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(54) **SUPPORT BRACKET FOR ELEMENT FOR FORMING A CABLE TRAY**

(57)

ABSTRACT

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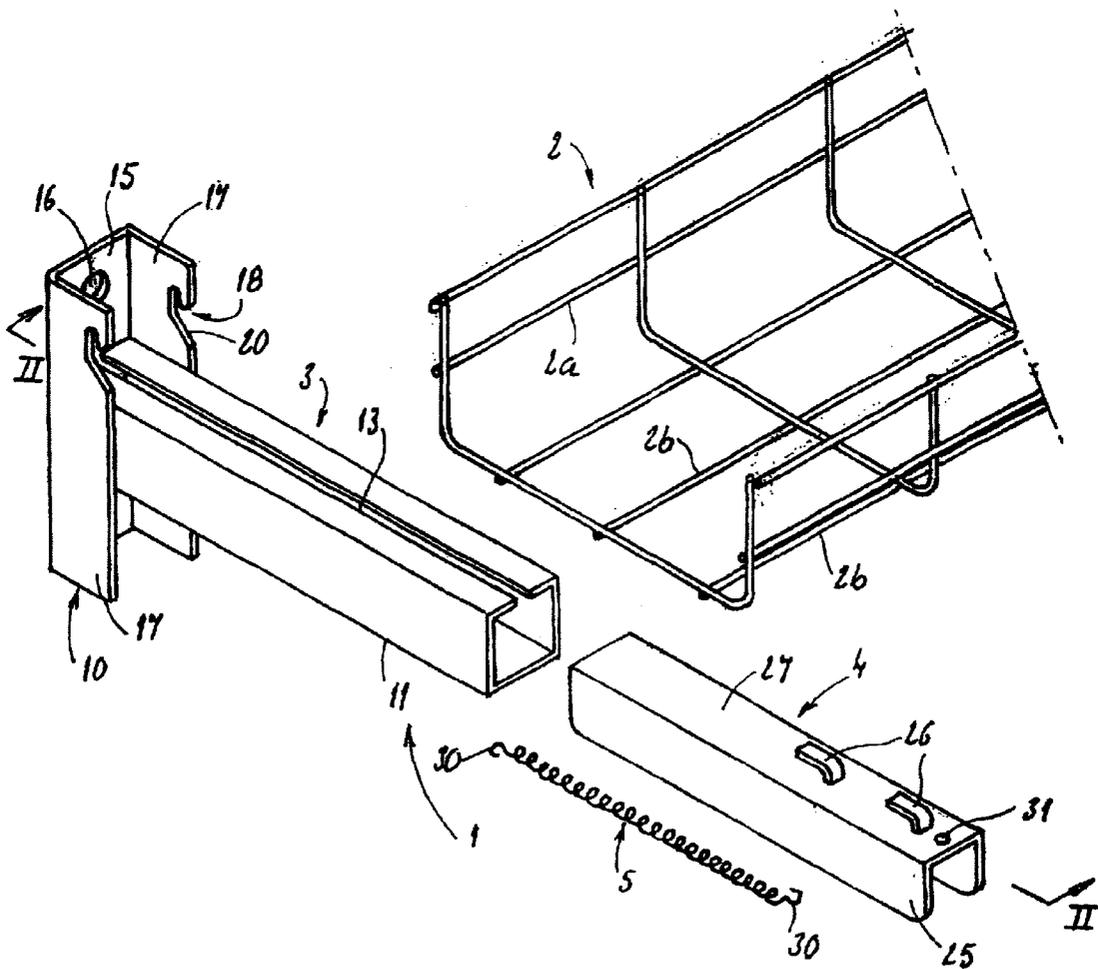
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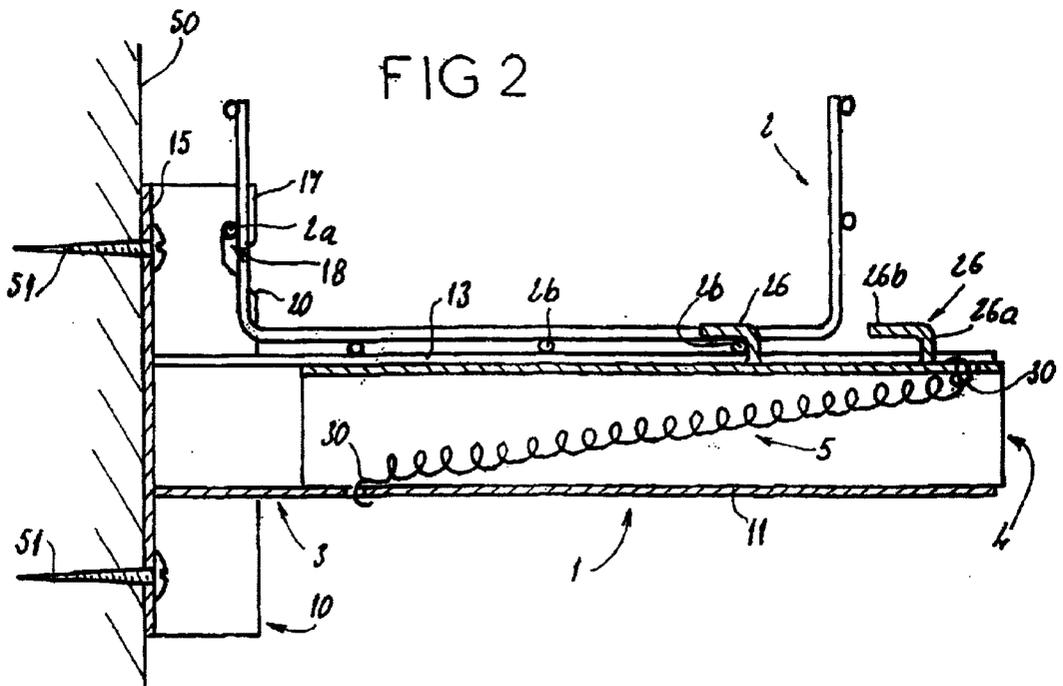
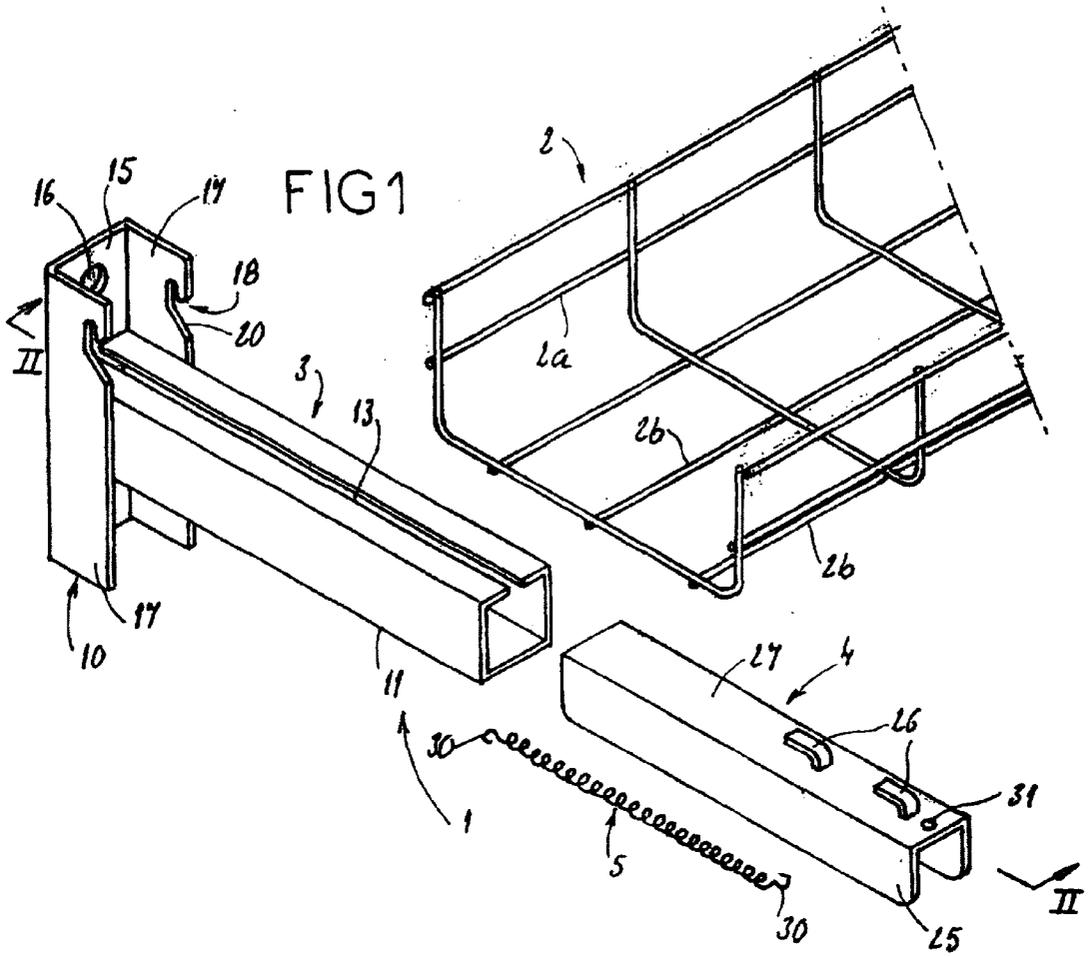
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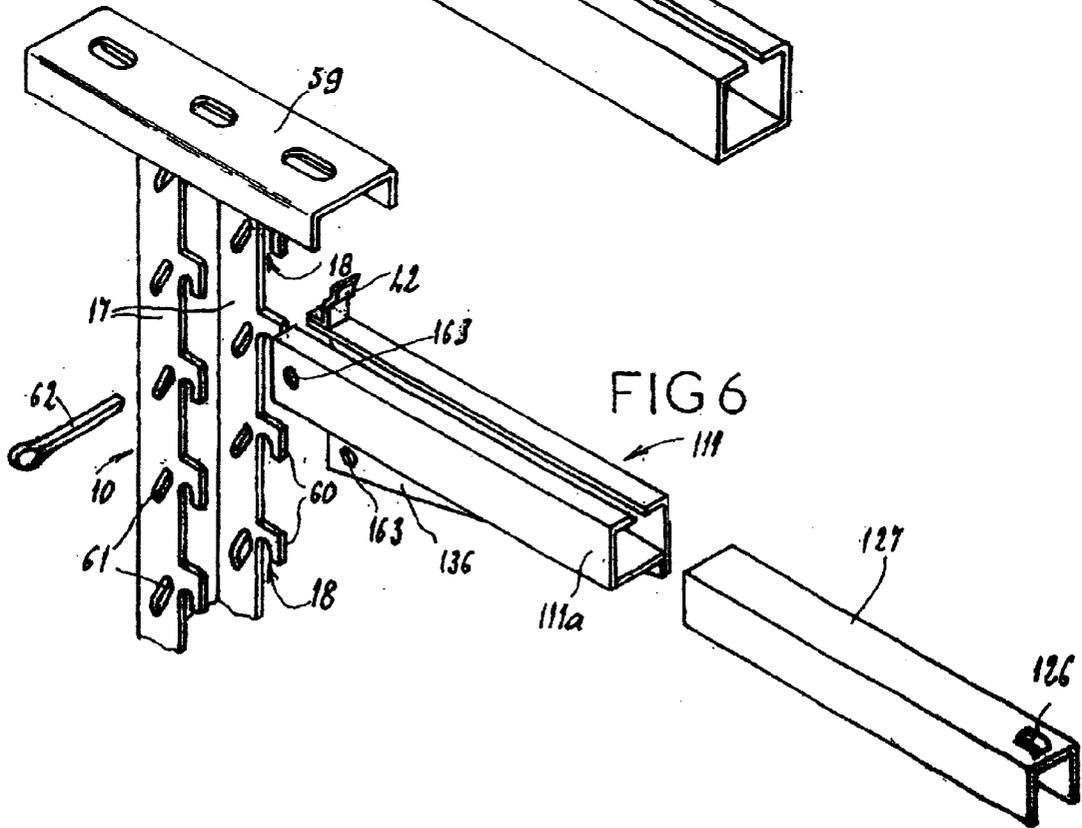
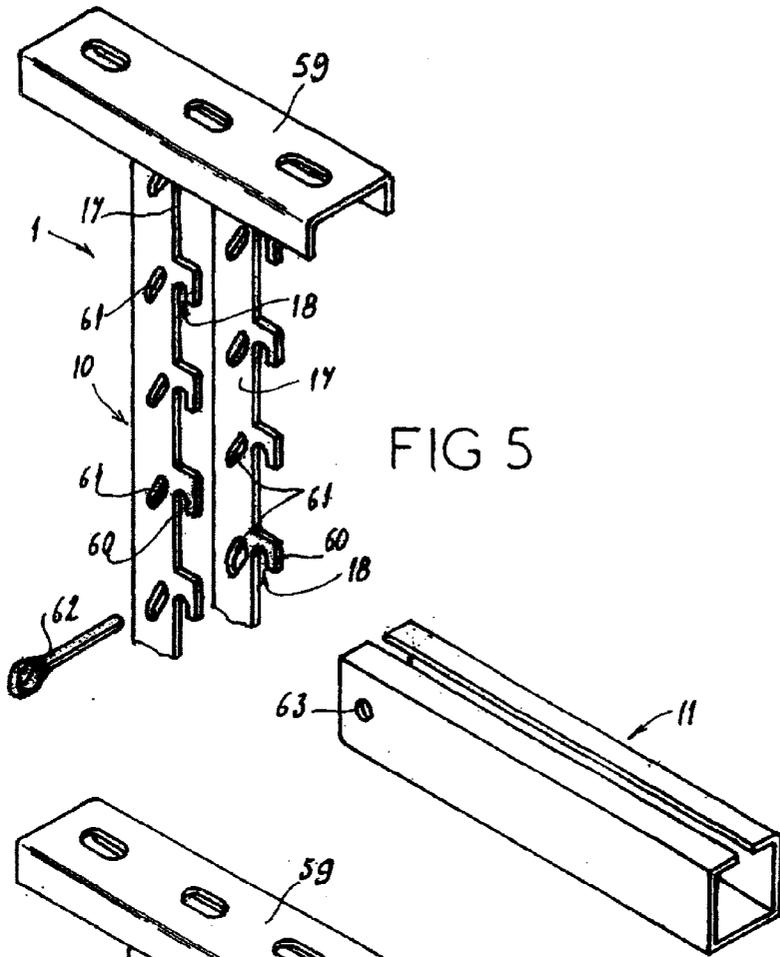
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The invention concerns a bracket (1) comprising a base part (3) and a mobile part (4). The invention is characterised in that: the base part (3) comprises at least locking means (18) for receiving part (2a) of an element (2) of cable tray and in locking said element (2) in a horizontal direction perpendicular to the cable tray; the mobile part (4) comprises at least locking means (26) configured to be urged in engagement with said cable tray element (2) by simple displacement of said mobile part (4) towards said element (2); and the bracket (1) comprises elastic means (5) configured to enable the mobile part to be displaced between an engagement position, wherein it is possible to engage said cable tray element (2) between the locking means, (18, 26) comprised in the base part (3) and the mobile part (4), and a normal locking position, wherein said locking means (18, 26) are engaged with said cable tray element (2).







