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(54) **ASSEMBLY FOR ADJUSTABLE ATTACHMENT OF POLE, BEAM OR SIMILAR TO A FUNDAMENT**

ANORDNUNG ZUR EINSTELLBAREN BEFESTIGUNG EINER STANGE, EINES BALKENS ODER
DERGLEICHEN AN EINEM FUNDAMENT

ENSEMBLE POUR FIXER DE MANIÈRE RÉGLABLE UN POTEAU, POUTRE OU ANALOGUE À UNE
BASE

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• **BJERKNES, Rolf**
7080 Heimdal (NO)

(30) Priority: **08.06.2015 NO 20150738**

(74) Representative: **Curo AS**

Vestre Rosten 81

7075 Tiller (NO)

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(72) Inventors:

• **ALSTAD, Helge**
7080 Heimdal (NO)

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Description

[0001] The present invention is related to an assembly for adjustable attachment of pole, beam or similar to a fundament, according to the preamble of claim 1.

[0002] The present invention is especially related to an assembly for adjustable attachment of pole, beam or similar to a fundament which is pressed or hammered down into the ground used for arranging noise-deflection walls, but also for fences, lamp posts or other similar applications.

Background

[0003] From SE-B-458 461 it is known a fundament for poles of different kinds, such as gateposts, flag poles, lamp poles or similar, which includes stabilizing wings and is intended for being pressed/hammered into the ground. At upper part of the fundament it is provided a plate having upwards protruding bolts. A pole can be arranged to the upwards protruding bolts by that it at lower end is provided with a plate with holes adapted to the upwards protruding bolts, and where the plate and there-through the pole is fixed to the fundament with nuts fixed to the upwards protruding bolts. This solution has however the disadvantage that it does not exhibit adjustment opportunities in connection with the attachment of the pole, something which require that the fundament is correctly placed both in horizontal and vertical direction. At pressing of the fundament down into the ground it is not always that this is possible, as it may be rocks and different soil conditions which results in that accurate positioning is not always possible.

[0004] DE 201 14229 U1 describes an adjustment device for a fundament intended for being inserted into the ground. The device includes two opposite plates, of which one plate is fixed to anchoring means inserted into the ground. It is further described means for arrangement of the mounting plates at a certain mutual distance.

[0005] NO 20054155 describes an adjustment device for a fundament which provides an improvement of SE-B-487 461. NO 20054155 describes an adjustment device for a fundament which is to be inserted into the ground, said adjustment device comprising two mounting plates that are located mainly opposite to each other, means for arranging the mounting plates at a certain mutual distance, means for fixing the first mounting plate to the fundament, and that a second mounting plate supports a pole or similar. The fastening means includes a lock bar that is received in the fundament, a first bolt that extends through a first hole of the first mounting plate, and that the lock bar is equipped with means for force transmitting cooperation with the first bolt. This solution has some advantages, but also some disadvantages by that it requires that the fundament at upper end is provided with holes for mounting of the lock bar. This results in that it only can be used on fundaments provided with such a hole, at the same time as one by arranging such

holes in the fundament itself weakens the construction of the fundament itself. This solution is further dependent on correct mounting, especially of the lock bar, and that the entire solution rests on the strength of a bolt connecting the lock bar and the mounting plate. This solution is further relatively expensive to manufacture due to the many parts which results in increased costs at production.

[0006] From US 5,501,048 A is known a structural joint and connector for securely connecting a vertical post to a foundation wall. The structural joint and connector comprise a lower plate firmly connected to the foundation wall, a middle plate positioned on top of the lower plate, and a plate. The lateral positioning of the middle plate is adjustable to accurate position the post relative to the foundation wall. US 5,501,048 A does not solve the mentioned drawbacks of SE-B-458 461, DE 201 14229 U1 and NO 20054155.

[0007] It is accordingly a need for providing an assembly for adjustable attachment of a pole, beam or similar to a fundament consisting of few parts, which is both reasonable to manufacture and which provides low mounting complexity, high strength and secure mounting.

Object

[0008] The main object of the present invention is to provide an assembly for adjustable attachment of pole, beam or similar to a fundament which partly or entirely solves the above mentioned disadvantages of prior art.

[0009] It is further an object of the present invention to provide an assembly for adjustable attachment of pole, beam or similar to a fundament which is plain and reasonable to manufacture.

[0010] A further object of the present invention is to provide an assembly for adjustable attachment of pole, beam or similar to a fundament consisting of few parts and has low mounting complexity.

[0011] An object of the present invention is to provide an assembly for adjustable attachment of pole, beam or similar to a fundament which provides higher strength and safety compared to prior art solutions.

[0012] It is further an object of the present invention to provide an assembly for adjustable attachment of pole, beam or similar to a fundament which provides high adjustment flexibility.

[0013] Further objects of the present invention will appear at consideration of the following description, claims and the attached drawings.

The invention

[0014] An assembly for adjustable attachment of pole, beam or similar to a fundament according to the present invention is described in claim 1. Preferable features of the assembly are described in the remaining claims.

[0015] The present invention is mainly related to arrangement of noise-deflection walls where one uses a

fundament of galvanized steel, e.g. a wing fundament, which is arranged for being pressed or hammered into the ground, as prior known. It shall however be mentioned that the present invention is also applicable for fundaments for lamp posts, fences and other similar applications.

[0016] The present invention includes an assembly for adjustable attachment of pole, beam or similar to a fundament, and especially of the kind wing fundaments being pressed or hammered into the ground.

[0017] The assembly according to the present invention includes a lower mainly elliptic plate provided with through holes at its outer ends, and a centrally through hole adapted outer circumference of upper end of the fundament, which lower elliptic plate is arranged to upper end of the fundament.

[0018] The assembly according to the present invention further includes an adjustment plate which mainly exhibits a square shape, which at two of its opposite sides are provided with longitudinal recesses, and that it at least at two of its corners are provided with through holes, typically diametrically arranged, but preferably it is arranged through holes at all the corners. The recesses of the adjustment plate are arranged to coincide with the through holes of the first elliptic plate.

[0019] The assembly according to the present invention further includes an upper mainly elliptic plate which at its outer ends is provided with through holes, which upper mainly elliptic plate exhibits a shape and size corresponding to the lower mainly elliptic plate.

