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(54) **Titre : ELEMENT DE LIAISON ET SYSTEME DE COFFRAGE D'UN ELEMENT DE PAROI**
(54) **Title: CONNECTING COMPONENT AND SYSTEM FOR SHUTTERING A WALL ELEMENT**

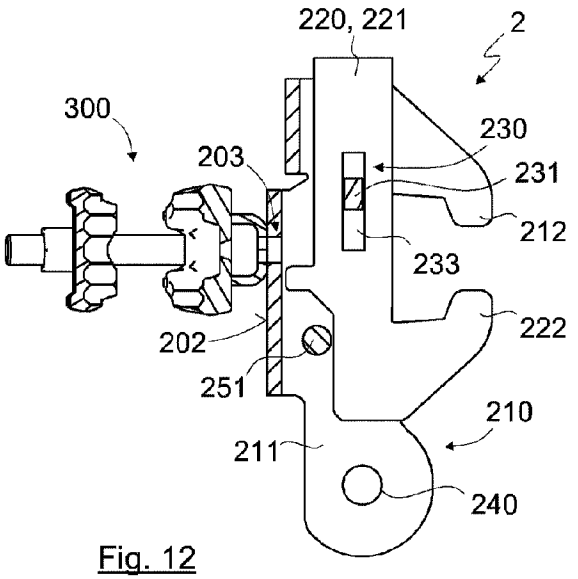

Fig. 12

(57) **Abrégé/Abstract:**
The invention relates to a connecting component (2) having a shuttering interface (200) for releasably connecting to a frame of a formwork panel (1), wherein the shuttering interface (200) comprises a first gripping device (210) having at least one first gripping arm (211) with a clamping jaw (212) and a second gripping device (220) having at least one second gripping arm (221) with a clamping jaw (222), wherein the first gripping arms (211) of the first gripping device (210) are movable in a closing direction (R) relative to the second gripping arms (221) of the second gripping device (220) in order to connect the clamping jaws (212, 222) to or release them from the frame (4), and having at least one fixture interface (300) for releasably connecting to a fixture (10, 12), wherein the shuttering interface (200) and the fixture interface (300) are actuable independently of one another.

Abstract

The invention relates to a connecting component (2) having a shuttering interface (200) for releasably connecting to a frame of a formwork panel (1), wherein the shuttering interface (200) comprises a first gripping device (210) having at least one first gripping arm (211) with a clamping jaw (212) and a second gripping device (220) having at least one second gripping arm (221) with a clamping jaw (222), wherein the first gripping arms (211) of the first gripping device (210) are movable in a closing direction (R) relative to the second gripping arms (221) of the second gripping device (220) in order to connect the clamping jaws (212, 222) to or release them from the frame (4), and having at least one fixture interface (300) for releasably connecting to a fixture (10, 12), wherein the shuttering interface (200) and the fixture interface (300) are actuatable independently of one another.

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CONNECTING COMPONENT AND SYSTEM FOR SHUTTERING A WALL ELEMENT

[0001] The present application claims the priority of German patent application 10 2021 120 438.0 and the priority of German patent application No. 10 2021 120 441.0, the content of which is completely incorporated herein by way of reference.

[0002] The invention relates to a connecting component having a shuttering interface for releasable connection to a frame of a formwork panel.

[0003] The invention also relates to a system for shuttering a wall element, comprising at least one formwork panel and at least one connecting component.

[0004] The invention relates to the field of construction. When erecting or remodeling buildings, building parts are often molded by casting concrete. The shape of these cast building parts is predetermined by formwork, wherein the formwork is erected on the construction site before casting. In particular, ceilings or walls of a building are erected with the aid of formwork. In the production of high walls or wall elements, a scaffold is required in order to be able to prepare the shuttering for the production of the wall element. A scaffold is required on the one hand to connect individual formwork panels to one another to form the overall formwork, for example by attaching formwork locks. Furthermore, two mutually opposite formwork panels have to be connected to one another by anchors before the production of a wall element in order to absorb the outward pressure of the cast concrete material. For this purpose, the formwork panels must be reachable over their entire height to workers, which is usually accomplished place by a scaffold or by a working platform.

[0005] In most cases before the production of the wall element, reinforcement must be attached to an already positioned formwork panel or between such a formwork panel and closing formwork which is opposite the formwork panel. According to the prior art, scaffold or working platforms which are provided for

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attaching formwork locks are arranged on the shuttering so that no reinforcement can be attached from these scaffolds or working platforms. The locations at which the reinforcement must be positioned are simply not reachable from these scaffolds or working platforms which serve to prepare the formwork panels, since they are located on the opposite side of the formwork panel. In practice, this means that a first type of framework is required for operating the formwork, and a second type of scaffold is required for positioning and introducing the reinforcement into the formwork. In addition, a plurality of different types of scaffolds and formwork panels usually exist on the construction site, whereby it is often not possible to connect the scaffold to the formwork panels, especially for the applications described above. Differences in the grid, which exist between the scaffolding systems and the formwork systems, usually prove to be problematic. Finally, in many applications after the casting of a wall element with the aid of the formwork, work still needs to be done on the wall element after removal of the formwork, for example the filling of anchor holes or also plastering or paint work. In order to be able to reach the wall element over its entire height, a scaffold or a working platform is thus again required after the actual casting in order to be able to perform final work. Furthermore, it is also necessary to provide the formwork panels with push-pull props. For the production of a wall element with the aid of a formwork, a plurality of different scaffolds or working platforms are thus required, which leads to complicated work processes and a need for a plurality of different scaffold elements.

[0006] The object of the present invention is therefore to simplify the production of a wall element, in particular to enable a flexible, universal and/or secure fastening of scaffolds, platforms and/or supports to formwork panels.

[0007] The object is achieved according to the invention by claim 1.

[0008] According to the invention, a connecting component is proposed having a shuttering interface for releasably connecting to a frame of a formwork panel,

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wherein the shuttering interface comprises a first gripping device having at least one first gripping arm with a clamping jaw and a second gripping device having at least one second gripping arm with a clamping jaw, wherein the first gripping arms of the first gripping device are movable in a closing direction relative to the second gripping arms of the second gripping device in order to connect the clamping jaws to or release them from the frame, and having at least one fixture interface for releasably connecting to a fixture, wherein the shuttering interface and the fixture interface are actuatable independently of one another.

[0009] The connecting component according to the invention creates a combination between a shuttering interface and an fixture interface, by means of which a plurality of different objects, in particular different types of scaffolds, platforms, supports, etc., can advantageously be detachably connected to the frame of the formwork panel.

[0010] The fixture interface can in particular be connectable to a scaffold section, in particular a vertical bar of a scaffold, a platform section, a support, in particular a push-pull prop, as an fixture. In particular, multiple fixtures can also be provided, in particular an fixture interface for a scaffold section and a separately formed fixture interface for a support, in particular a push-pull prop.

[0011] The fixture interface can preferably have a connection clamp for receiving an fixture. The connection clamp can preferably be connected or connectable to a vertical bar of a scaffold section in a force-fit.

[0012] The formwork panel to which the connecting component can be detachably fixed can preferably have a frame to the front of which a formwork facing is fixable, in particular attachable or mounted. The frame of the formwork panel furthermore preferably has multiple longitudinal struts and multiple cross struts running parallel to one another. The longitudinal struts and the cross

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struts can be arranged substantially perpendicular to one another or can run perpendicular to one another.

[0013] In an advantageous embodiment of the frame, which is suitable in particular for the system defined in claim 16, at least one arch-shaped bridging element can be arranged between at least two cross struts running adjacent to one another. The bridging element can have two end regions, wherein in each case one of the end regions is fixed to one of the two adjacent cross struts. In an ergonomically advantageous manner, the curved bridging element can simplify the handling of the formwork panel. With the aid of the curved bridging element, the formwork panel can be transported and positioned more easily. The bridging element can, insofar as this is legally permissible in the respective jurisdictions, advantageously also serve as a handhold and/or as a climbing aid or as a climbing strut, in particular in conjunction with a scaffold positioned adjacent to or on the formwork panel. The curved bridging element can in particular be an arch-shaped handle. The arcuate design of the bridging element makes it possible in a particularly advantageous manner way for a worker to grip around the bridging element.

[0014] The shuttering interface can have a locking mechanism in order to adjust and/or releasably fix the position of the gripping arms in the closing direction.

[0015] By means of the locking mechanism, the clamping jaws of the first and second gripping arms can be connected, for example clamped, to the frame, in particular to the cross struts and/or the longitudinal struts of the frame.

[0016] The locking mechanism can comprise a wedge, the outer contour of which preferably at least partially forms a control surface.

[0017] This measure provides a simple, detachable and at the same time secure locking option.

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[0018] The two gripping devices can each have recesses which at least partially overlap one another and into which the wedge is insertable or inserted.

[0019] It is advantageous if the connecting component is designed such that a movement of the wedge relative to the recesses leads to a closing movement (in the closing direction) in which the gripping arms move toward one another relative to one another. It is preferably provided that one of the gripping devices, preferably the first gripping device, does not move relative to the frame, but that the closing movement of the gripping devices only results from the movement of one of the two gripping devices, preferably of the second gripping device, which thus also moves relative to the frame, for example orthogonally to a cross strut of the frame on which the connecting component is to be fixed.

[0020] The wedge can be captively arranged in the recesses, wherein the wedge preferably has stops projecting beyond the recesses at its front ends to form the captive securing.

[0021] The captive securing can be designed, for example, in the form of a dowel pin, a clamping sleeve, a cotter pin of a locking pin, a bolt or the like.

[0022] The control surface of the wedge can preferably be designed in such a way that, by moving the wedge into a locking position, the gripping arms of the first gripping device and the second gripping device move relative to one another in the closing direction, and they thus engage with the frame, in particular with cross struts and/or longitudinal struts of the frame, or engage in the frame or are clamped to the frame.

[0023] In a special manner, the control surface of the wedge or the locking mechanism is suitable, if, as will be shown in more detail below, the frame, in particular the cross struts and/or longitudinal struts of the frame, have grooves, and the clamping jaws of the gripping arms engage in the grooves.

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[0024] Preferably, the wedge can be brought into its locking position with a hammer or a similar, suitable tool.

[0025] The first gripping device can preferably have two first gripping arms, and the second gripping device can have a second gripping arm.

[0026] This allows the connecting component to be stable and fixed to the frame.

[0027] The gripping arms can run plane-parallel and at a distance from one another, and the second gripping arm can be arranged in an intermediate space, preferably centrally, between the two first gripping arms.

