

5 **Arrangement of disconnect terminals having coupling device,
disconnect terminal having coupling device, and
disconnect terminal having switch status display**

10 The present invention relates to an arrangement of disconnect terminals having at least one coupling device according to the preamble of claim 1. The invention also relates to an disconnect terminal having a coupling device and to a disconnect terminal having a switch status display.

15 Disconnect terminals of this type are used in different applications.

DE 44 44 551 A1 describes a current transformer disconnect terminal having a switching piece in the form of an angle-adjustable contact disk, which ensures by means of a contact drag line that the secondary side of a connected current transformer can never be open when the current passage is separated or closed by the terminal. The contact disk is adjustable in the angle around an axis of rotation by means of a pivot lever. The actuation of the current transformer disconnect terminal, i.e., the manual pivoting of the pivot lever from the one switch position into the other in the case of multiple directly adjacent disconnect terminals can be performed en bloc in that a coupling pin is inserted into the handle knobs of the pivot levers of the directly adjacent disconnect terminals.

DE 44 44 556 A1 relates to switchable terminal blocks having a switching lever handle made of insulating material. The handle is provided with two visible surfaces, of which, in each of the two switch positions of the switching lever, alternately the one visible surface faces toward the viewing direction of the operator and the other visible surface faces away from the viewing direction of the operator in the same switch position. The handles of directly adjacent terminal blocks can be coupled by means of a transparent cap that overlaps two or more handles.

DE 10 2008 014 176 B4 describes a terminal block and also a series disconnecting switch with a knife disconnect for pivotable arrangement in a terminal housing of the terminal block, having a terminal housing, wherein a busbar consisting of two parts and two conductor connection elements for connecting one conductor to each part of the busbar are arranged in the terminal housing, wherein the two parts are connected to one another in a first position of the knife disconnect and are separated from one another in a second position of the knife disconnect. The knife disconnect is partially enclosed by an insulating housing. Actuation of the series disconnecting switch can be performed not only with the aid of a screwdriver, which is inserted for this purpose into an actuating shaft of the insulating housing, but rather also with the aid of a

- 5 switch connection, which comprises two legs and a handle section connecting the legs. Two series disconnecting switches of two terminal blocks arranged adjacent to one another can thus be actuated simultaneously, for which purpose one leg is inserted into the actuating shaft of each series disconnecting switch.
- 10 The known disconnect terminals have proven themselves as such. It is considered disadvantageous that a separate adjustment of the switching levers connected to connecting elements independently of one another is only possible if the connecting element is removed again.
- 15 However, it is desirable to refine these disconnect terminals, wherein a simple, rapid, and reversible switch connection is enabled and a compact structure and a small number of components is maintained or improved, and wherein simultaneously recognizability of the switch position is enabled.
- 20 Embodiments of the present invention seek to solve this problem. Embodiments of the present invention seek to solve the problem by the subject matter of claim 1.

Summary

- According to a first aspect of the present invention, there is provided an arrangement having at least two disconnect terminals and at least one coupling device, wherein
- 25 the at least two disconnect terminals each comprise at least one switching lever, wherein each switching lever is adjustable independently from the other switching lever from a first switch position into at least one second switch position and back, wherein the switching levers are connectable by means of the at least one coupling device,
- 30 wherein the at least one coupling device connects the switching levers if the at least one coupling device is switched into at least one first coupling position, and in that the at least one coupling device separates the switching levers from one another if the at least one coupling device is switched into at least one second coupling position, and
- 35 wherein the at least one coupling device comprises at least one coupling element which is switchable linearly in the radial direction in relation to a pivot axis of the switching levers from the at least one first coupling position into the at least one second coupling position or into at least one further coupling position and back.

5 According to a second aspect of the present invention, there is provided an arrangement having at least two disconnect terminals and at least one coupling device, wherein the at least two disconnect terminals each comprise at least one switching lever, wherein each switching lever is adjustable independently from the other switching lever from a first switch position into at least one second switch
10 position and back, wherein the switching levers are connectable by means of the at least one coupling device,

Wherein the at least one coupling device connects the switching levers if the at least one coupling device is switched into at least one first coupling position, and in that the at least one coupling device separates the switching levers from one another if
15 the at least one coupling device is switched into at least one second coupling position, and

wherein the at least one coupling device comprises at least one coupling element which is switchable rotationally around an axis from the at least one first coupling position into the at least one second coupling position or into at least one further
20 coupling position and back, wherein the axis is tangential to an imaginary circle having a center point through which a pivot axis of the switching lever extends.

An arrangement according to the invention comprises at least two disconnect terminals and at least one coupling device, wherein the at least two disconnect terminals
25 each comprise at least one switching lever, wherein each switching lever is adjustable independently from the other switching lever from a first switch position into at least one second switch position and back, wherein the switching levers are connectable by means of the at least one coupling device. The at least one coupling device connects the switching levers to one another if the at least one coupling device
30 is switched into at least one first coupling position, and the at least one coupling device separates the switching levers from one another if the at least one coupling device is switched into at least one second coupling position.

This results in an advantageously simple and rapid connection of switching levers of
35 the disconnect terminals and also a similarly simple and rapid reversal of the connection of the switching levers by means of the coupling device in two different coupling positions. Moreover, other coupling configurations can be enabled by further coupling positions.

40 A further advantage is that all disconnect terminals having the same structure can be used.

Moreover, it is possible that not only two, but rather switching levers of multiple disconnect terminals can be connected in an advantageously simple manner.

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A disconnect terminal according to the invention comprises the above-described coupling device.

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A further disconnect terminal according to the invention, in particular for the arrangement specified above, comprises at least one switching lever, wherein the switching lever is adjustable independently from the other switching lever from a first switch position at least into a second switch position and back. The disconnect terminal comprises a switch status display having a movable display portion and a fixed display portion, wherein the switch status display visibly displays the respective

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switch position or at least one further switch position, wherein in the first switch position these two display portions are unified so that a "closed" symbolism is unambiguously visibly apparent, and wherein in the second switch position this symbolism is separated, from which a separation is unambiguously apparent.

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An advantageously simple and unambiguous display of switching states is thus enabled.

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It is to be noted here that such a switch status display can also be used for other terminal types which do not comprise coupling elements. Such a terminal having switch status display can also be the subject matter of a separate application.

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In one embodiment, the at least one coupling device comprises at least one coupling element, which is switchable from the at least one first coupling position into the at least one second coupling position or into at least one further coupling position and back. It is advantageous that the coupling element is switchable, since unique switching states are thus enabled.

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Is additionally advantageous that the at least one coupling element is held captively on the switching lever of one of the at least two disconnect terminals.

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One embodiment provides that the at least one coupling element is switchable linearly in the radial direction in relation to a pivot axis of the switching lever from the at least one first coupling position into the at least one second coupling position or into the at least one further coupling position and back. The switching is thus achieved with an advantageously simple linear pull and push procedure.

Another embodiment provides that the at least one coupling element is switchable linearly in the radial direction in relation to a pivot axis of the switching lever from the at least one first coupling position into the at least one second coupling position or

5 into the at least one further coupling position and back perpendicularly or at an angle in relation to the movement direction of a switching lever.

In one embodiment, the at least one coupling element comprises at least one switch pin, at least one driver, and at least one handle, wherein the at least one switch pin is
10 longer than the at least one driver. This is advantageous since the longer switch pin can remain in its arrangement in both coupling positions, even if the driver is no longer engaged.

For this purpose, a further embodiment provides that the at least one coupling ele-
15 ment is accommodated in a displaceably guided manner with the at least one switch pin in a receptacle of the one switching lever of the at least one disconnect terminal and is fixed by a detent mechanism in each case in the at least one first coupling position and in the at least one second coupling position or in the at least one further coupling position. The coupling positions can thus advantageously be easily deter-
20 mined.

It is moreover advantageous here that the at least one switch pin of the at least one coupling element comprises a lug and at least one detent spring having at least one detent lug as a detent mechanism, since a simple and compact detent mechanism is
25 formed in this manner.

In a further embodiment, the at least one driver is engaged in the at least one first coupling position with at least one receptacle of the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a
30 grid, and the at least one driver is disengaged in the at least one coupling position or in the at least one further coupling position from the at least one receptacle of the adjacent or the at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid. One advantage in this case is the simple and compact structure.