[0020] The assembly according to the present invention is attached to the fundament by that the adjustment plate is arranged over the lower mainly elliptic plate in such a way that the recesses of the adjustment plate coincide with the through holes of the lower mainly elliptic plate, whereupon the upper mainly elliptic plate is arranged above the adjustment plate again with the through holes coinciding with the recesses of the adjustment plate and the holes in the lower elliptic plate, whereupon fixing bolts are arranged extending through the holes of the upper elliptic plate, through the recesses of the adjustment plate and through the holes of the lower elliptic plate, whereupon nuts are arranged to the fixing bolts at upper side of the upper elliptic plate and lower side of the lower elliptic plate. In this way the adjustment plate, when the nuts are not entirely tightened, will be movably attached between upper and lower elliptic plates, and in this way enable displacement of the adjustment plate in all direction in the horizontal plane in relation to the fundament, before the nuts are tightened and the adjustment plate is held securely and in fixed set position between the elliptic plates. It should further be mentioned that the displacement is limited by the extension of the recesses, both as regards displacement laterally and turning.

[0021] One can also imagine that one can use upper and lower plates not being elliptical, but that one then loses the opportunity to turn the adjustment plate with thought of covering of the holes in its corners, alterna-

tively the size of the adjustment plate will have to be increased such that the through holes are moved further out. This is however rarely desirable as poles, beams or similar which are to be arranged to the fundament are of standardized dimensions.

[0022] Poles, beams or similar for noise-deflection walls, lamp posts or fences which are to be arranged to the fundament will be provided with a base plate which usually exhibits a mainly square shape which at its corners are provided with through holes, preferably oblong holes, where the holes correspond with the through holes of the adjustment plate. It should be mentioned that this base plate also can exhibit other shapes than square, such as elliptic, rectangular or circular as long as the holes correspond with the holes of the adjustment plate.

[0023] By means of the corresponding holes of the base plate and adjustment plate these can be attached to each other by means of fixing bolts and nuts with a desired distance therebetween. This is preferably performed by that upwards protruding fixing bolts are arranged to the adjustment plate and fixed with bolts at both sides of the adjustment plate. The fixing bolts have an extension which at least is longer than the total height of the adjustment plate, the upper elliptic plate and the base plate. The extensions of the bolts are preferably longer than this. The base plate can then be arranged to the fixing bolts being fixed to the adjustment plate by means of nuts at both lower side and upper side of the base plate. By this is achieved adjustment of the pole, beam or similar in vertical direction, and minor adjustments in horizontal direction due to the oblong holes in the base plate.

[0024] The present invention accordingly provides an adjustment plate which provides rough adjustment of the pole, beam or similar arranged thereto in all direction in the horizontal plane, while the fixing bolts extending between the adjustment plate and the base plate provide adjustment in vertical direction for the pole, beam or similar, and that the oblong holes in the base plate of the pole, beam or similar provides fine adjustment in the horizontal plane.

[0025] It should incidentally be mentioned that in connection with the nuts preferably are arranged discs.

[0026] In other words, by the present invention is provided an assembly for adjustable attachment of poles, beams or similar to a fundament which consists of few parts, but still provide many adjustment opportunities.

[0027] The present invention further provides an assembly which cannot be incorrectly mounted so that a secure solution is provided, and that it will be capable of meeting all demands for fundaments for noise-deflection walls, lamp posts, fences and similar.

[0028] The assembly further exhibits higher strength than prior known solutions by that there are no separate elements having the responsibility to carry loads alone, neither in vertical direction nor in horizontal direction.

[0029] Further preferable features and advantageous details of the present invention will appear from the fol-

lowing example description.

Example

[0030] The present invention will below be described in further detail with references to the attached drawings, where:

Fig. 1 is a principle drawing of an assembly according to the present invention used for adjustable attachment of a pole for a noise-deflection wall to a wing fundament,

Fig. 2 is an example of a fundament to adapted the assembly according to the present invention in the form of a wing fundament,

Fig. 3a-d show details of the assembly according to the present invention, and

Fig. 4 show details of a base plate for a pole, beam or similar, where the pole, beam or similar is not shown.

[0031] Reference is now made to Figure 1 which is a principle drawing of an adjustable assembly 20 according to the present invention, arranged between a fundament 80 and a pole 100 for a noise-deflection wall (not shown) or similar. The main components of the assembly 20 according to the present invention is a lower mainly elliptic plate 30 arranged to upper side of the fundament 80, an adjustment plate 40 and an upper mainly elliptic plate 50, which elliptic plates are provided with fastening means (further described below) for attachment of the adjustment plate 40 therebetween and the adjustment plate 40 is provided with fastening means (further described below) for arrangement of the pole 100 thereto.

[0032] Reference is now made to Figure 2 showing details of a fundament 80 according to the present invention. A fundament 80 for a noise-deflection wall or similar is typically formed by a hollow tube 81 which is open at its upper end for arrangement of mechanical equipment pressing or hammering the tube 81 down into the ground at a desired location. A fundament 80 which often is used for noise-deflection walls are so-called wing fundaments of galvanized steel, where the tube 81 is provided with at least one protruding wing 82, typically often two or more wings 82, which wings 82 have a stabilizing function for the fundament 80. It is often such that when one press wing fundaments down into the ground they are displaced both horizontally and vertically due to varying soil conditions and if it possibly lies some rocks in the ground. This results in that there is a need for adjustment possibilities when one is to arrange e.g. noise-deflection walls to the fundament 80.

[0033] Reference is now made to Figure 2 and Figures 3a-d showing principle drawings and details of the assembly 20 according to the present invention. As men-

tioned above the assembly includes a lower mainly elliptic plate 30 arranged to upper end of the fundament 80, which plate 30 exhibits a centrally through hole 31 with a diameter adapted outer diameter of the tube 81 of the fundament 80, and is provided with through holes 32 at its outer ends, as shown in Figure 2. Mechanical equipment used for inserting the fundament 80 into the ground often requires access to the interior of the fundament 80 when the fundament 80 is to be pressed or hammered into the ground and accordingly also the elliptic plate 30 must be provided with a hole 31. If the fundament 80 is to be dug into the ground there is no need for this centrally arranged hole 31. The lower mainly elliptic plate 30 is arranged to the upper end of the tube 81 of the fundament 80 by means of welding (as shown in Figure 2) and forms a fixed fastening point in the fundament 80 for the assembly 20 according to the present invention.

