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(54) Fastening device for safety elements in construction works

(57) Consisting of a hollow body (1), open at its top and with a lateral extension (3) at its base, designed to remain embedded in a slab's concrete mass, with its mouth (2) duly levelled against it, wherein a connector (5) is lodged with a lower lateral extension (6) that also confers an L-shaped profile on it, in such a way that this connector (5) can be used to slot in the edge of a pole, a net hook or other similar safety element, with this lateral extension (6) suitably sized so as to enter within the hollow body (1) and finally lodge within the latter's lateral projection (3), where it becomes immobilised through introducing in the connector (5), a wedge (9) that displaces it sideways towards a lodged situation in which it becomes immobilised both in transversal and vertical directions. In this way, the problem with conventional fastening devices in which shores are fastened merely by slotting into previously inserted ferrules in the concrete, which can be easily unhooked through efforts in an ascendant direction, is resolved.

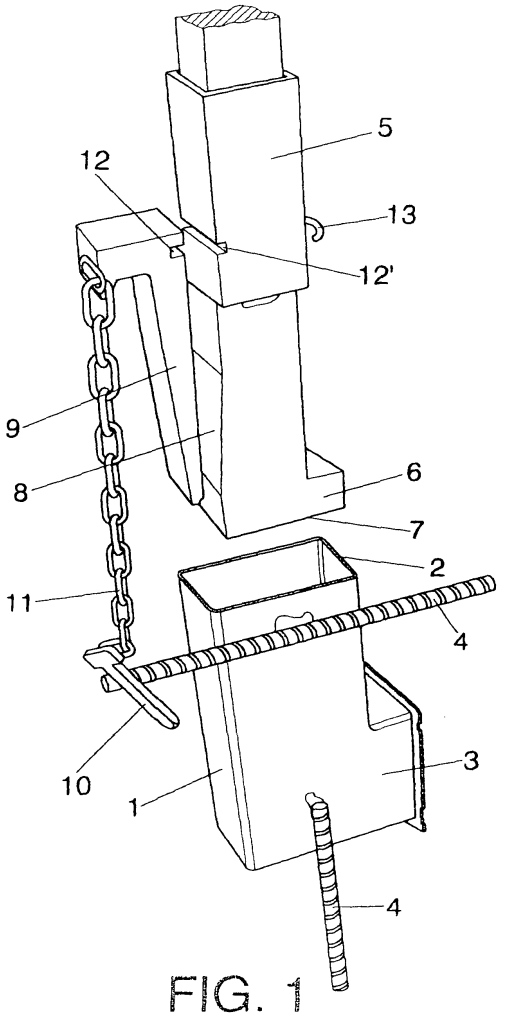

FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a fastening device, especially designed to secure with a removable nature safety elements and auxiliary means to fixed walls in building works and similar.

[0002] The object of the invention is to achieve a solid and effective fastening device that finds special application for securing net hooks, cages and handrails, tent masts to protect various levels of building works, supports for hanging scaffolding from the roof, perimeter platform walkways at roof or any other level, temporary or definitive safety line installations on slab or roof edges, temporary safety lines for shuttering workers with a vertical mast in the pillars, electricity driven scaffolding or columns, lifting mechanisms for prefabricated concrete slabs, safety elements on stairways such as handrails or nets, protecting cavities in floor slabs, transversal loads, debris lowering systems, etc., also able to be included in prefabricated concrete structures for fastening safety elements or auxiliary means.

BACKGROUND TO THE INVENTION

[0003] In the scope of application of the abovementioned invention, conventionally pincer-type or jack-type fasteners are used, which are fixed for example to the edges of slabs, an unsatisfactory solution both because of their large volume and the scarce safety guarantees they offer.

[0004] An alternative solution, increasingly used, consists of embedding in the concrete, during concreting works on the plate or floor slab, a series of ferrules that are thus left solidly joined to the concrete, which are subsequently capable of receiving, through simple insertion, masts, supports, hooks or the relevant elements. This solution considerably simplifies the volume of the fastening and ensures perfect stability of the fastening against downward or lateral efforts, but nonetheless against upwards efforts it is possible for masts to come easily unhooked, with the consequent risk that this entails.

DESCRIPTION OF THE INVENTION

[0005] The fastening device proposed by the invention resolves in a definitive manner, the problems set out above, in such a way that while belonging to the type mentioned last in the preceding section, in other words of those that have a receptacle that is designed to be embedded in the mass of concrete, make the movement of the masts or element in question impossible in any direction, whether lateral or ascending.

