either of the preceding claims, characterised in that~~ wherein the filling material ~~(T)~~ has sound-damping properties.

4. The fastener~~Base plate~~ according to claim 1, wherein~~one of the preceding claims, characterised in that~~ there is present on an~~its~~ upper side of the base plate,~~ (O)~~ a supporting surface ~~(3e)~~ for the rail ~~(S)~~ which is to be fastened in place, wherein the~~which~~ supporting surface ~~(3e)~~ is bounded by respective supporting shoulders~~ (3e)~~ at ~~its~~ longitudinal sides of

the supporting surface which are aligned in a~~the~~ longitudinal direction ~~(L)~~ of the rail ~~(S)~~ which is to be fastened in place.

5. The fastener~~Base plate~~ according to claim 4, wherein~~characterised in that~~ respective clamping members ~~(10a, 10b)~~ for bracing a resilient member ~~(8a, 8b)~~ can be fastened to the supporting shoulders ~~(3d, 3e)~~, the resilient member intended to hold down the rail ~~(S)~~ to be fastened in place.

6. The fastener~~Base plate~~ according to claim 5, ~~characterised in that, to allow the clamping member (10a, 10b) to be fastened in place,~~ wherein a through-opening ~~(3g, 3h)~~ which runs from the upper side ~~(O)~~ of the base plate ~~(3)~~ to the~~its~~ underside ~~(U)~~ of the base plate is formed or moulded in the given supporting shoulder to allow the clamping member to be fastened in place~~(3d, 3e)~~.

~~7. Base plate according to claim 6, characterised in that the clamping member (10a, 10b) is a clamping bolt having a polygonal head(10c) and in that there is formed or moulded in the underside (U) of the base plate (3), in the region of the mouth of the through-opening (3g, 3h), a receptacle (3i, 3h) on whose circumferential wall (3p) each side face (10d) of the bolt head (10c) has associated with it a face for contact (31) which extends for part (La) of the length of whichever is the associated side face (10d) of the bolt head (10c) and against which the relevant side face (10d) of the bolt head (10c) has, in the installed state, planar support, the faces for contact~~

~~(31) on the circumferential wall (3p) being arranged to be spaced apart from one another, and there being formed or moulded in the circumferential wall (3p) of the receptacle (3i, 3j), between each pair of adjacent faces for contact (31), a recess (3m) in which there is no contact between the bolt head (10c) and the circumferential wall (3p) of the receptacle (3i, 3j) in the fully installed state.~~

7. The fastener according to claim 6, wherein the clamping member is a clamping bolt having a polygonal head with side faces and, wherein a receptacle is formed or moulded in the underside of the base plate around the perimeter of the through-opening, wherein the receptacle comprises a circumferential side wall having contact faces formed thereon and associated with each side-face of the bolt head, wherein each contact face extends partially the length of an associated bolt head side-face, such that in an installed state, the contact faces provide planar support against the bolt head side-faces, wherein the contact faces of the circumferential wall are arranged to be spaced apart from one another such that recesses are formed or moulded in the circumferential wall of the receptacle, between directly adjacent contact faces, and wherein, at a first recess, there is no contact between the bolt head and the circumferential wall of the receptacle in the fully installed state.

8. The fastener~~Base plate~~ according to ~~one of~~ claim~~s~~ 4 ~~to 7~~, wherein the base plate~~characterized in that, when seen in plan, it~~ has a constriction in the region of the supporting surface~~ (3c)~~.

9. The fastener according to claim 1, wherein there ~~Base plate according to one of the preceding claims, characterised in that there~~ is formed on the~~its~~ underside of the base plate~~(U)~~ at least one projection ~~(3r)~~ which points away from the underside ~~(U)~~ and which acts as a stop.

10. The fastener~~Base plate~~ according to claim 1, wherein the base plate~~one of the preceding claims, characterized in that it~~ has at least one opening ~~(3o)~~, which runs from an~~its~~ upper side of the base plate to an~~(O) to its~~ underside of the base plate~~(U)~~, for a hold-down sleeve having a circumferential surface, wherein the~~(6a-6d), which~~ hold-down sleeve ~~(6a-6d)~~ has a projection ~~(6g)~~ protruding from the~~its~~ circumferential surface which bears against the upper side of the base plate ~~(3)~~ in a~~the~~ fully installed state.