SUPPORT BRACKET FOR ELEMENT FOR FORMING A CABLE TRAY

[0001] The present invention relates to a support bracket for supporting elements for forming a cable tray.

[0002] It is conventional practice for a cable tray to be produced by assembling U-shaped elements end to end. The cable tray thus obtained is then fixed to a wall using brackets, or suspended from a ceiling by a hanger, amongst other possibilities.

[0003] The width of these cable trays can vary according to the number of cables to be installed. Thus, by way of nonlimiting example, there are cable tray elements with standardized widths of 50, 100, 150, 200, 300, 400, 500, 600 mm or more.

[0004] An existing bracket, used in this application, is formed by bending a metal sheet. It comprises a part of trapezoidal shape, forming the actual bracket, a vertical edge pierced with holes to allow the bracket to be fixed to said support wall, and a horizontal edge pierced with holes and notches to house the cable tray element facing the bracket. These notches can house parts of this cable tray element, the latter being made of metal wire mesh or perforated sheet, while the holes house fixings comprising clamping bolts.

[0005] This bracket has the disadvantage of being relatively expensive to manufacture on account of its design. As cable trays can actually be installed in places to which access is difficult, it may therefore prove difficult to fit the fixings. In addition, the notches, holes and dimensions of this bracket are tailored to the fitting of an element of determined type and determined dimensions. As a result, it is necessary to have numerous different types of bracket in order to satisfy the requirements, and this constitutes a significant practical constraint. These various types of bracket may prove relatively difficult to manage on site.

[0006] The present invention aims to overcome all of these disadvantages.

[0007] To this end, the bracket to which it relates comprises:

[0008] a base piece intended to be fixed to a support wall; this base piece comprises, on its side intended to be fixed to this support wall, at least one locking means able to house part of the cable tray element facing the bracket, and to lock this element in a horizontal direction perpendicular to the cable tray;

[0009] a moving piece, mounted on the base piece and comprising at least one locking means shaped to engage with said cable tray element by a simple displacement of this moving piece toward this element; this moving piece is moveable between an engagement position, in which it is possible to engage said cable tray element between the locking means that the base piece and the moving piece comprise, and a locking position, in which these locking means are engaged with said cable tray element; and

[0010] means of keeping the locking means that the moving piece comprises in said locking position.

[0011] To fix a cable tray to one or several brackets, all that is then required is for the moving piece to be brought into

said engagement position, for the cable tray element lying facing the bracket to be engaged in each locking means of the base piece, then for the moving piece to be moved toward said locking position, so that the locking means (singular or plural) that the latter comprises engage with this cable tray element.

[0012] The bracket according to the invention thus makes it possible for the cable tray to be mounted very quickly and easily, particularly when the cable tray needs to be installed in a rather inaccessible place, giving a very dependable assembly. In addition, this bracket is suited to numerous types and/or sizes of cable trays and thus makes it possible to reduce the number of types and sizes of bracket needed. The bracket according to the invention also retains a simple structure that is also inexpensive to produce.

[0013] Advantageously, each locking means that the base piece comprises is shaped in such a way that the cable tray element has to be inclined in order to be able to engage with it, and each locking means that the moving piece comprises is shaped so that when it is engaged with the cable tray element it prevents any lifting of this element with respect to the bracket.

[0014] As a result, the cable tray element cannot in any way become inclined after it has been fitted and locked onto the bracket, and this ensures that it is mounted perfectly.

