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Closure and latching device, particularly for the doors of vans, containers and the like.

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Description

The present invention relates to a closure device particularly for closing doors in vans, containers freezer cars and the like, capable of giving to the doors maximum stability in closure, regardless of the type and the direction of the stresses to which said closure is subject during the movement of the vehicle.

Various mechanisms have long been known and used which are based on the use of clamps to ensure the closure of the rear or lateral doors of vans and of containers in general. Usually these mechanisms have one or more rods mounted vertically and rotatably on the outer face of the door be it a single door or a door with two shutters with the free sides partially overlapping in closure; at the opposite ends of each rotatable rod, a fork-like (or eccentric) locking element is provided arranged at 90° with respect to the longitudinal axis of the rotatable rod and engaging, in the final step of the closure of the door, with a variously shaped coupler which is mounted rigidly associated with the lintel of the opening and is variously shaped, for example as an inclined plane, pins or lugs protruding from said lintel. The prongs of the forks thus engage the respective coupler while the door is moved proximate to the closure and then "pull", that is to say force the stable closure of said shutter during the final step of rotation of the fork-bearing rod. A mechanism of this kind is shown in prior art document US-A-4 235 465

These known types of clamps for the closure of doors of vans and the like, though capable of ensuring a stable closure of shutter doors, in practice are unable to effectively bear the stresses to which the clamps are subject both as a consequence of the load being carried and due to the movement on the road. In fact, as is known, a clamp of this type must be able to recover any of the always possible elastic deformations of the assembly composed of the door-frame or lintel and of the related shutters and to oppose as much as possible the onset of vertical and rebound stresses which occur along the vertical axis of the clamps. The closure device must also react to the interior stresses created by the load bearing on the shutters during accelerations of the vehicle and oppose the torsional stresses generated by pavement deformations.

In order to partially overcome these disadvantages and shortcomings, hook-like couplers have already been proposed which provide a rib or protrusion, substantially in the shape of a truncated cone, at the end opposite to the one which bears the coupling forks and axially thereto. Once the coupling is effected, the rib accommodates in a complementarily shaped seat provided in the cou-

pler plate; this prevents the fork in closure from moving transversely with respect to the rotatable rod and therefore allows to oppose any stresses occurring transversely with respect to the shutters, ensuring a stable closure in this direction. These known couplers, however, are not capable of opposing all the other previously mentioned stresses to which the clamp is subject during movement and which jeopardize the stability of the clamp itself.

Therefore, the aim of the present invention is to provide a closure device particularly for closing doors in vans, containers, freezer cars and the like, capable to eliminate the disadvantages and shortcomings of known devices, and most of all such as to be capable, once the coupling has occurred, of recovering any elastic deformation of the door-frame/shutter assembly and of opposing with maximum effectiveness the various stresses to which the closure is normally subject during the movement of a vehicle on the road, as, for example, of a ship during seafaring transportation.

A further object of the invention is to provide a structurally simple and highly reliable door closure device, easily operated in closing and in opening, as well as adapted to be provided even with two or more closure rods for two shutters according to the loads and to the stability and safety requirements.

This aim, this object, and others which will become apparent from the following description, and are achieved by a closure device, as described in the appended claims.

The invention is described hereinafter in greater detail according to a preferred but not exclusive embodiment, given only by way of non-limitative example, with reference to the accompanying drawings, wherein:

figure 1 is a schematic front view of the component elements of an ordinary closure for doors of containers and the like;

figure 2 is a side view of a hook according to the invention, separated from the rotatable operating rod;

figure 3 is a front view of the hook of figure 2;

figure 4 is a top view of the hook of figure 2 according to the line A-A of figure 2;

figure 5 is a cross section view along the line B-B of figure 2;

figure 6 is a front view of the coupler element for the hook of figure 2;

figure 7 is a top view of the coupler element of figure 6;

figures 8 and 9 are two cross section views respectively taken along the lines VIII-VIII and IX-IX of Figure 6;

figure 10 is a view of the positions of the hook of figure 2 approaching the coupler element of figures 6 and 7;

figure 11 is a front view of the completed insertion of the fork of the hook in the related coupler; and

figure 12 is a middle cross section view of the insertion of figure 11.

With reference to said figures, and in particular to figure 1, an ordinary clamp for doors or shutters of vans and the like is composed of at least one rod 1, usually tubular at least at its extremities, which is mounted vertically and rotatably on the outer face of a door and, in the case of a two-shutter door, at the region of overlapping and mating of one shutter with the other; the rod 1 is rotatably supported by end brackets 2 and by intermediate brackets 3. A rod-like handle 5 is hinged perpendicular to the rod at a pivot 4 for rotating the shutter. The handle 5, when the shutter has been closed, is rotatable until it reaches the position 5a illustrated in phantom lines and is lockable in an adapted seat 6 by means of a lock 7 or the like.