[0028] At least one bolt can be present which bridges an intermediate space between the first gripping arms and is arranged such that it serves as a stop for a movement of the second gripping arm against the closing movement.

[0029] The bolt can also be provided to connect the two first gripping arms to one another.

[0030] It is advantageous if the clamping jaws have a projection at their front ends, which is designed to engage in grooves of the frame.

[0031] It is advantageous if at least a part of the cross struts and/or of the longitudinal struts in the upper side and the underside always has at least one groove which runs in the longitudinal direction of the cross struts.

[0032] Within the scope of the invention, the “upper side” and the “underside” of the cross struts (or the longitudinal struts) are also jointly referred to as side surfaces.

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[0033] In a cross-section, the profile of the cross struts and/or of the longitudinal struts can preferably have the shape of a bone or an "H." With the aid of the grooves and the connecting component according to the invention, different scaffolds, platforms and/or supports, in particular push-pull props, can be easily and securely fastened to the formwork panel. The connecting component whose gripping devices or gripping arms are preferably adapted to the profile can be variably attached to the frame and removed again. In this way, scaffolds, platforms and/or supports, in particular push-pull props, can be very flexibly attached to align the formwork.

[0034] It has proven to be particularly suitable if the grooves extend over the entire length of the respective cross strut and/or longitudinal strut. As a result, the connecting components can be fixed to the frame particularly advantageously and flexibly.

[0035] Viewed in a cross-section of the respective longitudinal strut and/or cross strut, the grooves can be arranged axially symmetrically relative to one another and/or be arranged opposite one another and have at least approximately the same shape as viewed in a cross-section.

[0036] By engaging the clamping jaws in the grooves, a stable force-fit and form-fit connection can be created between the connecting component and the longitudinal struts and/or cross struts of the frame of the formwork panel.

[0037] The clamping jaws are preferably designed complementary in shape to the grooves in the longitudinal and cross struts of the formwork panel.

[0038] The relative position between the connecting component and the formwork panel can be designed to be smoothly adjustable in a direction parallel to the running direction of the grooves in the longitudinal struts and/or cross struts.

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[0039] The connecting component can be used particularly advantageously, since the connecting component, in particular with the aid of the grooves, in particular along the cross struts of the frame, can be attached to the frame at a suitable horizontal (or also vertical) position. In addition, the position between the shuttering interface and the fixture interface can also be designed to be adjustable. On the other hand, a connection part formed at the fixture interface, e.g., a connecting clamp of the fixture interface, can be designed to be smoothly adjustable in its position relative to a scaffold section, e.g., a vertical bar. The connecting component thus enables an adaptation of the position between the formwork panel and the scaffold section or a push-pull prop in two spatial directions oriented perpendicular to one another.

[0040] With the aid of the grooves, the connecting component can be captively secured on the longitudinal and/or cross struts of the frame of the formwork panel.

[0041] It is advantageous if the grooves run off-center in the upper sides and the lower sides of the particular cross struts and/or longitudinal struts in such a way that the grooves run closer at a rear side of the frame than at the front side.

[0042] Preferably, the grooves run in the upper side and the underside at a constant or uniform distance from the edges of the upper side or the underside of the cross strut or the longitudinal strut.

[0043] The grooves preferably run off-center in the upper side or the underside of the cross struts and/or longitudinal struts in such a way that the grooves have a greater distance from a front edge of the strut in which the upper side or the underside adjoins the front side of the frame or the formwork facing than the respective rear edge of the strut which adjoins the rear side of the frame. Due to the fact that the grooves run off-center in such a way, the connecting component can be fixed or clamped in the grooves particularly advantageously.

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[0044] It is also advantageous if the cross struts have holes at a distance from the grooves in the upper side and/or the underside, which preferably serve to drain liquids, for example rainwater.

[0045] It has been found to be advantageous if side walls or the flanks of the respective grooves are inclined outwards from a groove base of the respective grooves, wherein the side walls can preferably enclose an angle of 95° to 125°, in particular 110°, with the groove base.

[0046] The grooves can preferably have a depth of 9 mm to 16 mm, preferably of 13 mm.

[0047] The aforementioned values have proven to be particularly suitable for fixing the connecting component. Due to this geometry, the connecting components can be fixed in the grooves particularly easily and without twisting, preferably by clamping.

[0048] The optional design of one or more bridging elements has proven to be particularly advantageous in connection with cross struts which, in the upper side and the underside, each have at least one groove which run in the longitudinal direction of the cross struts, in particular as described above. In particular in a particularly advantageous embodiment of the cross struts with grooves which run off-center in such a way that the grooves have a greater distance from a front edge of the cross strut, the arched profile of the bridging element is particularly suitable. Due to the arched profile of the bridging element, it is possible to fix the bridging element in a section of the upper side or the underside of the cross struts which do not have a groove. These sections adjoin the front side of the frame. A design of the bridging element with a linear profile would have the disadvantage that a worker's hand would not be able to grip the bridging element appropriately or easily due to its spatial proximity to the front side of the frame and therefore also to the formwork facing. This

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problem is solved in an advantageous manner by the arched design of the bridging element.

[0049] It can be advantageous if the frame has two outer frame cross struts and two outer frame longitudinal struts, between which inner cross struts are arranged.

[0050] It can be provided that the at least one bridging element is arranged between two of the inner cross struts. It has proven to be particularly suitable if the bridging element is arranged between two of the inner cross struts. In particular if the bridging element serves as a handle or as an climbing aid, such a positioning is advantageous.

[0051] It can be provided that all inner cross struts have the grooves and the outer frame cross struts do not have any grooves. It has been found to be sufficient if all inner cross struts have grooves. The additional formation of grooves also on the outer frame cross struts can therefore also be omitted for cost reasons.

[0052] The shuttering interface and at least one of the fixtures interfaces can be detachably connected to one another, wherein the shuttering interface and the fixture interface preferably each have a contact surface with an elongated hole, and wherein a fastening element can be introduced through the elongated holes in order to releasably connect the contact surfaces to one another.

[0053] The fastening element can preferably be designed in the form of a double T. An advantageous and preferably releasable coupling of the shuttering interface and the fixture interface is thereby achieved.

[0054] The form-fit connection between the shuttering interface and the fixture interface with the aid of the fastening element can preferably take place in that the fastening element is inserted into the elongated holes in an orientation

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aligned with the elongated holes and is then rotated by preferably 90 degrees, so that a cross beam of a T rests on the inside against the respective elongated hole, and the fastening element is therefore no longer able to be removed from the elongated holes.

[0055] Alternatively, a connection between the shuttering interface and the fixture interface can also be produced by a screw connection or other method familiar to the person skilled in the art.

[0056] The fastening element can be integrally connected to the contact surface of the fixture interface or the shuttering interface, and/or the second gripping arm can have a projection which is designed and arranged such that a rotation of the fastening element is limited by the projection.

[0057] The integral connection of the fastening element to the fixture interface or the shuttering interface can preferably be produced by welding or riveting. Other connection options are also conceivable here.

[0058] Preferably, the fastening element is integrally connected to the fixture interface and is positively connected to the shuttering interface, wherein a rotation of the fastening element relative to the shuttering interface is preferably prevented by the projection of the second gripping arm.

[0059] The contact surface of the shuttering interface can be formed by an angled surface of one of the first gripping arms, and/or the contact surface of the fixture interface can be formed by a base of a rail which is U-shaped in cross section.

[0060] The contact surface of the shuttering interface can preferably be designed so that one of the first gripping arms is bent at its end facing away from the clamping jaw. The contact surface of the shuttering interface, which is used to connect the fixture interface, can be formed after of the bend.

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[0061] At least one of the fixtures interfaces can have a bore for fastening a push-pull prop.

[0062] The bore or the fixture interface for the push-pull support can preferably be designed in at least one of the first and/or the second gripping arms.

[0063] Instead of connecting a push-pull support, the bore can also serve, for example, for fixing tools by means of a carabiner or the like.

[0064] Alternatively to a bore, the fixture interface for the push-pull support can also be realized by another fastening option, for example the fixture interface can be designed as a hook or angle.

[0065] In claim 16, a system for shuttering a wall element is specified, comprising at least one formwork panel and at least one connecting component, wherein the formwork panel has a frame with multiple longitudinal struts and multiple cross struts, wherein the longitudinal struts and the cross struts are arranged substantially perpendicular to one another, wherein at least a part of the longitudinal struts and/or of the cross struts has at least two grooves which run in the longitudinal direction and on opposite side surfaces of the respective longitudinal strut and/or cross strut, and wherein the connecting component is a connecting component according to any of claims 1 to 15 and/or one of the embodiments described above, wherein the gripping arms of the connecting component engage in the at least two grooves of a respective longitudinal strut and/or cross strut.

[0066] Within the scope of the invention, it can be provided that a cross strut is divided by a longitudinal strut into two or more cross strut parts. Such a multipart cross strut is to be regarded as a cross strut within the scope of the invention. This applies in particular if all cross strut parts run axially parallel to one another and thus, viewed functionally, form a cross strut.

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[0067] In a particularly advantageous embodiment of the formwork panel, it can be provided that these have two longitudinal struts which form outer frame longitudinal struts and, if necessary, an inner longitudinal strut running centrally and plane-parallel to the longitudinal frame struts is provided. This inner longitudinal strut can divide the cross struts into two cross strut parts in each case.

[0068] Advantageous embodiments and developments of the invention can be found in the dependent claims.

[0069] Exemplary embodiments of the invention are described in principle below with reference to the drawings.

