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Description

This invention concerns vehicle jacks of the type having two support members pivoted together, with a foot on one support member and a load engaging socket on the other, and a device to pivot the support members in relation to each other so that the foot and the load engaging socket move towards or away from each other, whereby a vehicle can be raised or lowered.

There are several jacks of this kind nowadays, often referred to as "Y" jacks because of the relative position of the two members. Examples of this type are shown in British Patent 1450369 and British Patent application 2176458 among others.

The jack of this patent is of the type which include two support members pivoted together, with a foot on one support member and a vehicle engaging socket on the other support member, and a device for pivoting the support members so that the foot and the vehicle engaging socket move towards or away from each others.

Within this field of application, the following patents are known:

A "Y" jack is known from British Patent 2134075 GERDES, with a first arm connected to a base plate, a second arm that pivots on the first and a threaded spindle. The base plate has two lugs projecting upwards at right angle, which have holes in them, as have the wings of the "U" profile of the first arm, so as to position a kind of pin between them.

The lower end of the first arm has two bevels which rest, in the two jack positions, on the foot surfaces,defining at least one position of the foot in relation to the arm.

As will shown later with regard to British Patent 607555 HART, the fact that a foot and an arm are pivoting, as well as the existence of foot lugs, are known details, and we therefore point out that the solution of British Patent 2134075 - GERDES shows a pivoting foot Which is not freely pivoting and refers to the stop that the arm makes with the foot. This stop is really imperfect because in all certainly, the frictions caused by this support when loaded will make the arm and foot surfaces unusable once that a few operations have been carried out. Moreover, it is also pointed out that direct contact is made between the front end of the arm and the foot itself.

The above-mentioned British Patent 607555 HART shows a foot (7) which pivots on an arm (5) by means of some lugs of the said foot (7), at a right angle from the base of the foot, and a shaft (23) equipped with pins, which are shown but not numbered.

In this jack, the arm (5) is engaged in the position shown to points in a mechanism composed of parts (27)-(20)-(22)-(25)... etc., and the engaging is carried out by inserting the projections of the shaft (23) in the hole (24) of the said mechanism.

It must be pointed out that the foot (7) and the arm (5) are not freely pivoting since it may be thought that the shaft (23) is perfectly secured between the said arm and foot and naturally has to bear the effects of the load when the jack is in use, which limits its working life.

On the other hand, we also wish to point out that this jack is limited in its folding, which is not total, and that the foot interconnection mechanism in the folded position is very complicated and is carried out on the shaft (23).

Patent EP 0 232 836 STORZ shows a jack with a foot (18) assembled by means of a series of rivets (22) onto the arm (12), obviously without free rotation between both as the help of a spring (30) is needed. The stop between the arm (12) and the foot (18) is carried out through the lower edge of the arm (12) and on the floor plate (18)-(20).

As opposed to these techniques, this patent introduces several innovatory factors.

A.1.- A jack foot support with a raised hook or coupling which connects with the vehicle bodywork support when the jack is folded to prevent noises in this position.

A.2.- Projections from the foot support itself which are housed in holes in the first arm so as to allow the said foot support and arm to rotate completely freely, without being subject to the effects of the load when the jack is in use.

A.3.- A method of coupling the foot support of the first arm to the other arm.

A.4.- A particular arrangement of the foot support to carry out the coupling with the second arm.

In accordance with the first factor, the jack includes two basic members, which turn around a point, and these two members are of a "U" cross section, for instance.

Connecting both members, there is an end crank handle, with the spindle having a screw connection with a bushing arranged on one of the jack members, specifically to the nearest one to the position of the crank handle.

The bushing in question is also connected to another similar bushing arranged in the other member, which spindle passes through and juts out at the opposite end.

The two ends of the spindle, connected with both bushings, are threaded and have threads cut in opposite directions, so that when the spindle is turned by the action of the crank handle, both bushing move.

The opposite end of the spindle to the crank handle can have a stop fitted to its free end in

order to prevent the bushing on this side, when turning in one direction, from becoming unscrewed from the spindle.

At the upper end of the member that includes the bushing nearer to the spindle stop, there is a support part, preferably made of hard plastic material, which makes contact with the bottom part of the vehicle when the jack is used.

The lower end or leg of the other support member is mounted on a foot support which turns freely and is made up of a channel-shaped body with a stop built into it. When wishing to use the jack, the foot support and the leg turn freely and mutually until an upwardly projecting edge of the foot support touches the leg. With this, the exact position of the jack beneath the vehicle is assured. The stop in question can be conveniently formed with a projecting portion of the "U" shaped channel section that makes up the foot support.

On the other hand, the foot support is also equipped with a hook or coupling formed by a projecting portion of the said foot support, which, when the jack is in its folded position, is prepared to couple with the part that makes contact with the bottom part of the vehicle, thus preventing the jack parts from making noise or rattling.