[0015] According to one option, said holding means consist of an elastic member shaped to allow the moving piece to move between said engagement position and said locking position and to return the moving piece to the locking position.

[0016] All that is then required is for the moving piece to be grasped and brought, against the elastic force of said elastic member, into said engagement position, and then for this moving piece to be released so that it can return to the normal locking position.

[0017] According to another option, each locking means that the moving piece comprises consists of a hook, and said holding means consist of a deformable structure of this hook such that this hook can be deformed over the part of the cable tray element around which it is engaged.

[0018] This or these hooks, in combination with the locking means (singular or plural) belonging to the base piece, prevent any movement of the cable tray with respect to the bracket, which means that deforming them allows the cable tray element to be locked perfectly onto the bracket.

[0019] Each hook is advantageously made of a metallic material and is shaped in such a way that it can be deformed by using a hammer.

[0020] According to yet another option, said holding means consist of at least one clamping means able, when tightened, to immobilize the moving piece with respect to the base piece.

[0021] Advantageously, the base piece is tabular and the moving piece is engaged telescopically in the base piece.

[0022] The bracket thus formed allows the moving piece a relatively long sliding travel, maintaining good rigidity. This bracket can therefore house cable tray elements of very varying widths, while at the same time ensuring that these elements are mounted perfectly on the support wall.

[0023] According to one option, more especially suited to cable tray elements made of metal wire mesh, each locking means that the base piece comprises consists of a notch formed in an upright of the base piece which extends over the surface of this piece housing the cable tray element.

[0024] As a preference, each notch is delimited at its lower end by an inclined edge forming a ramp.

[0025] This inclined edge allows the cable tray element to be guided into the notch when this element is simply moved along the bracket in a direction transverse to the cable tray.

[0026] Fitting the element on the bracket thereby becomes appreciably easier.

[0027] According to another option, more especially suited to cable tray elements made of perforated metal sheet, each locking means that the base piece comprises consists of a tab, of inflected shape, comprising a part able to be engaged inside the cable tray element, through an opening that at least one of the side walls of the cable tray element comprises.

[0028] Advantageously, the base piece comprises two parts, namely a part known as the "fixing" part, intended to allow the bracket to be fixed to a support wall, and a part known as the "housing" part, intended to house and to support said moving piece.

[0029] These two parts may be fixed together. However, as an alternative,

[0030] said fixing part has a length such that it may comprise a number of the aforesaid locking means, staggered along this length, and a number of means for assembling it with said housing part, these being staggered accordingly, and

[0031] said housing part comprises means for assembling it with the fixing part, it being possible for these assembly means to collaborate with the assembly means belonging to the fixing part so as to allow the housing part to be assembled in several possible positions staggered along the fixing part.

[0032] It thus becomes possible to adjust the position of the housing part with respect to the fixing part, or several housing parts can be fitted onto one and the same fixing part so as to set out several superposed cable trays.

[0033] According to one possible embodiment of the invention, in this case,

[0034] said fixing part is formed of a section piece of C-shaped cross section and said housing part is formed of a tabular section connected to the fixing part at right angles to the latter; the fixing part comprises at least one means for fixing it to the support wall, and has two lateral flanges each of which comprises a notch like the aforesaid one; said housing part is housed inside said fixing part and has a longitudinal slot opening into its upper face; and

[0035] the moving piece comprises a section piece of C-shaped cross section, shaped to be able to be engaged with sliding inside said housing part; this C-section of the moving piece comprises at least one hook fixed to the intermediate wall of this section, on the exterior face thereof.

[0036] According to another possible embodiment of the invention,

[0037] the base piece comprises a part of trapezoidal shape, a vertical edge pierced with holes, to allow this base piece to be fixed to said support wall, and a horizontal edge; and

[0038] the moving piece has the cross section of an inverted L, part of which sits along said part of trapezoidal shape and the other part of which forms a horizontal edge which is pressed against the horizontal edge of the base piece.

[0039] For a clear understanding thereof, the invention is described once again hereinbelow with reference to the attached diagrammatic drawing which, by way of nonlimiting examples, depicts several possible embodiments of the bracket to which the invention relates.

[0040] FIG. 1 is an exploded perspective view thereof, with a cable tray element that can be mounted thereby, according to a first embodiment;

[0041] FIG. 2 is a view thereof in section on II-II of FIG. 1, after mounting on a support wall and housing of the cable tray element;

[0042] FIG. 3 is an exploded perspective view thereof, with a cable tray element that can be mounted thereby, according to the second embodiment;

[0043] FIG. 4 is a view thereof in section on IV-IV of FIG. 3, after mounting on a support wall and housing of the cable tray element;

[0044] FIG. 5 is an exploded perspective view thereof according to a third embodiment, and

[0045] FIG. 6 is an exploded perspective view thereof according to a fourth embodiment.

