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(54) **Adjustable picture hook**
Verstellbarer Bilderhaken
Crochet ajustable pour tableaux

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Description

[0001] The present patent application refers to an adjustable picture hook that allows for adjusting the distance between the point in which it is fixed to the picture and the position of the nail on the wall.

[0002] Pictures are normally hung to the wall by means of suitable hooks applied on the back of the frame and provided with an upper eyelet where the nail is inserted, after driving it onto the wall.

[0003] In the case of a single hook in the centre of the upper side of the frame, the centre of the upper side must be carefully identified, since even a small mistake in measuring may prevent the picture from assuming the correct position spontaneously, that is say from being perfectly perpendicular with respect to the vertical axis of the nail. Normally, two hooks are used to avoid this problem and provide safe fixing, for example in the case of very large or heavy pictures.

[0004] The use of two hooks, however, is disadvantageous since it requires total accuracy in identifying the two points on the wall where the two nails are to be driven.

[0005] Total accuracy is needed to obtain the perfect horizontal alignment of the two nails and consequently the perfect position of the picture.

[0006] A new model of adjustable picture hook has been devised in order to allow for tolerance margins in the horizontal alignment of the nails, incorporating means used to change the distance between the point where the hook is fixed to the picture and the nail on the wall.

[0007] The hook can be adjusted either manually or with the aid of suitable built-in adjustable means.

[0008] In other words, the adjustable picture hook of the invention allows for set off small mistakes in the horizontal alignment of the two nails driven onto the wall, since the picture can be slightly raised or lowered by adjusting the hook, thus obtaining the perfect perpendicular position of the picture, in spite of the fact that the two nails are not perfectly aligned horizontally.

[0009] The built-in adjustable means are provided immediately above the upper side of the picture frame, in easily accessible position for the user, who can adjust them without removing the picture from the wall.

[0010] The adjustable hook of the invention is composed of two plates matched together with the possibility of sliding vertically, with one plate provided with means for fixing to the picture frame and the other plate provided with holes or slots for fixing to the nail on the wall.

[0011] The hook of the invention also comprises connection and fastening means for the plates, which allow for changing the position in which the plates are mutually held.

[0012] According to the simplest constructive embodiment of a hook not according to the invention, the adjustment is made manually by loosening the fastening means and holding them back in position once the picture has been placed correctly.

[0013] The fastening means consist in a screw with horizontal axis that is inserted and slides in a vertical slot on the plate fixed to the picture frame, while the other plate, that is to say the plate fixed to the wall, is provided with a threaded hole to engage the fastening screw.

[0014] British patent No. 758706 describes an adjustable picture hook comprising an upper plate provided with a slot at the top for attaching said plate to a pin fixed on the wall and a lower plate provided at the bottom with a hook for supporting the picture.

[0015] The lower plate slides with respect to the upper plate and co-operates with said upper plate by means of a fixing screw of known type having horizontal axis which is screwed into a threaded hole of the upper plate and is free to slide into a vertical slot provided on the lower plate.

[0016] In order to adjust said hook it is necessary to release said connection screw, then manually move the lower plate and finally fix said connection screw.

[0017] According to a more sophisticated constructive embodiment of the hook of the invention, the connection means also act as adjustment means.

[0018] In a first constructive embodiment, the connection and adjustment means consist in a pin with eccentric, whose rotation determines the sliding of one plate with respect to the other one.

[0019] More precisely, the pin with eccentric is housed and rotates in a hole suitable located on the plate fixed to the nail on the wall, while the other plate, that is to say the plate fixed to the picture frame, is provided with a slot in which the eccentric of the pin is engaged and slides.

[0020] Being an horizontal slot, the movement of the eccentric in the slot determines the vertical sliding of the plate fixed to the picture with respect to the plate fixed to the wall, thus raising or lowering the picture and modifying its inclination.

[0021] The plates are matched by means of guides that only allow for mutual translation.

[0022] The maximum adjustment travel is of course equal to the distance between the upper dead-end point and the lower dead-end point of the travel from the centre of the eccentric, it being evident that the upper dead-end point corresponds to the maximum height that can be reached by the plate fixed to the picture, and the lower dead-end point corresponds to the minimum height. However, it must be noted that in the two dead-end points the centre of the eccentric is perfectly aligned vertically with the centre of the pin, in such a way that the weight of the picture passes through the

centre of the pin, while in all points of the travel from the centre of the eccentric, the pin is not aligned with respect to the centre of rotation of the pin, with consequent misalignment of the weight that is discharged on the centre of the eccentric.

[0023] This condition generates a torque that tends to draw the eccentric downwards until it reaches the lower dead-end point, thus losing the adjustment that had been previously made.

[0024] In order to solve this inconvenience, the hook of the invention has been provided with means to lock the pin in every position.

[0025] According to an alternative constructive embodiment of the hook not according to the invention, the connection and adjustment means consist in a screw with vertical axis that is inserted and idles in a hole on a support that protrudes on the front of the plate fixed to the nail on the wall, while the other plate is provided with a counter-support with a threaded hole, in which the adjustment screw is engaged, whose rotation determines the vertical translation of the plate fixed to the picture with respect to the plate fixed to the wall.

