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The invention relates to a connection terminal having:

- at least one busbar piece and
- at least one clamping spring,

with the connection terminal having at least one spring-force clamping connection, which is formed from a clamping spring and a portion of a busbar piece, in order to clamp an electrical conductor at a clamping point between a clamping portion of the clamping spring and the busbar piece portion,

- and having an insulating-material housing which has at least one conductor insertion opening which leads to an associated spring-force clamping connection and extends in a conductor insertion direction,
- and having at least one pivotably mounted operating lever which is designed to interact with at least one clamping spring by means of an operating portion in order to open at least one associated spring-force clamping connection when the operating lever is pivoted, and has an operating arm which adjoins the operating portion.

DE 299 15 515 U1 discloses a spring terminal for connecting electrical conductors having an insulating-material housing which has a connection clip with a clamping spring which interacts with a busbar piece. The insulating-material housing has an integrated operating element in the form of an eccentric lever which is rotatably mounted in the insulating-material housing. The rotation axis of the eccentric lever is situated substantially vertically over the clamping point.

DE 87 04 494 U1 discloses a connection terminal having a spring-force clamping connection and an operating lever. The operating lever is pivotably mounted beneath the clamping spring behind the clamping point, as seen in the conductor insertion direction, by way of its rotation axis. An operating tab is bent at the free clamping limb end and interacts with an operating finger of the operating lever in order to open the spring-force clamping connection.

DE 19 84 159 U discloses a clamping device for the connection of electrical conductors by use of a sheet body having a recess for a lever as well as a clamping spring. The lever is arranged in conductor insertion direction behind the electrical conductor to be connected and is composed of a sheet body, which is bent in U-shape and a lever arm, which is mounted in a recess of the sheet body.

EP 1 605 547 A1 discloses a connection terminal comprising a double spring. An operating level is pivotably mounted above a current bar piece for operating of a respective spring element.

EP 1 641 079 A1 shows a connection terminal, wherein a pivotably operating lever is mounted in the insulation housing above the conductor insertion opening and the electrical conductor provided for connection.

DE 20 2009 002 240 U1 describes an electrical terminal clamp comprising an operating tool pivotably mounted in the insulation housing far outside of the electrical terminal provided for connection.

DE 29 22 477 A1 discloses a terminal block comprising a current bar piece having a contact surface designed with roof shape for guiding an electrical conductor. An operating lever is pivotably mounted laterally adjacent to a surface, which adjoins the contact surface.

EP 0 821 433 A1 discloses a connection terminal comprising a rod-shaped operating lever, which is pivotably arranged in the insulation housing between the inserted electrical conductor and the clamping limb of the clamping spring.

JP 2004 319394 A discloses a connection terminal comprising an operating lever, each having an operating tappet for a clamping spring arranged at the right and left side of a swivel bearing arm. An electrical conductor will than reach the clamping point sidewardly pathing each of one of these operating arms, wherein a free space is provided between the conductor insertion opening and the clamping point.

EP 1 081 790 A1 shows a spring terminal for connection of electrical conductors. The electrical conductor is guided along a sidewall of a current bar cage to a connection point. An operating lever is pivotably mounted above the current bar piece.

Proceeding from the above, the object of the present invention is to create an improved connection terminal which is as small as possible and has a spring-force terminal connection and operating lever which is also improved in respect of the force effect of the operating lever on the connection terminal and the conductor guidance.

The object is achieved by the connection terminal having the features of claim 1.

In a connection terminal of the type mentioned at the beginning, the operating lever is pivotably arranged in an associated conductor insertion opening or the extension of the conductor insertion opening continuing in the conductor insertion direction to the clamping point, wherein the axis of rotation of the operating lever is arranged transversely to the conductor insertion direction in the associated conductor insertion opening or the extension of the conductor insertion opening continuing in the conductor insertion direction to the clamping point. The operating lever has two opposing lateral boundary walls for guiding an electrical conductor inserted into a conductor insertion opening in the conductor insertion direction to an associated clamping point.

Due to the pivotable arrangement of the operating lever with its axis of rotation in the conductor insertion opening or in the alignment of the conductor insertion opening towards the clamping point, the rotation of the operating lever takes place in the area of the clamping point or in the space in front of it. This has the advantage that the operating lever can be accommodated in the insulating material housing in an extremely space-saving manner and at the same time serves as the wall of the conductor entry channel for guiding an electrical conductor. The operating lever thus replaces part of the guide wall for an electrical conductor of the conductor entry opening.

It is particularly advantageous when the at least one operating lever is arranged so as to be adjacent to an associated busbar portion, which forms the clamping point, such that the operating lever is arranged in the space between the plane which is spanned by the busbar piece portion and the plane which is parallel thereto and which is defined by the clamping edge of the clamping spring, which is fully open when the operating lever is pivoted. In this case, the operating lever is preferably positioned beneath the busbar piece portion in the conductor insertion direction somewhat in front of or directly beneath the clamping point. The busbar in the portion which forms the clamping point defines, irrespective of any raised portions for a contact edge, a first plane in relation to which a second imaginary plane is spanned. This second plane is spaced apart from the plane of the busbar piece in such a way that the clamping edge of an open clamping spring touches this plane. The intermediate space between the planes forms the preferred space in which the rotation axis of the operating lever should be located, in order to provide a mechanically stable connection terminal which is of extremely

compact construction.

It is particularly advantageous when at least one operating lever enters a cutout in the busbar piece, which cutout is made so as to adjoin a clamping portion of the associated busbar piece. The operating lever then acts, by way of an operating portion, on an operating tab which is arranged next to the clamping portion of the clamping spring as seen over the width of an associated clamping spring, in order to open the clamping spring. It is possible to accommodate the operating lever in a space-saving manner with the aid of the cutout on a side edge of the busbar piece. An operating tab is then produced on the clamping portion of the clamping spring beneath said cutout as seen in the width of the busbar piece and the associated clamping spring, said operating tab then being acted on by the operating portion of the operating lever when the operating lever is pivoted, in order to open the clamping spring. Electrical contact is then made with an electrical conductor adjacent to this portion of the busbar piece or, as seen over the width, adjacent to the operating tab by the clamping portion of the clamping spring and a contact edge of the busbar piece which is preferably situated in front.

The operating tab is preferably released by the clamping spring, for example by being stamped free or cut free, and projects obliquely from the clamping portion of the clamping spring.

The at least one clamping spring is preferably in the form of a clamping spring which is bent in the shape of a U and of which the free clamping portion points obliquely in the direction of an associated busbar piece. With the aid of a clamping spring of this kind which is bent in the shape of a U, it is possible to directly clamp in an electrical conductor without first opening the clamping spring by way of the associated operating lever. This is also known as a direct plug-connection technique.

