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(71) Applicant: **Bromall, S.L.****17220 Sant Feliu de Guixols (ES)**(72) Inventor: **Alba Cabra, José Antonio**  
**17220 Sant Feliu de Guixols (ES)**(74) Representative: **Gislon, Gabriele et al**  
**Torner, Juncosa i Associats, S.L.**  
**Bruc 21, 1r , 3a**  
**08010 Barcelona (ES)**

## (54) Extendable safety guardrail

(57) The extendable safety guardrail of the invention is useful for being installed in an opening, and comprises first and second members (1, 2), each of which including a support member joined to at least one bar (3a, 3b) such that said bar (3a) of the first member (1) can be telescopically introduced into said bar (3b) of the second member

(2) and the support members can be supported on surfaces on opposite sides of said opening. Each of the support members comprises at least one hole (8) configured for installing therethrough a corresponding self threading screw (5) or rivet fixed to a corresponding surface of said surfaces on opposite sides of the opening.

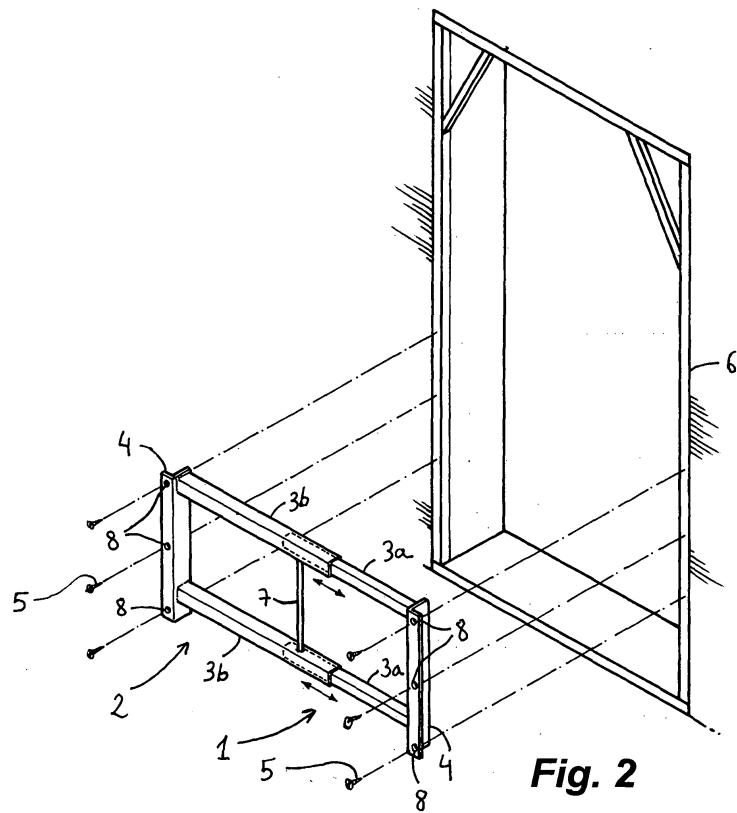


Fig. 2

## Description

### Technical Field

**[0001]** The present invention generally relates to an extendable safety guardrail useful for being installed in an opening between constructive members in order to provide safety in situations in which there are off-level openings which must be protected, for example in places under construction or buildings under construction, among others.

### State of the Prior Art

**[0002]** Patent document GB-1238955-A describes a safety device for windows comprising a guardrail formed by a main tube and another additional tube which is telescopically slid towards one end thereof by means of a lever-actuated cam mechanism. The ends of the cross-piece are pressure fixed against opposing surfaces delimiting the opening and the length of the crosspiece is adjusted by a spring. This guardrail also comprises feet which are supported on the floor.