[0034] The assembly according to the present invention further includes an adjustment plate 40, as shown in detail in Figure 3b, which exhibits a mainly square shape and where two of its opposite sides are provided with longitudinal recesses 41, which are adapted to the holes 32 of the lower elliptic plate 30 (further described below). The adjustment plate 40 is further at its corners provided with through holes 42. The function of the recesses 41 and holes 42 will be further described below.

[0035] The assembly 20 further includes an upper mainly elliptic plate 50, as shown in detail in Figure 3c, which exhibits the same shape and size as the lower elliptic plate 30 and which at its ends are provided with through holes 51 which correspond to the holes 32 in the lower elliptic plate 30.

[0036] In Figure 3a it is shown a situation where the assembly is attached to the fundament 80. Initially the fundament 80 is pressed or hammered into the ground by means of mechanical equipment which is well known for a skilled person within the area and requires no further description herein. When the fundament 80 with the lower elliptic plate 30 is in place in the ground the further mounting is performed by that the adjustment plate 40 is positioned over the lower elliptic plate 30 so that the recesses 41 at the two opposite sides of the adjustment plate 40 coincide with the through holes 32 of the lower elliptic plate 30. The upper elliptic plate 50 is next arranged over the adjustment plate 40 so that the through holes 51 of the elliptic plate 50 coincide with the recesses 41 of the adjustment plate 40 and the through holes 32 of the lower elliptic plate 30. Fixing bolts 60 are next arranged extending through the corresponding holes 32, 41 of the elliptic plates 30, 50 and thus extends through the recesses 41 of the adjustment plate 40, whereupon the fixing bolts 60 are fixed by nuts 61 and preferably discs 62 at upper side of the upper elliptic plate 50 and lower side of the lower elliptic plate 30, but without that they are entirely tightened, so that the adjustment plate 40 is movably attached in the horizontal plane between the two elliptic plates 30, 50.

[0037] In Figure 3d it is shown an assembled assembly

20 ready for arrangement of a pole, beam or similar 100 provided with a base plate 101 as shown in detail in Figure 4. The base plate 101 typically has a mainly square shape and a size adapted to the adjustment plate 40, and is provided with through holes 102 at its corners which correspond to the through holes 42 of the adjustment plate 40. The holes 102 of the base plate 101 are preferably oblong to enable minor adjustments in the horizontal plane.

[0038] After the assembly is assembled as shown in Figure 3a, arranged are upwards protruding fixing bolts 70 for poles, beams or similar 100 to the holes 42 of the adjustment plate 40 as shown in Figure 3d. The fixing bolts 70 have an extension in vertical direction which position the pole, beam, or similar 100 at a desired distance above the adjustment plate 40 and where the fixing bolts are fixed to the adjustment plate 40 by means of discs 71a and nuts 72a at both sides of the adjustment plate 40, and the fixing bolts 70 are thereby securely fixed thereto. To the fixing bolts 70 are next arranged discs 71b and nuts 72b at upper part of the fixing bolts 70 and the assembly is thus ready for attachment of the pole, beam or similar 100 by that its base plate 101 via its through oblong holes 102 are moved down onto the fixing bolts 70 and against the discs 71b and nuts 72b, whereupon further discs 71b and nuts 72b are arranged over the base plate 101 and one achieves a situation as shown in Figure 1. By that one do not entirely tighten the nuts 72b one have adjustment opportunities in the horizontal plane of the pole, beam or similar 100. One further have adjustment opportunities in vertical direction by adjusting the nuts 72b at upper part of the fixing bolts 70 for there-through to correct possible misalignment as a consequence of the fundament 80 not being optimally positioned in vertical direction. One further has adjustment opportunities by that the adjustment plate 40 via its recesses 41 is movable in all direction in the horizontal plane. By means of the above mentioned adjustment opportunities achieved is a desired and accurate positioning of the pole, beam or similar 100 by that the assembly provides adjustment both in vertical and horizontal direction. When desired accurate positioning is achieved the nuts 61, 72a-b are tightened such that the positioning becomes final.

Modifications

[0039] The base plate and/or adjustment plate can exhibit other shapes than square, such as rectangular, circular or elliptic.

[0040] The lower elliptic plate can be arranged to the fundament in other ways than by welding, e.g. by that it exhibits a downwards protruding flange extending on the outside of the fundament and that the flange and fundament are provide with one or more through holes for fixing of the elliptic plate with one or more bolts and nuts to the fundament.

[0041] The fundament can exhibit a different shape

than a circular tube, such as a tube with square or rectangular cross-section.

Claims

1. Assembly (20) for adjustable attachment of a pole, beam or similar (100) to a fundament (80) intended to be inserted into the ground, **characterized in that** the assembly (20) includes:

- a lower mainly elliptic plate (30) fixable at the upper end of the fundament (80), which mainly elliptic plate (30) is provided with through holes (32) at ends thereof,
- a mainly square, rectangular or circular adjustment plate (40) provided with longitudinal recesses (41) at two of its opposite sides, and that at least two of its corners are provided with through holes (42),
- an upper mainly elliptic plate (50) provided with through mounting holes (51) at ends thereof, where the two elliptic plates (30, 50) are fixed to each other by means of through fixing bolts (60) extending through the corresponding holes (32, 51), and where the adjustment plate (40) is arranged adjustable in the horizontal plane between the two elliptic plates (30, 50) by that the recesses (41) of the adjustment plate (40) coincide with the through fixing bolts (60) with nuts (61) arranged to the fixing bolts (60) at upper side of the upper elliptic plate (50) and at lower side of the lower elliptic plate (30) being tightened.

2. Assembly according to claim 1, **characterized in that** the lower elliptic plate (30) is provided with a centrally through hole (31).

3. Assembly according to claim 1, **characterized in that** the assembly comprises the base plate (101) of the pole at the lower end of the pole, which base plate (101) exhibits a size and shape corresponding to the adjustment plate (40), which base plate (101) at least at two of its corners exhibits through holes (102) corresponding to the holes (42) of the adjustment plate (40).