The hook means intended to insert in couplers rigidly associated with the frame of the door opening of the van or of the container are rigidly associated with the two ends 1a of the rod 1, and substantially form the object of the present invention and will be described in detail hereinafter with reference to figures 2 to 12.

Thus, according to the present invention, the closure device comprises a hook to be welded to the ends of the rod 1 and a coupler element to be connected, by welding or bolting, to the frame (above and below it) of the door opening of the vehicle, said door opening not being illustrated in the figures.

The hook is constituted by a substantially T-shaped element, generally indicated by 8 in figure 2, having a vertical portion 9 which inserts into the ends 1a of the rotatable tubular rod 1; an intermediate flange 9a provides an abutment against the end bracket 2. The horizontal part 10 of the T-shaped element constitutes instead the hooking and insertion element.

An end of this hooking element 10 is made in the shape of a fork 10c, the prongs 10a-10b whereof are provided at their ends with two teeth, or tips, 11-11a which are outwardly curved with respect to the door plane (figures 2-3), that is to say located at the end of a holder 12 (figure 4). The horizontal part 10 of the T-shaped element is longitudinally splined for its entire length so as to form a continuous groove 13 having a substantially conical cross section; said groove is open at the end 14 opposite to the fork end; the end 14 being curved and connected to a lower inclined plane 15 for reasons which will become apparent hereinafter.

As previously mentioned, two identical hooks 8 are inserted in the opposite ends of the rotatable

rod 1, as schematically illustrated in figure 1. Figure 5 illustrates a cross section of the horizontal part 10 along the line B-B of figure 2.

The coupler element, adapted to cooperate with the above described hook, comprises a plate-like element 16 (figures 6 and 7) provided with means for being fixed to the door-frame of the vehicle, such as, for example, bolts inserted in the holes 17 or welding.

An enlarged portion, forming a continuous rib 18 having a substantially conical cross section, as clearly illustrated in figure 9, is rigidly associated with said plate 16 and its size is such as to mate with the continuous groove 13 provided longitudinally in the hook 8.

A double lug transverse element 19 is provided at one end of said rib 18, while a heel or protruding abutment 20 (figure 7), against which the planar end 15 of the hook rests once the coupling has occurred, is provided at the other end. As clearly shown in figures 6 and 7, the double lug transverse element 19 is of a substantially cylindrical shape having ends which protrude above and below the rib 18. In addition, as can be seen from figures 7 and 10, the abutment 20 extends toward the end of the rib 18 having attached thereto the double lug 19 to thereby define an acute angle between the extension of the plate like element 16 and the extension of the abutment 20.

The closure device operates as follows (figure 10):

by moving the handle of the rotatable rod 1 which bears the two opposite hooks, the door is turned on its hinges along the radius of rotation R so that the hooks 8 pass from position 8 to position 8a etc., until the teeth 11-11a of the fork of the hook make contact with the double lug element 19; at the moment of the first contact 19a between the teeth and the double lug element, by reversing the direction of rotation of the rod 1 the hook and the coupler begin to engage since the fork tips, by resting on the lugs, act as levers, forcing the longitudinal groove of the hook to gradually accommodate the rib of the plate 16 until, when the coupling has occurred, the end 15 of the hook rests against the heel 20.

When the shutters are closed, the hook assumes the position illustrated in figures 11 and 12, wherein: a) the fork 10a-10b engaged by the double lug bears the outward thrusts against the door from inside; b) the hook end rests against the heel 20, thus any lateral forces components are counteracted and c) the conical coupling between the groove 13 and the rib 18, by preventing any possible play, eliminates the vertical rebound stresses, simultaneously reacting to torsional stresses.

Furthermore the double lug is engaged at the maximum possible distance and thus the shutter is

"pulled" into the door-frame, facilitating the insertion of perimetral gaskets made of rubber or the like.

Naturally, in practice the invention as described above is susceptible to structurally and functionally equivalent modifications and variations, without thereby abandoning the scope of the protection of the invention.

