(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 548 201 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.06.2005 Bulletin 2005/26

(51) Int Cl.[7]: **E04B 9/18**

(21) Application number: **04029896.0**

(22) Date of filing: **16.12.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(30) Priority: **16.12.2003 ES 200302961**
23.12.2003 ES 200303036

(71) Applicant: **Suspensiones Elasticas Del Norte, S.L.**
14014 Cordoba (ES)

(72) Inventor: **Munoz Molina, Juan**
14014 Cordoba (ES)

(74) Representative: **Schäfer, Matthias W., Dipl.-Ing.**
Patentanwalt
Schwanseestrasse 43
81549 München (DE)

(54) Vibration damping construction system

(57) A safe construction system for fixed or removable panels and false ceilings or those of a similar type used in the building industry in general, characterised by the fact that the assembly of a fixed panel is carried out by means of an isolator (1) screwed to a wall and, between adjoining panels, by means of a floating isolator (28), formed by a silent block, with or without a spring (37), whilst in false ceilings and likewise, destined to act as a link with the ceiling or support framing, it is carried out by means of a damping bracket that consists of a block (45) of elastomer material, acting as a silent block, which establishes a barrier against the possible transmission of vibrations and from the point of view of thermal/acoustic insulation, said bracket being fixed to the ceiling by means of the aforementioned silent block, and at the bottom, to the panels that form the false ceiling.

EP 1 548 201 A2

Description

[0001] The present description refers, as its title indicates, to a safe construction system for fixed or removable panels and false ceilings or those of a similar type used in the building industry in general, characterised by the fact that in the proposed system the assembly of a fixed panel is carried out by means of a isolator screwed to a wall and, between adjoining panels, by means of a floating isolator formed by a silent block with or without a spring, including one or more metal "L" shaped angle braces that are housed between the silent block system by means of a through screw and counter nuts, forming a compact block.

[0002] The panels are attached to the "L" shaped angle braces by means of fixing elements, enhancing thermal and acoustic insulation, whilst the false ceilings and similar elements in the proposed system incorporate a damping bracket formed by a block of elastomer material, by way of a silent block, destined to act as a link with the ceiling or support framing, establishing a barrier to impede the possible transmission of vibrations as well as from the point of view of thermal/acoustic insulation, said bracket being fixed to the ceiling by means of the aforementioned silent block, and at the bottom, to the panels that form the false ceiling, being characterised by the fact that it is made of thin laminar plate, bent into a "U" shape in the manner of a fork, one side being slightly longer than the opposite one and having grooves and folds at its ends that are specially designed to ensure their perfect coupling to the standardised orifices of additional profiles.

[0003] The object of the invention is to achieve a construction system that provides optimum safety guarantees in the coupling of the different elements that it comprises.

[0004] At the current time different systems are used for the installation of removable panels and false ceilings in the building industry in general, for the decoration of commercial premises, offices, showrooms, exhibition centres, etc. employing commonly used methods of fixing, such as angle braces, metal profiles, different types of brackets or embeddings. These systems are efficient but not always cost-effective since in many cases they require a considerable labour input, notably increasing costs.

[0005] Removable panels are secured using a wall isolator that comprises a metal surface with a vulcanised rubber silent block that remains screwed to a wall, at the same time incorporating a metal angle brace riveted to the silent block. A panel can be installed on the aforementioned angle brace by means of the orifices for this purpose, the main disadvantage of this device being its safety due to its poor performance in the event of a fire given the fact that the elements that it comprises do not maintain the structure in a block, with the added disadvantage that if a certain pressure is exerted the structure deforms readily.

[0006] For the construction of false ceilings, plaster panels or gypsum plasterboard etc. are used, on some occasions their only purpose being to provide the ceiling with an aesthetic finish and on other occasions to act as a means of thermal and acoustic insulation.

[0007] Although these panels may be fixed to the ceiling using rudimentary methods, such as blobs of plaster mixed with fibre, they normally incorporate on their top or unseen face, a "U" section profile with a narrowed tip, in some cases, and in others, suitably distributed hooks, both devices to help suspend the panels from the ceiling with the aid of the appropriate brackets

[0008] The selfsame applicant is the titleholder of Utility Model 9503240 in which the aforesaid brackets are in the form of a fork, comprising an appropriately die-cut plate, the side sections of which also have lateral recesses, to fit the narrowed tip of the "U" shape profile, and centred orifices to house the coupling pin, if applicable, of the corresponding hook. The middle section of the fork having a central orifice through which the screw for attachment to the ceiling passes, the head of which acts on the aforesaid section of the fork, with the interposition of a rubber piece or similar piece, acting as a silent block, absorbing possible vibrations and breaking the thermal and acoustic bridge established by the bracket itself. Along similar lines Utility Model U 200001684 (Lopetegui Galárraga) can be cited, incorporating a safety fork with the very same application as that proposed in Utility Model 9503240.

[0009] In the specific case of panels disposed with narrowed tip "U" shape profiles as the means of support, there are slight dimensional differences between the products offered by different manufacturers, which means that when mounted on the bracket there may be a certain play. This problem is solved with the solution given in Utility Model U 9902534 of which the application is also the titleholder, in which the previously mentioned bracket incorporates a sliding piece that matches up with each of its side branches and can be moved along them, with a couple of tabs on its lower end that fit round the side walls of the "U" shape profile, forcing them to perfectly adjust to the fork and thus eliminating any possibility of play.

[0010] The problem of play is completely resolved with the solution provided by Utility Model U200002612, of which the applicant is also the titleholder, in which, based on the classic "U" shaped fork with a silent block and devices for fixing to the ceiling, said fork is formed by two side branches, one opposite the other, their free ends being perfectly shaped for fixing and coupling, without allowing any play, to a grooved "U"-shaped plate complementary piece. Whilst the shorter branch of the fork is secured to a top groove of the aforementioned complementary piece, by means of a 90° rotation, the longer, thicker branch remains fixed, in the manner of a bayonet, passing through the two circular, coaxially opposing orifices of the complementary piece.

[0011] In this case the coupling is perfect, without any

play whatsoever, but there is the disadvantage that there are slight dimensional differences between the complementary elements used and that, depending on the manufacturer, the location of the circular coaxial opposing orifices varies, said orifices being fundamental for the attachment and securing of the fork of previously described the damping bracket.

[0012] To resolve the problems that currently exist, a safe construction system has been designed for the attachment of fixed or removable panels and the construction of false ceilings or similar.

[0013] The safety system for the attachment of fixed or removable panels basically comprises two types of isolators: a wall isolator and a floating isolator.

[0014] The wall isolator proposed in the present construction system comprises a base made of die-cut plate with orifices to screw to a wall, forming a compact block by means of a through screw that carries out its torque on a screwed orifice in the base itself, including a silent block that houses, in its middle part, an "L" shaped angle brace with several orifices for the attachment of the panel using fixing means, with the possibility of using a simple drill.

[0015] The wall isolator with a spring has a similar structure, the only difference being the silent blocks, which have a housing to accommodate the spring.

[0016] The floating isolator (for panel to panel attachment) comprises two opposing silent blocks separated by a central silent block; the silent blocks at both ends including an "L" shaped angle brace, forming a compact block by means of a through screw, that exerts its torque on a counter nut. These panels are installed in the same way as described in the previous case.

[0017] In detail, the components of the wall isolator with a rubber silent block, are a die-cut metal base that is circular at the centre and narrows at the top and bottom, both ends being radially finished off incorporating a perforation of a smaller diameter in its geometric centre. This base is fitted to the wall by means of screws and washers.

[0018] Centred on the highest part of the metal base there is a rubber silent block that is basically cylindrical, its centre part being wider and formed by a spoke, both ends being narrower and straight, one end adjoining the metal base and the other the rubber silent block, formed by a cone trunk, that, at its narrowest end, has a boss and a housing box for a bent L-shaped metal angle brace on which the fixed or removable panels are installed by means of fixing elements, through a plurality of equidistant perforations on said angle brace. All of the silent blocks have a through perforation at their geometric centre to allow the clamping screw to pass through.

[0019] All of this forms a compact block by means of a through screw screwed to the metal base. It is installed with a flat washer to enhance the screw torque

[0020] The floating isolator with the rubber silent block is formed by two "L"-shaped metal angle braces, each of which having a silent block formed by a cone trunk, that, in its narrowest part, has a boss and housing box between which there is another cylindrical rubber silent block whose centre part is wider and formed by a spoke, both of the narrower ends remaining straight.