[0026] For major clarity the description of the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration and not in a limiting sense, whereby:

- Figure 1 is a front view of the hook in which the adjustment means consist in a pin with eccentric;
- Figure 2 is the orthogonal projection of Fig. 1 from the left side;
- Figure 3 is a section of the hook with plane 3-3 of Fig. 1, with a diagrammatic section of the upper side of the picture;
- Figure 4 is a rear view of the hook of Fig. 1;
- Figure 5 is a front view of the plate of the hook of Fig. 1 designed to be fixed to the picture;
- Figure 6 is a front view of the plate of the hook of Fig. 1 designed to be fixed to the nail on the wall;
- Figure 7 is a front view of a second constructive embodiment of the hook not according to the invention, in which the adjustment means consist in a screw;
- Figure 8 is a section of the hook of Fig. 7 with plane VIII-VIII - Fig. 9 shows one of the plates of the hook of Fig. 7, and more precisely the plate fixed to the wall, seen from above;
- Figure 10 shows one of the plates of the hook of Fig. 7, and more precisely the plate fixed to the picture, seen from above;
- Figure 11 is a front view of the hook of the invention according to a third constructive embodiment of the hook, not according to the invention, provided with fastening means for the two sliding plates and not with adjustment means;
- Fig. 12 is a section of the hook of Fig. 11 with plane XII-XII of Fig. 11;
- Figure 13 is a front view of one of the plates of the hook of Fig. 11, and more precisely the plate designed to be fixed to the wall;
- Figure 14 is a front view of one of the plates of the hook of Fig. 11, and more precisely the plate designed to be fixed to the picture;
- Figure 15 shows an alternative constructive embodiment of the hook of Fig. 1;
- Figure 16 shows an alternative constructive embodiment of the hook of Fig. 7;
- Figure 17 shows an alternative constructive embodiment of the hook of Fig. 11;

[0027] As mentioned above, the adjustment of the hook can be carried out in a different way according to different embodiments according to the invention or not, by acting on the sliding plates directly or with the aid of suitable adjustment means that determine the mutual sliding of the plates.

[0028] Figures 1 to 6 shows the version of the hook in which the adjustment means consist in a pin with eccentric;

[0029] In this version, the hook of the invention (G1) is composed of a first mobile plate (1), with lower holes (1a) for fixing to the picture frame, and a second fixed plate (2) that slides with respect to the first plate and is provided with an upper slot (2a) for fixing to the nail on the wall.

[0030] More precisely, the fixed plate (2) is laterally provided with two vertical guides (2b) that are matched with two corresponding vertical guides (1b) on the two sides of the mobile plate (1).

[0031] The two plates (1 and 2) are connected by means of a pin (4) that rotates in inside a hole (2c) in the centre of the fixed plate (2) and ends with an enlarged head (4a) next to an eccentric (4b) housed in a suitable slot (1c) on the mobile plate (1).

[0032] The length of the horizontal slot (1c) is such that the eccentric (4b) can make a vertical travel between the upper dead-end point and the lower dead-end point during the rotation of the pin (4) in the hole (2c).

[0033] The hook (G1) is provided with locking means of the pin (4) in every position, which consist in two elastically flexible jaws (3) on the two guides (2b) provided with an internal tooth (3a) that is engaged in the notches (4c) of the saw-toothed edge of the head (4a) of the pin (4).

[0034] Finally, it must be noted that the mobile plate (1) has a transversal connection step (5) between the lower half-wing with holes (1a) and the upper half-wing with the slot (1c) that houses the eccentric (4b).

[0035] The dimensions of the step (5) are such that the lower half-wing is coplanar to the fixed plate (2), as shown in

Fig. 2.

[0036] In order to facilitate the rotation of the pin (4) during adjustment, the head (4a) of the pin (4) has a crossed configuration (4d) for the screwdriver.

[0037] Figures 7 to 10 show a second constructive version of the adjustable picture hook, not according to the invention, defined as (G2), which is composed of two sliding plates (10 and 20), whose travels are guided by pairs of lateral guides (10b and 20b).

[0038] In this version (G2) the sliding of the plates (10 and 20) is determined by means of suitable adjustment means that consist in a screw (40) with vertical axis that is inserted and idles inside a housing (20c) on a support (20d) that protrudes on the front of the fixed plate (20) designed to be fixed to the nail on the wall, while the mobile plate (10) is provided with a counter-support (10d) with a threaded hole (10c), in which the threaded section of the adjustment screw (40) is engaged in helical way.

[0039] It must be noted that, also in this version (G2), the mobile plate (10) has a transversal connection step (50) between the lower half-wing (that is to say the one fixed to the back of the picture frame) and the upper half-wing from which the counter-tooth (10d) internally protrudes.

[0040] The dimensions of the step (50) are such that the lower half-wing is coplanar to the fixed plate (20), as shown in Fig. 8.

[0041] Also in this alternative version, the adjustment screw (40) can be accessed by the user without removing the picture from the wall.