However, it is also feasible for the at least one operating lever to have an operating arm which extends in the conductor insertion direction or counter to said conductor insertion direction on the lower side or the upper side of the connection terminal. In order to achieve variants of the connection terminal which are of as compact construction as possible, combinations are feasible, in particular, in which the operating arms of the operating levers extend alternately in the conductor insertion direction and counter to said conductor insertion direction or alternately on the lower side and upper side in the same directions or alternately in opposite directions.

These embodiments are particularly dependent on the specific combination of spring-force

connection terminals and the physical position thereof in relation to one another.

The invention will be explained in more detail below with reference to embodiments with the accompanying drawings, wherein Figures 1 to 4 are not covered by claim 1. The figures show:

5

figure 1 - shows a sectional side view of a twin connection terminal having two spring-force connections and associated operating levers;

figure 2 - shows a perspective view of a spring-force terminal connection having associated operating levers in the closed position;

figure 3 - shows a spring-force terminal connection having an operating lever from figure 2, as seen from the other side;

figure 4 - shows a sectional side view of an embodiment of an embodiment of a connection terminal having operating levers which are arranged alternately on the upper side and lower side;

figure 5 - shows a perspective sectional partial view of a multi-row connection terminal as an outlet box terminal;

figure 6 - shows a perspective illustration of an operating lever for the connection terminal from figure 5;

figure 7 - shows a perspective rear view of the operating lever from figure 6;

figure 8 - shows a perspective view of the operating lever from figures 6 and 7 from below;

figure 9 - shows a sectional side view of another embodiment of a multi-row connection terminal in the form of an outlet box terminal with operating levers, which are oriented toward the rear, in the closed position;

figure 10 - shows a sectional side view of the connection terminal from figure 9 with the operating lever in the open position;

figure 11 - shows a side view of an operating lever of the connection terminal from figures 9 and 10; and

figure 12 - shows a plan view of the lower side of the operating lever from figure 11.

Figure 1 shows a connection terminal 1 having an insulating-material housing 2 in which at least one pair of spring-force terminal connections 3a, 3b which are situated opposite one another are installed. The spring-force terminal connections 3a, 3b each have a clamping spring 4 which is bent in the shape of a U, and also a common busbar piece 5.

Each spring-force terminal connection 3a, 3b provides a clamping point by means of a clamping portion 6 which is formed on the free, moving end of the clamping spring, and in particular by means of the clamping edge at the free end of the clamping spring 4 and also on that busbar piece portion 5a which is situated opposite the clamping portion 6. In order to insert an electrical conductor to the clamping point, an associated conductor insertion opening 7 is made in the insulating-material housing for each spring-force terminal connection 3a, 3b. The conductor insertion opening 7 has a diameter which is matched to the maximum possible permissible cross section together with the insulating-material casing of an electrical conductor.

In order to open the clamping springs 4, each spring-force terminal connection 3a, 3b has an operating lever 8 with an operating portion 9 and also an operating arm 10 which adjoins said operating portion and extends in a longitudinal direction.

In figure 1, the operating lever 8a on the left-hand side is shown in the closed position of the clamping spring, and the operating lever 8b on the right-hand side is shown in the open position of the clamping spring. It can be seen that the operating levers 8a, 8b are pivoted from the closed position to the open position through approximately 90°. It is clear that the operating lever 8a, by way of its operating portion 9 and in particular the rotation axis D about which the operating lever 8a, 8b is mounted in a pivotable manner in the insulating-material housing 2 of the connection terminal, is arranged in the space in the associated conductor insertion opening 7 or in the conductor insertion direction L to the clamping point in the continuing extension of the conductor insertion opening 7. However, the rotation axis D, as seen in the conductor insertion direction L, is still positioned in front of the clamping point and is in no way

situated behind the clamping portion 6 of the clamping spring 4 as seen in the conductor insertion direction L.

Said figure also shows that, as seen in the direction of the width of the clamping spring 4, an operating tab 11 is released in addition to the clamping portion 6 and projects obliquely from the clamping portion 6. An eccentric-like, projecting contour of the operating portion 9 of the associated operating lever 8a, 8b acts at least partially on said operating tab 11 during the movement sequence when the operating lever 8a, 8b is pivoted from the closed position (operating lever 8a on the left-hand side) to the open position (operating lever 8b on the right-hand side). In this way, the clamping portion 6 of the clamping spring 4 is moved away from the adjacent busbar piece portion 5a which forms the clamping point, in order to open the clamping spring 4.

Said figure also shows that the operating levers 8a, 8b is accommodated in recesses in the insulating-material housing 2 for to accommodate part of the operating arm 10. In this case, the operating arm 10, in the closed position (operating arm 8a on the left-hand side in figure 1) projects in the opposite direction to the conductor insertion direction L on the respective front side of the associated conductor insertion opening 7 out of the insulating-material housing 2.

An embodiment in which the operating arm 10 is rotated through 180° and points in the conductor insertion direction L in the closed position is optionally also feasible. This is feasible, in particular, for a connection terminal in which only one spring-force terminal connection is present over the illustrated length of the connection terminal in the conductor insertion direction L and a plurality of spring-force terminal connections are arranged in a manner distributed over the width as seen in the viewing direction of figure 1.

In the connection terminal 1 illustrated in figure 1, it is feasible for not only such a pair of spring-force terminal connections 3a, 3b to be provided with associated operating levers 8a, 8b, but also for a plurality of such arrangements to be arranged next to one another over the width of the connection terminal as seen in the viewing direction.

It is also clear from figure 1 that, in the illustrated exemplary embodiment, a jumper insertion opening 12 is provided on the upper side of the insulating-material housing, said jumper insertion opening being open to the upper side of the insulating-material housing 2. The jumper

insertion opening 12 issues into a jumper terminal connection which is formed by a material tab 13 of the busbar 5 and an end 14, which is bent downward, of a clamping spring 4. In this way, busbars 5 which are arranged next to one another and have associated spring-force terminal connections 3a, 3b can be electrically conductively connected to one another over the width, as seen in the viewing direction of figure 1, as desired. Jumper of this kind have at least two comb tines which extend in parallel and are electrically conductively connected to one another by means of a web which runs transversely to said comb tines. At least this transversely running web can be surrounded by an insulating casing in a manner which is known per se.

It is also clear that the insulating-material housing 2 is of two-part construction and has a lower part 2a onto which an upper part 2b is latched. To this end, latching lugs 16 of the lower part 2a enter associated latching openings 17 in the upper part 2b.