35 An alternative embodiment provides that the at least one coupling element is switchable rotationally around an axis from the at least one first coupling position into the at least one second coupling position or into the at least one further coupling position and back, wherein the axis is tangential to an imaginary circle having a center point,
40 through which a pivot axis of the switching lever extends, or the axis is coaxial or at an angle in relation to the movement direction of a switching lever. This is advantageously simple and space-saving.

5 In a further embodiment, the at least one coupling element is a type of oblong hood and comprises a pivot section, a shaft section having the axis, and at least one coupling section, wherein the shaft section of the at least one coupling element is accommodated so it is pivotable around the axis in a receptacle of a radially protruding actuating section of the switching lever and is held captively by a suitable means, for example, an undercut. It is also advantageous in this case that the coupling device
10 can be retrofitted easily.

It is advantageous that the at least one coupling element is pivoted in the at least one first coupling position via the radially protruding actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged
15 remotely in a multiple of a grid and is coupled at least thereto in a formfitting manner, wherein the at least one coupling section of the at least one coupling element encloses in a hood-like manner the radially protruding actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged
20 remotely in a multiple of a grid, since in this manner the switching state of the switching lever is also particularly clearly visible.

In a further embodiment, the at least one coupling element is held in the at least one first coupling position in a first detent position, wherein at least one projection on the inner sides of side walls of the at least one coupling section of the at least one coupling element are engaged with ends of the receptacle of the actuating section of at
25 least the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid, and the at least one coupling element is held in the at least one second coupling position in a second detent position, wherein at least one having a protruding section and an indented section corresponding thereto is provided. In this case, the protruding section is attached in one embodiment on the movable coupling element and the indented section is located on a fixed part, for example, on the actuating section. Of course, it is also possible for the protruding section to be arranged on the fixed part, and the indented section to be located
30 on the movable coupling element. It is also conceivable that a combination of two or more such detent devices is provided. The protruding section of one detent device can be attached here on the movable coupling element, and the protruding section of the other detent device is fixed. One advantage in this case is a simple structure and the usability of similarly designed disconnect terminals.

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In another alternative embodiment, the at least one pivotable coupling element is arranged pivotably around at least one axis and captively in each case in a receptacle in at least one actuating section of the at least one switching lever, wherein the respective receptacle comprises at least one slot, through which the at least one cou-

5 pling element is installable. One advantage in this case is the space-saving and particularly compact structure.

A further embodiment provides that the at least one coupling element comprises in each case a cylindrical body having an associated pivot axis and at least one arm
10 attached to the body having at least one hook section. A narrow and space-saving structure is thus possible.

In still a further embodiment, the at least one hook section extends in the at least one first coupling position through the at least one slot and is engaged with at least one
15 further receptacle of the actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid, wherein the at least one hook section remains in the respective corresponding receptacle in the at least one second coupling position. This is advantageous, since a particularly compact structure may be enabled.

20 For an advantageous determination of the coupling positions, it is provided that the at least one coupling element is locked in each of the at least one first coupling position and in the at least one second coupling position or in the at least one further coupling position by means of at least one lug, which is engaged in the respective coupling
25 position with a respective fixed recess.

It is additionally advantageous that the at least one coupling element is switchable by means of a tool, since no additional functional parts have to be externally introduced to the switching lever and enlarge the switching labor.

30 In still a further embodiment, the at least one actuating section of the at least one switching lever having the corresponding receptacles can be formed having the at least one coupling element and the corresponding receptacles as at least one box-shaped region or receptacle section each as a separate part, which is attached in a
35 suitable manner to the at least one switching lever. Advantageous retrofitting and installation is thus possible. The actuating section can thus be manufactured and installed separately.

It is moreover advantageous that the disconnect terminal comprises a switch status
40 display having a movable display portion and a fixed display portion, which visibly displays the respective switch position or at least one further switch position of the switching lever, wherein in the at least one first switch position, these two display portions are unified so that a "closed" symbolism is unambiguously visibly apparent, and

5 wherein in the second switch position this symbolism is separated, from which a separation is unambiguously apparent.

A further embodiment provides that at least the first switch position is displayed by covering and/or making visible a display portion and at least the second switch position is displayed by making visible and/or covering a display portion. This results in a compact structure.

In still a further embodiment, the switch status display advantageously assists recognizability by way of coloring, symbolism, and/or geometry.

15 In one embodiment of the disconnect terminal, at least the first switch position is displayed by covering and/or making visible a display portion and at least the second switch position is displayed by making visible and/or covering a display portion. Such a structure is advantageously compact.

20 In a further embodiment of the disconnect terminal, the switch status display assists recognizability by way of coloring, symbolism, and/or geometry. This is advantageous since the recognizability is also possible from a greater distance.

25 Further advantageous designs can be inferred from the remaining dependent claims.

The invention is described in greater detail hereinafter with the aid of exemplary embodiments with reference to the drawings. In the figures:

30 Figure 1 shows a schematic perspective view of conventional disconnect terminals;

Figure 2 shows a schematic perspective view of a first exemplary embodiment of a disconnect terminal according to the invention having a coupling device according to the invention;

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Figures 3-9 show schematic perspective partial views of the coupling device according to Figure 2 in various coupling positions and switch positions;

40 Figures 10-10b show schematic perspective illustrations of a coupling element of the coupling device of the first exemplary embodiment of the disconnect terminal according to the invention according to Figure 2;

- 5 Figures 11-11b show schematic perspective illustrations of the coupling device of the first exemplary embodiment of the disconnect terminals according to the invention according to Figure 2 in various coupling positions;
- 10 Figures 12-13 show schematic perspective partial illustrations in a top view of actuating sections of disconnect terminals according to the first exemplary embodiment according to Figure 2
- 15 Figures 14-16 show schematic illustrations of a variant of the coupling element according to Figures 10-10b in various coupling positions;
- Figure 17 shows a schematic perspective view of a second exemplary embodiment of the disconnect terminal according to the invention according to Figure 2 having a coupling device according to the invention;
- 20 Figures 18-21 show schematic perspective partial views of the coupling device of the second exemplary embodiment according to Figure 17 in various coupling positions and switch positions;
- 25 Figures 22-22b show schematic perspective views of an actuating section of a switching lever of the second exemplary embodiment according to Figure 17;
- 30 Figures 23-27 show schematic illustrations of a coupling element of the second exemplary embodiment according to Figure 17;
- Figures 28-29 show schematic partial illustrations of arrangements of disconnect terminals according to the second exemplary embodiment according to Figure 17;
- 35 Figures 30-33a show schematic views of a coupling device of a third exemplary embodiment of disconnect terminals;
- Figures 34-40c show schematic views of switch status displays; and
- 40 Figures 41-41a show schematic perspective views of arrangements of disconnect terminals according to the invention.

The terms "top", "bottom", "left", "right" refer to the respective arrangement of the components in the figures.

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Figure 1 shows a schematic perspective view of a conventional disconnect terminal 1 in an arrangement 10, which comprises two disconnect terminals 1, 1' here (of course, there can also be more than two disconnect terminals 1, 1').

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To differentiate the two disconnect terminals 1, 1', the reference sign of the disconnect terminal 1' arranged at the rear in the figures, including the reference signs of the individual parts/sections thereof, are respectively identified hereinafter with an apostrophe. Different features of front and rear disconnect terminal 1, 1' are shown separately in the description.

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Such disconnect terminals 1, 1' are also referred to as extendable disconnect terminals 1, 1', measurement disconnect terminals, or series disconnect terminals.

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The disconnect terminal 1, 1' comprises a housing 2, 2' having a first terminal section 3, 3', a second terminal section 4, 4', and a separation section 5, 5' arranged in the middle in between.

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A first clamping section (not described in greater detail) for connecting an electrically conductive line (not shown) is arranged in the first connection section 3, 3'. The first clamping section is connected to a first conductor rail 3a, which extends into the separation section 5 with a connecting section (not identified).

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In a similar manner, a second clamping section (not described in greater detail) for connecting a further electrically conductive line (not shown) is arranged in the second terminal section 4, 4' in a mirror-image to the first terminal section 3, 3'. The second clamping section is connected to a second conductor rail 4a, which extends into the separation section 5, 5' with a connecting section (not identified).

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The connecting sections of the conductor rails 3a and 4a are operatively connected to a switching device (not shown) in the separation section 5, 5'. The switching device comprises a switching lever 6, 6', which is adjustable from a first switch position I into a second switch position II and back. The switching lever 6, 6' pivots in a switching movement SB around a pivot axis 5a here.

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The pivot axis 5a extends perpendicularly here to the lateral surfaces (not shown) of the housing 2, 2' of the disconnect terminal 1, 1'.

