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(54) Vehicle safety jack

(57) A vehicle safety jack, which includes a housing in the body of the jaw or clamp itself, into which are received two washers (14, 16) and a ball bearing cage (15), which are situated over the end of the screw spindle, with the most outwardly or front washer being secured to the end of the screw spindle by riveting. The support member that forms the foot (1) has windows (9) cut into it, creating internal lugs whose thickness controls the maximum opening of the other support member (2) and safeguards it.

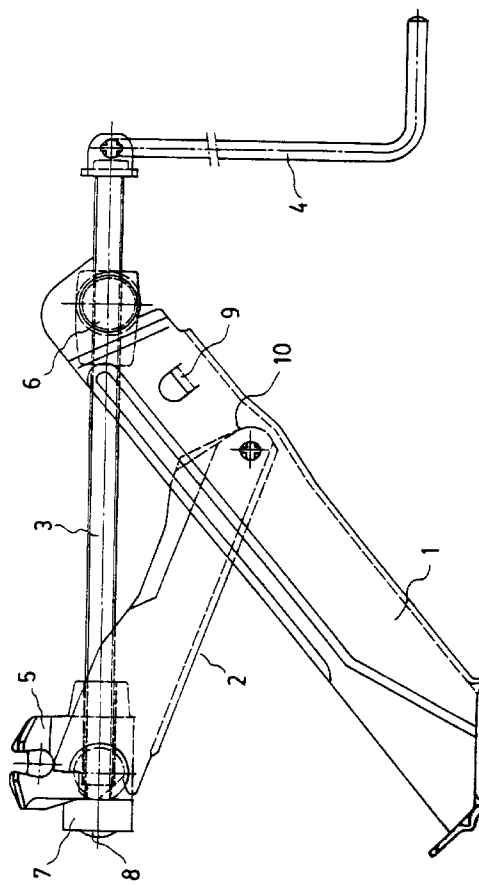


Fig. 1

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Description

This invention relates to a vehicle safety jack, of the type known as Y-jacks, with a first support member that includes one end in the form of a foot in order to rest the jack on the ground and the other end that receives a wharve, and another, second support member with one end that pivots on the first support member and is finished at its other end with a jaw or clamp in which the lower edge of the car body is received. A threaded screw spindle passes through the wharve and the jaw and has a winding handle connected to the end farthest from the wharve, so that when the winding handle is turned in one direction, the second support member is raised with the jaw and the vehicle, and when the winding handle is turned in the other direction, the second support member or arm and the vehicle are lowered.

The jaw on the second support member is kept fixed against the free end of the screw spindle, so that the screw spindle turns inside the wharve, thus moving the said wharve and the said screw spindle towards or away from each other and causing the second support member to be raised or lowered.

In order to keep the jaw fixed, the existence is known of a pipe or tube welded to the screw spindle. The disadvantage of this solution is that it means an extra part in the assemble, that increases the weight of the jack and also makes it more expensive, since it requires a series of assembly operations to be carried out.

More recently, the solution is also known which consists of machining the interior of the housing for the screw spindle in the jaw, thus providing an internal ledge in the hole in the jaw, on which a rebate or recess in the screw spindle rests. The free end of the screw spindle is connected by means of two washers and a central ball bearing cage, which are secured to the said end by being riveted to it.

This solution is also complicated and costly, since it needs the corresponding machining work to be carried out and also, when considerable stress is placed upon it, the screw spindle rises on the stepped part in the interior of the jaw, with the corresponding risks involved.

On the other hand, in jacks of this type, the support members or arms are usually made up of parts with a U-shaped cross-section, so that when the jack is raised, the end of the second support member, and more specifically the thickness of the end of this second support member, impinges on and affects the rounded internal corners of the first support member in such a way that, when considerably heavy loads have to be raised, the end of the second support member buckle or twist at these said corners, meaning that the jack is made unusable.

It is an object of this invention to provide a jack which has a simple jaw which in itself is secured to the screw spindle without the need for any special machining to be carried out.

Another object of this invention is to provide a jack

with a sturdy or robust stop for the support member that holds the screw spindle at its maximum elevation, so that it preserves the integrity of the assembly and ensures the absence of buckled areas when overloads exist.

In order to achieve these objectives, the invention claims a jaw, made of plastic, which has a totally flat axial perforation in which the screw spindle is housed without any kind of impediment. At the end of the jaw, on the side at the end of the screw spindle, a housing is made of a greater diameter than the diameter of the hole for the screw spindle, with this housing being connected on one side with the said hole and on the other side with the exterior of the jaw through a hole.

The housing has two internal walls, one towards the screw spindle input and the other towards its output. The screw spindle is housed freely in the jaw, as already pointed out, and in the interior of the housing receives the ball bearing cage and the two washers, which are controlled by the internal side walls of the said housing.