[0070] In the drawings:

Fig. 1 shows a perspective partial view of a formwork panel on which multiple connecting components according to the invention are releasably fixed;

Fig. 2 shows a perspective view of a transverse or longitudinal strut on which a connecting component according to the invention is fixed;

Fig. 3 shows a side view according to Fig. 2;

Fig. 4a shows a sectional view of a detail of the formwork panel with a representation of a cross strut with grooves in a first configuration engaging into the gripping arms of the connecting component;

Fig. 4b shows a sectional view of a detail of the formwork panel with a representation of a cross strut with grooves in a second configuration engaging into the gripping arms of the connecting component;

Fig. 5 shows a perspective view of the connecting component in conjunction with an fixture in a design as an intermediate bar of a scaffold section;

Fig. 6 shows a perspective view of the connecting component according to Fig. 2 in conjunction with an fixture designed as a push-pull prop;

Fig. 7 shows a perspective view of the connecting component according to Fig. 2 in conjunction with an fixture designed as a scaffold section, in particular as a vertical bar;

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Fig. 8 shows a simplified sectional view through a longitudinal or cross strut of a frame of a formwork panel with advantageous dimensions which are particularly suitable for a connection to a connecting component according to the invention;

Fig. 9 shows a perspective view of a system for shuttering a wall element;

Fig. 10 shows a side view of a system for shuttering a wall element;

Fig. 11 shows a front view of the connecting component in a first embodiment in the unlocked state;

Fig. 12 shows a sectional view according to the line XII-XII according to Fig. 11;

Fig. 13 shows a front view of the connecting component in the first embodiment in the closed position;

Fig. 14 shows a sectional view according to the line XIV-XIV according to Fig. 13;

Fig. 15 shows a front view of the connecting component in a second embodiment in the unlocked state;

Fig. 16 shows a sectional view according to the line XVI-XVI according to Fig. 15;

Fig. 17 shows a front view of the connecting component in the second embodiment in the closed position;

Fig. 18 shows a sectional view according to the line XVIII-XVIII according to Fig. 17;

Fig. 19 shows a side view of a wedge;

Fig. 20 shows a perspective view of the wedge according to Fig. 19;

Fig. 21 shows another perspective view of the wedge according to Fig. 19;

Fig. 22 shows a side view of the connecting component in which one of the first gripping arms is removed and a projection of the second gripping arm is drawn in a broken line which can serve as an anti-rotation device for a fastening element connecting the fixture interface and the shuttering interface;

Fig. 23 shows another view of the connecting component according to Fig. 22;

Fig. 24 shows another view of the connecting component according to Fig. 22;

Fig. 25 shows a side view of the connecting component according to Fig. 22, in which the second gripping arm is removed as well; and

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Fig. 26 shows a side view of the rear side of the contact surface of the fixture interface, wherein a fastening element designed as a double T is inserted into an elongated hole in the contact surface.

[0071] Functionally identical elements are provided with the same reference signs in the figures.

[0072] Figure 1 shows a formwork panel 1 which, together with connecting components 2, form a system 3 for shuttering a wall element (not shown). The formwork panel 1 has a frame 4 which has multiple cross struts 5 and multiple longitudinal struts 6, wherein the longitudinal struts 6 and the cross struts 5 are arranged substantially perpendicular to one another. At least a part of the longitudinal struts 6 and/or of the cross struts 5 has at least two grooves 7, 8 which run in the longitudinal direction and on opposite side surfaces 9 (or on the upper side and the underside) of the respective longitudinal strut 6 and/or cross strut 5. In Figure 1, only the upper side surfaces 9 of the cross struts 5 with the grooves 7 are visible. Only the cross struts 5 are also provided with the grooves 7. The grooves 8 in the lower side surfaces 9 of the cross struts 5 can be seen in more detail in Figure 2. As shown further in Figure 1, a scaffold section 10 with vertical bars 10a and horizontal bars 10b is attached to the formwork panel 1 by means of the connecting components 2.

[0073] As can also be seen from Figure 1, the formwork panel 1 has a formwork facing 11 which, when in a state connected to the frame 4, rests on at least a part of the longitudinal struts 6 and/or the cross struts 5. The side surfaces 9 of the respective longitudinal strut 6 and/or cross strut 5 in which the grooves 7, 8 are arranged run substantially perpendicular to a front side of the frame 4 provided for attaching the formwork facing 11.

[0074] The frame 4 comprises two outer frame cross struts 5a and two outer frame longitudinal struts 6a, between which the inner cross struts 5 and/or the

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inner longitudinal struts 6 are arranged, wherein the inner cross struts 5 have the grooves 7, 8.

[0075] All inner cross struts 5 and/or all inner longitudinal struts 6 can have the grooves 7, 8, and the outer frame cross struts 5a and/or the outer frame longitudinal struts 6a can preferably have no grooves 7, 8.

[0076] In the present exemplary embodiment, all inner cross struts 5 comprise the grooves 7, 8.

[0077] Figure 2 shows a cross strut 5 of a formwork panel 1 (not shown in Figure 2) with a connecting component 2 which engages in the grooves 7, 8 of the cross strut 5. In another exemplary embodiment, the cross strut 5 could also be a longitudinal strut 6. Viewed in cross section of the respective longitudinal strut 6 and/or cross strut 5, the grooves 7, 8 are arranged axially symmetrically relative to one another and are arranged opposite one another.

[0078] The grooves 7, 8 can extend at least over a partial length or over the entire length of the respective longitudinal strut 6 and/or cross strut 5.

[0079] The connecting component 2 has a shuttering interface 200 for detachably connecting to the frame 4 of the formwork panel 1. The shuttering interface 200 comprises a first gripping device 210 having at least one first gripping arm 211 having a clamping jaw 212 and a second gripping device 220 having at least one second gripping arm 221 having a clamping jaw 222 (see Figure 3).

[0080] In the exemplary embodiments (see also Figures 11 to 18 and Figures 22 to 25), the first gripping device 210 has two first gripping arms 211, each having a clamping jaw 212. The second gripping device 220 has a second gripping arm 221 which is arranged in an intermediate space between the two first gripping arms 211.

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[0081] The first gripping arms 211 of the first gripping device 210 are movable relative to the second gripping arm 221 of the second gripping device 220 in a closing direction (indicated by the double arrow R in Figure 3) in order to connect or release the clamping jaws 212, 222 with the frame 4, in particular a cross strut 5 or also a longitudinal strut 6 of the frame 2.

[0082] The connecting component 2 furthermore has at least one fixture interface 300 for detachably connecting to an fixture, in particular the scaffold section 10, wherein the shuttering interface 200 and the fixture interface 300 can be operable independently of one another. The mounting of the fixture interface 300 for attaching the fixture is well known, so that it will not be discussed in detail. The mounting of the attachment interface 300 for connection to the scaffold section 10 can in particular be a connecting clamp or a pipe clamp or the like.

[0083] The at least one attachment interface 300 can be connectable to a scaffold section 10, a platform section, a support, in particular a push-pull prop 13 (as explained below) as an fixture.

[0084] The shuttering interface 200 can have a locking mechanism 230 in order to adjust and/or releasably fix the position of the gripping arms 211, 221 in the closing direction R. The locking mechanism 230 can comprise a wedge 231, the outer contour of which preferably forms at least partially a control surface 232.

[0085] Figure 3 shows a side view of the arrangement from Figure 2. As can be seen from Figure 3, the grooves 7, 8 of the respective longitudinal strut 6 and/or cross strut 5 have at least approximately the same shape as viewed in cross section.

[0086] At least one of the gripping arms 211 preferably has a bore 240 for fastening a push-pull support 13 (see, for example, Figures 6, 9 and 10). In the

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context of the invention, the bore 240 represents an fixture interface 300 for connecting in particular the push-pull support 13 or another support. The fixture interface 300 designed as a bore 240 can also serve to fix tools by means of a carabiner or the like. Furthermore, the fixture interface 300 can also be formed by hooks or angles in one of the gripping arms 211 instead of a bore 240 in one of the gripping arms 211.

[0087] The connecting component 2 shown in the exemplary embodiment according to Figure 3 thus has two fixtures 300, wherein an fixture interface 300 is provided or designed for connection to a scaffold section 10 and an fixture interface 300 for connection to a push-pull support 13. Additional fixture interfaces 300 or only one of the two fixture interfaces 300 can also be provided.

[0088] The grooves 7, 8 preferably run off-center in the side surfaces 9 of the respective longitudinal struts 6 and/or cross struts 5.

[0089] As can also be seen in Figure 1, the cross struts 5 have holes 12 in the side surfaces 9 that are spaced apart from the grooves 7, 8 for liquid drainage. The holes 12 can of course also be present in other exemplary embodiments in the struts 5, 5a, 6, 6a.

[0090] As can be seen from Figures 2 and 3, the first and second gripping arms 211, 221 of the connecting component 2 are designed to engage in the at least two grooves 7, 8 of a respective longitudinal strut 6 and/or cross strut 5 of the formwork panel 1.

[0091] Figure 4a (and Figure 4b analogously) show a sectional view through a cross strut 5 of a formwork panel 1. Figure 4a shows greatly simplified the cross strut 5 which is connected to the shuttering interface 200 of the connecting component 2 in Figure 3. The cross strut 5 is shown cut in a plane perpendicular to its longitudinal direction. In the illustration on the left of the

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cross strut 5, the formwork facing 11, which is connected to the frame 4, can also be seen in section. The formwork facing 11 rests flat on the side or front side of the cross struts 5 facing the left. In the background, a region of longitudinal strut 6 can be seen which is connected to the strut 5 in section. In the illustration, the two gripping arms 211, 221 of the gripping devices 210, 220 of the connecting component 2 can also be seen which are connected to the cross strut 5 in a force-fit and form-fit. The cross strut 5 is formed by a profile tube which has the shape of a bone or an "H." On the side of the cross strut 5 pointing upwards in the illustration and on the side pointing downwards in the illustration, a groove 7, 8 can be seen in each case, which extends in the longitudinal direction of the cross strut 5, i.e. into the plane of the drawing in the illustration. Here, the grooves 7, 8 have an identical, rectangular cross-section. The two grooves 7, 8 are arranged symmetrically in the vertical direction and opposite one another on the cross strut 5. The regions of the gripping arms 211, 221, which are shown in Figure 4a, are designed identically. The two gripping arms 211, 221 have, on their tip facing the left in the illustration, a projection or a clamping jaw 212, 222 which here forms a region which in each case engages in one of the grooves 7, 8. As can be seen, the clamping jaws 212, 222 have a projection at their front ends which is designed to engage in the grooves 7, 8 of the frame 4. In the shown embodiment, the lower of the two gripping arms 221 is designed to be movable in a direction parallel to the formwork facing 11, whereby the distance between the two gripping arms 211, 221 is designed to be adjustable. To produce a connection between the shuttering interface 200 and the formwork panel 1, the lower gripping arm 221 is moved in the direction symbolized by an arrow in the illustration or vertically downward in the closing direction R, so that the distance between the two clamping jaws 211, 212 is greater than the width of the cross strut 5 in the vertical direction. Subsequently, the two gripping arms 211, 221 are pushed partially over the cross strut 5 until the clamping jaws 212, 222 are located adjacent to the two grooves 7, 8. Subsequently, the lower gripping arm 221 is moved toward the upper gripping arm 211, and the distance between the two gripping arms 211, 221 is reduced. In this case, the two projections or

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clamping jaws 212, 222 each engage in a groove 7, 8, thereby creating a form fit. In this state, in which the two clamping jaws 212, 222 already form a positive-form-fit with the grooves 7, 8, the connecting component 2 can be displaced parallel to the running direction of the grooves 7, 8 along the cross strut 5 until the desired relative position between the connecting component 2 and cross strut 5 is reached. Subsequently, the lower gripping arm 221 is moved toward the upper gripping arm 211 until the two gripping arms 211, 221 clamp the cross strut 5. In this state, a frictional connection is then also present between the clamping element or the shuttering interface 200 of the connecting component 2 and the cross strut 5. The described adjustability of the relative position of the connecting component 2 along the grooves 7, 8 is particularly advantageous for a flexible connection between the connecting component 2 and the formwork panel 1. Such a connection can also be made between a connecting component 2 and a longitudinal strut 6. In the background, a groove 7 is also arranged in the shown longitudinal strut 6 and is aligned with the grooves 7, 8 in the cross strut 5.