In the first switch position I, which is also referred to as the connected position, the switching device connects the two connecting sections and thus the first conductor

5 rail 3a and the second conductor rail 4a in an electrically conductive manner, so that the first clamping section is connected in an electrically conductive manner to the second clamping section. The upper region of the switching lever 6 abuts a stop section 9 of the housing 2 with an actuating section 7 here, as shown in Figure 1 for the front disconnect terminal 1.

10 In the second switch position II, which is also called the separated position, the two connecting sections are separated and isolated from one another, i.e., the electrically conductive connection of the two connecting sections and thus of the conductor rails 3a and 4a is eliminated or separated, wherein the conductor rail 3'a is still electrically
15 connected to the switching lever 6' here.

In this second switch position II, the actuating section 7' of the switching lever 6' abuts a further stop section 9'a of the housing 2, as shown in Figure 1 for the rear disconnect terminal 1'. Furthermore, in the switch position II, a cross bridge (not
20 shown in greater detail) is contacted in such a way that in the case of the switch position II, the terminals 3, 3' of all disconnect terminals located adjacent to one another are accordingly conductively connected to one another/short-circuited via this cross bridge. The cross bridge is provided with similar contacts as the conductor rails 3a, 4a toward the switching lever.

25 In the example shown in Figure 1, a receptacle 8, 8' is indented in the actuating section 7, 7' from above in the radial direction with respect to the pivot axis 5a.

30 The switching lever 6, 6' is actuated manually and/or using a suitable tool here, for example, a screwdriver engaged with the receptacle 8, 8'.

The actuating section 7, 7' of the switching lever 6, 6' comprises two opposing face sections in each case. Firstly there are end face sections 7a, 7'a, which face toward the terminal sections 4, 4' of the switch position I. There are end face sections 7b, 7'b
35 opposite thereto, which face toward the terminal sections 3, 3' of the switch position II. Face sections 7c, 7'c, are located perpendicularly thereto, the surfaces of which extend perpendicularly to the pivot axis 5a. And respective face sections 7d, 7'd are opposite thereto.

40 Figure 2 shows a schematic perspective view of a first exemplary embodiment of a disconnect terminal 1, 1' according to the invention having a coupling device 100 according to the invention; The arrangement 10 comprises two adjacent disconnect terminals 1, 1'.

5 The coupling device 100 is used to couple at least two adjacent switching levers 6, 6' of two adjacent disconnect terminals 1, 1'.

The term "coupling" is to be understood to mean that at least two adjacent switching levers 6, 6' are locked to one another and/or connected so that they are adjustable
10 jointly from the switch position I into the switch position II and back. When the "coupling" is eliminated, the switching levers 6, 6' are separated from one another again and are actuatable independently of one another.

In the conventional disconnect terminal 1, 1' shown in Figure 1, a type of bracket plug
15 having two plug pins is plugged into the receptacles 8, 8' of the switching levers 6, 6' of the disconnect terminals 1, 1'. The two switching levers 6, 6' can be connected and adjusted jointly by means of this bracket plug. A separate adjustment of the switching levers 6, 6' independently of one another is only possible here if the bracket plug is removed again.

20 In contrast thereto, the coupling device 100 of the exemplary embodiment according to Figure 2 comprises a switchable or adjustable coupling element 11, which couples two switching levers 6, 6' to one another as shown here, but can also be embodied for more than two switching levers 6, 6', as is easily conceivable.

25 The term "switchable" is to be understood as an adjustment of the respective coupling element 11, 18, 22 of the coupling device 100 from a first position into a second position and back. This adjustment can take place rotationally and/or linearly.

30 Furthermore, it is conceivable, but not explained in greater detail, that there can be further switch positions/mechanisms, which can effectuate, for example, a coupling of a middle disconnect terminal to disconnect terminals arranged on the left or right adjacent thereto. This is not shown, but is easily conceivable.

35 In the actuating sections 7, 7' of the switching levers 6, 6', two adjacent receptacles 8, 8a and 8', 8'a are formed in each case in the circumferential direction with respect to the pivot axis 5a. The receptacles 8a, 8'a are used to accommodate the coupling element 11 and are arranged between the receptacles 8, 8' and end face sections 7a, 7'a of the actuating section 7, 7'.

40 The end face sections 7a, 7'a are each in contact with a stop 9, 9' of the housing 2, 2' in the switch position I. In the switch position II, further end face sections 7b, 7'b of the actuating sections 7, 7' of the shift levers 6, 6' are each in contact with the further stop 9a, 9'a of the housing 2, 2'.

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The coupling element 11 is inserted into one of the switching levers 6, 6' and is held captively in this position by engaging behind it. Furthermore, the coupling element 11 is displaceably guided in this switching lever 6, 6' and can be switched from a first coupling position A into a second coupling position B (see Figures 4, 6, 7). This is explained in greater detail hereinafter.

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Figures 3-9 show schematic perspective partial views of the coupling device 100 according to Figure 2 in various coupling positions A, B and switch positions I, II.

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In Figure 3, the coupling element 11 is shown before the insertion into the receptacles 8, 8' of the switching levers 6, 6' in a so-called pre-installation position. The switching levers 6, 6' both about the stop sections 9, 9' of the respective housing 2, 2' in switch position I.

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The coupling element 11 comprises a switch pin 12, a driver 13 and a handle 14. The switch pin 12 and the driver 13 are attached to a lower side 4a of the handle 14. A length of the switch pin 12 is more than twice as long as a length of the driver 13 here. The switch pin 12 and the driver 13 are arranged adjacent with respect to the pivot axis 5a.

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Figure 4 shows the disconnect terminals 1, 1' having the switching levers 6, 6' and the coupling device 100 in the switch position I, wherein the switch position II is shown in Figure 5.

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The coupling element 11 is inserted here into the receptacles 8a, 8'a of the actuating sections 7, 7' of the switching levers 6, 6' linearly in the radial direction with respect to the pivot axis 5a, so that the long switch pin 12 is accommodated in the receptacle 8a of the switching lever 6 of the front disconnect terminal 1 shown in Figures 2 to 9 and the short driver 13 is accommodated in or engaged with the receptacle 8'a of the switching lever 6' of the rear disconnect terminal 1' shown in Figures 2 to 9. The lower side 4a of the handle 14 of the coupling element 11 rests on surfaces 7e, 7'e of the actuating sections 7, 7' in this case. This position of the coupling element 11 corresponds to the first coupling position A (Figure 4), in which a coupling, which is also referred to as a lock, of the switching levers 6, 6' is (mechanically) switched on.

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In this way, the switching levers 6, 6' are coupled in the first coupling position A by the coupling element 11 in such a way that both switching levers 6, 6' can be adjusted simultaneously by manual actuation by means of the handle 14 of the coupling element 11 using this in the switching movement SB (Figure 2) from the switch posi-

5 tion I into the switch position II and back. Of course, the adjustment can also be carried out by means of a tool, preferably a screwdriver, which is inserted into one of the receptacles 8, 8' of the actuating sections 7, 7' of the switching levers 6, 6'.

10 Figure 6 shows the second coupling position B of the coupling element 11 of the coupling device 100 in the first switch position I.

15 In the second coupling position B, the coupling element 11 is adjusted by a switching stroke travel SH radially in the receptacle 8a of the actuating section 7 of the front switching lever 6 out of the first coupling position A. The second coupling position B is thus switched on.

20 In the second coupling position B, the driver 13 of the coupling element 11 is completely moved out of its receptacle 8'a of the actuating section 7' of the rear switching lever 6', whereby the coupling between the shift levers 6, 6' is eliminated. In other words, the driver 13 is disengaged from the receptacle 8'a in the second coupling position B.

25 In this way, the coupling element 11 is switchable or adjustable linearly in the radial direction with respect to the pivot axis 5a.

Thus, for example, the rear switching lever 6' can be adjusted by means of a tool W, preferably a screwdriver, which is inserted into the receptacle 8', independently of the front switching lever 6 into the switch position II shown in Figure 7.

30 Similarly, the front switching lever 6 can be adjusted by means of manual actuation (or also by means of a tool) of the handle 14 of the coupling element 11 independently of the rear switching lever 6' from the switch position I shown in Figure 8 into the switch position II shown in Figure 9.

35 The coupling element 11 is fixed by means of the switch pin 12 in the associated receptacle 8 in the first coupling position A and in the second coupling position B by a detent mechanism in each case. This is described hereinafter in greater detail in conjunction with Figures 10 to 13.