Claims

1. Closure device, particularly for closing doors in vans, containers, freezer cars and the like, of the type having one or more rods (1) being rotatably associated with a door, a hook (8) being associated with the ends (1a) of the rods (1), a coupler device (16-20) being rigidly associated with the frame of the door opening, the hook being comprised of a vertical portion (9) and a horizontal portion (10), the vertical portion (9) being fixed to the end (1a) of the rod (1), the horizontal portion (10) having one end shaped as a fork (10c) having curved prongs (10a, 10b) which therebetween define a groove (13), the coupler device (16-20) comprising a plate-like element (16) being fixed to the frame of the door opening, a rib (18) projecting from the plate-like element (16) and having an outer surface shape adapted to mutually mate with the inner surface shape of said groove (13), and a double lug transverse element (19) being provided on one end of the rib (18) and extending vertically thereof, during the rotation of the rod (1) the curved prongs (10a, 10b) of the fork (10c) being inserted in the coupler device (16-20) to achieve a closed position in which the fork (10c) engages the double lug transverse element (19) and the groove (13) engages with the rib (18) to thereby close and lock the door, characterized in that said double lug transverse element (19) is of a substantially cylindrical shape having ends protruding above and below said rib (18), a protruding abutment (20) being provided on said plate-like element (16) at an end opposite to said double lug transverse element (19) for accommodating a plane surface (15) of one end (14) of said horizontal portion (10), said protruding abutment (20) protruding in a direction toward the end of said rib (18) having attached thereto said double lug transverse element (19) so as to define an acute angle between the extension of said plate-like element (16) and the extension of said protruding abutment (20), said plane surface (15) of said horizontal portion (10) being partially beveled

and partly in the shape of an inclined plane such that said plane surface (15) is accommodated the seat of said protruding abutment (20) in a closed position, said rib (18) being continuous and extending along said plate-like element from said double lug transverse element (19) to said protruding abutment (20), said groove (13) being continuous and extending in said horizontal portion (10) from said end shaped as a fork (10c) to an opposite end (14) such that said groove (13) is open at said end (14), said prongs (10a, 10b) of said fork (10c) having curved tips (11,11a), the size of said prongs (10a, 10b), of said fork (10c), of said groove (13) and of said rib (18) being such as to cause the coupling between said hook (8) and said coupler element (16-20) to begin when said curved tips (11,11a) of said prongs (10a, 10b) act as levers by resting on said double lug transverse element (19) as a consequence of the initial rotation of said rod (1), said longitudinal groove (13) being gradually inserted around said rib (18) during the further rotation of said rod (1), and when the coupling is completed, said inclined plane surface (15) of said horizontal portion (10) rests stably against said protruding abutment (20).

2. Device according to claim 1, characterized in that said groove (13) and said rib (18) have substantially conical cross-sections in order to facilitate their mutual coupling and to improve the stability of the device.
3. Device according to claim 1, characterized in that said curved tips (11,11a) of said prongs (10a, 10b) of said fork (10c) have a shape of a tooth or the like, said curved tips (11,11a) being adapted to constitute the initial resting regions of said prongs (10a, 10b) on said double lug transverse element (19).
4. Device according to one or more of the preceding claims, characterized in that said plate-like element (16) bearing said double lug transverse element (19) and said rib (18) is rigidly associated with the frame of the door, said plate-like element being provided with holes (17) for bolts.

Revendications

1. Dispositif de fermeture, en particulier pour la fermeture des portes de fourgons, réservoirs, véhicules frigorifiques et similaires, du type qui comporte une ou plusieurs tiges (1), montées pivotantes sur une porte, un crochet(8) étant

associé aux extrémités (1a) des tiges (1), un dispositif de liaison (16-20) étant rigidement fixé au cadre de l'ouverture de la porte, le crochet étant formé d'une partie verticale (9) et d'une partie horizontale (10), la partie verticale (9) étant fixée à l'extrémité (1a) de la tige (1), la partie horizontale (10) présentant une extrémité en forme de fourche (10c) qui a des dents incurvées (10a, 10b) qui définissent entre elles une gorge (13), le dispositif de liaison (16,20) comprenant un élément (16) en forme de plaque qui est fixé au cadre de l'ouverture de porte, une nervure (18) se projetant à partir de l'élément (16) et dont la surface extérieure présente une forme propre à opérer avec la forme de la surface intérieure de cette gorge (13) et une patte transversale (19) étant prévue à l'une des extrémités de la nervure (18) et s'étendant verticalement par rapport à elle, si bien que pendant la rotation de la tige (1) les dents incurvées (10a, 10b) de la fourche (10c) sont introduites dans le dispositif de liaison (16,20) pour atteindre une position fermée dans laquelle la fourche (10c) coopère avec la patte transversale (19) tandis que la nervure (18) s'engage dans la gorge (13) pour ainsi fermer et verrouiller la porte, caractérisé en ce que la patte transversale (19) est d'une forme sensiblement cylindrique avec des extrémités se projetant au-dessus et en-dessous de cette nervure (18), une butée saillante (20) étant prévue sur l'élément (16) similaire à une plaque à son extrémité, opposée à celle comportant la patte transversale (19) pour être en prise avec un plan incliné (15) d'une extrémité (14) de la partie horizontale (10), cette butée (20) faisant saillie en direction de l'extrémité de ladite nervure (18) qui porte la patte transversale (19) de manière à définir un angle aigu entre le prolongement de cet élément (16) et le prolongement de cette butée saillante (20), la surface plane (15) de la partie horizontale (10) étant partiellement en biseau et partiellement réalisée sous la forme d'un plan incliné, de telle sorte qu'elle puisse constituer siège pour ladite butée saillante (20) en position de fermeture, cette nervure (18) étant continuée et s'étendant le long dudit élément en forme de plaque à partir de la patte transversale (19) jusqu'à la butée (20), cette gorge (13) étant continue et s'étendant dans la partie horizontale (10) à partir de l'extrémité en forme de fourche (10c) jusqu'à l'extrémité opposée (14), de sorte que la gorge (13) est ouverte à l'extrémité (14), les dents (10a, 10b) de la fourche (10c) présentant des pointes incurvées (11, 11a), les dimensions desdites dents (10a, 10b) de la fourche (10c), de la

