

DEVICE FOR FITTING AND FASTENING A RAIL OF A RAILING

The present invention relates to a device for fitting and fastening a rail especially horizontal of a railing to a vertical stiffener supporting this rail.

5 It is known that a railing, especially for a balcony, terrace, staircase or other similar construction, generally consists of a flat panel, of a transparent or opaque material, arranged between two horizontal rails placed at the top and the bottom of
10 this panel, these rails themselves being supported by vertical posts or stiffeners, situated behind the panel and bearing on the floor, so as to protect users from the void beyond the railing.

 As a variant, the top and bottom rails of the
15 railing can include, instead of a solid panel or one made of transparent material, bars spaced apart along the length of the railing, these panels being built into the rails at their ends, the spacing being limited, in accordance with the standards in force, in

particular to a degree sufficient to preclude the head of a child passing between two successive bars.

In the solutions currently known in the art, the fastening of the rails of the railing is carried out by securing them to sturdy supporting stiffeners, by means of exterior clasps, enveloping both the body of the stiffener and, simultaneously, the rail to be fastened thereto, which takes up the panel or the associated bars. Such a clasp generally consists of two parts, one in the form of a cap gripped by the rail and the other exhibiting a tubular element which surrounds the stiffener. The binding of the latter to the two rails of the railing is then carried out by means of pressure screws which are visible from the outside.

Another solution consists in using a casting immobilized on the front face of the stiffener and including an extension which engages in a groove of the rail to be immobilized or conversely including a groove in which is engaged a flat part of this rail. Here again, the binding of the assembly is effected with the aid of screws which can be seen from the outside, this spoiling the aesthetics and presentation of the railing. Furthermore, the retail price of such fittings is relatively high, owing to the use of sturdy pieces for the stiffeners and mouldings for the fastening clasps.

The subject of the present invention is a device which avoids these drawbacks, by virtue of the use of tubular vertical stiffeners associated with

members for supporting the top and bottom rails, of very simple design, which afford both increased safety in the retention of the panel or bars of the railing and fast fitting, with a particularly satisfactory overall appearance aesthetically, the fastening of these members carrying the rails and their binding to the stiffener being effected by means of a single screw housed inside this stiffener and which subsequently can be completely hidden from the outside.

For this purpose, the relevant device, for fitting and fastening a rail, especially horizontal, of a railing to a vertical stiffener supporting this rail, by means of a linking member secured to the stiffener and supporting the rail, is characterized in that the stiffener exhibits a tubular structure, able to receive, in a horizontal through-passage defined by openings of like profile made facing one another in its opposite walls, the linking member exhibiting the form of an elongate clasp whose ends, when this clasp is set in place in this passage, are mutually symmetric with respect to the mid-plane of the stiffener, these ends outside the latter then being oriented towards the front of the stiffener in such a way as to receive in an open groove of the clasp a flat span forming part of the rail to be immobilized, the clasp moreover including a tapped central bore whose axis is oriented substantially in the mid-plane of the stiffener and in which is engaged a screw accessible via the rear of the stiffener, so that the rotation of the screw bearing on

the inner wall of the stiffener, engenders by reaction a displacement of the clasp along the axis of this screw, affording a binding effect of the clasp and accordingly the locking of the rail carried by the
5 latter relative to the stiffener.

According to a particular characteristic of the device, the clasp exhibits a semi-circular profile, the ends of the clasp, outside the stiffener, beyond the openings delimiting the passage through the stiffener
10 in which the clasp is engaged, each including a slot open at the top, the two slots being arranged in the same vertical plane, substantially tangential to the wall of the stiffener, in front of the latter.

Preferably, each slot provided at the ends of
15 the clasp includes within it an inner recess, able to receive a relief rib possibly provided at the lower end of the flat span of the rail to be immobilized, and carried by the clasp.

According to another characteristic, the clasp
20 includes in its mid-part a notch whose width is substantially equal to that of the stiffener square with the openings delimiting the through-passage in which the clasp is engaged, so that, upon the binding of the latter under the effect of the screw which it
25 supports, the edges of this notch come to mask the lateral walls of the stiffener, shutting off these openings.

Furthermore and in a manner known per se, each rail includes means of immobilizing a panel or parallel

bars, arranged in front of the flat span supported by the clasp.