To store the jack, the part that makes contact with the vehicle is lowered as much as possible and then the foot support of the other member is turned, so that the hook is inserted into the support part that makes contact with the vehicle. Next, the jack crank handle is turned and consequently the spindle, so that a tirght fit is obtained between the hook and the support part in question.

The connection between the foot support and the member of the jack on which the aside foot is fitted, is one of free rotation, as has been made clear earlier. However, this free turning can be achieved by providing the lower part of the support member with a series of holes made on opposite sides of its section, and positioning the foot support on the end of the said member, while at the same time making some facing projections on the sides of the foot support which pass through the said holes, forming a rotating connection. If necessary, holes could be made in the foot support at the points which have to be holed, to make the process easier. The ends of this support member are provided with rounded supporter surfaces, which connect the foot support and transfer the load.

The foor support has a "U" section according to a medium vertical plane of its wings, and the bottom is also in an inverted "U" shape with its raised base and with the ends of the little wings of this bottom connected with the foot support wings to produce spaces in which the rounded ends of the first support member or first arm are received.

The spaces mentioned are the ones that rest directly on the ground and the raised base is that which has its longitudinal ends occupied by the stop towards one side and by the hook towards the other side.

The stop has a raised surface, which connects with one side of the first arm, precisely with the outer bottom of the "U" that makes up the first arm and at a certain distance from its lower end, which is rounded. This rounded end is what rests on the inner sides of the foot support.

As a variant of the patent, and related with the foot support, the hook for connection with the second arm is eliminated, and a gap is made in the middle area of the raised base of the said foot support to house a pressure-fitted plastic or rubber part, which protrudes upwards and downwards from the base.

The portion that protrudes downwards is bulged and outwardly convex so that it makes contact with the ground and acts as a non-slip device for the foot support itself.

The upwardly protruding portion has a central recess and two raised sides, to receive the support part for the vehicle bodywork, as will be explained more fully later.

The raised area of the foot support that houses the plastic or rubber part is also equipped with the stop for the leg. However, as already mentioned, there is no opposing hook on the other end, as it has been eliminated and its function is performed by the folding and support part of the patent. On folding the jack to place it inside the vehicle, for example inside the spare wheel, the foot support assembly is turned until the upper face of the folding and support part takes in the vehicle support part. In the first place, the support member that includes the foot support is lowered, to then turn the said foot support so that the folding and support part takes in the support part of the other support member. Once in this position, the jack crank handle is turned in order to achieve the appropriate tightness between the said folding and support part and the vehicle bodywork support.

With this, contact is made by one of the edges of the support part inside the upper central section of the folding and support part. The edge does not occupy all the length of the said central section, but leaves a certain amount of play so that all the said edge rests on the central section and one of the raised sides.

As the folding and support part is flexible, the contact is very secure and also totally free from causing any kind of noise.

All these and other details of the patent will be clarified with reference to the attached sheets of drawings, in which the following are shown:

- Figure 1 is one version of a "Y" jack which is included in this specification for comparative purposes.
- Figure 2 shows an elevation of the jack covered by the patent.
- Figure 3 shows a partial elevation of the patent, when the ends of the two support members are gathered in.
- Figure 4 refers to the view provided by the cross-section II shown in figure 2.
- Figure 5 represents the variant in the patent referring to the foot support.
- Figure 6 is a view of the folded jack including the variant in the previous figure.

In accordance with these figures, and with reference to figure 1, we would like to point out that it represents a jack composed of two members (1) and (2), first and second support members, which turn mutually on a point (3). A threaded member (4) is operated by a crank handle at a free end. The other end of this spindle (4) is held in a bushing (11) which is retained in member (2). At an intermediate point, the spindle (4) is screwed into abushing (6) contained in a slot at the upper end of member (1). In this case, the threaded spindle does not go through the bushing (11) and has one single thread along all its length.

A part (9) situated in the upper part of member (2), provides an opening to receive the bottom part of the vehicle. A support base assembly (7) turns on point (8) in relation to member (1).

This jack has been included,as already explained earlier, with the object of comparing it with the object of this patent, which is shown in figures 2, 3, 4, 5 and 6.

In these figures, a jack is shown, of the type described in previous paragraphs, which incorporated the features of the patent. These features can be used individually or as a whole together with some or all of the other features of the jack shown in figure 1, for instance, and together with some other features of other types of "Y" jacks, such as those shown in Spanish Patent application Nº 8800105.

According to figure 2, this version of the jack includes two members, first and second support member , a leg (12) and an arm (13) which turn around a point (14). Both the arm (13) and the leg (12) are made of channel-shaped section.

Connecting the leg and the arm there is a spindle (15), which is connected with a crank handle (not shown) by its left end (19). This spindle screws into a bushing (18) which is received in an upper slot in the leg (12).

