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5 Quick-release fastening for snapping an electrical
service device onto a top-hat profile mounting rail

Description

10 The invention relates to a quick-release fastening for
snapping an electrical service device onto a top-hat
profile mounting rail according to the
precharacterizing clause of Claim 1.

15 Such quick-release fastenings are provided on the
bottom face of an electrical service device, in which
case the service device has a U-shaped recess on its
fastening surface, on one side wall of which recess a
fixed tab is provided and on the other side wall of
20 which recess a tab arranged on a slide is provided,
which tabs point towards one another, with the slide
being pressed inwards against the pressure of a spring,
and thus pressing the so-called moving tab, which is
integrally formed on it, inwards into the recess. In
25 order to fasten the service device on a top-hat profile
mounting rail, one of the longitudinal edges of the
top-hat profile mounting rail is pressed behind the
stationary tab, and the other edge is latched behind
the movable tab by pivoting the service device about
30 the first edge.

In the case of a circuit breaker, such a slide is known
which is formed as a metal part and is pressed inwards
by the pressure of a helical compression spring. For
35 dismantling, the slide is pulled away from the edge of
the top-hat profile mounting rail against the pressure

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of the spring, so that the service device can be removed from the top-hat profile mounting rail.

DE 30 02 589 A1 has disclosed a slide which has two
5 parallel longitudinal webs between the tab and the
opposite end, which is inclined to allow a tool to act
on it, and on whose inner longitudinal edges arms are
integrally formed which each overhang the other
longitudinal web and engage in recesses on the housing.
10 The arms thus act as springs, which press the slide
against the top-hat profile rail. When the arms deform,
the longitudinal webs also deform, which can lead to
the slide becoming jammed in the housing of the service
device. Furthermore, the longitudinal webs are arranged
15 at different levels, as a result of which the slide has
to be produced using a complex tool, and is unstable.

The object of the invention is to provide a
quick-action fastening of the type mentioned initially,
20 in which the production complexity and assembly are
simplified, with an optimum method of operation.

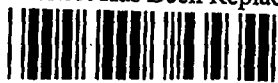
According to the invention, this object is achieved by
the features of Claim 1.

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According to the characterizing part of Claim 1, the
slide is intended to have an elongated slide body about
whose side edges which run parallel to its movement
direction sprung arms are integrally formed, which
30 project in opposite directions, engage in housing
recesses in the service device and are supported
therein, and thus press the slide against the top-hat
profile rail in a sprung manner; in addition, a
retaining tab is fitted to the slide and is used to
35 limit the inward movement, in the unmounted state,
against a step on the service device.

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These arms may be aligned with one another; it is also possible for the arms to be offset with respect to one another.

- 5 In order to enlarge the sprung arm length, depressions which engage in the slide body are provided on both sides of the arms.

- 10 Further advantageous refinements and improvements of the invention can be found in the other dependent claims.

- 15 The invention as well as further advantageous refinements and improvements of the invention will be explained and described in more detail with reference to the drawing, in which an exemplary embodiment of the invention is described, and in which:

- 20 Figure 1 shows a side view of a circuit breaker,

Figure 2 shows a part of the circuit breaker according to Figure 1, with the housing open, and

- 25 Figure 3 shows a section view along the section line III-III in Figure 2.

- 30 A circuit breaker 10 has a front face 11, out of which a switching toggle 12 projects. Located on the opposite face is an attachment surface 13, which has a U-shaped groove 14, on one side wall of which a stationary tab 15 is arranged, and on whose other side wall a moveable tab 16 is arranged. This moveable tab 16 is pressed in a sprung manner into the interior of the recess so that, when the circuit breaker is snapped onto a
35 top-hat profile mounting rail 21 (which is represented by dashed lines), both the stationary tab 15 and the moving tab 16 engage behind the adjacent longitudinal edges of the top-hat profile mounting rail 21.



The moveable tab 16 is integrally formed on a slide 17, which at the end opposite the tab 16, has a chamfered edge 18 away from the fastening surface 13, behind which a tool 19 can engage in order to pull the slide away from the top-hat profile mounting rail in the direction of the arrow P by being supported against a wall 20, so that the moveable tab 16 is released from the top-hat profile mounting rail 21.

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The slide 17 has an elongated slide body 17a composed of plastic, which is arranged between a housing lower part 22 and a housing upper part 23, which are separated from one another by a separating joint 24. To this end, the housing has housing recesses, which are not illustrated in any more detail and guide the slide in the direction of the arrow P.

Sprung arms 27 and 28 are provided on both sides of the longitudinal edges 25 and 26 of the slide body 17a, with the sprung length of the arms 27 and 28 being enlarged by depressions 29 and 30 on both sides. The arms 27 and 28 are offset with respect to one another, and project in opposite directions. In this case, the arm 28 is located closer to the tab 16 than the arm 27. The depressions 29, 30 extend to the longitudinal line of symmetry M-M of the slide body 17a.