Figure 2 shows a perspective view of a spring-force terminal connection 3 which is formed from a clamping spring 4, which is bent in the shape of a U, and a busbar piece portion 5a. It is clear that the busbar piece portion 5a which forms the clamping point has a clamping projection 18 at its free end, said clamping projection providing a defined abutment area of reduced surface area for an electrical conductor. The clamping force of the clamping spring 4 is then concentrated onto this clamping area, which is defined by the clamping projection 18, by means of the electrical conductor, so that the surface pressure is increased in comparison to a planar bearing area. It is also clear that the free end of the busbar piece portion 5a which forms the clamping point is angled obliquely upward in order to provide a guide for an electrical conductor to the clamping edge 18.

It is also clear that the busbar piece portion 5a which forms the clamping point has a cutout 19 in the form of a depression, which the operating portion 9 of the operating lever 8 enters, laterally adjacent to the clamping edge 18. As seen over the width of the clamping spring 4, that is to say approximately in the viewing direction of figure 2, the operating tab 11 is released by the clamping portion 6 of the clamping spring 4 beneath this cutout 19 and extends in the direction of the conductor insertion direction L.

It is clear that the side wall of the operating portion 9 of the operating lever 8 forms a lateral boundary wall for an electrical conductor which is inserted to the clamping point, said boundary wall being used to guide the electrical conductor to the clamping point.

Behind the busbar piece portion 5a which forms the clamping point, the busbar 5 is laterally folded over in such a way that a bearing area 20 for supporting an abutment limb 21 of the clamping spring 4 is created at a distance from and parallel to the busbar piece portion 5a which forms the clamping point.

Figure 3 shows a perspective view of the spring-force terminal connection 3 having an operating lever 8 from figure 2 from the other side. It is clear that a pivot pin 22 projects from the operating portion 9 only on that side which can be seen in figure 3. The pivot pin 22 is circular and therefore defines the rotation axis D about which the operating lever 8 is accommodated in the insulating-material housing 2 in a rotatable manner. The pivot pin 22 is provided in order to enter a corresponding opening or recess (not illustrated) in the insulating-material housing of the connection terminal 1. Therefore, the operating lever 8 is mounted in the insulating-material housing 2 on one side in a rotatable manner by the pivot pin 22 which serves as a bearing. In contrast, the operating lever 8 is only laterally guided in portions by insulating-material walls 2 and/or the busbar piece portion 5a of the insulating-material housing 2, without specific rotary mounting, on the opposite side which can be seen in figure 2.

As illustrated, the open operating lever 8 can hold itself in an over-dead-center position by a suitable contour of the operating portion in concert with the position of the rotation axis D.

It is also clear from figures 2 and 3 that the clamping spring 4 is formed in the form of a U-shaped clamping spring with an abutment portion 21, an adjoining spring bow 23 and, adjoining said spring bow, a clamping portion 6 which extends approximately in the direction of the abutment limb 21.

Figure 4 shows a variant of the connection terminal 1 in a reduced sectional side view. It is clear that the operating lever 8a on the left-hand side of the spring-force terminal connection on the left-hand side projects upward out of the upper side of the insulating-material housing. In contrast, the operating lever 8b on the right-hand side of the spring-force terminal connection 3b on the right-hand side is arranged in a mirror-inverted manner with respect to said operating lever on the right-hand side in such a way that it projects out of the lower side of the insulating-material housing 2.

Further variants are feasible. This applies, in particular, to variants of connection terminals in

which only one spring-force terminal connection and not, as in the exemplary embodiments according to figures 1 and 4, two spring-force terminal connections 3a, 3b which are connected in series are provided, as seen over the length of the connection terminal. In these embodiments, a plurality of such spring-force terminal connections 3a are advantageously arranged in series, as seen over the width, that is to say in the viewing direction of figure 4. In order to save installation space, it may then be advantageous when the operating levers 8 project alternately on the upper side and the lower side as seen over the width.

In this case, a variant is also feasible in which the operating arms 10 project alternately firstly in the conductor insertion direction and, in the spring-force terminal connection 3 next to it, counter to the conductor insertion direction L from the rear side or front side.

In this case, a variant is also feasible in that not only does the direction of the operating arms 10 alternately change, but also the orientation of the operating levers are alternately such that they project out of the upper side and in an adjacent manner out of the lower side of the insulating-material housing 2 or are accommodated in recesses in the upper side and alternately the lower side.

Figure 5 shows, for example, an embodiment of a multi-row connection terminal 1 in the form of an outlet box terminal. This connection terminal 1 has a plurality of spring-force terminal connections 3 which are situated next to one another and are electrically conductively connected to one another and of which the spring-force terminal connection on the left-hand side is shown. It can be seen that a clamping spring 4 is suspended in a busbar piece 5. The clamping spring 4 is again bent in the shape of a U, so that a clamping section 6 with a clamping cap at the free end to form a clamping point projects toward the busbar piece section 5a. In the unloaded state without electrical conductors clamping in, the clamping edge is situated on the busbar piece portion 5a.

In this embodiment, the clamping spring 4 has operating tabs 11 on both sides of the clamping portion 6.

The busbar pieces 5 of the spring-force terminal connections 3 which are arranged next one another obliquely toward the back-right can be electrically conductively connected to one another. However, an embodiment of the connection terminal 1 is also feasible in which in each

case two spring-force terminal connections 3 which are situated next to one another are electrically conductively connected to one another and two or three pairs of such spring-force terminal connections 3 which are electrically conductively connected to one another are provided. Therefore, in each case two conductors for a single-phase voltage supply connection to the connections L (phase), N (neutral conductor) and PE (ground) are each connected to one another, so that a power supply system connection terminal is formed.

It is clear that the operating levers 8 are each arranged next to the clamping points, that is to say next to the busbar piece portion 5a and the clamping portion 6 immediately behind the end of the conductor insertion opening 7 formed in the insulating-material housing 2. The operating portions 9 of the operating levers 8 form a continuation of the wall of the respective conductor insertion opening 7, in order to guide an electrical conductor to the clamping point. Each operating portion 9 interacts with an associated operating tab 11 of the clamping spring 4. The rotation axis of the operating lever 8 is situated, as in the above-described exemplary embodiment, beneath the busbar piece portion 5 in the region of the clamping point. The rotation axis extends transverse to the conductor insertion direction which is predefined by the direction of extent of the conductor insertion opening 7.

It is also clear that the operating arms 10 extend counter to the conductor insertion direction L and are arranged on the upper side of the insulating-material housing 2. The free ends of the operating arms 10 are situated in the region of the front face. The free ends of the operating arms 10 are spaced apart from the boundary walls of the conductor insertion opening 7 or the insulating-material housing 2 in such a way that they can be grasped and pivoted.