4. Assembly according to claim 3, **characterized in that** the through holes (102) are shaped oblong in longitudinal direction of the base plate (101) sides.

5. Assembly according to claim 1, **characterized in that** a base plate (101) is arranged to the adjustment plate (40) by fixing bolts (70), arranged upwards protruding from the adjustment plate (40) by means of nuts (72a) at upper and lower side of the adjustment plate (40), where the base plate (101) is attached

vertically adjustable to the fixing bolts (70) by means of nuts (72b) arranged at both sides of the base plate (101), at upper end of the fixing bolts (70).

Patentansprüche

1. Anordnung (20) für eine einstellbare Anlagerung einer Stange, eines Balkens oder dergleichen (100) an einem Fundament (80), das dazu vorgesehen ist, in den Boden eingesetzt zu werden, **dadurch gekennzeichnet, dass** die Anordnung (20) Folgendes beinhaltet:

- eine untere hauptsächlich elliptische Platte (30), die an dem oberen Ende des Fundaments (80) fixierbar ist, wobei die hauptsächlich elliptische Platte (30) mit Durchgangslöchern (32) an Enden davon versehen ist,
- eine hauptsächlich quadratische, rechteckige oder kreisförmige Einstellplatte (40), die an zwei ihrer gegenüberliegenden Seiten mit Längsausnehmungen (41) versehen ist, und dass wenigstens zwei ihrer Ecken mit Durchgangslöchern (42) versehen sind,
- eine obere hauptsächlich elliptische Platte (50), die mit Durchgangsbefestigungslöchern (51) an Enden davon versehen ist, wobei die zwei elliptischen Platten (30, 50) mittels Durchgangsfixierungsbolzen (60) aneinander fixiert sind, die sich durch die entsprechenden Löcher (32, 51) erstrecken, und wobei die Einstellplatte (40) in der horizontalen Ebene zwischen den zwei elliptischen Platten (30, 50) einstellbar angeordnet ist, indem die Ausnehmungen (41) der Einstellplatte (40) mit den Durchgangsfixierungsbolzen (60) zusammenfallen, wobei Muttern (61) an den Fixierungsbolzen (60) an der oberen Seite der oberen elliptischen Platte (50) und an der unteren Seite der unteren elliptischen Platte (30) festgezogen werden.

2. Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die untere elliptische Platte (30) mit einem zentralen Durchgangsloch (31) versehen ist.
3. Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Anordnung die Grundplatte (101) der Stange an dem unteren Ende der Stange umfasst, wobei die Grundplatte (101) eine Größe und Form vorweist, die der Einstellplatte (40) entspricht, wobei die Grundplatte (101) wenigstens an zwei ihrer Ecken Durchgangslöcher (102) vorweist, die den Löchern (42) der Einstellplatte (40) entsprechen.
4. Anordnung nach Anspruch 3, **dadurch gekennzeichnet, dass** die Durchgangslöcher (102) in Längsrichtung der Seiten der Grundplatte (101)

länglich geformt sind.

5. Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Grundplatte (101) an der Einstellplatte (40) durch Fixierbolzen (70) angeordnet ist, die aufwärts aus der Einstellplatte (40) vorstehend mittels Muttern (72a) an der oberen und der unteren Seite der Einstellplatte (40) angeordnet sind, wobei die Grundplatte (101) vertikal einstellbar an den Fixierungsbolzen (70) mittels Muttern (72b) angeordnet ist, die an beiden Seiten der Grundplatte (101) an dem oberen Ende der Fixierbolzen (70) angelagert ist.

Revendications

1. Ensemble (20) pour la fixation réglable d'un poteau, d'une poutre ou similaire (100) à un plot de fondation (80) destiné à être inséré dans le sol, **caractérisé en ce que** l'ensemble (20) comprend :

- une plaque inférieure principalement elliptique (30) pouvant être fixée à l'extrémité supérieure du plot de fondation (80), laquelle plaque principalement elliptique (30) est pourvue de trous traversants (32) à ses extrémités,
- une plaque de réglage (40) principalement carrée, rectangulaire ou circulaire pourvue d'évidements longitudinaux (41) sur deux de ses côtés opposés, et dont au moins deux de ses coins sont pourvus de trous traversants (42),
- une plaque supérieure principalement elliptique (50) pourvue de trous de montage traversants (51) à ses extrémités, dans lequel les deux plaques elliptiques (30, 50) sont fixées l'une à l'autre au moyen de boulons de fixation traversants (60) s'étendant à travers les trous correspondants (32, 51), et dans lequel la plaque de réglage (40) est disposée de manière réglable dans le plan horizontal entre les deux plaques elliptiques (30, 50) **en ce que** les évidements (41) de la plaque de réglage (40) coïncident avec les boulons de fixation traversants (60) avec des écrous (61) disposés sur les boulons de fixation (60) du côté supérieur de la plaque elliptique supérieure (50) et du côté inférieur de la plaque elliptique inférieure (30) étant serrés.

2. Ensemble selon la revendication 1, **caractérisé en ce que** la plaque elliptique inférieure (30) est pourvue d'un trou traversant central (31).
3. Ensemble selon la revendication 1, **caractérisé en ce que** l'ensemble comprend la plaque de base (101) du poteau à l'extrémité inférieure du poteau, laquelle plaque de base (101) présente une taille et

une forme correspondant à la plaque de réglage (40), laquelle plaque de base (101) présente au moins à deux de ses coins des trous traversants (102) correspondant aux trous (42) de la plaque de réglage (40).

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4. Ensemble selon la revendication 3, **caractérisé en ce que** les trous traversants (102) sont de forme oblongue dans le sens longitudinal des côtés de la plaque de base (101).

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5. Ensemble selon la revendication 1, **caractérisé en ce qu'**une plaque de base (101) est disposée sur la plaque de réglage (40) par des boulons de fixation (70), disposés vers le haut faisant saillie de la plaque de réglage (40) au moyen d'écrous (72a) sur les côtés supérieur et inférieur de la plaque de réglage (40), dans lequel la plaque de base (101) est fixée verticalement de manière réglable aux boulons de fixation (70) au moyen d'écrous (72b) disposés des deux côtés de la plaque de base (101), à l'extrémité supérieure des boulons de fixation (70).