gorge (13) et de la nervure (18) étant telles que l'accouplement du crochet (8) et l'élément de liaison (16-20) commence lorsque lesdites pointes incurvées (11, 11a) des dents (10a, 10b) agissent en tant que leviers en reposant sur la patte transversale (19), en raison de la rotation initiale de la tige (1), ladite gorge longitudinale (13) entourant progressivement la nervure (18) lorsque se poursuit la rotation de la tige (1), si bien lorsque l'accouplement est terminé, la surface en plan incliné (15) de la partie horizontale (10) repose de façon stable contre la butée en saillie (20).

2. Dispositif selon la revendication 1, caractérisé en ce que la gorge (13) et la nervure (18) présentent des sections transversales sensiblement coniques pour faciliter leur accouplement réciproque et pour améliorer la stabilité du dispositif.
3. Dispositif selon la revendication 1, caractérisé en ce que les pointes incurvées (11, 11a) des dents (10a, 10b) de la fourche (10c) ont la forme d'une dent ou similaire, les pointes incurvées (11, 11a) étant adaptées pour constituer les premières zones de repos desdites dents (10a, 10b) sur ladite patte transversale (19).
4. Dispositif selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément (16) en forme de plaque, portant la patte transversale (19) et la nervure (18) est rigidement fixé au cadre de la porte, ledit élément étant muni de trous (17) pour des boulons.

Ansprüche

1. Schließvorrichtung, insbesondere für Verschlußtüren von Packwagen, Containern, Kühlwagen und dgl. des Typs, der eine oder mehrere Stangen aufweist, die einer Tür drehbar zugeordnet sind und die einen Haken (8) verbunden mit den Enden (1a) einer Stange (1) aufweisen, eine Kopplungseinrichtung (16-20), die fest mit dem Rahmen der Tür einer Öffnung verbunden ist, wobei der Haken ein vertikales Teil (9) und ein horizontales Teil (10) aufweist und das vertikale Teil (9) an den Enden (1a) der Stange (1) befestigt ist und das horizontale Teil (10) ein als Gabel (10c) ausgeformtes Ende aufweist mit gewölbten Klauen (10a, 10b), die dazwischen eine Nut (13) begrenzen und wobei die Kopplungseinrichtung (16-20) aus einem plattenartigen Element (16)

besteht, befestigt am Rahmen der Türöffnung und aus einer Rippe (18), die aus dem plattenartigen Element (16) herausragt und die eine äußere Oberflächenform hat angepaßt für einen gegenseitigen Eingriff mit der inneren Oberflächenform der Nut (13) und die ein doppelzapfiges Querelement (19) aufweist, angeordnet an einem Ende der Rippe (13), zu der es sich vertikal erstreckt, wobei während der Drehung der Stange (1) die gewölbten Klauen (10a, 10b) der Gabel (10c) in die Kopplungseinrichtung (16-20) eingeschoben werden, um eine Schließstellung zu erreichen, in der die Gabel (10c) das doppelzapfige Querelement (19) ergreift und sich die Nut (13) mit der Rippe (18) verrastet, um damit die Tür zu schließen und zu sperren,