It is clear from figure 5, in particular with reference to the conductor insertion openings 7 (illustrated in the center) with the adjoining operating lever 8, that an operating lever, in each case in the exemplary embodiment, is provided in each case to open two spring-force terminal connections 3 which are situated next to one another. As an alternative, in each case one operating lever 8 can be provided for each clamping point.

Figure 6 shows a perspective view of such an operating lever 8 from the front side. However, it is clear in this case that there is an opening 24 in the middle, central region, a guide wall of the insulating-material housing entering said opening in order to guide the operating lever 8 in the insulating-material housing 2 such that it cannot tilt. The opening 24 is surrounded by a

peripheral collar in the upper region. Said collar serves to strengthen and reinforce the operating lever 8.

It is also clear that the operating lever has a pivot pin 22, which serves as a bearing, at its two lateral outer ends. The pivot pins 22 are accommodated in corresponding openings in the insulating-material housing 2.

It can be also seen that in each case two mutually opposite operating portions 9 are provided for each spring-force clamping connection 3, so that an electrical conductor is guided on both sides of these operating portions 9 to the clamping point, after which the electrical conductors exit from the conductor insertion opening 7 from the laterally peripherally bounded conductor insertion opening 7 in the direction of the clamping point.

The mutually opposite operating portions 9 therefore serve as a continuation of the conductor insertion opening 7.

The operating levers 8 can have latching grooves 26 or projecting latching pins on the mutually opposite side edges of the operating arms 10, in order to latch the operating lever to the insulating-material housing 2 in the closed state and to prevent unintentional opening of the operating lever 8 with a reduced force.

Figure 7 shows the operating lever from figure 6 in a view from the rear side. It is clear that the recess 24 which is designed as a slot is in the center of the operating lever 8.

It can be also seen the collar 25 which runs around the upper side of the operating arm 10 and merges with the walls which form the operating portions 9 with the opening 24 (slot) situated therebetween.

Figure 8 shows a perspective view of the operating lever from figures 6 and 7 from the lower side. In this case, it is clear that the opening 24 is closed again in the lower region. It is also clear that the walls which form the operating portions 9 merge with the operating arm 10 by means of webs 27 to the lower side of said operating arm, in order to thereby reinforce the operating arm 10 and to prevent rebounding relative to the operating portions 9. The operating portions 9 have a contour, which is matched to the rotation axis D, in such a way that the open operating lever 8 remains in an over-dead-center position in a self-retaining manner.

It can be also seen that, in addition to the pivot pin 22 in the middle region, there is a guide area 22a for bearing purposes.

Figure 9 shows a further embodiment of a connection terminal 1 having a plurality of spring-force terminal connections 3, which are arranged one behind the other in the viewing direction, and associated operating levers 8. In the illustration, the operating lever 8 is shown at the top in the closed position in which the clamping spring 4 of the spring-force terminal connection 3 is closed.

Figure 10 shows the same operating lever 8 in the open position in which the spring-force terminal connection 3 is open.

It is clear that the operating lever 8, by way of its operating portion 9, is arranged immediately behind the conductor insertion opening 7, once again laterally next to the busbar piece 5 or the busbar piece portion 5a which forms the clamping point. The rotation axis D is again situated in the conductor insertion opening 7 or directly behind it and, as seen in the conductor insertion direction L, just in front of the clamping point and beneath the busbar piece portion 5a which forms the clamping point. The operating arms 10 of the operating levers 8 are directed in the direction of the rear side of the connection terminal 1 away from the conductor insertion opening 7 in the conductor insertion direction L. Therefore, a very compact construction of the connection terminal 1 together with a simple and reliable operation of the spring-force terminal connection 3 is made possible.

It can be also seen that a test opening 28 is provided on the rear side of the insulating-material housing 2 in the lower region, said test opening being open to the clamping spring 4. In this way, the voltage potential which is applied to the spring-force terminal connection can be measured with the aid of a test pin which is inserted into the test opening 28.

Figure 11 shows a side view of the operating lever 8 of the connection terminal 1 from figures 9 and 10. It is clear that the operating arm 10 projects away from the operating portion 9 initially obliquely toward the rear and then in the conductor insertion direction L. Said figure 11 also shows the transverse piece 10c at the lower free end of the operating arm 10.

The operating portion 9 has a lug 30 which is matched to the position of the rotation axis such

that the open operating lever 8 remains in an above-dead-center position in a self-retaining manner.

Figure 12 shows a plan view of the operating arm from figure 11 from below. Said figure clearly shows the construction of the operating arm 10 with two arm portions 10a, 10b and the transverse piece 10c which connects the arm portions 10a, 10b at the free end.

It can be also seen that pivot pins 22 project laterally at the outer sides of the operating portions 9 and are mounted in corresponding recesses in the insulating-material housing 2 of the connection terminal 1.

It can be also seen that the mutually opposite inner sides of the operating portions 9 are inclined in the direction of the free end and have insertion slopes 29 for guiding an electrical conductor without interfering edges.

PATENTKRAV

1. Tilslutningsklemme (1) med:

- mindst et strømskinnestykke (5) og
- mindst en klemmefjeder (4),

hvor tilslutningsklemmen (1) har mindst en fjederkraftklemmetilslutning (3, 3a, 3b), der er dannet af en klemmefjeder (4) og et afsnit (5a) af et strømskinnestykke (5), til ved et klemmested at klemme en elektrisk leder mellem et klemmeafsnit af klemmefjederen (4) og strømskinnestykkeafsnittet (5a),

- og med et isoleringsmaterialehus (2), der mindst har en lederindføringsåbning (7), der fører til en tilknyttet fjederkraftklemmetilslutning (3, 3a, 3b) og strækker sig i en lederindføringsretning (L),
- og med mindst et drejeligt lejret betjeningshåndtag (8, 8a, 8b), der via et betjeningsafsnit (9) er udformet samvirkende med mindst en klemmefjeder (4) til åbning af mindst en tilknyttet fjederkraftklemmetilslutning (3, 3a, 3b) ved drejning af betjeningshåndtaget (8, 8a, 8b), og som har en betjeningsarm (10), der støder op til betjeningsafsnittet (9),

kendetegnet ved, at

- betjeningshåndtaget (8, 8a, 8b) er anbragt drejeligt i en tilknyttet lederindføringsåbning (7) eller i forlængelsen af lederindføringsåbningen (7), der i lederindføringsretning (L) fører videre til klemmestedet, hvor betjeningshåndtagets (8, 8a, 8b) drejeakse (D) er anbragt på tværs af lederindføringsretningen i den tilknyttede lederindføringsåbning (7) eller i forlængelsen af lederindføringsåbningen (7), der i lederindføringsretning (L) fører videre til klemmestedet, og at betjeningshåndtaget (8, 8a, 8b) har to indbyrdes modsatliggende laterale afgrænsningsvægge til at lede en elektrisk leder, der i lederindføringsretning (L) er indført i en

lederindføringsåbning (7), til et tilknyttet klemmested.