The right end of the spindle (15) screw into a bushing (20), similar to the bushing (11) in figure **1,** but with the difference that in this case the spindle passes through the bushing (20) and protrudes out the other side (21).

The two ends (16) and (17) of the spindle (15) are provided with threads in opposite directions, in such a way that when the spindle is turned, both bushing (18) and (20) move. The end (21) of the right portion of the spindle, which protrudes out from the bushing (20) can be equipped at its free end (not shown), with a stop to prevent its becoming accidentally unscrewed from the bushing (15).

At the end of the member or arm (13) further away from the other member or leg (12), there is a part (22), preferably made of hard plastic material, which makes contact with the bottom side of the vehicle when the jack is used. The hollow (23) in the part (22) receives the sill seam weld or projection of the vehicle.

The lower end of the leg (12) is mounted on a foot support (25) which turns freely and is formed by a "U"-shaped profile or channel. This foot support (25) has a stop (28) incorporated into it. To prepare the jack for use, the foot support (25) and the leg (12) are turned until the upper end of the stop edge (28) touches the leg (12) at (30),as shown in the figure. With this, correct positioning of the jack beneath the car is assured. Exactly as is shown graphically, the stop (28) the stop can be conveniently formed by a projecting portion of the channel section that makes up the foot support (25).

In accordance with figure 3, the foot support (25) is also equipped with a hook (29), also formed by the projecting portion of the foot support (25), which, when the jack is in its closed or folded position, can engage the part (22) by inserting itself into the groove or hollow (23) of this part, thus preventing the jack parts from rattling or making noise.

To store the jack,the arm(12)is lowered as far as possible and then the foot support (25) is turned to the position shown, so that the hook (29) takes in the part (22) and then the crank handle of the jack is turned in the direction used when raising the arm, until the said hook (29) is tightly pressed against the part (22).

The connection (32) between the foot support (25) and the leg (12) is free turning and is shown in figure 4, which corresponds to the cross-section view II of the jack foot carried out in figure 2. This connection between foot support (25) and leg (12) can be carried out by providing the leg (12) with holes or opposite sides of its "U" channel section, for example holes (31) and positioning the foot support on the end of the leg, while at the same time the sides of the foot support (25) are holed to form projections (32) so that these metallic projections pass through the holes (31) to form the giratory connection.

If necessary, holes could be made in the foor support at the points that have to be drilled, to make the process easier. The ends of the leg (12), at this side, have rounded support surfaces (26) which engage on the foot support (25) and transfer the weight.

Figure 5 shows the variant of the part or foot support (25) of one of the jack support members, which turns freely on the position (24) when it is mounted onto the said member.

The section made for this view is that of a middle vertical plane according to the axis (24), and the central or bridge area (27) can be seen, in which is included, for example by pressure, the folding and support part (35) of the patent, which at the lower end finishes in a outwardly convex surface which rests on the ground when the jack is in its working position.

This part (35) protrudes downwards through its downwards projection (36) to produce a support surface for the foot support (25), which is of the non-slip variety because the part is made of rubber, plastic, etc.

The bridge area (27) is provided only with the stop (28) for its contact with the support member or leg, and the opposite end is straight.

The support part (35) protrudes upwards with a cental section (39) and two raised sides (38) and (40) as illustrated in fig. 5.

As regards fig. 6, the jack is shown, in the folded position, with the two support members (12) and (13), of which member (12) incorporates the foot support (25) of the patent and member (13) has the vehicle support part (15).

The spindle (17)-(15)-(16) is connected to the threaded sections (33) and (34) and the tilting or pivoting point (14) of the two members (12) and (13) can also be seen.

In this position, it can be appreciated how the edge (37) of the support part (22) becomes lodged in the central section (39) of the part (35), with its free edge making contact with the raised side (38), although without occupying the full lenght of the central section (39), as can be seen.

The support for the edge (37) is wide, so that sufficient pressure is brought to bear to prevent any possibility of noise, once that the jack crank handle has been turned.

Claims

1. Vehicle jack which has first and second support members (12, 13) pivoted together, with a rotatable foot support (25) at the lower end of the first support member (12) and a vehicle engaging part(22) on the second support member (13), as well as means (19) for pivoting the first and second support members (12, 13) so that the rotatable foot support (25) and the vehicle engaging part (22) move towards or away from each other, said rotatable foot support (25) having a longitudinal stop (28) raised from the inner face of the said rotatable foot support (25) making frontal contact with the external base (30) of the U-profile that forms the first support member (12), to support the said first support member (12) so that the first support member (12) can be positioned at a predetermined angle in relation to the base (30) of the said rotatable foot support (25) when the jack is at the minimum possible height characterized by
   - two projections (32) that protrude from the foot support (25), each one of them engages with a hole (31) in the opposite sides of the first support member (12),
   - a support part (35) inserted in a bridge area (27) of the foot support (25), said support part protruding upwards and downwards in the foot support (25), the lower end of said support part (35) having an outwardly convex surface which rests on the ground when the jack is in its working position, the upper end having a central section (39) and two raised sides (38,39), with contact being made, when the jack is in the folded position, between an edge of the vehicle engaging part (22) and the central section (39) and the raised side (38) on the side of the longitudinal stop (28), the length of the said central section (39) being slightly more than the length of the edge of the vehicle engaging part (22).