Through the hole at the outer end, the end of the screw spindle is riveted to the outer of the two washers, thus securing the whole assembly irremovably. The screw spindle remains free and completely unhindered inside the jaw and the jaw remains perfectly controlled by means of the inclusion of the washers and the ball bearing cage inside the housing in the jaw.

In order to achieve the second object of the invention, the invention claims the realization of a set of lugs, one in each of the facing wings or sides of the first support member of the jack, in a position that corresponds to that of the maximum elevation of the second support member of the jack, usually close to the position of the wharve in the first support member.

The two lugs are formed facing each other and as the result of windows or cut-outs made in the said wings, protruding towards the interior of the support member, usually perpendicular to the said wings.

In this way, when the edges of the second support member, in the position close to that of maximum elevation, touch the base of the corners, they have come up against the edges or thicknesses of the lugs. This meeting, edge against edge, offers sufficient guarantees of resistance to allow the second support member to be completely protected, even in spite of its being used to raise heavier loads than those for which it is designed.

All these and other details of the invention are illustrated in the attached sheets of drawings, in which a solution of the details claimed is represented for guidance purposes only.

Figure 1 is an elevation of the jack that includes the invention.

Figure 2 is an external side elevation of the jaw in accordance with the invention.

Figure 3 is a longitudinal cross-sectional view of a conventional jaw with the screw spindle assembled in its interior.

Figure 4 is a longitudinal cross-sectional view of the jaw with the screw spindle, in accordance with the inven-

tion.

Figure 5 is a double cross-sectional view of the two support members or arms of the jack, which illustrates, on the one hand, the problem that arises in the position of maximum elevation and, on the other hand, the solution claimed by the invention.

Looking now at Figure 1, it is possible to appreciate a jack of the type known as Y-jacks, provided with a first support member (1) with a support foot for resting on the ground and which at its upper end receives the wharve (6) which has the threaded screw spindle (3) passing through it. Seated on this first support member (1) is the pivoting edge (10) of the second support member, whose other end includes the jaw (5) which, in turn has the screw spindle (3) passing through it.

It is also possible to appreciate the housing (7) in the jaw (5) and its riveted end (8), as well as the winding handle (4) for turning the screw spindle. We can also observe the lug (9) cut into the wing or side of the first support member, and the edge (10) of the second support member (2), close to the internal corners of the first support member (1), which takes place when the said second support member (2) is at its maximum elevation.

Referring now to Figure 2, the jaw (5) can be seen, with its end (11), into which the screw spindle is inserted, and the forward housing (7).

Figure 3 shows the already known solution for making the jaw (12) irremovable. The interior of this jaw has been machined, as shown, giving rise to the ledge (13) on which the screw spindle (3) rests. The end of the screw spindle and the neck (17) receive the two washers (14, 16) with the ball bearing cage (15) between them, which are secured by the end of the screw spindle (8) being properly riveted.

The solution claimed by the invention, as best seen in Figure 4, shows how the screw spindle passes through the straight continuous interior of the jaw (5), and in the interior of the housing are situated the washers (14, 16) with the ball bearing cage (15), controlled between the side walls of the said housing (7). Riveting of the end (8) of the screw spindle is carried out through the outer hole, as illustrated, with which the jaw (5) becomes perfectly irremovable.

Finally, the left part of Figure 5 shows the problem that arises in jacks when they are subjected to overloading in the maximum elevation position of the second support member, according to which the end edges of the support member (2) impinge on the rounded corners (1) of the first support member (1), leading to their becoming strained and permanently deformed, as at (20).

The right part represents the solution claimed in order to prevent this disadvantage, and also illustrated in Figure 1. The lugs (9) in the wings or sides of the first support member (1) are made, preferable from the support member itself, by the machining that produces the windows or cut-outs (18). The lugs are established facing and aligned with each other, as shown, so that their edges or thicknesses make contact with the edges (10) of

the support member (2), with sufficient strength at the meeting point to be able to resist overloads.

It is important to emphasize, once having described the nature and advantages of this invention, its non-restrictive character, inasmuch as changes in the shape, material or dimensions of its constituent parts will not in any way alter its essence, as long as they do not mean a substantial variation of the whole.