2. Tilslutningsklemme (1) ifølge et af de foregående krav, **kendetegnet ved, at** det mindst ene betjeningshåndtag (8, 8a, 8b) har en betjeningsarm (10), der i lukket tilstand af den tilknyttede fjederkraftklemmetilslutning (3, 3a, 3b) strækker sig i lederindføringsretning (L).

3. Tilslutningsklemme (1) ifølge et af de foregående krav, **kendetegnet ved, at** det mindst ene betjeningshåndtag (8, 8a, 8b) er anbragt stødende op til et tilknyttet strømskinnestykkeafsnit (5a), der danner klemmestedet, således, at betjeningshåndtaget (8, 8a, 8b) er anbragt drejeligt i rummet mellem det af strømskinnestykkeafsnittet (5a) opspændte plan og et hermed parallelt plan, hvori klemmekanten af den ved omdrejning af betjeningshåndtaget (8, 8a, 8b) fuldstændigt åbnede klemmefjeder (4) ligger.

4. Tilslutningsklemme (1) ifølge et af de foregående krav, **kendetegnet ved, at** mindst et betjeningshåndtag (8, 8a, 8b) dykker ned i en udskæring (19) i strømskinnestykket (5), der er udformet stødende op til et klemmeafsnit af det tilknyttede strømskinnestykke (5a) og til åbning af klemmefjederen (4) med et betjeningsafsnit (9) påvirker en betjeningslaske (11), der set over bredden af en tilknyttet klemmefjeder (4) er anbragt ved siden af klemmefjederens (4) klemmeafsnit (6).

5. Tilslutningsklemme (1) ifølge krav 4, **kendetegnet ved, at** betjeningslasken (11) er frigjort fra klemmefjederen (4) og rager skråt ud fra klemmefjederens (4) klemmeafsnit (6).

6. Tilslutningsklemme (1) ifølge et af de foregående krav, **kendetegnet ved, at** den mindst ene klemmefjeder (4) er en U-formet bøjet klemmefjeder (4), hvis fri klemmeafsnit (6) peger skråt i retning af et tilknyttet strømskinnestykke (5) for at muliggøre en direkte indføring af en elektrisk leder uden forudgående åbning af

klemmefjederen (4) med det tilknyttede betjeningshåndtag (8, 8a, 8b).

7. Tilslutningsklemme (1) ifølge et af de foregående krav, **kendetegnet ved, at** det mindst ene betjeningshåndtag (8, 8a, 8b) har en betjeningsarm (10), der strækker sig på undersiden eller oversiden af tilslutningsklemmen (1) i lederindføringsretning (L) eller modsat herfor.

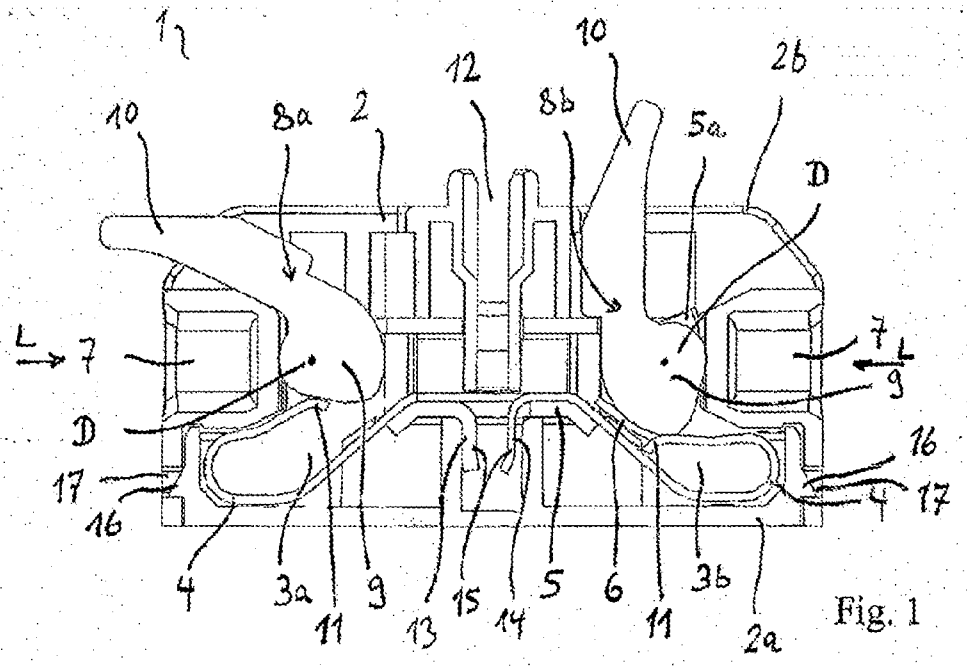
1
10
8a
2
12
10
8b
5a
2b
D
L
7
D
17
16
4
3a
11
9
13
15
14
5
6
11
3b
2a
7
L
9
16
17
4