[0042] As shown in Fig. 8, the head (40a) of the screw (40) can be accessed from above, over the support (20d) that is located in higher position on the transversal side of the frame, fixed under the step (50).

[0043] Figures 11 to 14 show a third constructive embodiment of the adjustable picture hook, not according to the invention, provided with fastening means for the pair of sliding plates and not with adjustment means.

[0044] The hook (G3) of this version is composed of two sliding plates (100 and 200), whose travels are guided by pairs of lateral guides (100b and 200b).

[0045] In this version the plates (100 and 200) are connected by a fastening screw (400) with horizontal axis that is inserted and slides in a vertical slot (100c) on the plate (100) fixed to the picture frame, while the other plate (200), that is to say the plate fixed to the nail on the wall, is provided with a threaded hole (200c) where the fastening screw (400) is engaged.

[0046] It appears evident that the plates (100 and 200) are held in place once the picture has been placed in the correct position, by fastening the screw (400) with a screwdriver according to the configuration (400d) of the head (400a) engaged against the external side of the mobile plate (100).

[0047] It must be noted that, also in this constructive version, the mobile plate (100) has a transversal connection step (500) between the lower half-wing (that is to say the one fixed to the back of the picture frame) and the upper half-wing with slot (200c).

[0048] The dimensions of the step (500) are such that the lower half-wing is coplanar to the fixed plate (200), as shown in Fig. 12.

[0049] Also in this alternative version, the adjustment screw (400) can be accessed by the user without removing the picture from the wall.

[0050] As shown in Fig. 12, the head (400a) of the fastening screw (400) can be accessed frontally, immediately above the step (500).

[0051] Figures 15, 16 and 17 show the hooks (G1, G2 and G3) provided with a hook (1d, 10d, 100d) to support the picture, replacing the holes (1a, 10a or 100a).

Claims

1. Adjustable picture hook comprising:

- a fixed plate (2) provided with at least one upper slot (2a) for fixing to supporting means on the wall, with the fixed plate being provided with guide elements (2b);
- a mobile plate (1a) that slides with respect to the fixed plate (2) provided with lower means (1a or 1d) for fixing to the picture, with the mobile plate (1) being provided with guide elements (1b) capable of co-operating with the corresponding guide elements (2b) of the fixed plate (2);
- connection means (4) between the pair of sliding plates, the connection means also acting as adjustment means for the travel of the mobile plate (1) **characterised in that** the connection means consist in a pin (4) that rotates inside a hole (2c) in the centre of the fixed plate (2) and ends with an enlarged head (4a) next to an eccentric (4b) housed in a suitable horizontal slot (1c) on the mobile plate (1), whose height is such that the eccentric (4b) can make a vertical travel between the upper dead-end point and the lower dead-end point during

the rotation of the pin (4) in the hole (2c).

2. Adjustable picture hook as defined in claim 1, **characterised in that** the guide elements consist in parallel vertical guides (1b and 2b) on the two vertical sides of the mobile plate (1) and the fixed plate (2), respectively.
3. Adjustable picture hook as defined in claim 1 and 2, **characterised in that** it is provided with locking means of the pin (4) in every position, which consist in two elastically flexible jaws (3) on the two lateral guides (2b) provided with an internal tooth (3a) that is engaged in the notches (4c) of the saw-toothed edge of the head (4a) of the pin (4).
4. Adjustable picture hook as defined in claims 1 to 3 **characterised in that** the means used to fix the mobile plate (1) to the picture consist in one or more holes (1a) on the lower half-wing of the mobile plate (1).
5. Adjustable picture hook as defined in claims 1 to 3 **characterised in that** the means used to fix the mobile plate (1) to the picture consist in a hook (1d),
6. Adjustable picture hook as defined in the preceding claims **characterised in that** the mobile plate (1) is provided with a transversal connection step (5) between the lower half-wing and the upper half-wing, with such dimensions that the lower half-wing is coplanar to the fixed plate (2).

Patentansprüche

1. Einstellbarer Bilderhaken, bestehend aus:

- einer festen Platte (2), welche oben mindestens einen Schlitz (2a) zum Einhängen an die Halterungsmittel an der Wand aufweist, wobei die feste Platte mit Führungselementen (2b) ausgestattet ist;
- einer beweglichen Platte (1a), welche gleitbar bezogen auf die feste Platte (2) verschoben werden kann und unten Mittel (1a oder 1d) zum Aufhängen am Bild aufweist, wobei die bewegliche Platte (1) mit Führungselementen (1 b) ausgestattet ist, die dazu dienen, mit den entsprechenden Mitteln (2b) der festen Platte (2) zusammenzuarbeiten;
- Mitteln zur Verbindung (4) zwischen dem Paar beweglicher Platten, wobei diese Verbindungsmittel auch als Mittel zur Einstellung des Laufes der beweglichen Platte (1) dienen und **dadurch gekennzeichnet sind, dass** sie aus einem Stift (4) bestehen, welcher sich in einem in der Mitte der festen Platte (2) vorgesehenen Loch (2c) dreht und in einem vergrößerten Kopf (4a) endet, neben dem ein Exzenter (4b) herausgearbeitet ist, welcher in einem entsprechenden Schlitz (1c) auf der beweglichen Platte (1) sitzt, sich in horizontale Richtung erstreckt und so lang ist, dass der Exzenter (4b) sich während der Drehung des entsprechenden Stiftes (4) im Loch (2c) vertikal zwischen einem oberen Totpunkt und einem unteren Totpunkt bewegen kann.