[0092] Figure 4b shows an embodiment of the connecting component 1 with a design of the fixture interface 300 deviating from Figure 2. Only an fixture interface 300 designed as a bore 240 is shown; an fixture interface 300 for a scaffold section 10 is not provided, but could however be connected, preferably detachably, to the contact surface of the shuttering interface 200 shown in more detail below.

[0093] Figure 5 shows a perspective detailed view of another embodiment of a shuttering interface 200 of a connecting component 2. The connecting component 2 of the embodiment shown in Figure 5 has an intermediate rod 10c as an fixture interface 300 which is formed by a tube section with a round cross-section. The size and shape of the cross section of the pipe section of the intermediate rod 10c corresponds to the shape and size of a vertical rod 10a of the scaffold section 10. The two gripping arms 211, 221 of the shuttering interface 200 and the locking mechanism 230 are arranged on the intermediate

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rod 10c and are connected to a cross strut 5 of the formwork panel 1 (not shown in detail). The scaffold section 10 is connected to the intermediate rod 10c via a horizontal rod 10b via a scaffold interface (not shown in detail).

[0094] Figure 6 shows a perspective detailed view of a cross strut 5 into which a connecting component 2 is clamped. Furthermore, a push-pull support 13 is attached to the bore 240 of the gripping arm 211 of the connecting component 2.

[0095] Figure 7 shows a perspective detailed view of a cross strut 5 on which a scaffold section 10 is connected by means of the connecting component 2.

[0096] Figure 8 shows a simplified sectional view through a longitudinal strut 6 or a cross strut 5 of the frame 4 of the formwork panel 1. The dimensions are to be understood here purely by way of example and not in a limiting manner but have, however, proven to be advantageous.

[0097] The side walls 7b, 8b of the respective grooves 7, 8 are inclined outwardly from a groove base 7a, 8a of the respective grooves 7, 8, wherein the side walls 7b, 8b preferably enclose an angle of 95° to 125°, in particular 110°, with the groove base 7a, 8a.

[0098] Furthermore, the grooves 7, 8 can have a depth of 9 mm to 16 mm, preferably of 13 mm.

[0099] Figure 9 shows a perspective view of a system 3 for shuttering a wall element. In the exemplary embodiment, the system 3 is composed of three formwork panels 1, wherein a corresponding system is also to be positioned opposite to form a receiving space for, for example, concrete, for example as described in WO 2021/148232 A1.

[0100] Figure 9 is intended to illustrate that the grooves 7, 8 can be used to attach connecting components 2 to the cross struts 5. The connecting

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components 2 can serve to fix the scaffold section 10 to the formwork panel 1 with vertical bars 10a, a horizontal rod 10b and a tread surface 10d and also push-pull props 13.

[0101] In the grooves 7, 8, the connecting component 2 can be fixed continuously along the extension of the grooves 7, 8.

[0102] The grooves 7, 8 and the connecting components 2 enable a scaffold or a scaffold section 10 to be connected directly to the formwork panel 1.

[0103] Figure 10 shows a side view of a system 3 for shuttering of a wall element.

[0104] Figure 11 shows a front view of the connecting component 2 in a first embodiment in the unlocked state.

[0105] Figure 12 shows a sectional view according to the line XII-XII of Figure 11.

[0106] As can be seen, the two gripping devices 210, 220 each have recesses 233 which at least partially overlap one another and into which the wedge 231 is insertable or inserted. Only the recess 233 in the second gripping device 220 is visible in the figure. The recess 233 of the first gripping device can be seen, for example, in Figures 2, 3, 4b, 6 and 7. The wedge 231 can be arranged in a captive manner in the recesses 233, wherein the wedge 231 preferably has stops 231c, 231d projecting beyond the recesses 233 at each of its end faces 231a, 231b to form the captive securing (see in particular also Figures 2, 3, 6 and 7). As can be seen from Figure 11, the gripping arms 211, 221 run plane-parallel and at a distance from one another, and the second gripping arm 221 is arranged in an intermediate space 250 between the two first gripping arms 211. At least one bolt 251 can be present, which bridges the intermediate space 250 between the first gripping arms 211 and is arranged such that it serves as a stop for the second gripping arm 221.

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[0107] Figure 13 shows a front view of the connecting component in the first embodiment in the closed position.

[0108] Figure 14 shows a sectional view according to line XIV-XIV of Figure 13.

[0109] Figure 15 shows a front view of the connecting component 2 in a second embodiment in the unlocked state. In this case, no separate fixture interface 300 is provided, but the bore 240 can be used as an fixture interface 300, for example for fastening a push-pull support 13.

[0110] Figure 16 shows a sectional view according to the line XVI-XVI of Figure 15.

[0111] Figure 17 shows a front view of the connecting component 2 in the second embodiment in the closed position.

[0112] Figure 18 shows a sectional view according to the line XVIII-XVIII from Figure 17.

[0113] In Figures 19 to 21, different views of the wedge 231 are shown. As can be seen, the wedge 231 or its main surface has different widths to be able to be introduced or driven in the recesses 233 in a correspondingly fixed and secured manner in order to be braced.

[0114] Figure 22 shows a side view of the connecting component 2 in which one of the first gripping arms 211 is removed, and a projection 221a of the second gripping arm 221 is drawn in a broken line which can serve as an anti-rotation device for a fastening element 301 connecting the fixture interface 300 and the shuttering interface 200. A contact surface of the fixture interface 300 is provided with the reference sign 302.

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[0115] Figures 23 and 24 show further views of the connecting component 2 according to Figure 22.

[0116] Figure 25 shows a side view of the connecting component 2 according to Figure 22, in which the second gripping arm 221 is additionally removed as well.

[0117] The shuttering interface 200 and at least one of the fixture interfaces 300 can be detachably connected to one another, wherein the shuttering interface 200 and the fixture interface 300 preferably each have a contact surface 202, 302 with an elongated hole 203, 303 (see also Figures 12 and 14), and wherein the fastening element 301 can be introduced through the elongated holes 203, 303 in order to releasably connect the contact surfaces 202, 302 to one another.

[0118] The fastening element 301 can be integrally connected to the contact surface 302 of the fixture interface 300 (for example by welding), and/or the second gripping arm 221 can have the projection 221a which is designed and arranged such that a rotation of the fastening element 301 is limited by the projection 221a.

[0119] The contact surface 202 of the shuttering interface 200 can be formed by an angled surface of one of the first gripping arms 211, and/or the contact surface 302 of the fixture interface 300 can be formed as shown in Figure 26 by a base of a rail which is U-shaped in cross section.

[0120] Figure 26 shows a side view of the rear side of the contact surface 302 of the fixture interface 300, wherein the fastening element 301 designed as a double T is inserted into an elongated hole 303 of the contact surface 302.

[0121] For assembly, the fastening element 301 is inserted through the two elongated holes 203, 303, then rotated by 90° and welded to the bottom of the

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U-shaped rail to achieve captive securing. In this embodiment, the fastening element is thus part of the fixture interface 300.

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List of reference signs:

1	Formwork panel
2	Connecting component
3	System
4	Frame
5	Cross strut
5a	Frame cross strut
6	Longitudinal strut
6a	Frame longitudinal strut
7	Groove
7a	Groove bottom
7b	Side walls of the groove
8	Groove
8a	Groove bottom
8b	Side walls of the groove
9	Side surfaces
10	Scaffold section
10a	Vertical bar
10b	Horizontal bar
10c	Intermediate rod
10d	Tread surface
11	Formwork facing
12	Holes
13	Push-pull support
200	Formwork interface
202	Contact surface of the shuttering interface
203	Elongated hole
210	First gripping device
211	First gripping arm
212	Clamping jaw
220	Second gripping device
221	Second gripping arm

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221a Projection of the second gripping arm
222 Clamping jaw
230 Locking mechanism
231 Wedge
231a End face of the wedge
231b End face of the wedge
231c Stop
231d Stop
232 Control surface
233 Recess
240 Hole
250 Intermediate space
251 Bolt
300 Fixture interface
301 Fastening element
302 Contact surface of the fixture interface
303 Elongated hole
R Closing direction

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Claims

1. A connecting component (2) having a shuttering interface (200) for releasably connecting to a frame (4) of a formwork panel (1), wherein the shuttering interface (200) comprises a first gripping device (210) having at least one first gripping arm (211) with a clamping jaw (212) and a second gripping device (220) having at least one second gripping arm (221) with a clamping jaw (222), wherein the first gripping arms (211) of the first gripping device (210) are movable in a closing direction (R) relative to the second gripping arms (221) of the second gripping device (220) in order to connect the clamping jaws (212, 222) to or release them from the frame (4), and having at least one fixture interface (300) for releasably connecting to a fixture (10, 13), wherein the shuttering interface (200) and the fixture interface (300) are actuatable independently of one another.

2. The connecting component (2) according to claim 1,

characterized in that the fixture interface (300) can be connected to a scaffold section (10), a platform section, a support, in particular a push-pull prop (13), as an fixture.

3. The connecting component (2) according to claim 1 or 2,

characterized in that the shuttering interface (200) has a locking mechanism (230) in order to adjust and/or releasably fix the position of the gripping arms (211, 221) in the closing direction.

4. The connecting component (2) according to claim 3,

characterized in that the locking mechanism (230) comprises a wedge (231) whose outer contour preferably at least partially forms a control surface (232).

5. The connecting component (2) according to claim 4,

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characterized in that the two gripping devices (210, 220) each have recesses (233) which at least partially overlap one another and into which the wedge (231) is or is inserted.

6. The connecting component (2) according to claim 5,

characterized in that the wedge (231) is captively arranged in the recesses (233), wherein the wedge (231) preferably has stops (231c, 231d), each projecting beyond the recesses (233) at its front ends (231a, 231b) to form the captive securing.