Fig. 1

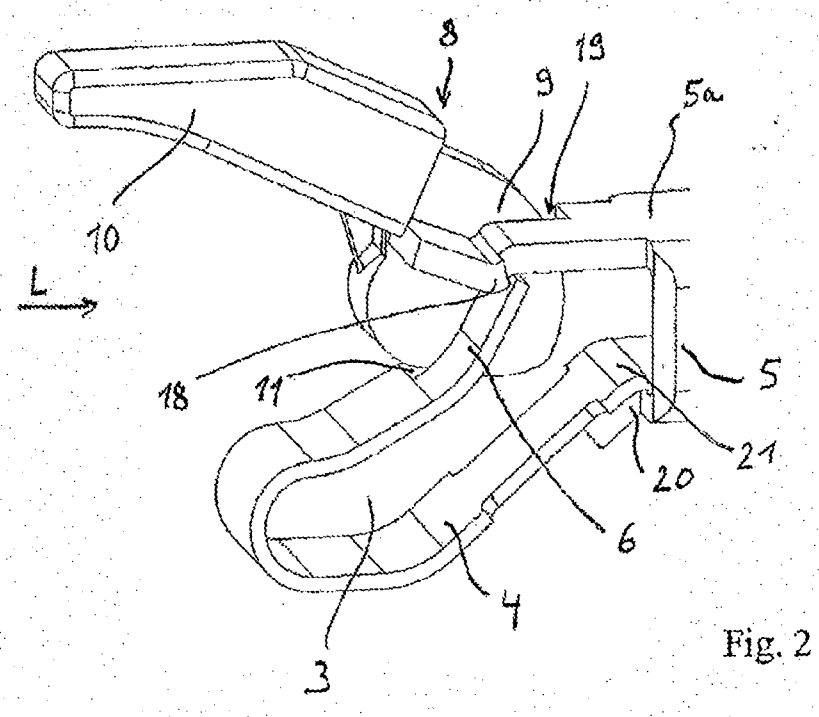
8
9
19
5a
10
L
18
11
5
21
20
6
4
3

Fig. 2

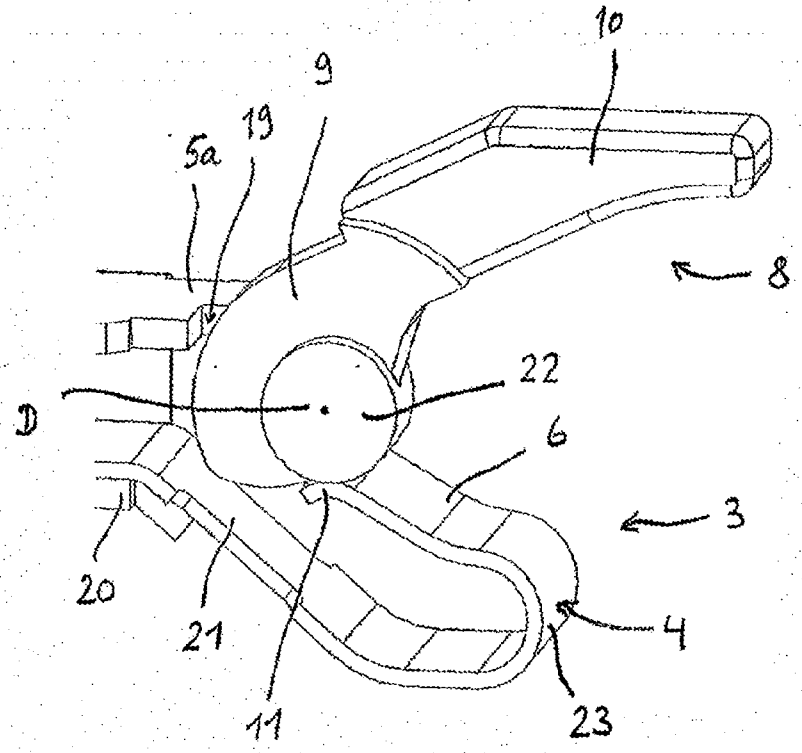

Fig. 3

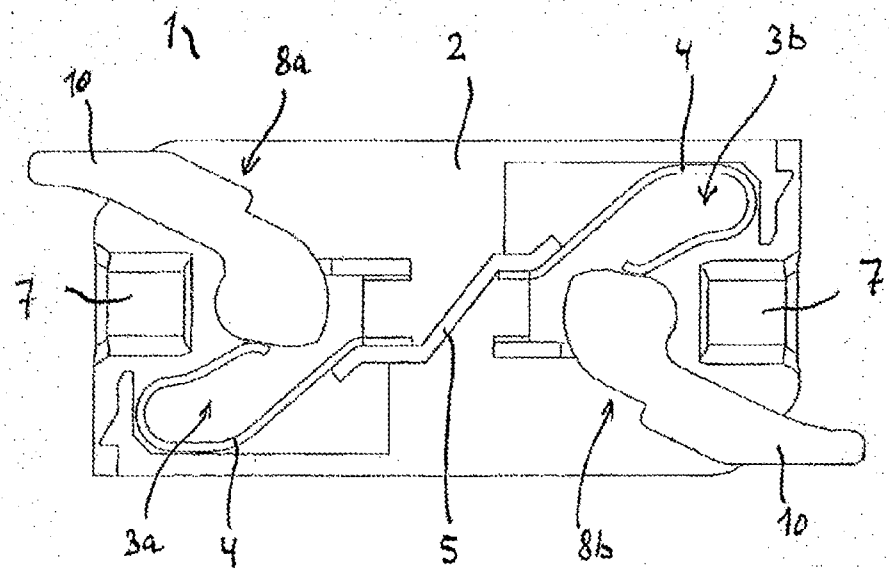

Fig. 4