2. Vehicle jack which has first and second support members (12, 13) pivoted together, with a rotatable foot support (25) at the lower end of the first support member (12) and a vehicle engaging part (22) on the second support member (13), as well as means (19) for pivoting the first and second support members (12,13) so that the rotatable foot support (25) and the vehicle engaging part (22) move towards or away from each other, said rotatable foot support (25) having a longitudinal stop (28) raised from the inner face of the said rotatable foot support (25) making frontal contact with the external base (30) of the U-profile that forms the first support member (12), to support the said first support member (12) so that the first support member (12) can be positioned at a predetermined angle in relation to the base (30) of the said foot support (25) when the jack is at the minimum possible height characterized by

- a coupling device (29) in the rotatable foot support (25) to secure the rotatable foot support (25) into the second support member (13) when the jack is almost completely folded, to thus limit the relative movement between the two support members (12,13).

3. Vehicle jack in accordance with claim 1, characterized in that the support part (35) is made of rubber.

4. Vehicle jack in accordance with claim 1, characterized in that the support part (35) is made of plastic.

Patentansprüche

1. Wagenheber bestehend aus einer ersten und einer zweiten Stütze (12, 13), die miteinander drehbar gelagert sind, einer rotierenden Fußtütze (21) an dem unteren Ende der ersten Stütze (12) und einem mit dem Wagen einrastenden Teil (22) an der zweiten Stütze (13), sowie Werkzeugen zum Drehen der ersten und zweiten Stützen (12, 13), so daß sich die rotierende Fußstütze (25) und das mit dem Wagen einrastende Teil (22) aufeinander zu oder voneinander weg bewegen, und daß die rotierende Fußstütze (25) einen Längsanschlag (28) hat, der sich aus der Innenseite der erwähnten Fußtütze (25) erhebt, und mit dem äußeren Unterteil (30) des U-Profils, das die erste Stütze (12) bildet, Kontakt macht, um die erste Stütze (12) zu stützen, so daß die erste Stütze (12) in einen vorbestimmten Winkel gebracht werden kann, bezüglich des äußeren Unterteiles (30) der erwähnten rotierenden Fußstütze (25), wenn der Wagenheber auf der mindestmöglichen Höhe ist.
gekennzeichnet durch:
- zwei aus der Fußstütze (27) hervorstehenden Vorsprünge (32), die mit einer Bohrung (31) in der jeweiling gegenüberstehenden Seite der ersten Stütze (12) einrasten,
- ein in einem Übergang (27) der Fußstütze (25) eingefügtes Stützteil (35), das in der Fußstütze (25) nach oben bzw. nach unten beweglich ist, dessen unteres Ende eine nach außen gewölbte Oberfläche aufweist, die auf dem Boden aufliegt, wenn der Wagenheber in Arbeitstellung ist, und dessen oberes Ende ein zentrales Bereich (39) sowie zwei erhöhte Seiten (38, 39) aufweist, so daß wenn der Wagenheber zusammengeklappt ist, die eine Kante des mit dem Wagen einrastenden Teiles (22), zwei zentrale Bereiche (39) und die erhöhte Seite (38) seitens des länglichen Anschlags (28) in Kontakt kommen, wobei die Länge des genannten Zentralbereiches (39) etwas länger als die Kante des mit dem Wagen einrastenden Teiles (22) ist.

2. Wagenheber bestehend aus einer ersten und einer zweiten Stütze (12, 13), die miteinander drehbar gelagert sind, einer rotierenden Fußstütze (21) an dem unteren Ende der ersten Stütze (12) und einem mit dem Wagen einrastenden Teil (22) an der zweiten Stütze (13), sowie Werkzeugen zum Drehen der ersten und zweiten Stützen (12, 13), so daß sich die rotierende Fußtütze (25) und das mit dem Wagen einrastende Teil (22) aufeinander zu oder voneinander weg bewegen, und daß die rotierende Fußstütze (25) einen Längsanschlag (28) hat, der sich aus der Innenseite der erwähnten Fußtütze (25) erhebt, und mit dem äußeren Unterteil (30) des U-Profils, das die erste Stütze (12)bildet, Kontakt macht, um die erste Stütze (12) zu stützen, so daß die erste Stütze (12) in einen vorbestimmten Winkel gebracht Werden kann, bezüglich des äußeren Unterteiles (30) der erwähnten rotierenden Fußstütze (25), wenn der Wagenheber auf der mindestmöglichen Höhe ist.
gekennzeichnet durch:
- eine kupplung (29) in der rotierenden Fußstütze (25), die die rotierende Fußstütze (25) innerhalb der zweiten Stütze (13) befestigt, wenn der Wagenheber fast völlig zusammengeklappt ist, um auf diese Weise die Bewegung zwischen den zwei Stützen (12, 13) zu beschränken.