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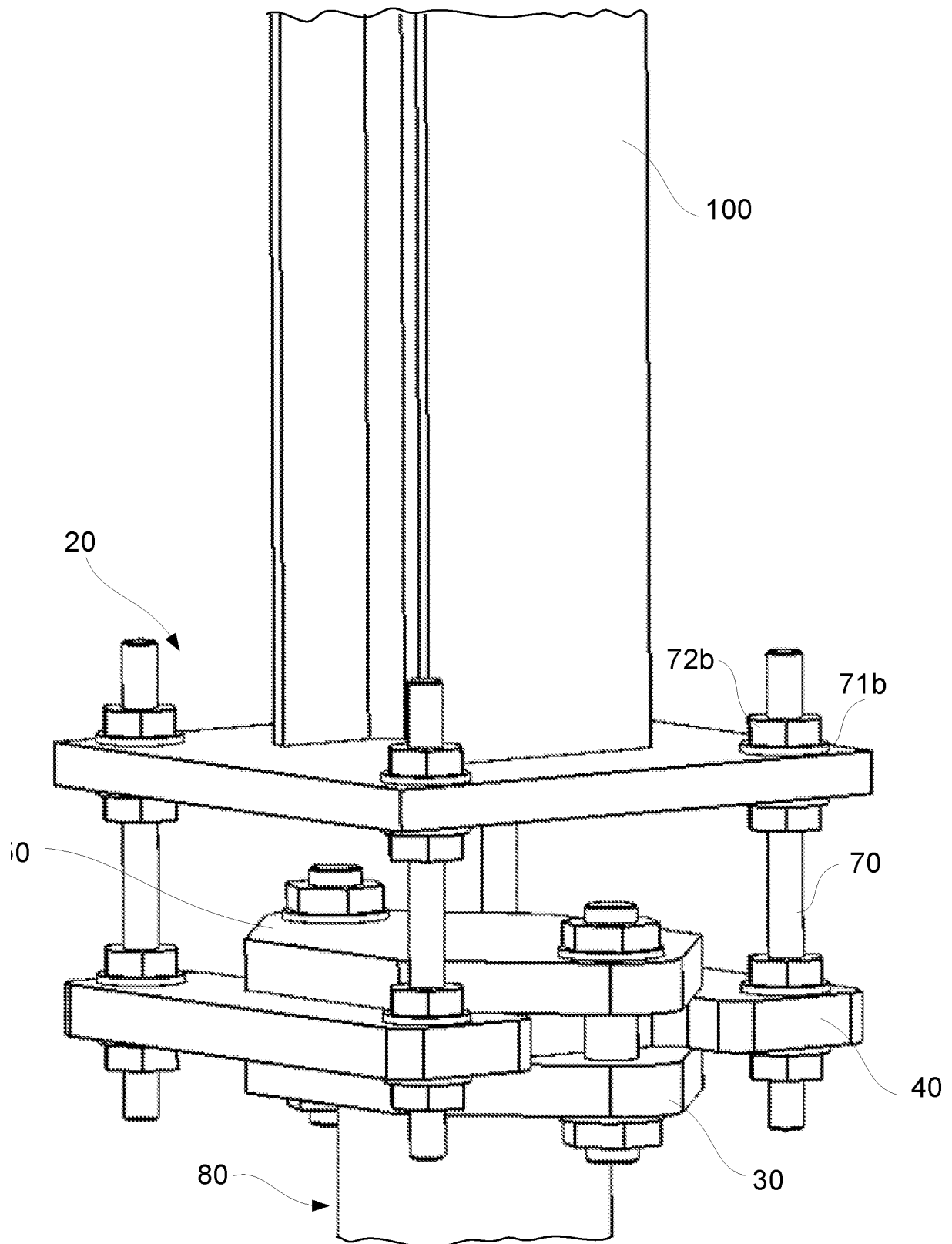


Fig. 1.