7. The connecting component (2) according to any of claims 1 to 6,

characterized in that the first gripping device (210) has two first gripping arms (211), and the second gripping device (220) has a second gripping arm (221).

8. The connecting component (2) according to claim 7,

characterized in that the gripping arms (211.221) run plane-parallel and at a distance from one another, and the second gripping arm (221) is arranged in an intermediate space (250) between the two first gripping arms (211).

9. The connecting component (2) according to claim 7 or 8,

characterized in that at least one bolt (251) is present which bridges an intermediate space (250) between the first gripping arms (211) and is arranged such that it serves as a stop for the second gripping arm (221).

10. The connecting component (2) according to any of claims 1 to 9,

characterized in that the clamping jaws (212, 222) have a projection at their front ends, which projection is designed to engage in grooves (7,8) of the frame (4).

11. The connecting component (2) according to any of claims 1 to 10,

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characterized in that the shuttering interface (200) and at least one of the fixtures (300) are detachably connected to one another, wherein the shuttering interface (200) and the fixture interface (300) preferably each have a contact surface (202, 302) with an elongated hole (203, 303), and wherein a fastening element (301) can be introduced through the elongated holes (203, 303) in order to releasably connect the contact surfaces (202, 302) to one another.

12. The connecting component (2) according to claim 11,

characterized in that the fastening element (301) is integrally connected to the contact surface (302) of the fixture interface (300), and/or the second gripping arm (221) has a projection (221a) which is designed and arranged such that a rotation of the fastening element (301) is limited by the projection (221a).

13. The connecting component (2) according to claim 11 or 12,

characterized in that the contact surface (202) of the shuttering interface (200) is formed by an angled surface of one of the first gripping arms (211), and/or the contact surface (302) of the fixture interface (300) is formed by a base of a rail U-shaped in cross section.

14. The connecting component (2) according to any of claims 1 to 13,

characterized in that at least one of the fixtures interfaces (300) has a bore (240) for fastening a push-pull prop (13).

15. The connecting component (2) according to claim 14,

characterized in that at least one of the first and/or second gripping arms (211, 221) has the bore (240).

16. A system (3) for shuttering a wall element, comprising at least one formwork panel (1) and at least one connecting component (2), wherein the formwork panel (1) has a frame (4) having multiple longitudinal struts (6) and

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multiple cross struts (5), wherein the longitudinal struts (6) and the cross struts (5) are arranged substantially perpendicular to one another,

characterized in that at least a section of the longitudinal struts (6) and/or of the cross struts (5) has at least two grooves (7,8) which run in the longitudinal direction and on opposite side surfaces (9) of the respective longitudinal strut (6) and/or cross strut (5), and wherein the connecting component is a connecting component (2) according to any of claims 1 to 15, wherein the gripping arms (211, 221) of the connecting component (2) engage in the at least two grooves (7, 8) of a respective longitudinal strut (6) and/or cross strut (5).

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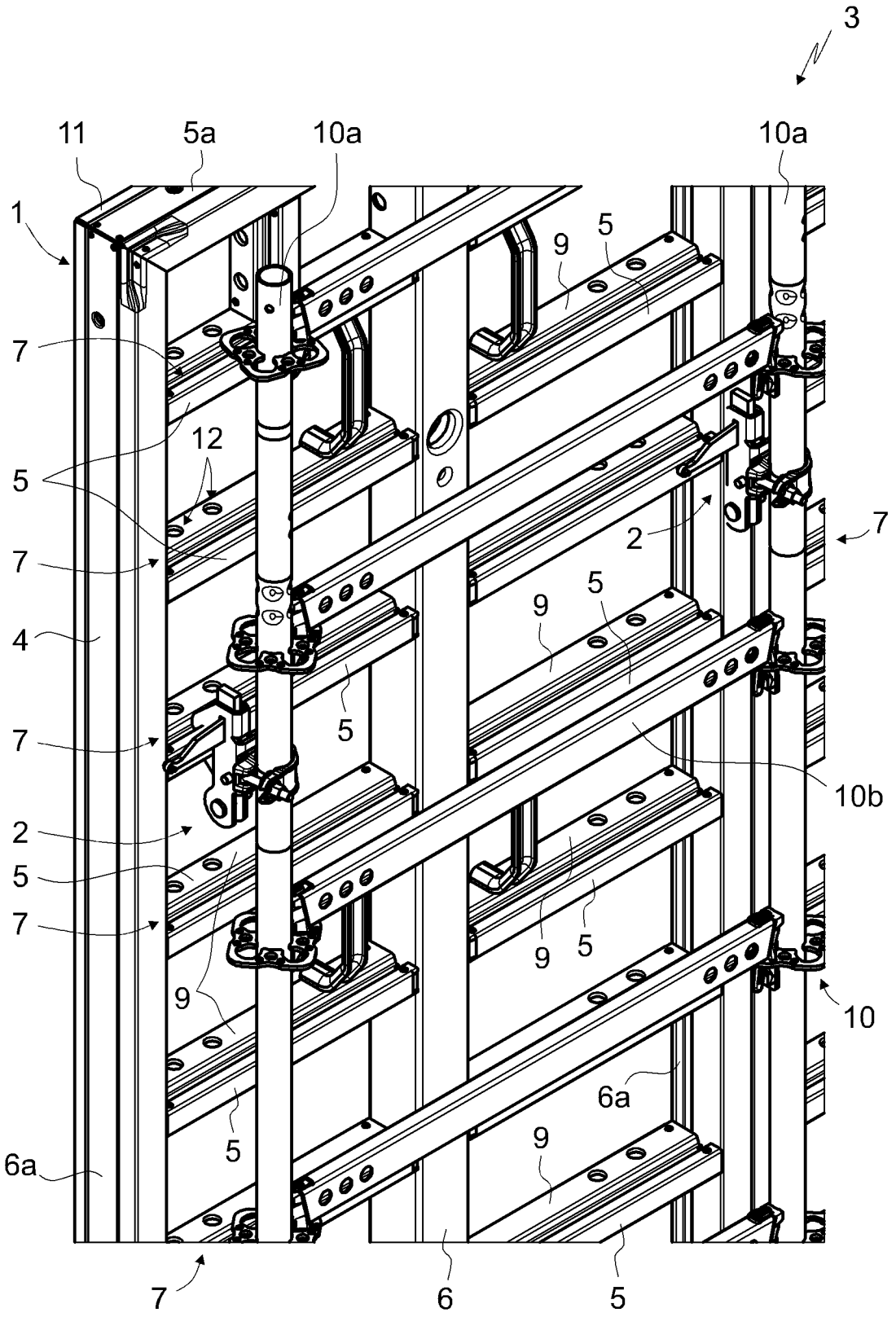
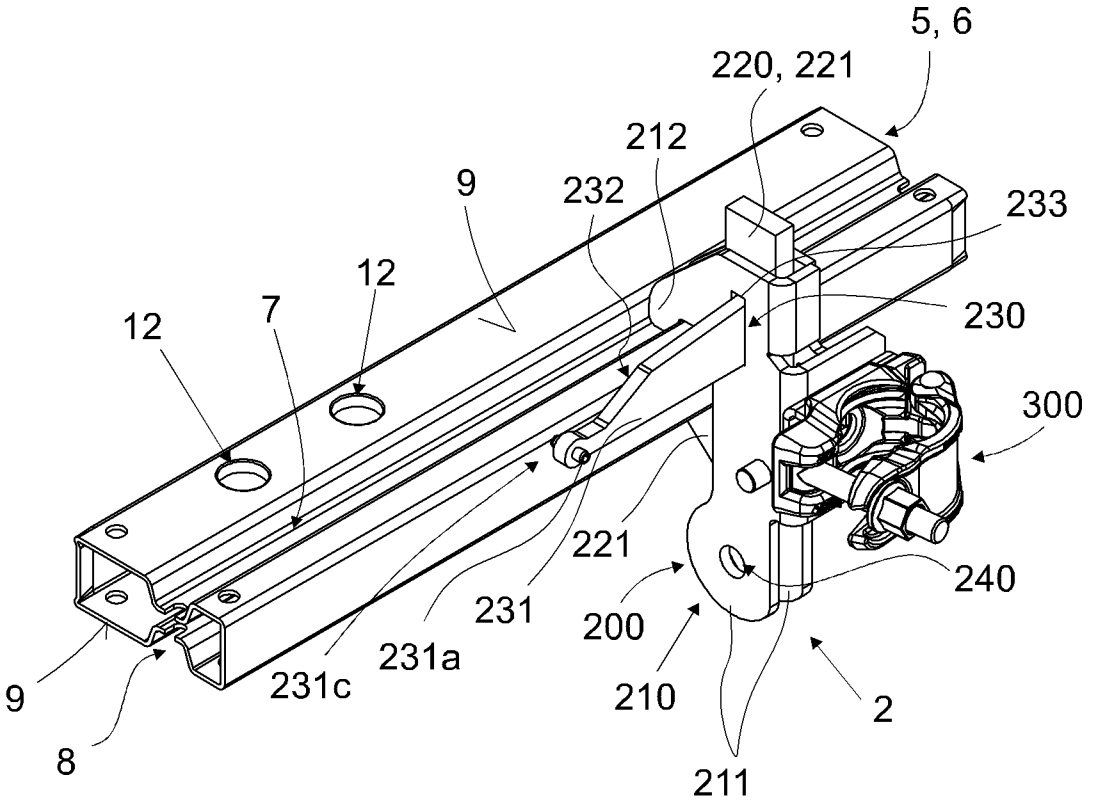