[0021] The fixed or removable panels are installed on bent L-shaped metal angle braces by means of fixing elements, through a plurality of equidistant perforations on said angle braces. All of the silent blocks have a through perforation at their geometric centre to allow the clamping screw to pass through.

[0022] All of this forms a compact block by means of a through screw screwed at the opposite end by means of a counter nut. Flat washers are fitted to enhance the screw torque.

[0023] In detail, the components of the wall isolator with a rubber silent block and spring are a die-cut metal base that is circular at the centre and narrows at the top and bottom, both ends being radially finished off incorporating a perforation of a smaller diameter at its geometric centre. This base is fitted to the wall by means of screws and washers.

[0024] Centred on the highest part of the metal base there is a basically cylindrical rubber silent block, its centre part having a larger diameter. Both ends, of a smaller diameter, comprise a straight section, a hemispherical boss and a housing box for a bent L-shaped metal angle brace, onto which the fixed or removable panels are installed by means of fixing elements, through a plurality of equidistant perforations on said angle brace. Whilst one end of the aforementioned silent block remains adjoining the metal base, the opposite end, of the same design, houses a spring that in turn is centred on another cylindrical rubber silent block formed by a larger diameter straight section and a section of a smaller diameter that has a straight section, a hemispherical boss and a housing box in which the opposite end of the spring is housed.

[0025] All of the silent blocks have a through perforation at their geometric centre to allow the clamping screw to pass through. All of this forms a compact block by means of a through screw screwed to the metal base. It is installed with a flat washer to enhance the screw torque.

[0026] In detail, the floating isolator with rubber silent block and springs comprises two "L"-shape metal angle braces, each of which has a cylindrical silent block, the centre part of which is of a larger diameter. Both ends, of a smaller diameter comprise a straight section, a hemispherical boss and a housing box between which there is another cylindrical rubber silent block, the centre part being wider and formed by a spoke, both of the narrower ends remaining straight.

[0027] Whilst one end of the aforementioned silent block remains adjoining the metal base, the opposite end, of the same design, houses a spring that in turn is centred on another cylindrical rubber silent block formed by a short, larger diameter, straight section and a section of a smaller diameter that has a straight section, a hem-

ispherical boss and a housing box in which the opposite end of the spring is housed.

[0028] The fixed or removable panels are installed on the bent L-shaped metal angle braces by means of fixing elements, through a plurality of equidistant perforations on said angle braces. All of the silent blocks have a through perforation at their geometric centre, to allow the clamping screw to pass through.

[0029] All of this forms a compact block by means of a through screw screwed at the opposite end by means of a counter nut. Flat washers are fitted to enhance the screw torque.

[0030] The safety system for the construction of false ceilings that also forms part of the present construction system is carried out by means of a damping bracket proposed by the invention, providing a structurally simple and functionally effective solution that, in addition to totally eliminating any type of play, allows perfect coupling to any of the currently existing complementary elements.

[0031] It is mainly based on the use of the standardised orifices and grooves that all manufacturers use, that is, a split groove on the top and a circular orifice located on the same plane, near to the aforesaid groove.

[0032] For this purpose, based on the classic "U"-shaped fork, to which the silent block is attached with the devices for fixing to the ceiling, the invention centres on the fact that one of the side branches of the fork, the free end of which is narrow and rounded, incorporates two lateral, opposing, aligned grooves, whilst the other side branch is slightly wider, with a semicircular reinforcement in the middle part, narrowing at its free end, running parallel to the branch by means of a spoke forming a type of hook that widens slightly at the free end, by way of a retaining stop.

[0033] The complementary piece that works with the aforesaid fork, formed by a plate that is also grooved and "U"-shaped, substantially narrower than the fork, which has, on its middle branch, a split orifice for the bayonet coupling of the first branch of the fork and, at a suitable distance from the aforesaid groove, a circular orifice for the aforementioned hook to pass through.

[0034] In addition to the structure described, the lower "U"-shaped piece incorporates, on the lower, free edges of each of its side branches, two large end recesses, of a trapezoidal shape, which frame an interior, basically rectangular-shaped wing with pronouncedly rounded vertexes and with slightly downward and inward-facing side grooves, the purpose of which is to accommodate the "U" profile with a narrowed tip that forms part of the plates that form the false ceiling to be supported.

[0035] As the preferred practical embodiment of the proposed construction system to carry out the installation of fixed or removable panels over a large surface area, the initial step is to screw the isolators to the wall and on them the corresponding panels, so that to continue prolonging the wall, the floating isolators must be used, attaching, in this way, as many panels as are needed. With regard to the fixing of false ceilings or similar ceilings, to proceed to installation, the damping bracket is assembled with the grooved plate in such a way that they remain coupled together after inserting the shorter side branch of the fork into the groove on the latter piece, by means of a 90° rotation of said fork, achieving a situation in which both pieces are perfectly in place and immobilised in all directions and essentially in relation to the weight exerted on them by the panels that form the false ceiling. This mounting considerably improves costs due to the reduction in time required, as well as optimising the posture required of fitters, lessening any possible risks when working.

[0036] This safe construction system presented provides, in relation to the fixing of panels, numerous advantages over the systems currently available, having a highly effective fire performance in the case of fixed or removable panels, given that, since the system is formed by a compact block by means of a screw that fixes the whole assembly together, in the event of fire the structure will never collapse inwards into the premises, thus preventing, as far as is possible, injury to persons.

[0037] Another of the most important advantages is the elasticity to stretching that this system permits since normally panels installed on walls or adjoining panels have a considerable weight and it is the silent blocks and springs that regulate the tension.

[0038] In relation to the construction of false ceilings and similar ones, this safe construction system provides numerous advantages over the systems currently available, the most important of these being the perfect coupling that is achieved with the complementary piece, that remains in place and immobilised, without any play in any direction, and essentially with regard to the weight exerted on it by the panels that form the false ceiling.

[0039] Another of the most important advantages is the simplicity of inserting the different parts of the complementary piece in the common grooves by virtue of the side branches of the damping bracket as defined here.

[0040] Another important common advantage of the safe construction system is the reduction of assembly times, considerably reducing costs and increasing productivity as well as favouring handling during assembly without fitters having to adopt forced postures, complying in this way with the current legislation on the prevention of risks at work.

[0041] In order to gain a better understanding of the present invention, the attached drawing shows a preferred practical embodiment of the same. In said drawing and in reference to the different elements defined in the proposed construction system, the following can be observed:

Figure - 1 - shows a close view of the mounting of a wall isolator with rubber silent block.

Figure -2- shows a close view of the mounting of a floating isolator with rubber silent block.

Figure -3- shows a close view of a coupling base for wall isolators.

Figure -4- shows a close view of a bent L-shaped angle brace to attach fixed or removable panels.

Figure -5- shows a plan and an elevational close view of a silent block.

Figure -6- shows a plan and elevational close view of a silent block.

Figure - 7 - shows the close view of the mounting of a wall isolator with a rubber silent block and spring.

Figure -8- shows a close view of the mounting of a floating isolator with a rubber silent block and springs.

Figure -9- shows a plan and elevational close view of a silent block.

Figure -10- shows a plan and elevational close view of a silent block.

Figure - 11 - shows a perspective exploded view of the damping bracket for false ceilings and similar ones, which is the object of the present invention.

Figure -12- shows a front elevational close view of one of the side branches that forms part of the fork of the support in the previous figure.

Figure -13- shows a front elevational close view of the other side branch.

Figure -14- shows a profile of the same fork.

Figure -15- shows a top plan view of the fork in which its middle branch can be seen.

Figure -16- shows a schematic elevational view of the damping bracket mounted on a ceiling and supporting a false ceiling insulating panel of the type that incorporates an integral anchoring profile.

[0042] The wall isolator (1), with rubber silent block, basically comprises a die-cut laminar metal base (2) that is circular in its centre part (3), narrowing at the top (4) and bottom (5) both ends being radially finished off (6) incorporating a perforation (7) of a smaller diameter in its geometric centre; this base is installed on a wall (8) by means of screws (9) and washers (10). The centre part (11) is notably higher due to the spokes (12) that form it, incorporating a threaded perforation (13) at its geometric centre.

