

"Profiled support rail"

The invention relates to a profiled support rail.

Profiled support rails are used for securing installation appliances, such as circuit breakers for example. A very common type of such support rails is represented by the so-called hat-section support rails which in accordance with DIN (German Industrial Standard) EN 50022 are standardized throughout Europe and which are used for snapping on installation appliances.

In addition to the latter, installation systems have also been developed, in particular in areas under British influence, in which both the fastening of the installation appliances and their current supply are provided by means of integrated bus bars. In these systems it is possible in part to detach the appropriate installation appliances individually from the bus bar and to remove them with the catches integrated on the appliance from the installation group and vice versa, and to insert and attach them there.

These catches vary greatly, however, in terms of their design and arrangement and do not permit the universal application of marketable installation appliances.

Taking this state of the art as a starting point, the object of the invention is to provide a profiled support rail of the type according to the preamble which will permit a comprehensive application of installation appliances, independently of the nature and arrangement of the fastening catches suitable for the appliances.

According to the invention the attainment of this object is characterized by the features of the appended Claims 1 to 8, to which reference is directed.

The particular advantages of the invention, further developments of the invention and improvements will be explained and described in greater detail with reference to an embodiment illustrated in the Figures, which is given by way of example, in which

Fig. 1 is a perspective view of an insertable holding element;

Fig. 2 is a perspective view of a profiled support rail;

Fig. 3 is a perspective view of the profiled support

rail of Fig. 2 with the insertable holding element of Fig. 1 inserted;

Fig. 4 shows a profiled support rail including an insertable holding element with an installation appliance attached, and

Fig. 5 shows a profiled support rail including an insertable holding element with an installation appliance attached.

In Fig. 1 an insertable holding element 10 is shown, which is an elongate flat section comprising integral portions 12 on its top 11 and integral portions 14, 15, 16 on its underside 13. In addition, the insertable holding element 10 is provided with transverse slots 18 which traverse the section over approximately half the width of the section in each case and thus define in the insertable holding element 10 individual portions, so-called tongues 19, the width of each of which corresponds to that of installation appliances customary in the trade.

The integral portions 12 have a trapezoid cross-section and act as stops and supports for an installation appliance, which is not shown in Fig. 1. In addition, the integral portion 12 contributes to the reinforcement

of the tongues 19, at the free end of which the integral portion 16 is situated. The integral portion 16 forms an angled pressure surface at the end face of the tongue 19 for an installation appliance or for its fixed catch stud, provided for fastening on a hat-section support rail, as made clear below and in Figs. 4 and 5.

The integral portions 14, 15, which form a longitudinal groove 17 between them, are provided for positive-locking engagement in a profiled support rail 20, Fig. 2. In this connexion the integral portions 14, 15 are constructed in such a way that their envelope naturally forms a larger cross-section than the receiving profile (described below) provided in the support rail 20. The longitudinal groove 17 allows the integral portions 14, 15 to yield resiliently during insertion into the receiving profile in the support rail 20 and thus to bear against the receiving profile of the support rail 20 with uniform pressing force.

The integral portion 16 likewise has a trapezoid cross-section and is likewise integrally formed at the free ends of the tongue 19. In this connexion, a narrow strip, the width of which corresponds approximately to the thickness of the profile of the insertable holding element 10, projects forward and forms an angle with the lateral edge of the insertable holding element 10.

The housing (not shown in Figs. 1 and 2) of an installation appliance engages in this angle (see below) in a positively locking or form-locking manner and is acted upon in a non-positively locking or force-locking manner on account of the elasticity of the resilient tongue 19.

A longitudinal groove 21, which is formed in the underside 13 of the insertable holding element 10 at a slight distance from the integral portion 15, is used to improve the elasticity of the resilient tongue 19.

Referring to Fig. 2, showing the profiled support rail 20 in accordance with the invention, the underside of the support rail 20 is flat and the top of it is provided with integral portions 22, 23, 24, 25 associated in pairs 22, 23 and 24, 25 with one another. These integral portions 22, 23, 24, 25 are provided with overhangs in each case, which are used to hold parts of the installation appliances (not shown in Fig. 2) to be attached. One of these integral portions 22, 23, 24, 25, which all run parallel to the longitudinal axis of the profiled support rail 20, namely the integral portion 25, has an approximately circular, open hollow profile 26 which is used as a receiving profile (see above) for the insertable holding element 10 for fixing it.

In Fig. 3 the profiled support rail 20 of Fig. 2 is shown, into which the insertable holding element 10 according to Fig. 1 is inserted. This illustration shows that the integral portions 14, 15 on the insertable holding element 10 bear closely against the inner wall of the hollow profile 26 and reduce the cross-section of the longitudinal groove 17 between them. It should also be noted that the insertable holding element 10 is supported on an integral portion 27 on the profiled support rail 20 and thus produces an additional fastening. The tongues 19, as shown, project in cantilever above the support rail 20.

The groove 21, mentioned above, on the insertable holding element allows the tongues 19 to yield resiliently, for example while setting up or dismantling an installation appliance.

Fig. 4 is a lateral elevation of the profiled support rail 20 of Fig. 2 with the insertable holding element 10 of Fig. 1 inserted therein and an installation appliance 30 which is attached thereto and which is shown only in profile, the installation appliance (which may be a circuit breaker) also being adapted for fastening to a (not shown) standardized hat-section rail (referred to above).