40 Figures 10-10b show schematic perspective illustrations of the coupling element 11 of the coupling device 100 of the first exemplary embodiment of the disconnect terminal 1, 1' according to the invention according to Figure 2.

5 The switch pin 12 of the coupling element 11 comprises a lug 12a and at least one detent spring 15 having a detent lug 16 as a detent mechanism. The lug 12a is arranged formed on the switch pin 12 in a strip shape approximately at a distance of approximately one third of the length of the switch pin 12 from the lower side 14a of the handle 14, faces toward the associated stop section 9d in the installed state, and
 10 extends here in parallel to an edge of the lower side 14a of the handle 14 and in parallel to the pivot axis 5a in the installed state of the coupling element 11.

Two opposing detent springs 15 are provided here approximately in the lower third of the switch pin 12, on the outer side of each of which an outwardly protruding detent
 15 lug 16 is formed in a lower region. The detent lugs 16 protrude in a width direction of the handle 14, wherein the width direction extends in the direction of the pivot axis 5a in the installed state of the coupling element 11.

Each detent spring 15 tapers in its course in the direction of the longitudinal axis of
 20 the switch pin 12 towards its respective free end in such a way that a wedge-shaped intermediate space 15b is formed between inner surfaces 15a of the detent springs 15. A U-shaped recess (not shown), which extends essentially in parallel to the extension direction (see Figure 15a) is located behind this.

25 An expanding section 7f can be accommodated in this wedge-shaped intermediate space 15b and/or in this U-shaped recess. The expanding section 7f can be arranged in the receptacle 8a and interacts with the inner surfaces 15a and/or with the U-shaped recess in such a way that it pushes the detent springs 15 with the detent lugs 16 outward if the switch pin 12 is inserted into the receptacle 8a during the insertion
 30 of the coupling element 11. This has the advantage that a retention effect of the detent lugs 16 is reinforced. This is also explained once again in conjunction with Figures 11a and 11b.

Furthermore, starting from the lower side 14a of the handle 14, a guide web 12b extending over the entire length of the switch pin 12 and the respective detent spring 15
 35 is formed on the switch pin 12. In the example shown, two opposing guide webs 12b are provided.

The driver 13 also comprises two opposing guide webs 13a, which extend over the
 40 entire length of the driver on two opposing longitudinal sides of the driver 13.

The handle 14 comprises an arrow as a symbol 14b here, which points downward toward the switching levers 6, 6' and thus indicates the plugging direction of the coupling element 11 in the direction toward the first coupling position A.

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Using this principle, independent switching of adjacent switching levers 6, 6' is possible from almost any position. The exception is when both switching levers 6, 6' are in the second switch position II and the coupling element 11 is in the coupling position B. The switching lever 6' located in the rear in Figures 2-9 then cannot be moved

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without displacing/adjusting the front switching lever 6.

Figures 11-11b show schematic perspective illustrations of the coupling device 100 of the first exemplary embodiment of the disconnect terminals 1, 1' according to the invention according to Figure 2 in various coupling positions.

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A guide recess 17 is indented in each of the opposing side walls 6a of the switching lever 6 (and also of the switching lever 6', which is not shown but is easily conceivable) in the respective actuating section 7, 7'. The guide recess 17 is a type of oblong hole and forms a lateral opening of the receptacle 8a, 8'a having an upper retaining section 17a and a lateral retaining section 17b. The upper retaining section 17a is formed here from the upper rounding of the guide recess 17. The lateral retaining section 17b is introduced laterally approximately in a semicircle approximately in the upper fourth of the guide recess 17.

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When the coupling element 11 having the switch pin 12 is inserted having its detent springs 15 in front into the receptacle 8a of the switching lever 6, the detent springs 15 are firstly compressed toward one another. Upon further insertion, the detent lugs 16 are pressed outward into the guide recesses 17 again by the pre-tensioned detent springs 12 with assistance of an expanding locking web 7g, 7'g (see Figure 12), corresponding to the expanding web 7f, located in the receptacle 8a.

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In the second coupling position B (Figure 11a), the detent lugs 16 are then in formfitting contact with the upper retaining sections 17a of the guide recess 17, wherein the lug 12a of the switch pin 12 simultaneously rests on the surface 7e of the switching

35

lever 6.

In this way, the coupling element 11 is fixed in its longitudinal movement option in the second coupling position B, in that the detent lugs 16 in conjunction with the upper retaining sections 17a of the guide recess 17 prevent withdrawal of the coupling element 11 (using a defined force located below the destruction limit) and the lug 12a also opposes pushing in of the coupling element 11 with a defined retaining force. In this way, the detent lugs 16 additionally form a captivity function of the coupling element 11.

40

5 Strengthening of the retaining force of the detent lugs 16 can be reinforced by the above-described expanding section 7f (see Figure 10b). The captivity function is thus enhanced.

10 To assume the first coupling position A, the retaining force of the lug 12a has to be overcome. Further pushing of the switch pin 12 of the coupling element 11 into the receptacle 8a is then possible, until the lug 12a engages with the lateral retaining sections 17b of the guide receptacles 17 and in this manner fixes and maintains the first coupling position A of the coupling element A. This is illustrated in Figure 11b.

15 Figures 12-13 show schematic perspective partial illustrations in a top view of the actuating sections 8, 8'; 8a, 8' of the disconnect terminals according to the first exemplary embodiment according to Figure 2.

20 In the transition regions between the successive receptacles 8 and 8a and 8' and 8'a, two opposing guide grooves 8b, 8'b are each shaped into the sides of the receptacles 8' and 8'a. These guide grooves 8b, 8'b each extend over the entire length of a respective receptacle 8', 8'a.

25 The guide grooves 8b correspond to the guide webs 12b of the switch pin 12 and are engaged with them when the coupling element 11 is being inserted and is inserted into the receptacle. In the same way, the guide grooves 8' b correspond to the guide webs 13a of the driver 13 and are also engaged with them. The guide grooves 8b, 8'b and guide webs 12b, 13a moreover form a confusion-free insertion of the coupling element 11 into the receptacles 8a, 8'a. This is apparent from Figure 13

30 Figures 14-16 show schematic illustrations of a variant of the coupling element 11 according to Figures 10-10b in various coupling positions;

35 Figure 14, like Figure 11, shows the coupling element 11 before the insertion. The second coupling position B is shown similarly in Figure 15 as in Figure 11a. Figure 16 illustrates the first coupling position A like Figure 11b.

40 In this variant, the guide webs 12b only extend over half of the length of the switch pin 12. The detent lugs 16 are formed laterally on the free ends of the detent springs 12. The retaining sections 17a and 17b of the guide recesses 17 merge into one another.

In the second coupling position B, which is shown in Figure 15, the detent lug 16 is in formfitting contact with the upper retaining section 17a of the guide recess 17. This is

5 also the case on the other side of the switching lever 6, which is not shown but is easily conceivable.

Figure 15a shows a cross-sectional view through the actuating section 7 of the switching lever 6 in the second coupling position B of the coupling element 11. The
 10 guide webs 12b are accommodated linearly guided in the guide grooves 8b. The expanding locking web 7g is engaged and shows that in coupling position B, the detent springs 15, which are also referred to as spring legs, cannot deflect.

In the first coupling position A, the lug 12a is not only engaged with the lateral retaining section 17b of the guide recess 17, but rather the lug 12a is also in contact with
 15 the upper retaining section 17a of the guide recess.

In the examples shown, the switching or adjusting or moving direction of the coupling element 11 is linear in the radial direction with respect to the pivot axis 5a. The
 20 switching/adjusting/moving direction can also extend rotationally or in another trajectory, however. However, this takes place in a different direction than the direction in which the actuating movement of the switching lever 6, 6' extends around the pivot axis 5a, for example, along another trajectory is also conceivable.

25 The coupling element 11 is shown in the preceding examples having the switch pin 12 inserted into the switching lever 6 of the front disconnect terminal 1. Of course, the coupling element 11 can also be inserted rotated by 180°, wherein the switch pin 12 is inserted into the receptacle 8'a of the rear disconnect terminal 1' and the driver 13 is inserted into the receptacle 8a of the front disconnect terminal 1. In this manner,
 30 the switching levers 6, 6' can be switched on alternately to one another.