[0043] Centred on the central part (11) of the metal base (2) there is a rubber silent block (14), that is basically cylindrical, its central part (15) being wider and formed by an interior spoke, both narrower ends (16) remaining straight. During mounting one end is fitted adjoining the metallic base (2) and the other end adjoining another rubber silent block (17), of a cone trunk shape, with a boss (18) at its narrowest point and a smaller diameter housing box (19), to house a bent L-shaped metal angle brace (20), on which the fixed or removable panels are installed by means of fixing elements through a plurality of equidistant perforations (21) located along the top and bottom part.

[0044] The angle brace (20) is made of thin laminar plate and of a rectangular shape, the edges (22) of its free end being rounded, the opposite end (23), of a reduced length and bent in an "L" shape, with an orifice (24) at its centre and the edges (22) of its free end being rounded.

[0045] The silent block (17) remains secured in the angle brace (29) when the boss (18) is inserted into the orifice (24), maintaining a slight pressure and remaining in position in the box (19).

[0046] All of the silent blocks have a through perforation (25) located at their geometric centre to allow a clamping screw (26) to pass through, producing a compact block when screwed to the metal base (2), a flat washer (27) being fitted to enhance the screw torque.

[0047] The floating isolator (28) with rubber silent block, is basically formed by two metal angle braces (20) bent in an L-shape, each of which includes a silent block (17), between both of these there is another cylindrical rubber silent block (14).

[0048] The fixed or removable panels are installed on the metal angle braces (20) by means of fixing elements through a plurality of equidistant perforations (21).

[0049] All of the silent blocks have a through perforation (25) at their geometric centre to allow a clamping screw (29) to pass through, producing a compact block when screwed to a counter nut (30), flat washers (27) being fitted to enhance the tightening torque .

[0050] The wall isolator (31), with rubber silent block and spring is basically formed by a die-cut laminar metal base (2) and it is installed on a wall (8) by means of screws (9) and washers (10).

[0051] Centred on the central part (11) of the metal base (2) there is a rubber silent block (32), that is basically cylindrical, its central part (33) having a larger diameter, both ends being equal and of a smaller diameter comprise a straight section (34), a hemispherical boss (35) and a housing box (36) to accommodate a bent L-shaped metal angle brace (20). Whilst one end (34) of the aforementioned silent block (32) remains adjoining the metal base (2), the opposite end, formed in the same way, houses a spring (37) that, in turn, is centred on another cylindrical rubber silent block (38), formed by a

short straight section (39) of a larger diameter, with one end formed by another short straight section (40) of a smaller diameter and the opposite end, of a smaller diameter, having a straight section (34), a hemispherical boss (35) and a housing box (36) in which the opposite end of the spring (37) is housed.

[0052] The silent block (32) remains secured in the angle brace (20) when the hemispherical boss (35) is inserted into the orifice (24), maintaining a slight pressure, remaining in position in the box (36), the spring (37) then remains positioned between the box (36) and the hemispherical boss (35).

[0053] All of the silent blocks have a through perforation (25) at their geometric centre to allow a clamping screw (26) to pass through, providing a compact block when screwed to the metal base (2), a flat washer (27) being fitted to enhance the tightening torque.

[0054] The floating isolator (41), with rubber silent block and springs, basically comprises two bent L-shaped metal angle braces (20), each one of which has a silent block (32), between each of these there is another cylindrical rubber silent block (14), in turn each silent block (32) takes a spring (37) housing its opposite end in a silent block (38).

[0055] On the metal angle braces (20) fixed or removable panels are installed by means of fixing elements through a plurality of equidistant perforations (21).

[0056] All of the silent blocks have a through perforation (25) at their geometric centre to allow a clamping screw (42) to pass through, providing a compact block when screwed to a counter nut (30), being fitted with flat washers (27) to enhance the tightening torque.

[0057] The damping bracket for false ceilings and similar ones that is presented comprises a fork (43), formed by a metal plate with a split orifice (44) centred on its middle branch, coupled to which there is a silent block (45) with an axial orifice through which a threaded rod (46) passes, which is the means of fixing the support to the ceiling, after having installed the corresponding plug in the ceiling. On said rod there is a bottom bowl (47) with an axial, threaded neck for coupling to it, so that it forms a seat for the silent block (45), being height-adjustable in order to obtain the perfect levelling of the different brackets that support the false ceiling.

[0058] The side branches (48) and (49) of said fork (43) have totally different structures and functions, one of said branches (48) being slightly shorter than the other (49) and notably narrower at its end half, incorporating, near to its free end, that has a semicircular finish (50), curved bosses, one in the top direction (51) and the opposite in the bottom direction (52), with rounded ends and with two deep, narrow side grooves (53) for bayonet coupling in the groove (54) of a complementary piece (55).

[0059] The branch (48) fits into the complementary piece (55), in a position noticeably parallel to the groove (54) and when the recesses or grooves (53) reach the level of said groove (54) a 90° rotation of the branch produces their interlocking, aided by the arched bosses (51) and (52) located opposite each other, at the top end of the grooves or recesses (53).

[0060] The other side branch (49) is slightly wider, with a semicircular reinforcement in its middle part, narrowing at its free end (57), running parallel to the branch by means of a spoke (58) forming a type of hook (59), that widens slightly at its free end (60), by way of a retaining stop, this hook (59) being destined to interlock with the orifice (61) of the complementary piece (55), during the swivel movement or 90° rotation of the fork (43) previously mentioned.

[0061] This complementary piece (55) is of a grooved design with a U-shaped section, also obtained with a die-cut metal plate, in whose middle branch the previously mentioned groove (54) and orifice (61) are established, grooves standardised by manufacturers may also include, in their side branches, the orifices (62) axially opposed, or just one on one side.

[0062] In addition, this complementary piece (55) has, on the bottom, free edge of its side branches, large side recesses (63) that are symmetrical and roughly trapezoidal, which delimit a basically rectangular intermediate wing (64) with rounded free vertexes, having two grooves (65) at its ends, which are considerably recessed both inwards and downwards and whose purpose is to receive the narrowed tip of the classic U-shaped profile (66) that the false ceiling panels (67) have to fix them to the bracket described.

[0063] This special coupling of the fork (43) to the complementary piece (55) ensures the perfect, totally stable, effective attachment between these elements, with no play.

[0064] It was decided to omit a detailed description of the other particular features of the system being disclosed or of the components forming part of it, as it was felt that the rest of said particular features are not the object of any claims.

[0065] Having described the nature of the present invention in sufficient detail, in addition to the means of putting it into practice, all that remains to be added is that its description is not restrictive, and that variations both in materials and shapes and sizes can be made provided that said variations do not alter the essential nature of the characteristics claimed below.

Claims

1. A safe construction system for fixed or removable panels and false ceilings or those of a similar type used in building industry in general, wherein the assembly of a panel is carried out by means of a isolator screwed to a wall and the assembly between adjoining panels by means of a floating isolator, forming a compact block by means of the tightening torque of a through screw, allowing the structure to remain in place, without collapsing, in the event of

a fire.

2. A safe construction system, according to the preceding claim, wherein the wall isolator (1), with a silent block, comprises a die-cut laminar metal base (2), a silent block (14) preferably made of rubber, adjoining a metal base (2) and the other end adjoining another silent block (17), preferably made of rubber, housed on a metal L-shaped angle brace (20), forming a compact block by means of screw (26) screwed into orifice (13) of the base (2) and a flat washer (27).

3. A safe construction system, according to the preceding claims, wherein the floating isolator (28) with silent block, is basically formed by two L-shaped metal angle braces (20), each of which incorporates a silent block (17), preferably made of rubber, there being a silent block (14) preferably made of rubber between both of them, forming a compact block by means of the screw (29) screwed to a counter nut (30) and two flat washers (27).

4. A safe construction system, according to the preceding claims, wherein the wall isolator (31), with silent block and spring, basically comprises a die-cut laminar metal base (2), a silent block (32), preferably of rubber, adjoining the base (2) and a metal L-shaped angle brace (20), incorporating a spring (37) placed between a silent block (32) and a silent block (38), preferably of rubber, forming a compact block by means of a screw (26) screwed in the orifice (13) of the base (2) and a flat washer (27).

