(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 632 534 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94107961.8**

(51) Int. Cl.[6]: **H01R 13/506**

(22) Date of filing: **24.05.94**

(30) Priority: **25.05.93 DE 4317344**

(43) Date of publication of application:
04.01.95 Bulletin 95/01

(84) Designated Contracting States:
AT ES FR GB IT NL SE

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(54) Electric Connector.

(57) For an electric connector, in particular between a generator and an electronic controller for inflatable restraint systems (airbags) in motor vehicles, with a connector housing for housing the contact tubes with leads, where the connector housing in the coupling position lifts a jumper, disposed in a receptacle for the generator-sided plug pins, from the plug pins, it is provided in order to simplify the assembly and mount the connector reliably on the generator, that the connector housing (1) exhibits an assembly opening (2), which can be closed by means of a cover member (11), that the cover member (11) can slide over the assembly opening (2) of the connector housing (1) and can be held at the connector housing (1) by means of a pin (16), arranged in front in the push-on direction, and guide elements (12, 13, 14, 15), attached to the front and rear regions of the longitudinal sides, and can be arrested at the connector housing (1) in a preclick-stop position and click-stop position by means of shoulders (21) designed on the longitudinal sides, and strip-shaped extensions (18), which reach in the click-stop position as the blocking element behind hook-shaped spring elements (19, 20), which are attached to the connector housing (1) and engage with recesses (24) of the generator (29), and prevent a return swing.

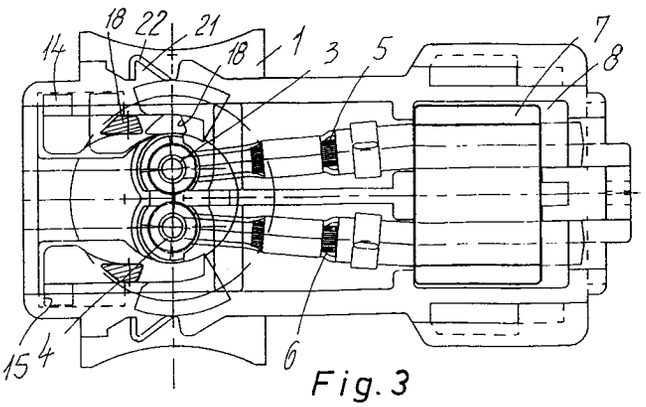

Fig. 3

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The invention relates to an electric connector, in particular between a generator and an electronic controller for inflatable restraint systems (airbags) in motor vehicles, with a connector housing for housing the contact tubes with leads, where the connector housing in the coupling position lifts a jumper, disposed in a receptacle for the generator-sided plug pins, from the plug pins.

Known connectors of the above class are used in ignition systems in order to avoid unwanted triggering of ignitions. They exhibit the drawback that not only are the designs of said connectors complicated but the connection between connector housing and ignition generator is unstable, thus enabling unintentional separations and preventing the ignition systems from functioning reliably.

The object of the invention is to provide a connector, whose construction and assembly is simple, and to provide measures for a reliable hold of the same at the generator.

This problem is solved according to the invention in that the connector housing exhibits an assembly opening, which can be closed by means of a cover member, that the cover member can slide over the assembly opening of the connector housing and can be held at the connector housing by means of a pin, arranged in front in the push-on direction, and guide elements, attached to the front and rear regions of the longitudinal sides, and can be arrested at the connector housing in a preclick-stop position and click-stop position by means of shoulders designed on the longitudinal sides, and strip-shaped extensions, which reach in the click-stop position as the blocking element behind hook-shaped spring elements, which are attached to the connector housing and engage with recesses of the generator, and prevent a return swing. The connector housing, designed thus, can be equipped in a simple manner with contact tubes and leads, while the dual function of the cover member guarantees that the connector housing is closed reliably and mounted on the generator, whereby only a simple sliding movement of the cover member is required for these operations.

It is self-evident that the receptacle provided with the jumper can be formed by means of a tube, which may or may not be mounted in a prefabricated state on the connector housing, e.g. a plug extension, and can be attached together with the connector housing to the generator or designed separately from the connector housing directly on the generator.

The design of the connector provides that the extensions are shaped like a wedge and can be slid into the recesses, designed in succession in the shape of saw teeth in the direction of displacement of the cover member in the connector housing. The front side of each extension exhibits expediently an inclined plane, a state that results, subject to the influence of a component of the push-on force that acts on the inclined planes at right angles to the direction of displacement, in the corresponding generator parts bending up; when said generator parts are then run over, they automatically grasp behind the extensions.