It is not shown, but it is conceivable that the coupling element 11 comprises one switch pin 12 and two or more drivers 13. These drivers 13 can be arranged on one side to the right or left of the switch pin 12 or on both sides distributed evenly or un-
 35 evenly. In this way, the switching levers 6, 6' can be additionally connected by, for example, three or four or more disconnect terminals 1, 1'.

All or only some of these additional connections can be established in the first coupling position A. Intermediate positions between the first coupling position A and the
 40 second coupling position B are possible, in which the switching levers 6, 6' of the further disconnect terminals 1, 1' are connected.

A variant of the coupling element 11 which is not shown, but is conceivable is that the coupling element 11 comprises two pins of equal length, which are inserted into the

5 receptacles of the adjacent switching levers 6, 6' and the handle 14 has a separation (for example, in the middle), which is closed in the connected state of the switching levers 6, 6', i.e., in the first coupling position A. The separation is opened to eliminate the connected state of the switching levers 6, 6', in order to obtain the second coupling position B. The opening takes place in that the separable parts of the handle 14
 10 are pivoted away from one another together with the associated pins in opposing pivot directions around the axes of the respective pins in the respective receptacles of the switching levers 6, 6'. The pins remain in the receptacles of the switching levers in this case. The separation is form-fitting, for example, like two gearwheels or tooth segments which disengage.

15 In still a further variant of the coupling element 11, the switch pin 12 is rotatably attached to the handle 14. This embodiment is not shown, but is easily conceivable in conjunction with the figures (for example, Figures 6, 11). If the coupling element 11 is located in the second coupling position B, in this variant the handle 14 can be pivoted
 20 by 180° together with the driver 13 due to the rotatably attached switch pin 12 around the longitudinal axis of the switch pin 12 remaining in the associated receptacle 8a. This is advantageous if the arrangement 10 comprises, for example, three disconnect terminals 1, 1', in which the disconnect terminal 1 has the receptacle 8a into which the coupling element 11 having the switch pin 12 is inserted. In this way, by pivoting
 25 the handle 14 with the driver 13 into the second coupling position B, alternately one of the switching levers 6' of the adjacent disconnect terminal 1' can be connected in the first coupling position A, without the coupling element 11 having the switch pin 12 having to be withdrawn completely from the associated receptacle 8a and turned over.

30 Figure 17 shows a schematic perspective view of a second exemplary embodiment of the disconnect terminal 1, 1' according to the invention according to Figure 2 having a coupling device 100 according to the invention.

35 The coupling device 100 comprises here a coupling element 18 pivotable around an axis 19. The pivotable coupling element 18 is also referred to as a switchable rotation locking element.

40 Furthermore, it is conceivable, but not explained in greater detail, that there can be further switch positions/mechanisms, which can effectuate, for example, a coupling of a middle disconnect terminal 1, 1' to disconnect terminals 1, 1' arranged on the left or right adjacent thereto.

5 Only the receptacles 8, 8' for an actuating tool are each indented in the actuating sections 7, 7' of the switching levers 6, 6' here. One actuating section 7, 7' protrudes radially in each case between the receptacles 8, 8' and the further end face sections 7b, 7'b of the actuating sections 7, 7' of the switching levers 6, 6'.

10 The coupling element 18 is pivotable around the axis 19 on the radially protruding actuating section 7 of the switching lever 6 and is held captively thereon. The axis 19 extends at perpendicularly to the pivot axis 5a of the switching lever 6, 6', wherein the axis 19 is tangential to an imaginary circle having a center point, through which the pivot axis 5a of the switching levers 6, 6' extends.

15

The coupling element 18 can be switched from a first coupling position A into a second coupling position B (see Figures 19, 19a) by means of pivoting around the axis 19. This is explained in greater detail hereinafter.

20 Figures 18-21 show schematic perspective partial views of the coupling device 100 of the second exemplary embodiment according to Figure 17 in various coupling positions and switch positions;

Figure 18 shows the switch position I and the switch position II is shown in Figure 18a. The coupling element 18 is in the coupling position A in each case, in which it couples and/or locks the two switching levers 6, 6' to one another.

25

The coupling element 18 is a kind of oblong hood and comprises a pivot section 18a, a shaft section 18b having the axis 19, and a coupling section 18c. The pivot section 18a and the coupling section 18c are connected by two side walls 18d arranged in parallel. The side walls 18d are connected centrally on the upper longitudinal sides thereof by a transverse wall 18e. In the end region of the coupling section 18c, the ends of the side walls 18d are connected by a further transverse wall 18e.

30

35 The pivot section 18a is formed from first rounded ends of the side walls 18d, between which the shaft section 18b is attached.

The shaft section 18b comprises a disk-shaped solid shaft section 18i and a section flattened thereon in the direction of the axis 19. This flattened section is referred to as the key surface 18j. The key surface 18j here extends in parallel to the lower edges of the side walls 18d and faces downward when the coupling element 18 is in the first coupling position A.

40

5 The coupling section 18c is determined from the second ends of the side walls 18d and the transverse wall 18f.

The distance of the parallel side walls 18d to one another corresponds to a thickness of the actuating sections 7, 7' projecting radially from the switching levers 6, 6' in
 10 such a way that the free end regions of the actuating sections 7, 7' can each be accommodated between the side walls 18d of the coupling element 18.

The pivot section 18a and the coupling section 18c thus form two hood sections which are connected to one another.

15

The shaft section 18b of the pivot section 18a of the coupling element 18 is pivotably accommodated in a receptacle 20 of the protruding actuating section 7. This is explained in greater detail hereinafter. An internal diameter of the receptacle 20, 20' corresponds to an external diameter of the disk-shaped solid shaft section 18i of the
 20 shaft section 18. In this way, the coupling element 18 is pivotably attached to the protruding actuating section 7.

In the first coupling position A, which is shown in Figures 17, 18, and 18a, the coupling element 18 is pivoted via the radially protruding actuating section 7' of the adjacent switching lever 6' and is coupled thereto in a formfitting manner. The coupling
 25 section 18c encloses the radially protruding actuating section 7' of the adjacent switching lever 6' like a hood here. A longitudinal axis of the coupling element 14 extends in the first coupling position A in parallel to the pivot axis 5a of the switching lever 6, 6'. At the same time, the coupling section 18c is fixed in the coupling position
 30 A to the radially protruding actuating section 7' using a detent device, which will be described hereinafter.

Lever overhangs 18g are formed on each of the upper end regions of the side walls 18d of the coupling section 18c. By means of the lever overhangs 18g as handle sections,
 35 the coupling element 18 can be pivoted manually from the first coupling position A into the second coupling position B by lifting the coupling section 18c and pivoting the coupling element 18 around the shaft section 18b and its axis 19. A pivot angle between the two coupling positions A and B is 90° here.

40 In the second coupling position B, the coupling element 18 or its longitudinal axis is perpendicular to the actuating section 7 of the switching lever 6 and radial with respect to the pivot axis 5a. The coupling element 18 is retained in this second coupling position B by a detent device or a detent mechanism, which will be explained in greater detail hereinafter.

5

Figure 19 shows the switch position I and the switch position II is shown in Figure 19a. The coupling element 18 is in the coupling position B in each case, in which the two switching levers 6, 6' are neither coupled nor locked to one another.

10

Figure 19 also shows the actuating section 7' of the switching lever 6', which is free in the second coupling position B of the coupling element 18. This actuating section 7' is formed here exactly like the other actuating section 7 of the other switching lever 6. In other words, the switching levers 6, 6' and the actuating sections 7, 7' are identical. No special embodiments are required.

15

The actuating section 7, 7' of the switching lever 6, 6' of the second exemplary embodiment according to Figure 17 is illustrated in schematic perspective views in Figures 22-22a. Figure 22b shows a side view of the actuating section 7.

20

Figures 23-27 show schematic illustrations of the coupling element 18 and also at least partial illustrations of the actuating section 7, 7' of the second exemplary embodiment according to Figure 17.

25

The actuating section 7, 7' is provided in its upper end region with a receptacle 20, 20'. The receptacle 20, 20' is circular-cylindrical, comprises an axis 19a, 19'a, and extends perpendicularly to the pivot axis 5a of the switching levers 6, 6'. The axis 19a, 19'a forms a tangent to an imaginary circle, through the center point of which the pivot axis 5a extends.