11. The fastener~~Base plate~~ according to claim 10, wherein~~characterised in that~~ the hold-down sleeve takes the form of an eccentric sleeve and, wherein ~~(6a-6d) and in that~~ there are formed, in the opening ~~(3o)~~ for the sleeve, markers for indexing ~~(3q)~~ which are arranged at a spacing from one another such that, allowing for the eccentricity of an~~the~~ axis of rotation of the eccentric sleeve ~~(6a-6d)~~ from a~~the~~ central longitudinal axis ~~(Mh)~~ of the opening ~~(3o)~~ for the sleeve, the markers for indexing ~~(3q)~~ define positions in rotation of the eccentric sleeve ~~(6a-6d)~~ if the eccentric sleeve ~~(6a-6d)~~ is adjusted in rotation about the~~its~~ axis of rotation in the opening

~~(3o)~~ for the sleeve, which positions in rotation correspond to a step-by-step change in the position of the base plate ~~(3)~~ by a defined amount.

~~12. Fastener for fastening a rail (S) to a fixed bottom support (2), having a base plate (3) formed in accordance with one of claims 1 to 11 and an intermediate layer (4) of an elastic material which is arranged between the base plate (3) and the fixed bottom support (2).~~

12. The fastener according to claim 1, wherein the base plate has at least one opening, which runs from an upper side of the base plate to an underside of the base plate, for a hold-down sleeve having a circumferential surface, which hold-down sleeve has a projection protruding from the circumferential surface which bears against the upper side of the base plate in a fully installed state, which hold-down sleeve can be inserted from the upper side of the base plate through the opening for a sleeve associated with the opening in the base plate as a sliding fit, the height of which hold-down sleeve is greater than a thickness of the base plate in a region of the opening for a sleeve associated with the opening, and which hold-down sleeve has a projection protruding from its circumferential surface which bears against the upper side of the base plate in the fully installed state, and wherein a fastening member which can be inserted through the opening of the hold-down sleeve is intended to fasten the hold-down sleeve to the fixed bottom support.

~~13. Fastener according to claim 12, characterised in that the base plate (3) is formed in accordance with claim 10 or 11, in that a hold-down sleeve (6a-6d) is provided, which hold-down sleeve (6a-6d) can be inserted from the upper side of the base plate (3) through the opening (3o) for a sleeve associated with it in the base plate (3) as a sliding fit, the height (He) of which hold-down sleeve (6a-6d) is greater than the thickness of the base plate (3) in the region of the opening (3o) for a sleeve associated with it, and which hold-down sleeve (6a-6d) has a projection (6f) protruding from its circumferential surface which bears against the upper side of the base plate (3) in the fully installed state, and in that a fastening member (7a-7d) which can be inserted through the opening of the hold-down sleeve (6a-6d) is intended to fasten the hold-down sleeve (6a-6d) to the fixed bottom support (2).~~

13~~14~~. ~~Fastener according to claim 13, characterised in that the base plate (3) is formed in accordance with claim 11, in that the hold-down sleeve takes the form of an eccentric sleeve (6a-6d), and in that the hold-down sleeve (6a-6d)~~ The fastener according to claim 12, wherein the base plate has at least one opening, which runs from an upper side of the base plate to an underside of the base plate, for a hold-down sleeve having a circumferential surface, which hold-down sleeve has a projection protruding from the circumferential surface which bears against the upper side of the base plate in a fully installed state, wherein the hold-down sleeve takes the form of an eccentric sleeve and, wherein there are formed, in

the opening for the sleeve, markers for indexing which are arranged at a spacing from one another such that, allowing for the eccentricity of an axis of rotation of the eccentric sleeve from a central longitudinal axis of the opening for the sleeve, the markers for indexing define positions in rotation of the eccentric sleeve if the eccentric sleeve is adjusted in rotation about the axis of rotation in the opening for the sleeve, which positions in rotation correspond to a step-by-step change in the position of the base plate by a defined amount, and wherein the hold-down sleeve has a shaped member ~~(6f)~~ corresponding to the markers for indexing ~~(3q)~~ in the opening ~~(3o)~~ for the sleeve by means of which shaped member ~~(6f)~~ the hold-down sleeve ~~(6a-6d)~~ inserted in the opening ~~(3o)~~ for a sleeve associated with the said hold-down sleeve ~~(6a-6d)~~ is coupled by positive-fit to a given one of the markers for indexing ~~(3q)~~ in the opening ~~(3o)~~ for the sleeve.

14~~15~~. The ~~F~~fastener according to ~~one of~~ claim~~s~~ 1~~12 to 14~~, ~~characterized in that~~wherein a carrier plate ~~(5)~~ is arranged between the elastic intermediate layer ~~(4)~~ and the fixed bottom support ~~(2)~~.