5. A safe construction system, according to the preceding claims, wherein the floating isolator (41), with silent block and springs, is basically formed by two L-shaped metal angle braces (20) each of which incorporates a silent block (32), with a silent block (14) between both, in turn each silent block (32) takes a spring (37) the opposite end of which is housed in a silent block (38), forming a compact block by means of screw (42) screwed to a counter nut (30) and two flat washers (27)

6. A safe construction system, according to the preceding claims, wherein the die-cut laminar metal base (2) is formed by a circular shape in its central part (3), narrowing to the top part (4) and bottom part (5) both ends finishing off with a spoke (6) incorporating a perforation (7) of a smaller diameter at its geometric centre, the central part (11) being notably higher due to the spokes (12) that form it, incorporating a screwed perforation (13) at its geometric centre, subsequently being installed on a wall (8) by means of screws (9) and washers (10).

7. A safe construction system, according to the preceding claims, wherein the metal angle brace (20) is made of thin laminar plate and made in a rectangular shape, the edges (22) of its free end being rounded, the opposite, shorter end (23), bent to an L shape and having an orifice (24) at its centre and with the edges (22) of its free end rounded. On it the fixed or removable panels are installed by means of fixing elements, through a plurality of equidistant perforations (21) located along the top and bottom part.

8. A safe construction system, according to claims 2,3 and 5, wherein the silent block (14) may be of rubber or a similar material, cylindrical, with its central part (15) wider and formed by an arched shape, ends (16) that are narrower and remain straight, and having a longitudinal, cylindrical perforation (25), located at its geometric centre.

9. A safe construction system, according to claims 2 and 3, wherein the silent block (17) may be of rubber or a similar material, formed by a cone trunk, having, in its narrowest part, a short boss (18) and a housing box (19) of a smaller diameter, with a longitudinal, cylindrical perforation (25), located at its geometric centre.

10. A safe construction system, according to claims 2 and 3, wherein the silent block (17) is secured in the angle brace (20) when the boss (18) is inserted through the orifice (24), maintaining a slight pressure and remaining in position in the box (19).

11. A safe construction system, according to claims 4 and 5 wherein the silent block (32) may be of rubber or a similar material, basically cylindrical, its central part (33) having a larger diameter, both ends being equal and of a smaller diameter, formed by a straight section (34), a hemispherical boss (35) and a housing box (36) with a longitudinal cylindrical perforation (25) located at is geometric centre

12. A safe construction system, according to claims 4 and 5, wherein the silent block (38) may be of rubber or a similar material, basically cylindrical, formed in its central part by a short, straight section (39) of a greater diameter, one end formed by a short straight section (40) of a smaller diameter and the opposite end, of a smaller diameter, having a straight section (34), a hemispherical boss (35) and a housing box (36).

13. A safe construction system, according to claims 4 and 5, wherein the silent block (32) is secured in the angle brace (20) when the hemispherical boss (35) is inserted through the orifice (24), maintaining a slight pressure, remaining in position in the box (36), subsequently the spring (37) remains in posi-

tion between the box (36) and the hemispherical boss (35).

14. A safe construction system for fixed or removable panels and false ceilings or those similar to the type used in the building industry in general, forming the link between the false ceiling and the corresponding ceiling or support framing and comprising a fork (43), obtained from a metal plate with a slit orifice (44), centred on its middle branch, to which a silent block (45) is coupled, said silent block (45) having an axial orifice through which a screwed rod (46) is passed, constituting the means of fixing the bracket to the ceiling, after the corresponding plug has been installed; the rod having a bottom bowl (47) with an axial threaded neck for coupling to it, said bowl forming the seat for the silent block (45) and being height-adjustable to achieve the perfect levelling of the different brackets that support the false ceiling.

15. A safe construction system, according to the preceding claim, wherein the fork (43) has two side branches (48) and (49), side branch (48) being slightly shorter than side branch (49) and notably narrower at its end half, incorporating in its free end, with a semicircular shaped finish (50), curved bosses (51) in the top direction and the opposite one (52) in the bottom direction, their ends being rounded, also having two deep, narrow side grooves (53) for its bayonet coupling in a groove (54), located in à complementary piece (55).

16. A safe construction system according to claims 14 and 15, wherein the side branch (48) is coupled to the complementary piece (55) in a position noticeably parallel to the groove (54) and when the recesses or grooves (53) reach the level of said groove (54), a rotation of 90° of the fork produces their interlocking, favoured by means of the aid of arched bosses (51) and (52) opposite each other, at the top end of the grooves or recesses (53).

17. A safe construction system, according to claims 14, 15 and 16, wherein the other side branch (49) is slightly wider, with a semicircular reinforcement (56) in its middle part, its free end (57) narrowing, running parallel to the branch by means of a spoke (58), with a slight widening at its free end (60).

18. A safe construction system, according to claims 14, 15, 16 and 17, wherein the side branch (49) is coupled to the complementary piece (55), when the hook (59) interlocks with the orifice (61), during the swivel movement or 90° rotation of the fork (43).

19. A safe construction system, according to claims 14, 15, 16, 17 and 18, wherein advantage is taken of the groove (54) and the orifice (61) of the complementary piece (55) with the fork (43), ensuring a perfect, fully stable and effective attachment between these elements, without any play.