2. Einstellbarer Haken gemäß Anspruch 1, **dadurch gekennzeichnet, dass** er Führungselemente aus vertikalen, parallelen Führungen (1b und 2b) vorsieht, welche jeweils auf den beiden vertikalen Seiten der beweglichen Platte (1) und der festen Platte (2) herausgearbeitet sind.
3. Einstellbarer Haken gemäß den Ansprüchen 1 und 2, **dadurch gekennzeichnet, dass** er Mittel zur Blockierung des Stiftes (4) in jeder seiner Arretierpositionen umfasst, welche aus zwei elastisch flexiblen Backen (3) bestehen, welche auf den beiden seitlichen Führungen (2b) herausgearbeitet sind und beide einen internen Zahn (3a) aufweisen, welcher in die Einkerbungen (4c) der gezahnten Kante des Kopfes (4a) des Stiftes (4) einrastet.
4. Einstellbarer Haken gemäß einem der Ansprüche von 1 bis 3, **dadurch gekennzeichnet, dass** die Mittel zum Einhängen der beweglichen Platte (1) am Bild aus einem oder mehreren Löchern (1a) bestehen, welche auf dem unteren Halbflügel der beweglichen Platte (1) herausgearbeitet sind.
5. Einstellbarer Haken gemäß einem der Ansprüche von 1 bis 3, **dadurch gekennzeichnet, dass** die Mittel zum Einhängen der beweglichen Platte (1) am Bild aus einem Häkchen (1d) bestehen.
6. Einstellbarer Haken gemäß den vorstehenden Ansprüchen **dadurch gekennzeichnet, dass** die bewegliche Platte (1) zwischen ihrem unteren Halbflügel und ihrem oberen Halbflügel eine Verbindungsquerstufe(5) aufweist, die so bemessen ist, dass der untere Halbflügel sich koplanar zur festen Platte (2) befindet.

Revendications

1. Crochet réglable pour tableaux comprenant ;

- une plaque fixe (2) ayant sur sa partie supérieure au moins une fente (2a) pour son accrochage à des moyens de support mural, la dite plaque fixe étant équipée d'éléments de coulissement (2b) ;
- une plaque mobile (1a) coulissante par rapport à la plaque fixe (2) et ayant sur sa partie inférieure des moyens (1a ou 1d) pour son accrochage au tableau, la dite plaque mobile (1) étant équipée d'éléments de coulissement (1 b) aptes à coopérer avec ceux correspondants (2b) de la plaque mobile (2) ;
- des moyens d'union (4) entre dite paire de plaques coulissantes, les dits moyens d'union fonctionnant également en tant que moyen de registre de la course de la plaque mobile (1), **caractérisés en ce que** les dits moyens d'union consistent en un pivot (4), qui tourne à l'intérieur d'un trou (2c) prévu au centre de la plaque fixe (2) et terminant par une tête grossie (4a) à côté de laquelle un excentrique (4b) est réalisé, étant le dit excentrique logé dans une fente (1c) prévue à cet effet sur la plaque mobile (1), et se développant en horizontale en présentant une longueur telle à consentir à l'excentrique (4b) d'accomplir une course verticale entre un point mort supérieur et un point mort inférieur pendant la rotation du relatif pivot (4) dans le trou (2c).