3. Wagenheber nach Anspruch 1, dadurch gekennzeichnet, daß die Stütze (35) aus Gummi ist.

4. Wagenheber nach Anspruch 1, dadurch gekennzeichnet, daß die Stütze (35) aus Kunststoff ist.

Revendications

1. Cric pour véhicule dont le premier et le second bras d'appui (12, 13) tournent ensemble, avec un pied d'appui pivotant (25) du côté inférieur du premier bras d'appui (12) et une pièce s'engageant sous le véhicule (22) sur le second bras d'appui (13), ainsi que des moyens (19) permettant de faire pivoter les premier et second bras d'appui (12, 13) de sorte que le pied d'appui pivotant (25) et la partie s'enga-

geant sous le véhicule (22) se rapprochent ou s'éloignent l'un de l'autre, ledit pied d'appui pivotant (25) étant doté d'une butée longitudinale (28) se relevant de la face interne dudit pied d'appui pivotant (25) pour entrer en contact frontal avec la base externe (30) du profil en U qui constitue le premier bras d'appui (12), pour servir de soutien à ce premier bras d'appui (12), de sorte que le premier bras d'appui (12) puisse être positionné selon un angle prédéterminé par rapport à la base (30) de ce même pied d'appui pivotant (25) lorsque le cric se trouve à la hauteur la plus faible possible pour se caractériser par

- deux saillants (32) qui sortent du bras d'appui (25) chacun d'entre eux s'engageant par un trou (31) dans les côtés opposés du premier bras d'appui (12),
- une pièce d'appui (25) insérée dans une partie servant de pont (27) au pied d'appui (25), ladite pièce d'appui faisant saillie vers le haut et le bas dans le pied d'appui (25), l'extrémité inférieure de ladite pièce d'appui (35) présentant une surface convexe orientée vers l'extérieur qui repose sur le sol dès lors que le cric se trouve dans sa position de travail, l'extrémité supérieure présentant une section centrale (39) et deux côtés latéraux (38, 39), le contact étant effectué, quand le jack se trouve en position repliée, entre un bord de la pièce du véhicule sous lequel s'engage le cric (22) et la section centrale (39), le côté de la partie se relevant (38) du côté de la butée longitudinale (28), la longueur de ladite section centrale (39) étant légèrement supérieure à la longueur du bord de la pièce s'engageant sous le véhicule (22).

2. Cric pour véhicule dont les premier et second bras d'appui (12, 13) tournent ensemble, avec un pied d'appui pivotant (25) à l'extrémité inférieure du premier bras d'appui (12) et une partie s'engageant sous le véhicule (22) sur le second bras d'appui (13), ainsi que des moyens (19) destinés à faire pivoter les premier et second bras d'appui (12, 13) de sorte que le pied d'appui pivotant (25) et la pièce s'engageant sous le véhicule (22) se rapprochent ou s'éloignent l'un de l'autre, ledit pied d'appui pivotant (25) étant doté d'une butée longitudinale (28) relevée de la face interne de ce même pied d'appui pivotant (25) pour entrer en contact frontal avec la base externe (30) du profil en U, laquelle conforme le premier bras d'appui (12), pour soutenir ledit premier bras d'appui (12), de sorte que le premier bras d'appui puisse être positionnée dans un angle prédéterminé par rapport à la base (30) de ce même pied d'appui (25) dès lors que le cric se trouve à la hauteur la plus faible possible caractérisée par

- un dispositif d'accouplement (29) dans le pied d'appui pivotant (25) en vue d'assurer le pied d'appui pivotant (25) dans le second bras d'appui (13), dès lors que le cric se trouve presque complètement replié, de manière à limiter le mouvement relatif entre les deux bras d'appui (12, 13).

3. Cric pour véhicule conforme à la revendication 1, se caractérisant par le fait que la pièce d'appui (35) est en caoutchouc.

4. Cric pour véhicule conforme à la revendication 1, se caractérisant par le fait que la pièce d'appui (35) est en plastique.