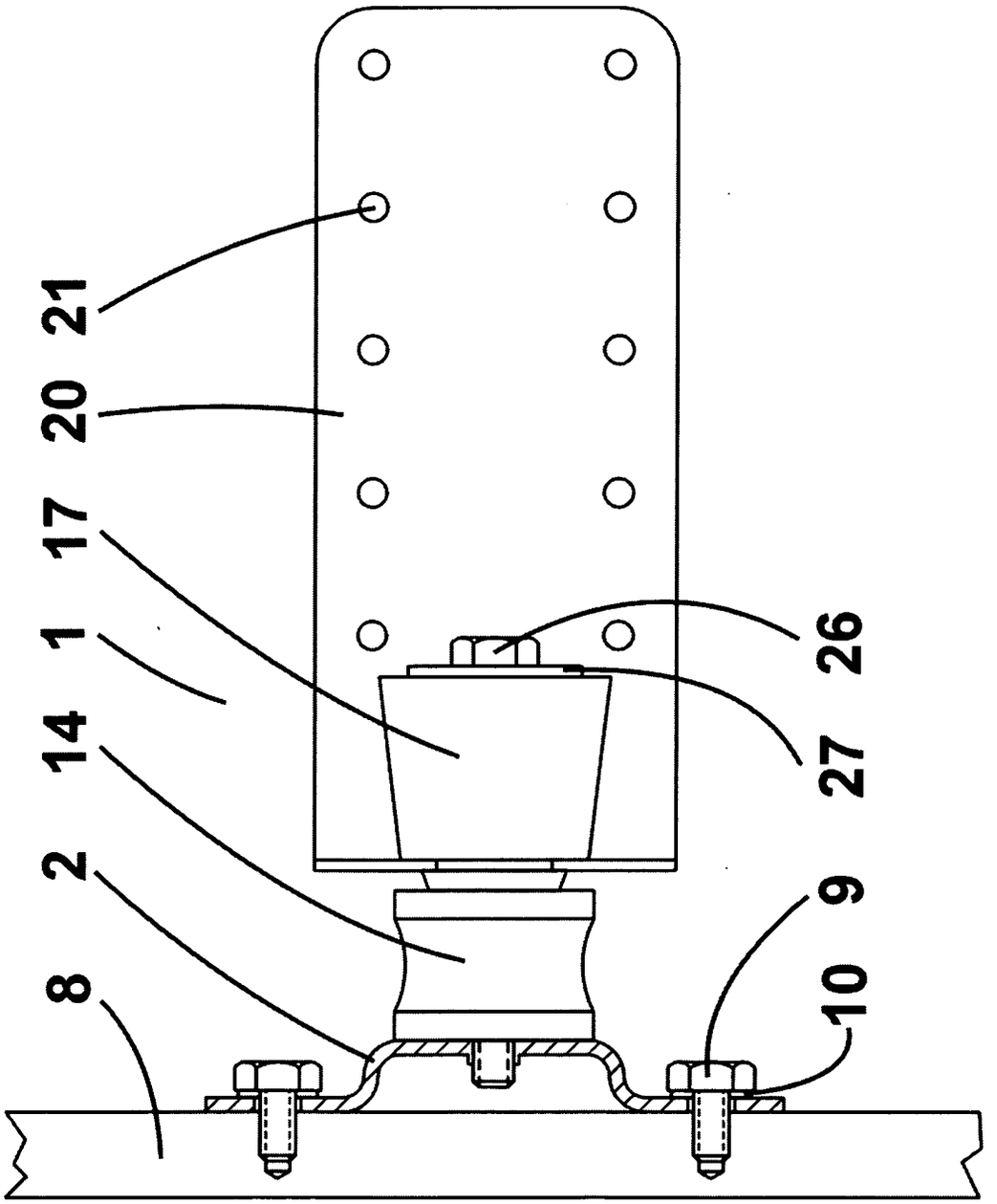

FIG.1

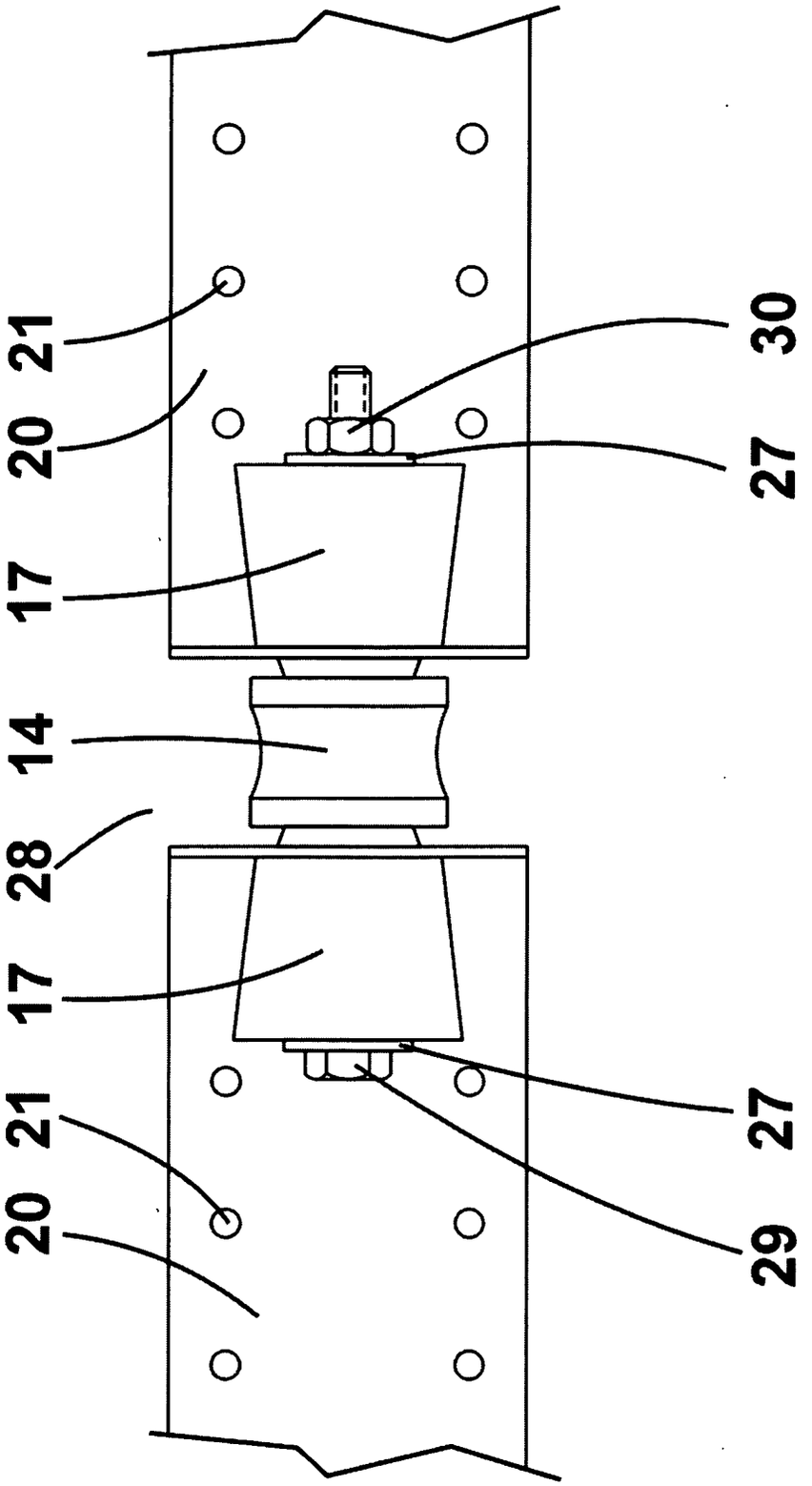

FIG.2

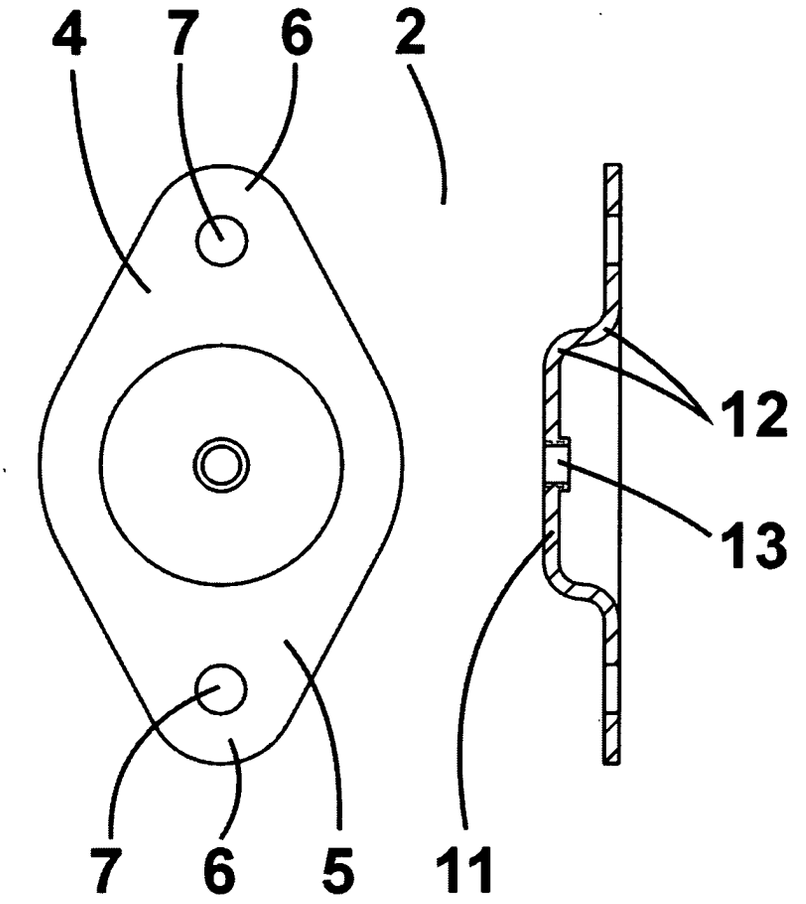

FIG.3

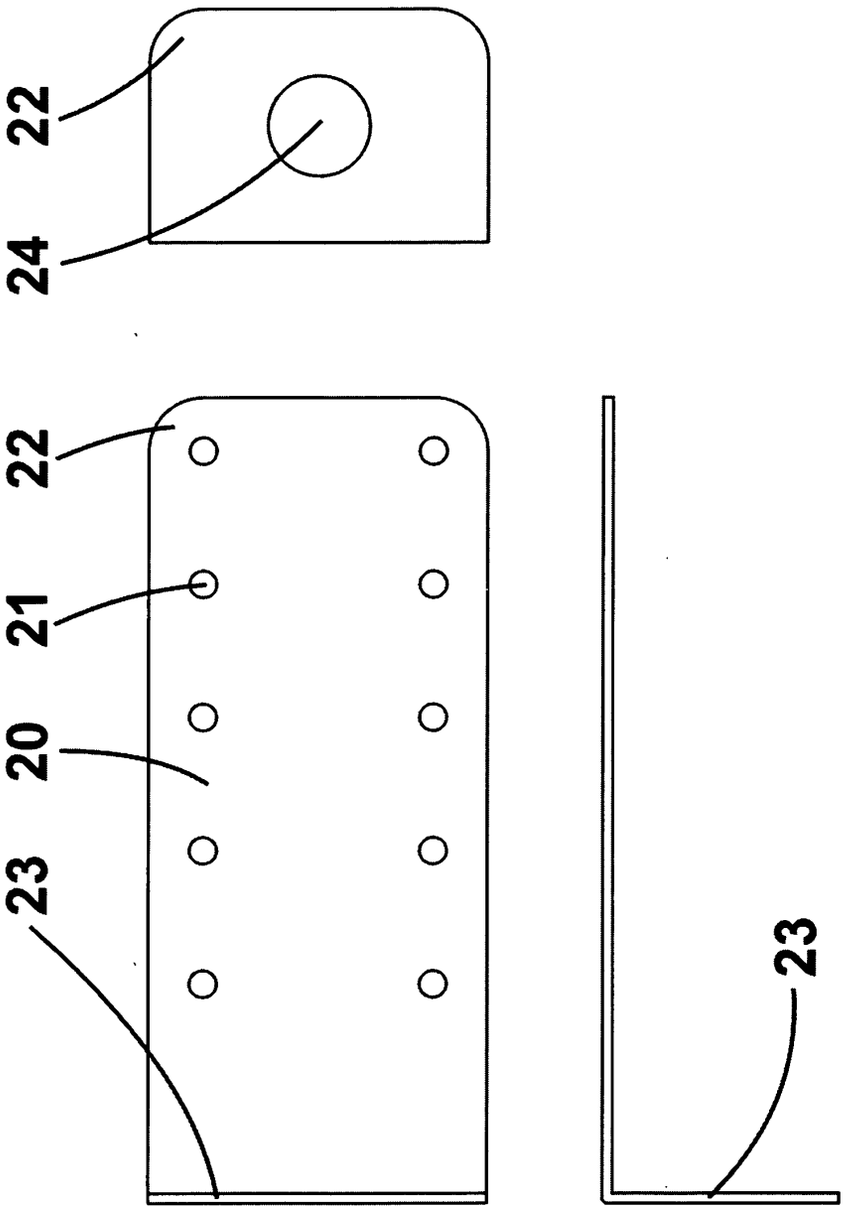

FIG.4