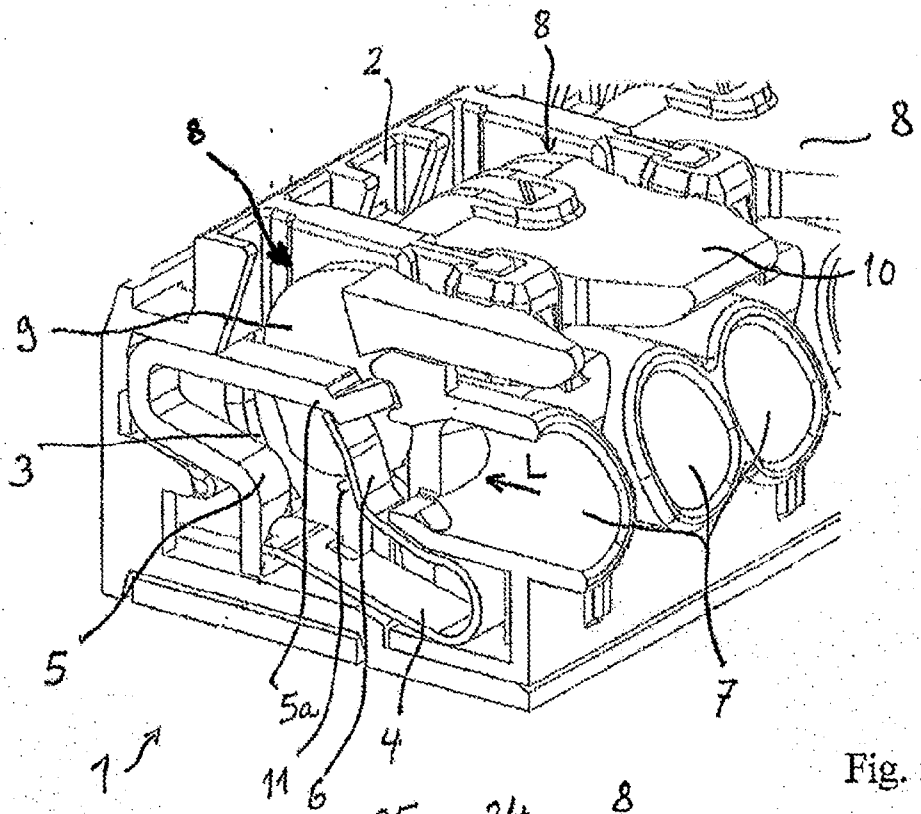

Fig. 5

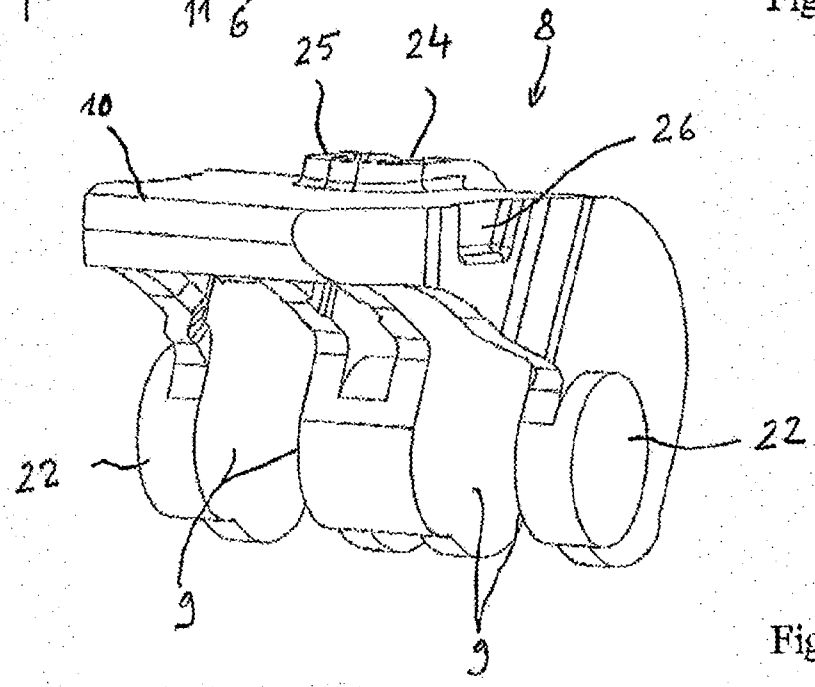

Fig. 6

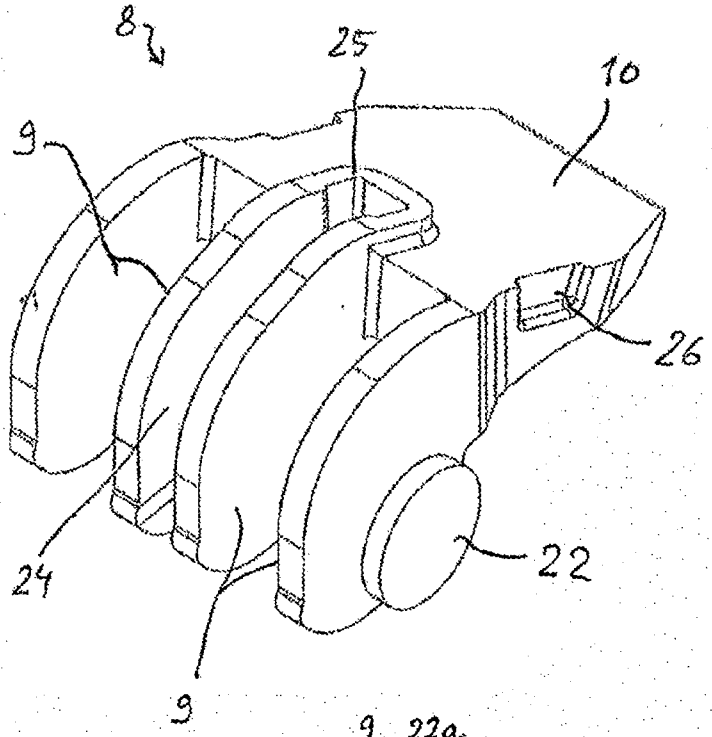

Fig. 7

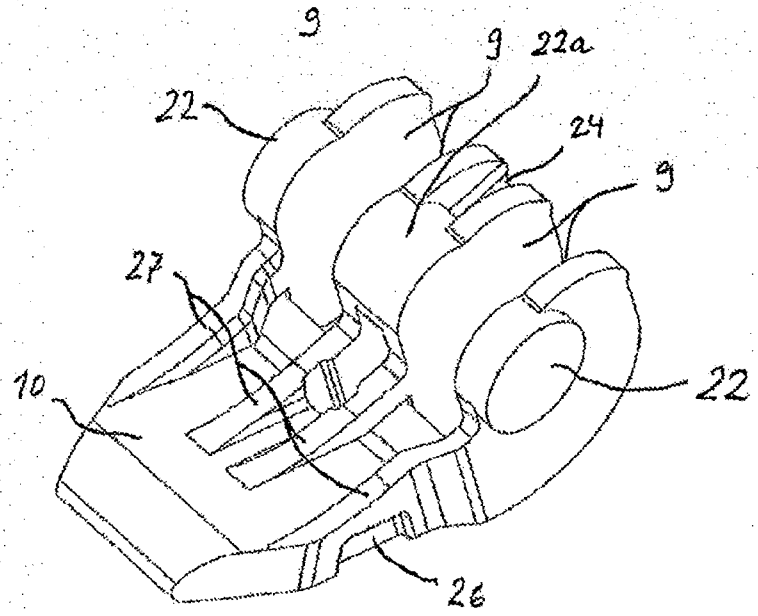

Fig. 8