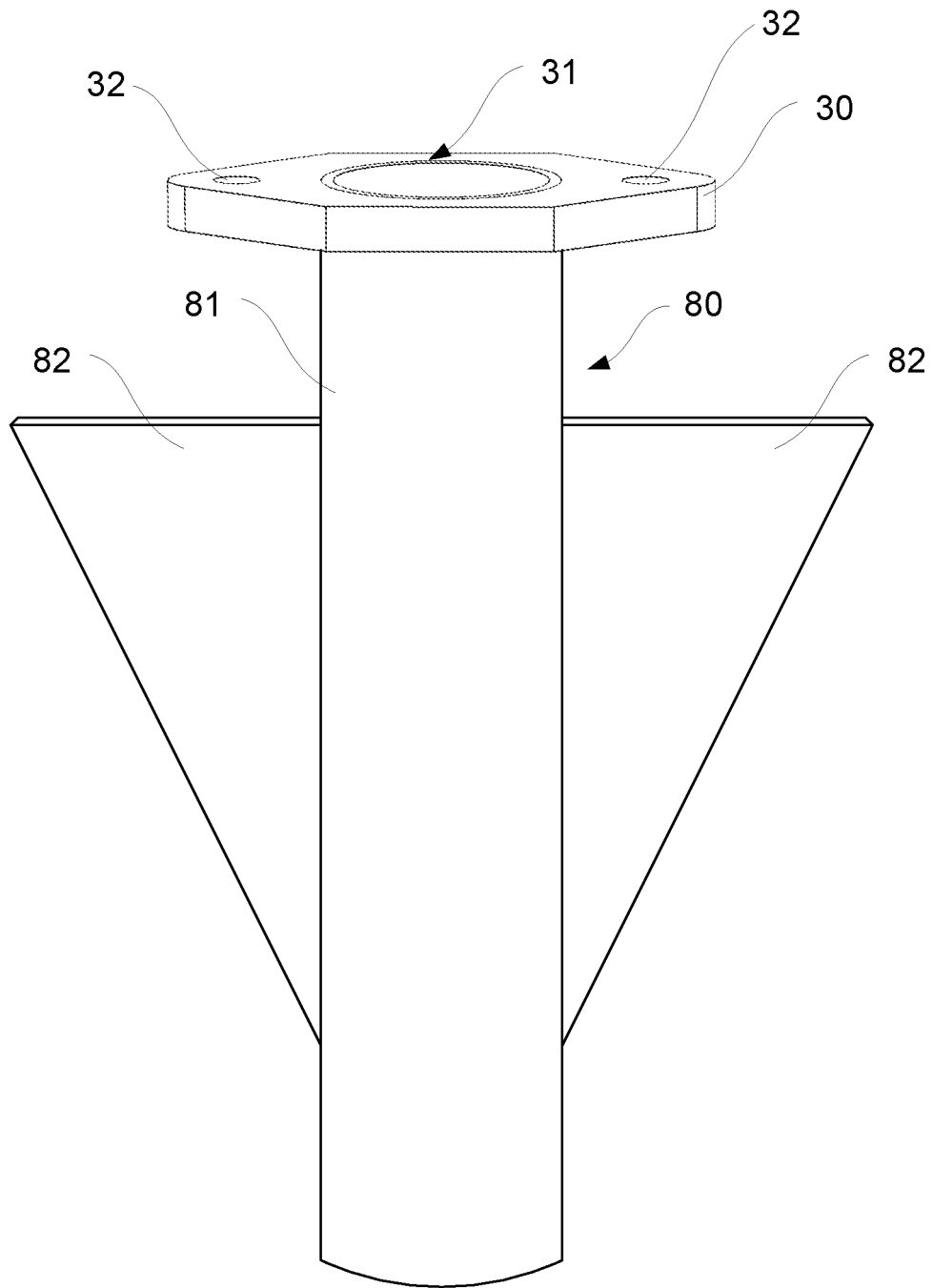


Fig. 2.