The arms 27 and 28 respectively engage at the side in a recess 31 and 32, with the recess 31 having a stop 33 on its wall located away from the tab, and having an inclined surface 34 adjacent to this stop 33; the recess 32 has a further inclined surface 35, corresponding to the inclined surface 34.

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The stop 33 and the inclined surfaces 34 and 35 are dimensioned with respect to the slide such that the arms 27 and 28 come to rest precisely on the stop 33



and on the inclined surface 35, respectively, when the tab is pressed into the interior of the recess, so that there is virtually no stress on the sprung arms 27 and 28 in this position.

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In order to mount the circuit breaker 10 on the top-hat profile mounting rail 21, the tab 15 is placed behind the adjacent edge of the top-hat profile mounting rail 21. The other edge of the top-hat profile mounting rail 21 slides upwards on the inclined surface 16a of the tab 16 and latches behind an undercut 16b in the tab 16, with the slide in consequence being pressed slightly to the left in the direction of the arrow P, and the sprung arms 28 and 27 being pressed against the inclined surface 35 and against the stop 33, respectively.

For dismantling, the slide is moved further in the direction of the arrow P by means of the tool 19, with the sprung arms being bent further, and the tab 16 is released from the adjacent edge of the top-hat profile mounting rail 21.

The circuit breaker according to the drawings has two vertically projecting connecting lugs 36 and 37 on its fastening surface which, in the fitted state, engage with mating contacts in a distribution panel; these connecting lugs are known per se, for example from DE 196 28 957.2 A1.

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In the case of the present circuit breaker 10, two connecting lugs 36 and 37 are provided which are arranged one behind the other and at a distance from one another, with respect to an axis at right angles to the top-hat profile rail and lying in the fastening surface, which distance is dimensioned such that the slide fits accurately in between. The slide 17 is thus also used for insulation between the connecting lugs.



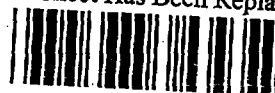
It is, of course, also possible to accommodate the slide in the housing for any type of circuit breaker.

5 A retaining lug 40 is provided in the region of the tab
on that surface of the slide 17 which faces away from
the fastening plane, which retaining tab 40 has a
sawtooth shape and, in the position shown in Figure 2,
that is to say when it is not fitted to the mounting
10 rail 21, is pressed against a step 41 by the sprung
arms, with a slight force, so that the slide 17 cannot
slide freely into the interior of the recess 14.

Patent Claims

- 5 1. Quick-release fastening for snapping an electrical
service device, in particular a circuit breaker,
onto a top-hat profile mounting rail, having a
10 recess (14) on the fastening surface of the
electrical service device (10), and having a slide
(17) which is pressed in a sprung manner into the
recess (14), is composed of plastic and, in the
latched-on state, has a tab (16) which engages
behind a longitudinal edge of the top-hat profile
15 mounting rail, characterized in that the slide
(17) has an elongated slide body on whose side
edges (25, 26) which run parallel to the movement
direction sprung arms (27, 28) are integrally
formed which project in opposite directions and
20 parallel to the longitudinal extent of the top-hat
profile mounting rail (14), engage in housing
recesses (31, 32) and are supported in said
housing recesses (31, 32), thus pressing the slide
(17) against the top-hat profile mounting rail
(21), and in that a retaining tab (40) is
25 integrally formed on the slide (17) and is used to
limit the inward movement, in the unmounted state,
against a step (41) on the service device.
- 30 2. Quick-release fastening according to Claim 1,
characterized in that depressions (29, 30) which
engage in the slide body and enlarge the sprung
arm length are provided on both sides of the arms
(27, 28) on the slide (17).
- 35 3. Quick-release fastening according to Claim 1 or 2,
characterized in that the arms (27, 28) are
aligned.

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4. Quick-release fastening according to one of Claims 1 or 2, characterized in that the arms (27, 28) are offset with respect to one another and are at a different distance from the top-hat profile mounting rail (21).
5. Quick-release fastening according to Claim 4, characterized in that the depressions (29, 30) end at the longitudinal axis of symmetry of the slide body.
6. Quick-release fastening according to one of the preceding claims, characterized in that the housing recesses (31, 32) have inclined surfaces (34, 35) on which the free ends of the arms (27, 28) run away from the top-hat profile mounting rail when the slide (17) is pulled back.
7. Quick-release fastening according to Claim 6, characterized in that at least one of the inclined surfaces (34) has a stop (33), which is aligned at right angles to the movement direction of the slide (17) and against which the adjacent arm (27) rests when the slide is pressed freely inwards and there is thus no stress on the arms (27, 28).



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