dadurch gekennzeichnet

daß das doppelzapfige Querelement (19) im wesentlichen zylindrische Form hat, dessen Enden über die Rippe (18) nach oben und unten herausragen, daß ein hervorspringendes Widerlager (20) für die Aufnahme einer ebenen Fläche (15) des einen Endes (14) des horizontalen Teiles (10) auf dem erwähnten plattenartigen Element (16) an einem Ende angeordnet ist, das sich gegenüber dem Doppelzapfenelement (19) befindet, wobei das herausragende Widerlager (20) in Richtung gegen das Ende der Rippe (18) weist, an dem das doppelzapfige Querelement (19) angeordnet ist, und zwar derart, daß ein spitzer Winkel zwischen der Erstreckung des plattenförmigen Elementes (16) und der Erstreckung des hervorspringenden Widerlagers (20) vorliegt, wobei die ebene Fläche (15) des horizontalen Teiles (10) teilweise abgeschrägt ist und teilweise die Form einer geneigten Ebene derart hat, daß die ebene Fläche (15) im Sitz des hervorspringenden Widerlagers (20) in geschlossener Stellung aufgenommen ist, wobei sich die Rippe (16) ununterbrochen längs des plattenartigen Elementes vom doppelzapfigen Querelement (19) bis zum hervorspringenden Anschlag (20) erstreckt; und daß sich die Nut (13) ununterbrochen im horizontalen Teil (10) vom als Gabel (10c) ausgebildeten Ende bis zum entgegengesetzten Ende (14) derart erstreckt, daß die Nut (13) am Ende (14) offen ist, daß ferner die Klauen (10a, 10b) der Gabel (10c) gewölbte Spitzen (11, 11a) aufweisen, wobei die Größe der Klauen (10a, 10b), der Gabel (10c), der Nut (13) und der Rippe (18) so bemessen sind, daß die Kopplung zwischen dem Haken (11) und dem Kopplungselement (16-20) zu wirken beginnt, wenn die gewölbten Spitzen (11, 11a) der genannten Klauen (10a, 10b) als Hebel auf dem doppelzapfigen Quer-

element (19) aufzusetzen beginnen infolge einer anfänglichen Drehung der genannten Stange (1), wobei sich die Nut (13) schrittweise rund um die Rippe (18) bei Weiterdrehung der Stange (1) anlegt und wobei, wenn die Verkopplung abgeschlossen ist, die geneigte ebene Fläche (15) des horizontalen Teiles (10) fest gegen das hervorspringende Widerlager (20) angelegt ist.

2. Vorrichtung nach Anspruch 1,

dadurch gekennzeichnet,

daß die Nut (13) und die Rippe (18) im wesentlichen konische Querschnitte haben, um deren gegenseitige Verkopplung zu erleichtern und die Stabilität der Vorrichtung zu verbessern.

3. Vorrichtung nach Anspruch 1,

dadurch gekennzeichnet,

daß die gewölbten Spitzen (11, 11a) der Klauen (10a, 10b) der Gabel (10c) die Form eines Zahnes od. dgl. haben, wobei die gewölbte Spitzen (11, 11a) derart ausgebildet sind, daß Anfangsauflagebereiche der Klauen (10a, 10b) auf dem doppelzapfigen Querelement (19) gebildet werden.

4. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche,

dadurch gekennzeichnet,

daß das plattenartige Element (16), das das doppelzapfige Querelement (19) und die Rippe (18) aufweist, fest mit dem Türrahmen assoziiert ist und das plattenartige Element mit Löchern (17) für Bolzen versehen ist.