30

The inner wall of the receptacle 20, 20' is interrupted by an opening 21, 21' extending in parallel to the direction of the axis 19a, 19'a. The opening 21, 21' has two regions having different opening widths. The first region (arranged on the left in Figure 22) corresponds to approximately one fourth of the length of the opening 21, 21' and has a recess 20a, 20'a having an opening width which corresponds to the diameter of the receptacle 20, 20'. The second region (adjoining the first region on the right in Figure 22) extends over a length of approximately three fourths of the total length of the receptacle 20, 20' and comprises a protruding longitudinal edge LR. The opening width of this second region having the longitudinal edge LR is smaller than the diameter of the receptacle 20, 20'. The longitudinal edge LR of the opening 21, 21' comprises an undercut 20b, 20'b here.

40

The coupling element 18 is inserted through the opening 21 during assembly into the receptacle 20 of the actuating section 7 of the switching lever 6 using the shaft section 18b of the pivot section 18a. This is only possible in a specific installation posi-

tion C, which is shown in Figures 20-21. The coupling element 18 is at an angle of approximately 30° with respect to the pivot axis 5a in this case. The installation position is thus located by approximately 150° in relation to the first coupling position A with respect to the axis 19. If the coupling element 18 is in the installation position C, the key surface 18j faces upward. In this position, inserting the shaft section 18b into the receptacle 20 of the actuating section 7 is facilitated due to the flattened key surface 18j of the shaft section 18b, since the flattened key surface 18j reduces the outer dimension of the shaft section 18b in such a way that the shaft section 18b can be easily inserted into the receptacle 20, 20' due to the smaller opening width. The diameter of the disk-shaped solid shaft section 18i fits through the first region of the opening 21, 21' into the recess 20a, 20'a, which is provided for this purpose.

If the coupling element 18 is inserted in this manner in the installation position C into the receptacle 20, 20', as shown in Figure 21, the coupling element 18 is pivoted into the second coupling position B. In this second coupling position B, in the first coupling position A, and in all other positions except for the installation position C, the coupling element 18 is held captively by the undercut 20b via the shaft section 18b in the receptacle 20.

In the installed state of the coupling element 18, the axis 19 of the shaft section 18a of the coupling element 18 and the axis 19a of the receptacle 20 extend coaxially to one another.

The coupling element 18 has two detent positions. The first detent position is formed in the first coupling position A in parallel to the pivot axis 5a of the switching levers 6, 6' by a detent device or by a detent mechanism. This detent device comprises at least one projection 18h in the form of a spherical section. In the example shown, a projection 18h in the form of a spherical section on the inner sides of each of the side walls 18d in the region of the coupling section 18c of the coupling element 18 is engaged with the ends of the receptacle 20' of the actuating section 7' of the adjacent switching lever 6'. It is also possible that only one projection 18h in the form of a spherical section or also several are provided.

The second detent position of the coupling element 18 is the second coupling position B perpendicular to the pivot axis 5a of the switching lever 6, wherein a detent device or a detent mechanism is provided having a protruding section and an indented section corresponding thereto. In the example partially shown here, this detent device comprises an indentation 7h, 7'h in the form of an elongated groove as a section indented in one side of the actuating section 7, 7' and a web 18k as a protruding section on an inner side of the side wall 18d of the coupling element 18 in the region

5 of the pivot section 18a. The web 18k is formed in the end region of the side wall 18d of the coupling element 18 in the pivot section 18a perpendicularly to the longitudinal edges of the side walls 18d. This is clearly apparent in Figures 18 and 18a, where the web 18k is perpendicular to the pivot axis 5a and also perpendicular to the inden-
 10 18k is engaged with the indentation 7h. This is apparent in Figure 25. The web 18k extends in parallel to the pivot axis 5a and in parallel to the indentation 7h here.

In a further example, this detent device for the second coupling position B can com-
 15 prise a projection, which is not shown, but is easily conceivable (or two or multiple, similar to the projections 18h) on the inner sides of the side walls 18d in the pivot section 18a of the coupling element 18, which is/are engaged in the second coupling position B with an end of the opening 21, 21' and/or an end of the receptacle 20, 20' between longitudinal edge LR and a lower longitudinal edge.

20 If a further switching lever (for example, in front of the front switching lever 6 in Figure 21) is located adjacent, the coupling element 18 cannot be pivoted into the installa-
 tion position C and cannot be removed. This is illustrated in Figure 28.

In this exemplary embodiment, the movement direction of the coupling element 18
 25 extends rotationally around the axis 19. However, the movement can also be rota-
 tionally designed in addition by another type of trajectory, but in a plane different than the actuating plane of the switching lever 6. The movement is also conceivable along another trajectory.

30 Figure 23 is a side view of the coupling element 18 in the installation position C with respect to the actuating section 7 of the switching lever 6 shown adjacent. The axis 19 extends outside an imaginary longitudinal axis of the coupling element 18 here.

A cross section through the coupling element 18 in the region of the pivot section 18a
 35 through the shaft section 18b is shown in Figure 24. The shaft section 18b, the disk-
 shaped solid shaft section 18i, and the side walls 18d are formed in one piece here, for example from a suitable plastic material. The key surface 18j is here arranged between the left side wall 18d and the disk-shaped solid shaft section 18i. A reduc-
 40 tion of the external dimension of the shaft section 18b in relation to the solid shaft section 18i is clearly apparent.

Figure 25 shows a side view of actuating section 7 of the switching lever 6 and the coupling element 18 located in the second coupling position B. The projections 18h the form of spherical sections of the detent device protrude into the interior of the

5 coupling section 18c from the inner sides of the sidewalls 18d in the region of the coupling section 18b of the coupling element 18.

In Figure 26, the coupling element 18 of the detent device is in the first coupling position A. A sectional illustration along line XXVII to the coupling section 18c is shown in
 10 Figure 27, wherein the projections 18h are engaged with the open ends of the receptacle 20' of the actuating section 7' of the adjacent switching lever 6' and form a detent position.

An additional detent device for the first coupling position A is indicated in Figure 27,
 15 which (like the detent device for the above-described second coupling position B), comprises a protruding section as a web 18'k and an indented section as an indentation 7'h of the actuating section 7' of the switching lever 6'. The web 18'k is arranged in the coupling section 18c of the coupling element 18 on its side wall 18d in parallel to its longitudinal edge. In the first coupling position A, the web 18'k extends in parallel
 20 to the pivot axis 5a and in parallel to the indentation 7'h and is engaged with the indentation 7'h.

The webs 18k, 18'k and the associated indentations 7h, 7'h can of course also be arranged at other angles in relation to the pivot axis 5a for the two coupling positions
 25 A, B. They can also have other shapes, for example spherical section, polygonal, oval shape, cross shape, etc. Of course, these detent devices for the coupling positions A, B are also expandable for further coupling positions of the coupling element 18.

30 Using this principle of the coupling element 18 of the second exemplary embodiment, independent switching of adjacent switching levers 6, 6' is possible from any position.

Figures 28-29 show schematic partial illustrations of coupling devices 100 of disconnect terminals 1, 1' according to the second exemplary embodiment according to
 35 Figure 17.

Figure 28 shows two pairs of switching levers 6, 6'; 6, 6', in which the two front switching levers 6, 6' are shown having the coupling element 18 of the coupling device 100 in the coupling position A. The coupling element 18 of the other coupling
 40 device 100 is in the second coupling position B.

The coupling element 18 can also be designed for more than two switching levers 6, 6'. Figure 29 shows an example for four switching levers 6, 6' here. The coupling element 18 is correspondingly embodied longer. The regions of the coupling element

5 18 which couple the actuating sections 7' of the middle switching lever 6' can also be provided with corresponding projections 18h.

Figures 30-33a show schematic views of a coupling device 100 of a third exemplary embodiment of disconnect terminals 1, 1'.

10

This coupling device 100 comprises a rotatable or pivotable coupling element 22, 22', which is arranged in a receptacle 23, 23' in the actuating section 7, 7' of a switching lever 6, 6'.

15

The receptacle 23, 23' is open toward the side section 7d, 7'd (see Figure 1) of the actuating section 7, 7' via a slot 25, 25'. Toward the other side section 7c, 7'c, the receptacle 23, 23' is open through an intermediate wall 27, 27' of a further receptacle 24, 24', which in turn is open toward the other side section 7c, 7'c of the actuating section 7, 7', also through a slot 25a, 25'a.