In addition, it is provided that the guide bodies are formed simply by means of strips and/or ribs and/or wedge elements, which are designed by grasping under the projections or by sliding in grooves. Finally, in order to ensure that electric and/or magnetic fields will not build up in the region of the leads it is provided that the connector housing accepts an electric attenuating element, which envelops the contact tubes and is made, e.g., of a ferrite material. The attenuating element can be designed as a prism and exhibit passage openings for the leads.

The embodiment depicted with the features that are essential to said invention in the figures shows how the invention can be designed.

Figure 1 depicts a connector with a receptacle for a jumper in the separating position.

Figure 2 depicts a connector according to Figure 1 in the coupling position.

Figure 3 is a top view of an open connector.

Figure 4 depicts a connector that is open.

Figure 5 is a top view of a connector with preclick-stopped cover member.

Figure 6 is a partial view of a connector.

Figure 7 is a front view of a connector.

Figure 8 is a sectional view of a cover member.

Figure 9 is a side view of a cover member.

Figure 10 is a top view of a cover member.

Figure 11 is a front view of a cover member.

Figure 12 is a sectional view along the line XII-XII of Figure IX; and

Figure 13 is a reduced bottom view of a plug extension with a tube.

A plastic connector housing, which exhibits an assembly opening 2 in the region of its upper side, is denoted as 1 in the figures. Socket contacts 3 and 4, which are connected to leads 5 and 6, can be inserted into the connector housing via the assembly opening 2. The leads 5 and 6 are run through boreholes of an attenuating element 7 made of ferrite material, which is situated in an extension 8 of the connector housing 1. The connector housing 1 is provided on the underside with a plug extension 9, into which the socket contacts 3 and 4 dip with a partial length up to the vicinity of the plug openings 10. A cover element, which is used as the closing element of the assembly opening 2 of the plug housing 1, is denoted as 11. The cover member 11 is provided with shoulders 12, 13, 14, and 15, which can be slid into guides of the connector housing 1 in order to hold the cover

member 11. In addition, the front end 11' of the cover member 11 exhibits a pin 16, which can be made effective with a hole 17. Shoulders 18, which serve as the blocking elements for spring elements 19, 20 (Figure 8) that are designed on the connector housing, are moulded at the bottom to the cover member 11.

Following insertion of the socket contacts 3, 4 of the leads 5, 6 and the attenuating element 7, the cover member 11, as apparent from Figures 1, 3, and 4, can be slid into a pre-click-stop position onto the connector housing 1. In the pre-click-stop position the wedge-shaped shoulders 21 of the cover member 11 engage with recesses 22, which are arranged like saw teeth in succession on the connector housing 1. In so doing, the shoulders 18 assume the positions shown with the shaded areas (Figures 3 and 4). When the cover member 11 is pushed further, possibly after completed attachment of the connector housing 1 to a tube 27 of the generator 29, the shoulders 21 move into the recesses 28 of the connector housing, said recesses forming a click stop position. At the same time the pin 16 reaches into the hole 17 of the connector housing 1. Furthermore, the connector housing 1 dips with the hook-shaped ends 19', 20' of the spring elements 19, 20 into recesses 24, which cause the connector housing 1 to stop at the generator 29 and by means of which the shoulders 18, which have pushed themselves between the spring elements 19, 20 and the connector housing 1, are prevented from swinging back unintentionally.

The tube 23 receives a jumper 25, whose spring tongues 26 rest against the plug pins (not illustrated) attached to the generator 29 prior to depositing the plug housing 1 on the generator 29. As soon as the connector housing 1 is attached to the generator 29, the plug extension 9 pushes itself into the tube 23. In so doing, the socket contacts 3, 4 interact with the plug pins of the generator 29 and during the subsequent plugging action the spring tongues 26 of the jumper 25, as depicted in Figure 2, are swung outwardly by means of the plug extension 9 in order to release the plug pins.

Moreover, the tube 23 is provided with a coding extension 30, which can be made effective with a groove-shaped recess 31 in the plug extension 9.