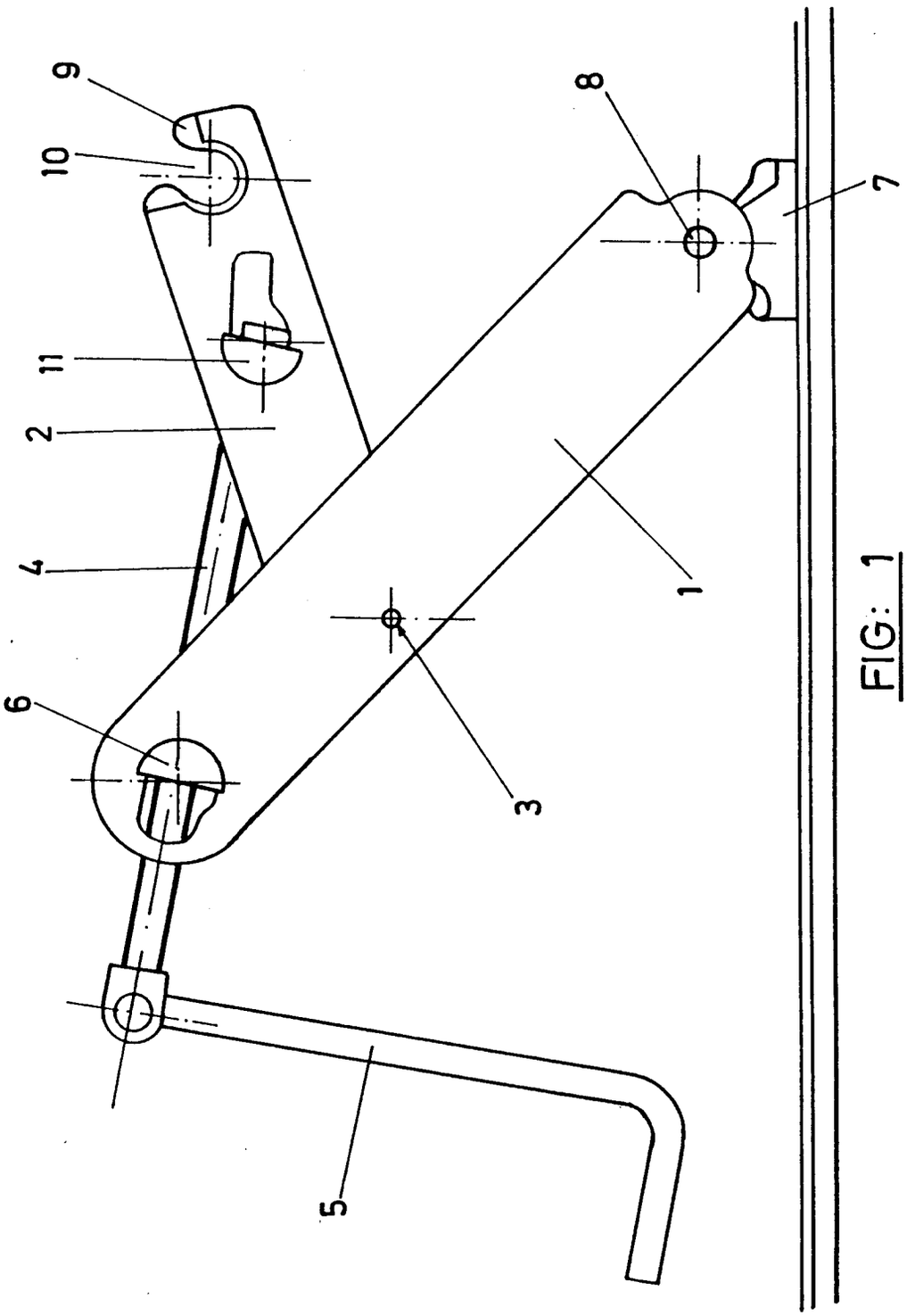

FIG: 1

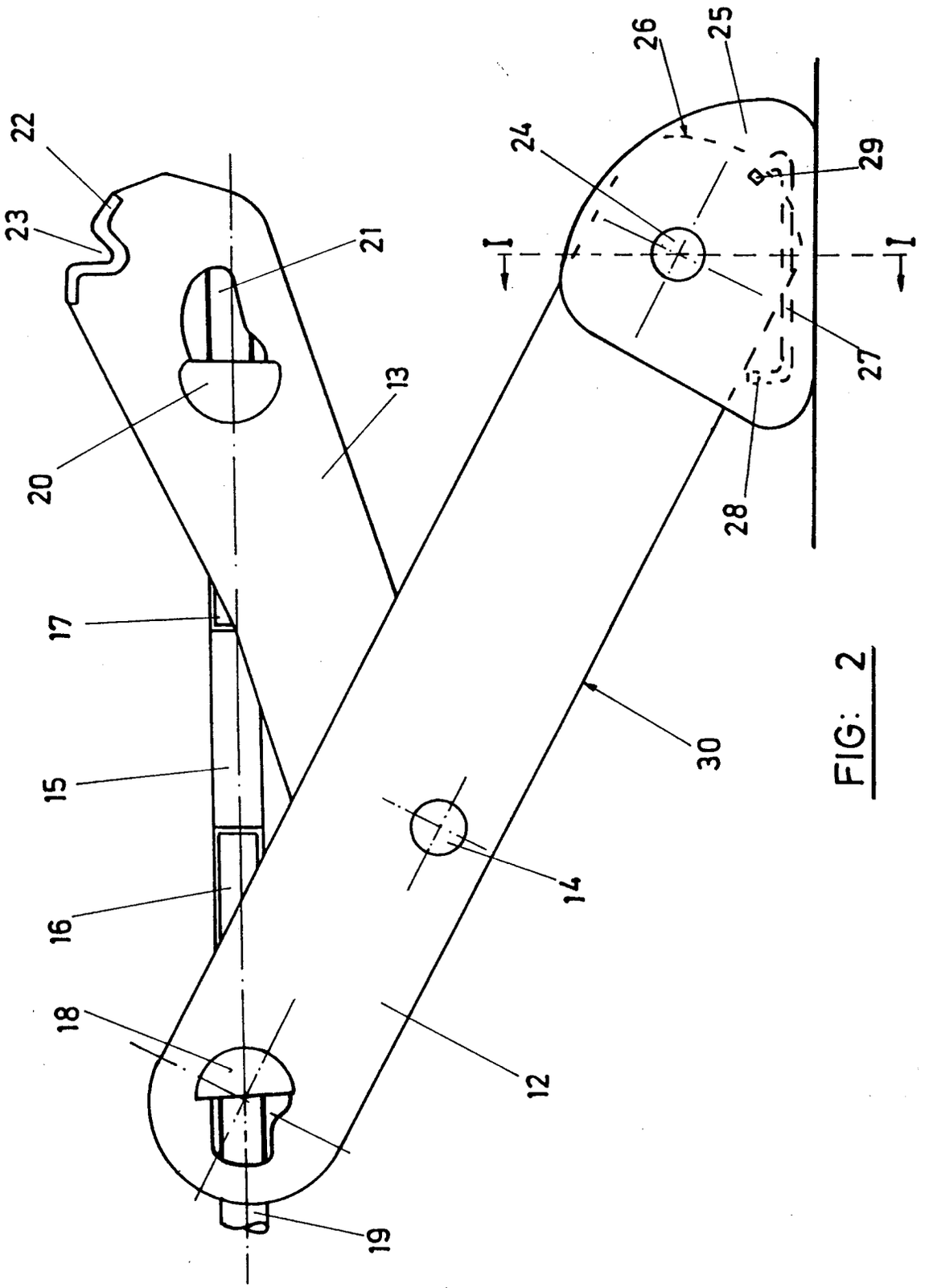

FIG: 2

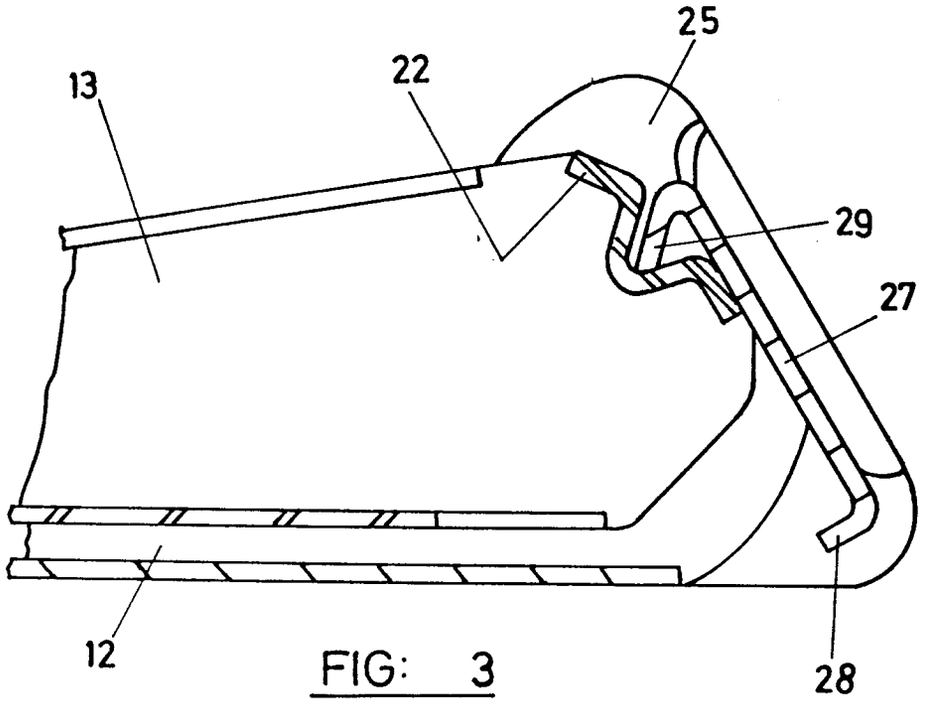