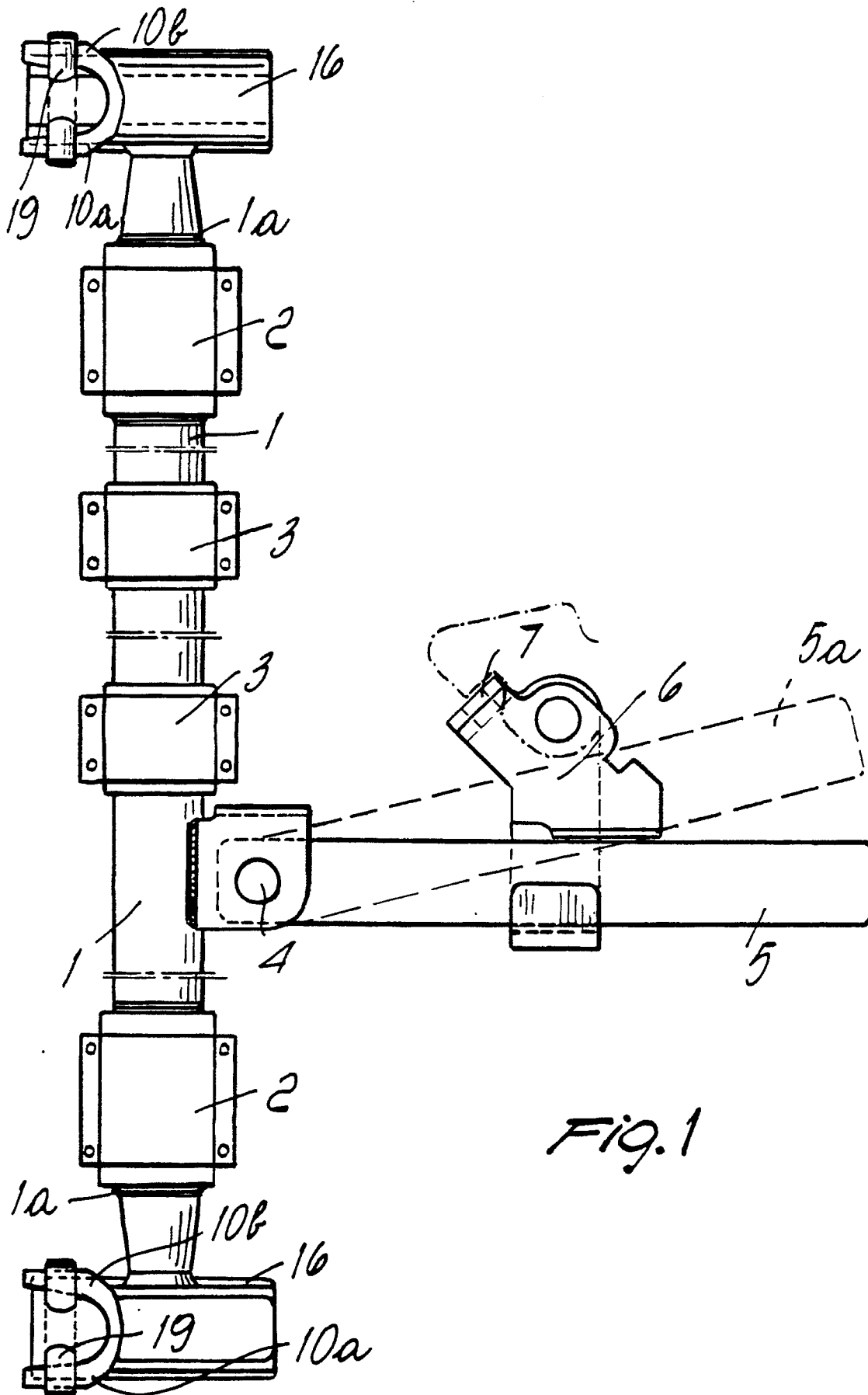


Fig. 1

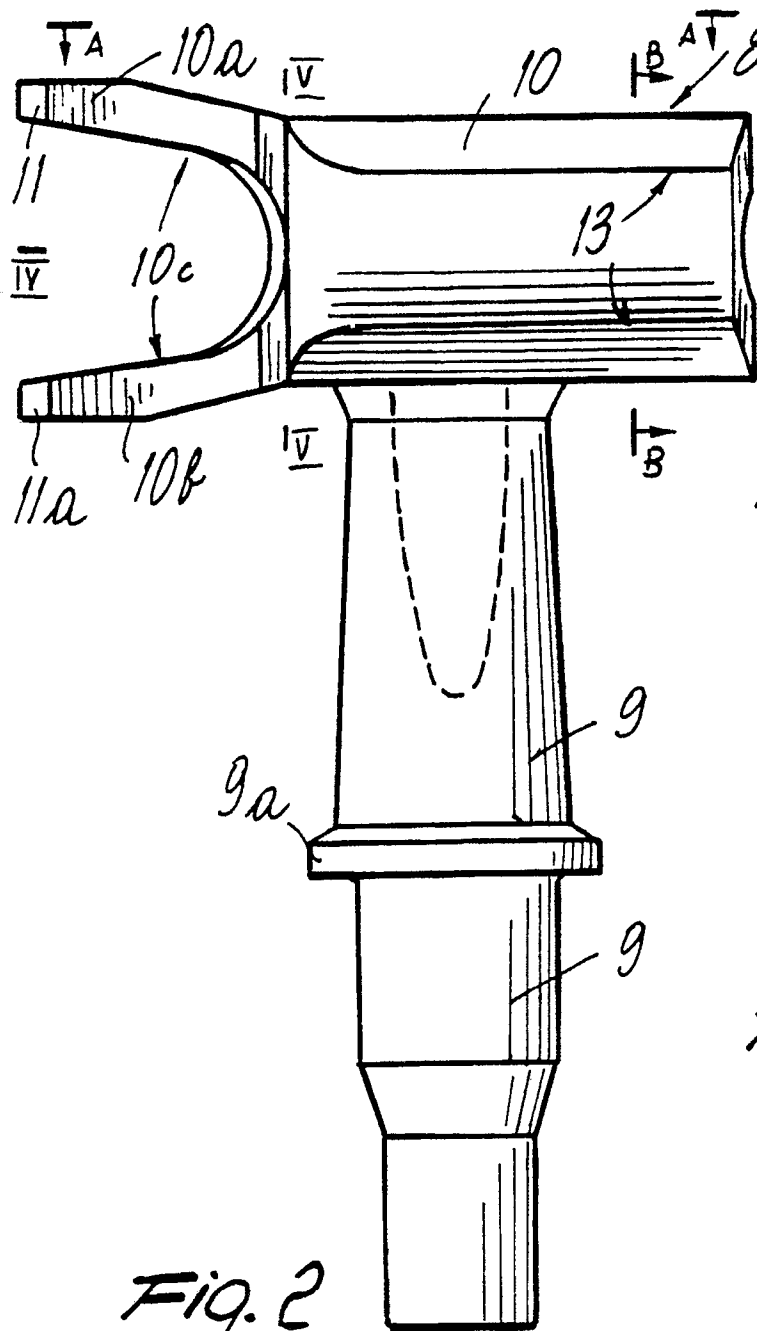


Fig. 2

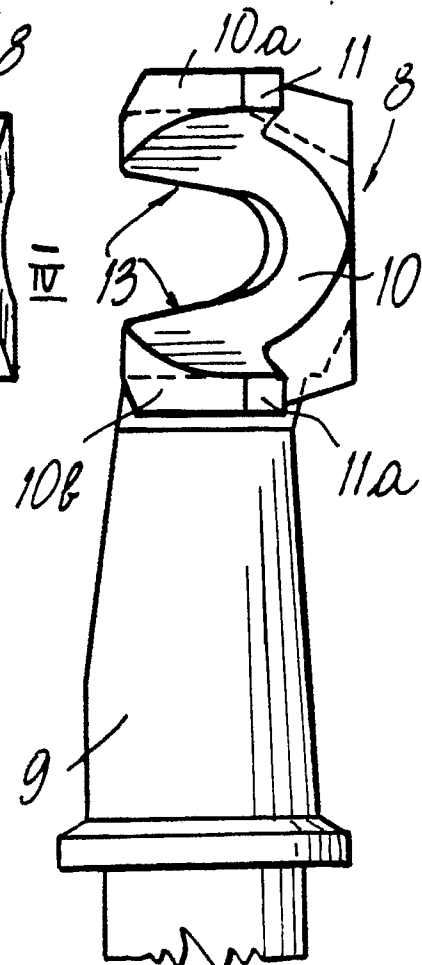


Fig. 3