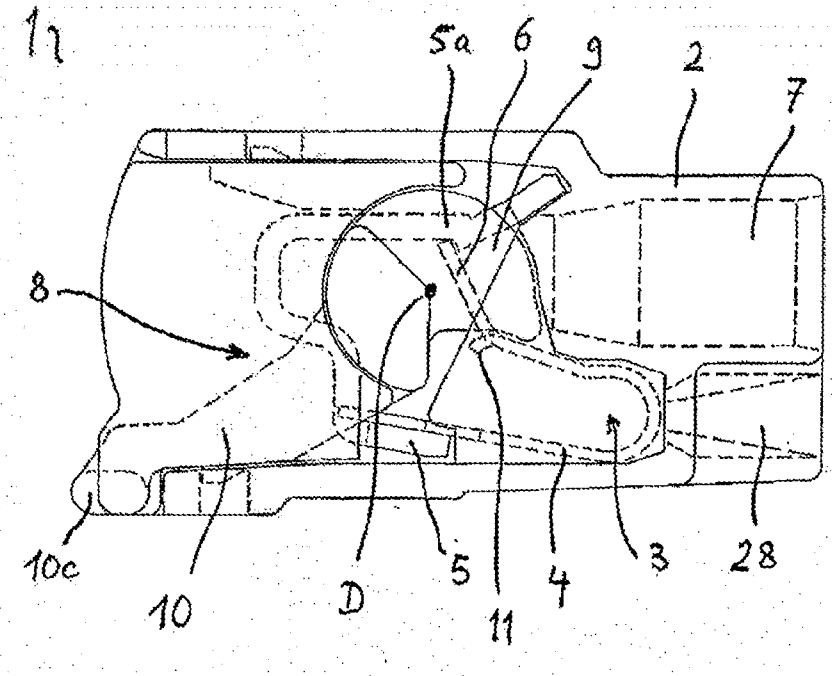

Fig. 9

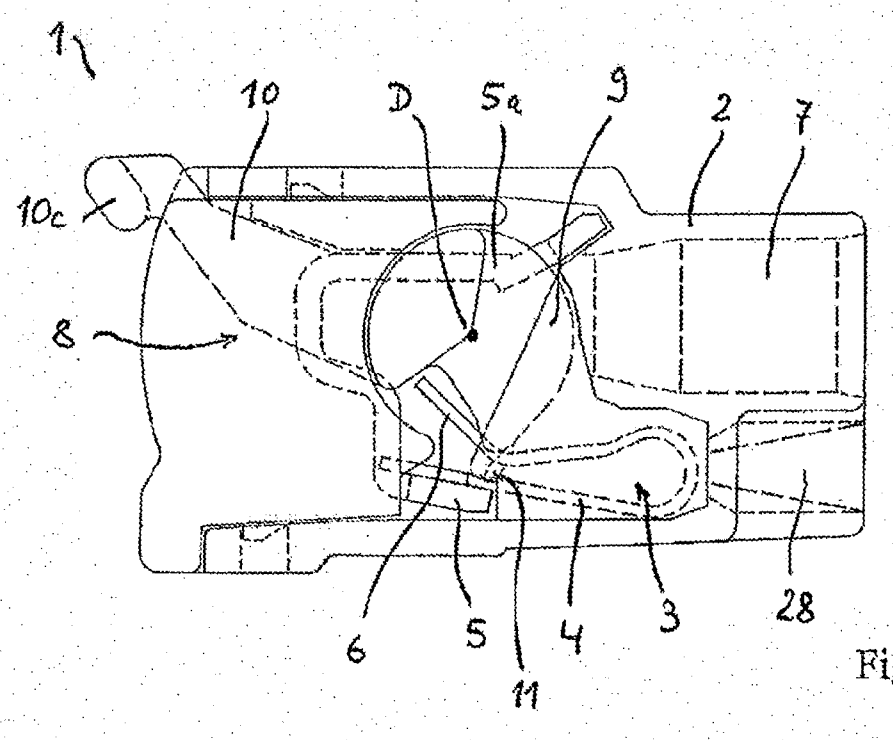

Fig. 10

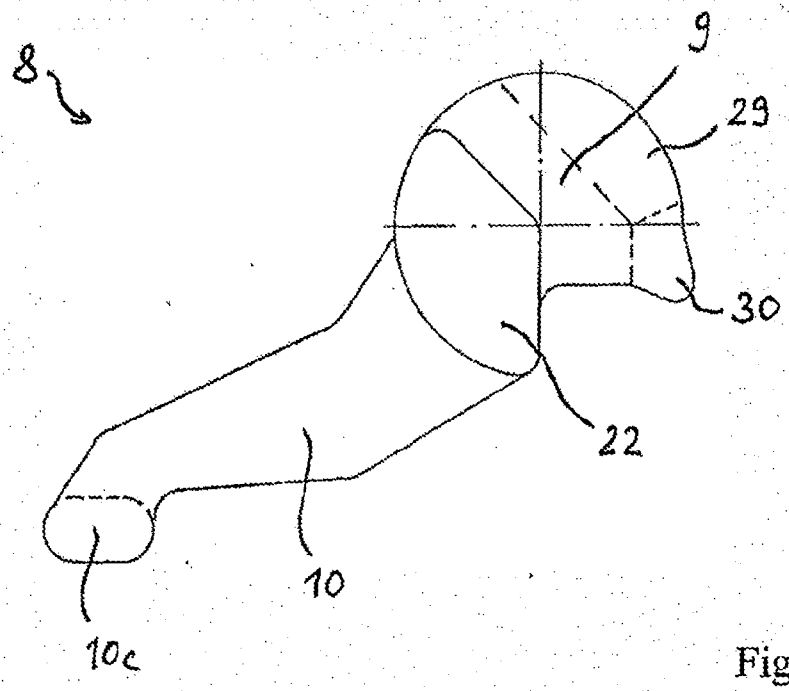

Fig. 11

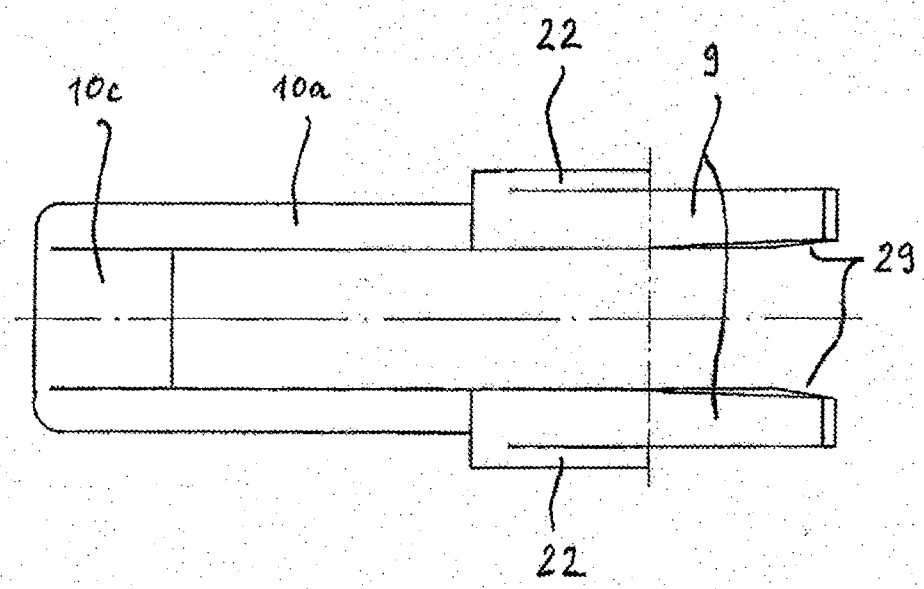

Fig. 12