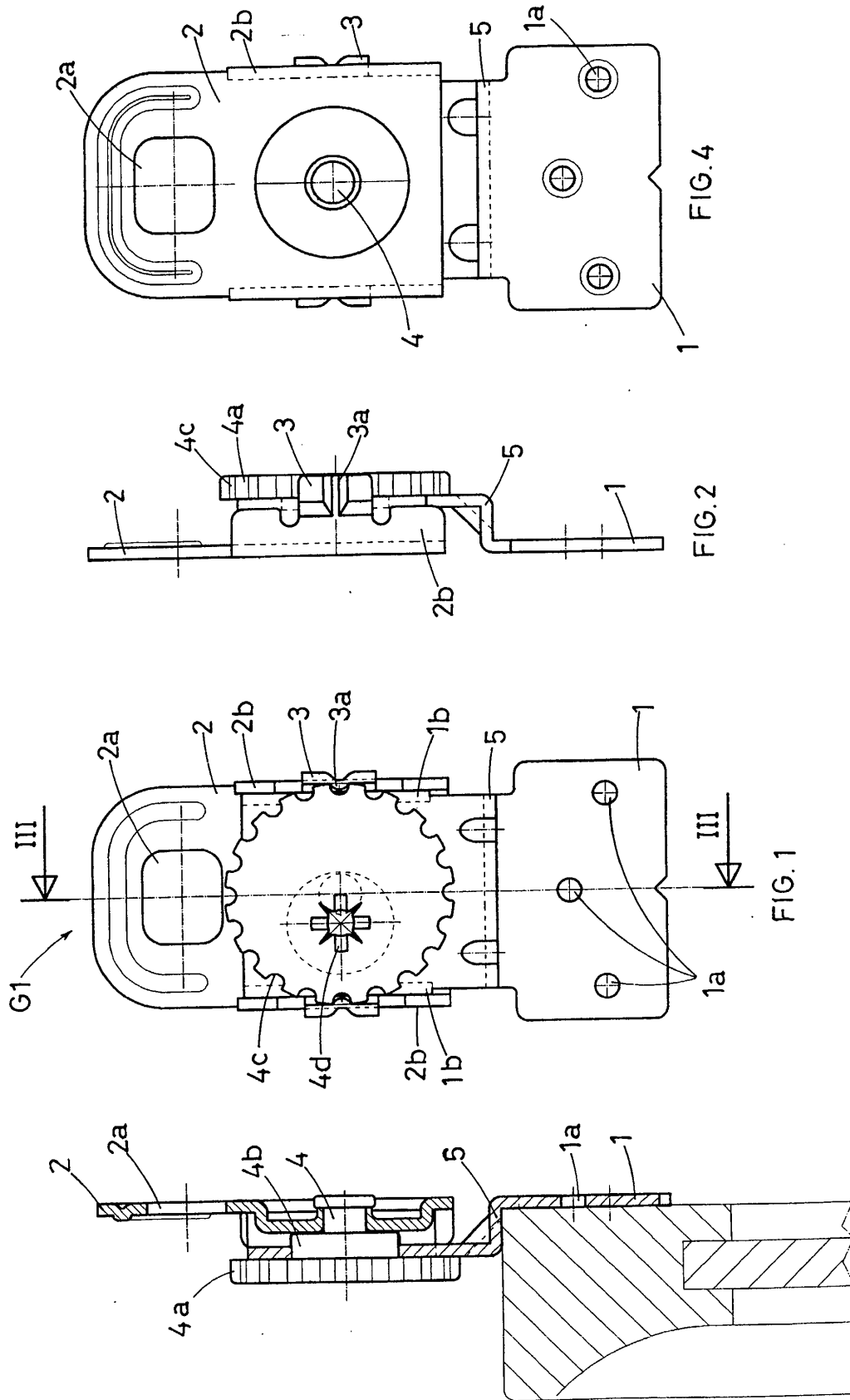
2. Crochet réglable pour tableaux selon la revendication 1, **caractérisé en ce que** les dits éléments de coulissement consistent en des guides parallèles verticales (1 b et 2b) respectivement réalisées sur les deux côtés verticaux de la plaque mobile (1) et de la plaque fixe (2).

3. Crochet réglable pour tableaux selon les revendications 1 et 2, **caractérisé en ce qu'il** prévoit des moyens de blocage du pivot (4) sur toutes ses positions d'arrêt, ces moyens consistant en deux mâchoires flexibles de manière élastique (3) prévues sur les deux coulisses latérales (2b), les mâchoires ayant les deux une dent interne (3a) qui s'enfile dans les entailles (4c) du bord dentelé de la tête (4a) du pivot (4).

4. Crochet réglable pour tableaux selon l'une des revendications de 1 à 3, **caractérisé en ce que** les dits moyens pour l'accrochage de la plaque mobile (1) au tableau sont soit un, soit plusieurs trous (1a) réalisés sur la demi-aile inférieure de la plaque mobile (1).

5. Crochet réglable pour tableaux selon l'une des revendications de 1 à 3, **caractérisé en ce que** les dits moyens pour l'accrochage de la plaque mobile (1) au tableau consistent en un crampon (1d).

6. Crochet réglable pour tableaux selon l'une des revendications précédentes, **caractérisé en ce que** la plaque mobile (1) présente, entre sa demi-aile inférieure et sa demi-aile supérieure, un rebord transversal de raccord (5) dont les dimensions sont telles que la dite demi-aile inférieure résulte coplanaire avec la plaque fixe (2).