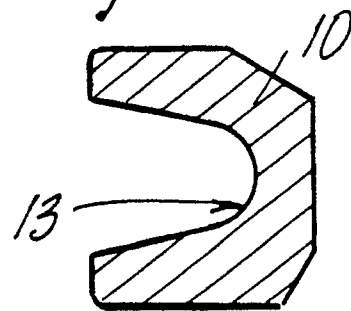


Fig. 5

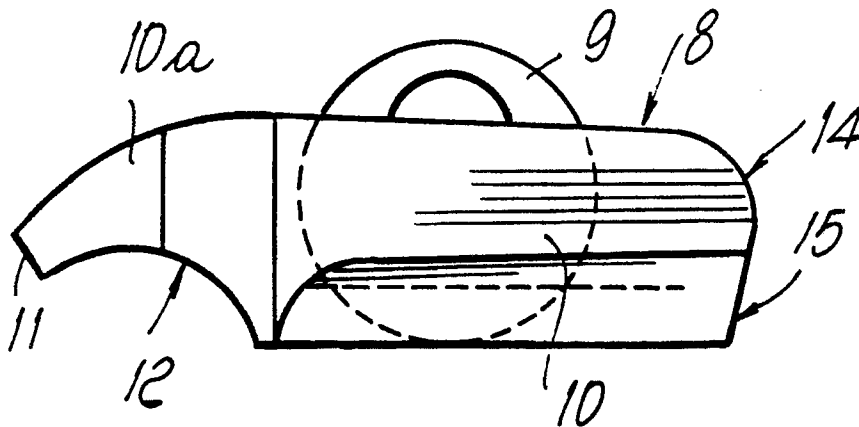


Fig. 4

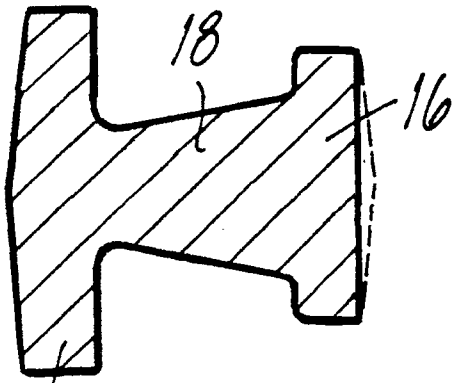


Fig. 8