Fig. 1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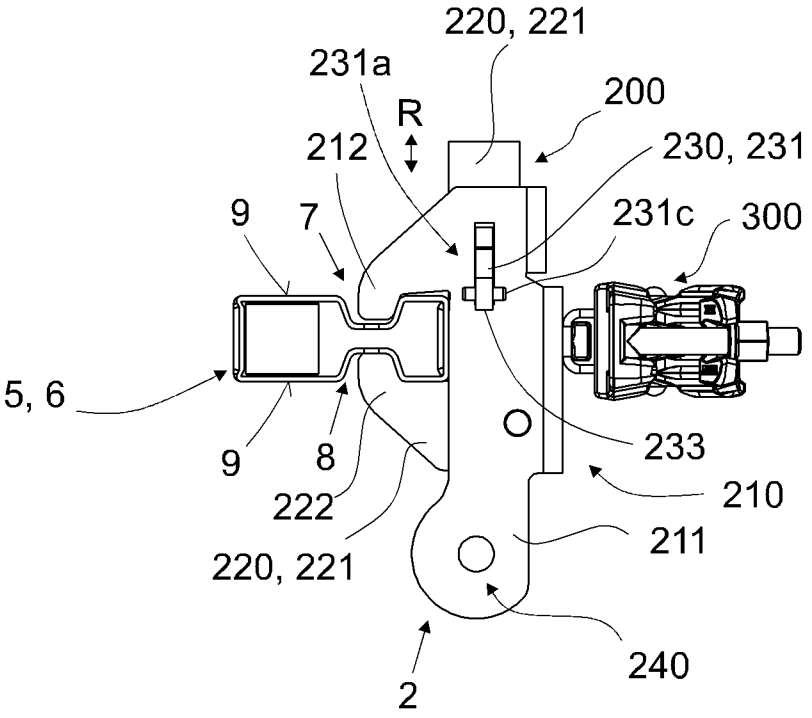
8
2
211

Fig. 2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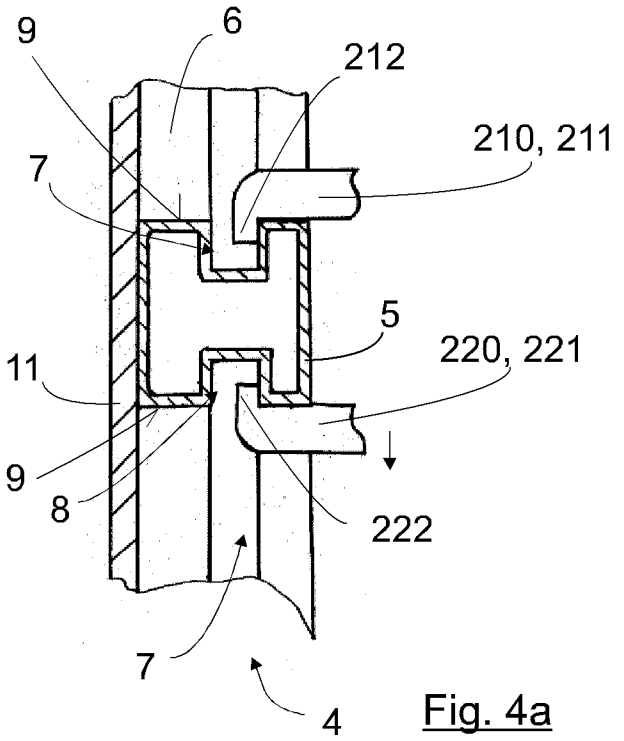
2

Fig. 3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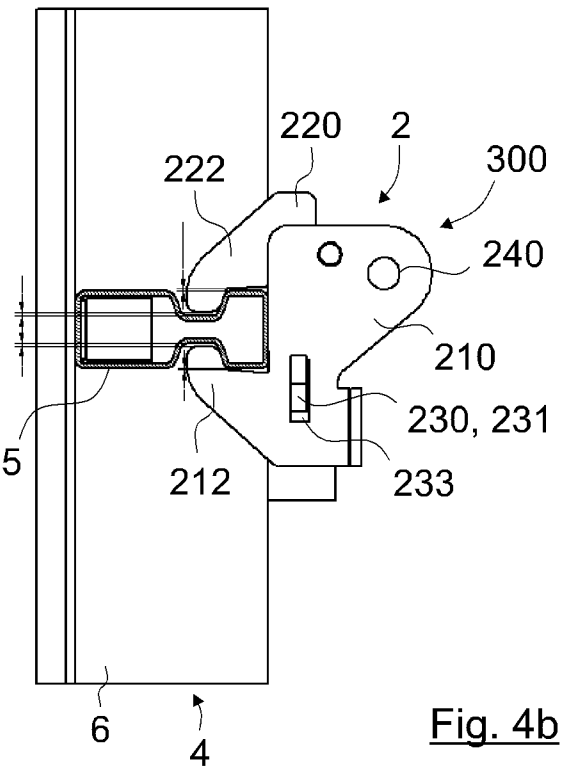
4

Fig. 4a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6
4

Fig. 4b

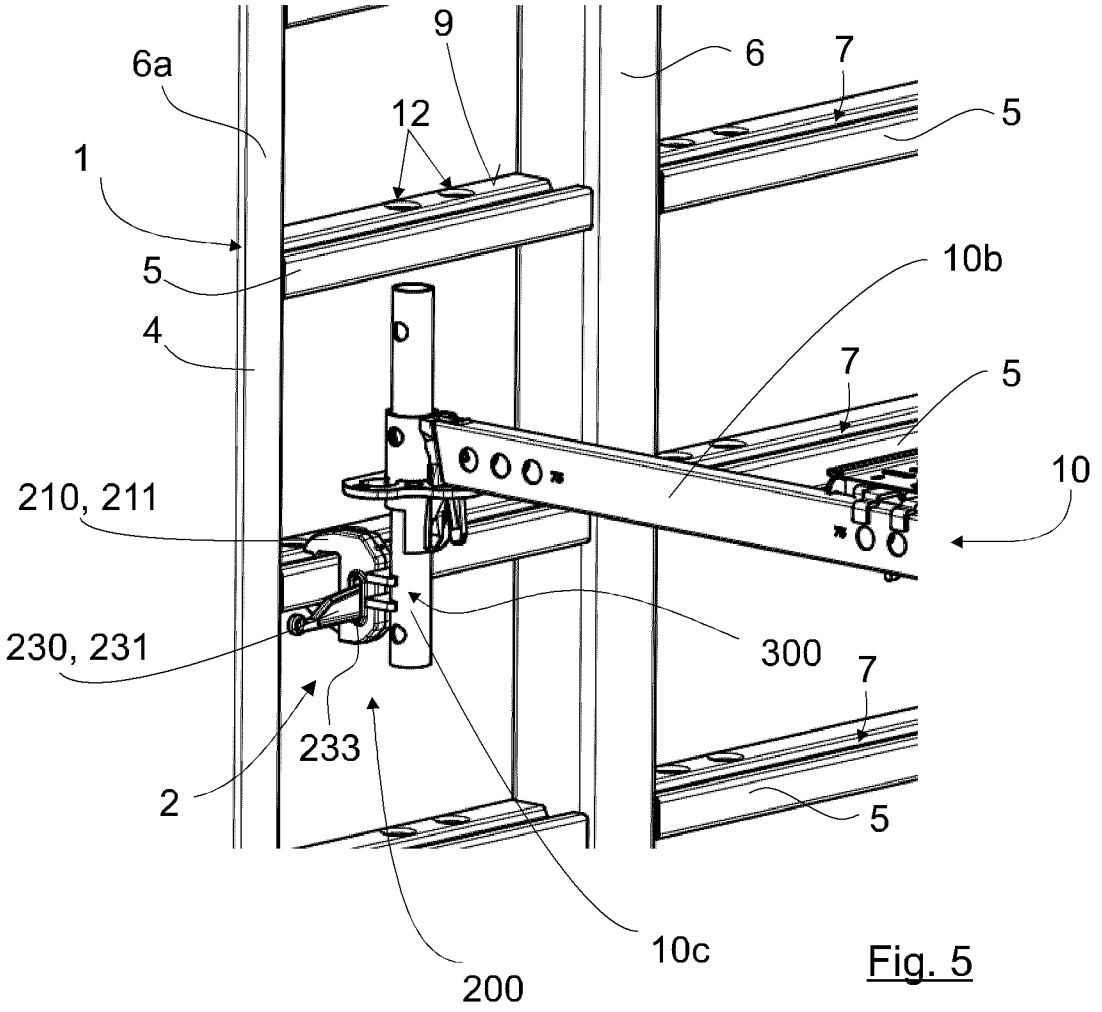
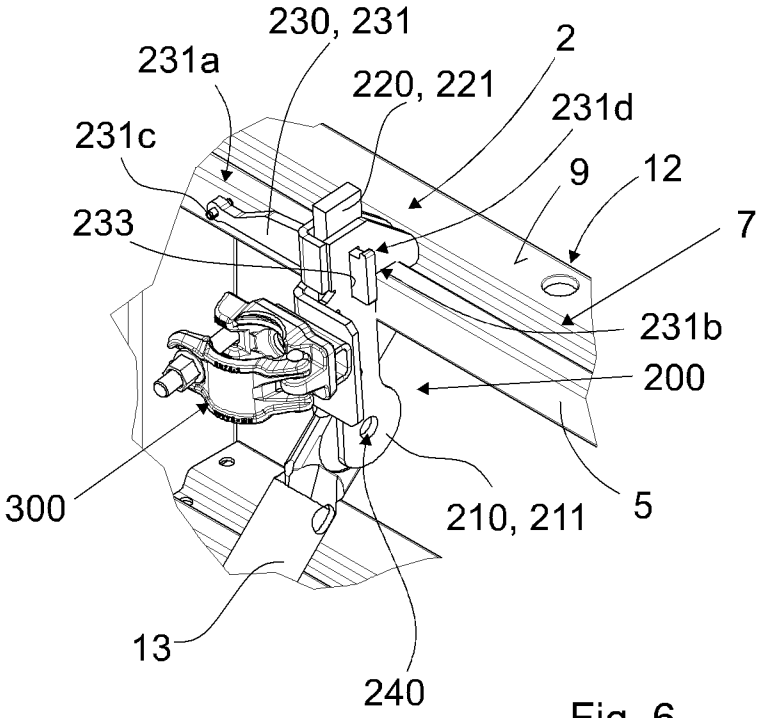