[0046] FIGS. 1 and 2 depict a support bracket 1 for supporting an element 2 for forming a cable tray.

[0047] The element 2 in this case is of the type made of metal wire mesh. It has a U shape and is intended to be assembled end to end with other identical elements to form a trough to house cables, which constitutes the cable tray.

[0048] The bracket 1 comprises a base piece 3, a moving piece 4 and a spring 5.

[0049] The base piece 3 comprises a metal section piece 10 of C-shaped cross section and a tabular metal section piece 11 fixed to the section 10.

[0050] The section 10 has an intermediate wall 15 comprising two holes 16 to allow the bracket 1 to be fixed to the support wall 50, and two lateral flanges 17 which each have a notch 18.

[0051] The section 11 is housed inside the section 10 and is welded to the walls 17. It has a longitudinal slot 19 opening into its upper face.

[0052] Each notch 18 is formed in the part of the section 10 that extends over the upper face of the section 11 and opens downward being delimited, at its lower end, by an inclined edge 20 forming a ramp.

[0053] It is clear from the figures that the notches 18 are formed in such a way that it is necessary for the element 2

to be inclined in order to engage the lateral longitudinal wire **2a** that this element **2** comprises approximately mid-way up its side wall in these notches **18**. The ramps that the inclined edges **20** form allow this wire **2a** to be guided into the notches **18** by simple movement of the element **2** along the bracket **1**.

[0054] The moving piece **4** comprises a section piece **25** with a C-shaped cross section, shaped to be able to be engaged with sliding inside the section **11**. This section **25** comprises two hooks **26** fixed to its intermediate wall **27**, on the exterior face thereof. These hooks **26** are L-shaped, that is to say each comprise a vertical branch **26a** via which they are connected to the section **25**, and a horizontal branch **26b** facing toward the section **10**. The branches **26a** have lengths such that the branches **26b** can be engaged around longitudinal wires **2b** of the bottom wall of the element **2**, simply by sliding the section **25** inside the section **11**, the slot **19** having a width that exceeds that of the hooks **26**, in order to allow this sliding.

[0055] This engagement of the branches **26b** around the wires **2b** prevents any lifting of the element **2** with respect to the bracket **1**.

[0056] The distance between the two hooks **26** corresponds to the distance separating two adjacent wires **2b**, so that either just one of the hooks **26** can engage with a wire **2b** as shown in FIG. 2, but, if necessary, both hooks **26** can engage with two of these wires **2b**.

[0057] Furthermore, these hooks **26** are made of a metallic material and have a thickness such that they can be deformed using a hammer.

[0058] The spring **5** is of the helical type and comprises two hooks **30** formed at its ends, one of which can be engaged in a hole formed in the underside of the section **10** and the other of which can be engaged in a hole **31** formed in the top face **27** of the section **25**.

[0059] In practice, several brackets **1** are fixed to the wall **50** by means of screws **51** and several elements **2** are assembled end to end to form a cable tray. This cable tray is then laid on the brackets **1** and inclined in such a way as to engage the wires **2a** of each element **2** lying facing a bracket **1** in the notches **18** of this bracket. The section **25** of each bracket **1** is then grasped and slid into a deployed position with respect to the section **10**, against the elastic force of the spring **5**, so as to allow the wires **2b** of the element **2** to come into contact with the top face of the section **11**. The tension exerted on the section **25** is then released, and this allows a hook **26** to engage around a wire **2b**, or allows both hooks **26** to engage around two adjacent wires **2b**.

[0060] FIGS. 3 and 4 show a second embodiment of a support bracket for supporting a cable tray, based on the same principles as the bracket **1** described above with reference to FIGS. 1 and 2. The elements that have already been described, which are to be found identically or similarly in this second embodiment, are denoted by the same numerical references.

[0061] The bracket **1** shown in these figures is more particularly suited to cable tray elements **2** made of perforated metal sheet, comprising a plurality of openings **35**.

[0062] In this case, the base piece **3** comprises a part **36** of trapezoidal shape, a vertical edge **37** pierced with holes to allow this piece **3** to be fixed to the wall **50**, and a horizontal edge **38**.

[0063] The part **36** has a pressed rib **40** and a hole for the passage of the screw shank **41** of a bolt used for clamping the pieces **3** and **4** together, this clamping allowing the piece **4** to be immobilized with respect to the piece **3**.

[0064] The edge **38** comprises, at its end near the edge, a tab **42** of inflected shape, comprising a part **42a** able to be engaged inside the cable tray element **2**, through an opening **35**. The edge **38** also comprises three aligned slots **43**.

[0065] The moving piece **4** has the cross section of an inverted L, part **44** of which lies along the part **36** and the other part **45** of which forms a horizontal edge which is pressed against the edge **38**.