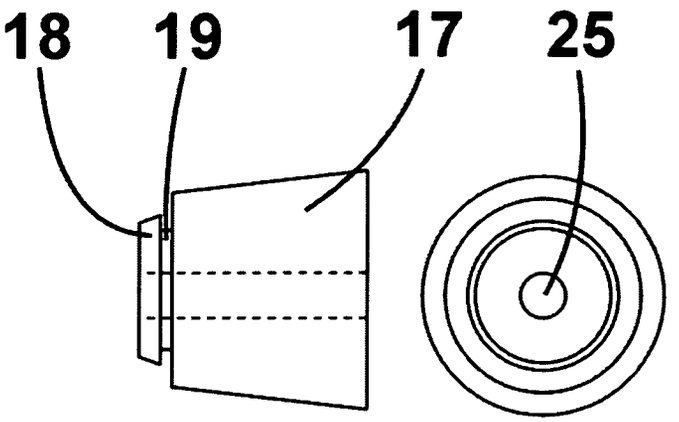

FIG.5

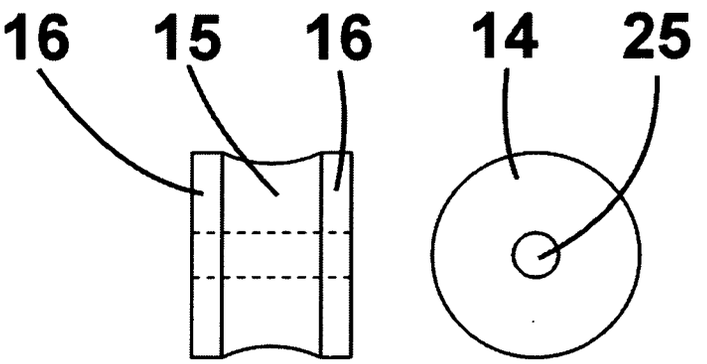

FIG.6

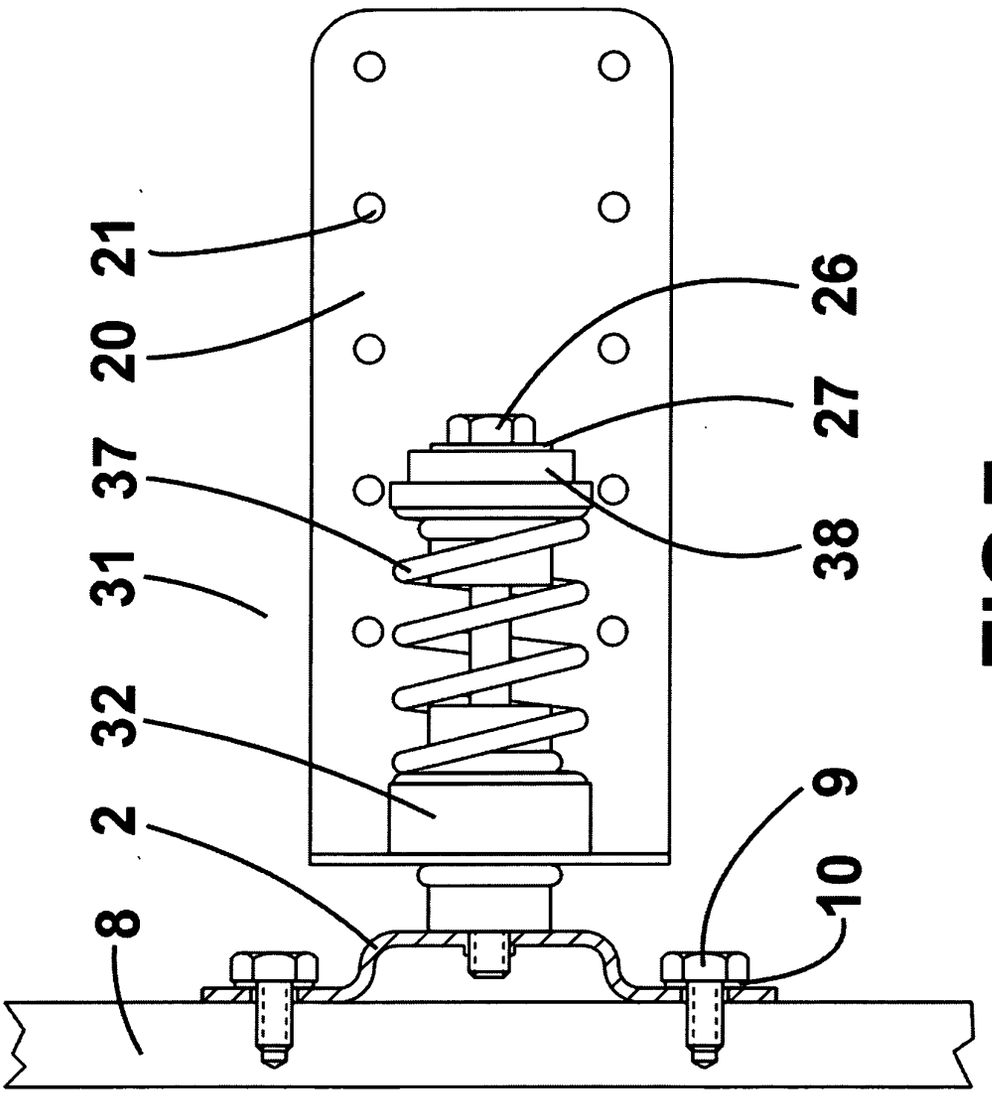

FIG.7

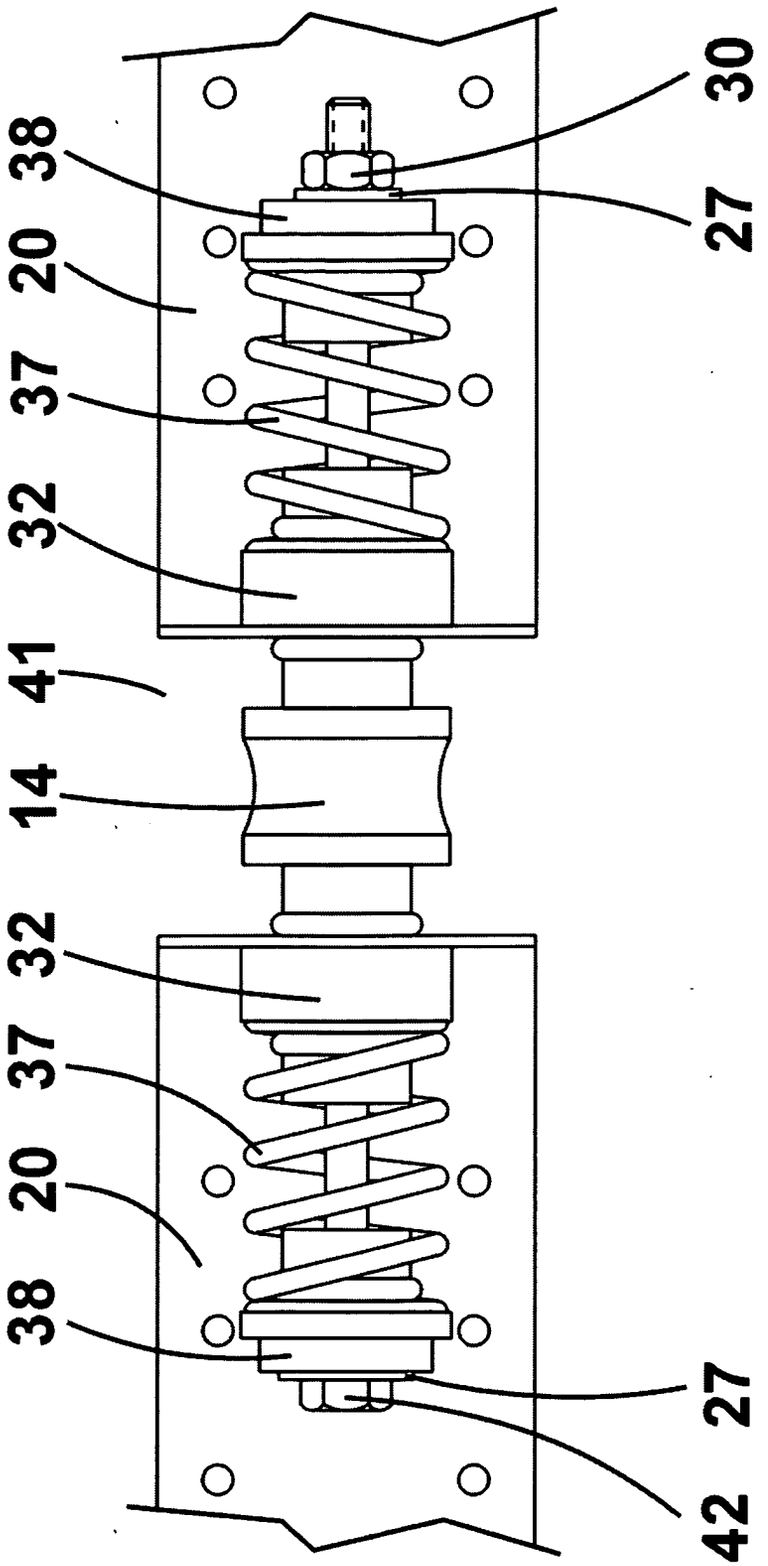

FIG.8