**[0003]** In addition patent documents ES-1050751, ES-1060082, ES-1060228 and ES-2192931 describe respective protection devices formed by a single cross-piece comprising two tubular parts, one of which telescopically slides inside the other. In the first two mentioned documents, the tubular parts have a U-shaped enlargement at their free ends, allowing contact with opposing surfaces delimiting the opening embracing the thickness of the wall or pillar. In mentioned document ES-1060228, the telescopic bars have rods with a circular section fixed thereto by welding projecting from their ends which are fixed by inserting in the joints of the brick wall. In mentioned patent document ES-2192931, the single crosspiece includes angular profiles fixed to opposite ends of the tubular bars and it is pressure fitted between the opposing surfaces delimiting the opening by means of a spring-adjustable and lever-operated toggle mechanism.

**[0004]** Patent document ES-1053749 shows a protective guardrail for construction works comprising two frames laterally and telescopically intercoupled having at their free ends means for fixing them to two concrete pillars of the work at the sides opposite the opening theretwixen.

**[0005]** Patent documents ES-1050367, ES-1057399, ES-2265708 and ES-2128915 describe other examples of telescopic safety guardrails for constructions secured to the floor or to the edge of the top slab by means of vertical struts.

**[0006]** Thus, different protective guardrails for openings, applied to buildings under construction for example, based on the telescopic movement of one or more cross-pieces or crossbars thus providing the possibility of adapting them to openings with different widths are known. Some of these guardrails are fixed to opposing

surfaces delimiting the opening by means of fixing members, either by applying pressure with a spring on the walls of the building site or by a screw placed in a groove located in the telescopic crossbars in order to immobilize one with respect to the other. However, by means of these fixing devices there is the possibility that the guardrail is easily removed voluntarily, by mistake or even fraudulently from its position. Thus, there is a need for a guardrail which can be securely fixed to a structure or subframe of the building site and which requires the use of specific tools in order to uninstall it.

### Disclosure of the Invention

**[0007]** The present invention contributes to reaching the previous and other objectives by providing an extendable guardrail useful for protecting holes or openings with a risk of falling, for example in construction areas, of the type comprising first and second members, each of which

5 has an angular profile for fixing the guardrail to a subframe by means of self-threading screws or rivets and at least one bar joined by means of welding to said angular profile. The mentioned bar of the first member is telescopically introduced inside said bar of the second member, which has a tubular profile, in order to form a cross-piece which can be adapted to the width of a subframe, for which the bar or the bars of the first member must have a section that is less than the bar or the bars of the second member.

20 **[0008]** The subframe is installed during the construction work in an inner part of the opening and there is no reason why it must have the same depth as the thickness of the wall, it being possible to be made of iron, aluminum, PVC or wood, among other possible materials. The extendable guardrail is configured to be placed from the inner part of the door, i.e. from the side opposite the area where there is the risk of falling because of unevenness, and therefore the danger.

25 **[0009]** Each of the angular profiles has a first branch arranged to make contact with one of the opposing surfaces delimiting the opening and a second branch arranged to make contact with a surface adjacent to the opening and perpendicular to said opposing surfaces. It is important to emphasize that the second branch of said 30 angular profiles must have a length less than the width of the subframe so as to not hinder other operations to be carried out by the operators, such as plastering the walls contiguous to the subframe. Said second branch is placed in the front part of the door, the first branch, which is longer, being in contact with the opposing inner surfaces of the opening of the door. Furthermore, both angular profiles have holes in order to allow the passage of said self-threading screws or rivets in the second branch.

35 **[0010]** With this construction, the self-threading screws or rivets pass through said holes located in the angular profiles and are screwed to the subframe, without the subframe needing to have any type of previous hole

when self-threading screws are used. The self-threading screws or rivets can therefore only be inserted in or removed from the subframe by means of using suitable tools, whereby safety is ensured given that it is not possible to remove said safety guardrail accidentally or by means of a non premeditated act.

**[0011]** In addition, in the event that each of the respective first and second members has several telescopically mating bars in order to form several crosspieces of the guardrail, said bars will be placed at a distance such that, ensuring the safety, the crosspieces allow the passage of materials and people through the guardrail, for example people passing in a crouched position under one of the crosspieces and passing the legs, first one and then the other, above another of the crosspieces immediately below. It has been stated that two crosspieces are sufficient for this task.