[0066] The part **44** has a longitudinal slot **46** allowing it to be engaged over the rib **40** and to slide, notwithstanding the screw **41**.

[0067] The part **45** comprises a hook **26** and three longitudinal slots **47** and two transverse slots **48** which can be superposed with the slots **43** to allow fastening bolts to be engaged so as to secure the element **2** to the bracket **1**.

[0068] The latter further comprises a nut **49** engaged on the screw shank **41**.

[0069] Just as before, once the piece **3** has been fixed to the wall **50**, the element **2** lying facing the bracket **1** is inclined so as to allow the part **42a** of the tab **42** to engage in one of the openings **35**. The piece **4** is then moved so as to allow the hook **26** to engage in an opening **35** and then allow this hook **26** to sit around a wall portion of the element **2** delimiting this opening **35**. The nut **49** is then tightened to immobilize the piece **4** in this position.

[0070] FIG. 5 shows a bracket **1** in which the section **10** is not permanently secured to the tabular section **11** but in which the section **11** can be assembled with the section **10** in several positions staggered along the length of this section **10**.

[0071] The section piece **10** has a C-shaped cross section; its central wall may comprise holes for fixing it to a wall, or this section **10** may comprise, as in the example depicted, a fixing head **59** for fixing it to a ceiling.

[0072] The section **10** has two series of curved tabs **60**, projecting from the free edges of its lateral flanges **17**. Each of these tabs **60** delimits a notch **18** whose function is to house the cable tray element **2**, in the same way as mentioned above.

[0073] The flanges **17** further comprise two series of holes **61** staggered to correspond with the tabs **60**, able to house a pin **62** for assembling the section **11** with the section **10**, or screw, spindle, peg or other similar connecting pieces.

[0074] The section **11** for its part is identical to the one already described, except that, at its part intended to be engaged between the flanges **17**, it has two holes **63** able to come into register with the holes **61** to allow the pin **62** to be engaged through them and the holes **61**.

[0075] This section **11** houses a section **25** like the one described hereinabove, equipped with one or several hooks **26**.

[0076] Instead of the section **11** shown in FIG. 5, intended to form a bracket housing a cable tray of wire structure, it is possible to mount on the section **10** a piece **111** like the one

shown in FIG. 6, intended more specifically to house a bent sheet metal cable tray. This piece 111 comprises a tabular pipe 111a likenable to the section 11 shown in FIG. 5, secured to a part 136 of trapezoidal shape. This tabular pipe 111a is pierced with holes 163 like the aforementioned ones, to house a pin 62, and the part 136 is also pierced with a hole 163 than comes into register with one of the holes 61 of the section 10 so that this piece 111 can be mounted on this section 10.

[0077] The piece 111 is equipped with a tab 42 like the aforementioned one and the tabular pipe 111a can house a sliding piece 127 equipped with one or several hooks 126 able to engage with the openings 35 of the cable tray element.

[0078] Thus, according to this third embodiment, a wide variety of brackets 1 can be obtained using the same basic elements. This bracket can therefore house cable trays of differing widths and makes it possible to have fewer different part numbers to manage.

[0079] As is evident from the foregoing, the invention provides a support bracket for supporting cable tray elements that exhibits numerous advantages over the similar brackets of the prior art. This bracket is actually easy to handle, something which is particularly advantageous when the cable tray needs to be installed in a somewhat inaccessible place, and is suited to numerous types and/or sizes of cable tray, while at the same time remaining relatively easy and inexpensive to manufacture.

[0080] It goes without saying that the invention is not restricted to the embodiment described hereinabove by way of example but that on the contrary, it encompasses all alternative forms of embodiment thereof. Thus, the notches 18 could be open at the top; the spring 5 could be of a type other than helical.

1. A support bracket for supporting cable tray elements, characterized in that it comprises:

a base piece (3) intended to be fixed to a support wall (50); this base piece (3) comprises, on its side intended to be fixed to the support wall (50), at least one locking means (18, 42) able to house part of the cable tray element (2) facing the bracket (1), and to lock this element (2) in a horizontal direction perpendicular to the cable tray;

a moving piece (4), mounted on the base piece (3) and comprising at least one locking means (26) shaped to engage with said cable tray element (2) by a simple displacement of this moving piece (4) toward this element (2); this moving piece (4) is moveable between an engagement position, in which it is possible to engage said cable tray element (2) between the locking means (18, 42, 26) that the base piece (3) and the moving piece (4) comprise, and a locking position, in which these locking means (18, 42, 26) are engaged with said cable tray element (2); and

means (5, 41, 49) of keeping the locking means (26) that the moving piece (4) comprises in said locking position.

2. The bracket as claimed in claim 1, characterized in that each locking means (18, 42) that the base piece (3) comprises is shaped in such a way that the cable tray element (2)

has to be inclined in order to be able to engage with it, and in that each locking means (26) that the moving piece (4) comprises is shaped so that when it is engaged with the cable tray element (2) it prevents any lifting of this element (2) with respect to the bracket (1).