The installation appliance 30 is held by virtue of the fact that a part 32 disposed on the rear thereof engages behind the overhang of the integral portion 24 and the insertable holding element 10 with its integral portion 16 acts in a resilient manner upon the part 32 integrally joined to the installation appliance 30 and thus fixes it in this position. More particularly, portion 16 of the insertable holding element 10, as shown in Figs. 4 and 5, has a vertical surface engaging a vertical surface of portion 32, 33 of appliance 30, 31 in a positive, or "form-locking", manner to hold portion 32, 33 in engagement with portion 24 of support rail 20. Moreover, the friction between these vertical surfaces, due to the resilience of tongue 19, acts in a "force-locking" manner to prevent portion 32, 33 from being inadvertently disengaged.

In addition, a holding element 34 is provided, which engages in a positively locking manner in the dovetail-shaped groove formed by the integral portions 22, 23 and at its other end embraces a bus bar 36 which is used for supplying the installation appliance.

An arrangement is shown in Fig. 5 which closely resembles the arrangement shown in Fig. 4. An installation appliance 31, which in contrast to Fig. 4 is not adapted for fastening to standardized hat-section

support rails 20, is attached to a profiled support rail 20 and with a lug 33 integrally formed on its rear engages, in the same manner as in the case of the installation appliance 30 shown in Fig. 4, behind an overhang of the integral portion 24 on the support rail 20, the insertable holding element 10 with its integral portion 16 acting upon the installation appliance 31 in a resilient manner and thus fixing it in position. In addition, a holding element 34 is provided which is likewise held in the dovetail-shaped groove formed by the integral portions 22, 23 in a positively locking manner against the profiled support rail and embraces a bus bar 36 at its other end.

The part 10 may be moulded. Alternatively it may be made by extrusion followed by cutting out the slots 18. The plastics material may for example be polyamide or reinforced polyamide. The resilience of tongues 19 depends, of course, on the nature of the plastics material and on the design of the part 10.

The support rail 20 is preferably extruded.

Claims:

1. A profiled support rail for securing inserted installation appliances (30) with a common bus bar connexion, which profiled support rail is constructed as an elongate formed metal-sheet or extrusion piece with holding elements which project on a flat side and are disposed parallel to the longitudinal axis and the arrangement of which is adapted to the installation appliances (30), characterized in that, in order to secure the installation appliances (30, 31) on the profiled support rail (20), two holding elements (10, 24) orientated towards one another are provided which clamp a part of each installation appliance between themselves, one holding element (24) is connected integrally with the profiled support rail and engages behind a part (32, 33) of a respective installation appliance 30, while the other is constructed as an insertable holding element (10) which can be inserted into the profiled support rail (20); and in that each installation appliance (30) is held by virtue of the fact that said part (32) of the installation appliance disposed on the rear thereof engages behind an overhang of the integral holding element (24); and in that the insertable holding element (10) comprises an integral portion (16) which acts in a resilient manner



upon said part (32) of the installation appliance, and thus fixes the installation appliance in position; and in that a portion (16) of the insertable holding element (10) has a surface for interlocking with a surface of the part (32) of the installation appliance in order to hold said part (32) of the installation appliance in engagement with the integral holding element (24); and in that friction between said surface of said portion (16) of the insertable holding element (10) and said surface of the part (32) of the installation appliance, due to the resilience of said integral portion (16), can also act in such a manner as to prevent said part (32) of the installation appliance from becoming inadvertently disengaged from said portion (16) of the insertable holding element (10).

2. A profiled support rail according to Claim 1, characterized in that the insertable holding element (10) is a flat section of plastics material, which is provided on both flat sides (11, 13) with integral portions (12, 14, 15, 16) which are used for anchoring in the profiled support rail (20) on the one hand and engage with the installation appliance (30, 31) on the other hand.

3. A profiled support rail according to Claim 1 or 2,



characterized in that the insertable holding element (10) comprises resilient tongues (19) which are separated from one another by transverse slots (18), the distance between which in each case corresponds to the width of an installation appliance (30, 31).

4. A profiled support rail according to Claim 3, characterized in that the tongues (19) are arranged on one longitudinal side of the insertable holding element (10) and are used for acting upon the installation appliance (30, 31) after insertion in the profiled support rail (20).

5. A profiled support rail according to Claim 3 or 4, characterized in that the tongues (19) comprise integral portions (12, 16), the shape of which is adapted to the installation appliances (30, 31) and which act upon the installation appliances (30, 31) in a resilient manner in order to secure them.

6. A profiled support rail according to any one of Claims 3 to 5, characterized in that on the longitudinal side opposite the tongues (19) insertable holding element (10) comprises a longitudinal bulge (14, 15) which engages in a positively locking manner in a corresponding longitudinally profiled recess (26) in the profiled support rail (20).



7. A profiled support rail according to Claim 6, characterized in that the longitudinal bulge (14, 15) in the insertable holding element (10) comprises a first longitudinal groove (17) which effects the resilient deformation of the longitudinal bulge (14, 25) and thus ensures a non-positively locking connexion of the insertable holding element (10) with the profiled support rail (20).

8. A profiled support rail according to Claim 7, characterized in that a second longitudinal groove (21), which increases the resilience of the tongues (19), is formed in the insertable holding element (10) parallel to the first longitudinal groove (17).

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