**[0012]** The first or second member optionally has a securing configuration joined to the angular profile or to the bar or bars by means of welding so that an operator can fix and tie his or her safety harness by means of a rope and perform tasks outside wearing the harness.

#### Brief Description of the Drawings

**[0013]** The previous features and advantages will become evident from the following detailed description of an exemplary embodiment with reference to the attached drawings, in which;

Figure 1 is a front view of two members forming an extendable safety guardrail for building sites according to an embodiment of the present invention in a position prior to the operating position;

Figure 2 is an exploded perspective view of the extendable guardrail with the two members coupled and in a position prior to the operating position, to be placed in the subframe;

Figure 3 is a cross-section view of the extendable guardrail in an operating position.

#### Detailed Description of an Exemplary Embodiment

**[0014]** First of all, Figure 1 shows an extendable guardrail in a position prior to the operating position. Still separated first and second members 1, 2 can be observed. For this exemplary embodiment, each of said members has a pair of bars 3a, 3b respectively welded to an angular profile 4. Said bars 3a of said first member 1 are tubular and have an inner section that is smaller than the outer section of the bars 3b of said second member 2 in order to make it possible for the bars 3a of the first member 1 to be telescopically inserted inside the bars 3 of the second member 2 in order to form crosspieces of the guardrail. In practice, all the bars 3a, 3b can be, for example, 35x35x2 and 30x30x2 iron squared tubular profiles respectively, although obviously other shapes, sizes and materials are possible.

**[0015]** Each of said angular profiles 4 corresponding to the first member 1 and to the second member 2 comprises a first branch 4a arranged to make contact with one of the opposing surfaces delimiting the opening and a second branch 4b arranged to make contact with a surface adjacent to the opening and perpendicular to said opposing surfaces. The second branch 4b has a number of holes 8, in this case there are three holes 8 arranged so as the self-threading screws 5 or rivets pass through said holes 8 and are screwed to a subframe 6 previously installed in said opening (see Figures 2 and 3). It must be pointed out that for the purpose of the present invention, the holes 8 could be formed in the first branches 4a of the angular profiles 4 and that the self-threading screws 5 or rivets could be configured to thread directly in the wall in absence of a subframe.

**[0016]** The second member 2 further comprises a securing configuration 7 by means of which an operator can fix or tie a rope connected to his or her harness in order to safely carry out operations outside. In this embodiment, said securing configuration 7 is formed by a bar joined to two of the bars 3b of the member 2 by means of welding. The securing configuration 7 can alternatively be formed by any other member, such as an ear or ring, fixed by welding or another technique to only one of the bars 3a, 3b or angular profiles 4 of any of the first or second members 1, 2.

**[0017]** The distance between two contiguous bars 3a, 3b of one and the same member 1, 2, or what is the same, between two contiguous crosspieces of the guardrail, is enough to provide a suitable degree of safety and at the same time allow the passage of materials and people from one side to another of the extendable guardrail.

**[0018]** In relation to Figure 2, the guardrail is shown in a position also prior to the operating position, but with the bars 3a of the first member 1 already being partially inserted into the bars 3b of the second member 2. In other words, the extendable guardrail is formed with a pair of crosspieces and already arranged to be joined and fixed to said subframe 6 by means of self-threading screws 5 or rivets. As can be observed in this exemplary embodiment, said self-threading screws 5 or rivets will be passed through the holes 8 of the angular profiles 4 arranged at the ends of each of the members 1, 2 and screwed into said subframe 6. Both in the case of using self-threading screws 5, for which the subframe 6 has no prior holes, and when rivets are used, the use of tools will be necessary in order to place and fix the guardrail and also to uninstall it, which prevents the guardrail from being uninstalled in an accidental or fraudulent manner.

**[0019]** The subframe 6 is placed and joined to opposing surfaces of a wall defining the opening of a door, in the inner part of said wall opposite the area with the risk of falling. The guardrail will thus be placed on the same side of the wall as the subframe 6.