20

The coupling element 22, 22' is shown in perspective from various views and installed in Figures 33-33a. It comprises a cylindrical body 22a, 22'a having a pivot axis 22c, 22'c. An arm having a hook section 22b, 22'b is radially attached to the body 22a, 22'a. The body 22a, 22'a comprises an actuating section 22d, 22'd, here in the form of a slot, for a suitable tool, for example a screwdriver, on one end face. The other end face of the body 22a, 22'a is provided with a centrally formed bearing projection 22f, 22'f, which is a spherical section here. A lug 22e, 22'e (a cam) is attached diametrically to the formed hook section 22b, 22'b on the outer side of the body 22a, 22'a. This lug 22e, 22'e extends from the end face of the body 22a, 22'a with the bearing section 22f, 22'f in parallel to the pivot axis 22c, 22'c to approximately half of the length of the body 22a, 22'a.

25

30

The receptacle 23, 23' corresponds to the shape of the coupling element 22, 22' and is closed in its lower section with a curved receptacle wall 27a, 27'a having an undercut 23a, 23'a in the region of the slot 25, 25', the radius of which corresponds to the radius of the body 22a, 22'a of the coupling element 22, 22'.

35

The receptacle 24, 24' corresponds to the hook section 22b, 22'b of the coupling element 22, 22' and has an undercut 24a, 24'a in its lower region, which is provided to engage with the hook section 22b, 22'b of the coupling element 22, 22' in the slot 25a, 25'a.

40

The receptacles 23, 23' and 24, 24' are closed using the end face sections 7a, 7'a and 7b, 7'b of the actuating sections 7, 7', wherein openings 26, 26' for access to the

5 slot 22d, 22'd of the coupling element 22, 22' for the pivoting thereof are indented in the region of the body 22a, 22'a of the coupling element 22, 22' in the end face section 7b, 7b', and wherein bearing sections 29, 29' are introduced into the opposing end section 7a, 7'a for mounting the bearing projections 22f, 22'f of the coupling elements 22, 22'. In this way, the coupling element 22, 22' is pivotably guided by the
 10 bearing sections 29, 29' and the lower receptacle wall 27a, 27'a and the intermediate wall 27, 27' around the pivot axis 22c, 22'c in the receptacle 23, 23'.

The pivot axis 22c, 22'c is perpendicular to the pivot axis 5a of the switching lever 6, 6' and tangential to an imaginary circle having a center point, through which the pivot
 15 axis 5a of the switching lever 6, 6' extends.

The coupling element 22, 22' is clipped from the side section 7d, 7'd through the slot 25, 25' into the receptacle 23, 23', wherein the undercut 23a, 23'a and the bearing projection 22f, 22'f in the form of a spherical section hold the coupling element 22, 22'
 20 captively in the receptacle 23, 23'.

Figure 30 shows two coupling elements 22, 22' in adjacent actuating sections 7, 7' of adjacent switching levers 6, 6' in the first coupling position A. The hook sections 22b, 22'b are inside the receptacles 23, 23' here.

25

Figure 30b shows the receptacles 23, 23'; 24, 24' closed by the side sections 7b, 7'b with the openings 26, 26' through which, using a tool, preferably a screwdriver, engaged with the actuating sections 22d, 22'd, the coupling elements 22, 22' can each be pivoted around the pivot axes 22c, 22'c out of the first coupling position A into the
 30 second coupling position B and back.

The openings 26, 26' are here provided with additional stops 26a, 26'a for the tool, in order to restrict pivoting of the coupling element 22, 22' to the coupling positions A and B.

35

In Figures 30a and 30c, the second coupling positions B are shown. The coupling elements 22, 22' are pivoted such that the hook sections 22b, 22'b extend through the slots 25, 25' and are engaged with the receptacle 24 of the adjacent actuating section 7, 7', whereby coupling of the adjacent switching levers 6, 6' is enabled.

40

It is also conceivable for two opposing hook sections 22b, for example in the form of an anchor, to be provided, wherein the coupling element 22, 22' is pivotable in two different pivot directions, wherein it occupies a middle position in the second coupling position B.

5

In Figure 31, only one coupling element 22' is pivoted into the second coupling position B, the other coupling element 22 has remained in the first coupling position A. The coupling elements 22, 22' are thus switchable and/or adjustable and/or pivotable independently of one another.

10

Independent movements of the switching levers 6, 6' are thus possible as soon as the coupling element 22, 22' on the respective adjacent switching lever 6, 6' is switched to the first coupling position A, and thus does not lock with the adjacent switching lever(s) 6, 6'.

15

The lower side of the receptacle wall 27a, 27'a is shown having a recess 28, 28' in each case in Figure 31a.

Figure 31b shows the coupling elements 22, 22' from Figures 31 and 31a without side sections. In Figure 31c only the open receptacles 23, 23'; 24, 24' are shown without coupling elements 22, 22'.

20

The intermediate wall 27, 27' also comprises a recess 28a, 28'a.

25

The recesses 28, 28'; 28a, 28'a correspond in the shape thereof to the lug 22e, 22'e of the coupling element 22, 22'.

As is clearly apparent from Figures 31a and 31b, the lug 22e of the coupling element 22 located in the first coupling position A is engaged with the recess 28 in the lower receptacle wall 27a and thus forms a locking of the coupling element 22 in the first coupling position A.

30

The lug 22'e of the other coupling element 22', which is in the second coupling position B, is engaged with the other recess 28'a in the intermediate wall 27. A locking of the coupling element 22' in the second coupling position B is thus enabled.

35

The recesses 28, 28' and 28a, 28'a are shown enlarged in Figure 32 together with the bearing sections 29, 29'.

40

The regions of the actuating sections 7, 7' of the switching levers 6, 6' having the indented receptacles 23, 23'; 24, 24' are shown box-shaped here. These box-shaped regions are embodied in one piece with the switching levers 6, 6'.

5 In another embodiment, these box-shaped regions or receptacle sections can also be formed as separate parts, which are attached in a suitable manner to the switching levers 6, 6'. Such an attachment can be formed, for example, as a clip connection, tongue-and-groove connection, screw connection, plug connection, or the like.

10 Figures 34-40c show schematic views of switch status displays 30.

The respective switch position I, II, i.e., the connection position and the separation position of the switching levers 6, 6', is visibly displayed by the switch status display 30.

15

This is carried out in such a way that, on the one hand, a first display portion 31 is arranged on the movable switching lever 6, 6' or the actuating section 7, 7', and, on the other hand, a second display portion 32 matching thereto is attached to the fixed housing. In the first switch position I ("closed") these two display portions 31 and 32 are unified in such a way that a "closed" symbolism is clearly visible. And in the second switch position II ("separated") this symbolism is separated, from which a separation is clearly apparent.

20

The following geometrical solutions are possible for this purpose:

25

- geometric break
(For example, separate/combined two semicircles – closed circle)
- fork and connection point
- geometric elements designed in the form of arrows, which are not visible in the
- 30 switch position I.
- switch symbols: fork having connection point or switch symbol open/closed
- surfaces flush in switch position I
- elements can be colored to represent togetherness, to offer contrast or a traffic signal function.

35

Different examples of this are shown in Figures 34-40c.

40

Figure 34-34a show the switch position II, wherein Figures 34b-34c display the switch position I. In this case, the movable display portion 31 is a forked circular arc, which encloses the fixed display portion 32, which is formed as a protruding circular cylinder, in the switch position II.

The geometric reversal is shown in Figures 35-35a in switch position II and in Figures 35b-35c in switch position I. The circular cylinder is now the movable display portion

5 31, which is enclosed in switch position I by a receptacle corresponding thereto as the fixed display portion 32.

Figures 36-36c show the separated two semicircles, which are then brought together as a closed circle in switch position I.

10

Figures 37-37c is a variant of the embodiment according to Figures 35-35c, wherein the fixed display portion 32 comprises an upwardly protruding symbol, which represents the switching state I as a plugged-together plug connection circuit symbol.

15 Figures 38-38c and Figures 39-39c each show a cut-through contour, which can be recognized as joined in the switch status I.

Figures 40-40a show a colored circuit symbol of an open switch as the movable display portion 31. The fixed display portion 32 is an opening in the form of the circuit symbol for a closed switch. In the switch position I, the circuit symbol of the open switch is no longer visible, wherein the opening in the form of the circuit symbol for the closed switch is represented by the colored background of the movable display portion 31 located underneath.

25 The switch status display can also be designed having a type of traffic signal function.

Schematic perspective views of arrangements 10 of disconnect terminals 1, 1' according to the invention are shown in Figures 41 and 41a in arrayed arrangements 30 10.