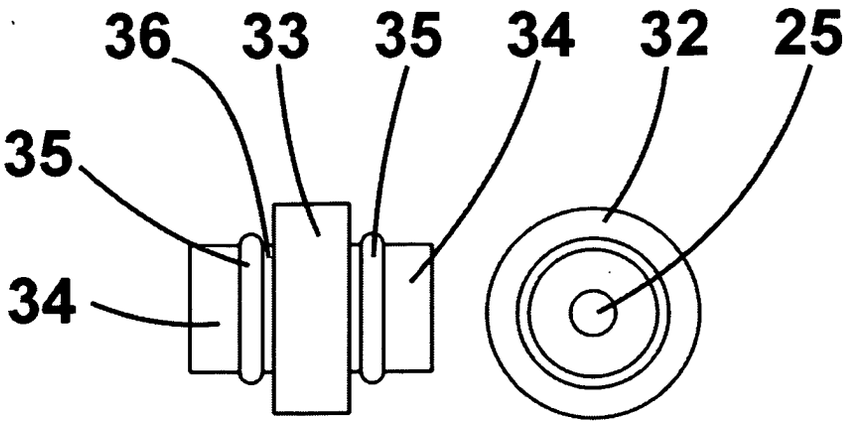

FIG.9

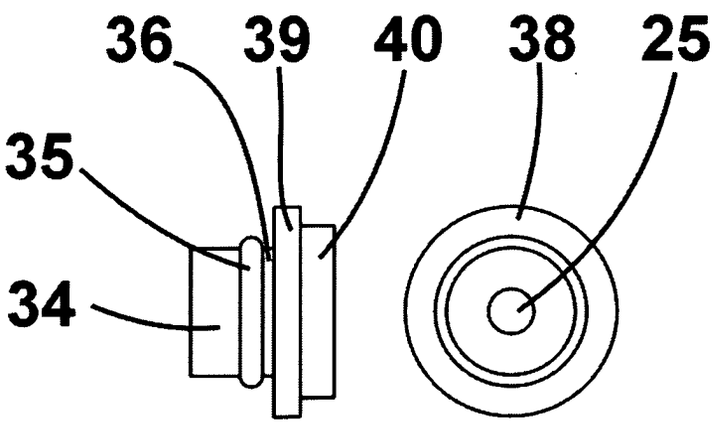

FIG.10

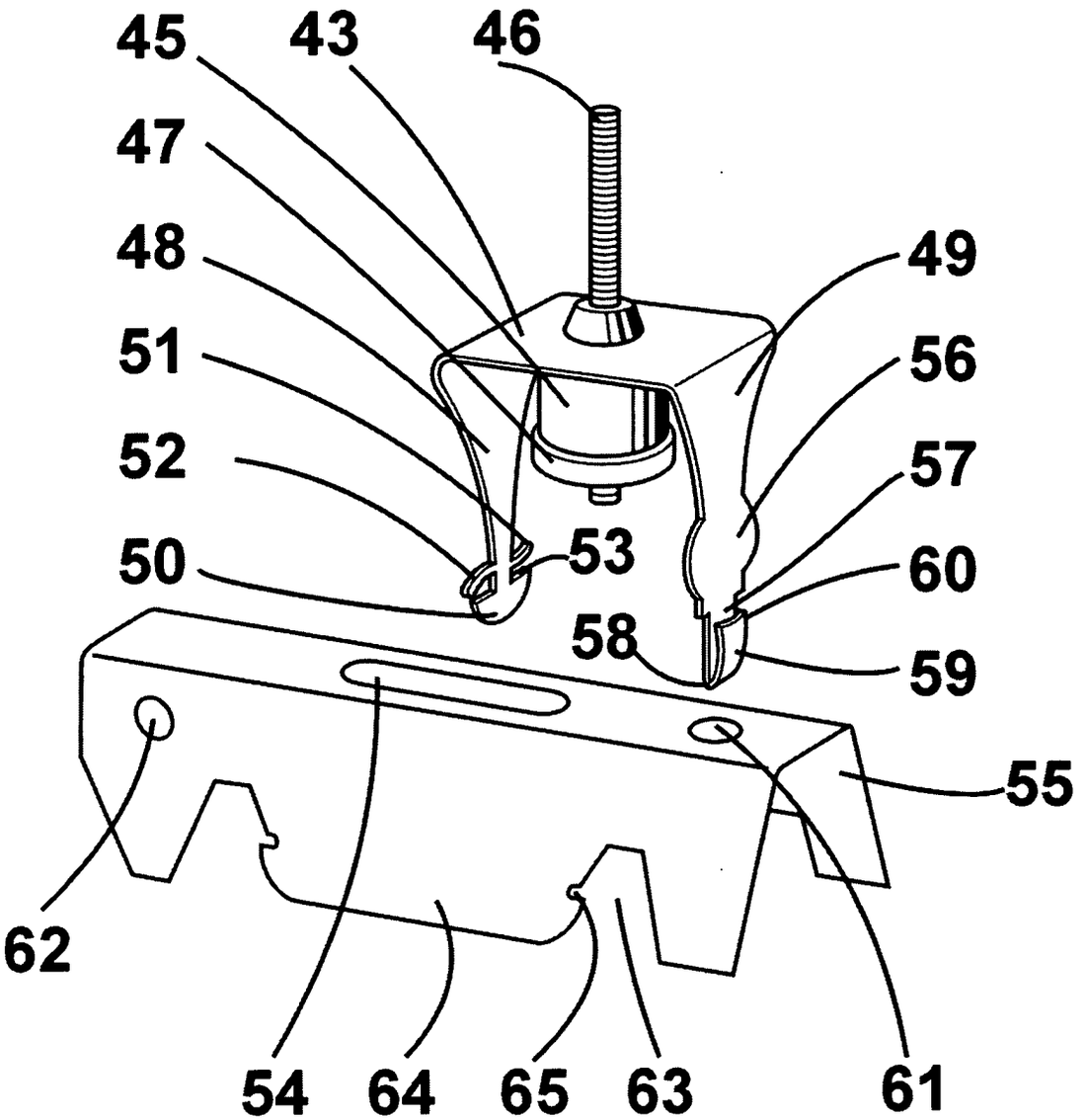

FIG.11

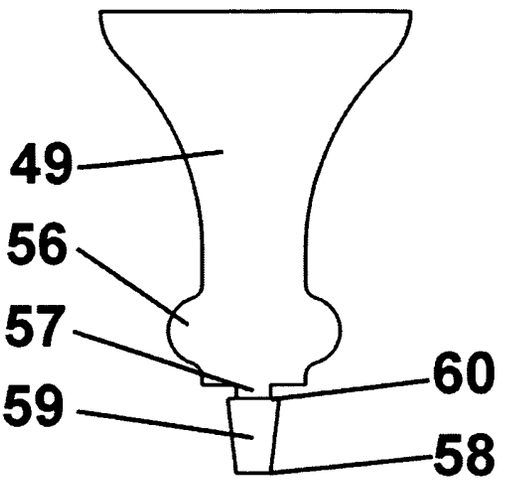

FIG.12