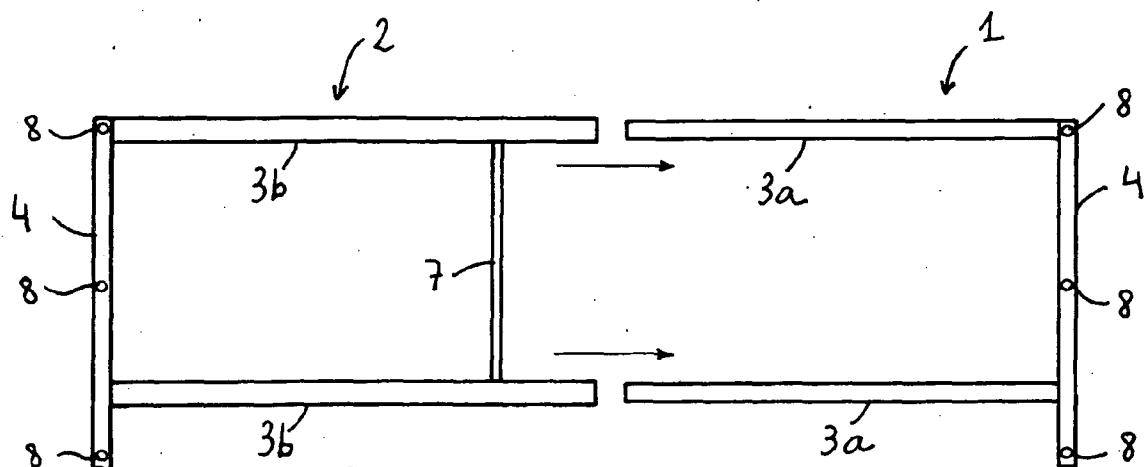
**[0020]** Figure 3 shows a cross-sectional view of the extendable guardrail installed in the operating position in an opening existing in an outer wall, for example, of a

building under construction. The side of the wall located in the upper part of Figure 3 corresponds to the inside of the building, and the side of the wall located in the lower part of Figure 3 corresponds to the outside of the building. The subframe 6 is built into an area of the wall delimiting the opening and has self-threading screws 5 or rivets screwed in. These screws or rivets pass through the holes 8 formed in the angular profiles 4 and fix the guardrail to the subframe 6. Although in the exemplary embodiment shown the subframe 6 is formed by hollow tubular profiles, it could alternatively be equally formed by solid laths. It can be observed that the bars 3a of the member 1 are partially introduced in the bars 3b of the member 2 to form the crosspieces of the guardrail, allowing the extendable guardrail to adapt to openings with different widths in a wall. The extendable guardrail of the present invention could alternatively be installed in an opening formed between two pillars.