FIG: 3

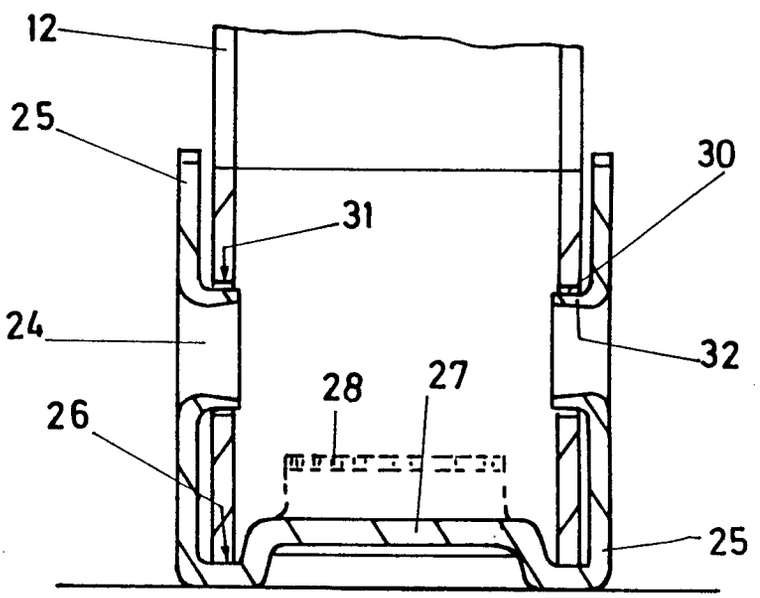

FIG: 4

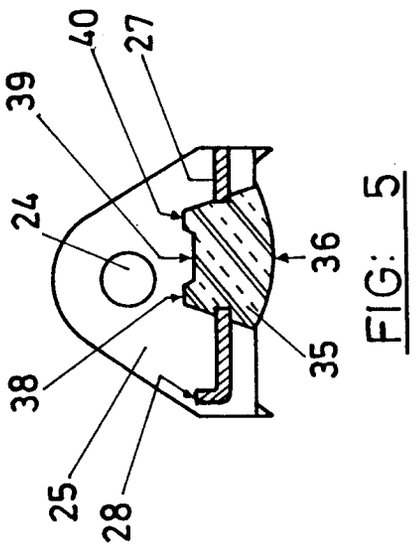
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