It is clearly visible here which disconnect terminals 1, 1' are in the switch position I and which are in the switch position II, since the associated end face sections 7a, 7'a; 7b, 7'b of the switching levers 6, 6' each rest on the stops 9, 9' and 9a, 9'a, respectively. 35

In the exemplary embodiments described, a first coupling position A and a second coupling position B and also an installation position C are specified. The number of possible coupling positions located in between and located outside these positions is not thus restricted. 40

The invention is not restricted by the above-explained exemplary embodiments, but rather is modifiable within the scope of the claims.

5	List of reference signs	
	disconnect terminal	1, 1 '
	housing	2, 2 '
	attachment section	3, 4
	conductor rail	3a, 4a
10	separation section	5, 5 '
	pivot axis	5a
	switching lever	6, 6 '
	lateral wall	6a, 6'a
	actuating section	7, 7 '
15	end face section	7a, 7'a; 7b, 7'b
	face section	7c, 7'c; 7d, 7'd
	surface	7e, 7'e
	expanding section	7f
	expanding blocking web	7g, 7'g
20	indentation	7h, 7'h
	receptacle	8, 8 '; 8a, 8'a
	guide groove	8b, 8'b
	stop section	9, 9 '; 9a, 9'a
	arrangement	10
25	coupling element	11
	switch pin	12
	lug	12a
	guide web	12b
	driver	13
30	guide web	13a
	handle	14
	lower side	14a
	symbol	14b
	detent spring	15
35	inner surface	15a
	intermediate space	15b
	detent lug	16
	guide recess	17
	retaining section	17a, 17b
40	coupling element	18
	pivot section	18a
	shaft section	18b
	coupling section	18c
	side wall	18d

5	transverse wall	18e, 18f
	overhang	18g
	projection	18h
	solid shaft section	18i
	key surface	18j
10	axis	19, 19a, 19'a
	receptacle	20, 20 '
	recess	20a, 20'a
	undercut	20b, 20'b
	opening	21, 21 '
15	coupling element	22, 22 '
	body	22a, 22'a
	hook section	22b, 22'b
	pivot axis	22c, 22'c
	actuating section	22d, 22'd
20	lug	22e, 22'e
	bearing projection	22f, 22'f
	receptacle	23, 23'; 24, 24'
	undercut	23a, 23'a; 24a, 24'a
	slot	25, 25'; 25a, 25'a
25	actuating opening	26, 26'
	stop	26a, 26'a
	intermediate wall	27, 27 '
	receptacle wall	27a, 27'a
	recess	28, 28'; 28a, 28'a
30	bearing section	29, 29 '
	switch status display	30
	display portion	31, 32
	coupling device	100
35	coupling position	A, B
	installation position	C
	switching movement	SB
	tool	W
40	switch position	I, II

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Claims

1. An arrangement having at least two disconnect terminals and at least one coupling device, wherein the at least two disconnect terminals each comprise at least one switching lever, wherein each switching lever is adjustable independently from the other switching lever from a first switch position into at least one second switch position and back, wherein the switching levers are connectable by means of the at least one coupling device, wherein the at least one coupling device connects the switching levers if the at least one coupling device is switched into at least one first coupling position, and in that the at least one coupling device separates the switching levers from one another if the at least one coupling device is switched into at least one second coupling position, and wherein the at least one coupling device comprises at least one coupling element which is switchable linearly in the radial direction in relation to a pivot axis of the switching levers from the at least one first coupling position into the at least one second coupling position or into at least one further coupling position and back.
2. The arrangement as claimed in claim 1, wherein the at least one coupling element is held captively on the switching lever of one of the at least two disconnect terminals.
3. The arrangement as claimed in claim 1 or 2, wherein the at least one coupling element is switchable linearly in the radial direction in relation to a pivot axis of the switching levers from the first coupling position into the second coupling position or into the at least one further coupling position and back perpendicularly or at an angle in relation to the movement direction of a switching lever.
4. The arrangement as claimed in claim 3, wherein the at least one coupling element comprises at least one switch pin, at least one driver, and at least one handle, wherein the at least one switch pin is longer than the at least one driver.
5. The arrangement as claimed in claim 4, wherein the at least one coupling element is accommodated in a displaceably guided manner with the at least one switch pin in at least one receptacle of the one switching lever of the at least one disconnect terminal and is fixed by a detent mechanism in each case in

- 5 the at least one first coupling position and in the at least one second coupling position or in the at least one further coupling position.
6. The arrangement as claimed in claim 5, wherein the at least one switch pin of the at least one coupling element comprises at least one lug and at least one
10 detent spring having at least one detent lug as a detent mechanism.
7. The arrangement as claimed in any one of the preceding claims, wherein the at least one driver is engaged in the at least one first coupling position with at least one receptacle of an adjacent or at least one closest switching lever or at
15 least one switching lever arranged remotely in a multiple of a grid, and in that the at least one driver is disengaged in the at least one coupling position or in the at least one further coupling position from the at least one receptacle of the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid.
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8. An arrangement having at least two disconnect terminals and at least one coupling device, wherein the at least two disconnect terminals each comprise at least one switching lever, wherein each switching lever is adjustable independently from the other switching lever from a first switch position into at
25 least one second switch position and back, wherein the switching levers are connectable by means of the at least one coupling device,
Wherein the at least one coupling device connects the switching levers if the at least one coupling device is switched into at least one first coupling position, and in that the at least one coupling device separates the switching levers
30 from one another if the at least one coupling device is switched into at least one second coupling position, and
wherein the at least one coupling device comprises at least one coupling element which is switchable rotationally around an axis from the at least one first coupling position into the at least one second coupling position or into at least
35 one further coupling position and back, wherein the axis is tangential to an imaginary circle having a center point through which a pivot axis of the switching lever extends.
9. The arrangement as claimed in claim 8, wherein the at least one coupling element is held captively on the switching lever of one of the at least two disconnect terminals.
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10. The arrangement as claimed in claim 8 or 9, wherein the at least one coupling element is a type of oblong hood and comprises a pivot section, a shaft sec-

- 5 tion having the axis, and at least one coupling section, wherein the shaft section of the at least one coupling element is accommodated so it is pivotable around the axis in a receptacle of a radially protruding actuating section of the switching lever and is held captively by a suitable means.
- 10 11. The arrangement as claimed in claim 10, wherein the suitable means is an undercut.
12. The arrangement as claimed in claim 11, wherein the at least one coupling element is pivoted in the at least one first coupling position via the radially protruding actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid and is coupled at least thereto in a formfitting manner, wherein the at least one coupling section of the at least one coupling element encloses in a hood-like manner the radially protruding actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid.
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13. The arrangement as claimed in any one of claims 10 to 12, wherein the at least one coupling element is held in the at least one first coupling position in a first detent position, wherein at least one projection on the inner sides of side walls of the at least one coupling section of the at least one coupling element is engaged with ends of the receptacle of the actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid, and in that the at least one coupling element is held in the at least one second coupling position in a second detent position, wherein at least one detent device having a protruding section and an indented section corresponding thereto is provided.
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14. The arrangement as claimed in claim 8 or 9, wherein the at least one coupling element is arranged pivotably around at least one axis and captively in each case in a receptacle in at least one actuating section of the at least one switching lever, wherein the respective receptacle comprises at least one slot, through which the at least one coupling element is installable.
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15. The arrangement as claimed in claim 14, wherein the at least one coupling element comprises in each case a cylindrical body having an associated pivot axis and at least one arm attached to the body having at least one hook section.
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- 5 16. The arrangement as claimed in claim 15, wherein the at least one hook section extends in the at least one first coupling position through the at least one slot and is engaged with at least one further receptacle of the actuating section of at least the adjacent or at least one closest switching lever or at least one switching lever arranged remotely in a multiple of a grid, wherein the at
10 least one hook section remains in the respective corresponding receptacle in the at least one second coupling position.
- 15 17. The arrangement as claimed in any one of claims 14 to 16, wherein the at least one coupling element is locked in each of the at least one first coupling position and in the at least one second coupling position by means of at least one lug or at least one projection, which is engaged in the respective at least one coupling position or in the at least one further coupling position with a respective fixed recess.
- 20 18. The arrangement as claimed in any one of claims 14 to 17, wherein the at least one coupling element is switchable by means of a tool.
- 25 19. The arrangement as claimed in any one of claims 13 to 16, wherein the at least one actuating section of the at least one switching lever having the corresponding receptacles is formed having the at least one coupling element and the corresponding receptacles as at least one box-shaped region or receptacle sections each as a separate part, which is attached in a suitable manner to the at least one switching lever.