Claims

1. Electric connector, in particular between a generator and an electronic controller for inflatable restraint systems (airbags) in motor vehicles, with a connector housing for housing the contact tubes with leads, where the connector housing in the coupling position lifts a jumper, disposed in a receptacle for the generator-sided plug pins, from the plug pins, characterized in that the connector housing (1) exhibits an assembly opening (2), which can be closed by means of a cover member (11), that the cover member (11) can slide over the assembly opening (2) of the connector housing (1) and can be held at the connector housing (1) by means of a pin (16), arranged in front in the push-on direction, and guide elements (12, 13, 14, 15), attached to the front and rear regions of the longitudinal sides, and can be arrested at the connector housing (1) in a preclick-stop position and click-stop position by means of shoulders (21) designed on the longitudinal sides, and strip-shaped extensions (18), which reach in the click-stop position as the blocking element behind hook-shaped spring elements (19, 20), which are attached to the connector housing (1) and engage with recesses (24) of the generator (29), and prevent a return swing.

2. Connector as claimed in claim 1, characterized in that the connector housing (1) accepts an electric attenuating element (7), which envelops the leads (5, 6) to the contact tubes (3, 4) and is made, e.g., of a ferrite material, for electrical and/or magnetic fields that build up in the region of the leads (5, 6).

3. Connector as claimed in claim 1, characterized in that the extensions (21) are wedge-shaped and can be slid into the recesses (22, 28), which are designed in succession in the shape of saw teeth and form pre-click-stop and click-stop positions in the push-on direction of the cover member (11) in the connector housing (1).

4. Connector as claimed in claim 1, characterized in that the guide elements are formed by strips and/or ribs and/or wedge elements.

5. Connector as claimed in claim 1, characterized in that the receptacle exhibiting the jumper (25) is formed by means of a tube (23) receiving a plug extension (9) that is stationary in the connector housing.

6. Connector as claimed in claim 5, characterized in that the plug extension (9) exhibits a groove-shaped recess (31), which forms together with a shoulder (30), which is rigidly attached to the tube, a coding between connector housing (1) and tube (23).