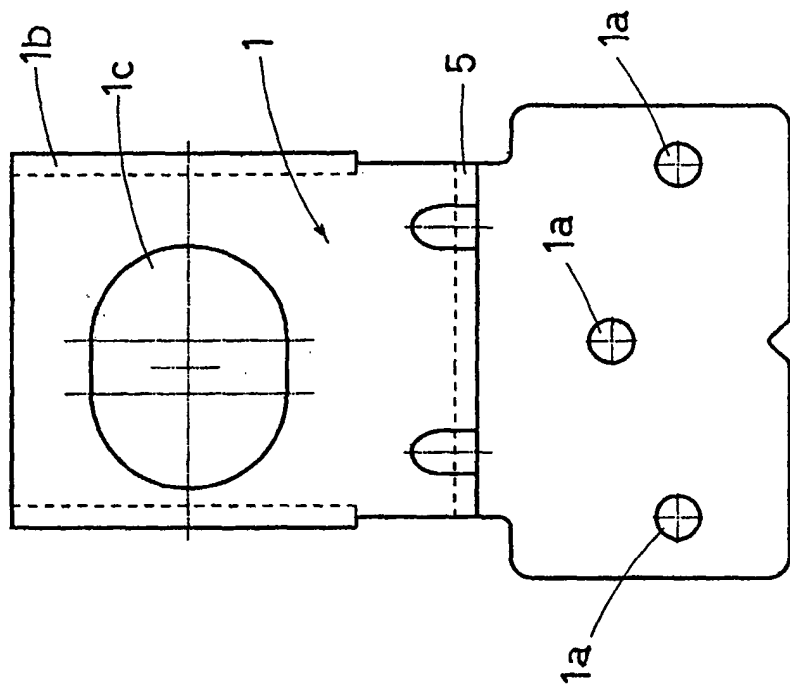


FIG. 5

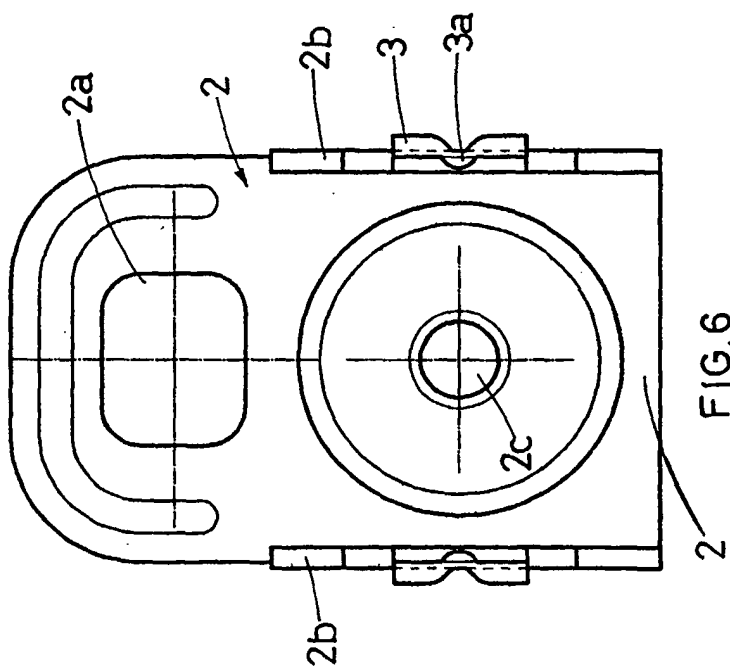
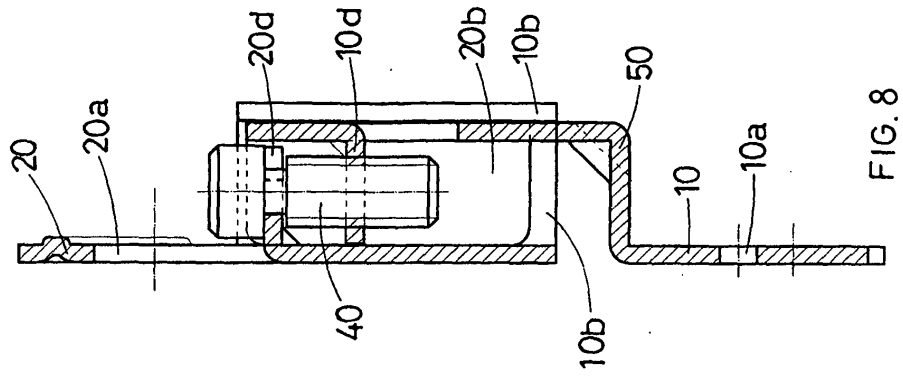
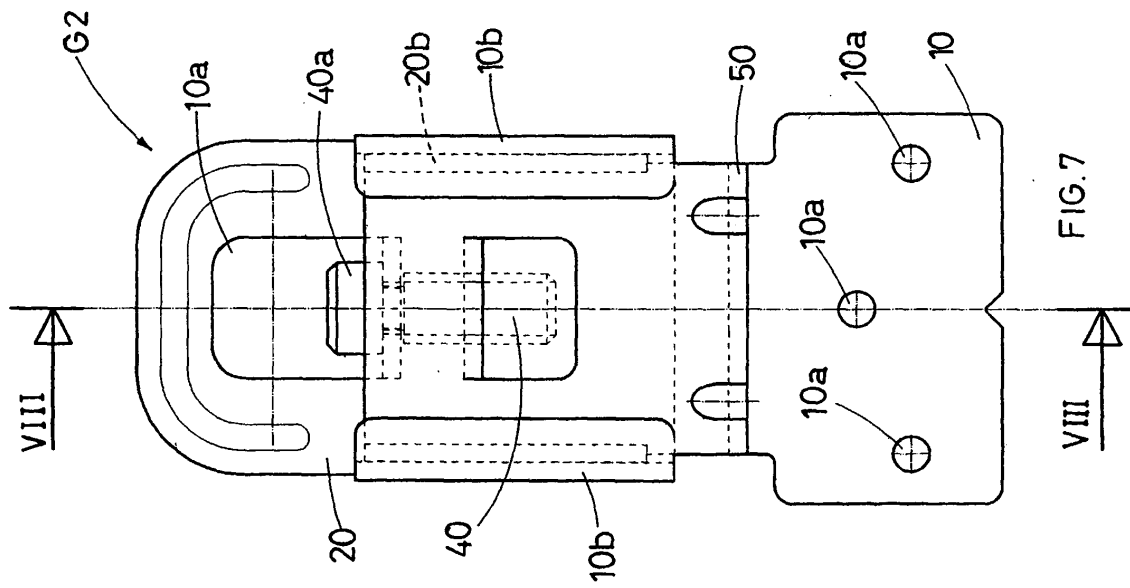