Advantageously, the stiffener includes a hole for access to the head of the screw, made in the rear part of this stiffener for the insertion of a tool for rotating this screw.

According to yet another characteristic, the lateral walls of the stiffener each include a continuous groove, extending along a vertical generatrix made towards the rear of the stiffener so as to allow the fitting, in the manner of a clip, of the folded-down edges of a cover, concealing the hole for access to the head of the screw.

Other characteristics of a device for fitting and fastening a horizontal rail of a railing, established in accordance with the invention, will emerge further through the description which follows of several embodiments, given by way of non-limiting indication, with reference to the appended drawings in which:

- Figure 1 is a partial sectional view in elevation of a railing stiffener, furnished with a device in accordance with the invention, according to a first embodiment in which the rails of this railing support a flat panel between them, in front of the stiffener.

- Figure 2 is a front view of a part of the stiffener according to Figure 1, square with a clasp fitted therein.

- Figures 3, 4 and 5 are transverse sectional views of the stiffener and of the associated clasp, illustrating the procedure for setting the latter into place.

5 - Figure 6 is a view similar to Figure 5, but in which the rail to be immobilized on the stiffener is represented, while being supported by the clasp.

- Figure 7 is a view similar to Figure 1 but relating to a variant embodiment.

10 In Figure 1, the reference 1 denotes as a whole a railing, intended to be fitted as a border to a flat support 2, consisting for example of the floor of a balcony, of a terrace or of a staircase, or else of any other similar construction overlooking a void and which
15 requires to be protected with regard to the latter.

Such a railing consists in particular, in a manner known per se, of a series of vertical stiffeners 3, suitably spaced along the length of the support to be protected, these stiffeners each including a bearing
20 plate 4 for fastening to the support 2, by any conventional means (not represented), and the detail of which is of little importance to the present invention.

In its upper part, the railing 1 includes, as appropriate, a handrail 5, extending horizontally and
25 joining the upper ends of the various stiffeners 3, protection with regard to the outside being ensured, in the exemplary embodiment represented in Figure 1, by means of a flat panel 6, here of a transparent material, made integral therewith (or formed of

adjacent panels as illustrated in Figure 6), arranged over the major part of the height of the stiffeners 3, this panel being supported by them by means of two likewise horizontal rails, a bottom rail 7 and a top rail 8 respectively.

In accordance with the invention, each stiffener 3 exhibits a tubular cross-section, as may be seen more clearly in the sectional views of Figures 3 to 6, each stiffener including, at the level of these rails 7 and 8, a linking member in the form of a clasp 9, the structure and profile of which will likewise emerge clearly from these figures.

The stiffener 3 with tubular cross-section includes, in particular, in its opposite lateral faces, openings 12 and 13 facing one another and made in the walls of the stiffener substantially at the level at which each of the rails 7 and 8 is to be placed relative to it, these openings delimiting from one to the other a through-passage for the clasp 9, once the latter is engaged in the former.

According to an advantageous characteristic of the invention, the clasp 9 exhibits a general semi-circular profile, with a rectangular outline in cross-section, corresponding to the profile of the openings 12 and 13 through which the clasp is engaged into the passage made through the stiffener. Of course, there could be provision for endowing the cross-section of the clasp 9 with a different outline, so long as it can be inserted easily into this passage and its ends, 14

and 15 respectively, can be arranged, when the clasp is set in place and immobilized in position in the manner described below, on either side of the stiffener, then being substantially symmetric one with another, on each
5 side of the vertical mid-plane of the stiffener, shown diagrammatically in Figures 2 to 6 under the reference 16.

The dimensions of the clasp 9 are moreover determined so that its ends 14 and 15 are arranged, in
10 the previous position, corresponding to Figures 5 and 6, slightly in front of the forward face 17 of the stiffener 3, in such a way that a flat span 18, belonging to the horizontal rail 7 or 8 associated with this clasp, can be engaged in slots open at the top, 19
15 and 20 respectively, provided in these ends 14 and 15, and furthermore is substantially tangential to and almost in contact with this face 17.