FIG: 5

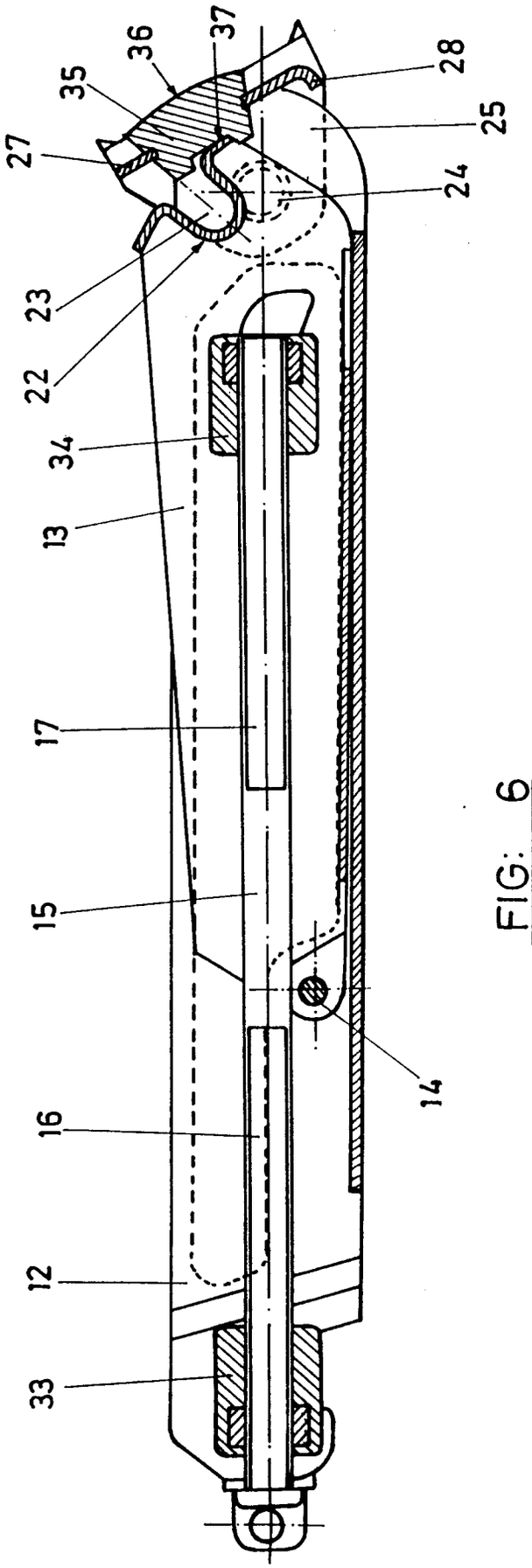
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FIG: 6