FIG. 6



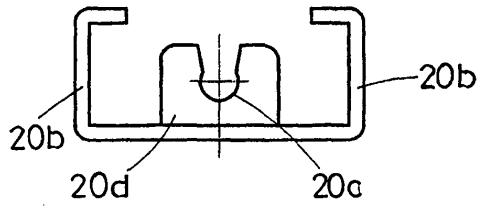


FIG. 9

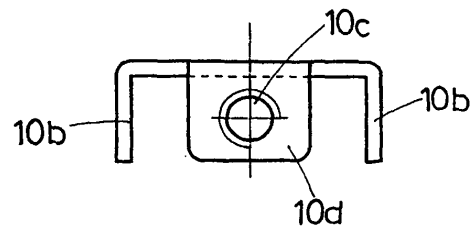


FIG. 10

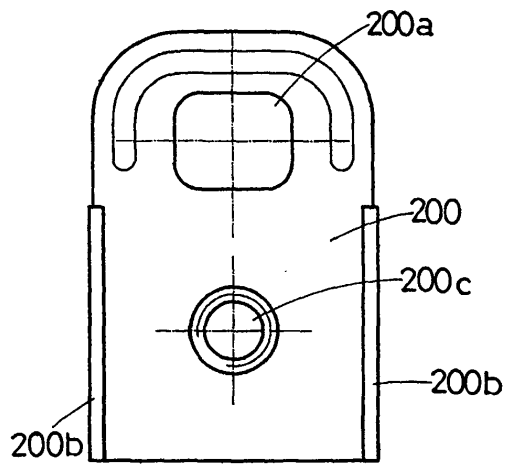


FIG. 13

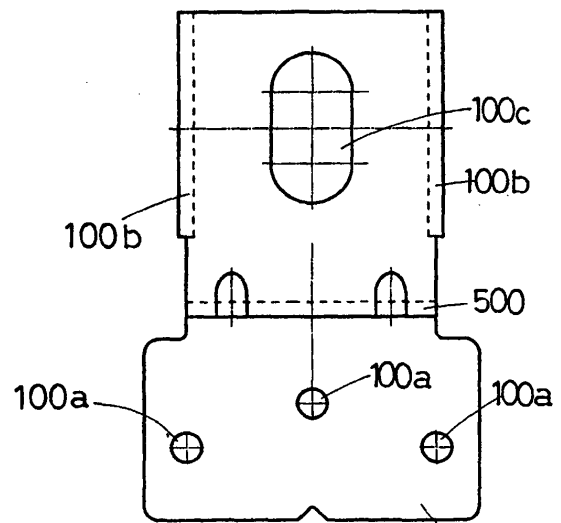


FIG. 14