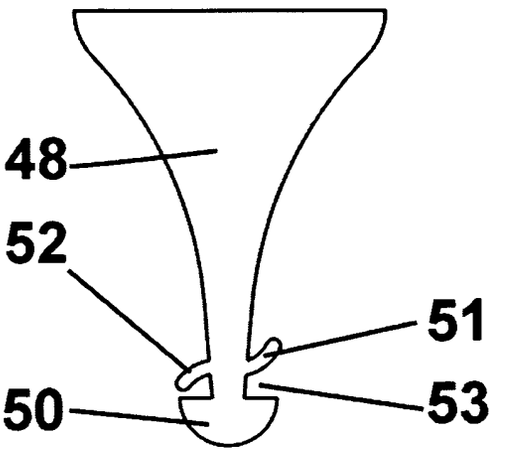

FIG.13

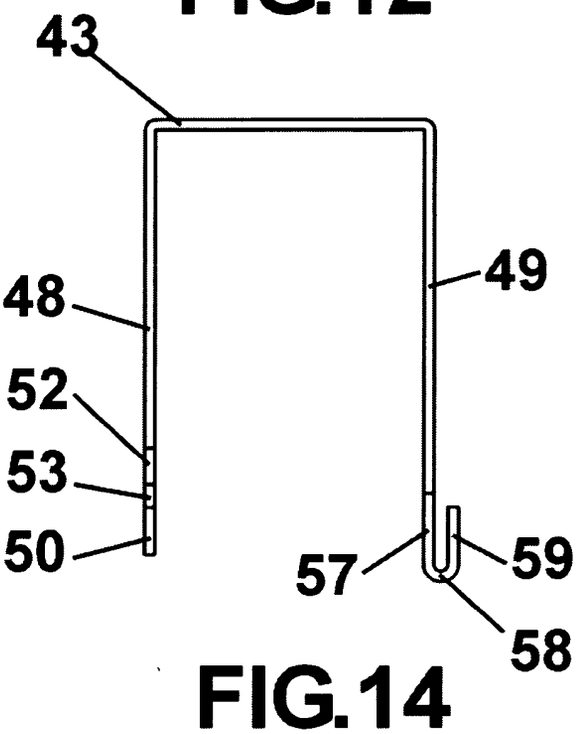

FIG.14

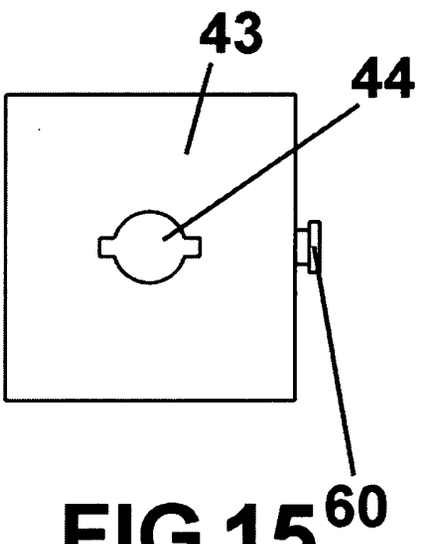

FIG.15

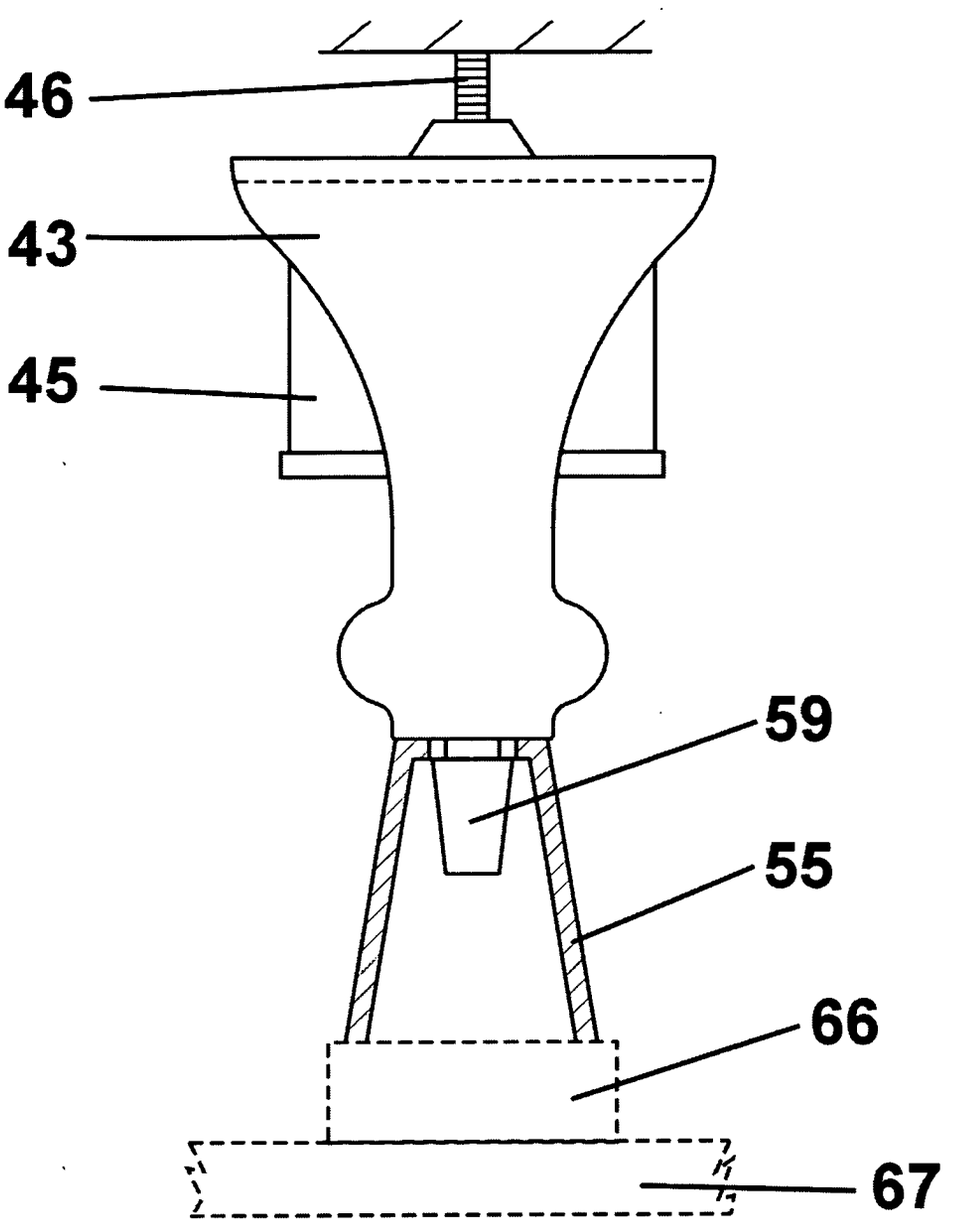

FIG.16