Claims

1.- Vehicle safety jack, of the type known as Y-jacks, with one support member (1) provided at one end with a support foot and at the other end with a wharve (6) through which a screw spindle (3) passes, and another support member (2) that pivots on the first and includes a jaw or clamp (5) to receive the edge of the vehicle body, with the screw spindle (3) also passing through this jaw, with a ball bearing cage (15) arranged between two washers (14, 16) being situated between the jaw and the end of the screw spindle, and one of these washers (14) being riveted to the said end (3) of the screw spindle, which is characterized in that,

- the jaw (5) has a cylindrical continuous longitudinal internal cavity or recess, crossed through by the screw spindle (3), with a housing (7) of a greater diameter than the screw spindle at its outer end, with this housing receiving the washers (14, 16) that hold the ball bearing cage (15) between them, with these washers also having the screw spindle passing through them and being controlled by the internal side walls of the housing (7), in one direction or the other, and this housing also having an open hole towards the free end (8) of the screw spindle into which the end of the screw spindle enters and is riveted to the washer (14) situated in the position close to the said end,
- two lugs cut into the wings of the U-shaped cross section of the support member (1) provided with the foot, and both lugs being opposite and aligned with each other in the interior of the said member, these lugs being made in a position close to the wharve (6) and corresponding to the maximum elevation of the other support member (2) of the jack, in such a way that the side edges of these lugs (9) make contact with the edges of the jack member (2) in the maximum elevation position.

2.- Vehicle safety jack, in accordance with claim 1, characterized in that the facing lugs (9) are essentially horizontal and are created in the wings of the support member as a result of windows (18) cut into

the said wings.

3.- Vehicle safety jack, in accordance with claim 1, characterized in that the jaw or clamp (5), together with its housing (7), is, preferably, made of plastic. 5

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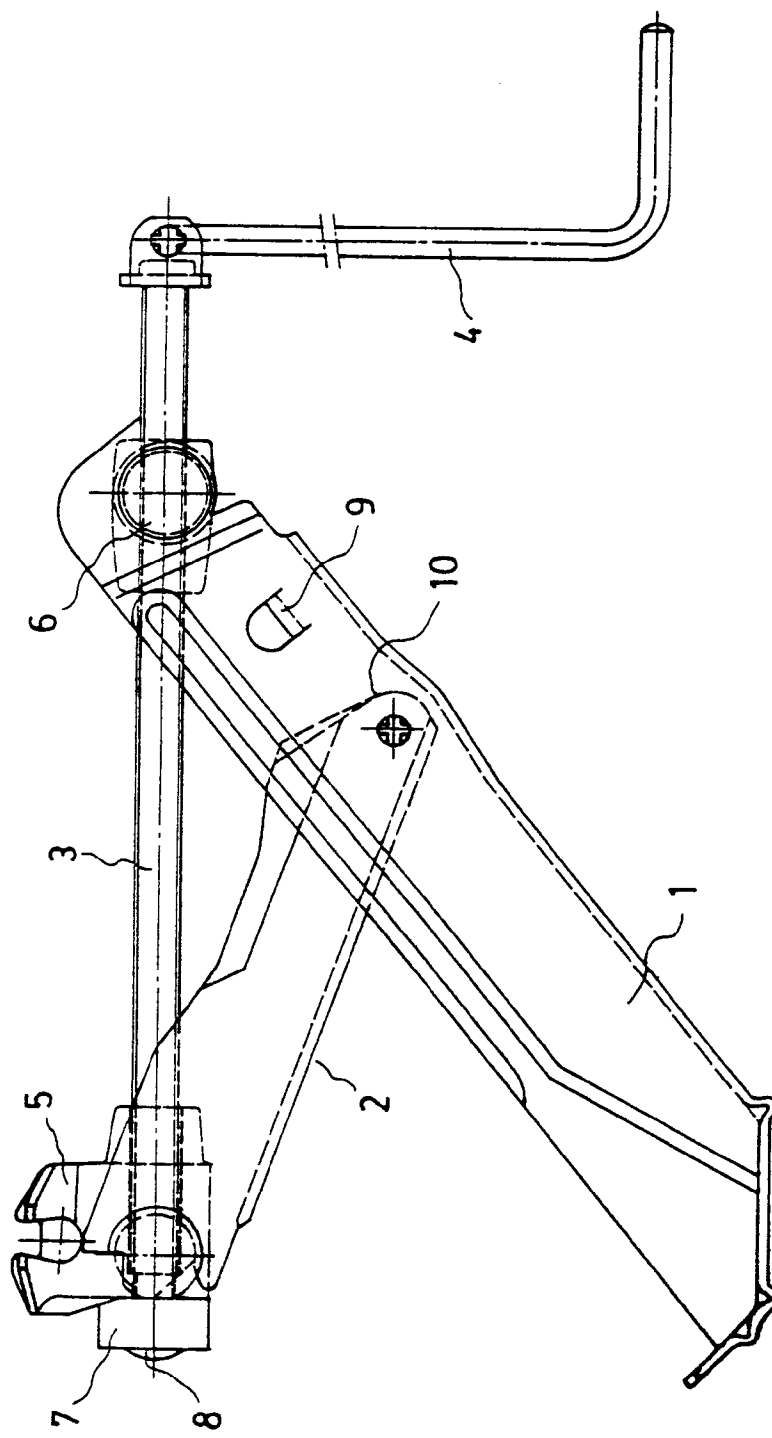