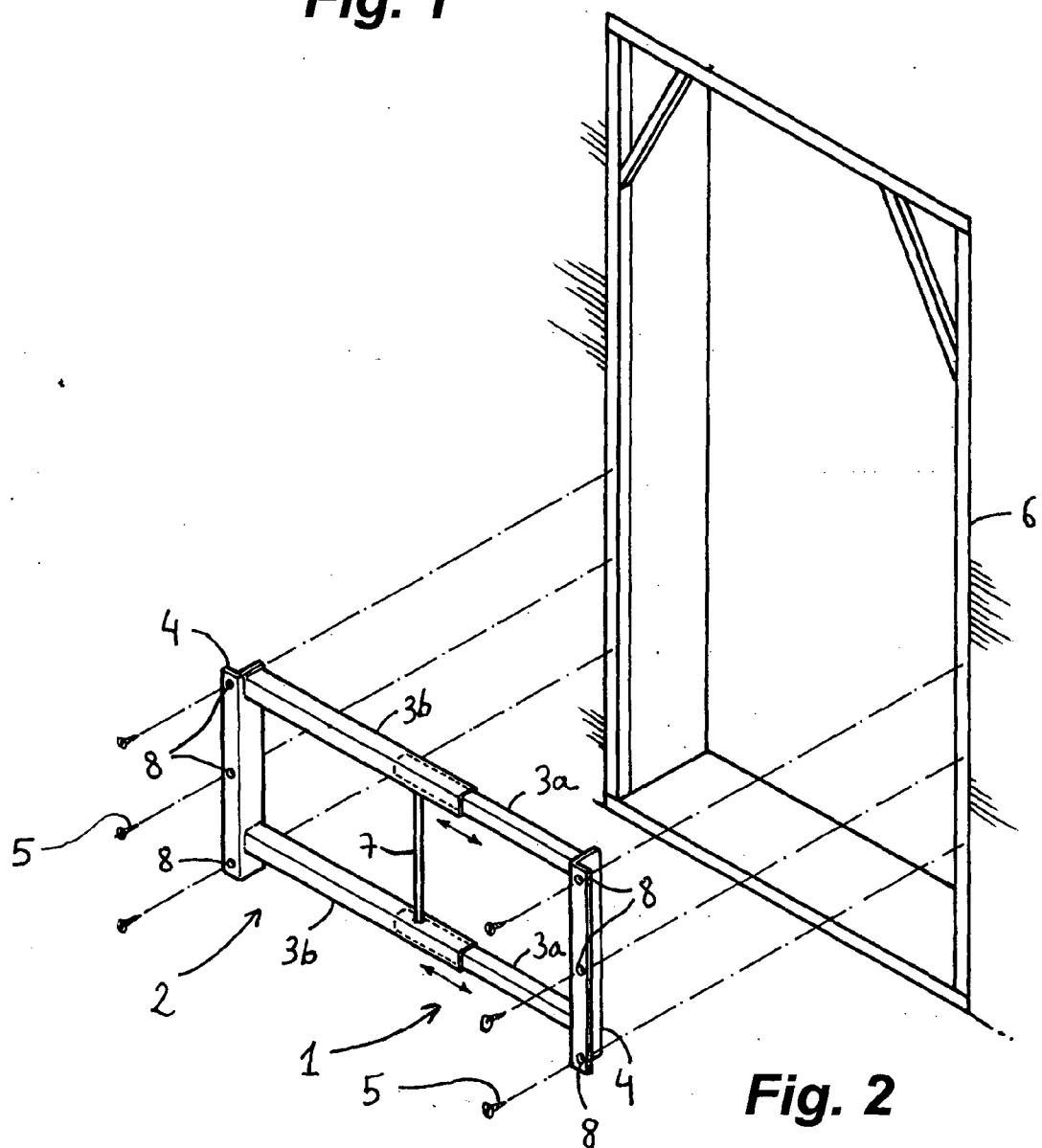
**[0021]** A person skilled in the art will be able to introduce variations and modifications in the exemplary embodiment shown and described without departing from the scope of the present invention as defined in the attached claims.

## Claims

1. An extendable safety guardrail useful for being installed in an opening, of the type comprising first and second members (1, 2), each of which including a support member joined to at least one bar (3a, 3b) such that said bar (3a) of the first member (1) can be telescopically introduced into said bar (3b) of the second member (2) and the support members can be supported on surfaces on opposite sides of said opening, **characterized in that** each of the support members comprises at least one hole (8) configured for installing therethrough a corresponding self-threading screw (5) or rivet fixed to a corresponding surface of said surfaces on opposite sides of the opening.
2. A guardrail according to claim 1, **characterized in that** each of the support members comprises an angular profile (4) with a first branch (4a) arranged to make contact with one of the opposing surfaces delimiting the opening, and a second branch (4b) arranged to make contact with a surface adjacent to the opening and perpendicular to said opposing surfaces.
3. A guardrail according to claim 2, **characterized in that** said surfaces with which the angular profiles (4) make contact are defined by a subframe (6) installed in said opening, said self-threading screws (5) or rivets being fixed to said subframe (6).
4. A guardrail according to claim 3, **characterized in** that said holes (8) are formed in said second branch (4b) of each angular profile (4).
5. A guardrail according to claim 4, **characterized in that** the second branch (4b) of said angular profiles (4) has a length no greater than the width of the subframe (6).
6. A guardrail according to claim 1, **characterized in that** at least one of said first and second members (1, 2) further comprises a securing configuration (7) joined to said bar (3a, 3b) to fix and secure a safety rope connected to a harness worn by an operator.
- 10 7. A guardrail according to claim 1, **characterized in that** each of said first and second members (1, 2) comprises a plurality of bars (3a, 3b) mated for telescopic connection, said securing configuration (7) being formed by a bar connected at its ends to two of said bars (3b) of the second member (2).
- 15 8. A guardrail according to claim 7, **characterized in that** each of said first and second members (1, 2) comprises two of said bars (3a, 3b) placed at a suitable distance in order to provide safety and also allow the passage of materials and operators therebetween.
- 20 9. A guardrail according to the previous claims, **characterized in that** both the bars (3a, 3b) and the securing configuration (7) are joined respectively to the angular profiles (4) and to the bars (3a, 3b) of the second member (2) by means of welding.
- 25 10. A guardrail according to any of claims 3 to 9, **characterized in that** the self-threading screws (5) are configured to be screwed in said subframe (6) without the subframe (6) having any previous hole.
- 30 11. A guardrail according to any of claims 3 to 9, **characterized in that** the self-threading screws (5) or rivets are configured to be screwed in a subframe (6) made of a material selected from a group including iron, aluminum, PVC and wood, among others.
- 35 45 50 55