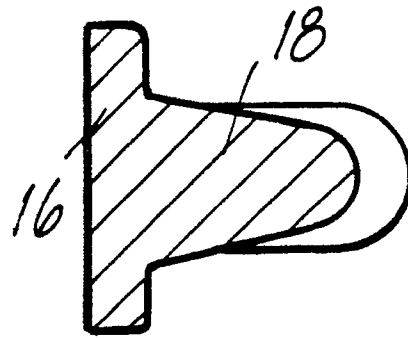


Fig. 9

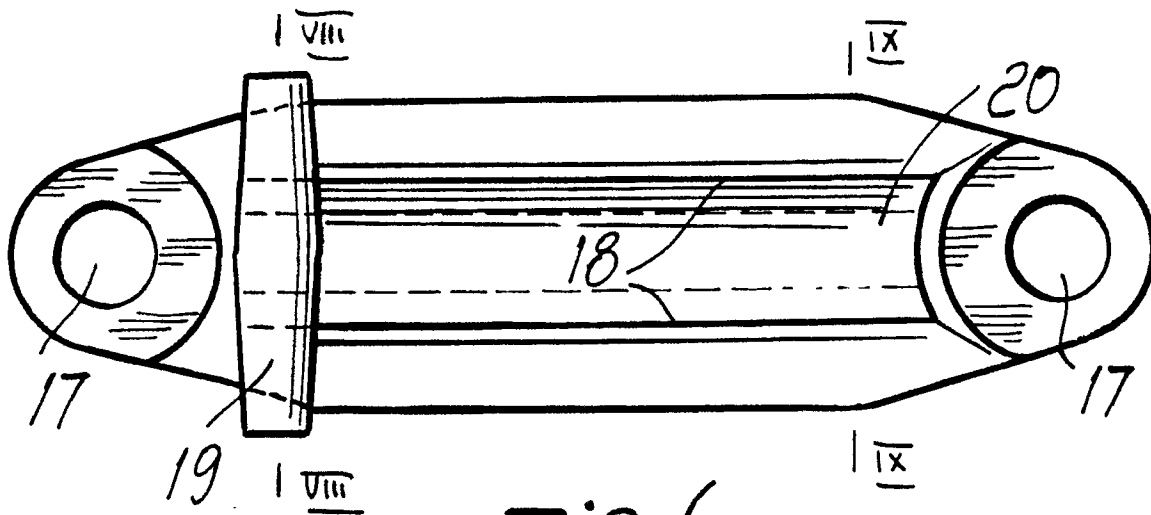


Fig. 6

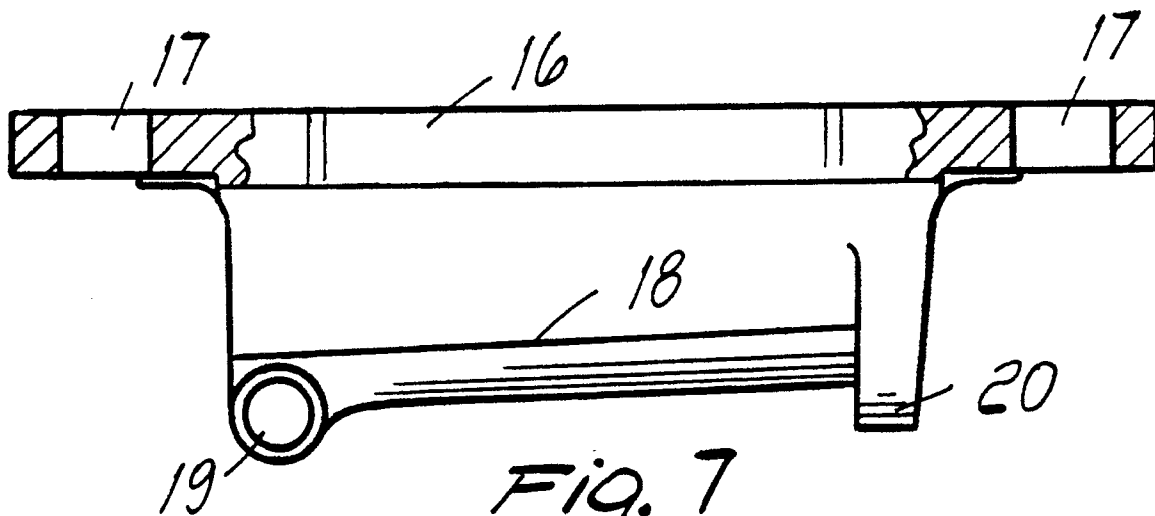


Fig. 7