Fig.: 1

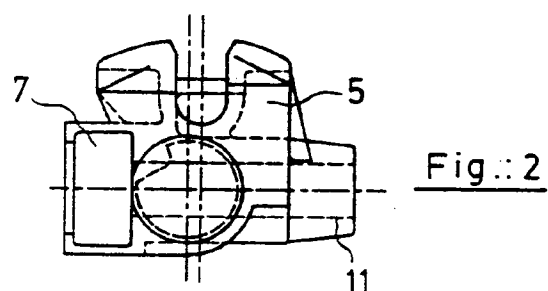


Fig. 2

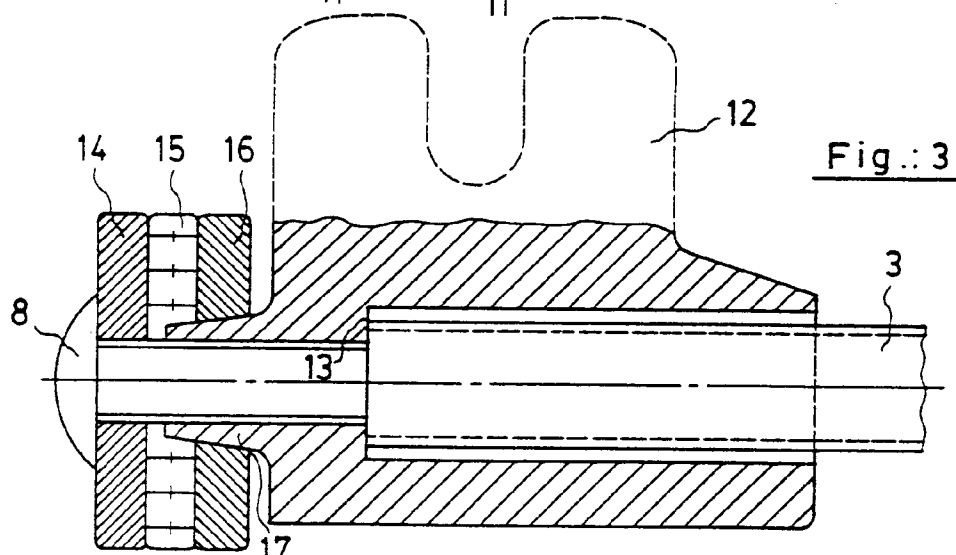


Fig. 3

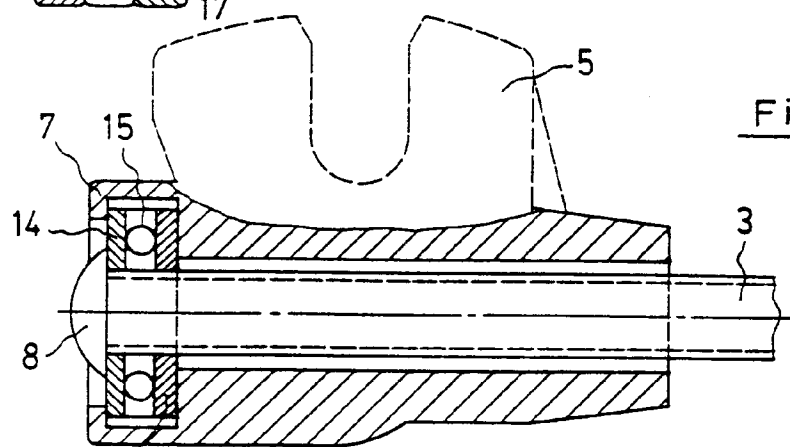


Fig. 4

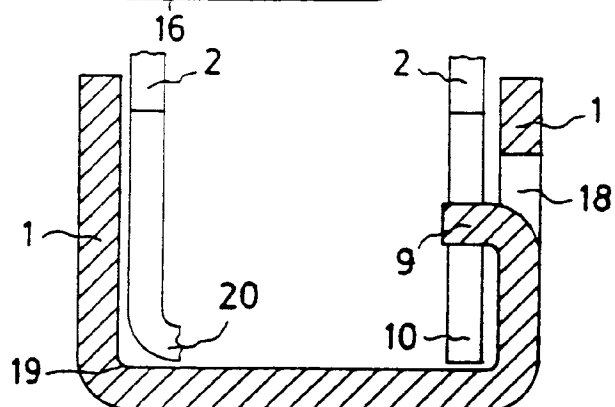


Fig. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 95 50 0110

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 340 551 (E.A.STORZ & CO.) * abstract; figure 1 *	1	B66F3/12
A	GB-A-2 136 393 (METALLIFACTURE)		
A	FR-A-2 273 752 (FIRME AUGUST BILSTEIN)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B66F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 October 1995	Examiner Van den Berghe, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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