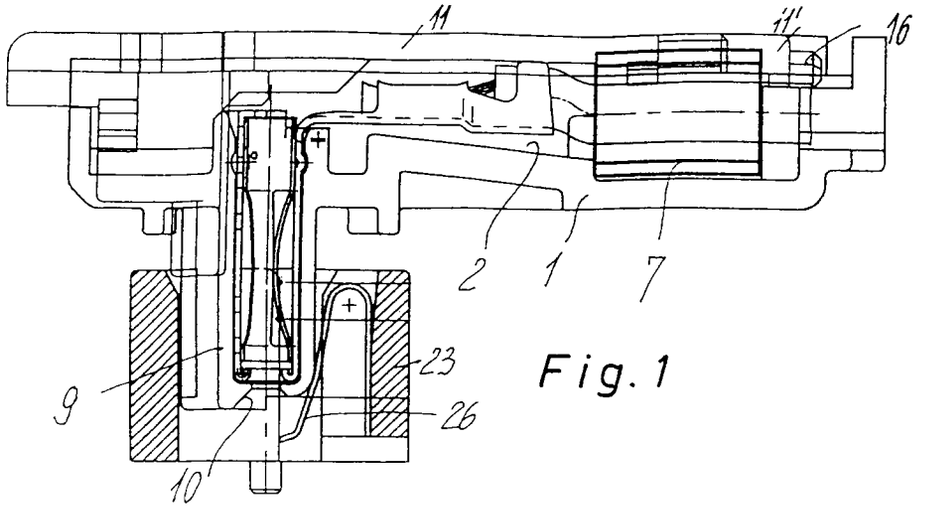


Fig. 1

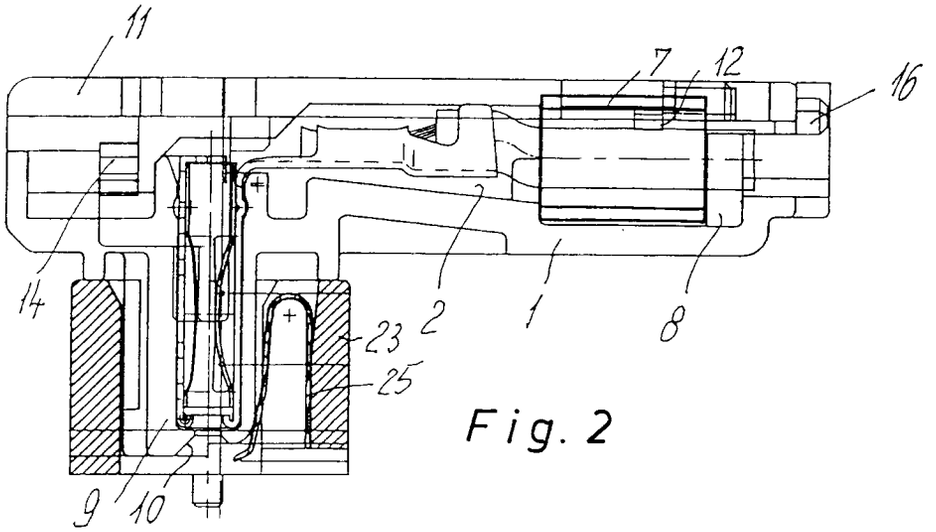


Fig. 2

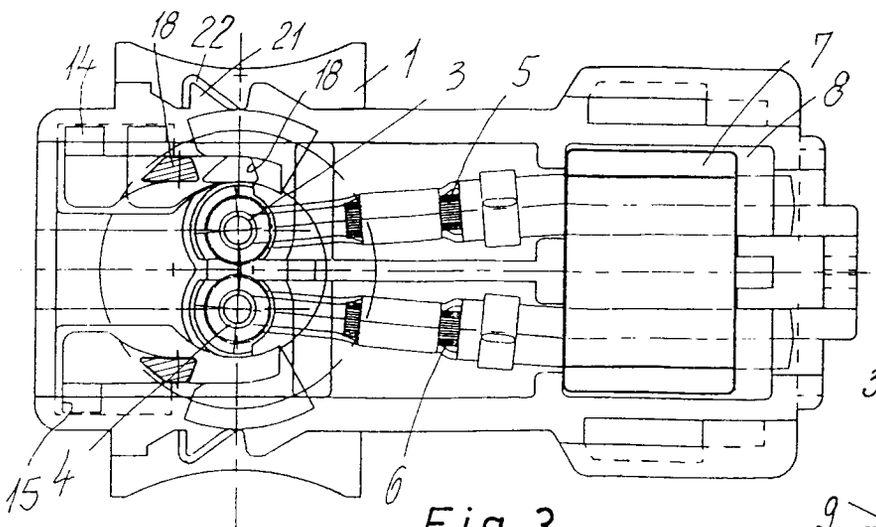
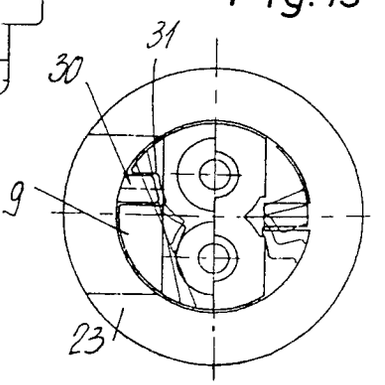