[0006] For this purpose and more specifically, the fastening comprises a hollow body, determining the abovementioned receptacle, with an L-shaped profile, open at the upper and free end of its vertical branch, designed to be embedded in the mass of concrete, preferably with its mouth level against the plate, a hollow body that is externally fitted with rods welded on to it to improve its conditions of fastening to the concrete. This receptacle or hollow body is complemented with a male element designed to constitute the lower end of the relevant safety element, or as appropriate of the derived element usable in the building in question, a male element that also adopts an L-shaped profile, like the hollow body, but that has a reduced size with respect to the latter in such a way that it can penetrate inside it until touching its base, and once there is movable so that its horizontal branch may likewise penetrate the horizontal branch of the hollow body.

[0007] The described structure is complemented with a wedge that can also be fitted inside the hollow body, once the male element has adopted its definitive position, for which purpose said male element incorporates a lateral bevel, opposite the horizontal branch of its L-shaped profile for acting of the wedge.

[0008] Finally, the male element and wedge present on the opposing sides respective grooves designed to remain facing each other in the definitively assembled condition, constituting a keyseat that is situated outside the hollow body and that consequently, is accessible, for inserting a cotter key that blocks the wedge making it impossible for it to release accidentally.

[0009] The cotter key is attached to the wedge by a chain that keeps these elements permanently joined, the male element incorporates on its side, in its zone also designed to remain outside the hollow body, a hook that can be attached to said chain, so that during manoeuvres to remove the wedge, which is achieved through knocking, there is no risk of said wedge accidentally falling to the ground.

DESCRIPTION OF THE DRAWINGS

[0010] To complement the description being made and in order to contribute to a better understanding of the invention's characteristics following a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description, which by way of illustration but not limitation represent the following:

- Figure 1 Shows a perspective view of the separate components of a fastening device for safety elements and auxiliary means in construction and civil works, made in accordance with the object of the present invention.
- Figure 2 Shows a lateral front elevation and section view of the ensemble represented in the preceding figure, during the first phase of its assembly.
- Figure 3 Finally, shows a similar representation to the one of the preceding figure in the device's definitive assembly position.

PREFERRED EMBODIMENT OF THE INVENTION

[0011] In view of the abovementioned figures we may observe how the device proposed by the invention is constituted by a hollow body (1), basically prismatic or rectangular, for which a rectangular upper mouth is defined (2), but with the particularity that is presents a lateral extension (3) at its base that determines said body's L-shaped profile.

[0012] This hollow body (1), designed to remain embedded in the concrete that forms the wall, with its mouth (2) level against the latter, is preferably equipped with external corrugated steel rods (4), conveniently welded thereto, which improve the body's (1) fastening to the concrete. Optionally, it may have plates in the form of legs to nail into the deck of welded components in floor slabs that due to their nature would make their use appropriate.

[0013] The body or base (1) is complemented with a connector (5) that finishes off the lower end of the mast or element to be fastened, an essentially prismatic connector, but with a lateral and inferior projection (6) that is designed to slot tightly into the lateral projection (3) of the hollow body (1), until it reaches the latter's base, and subsequently to move in a transversal direction so that its projection (6) fits in turn into the projection (3) of the latter. Optionally, it may be fitted with iron plates in the form of legs to be nailed into the deck of welded components in floor slabs that due to their nature would make their use appropriate.

[0014] Complementarily, the connector (5) incorporates on its lateral face opposite the projection (6) an extensive bevel or inclined plane (8) designed to receive a complementary wedge (9), which is what provokes the transversal movement of the connector (5) within the hollow body (1), once the former has reached the base of the latter.

[0015] Therefore, the wedge (9) acts as a blocking mechanism for the connector (5) on the hollow body (1), and in turn said wedge (9) is blocked by means of a cotter key (10) joined by a chain (11) to the wedge (9), for which both the wedge (9) and the connector (5) have grooves (12-12'), on their facing sides, that in the wedge's (9) insertion limit situation, the one shown in figure 3, are facing each other and constitute a keyseat for insertion within it of the abovementioned cotter key (10).

[0016] It only remains to be mentioned finally, that the connector (5) is equipped, outside the level of its insertion into the hollow body (1), like the groove (12'), with a hook (13) duly welded to it, capable of receiving the chain (11) through one of its links, once the cotter key (10) has been released from the keyseat (12-12'), for the purpose of preventing the loss of the wedge (9) during the manoeuvre for removing it.