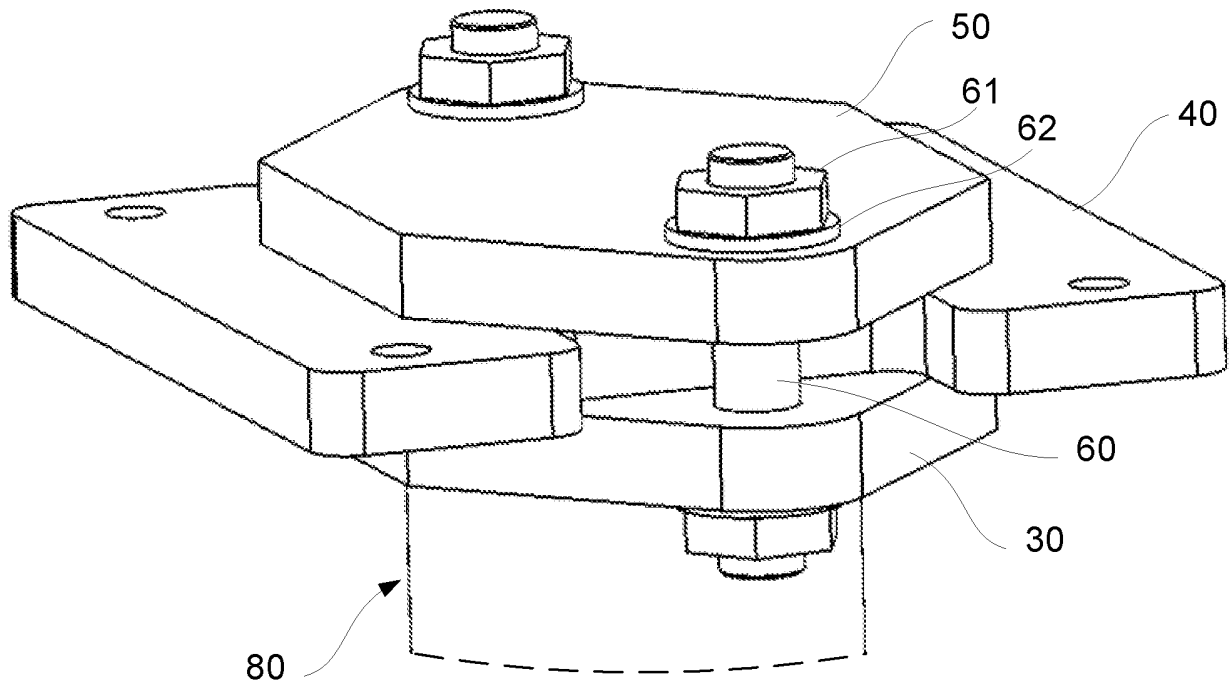


Fig. 3a

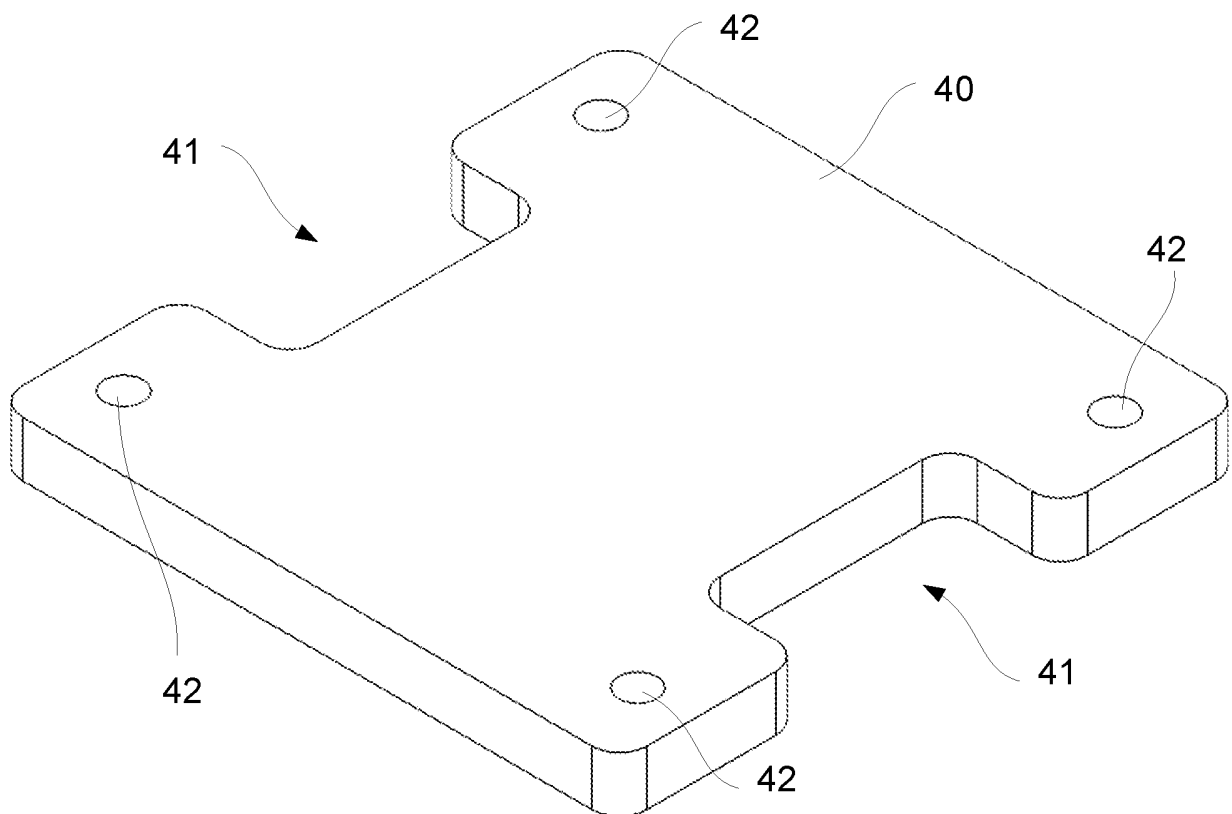


Fig. 3b

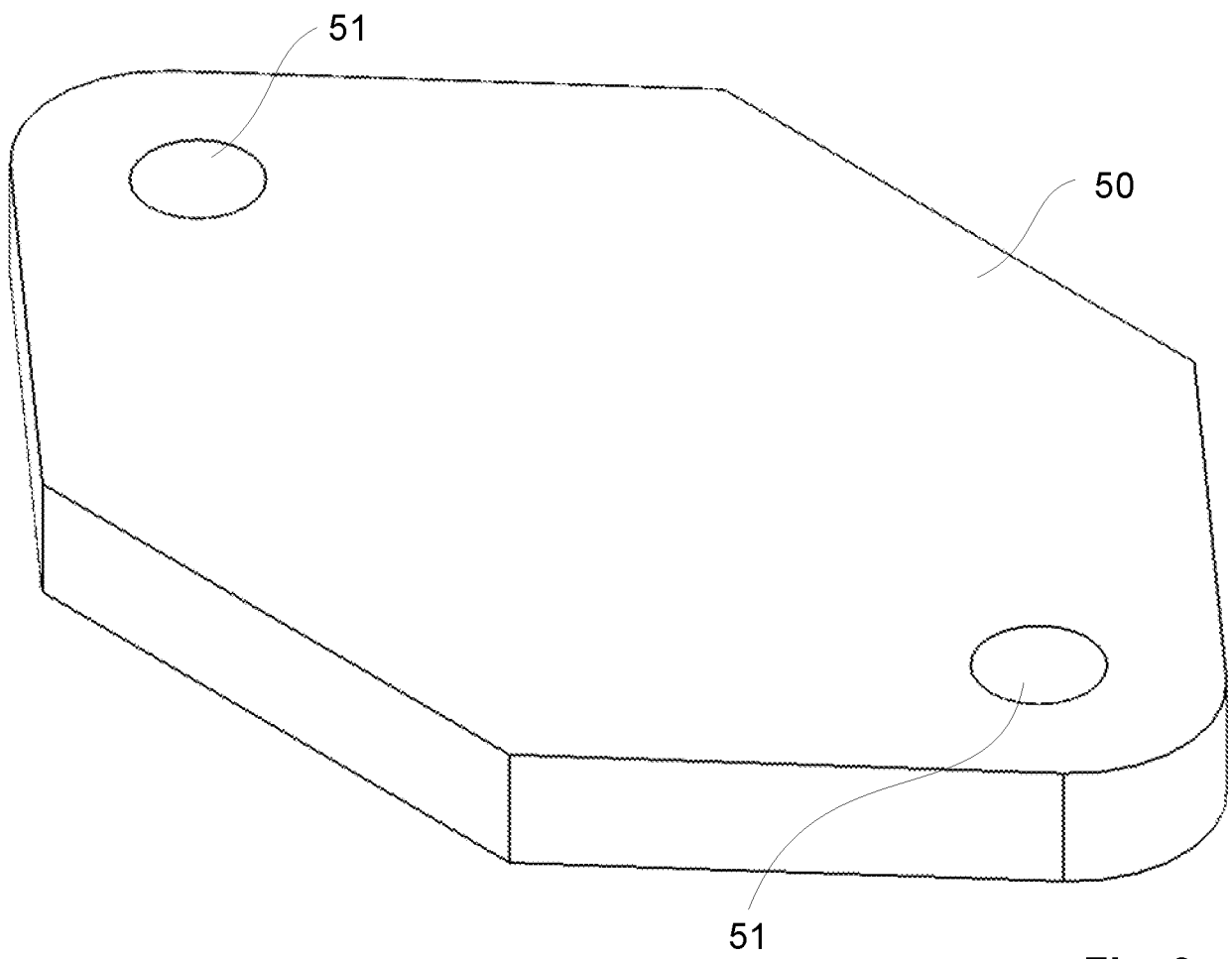


Fig. 3c

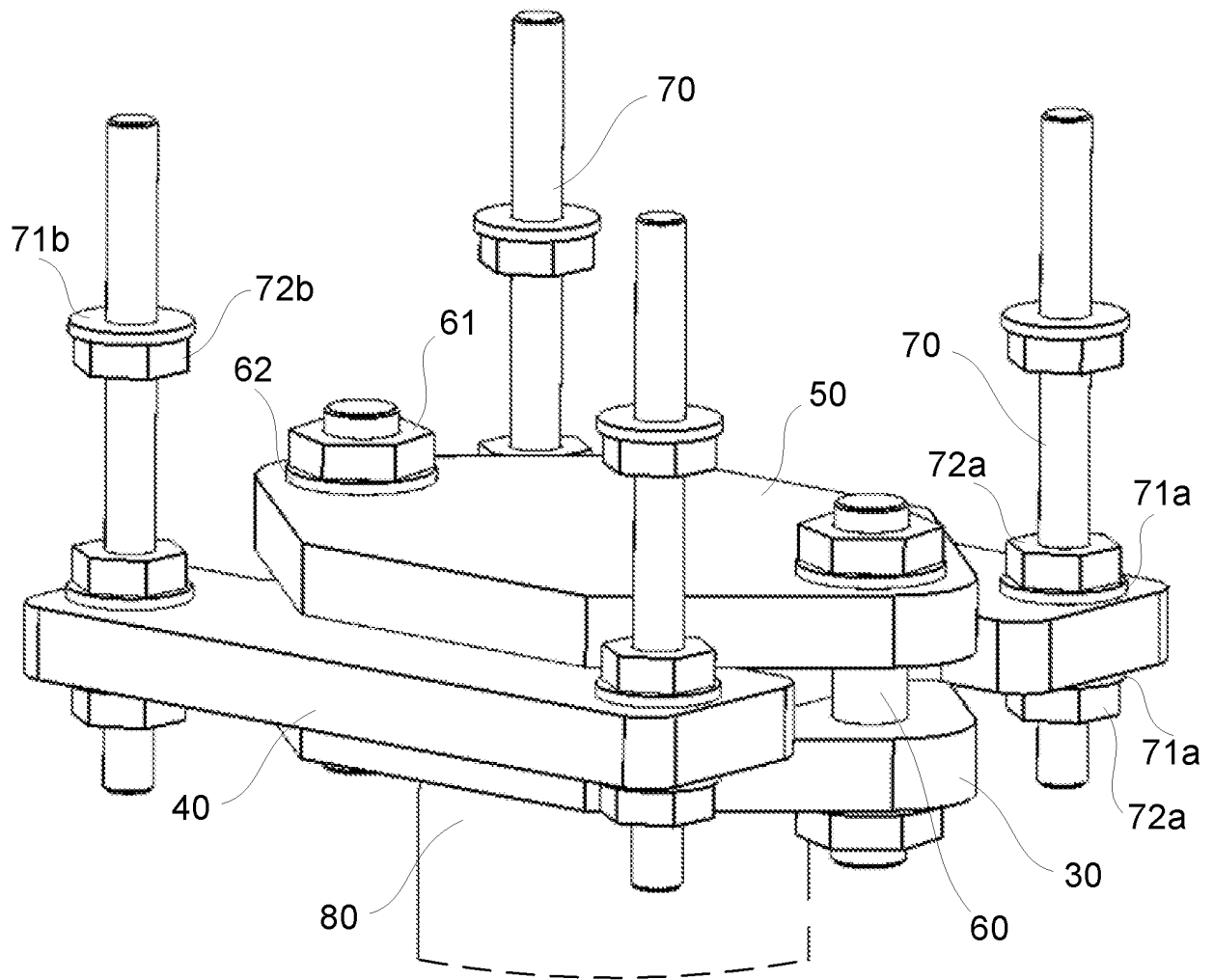