3. The bracket as claimed in claim 1 or claim 2, characterized in that said holding means consist of an elastic member (5) shaped to allow the moving piece (4) to move between said engagement position and said locking position and to return the moving piece (4) to the locking position.

4. The bracket as claimed in claim 1 or claim 2, characterized in that each locking means that the moving piece (4) comprises consists of a hook (26), and in that said holding means consist of a deformable structure of this hook (26) such that this hook (26) can be deformed over the part of the cable tray element (2) around which it is engaged.

5. The bracket as claimed in claim 4, characterized in that each hook (26) is made of a metallic material and is shaped in such a way that it can be deformed by using a hammer.

6. The bracket as claimed in claim 1 or claim 2, characterized in that said holding means consist of at least one clamping means (41, 49) able, when tightened, to immobilize the moving piece (4) with respect to the base piece (3).

7. The bracket as claimed in one of claims 1 to 6, characterized in that the base piece (3) is tabular and the moving piece (4) is engaged telescopically in the base piece (4).

8. The bracket as claimed in claim 7, characterized in that each locking means that the base piece (3) comprises consists of a notch (18) formed in an upright of the base piece (3) which extends over the surface of this piece housing the cable tray element (2).

9. The bracket as claimed in claim 8, characterized in that each notch (18) is delimited at its lower end by an inclined edge (20) forming a ramp.

10. The bracket as claimed in one of claims 1 to 7, characterized in that each locking means that the base piece (3) comprises consists of a tab (42), of inflected shape, comprising a part (42a) able to be engaged inside the cable tray element (2), through an opening (35) that at least one of the side walls of the cable tray element (2) comprises.

11. The bracket as claimed in one of claims 1 to 10, characterized in that:

the base piece (3) comprises a section piece (10) of C-shaped cross section and a tabular section piece (11) fixed to the C-section (10), at right angles to the latter; said C-section (10) has an intermediate wall (15) which comprises at least one hole (16) to allow the bracket (1) to be fixed to the support wall (50), and two lateral flanges (17) which each comprise a notch (18) like the aforesaid one; said tabular section (11) is housed inside the C-section (10) and has a longitudinal slot (19) opening into its upper face; and

the moving piece (4) comprises a section piece (25) of C-shaped cross section, shaped to be able to be engaged with sliding inside the tabular section (11) of the base piece (3); this C-section (25) of the moving piece (4) comprises at least one hook (26) fixed to the intermediate wall (27) of this section (25), on the exterior face thereof.

12. The bracket as claimed in one of claims 1 to 10, characterized in that:

the base piece (3) comprises a part (36) of trapezoidal shape, a vertical edge (37) pierced with holes, to allow this base piece (3) to be fixed to said support wall (50), and a horizontal edge (38); and

the moving piece (4) has the cross section of an inverted L, part (44) of which sits along said part (36) of trapezoidal shape and the other part (45) of which forms a horizontal edge which is pressed against the horizontal edge (38) of the base piece (3).

13. The bracket as claimed in one of claims 1 to 10, characterized in that:

the base piece (3) comprises two parts (10, 11), namely a part (10) known as the "fixing" part, intended to allow the bracket to be fixed to a support wall, and a part (11) known as the "housing" part, intended to house and to support said moving piece (4);

said fixing part (10) has a length such that it comprises a number of the aforesaid locking means (18), staggered along this length, and a number of means (61) for assembling it with said housing part (11), these being staggered accordingly, and

said housing part (11) comprises means (63) for assembling it with the fixing part (10), it being possible for these assembly means (63) to collaborate with the assembly means (61) belonging to the fixing part (10)

so as to allow the housing part (11) to be assembled in several possible positions staggered along the fixing part (10).

14. The bracket as claimed in claim 13, characterized in that:

said fixing part (10) is formed of a section piece of C-shaped cross section and said housing part (11) is formed of a tabular section connected to the fixing part (10) at right angles to the latter; the fixing part (10) comprises at least one means for fixing it to the support wall, and has two lateral flanges (17) each of which comprises a notch (18) like the aforesaid one; said housing part (11) is housed inside said fixing part (10) and has a longitudinal slot opening into its upper face; and

the moving piece (4) comprises a section piece of C-shaped cross section, shaped to be able to be engaged with sliding inside said housing part (11); this C-section of the moving piece (4) comprises at least one hook (26) fixed to the intermediate wall of this section, on the exterior face thereof.

15. The bracket as claimed in claim 13, characterized in that said housing part (11) comprises a piece (111) exhibiting a tabular duct (111a) for housing said moving part (4), secured to a part (136) of trapezoidal shape.

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