Claims

1. Fastening device for safety elements and auxiliary means in construction and civil works, such as masts, hooks, and similar, that must be fixed temporarily and in a removable fashion to a concrete plate or floor slab, **characterised in that** it is constituted on the basis of a hollow body open at its top, designed to be embedded in the concrete, preferably with its mouth level with the latter, a basically prismatic body but with a lateral projection at its base that confers an L-shaped profile on it, with said hollow body collaborating with a connector that crowns the lower end of the mast or element in question, which also adopts an L-shaped, but suitably sized so that it may be inserted tightly within the hollow body and be able to move sideways to the limit situation in which its lateral projection slots into the lateral projection of the hollow body, with a wedge collaborating with said connector opposite the side of the lateral projection, which is what provokes the sideways movement of the latter within the body.

2. Fastening device for safety elements and auxiliary means in construction and civil works, according to claim 1, **characterised in that** the hollow body externally incorporates steel rods or plates suitably welded to it to improve its fastening within the mass of concrete that constitutes the slab.

3. Fastening device for safety elements and auxiliary means in construction and civil works, according to claim 1, **characterised in that** the connector incorporates opposite its lateral projection an extensive bevel on which the complementary wedge acts, at the same time as the connector and the wedge incorporate on their facing sides, and in the sector between these elements that remains outside the hollow body in the assembled situation, respective grooves opposite each other that, in the assembly limit situation, configure a keyseat for insertion of the complementary cotter key that immobilises the wedge with respect to the connector.

4. Fastening device for safety elements and auxiliary means in construction and civil works, according to claims 1 and 3, **characterised in that** the cotter key is fixed to the wedge by means of a chain, while the connector incorporates a hook to which said chain can be attached through any one of its links, to block it during the manoeuvres to dislodge the wedge.