Fig. 5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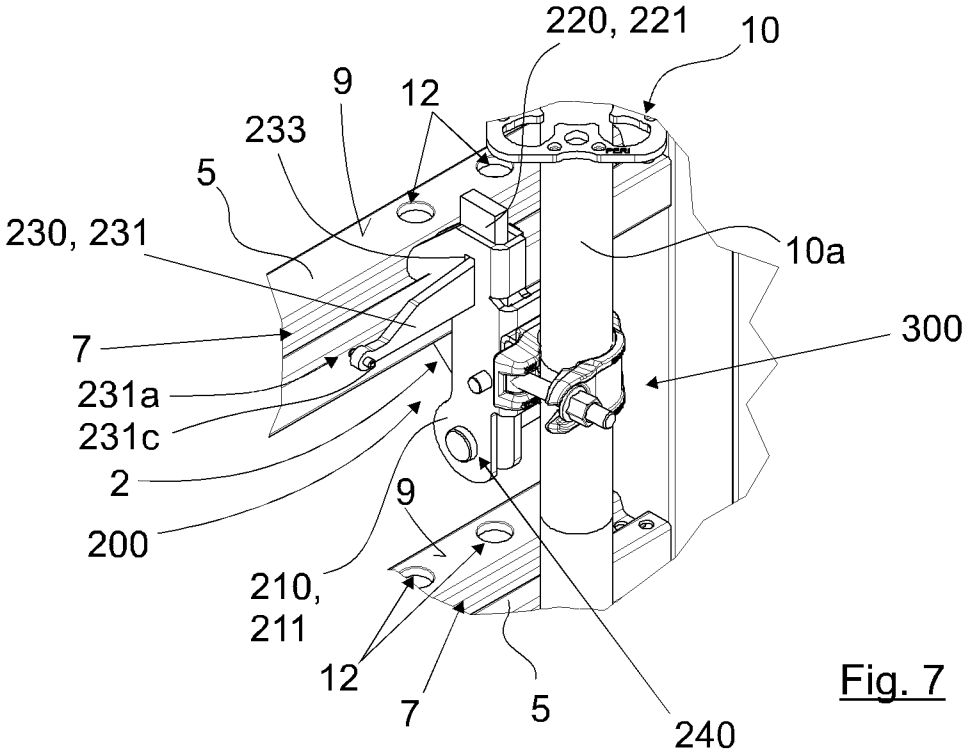
5
13
240

Fig. 6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12
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240

Fig. 7

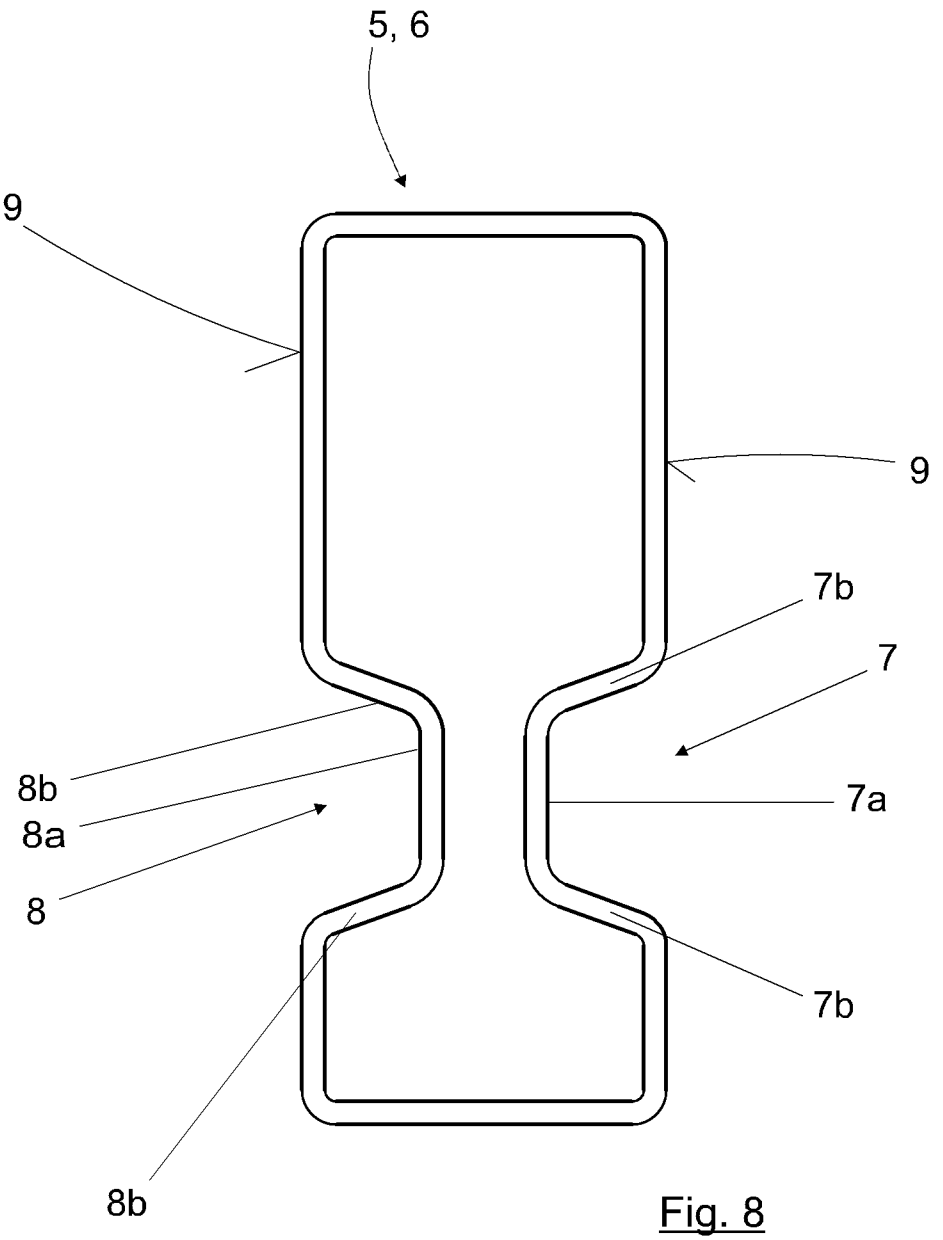


Fig. 8

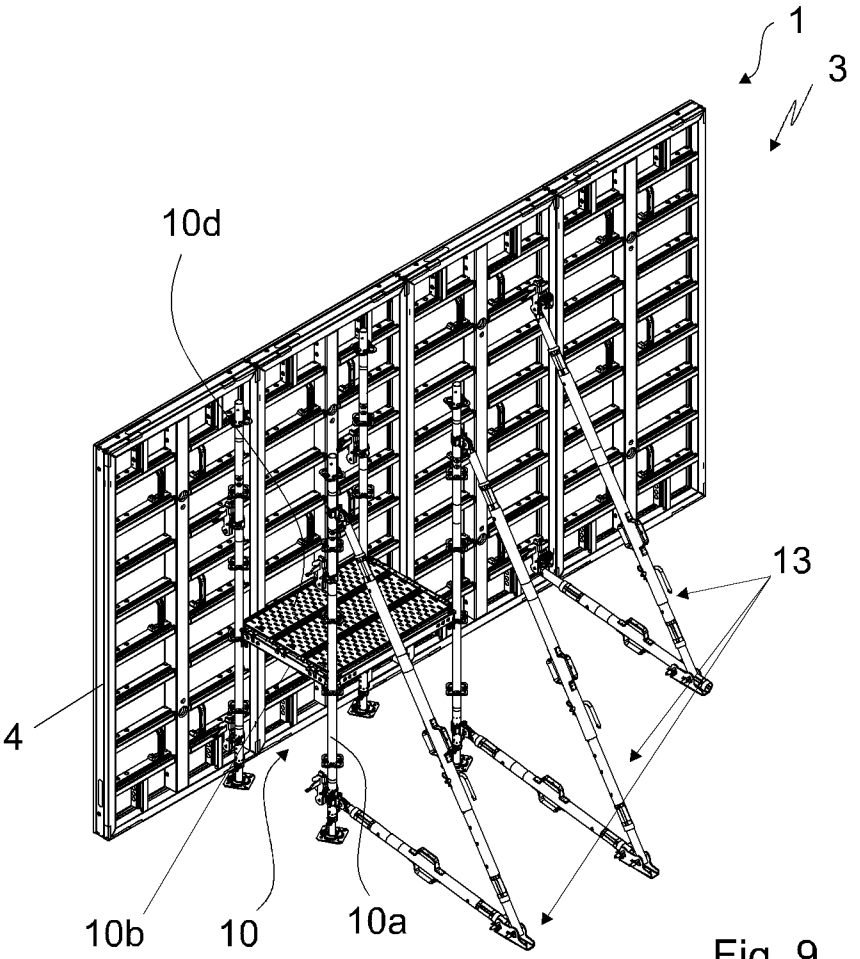


Fig. 9

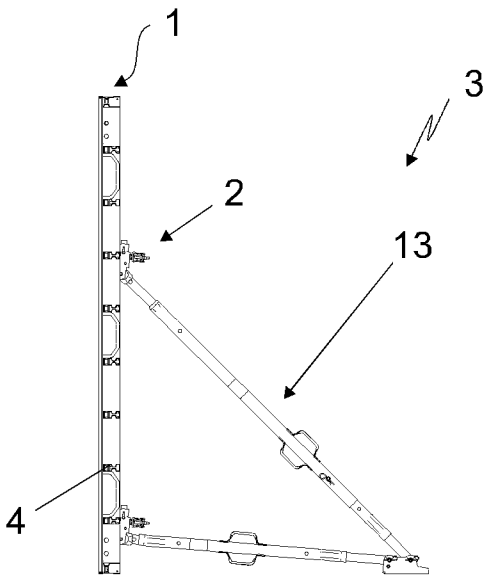
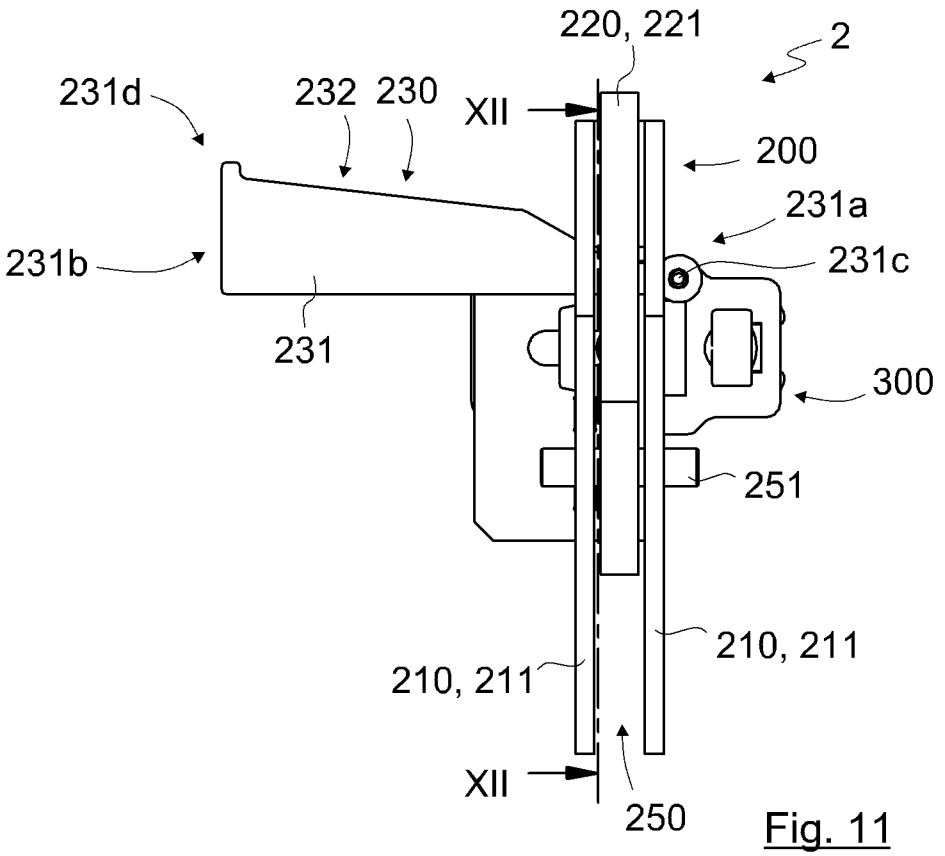