Fig. 3

Fig. 13



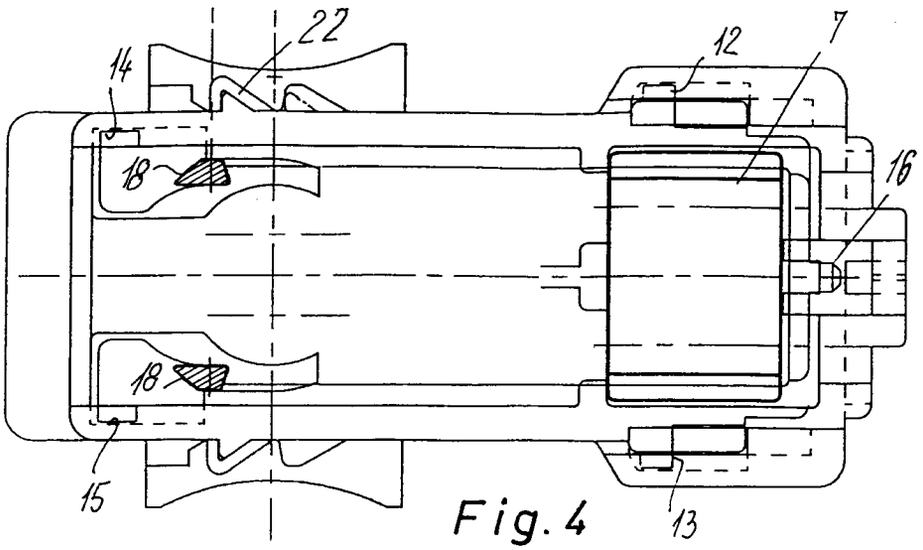


Fig. 4

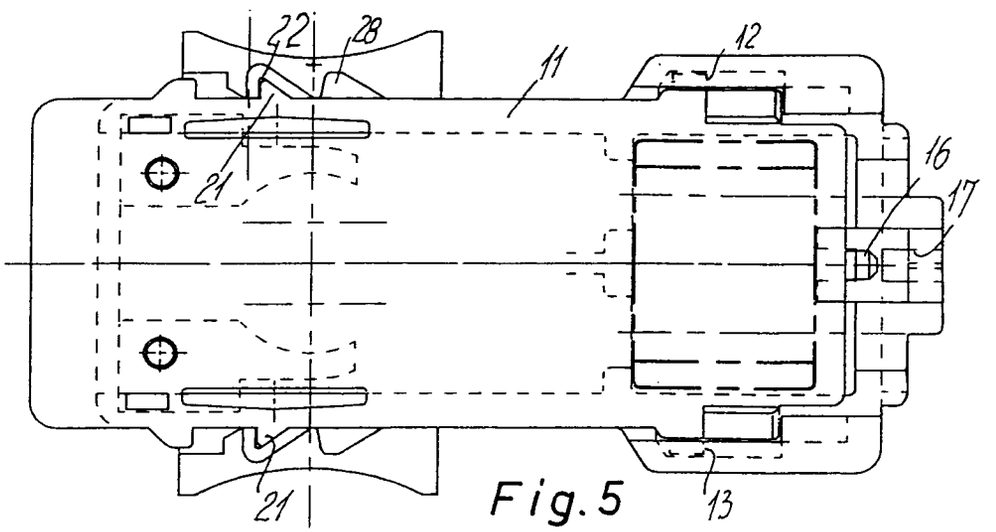


Fig. 5

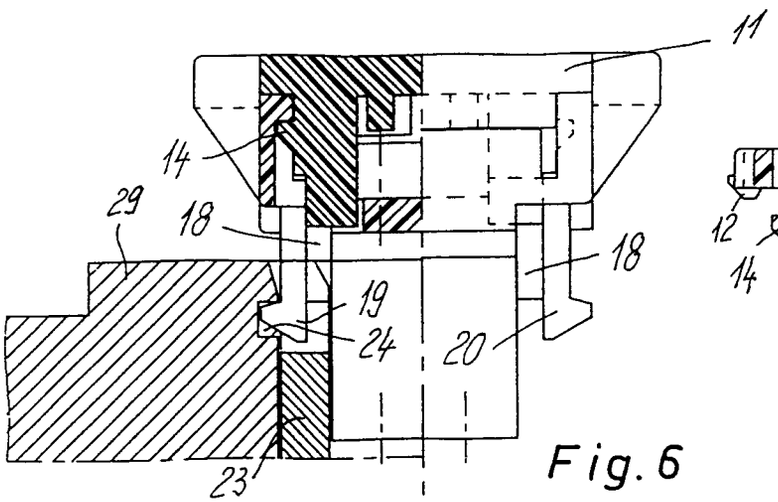


Fig. 6

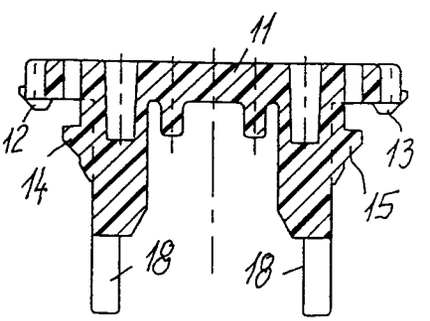


Fig. 12