As represented in Figure 1, the clasp 9 advantageously includes, within its open slots 19 and
20 20, an inner recess 21, in which is engaged a rib 22 provided at the lower end of the flat span 18. Such a rib can in particular be provided on the spans of one and the other of the two rails 7 and 8, or on one of them only as appropriate, these ribs essentially having
25 the purpose in the event of an impact on the panel 6 from the inside towards the outside of the railing, of precluding the breaking free of the rails from the clasps 9, the rib 22 abutting against the upper part of the recess 21 thereby suitably locking the span 18,

thus prevented from escaping from the corresponding slots.

The clasp 9 moreover includes, in its central part, a notch 23, whose width corresponds substantially to that of the stiffener 3, square with the through-
5 passage formed in the latter between the openings 12 and 13 in its lateral walls 10 and 11. At the centre of this notch is provided a tapped hole 24, into which is engaged a screw 25, including at one end a groove 26
10 enabling it to be rotated when the clasp is set in place in the stiffener 3, in particular owing to the engaging inside the latter of a tool (not represented) of the screwdriver type, inserted through an access hole 27 provided in the anterior face 28 of the
15 stiffener, directed towards the inside of the railing away from its forward face 17.

The width of the notch 23 is determined by construction, in such a way that its inner edges, 23a and 23b respectively, are separated by a distance which
20 corresponds to the width of the stiffener 3 at the level of the rear part of the openings 12 and 13 in its lateral walls 10 and 11, in such a way that the clasp 9 can slide slightly inside the through-passage, these edges 23a and 23b partly masking the outer faces of
25 these lateral walls, in the position illustrated in Figure 6.

So as to allow this movement of the clasp in its through-passage, the screw 25 includes, at its opposite end, a flat land 29, able to bear on the inner

wall of the forward base 17 of the stiffener, while engendering on the clasp 9 a force of displacement towards the rear of the stiffener, consequent upon the rotating of the screw.

5 The stiffener finally includes, in its lateral walls 10 and 11, longitudinal grooves, 30 and 31 respectively, extending along the height of the stiffener and intended to cooperate with the inward curved ends 32 and 33, of an exterior cover 34, which
10 can thus be set in place against the stiffener in the manner of a clip, concealing its anterior face 28 and in particular the hole 27 for access to the screw 25, at the level of the clasps 9 supporting the rails 7 and 8.

15 The implementation of the device described above is deduced readily from considering the various figures of the appended drawing, as for the foregoing description.

 Firstly, the stiffeners 3 of the railing 1
20 being in place and immobilized on the support 2 by their plates 4, the clasps 9 are inserted into each of these stiffeners at the locations corresponding to the points of fastening of the top and bottom horizontal rails 7 and 8, by slipping each clasp into its through-
25 passage through the openings 12 and 13 made in the lateral walls 10 and 11, these openings here being rectangular and corresponding to the cross-section selected for the clasp 9.

 When the latter is set in place, with its ends

14 and 15 brought into positions which are substantially symmetric the one with the other, on either side and towards the front of the stiffener, the flat span 18 of the corresponding rail is engaged into
5 the slots 19 and 20, open at the top, of this clasp. Preferably, when at its lower end it includes a rib 22, the latter is imprisoned in the recess 21 provided at the base of these slots.

When the rails are thus engaged in all the
10 clasps of the stiffeners 3, it then suffices for each of the clasps to bind the assembly, by acting on the screw 25 of these clasps through the hole 27 of the anterior wall 28 of the stiffeners.

Each clasp 9, blocked from tilting in the
15 openings 12 and 13 but free to translate in them, is then displaced owing to the bearing of the plane end 29 of the screw on the inner wall of the face 17 of the associated stiffener 3, causing the slipping of the edges 23a and 23b of the notch 23 which come to mask
20 the lateral faces 10 and 11. This longitudinal displacement makes it possible to obtain final locking of the clasp 9, in which the openings 12 and 13 are fully closed by the clasp itself, the flat span 18 of each rail bearing simultaneously against the outer wall
25 of this same face 17, as illustrated in Figure 6, thereby immobilizing the assembly.

Once all the clasps 9 are thus bound with the two rails 7 and 8 to the assembly of stiffeners 3, fitting is completed by placing, on each of them, its

cover 34 which conceals the holes 27, the structure produced removing from view all of the elements housed inside these stiffeners.