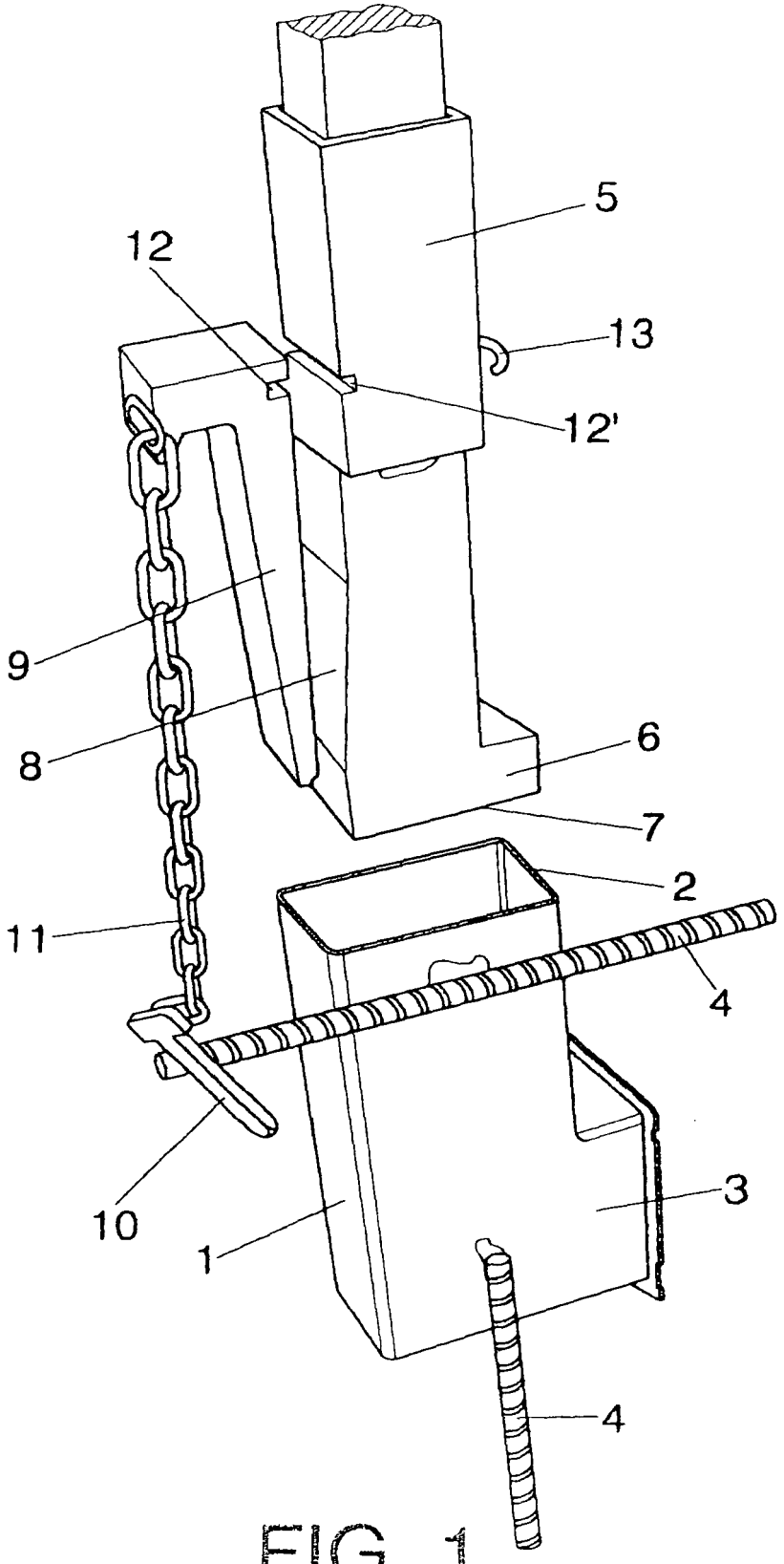

FIG. 1

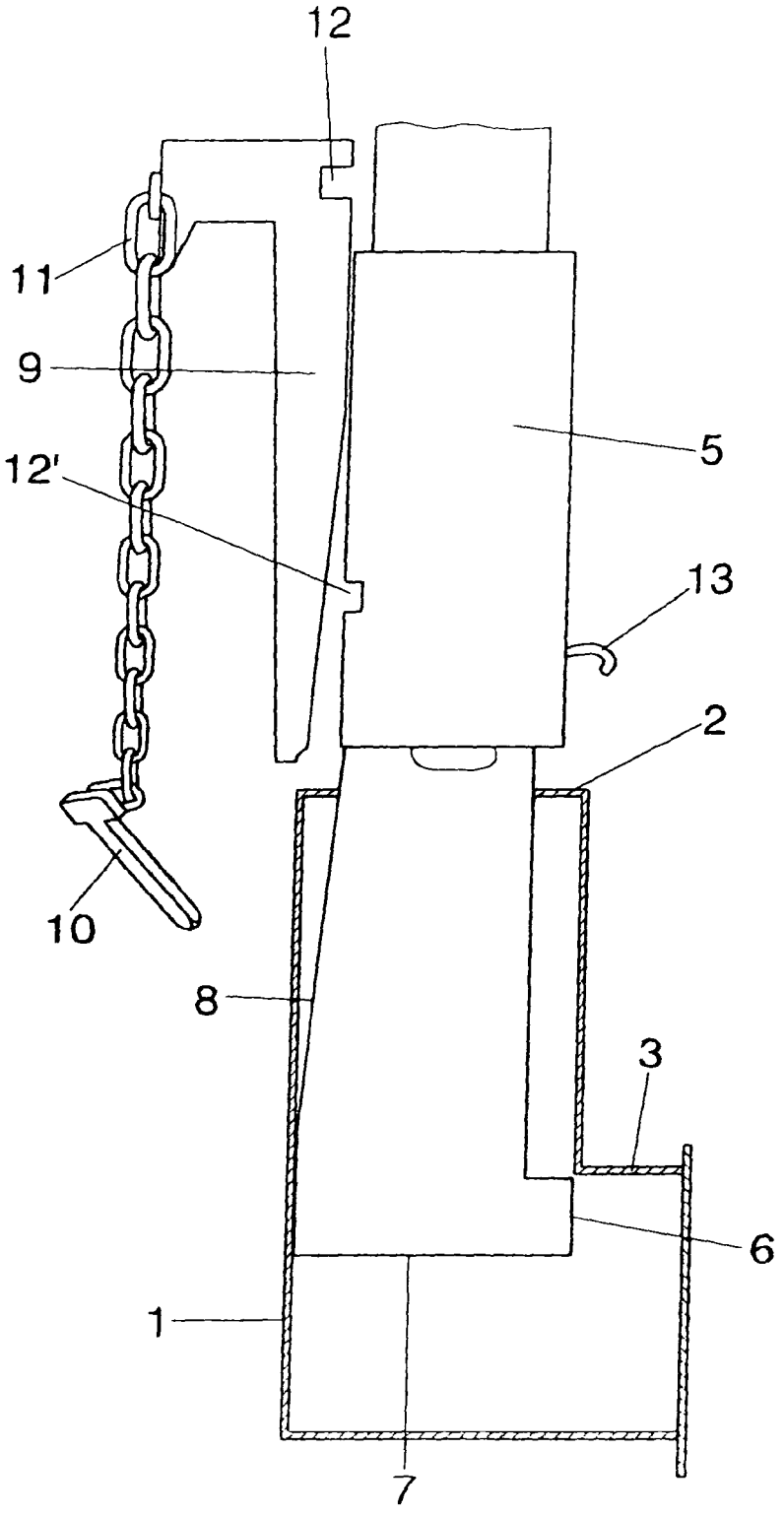