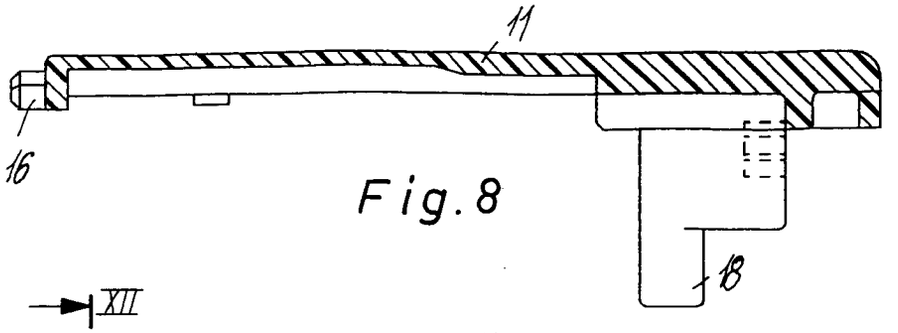


Fig.8

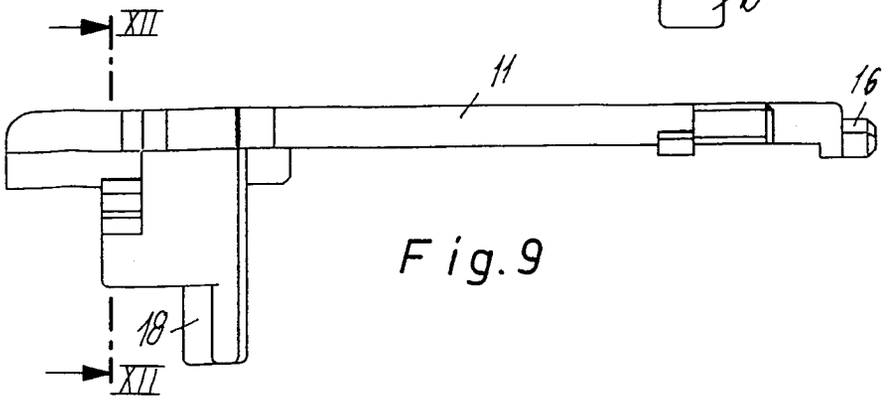


Fig.9

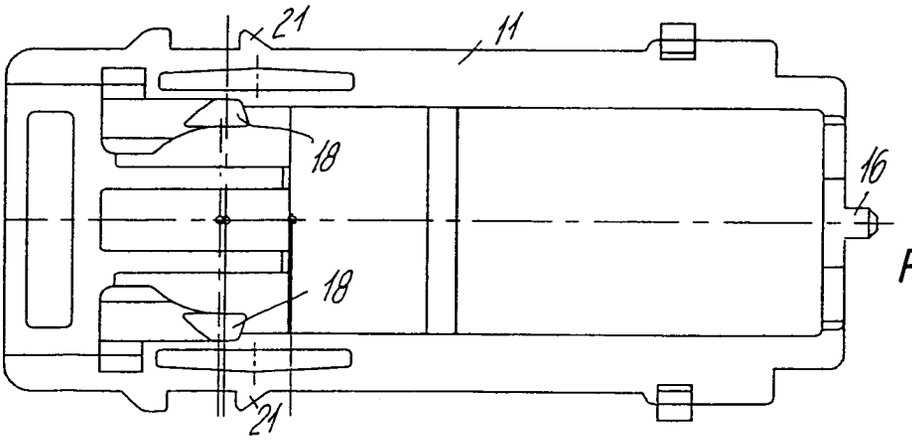


Fig.10

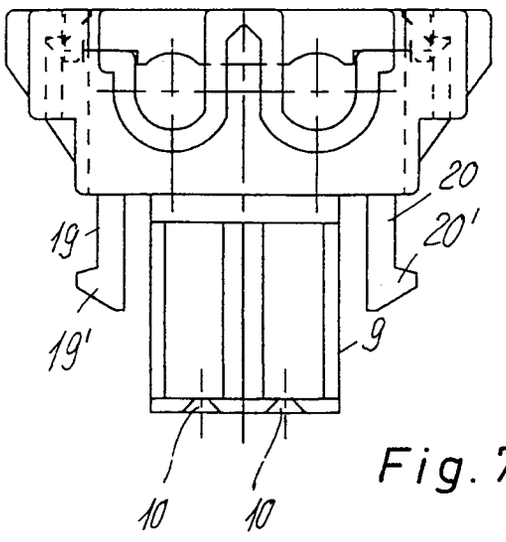


Fig.7

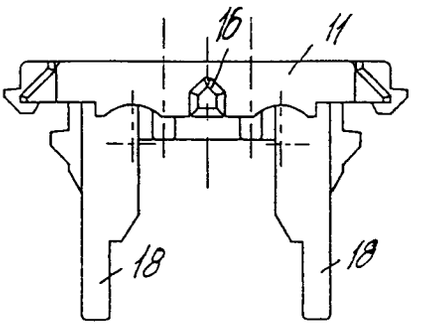


Fig.11