5 A fitting and fastening device for the rails of a railing, of very simple design and relatively much reduced cost is thus produced, which exhibits a particularly aesthetic exterior appearance, the circular-shaped branches of the clasps emerging symmetrically on either side of the stiffeners, whilst
10 alone remaining visible and matching without visible clearance with the wall of these stiffeners.

The locking of the clasps and of the rails which they support is effected with the aid of a single screw, the latter being moreover fully concealed in
15 each of the stiffeners. On the other hand, after removing the rear cover from the stiffeners, access to the control screw can be readily obtained, allowing fast and safe dismantling of the clasps.

Of course, it goes without saying that the
20 invention is not limited to the example more specially described with reference to Figures 1 to 6. Thus, and as represented in Figure 7, it is possible to envisage, without modifying the structure or the operation of the device, adapting the latter directly to the fastening
25 of rails intended to support, not one or more solid or transparent panels situated in front of the railing, but rather parallel bars such as 35, the latter being built in, via their ends, into the rails 7 and 8 respectively, if appropriate even into the upper

handrail 5 when the latter serves directly as top rail, the railing 1 in this case including only a bottom rail 7 fitted and fastened to the stiffeners by means of the device of the invention.



CLAIMS

1. Device for fitting and fastening a rail (7 or 8), especially horizontal, of a railing (1) to a vertical stiffener (3) supporting this rail, by means of a linking member (9) secured to the stiffener and supporting the rail, characterized in that the stiffener (3) exhibits a tubular structure, able to receive, in a horizontal through-passage defined by openings (12, 13) of like profile made facing one another in its opposite walls, the linking member exhibiting the form of an elongate clasp (9) whose ends (14, 15), when this clasp is set in place in this passage, are mutually symmetric with respect to the mid-plane (16) of the stiffener, these ends outside the latter then being oriented towards the front of the stiffener in such a way as to receive in an open groove (19, 20) of the clasp a flat span (18) forming part of the rail (7, 8) to be immobilized, the clasp moreover including a tapped central bore (24) whose axis is oriented substantially in the mid-plane of the stiffener and in which is engaged a screw (25) accessible via the rear of the stiffener, so that the rotation of the screw bearing on the inner wall of the stiffener, engenders by reaction a displacement of the clasp along the axis of this screw, affording a binding effect of the clasp and accordingly the locking of the rail carried by the latter relative to the stiffener.
2. Device according to Claim 1, characterized in that the clasp (9) exhibits a semi-circular profile,



the ends (14, 15) of the clasp, outside the stiffener (3), beyond the openings (12, 13) delimiting the passage through the stiffener in which the clasp is engaged, each including a slot (19, 20) open at the top, the two slots being arranged in the same vertical plane, substantially tangential to the wall of the stiffener, in front of the latter.

3. Device according to Claim 2, characterized in that each slot (19, 20) provided at the ends (14, 15) of the clasp (9) includes within it an inner recess (21), able to receive a relief rib (22) possibly provided at the lower end of the flat span (18) of the rail (7, 8) to be immobilized, and carried by the clasp.

4. Device according to any one of Claims 1 to 3, characterized in that the clasp (9) includes in its mid-part a notch (23) whose width is substantially equal to that of the stiffener (3) square with the openings (12, 13) delimiting the through-passage in which the clasp is engaged, so that, upon the binding of the latter under the effect of the screw which it supports, the edges (23a, 23b) of this notch come to mask the lateral walls (10, 11) of the stiffener, shutting off these openings.

5. Device according to any one of Claims 1 to 4, characterized in that each rail includes means of immobilizing a panel (6) or parallel bars (35), arranged in front of the flat span (18) supported by the clasp (9).



6. Device according to any one of Claims 1 to 5,
characterized in that the stiffener (3) includes a hole
(27) for access to the head of the screw (25), made in
the rear part of this stiffener for the insertion of a
5 tool for rotating this screw.

7. Device according to Claim 6, characterized in
that the lateral walls (10, 11) of the stiffener (3)
each include a continuous groove (30, 31), extending
along a vertical generatrix made towards the rear of
10 the stiffener so as to allow the fitting, in the manner
of a clip, of the folded-down edges (32, 33) of a cover
(34), concealing the hole (27) for access to the head
of the screw (25).