Fig. 3d

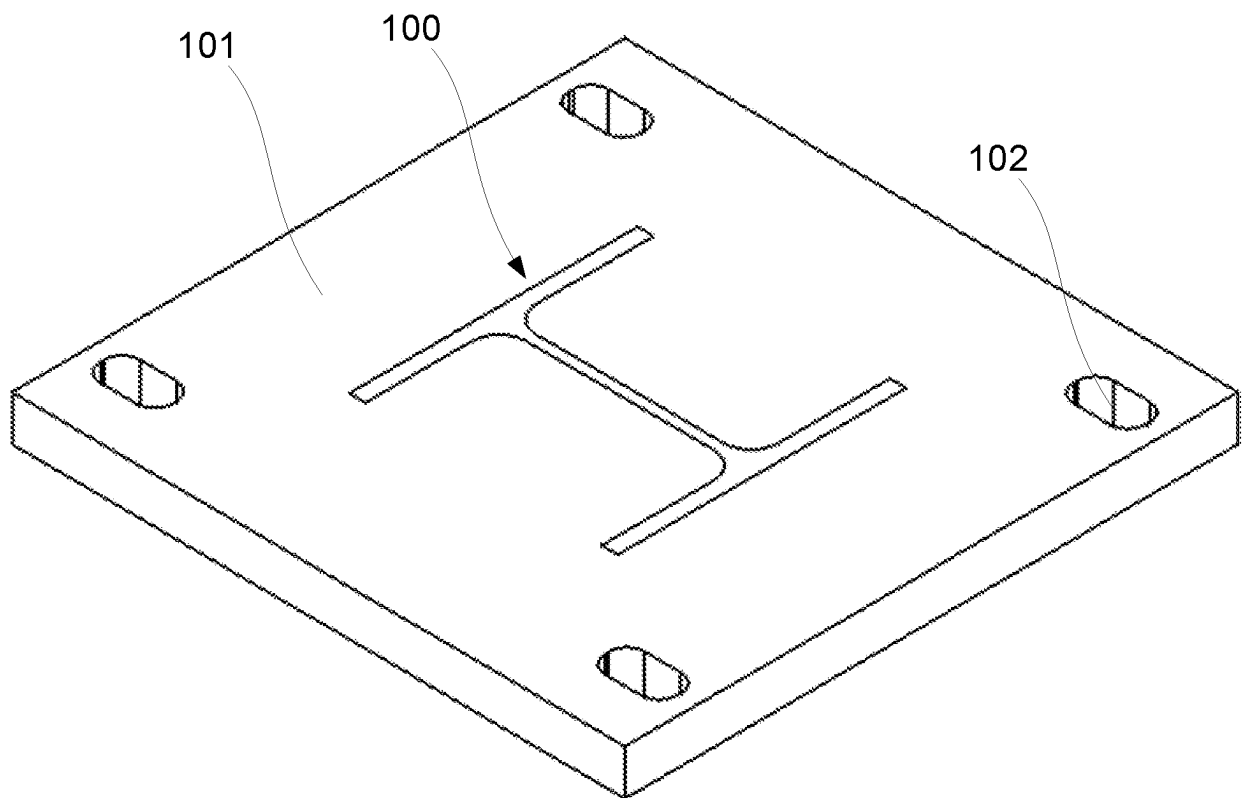


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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