FIG. 2

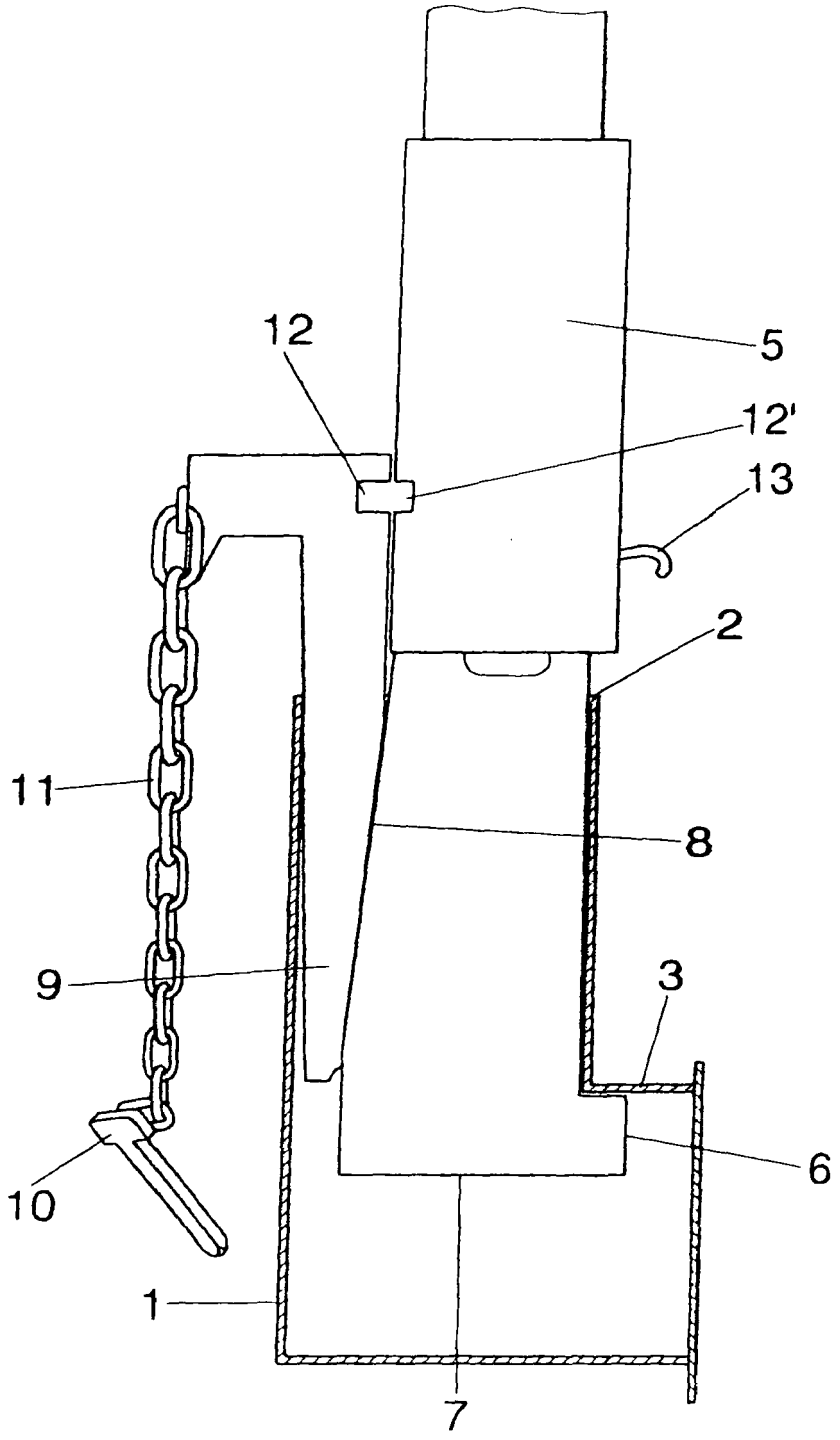

FIG. 3