**Fig. 1**



**Fig. 2**

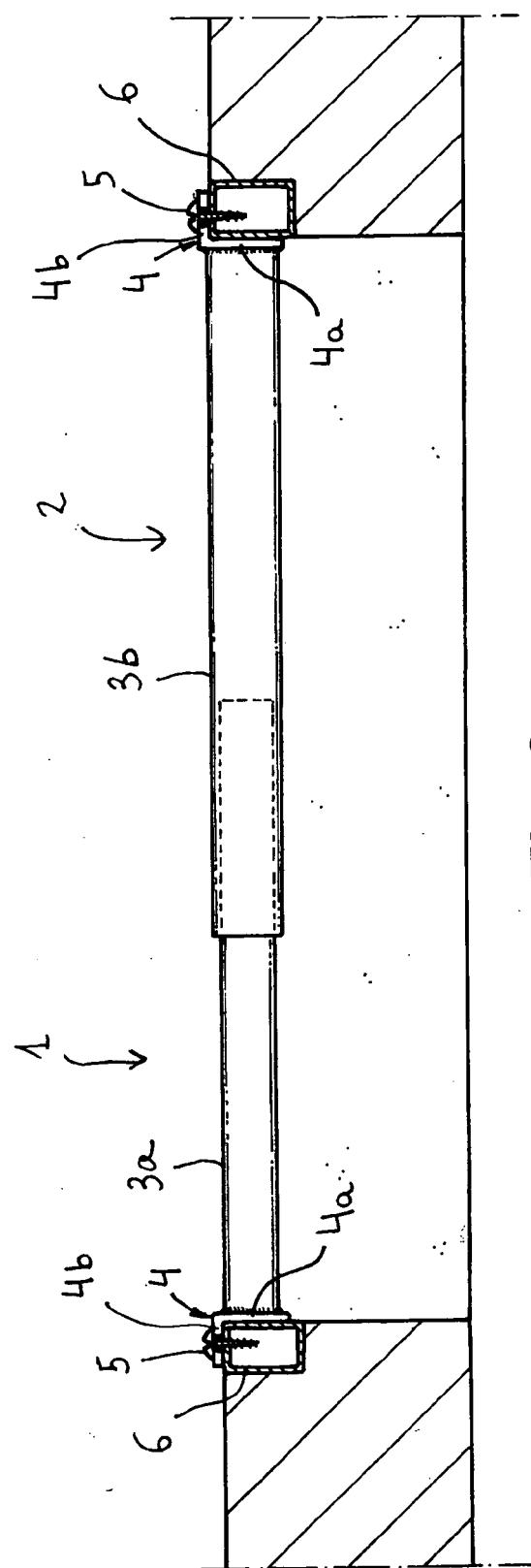


Fig. 3

**REFERENCES CITED IN THE DESCRIPTION**

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