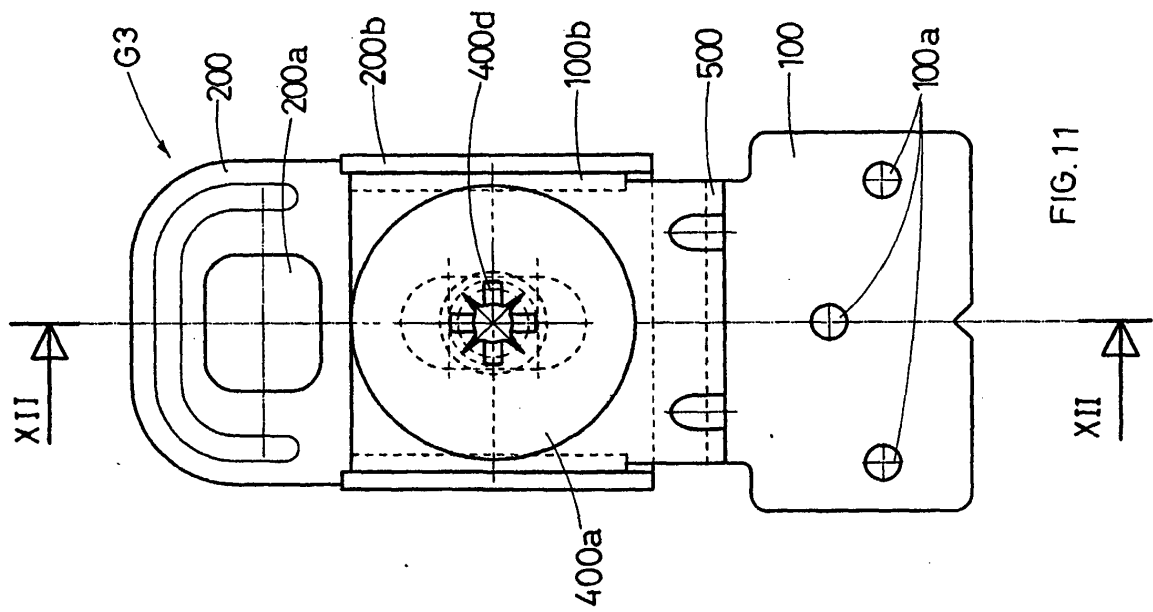


FIG. 11

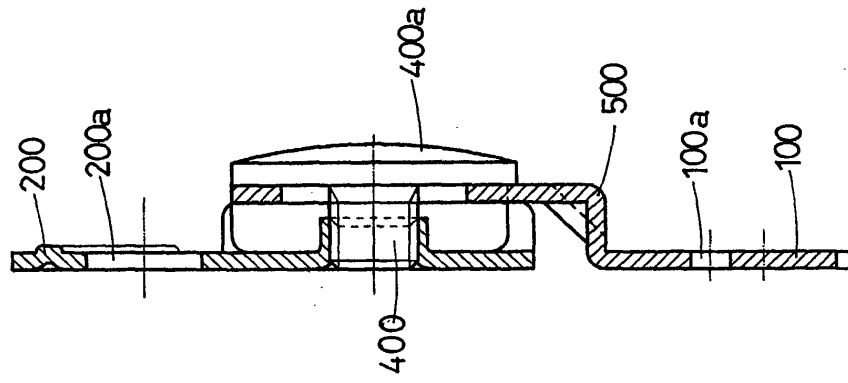


FIG. 12

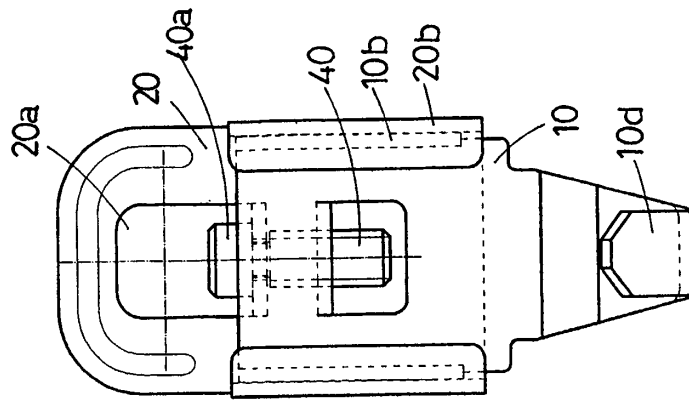


FIG. 16

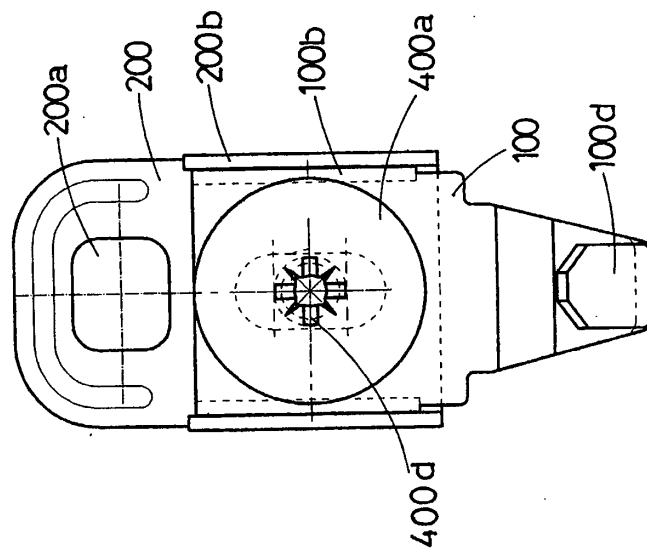


FIG. 17

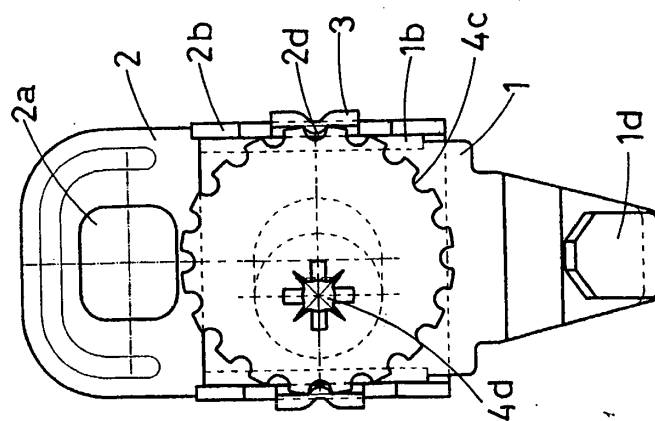


FIG. 15