Fig. 10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300
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XII
250

Fig. 11

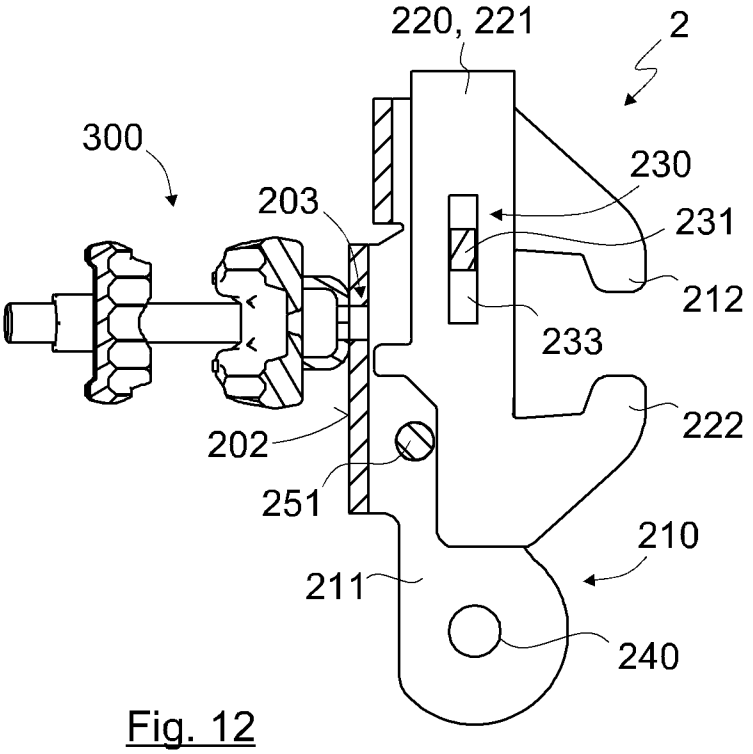
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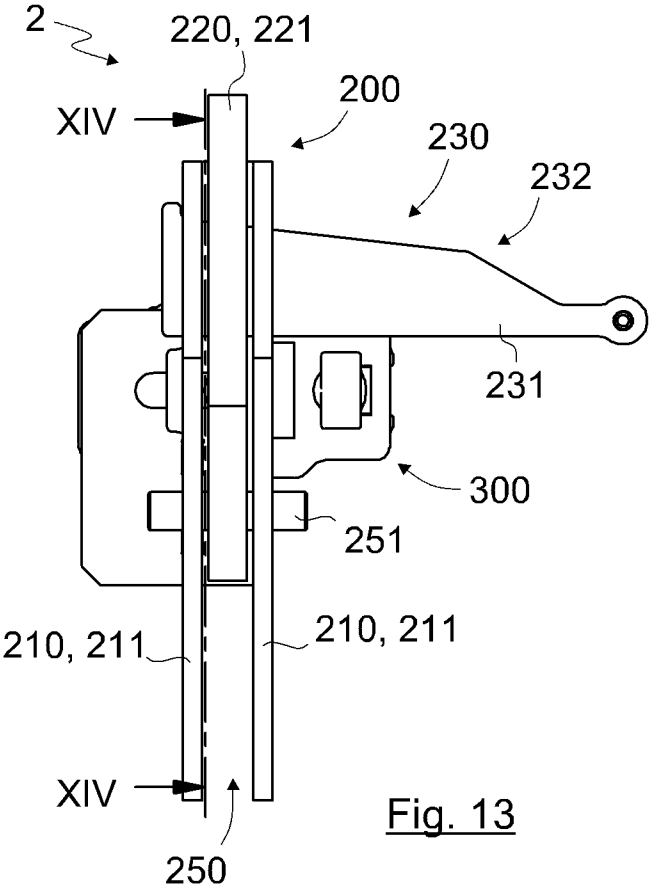
Fig. 12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XIV
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Fig. 13

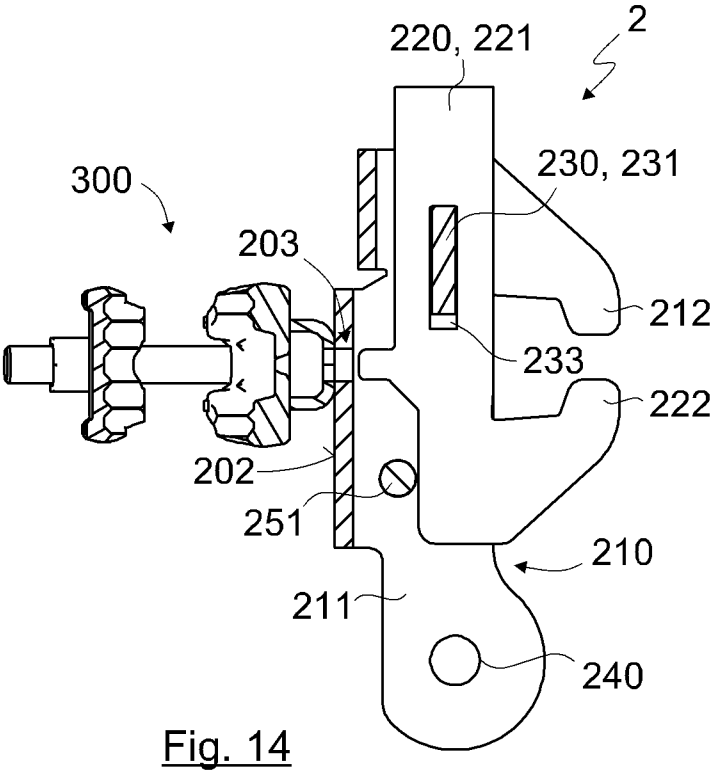
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Fig. 14

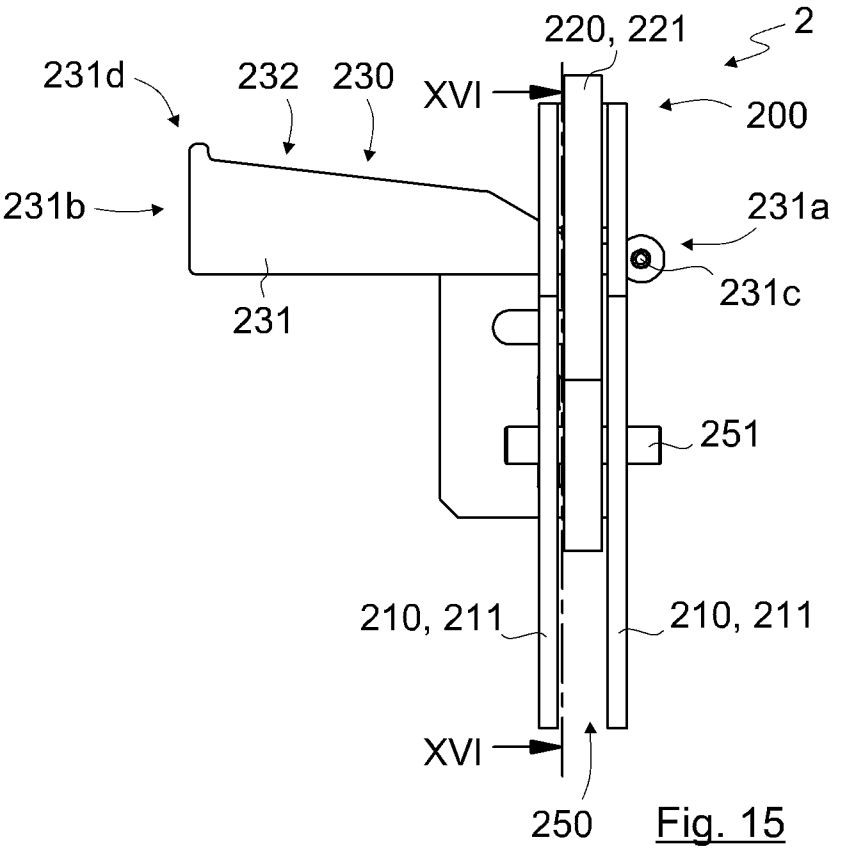
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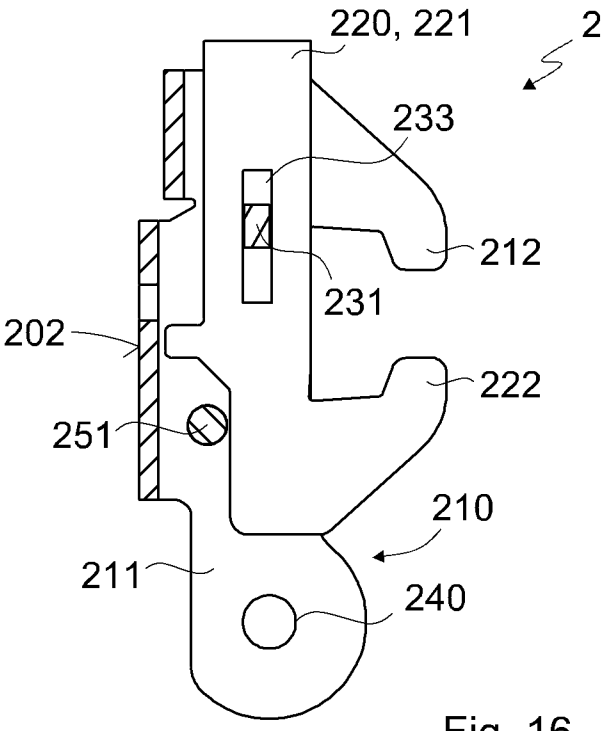
Fig. 15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211
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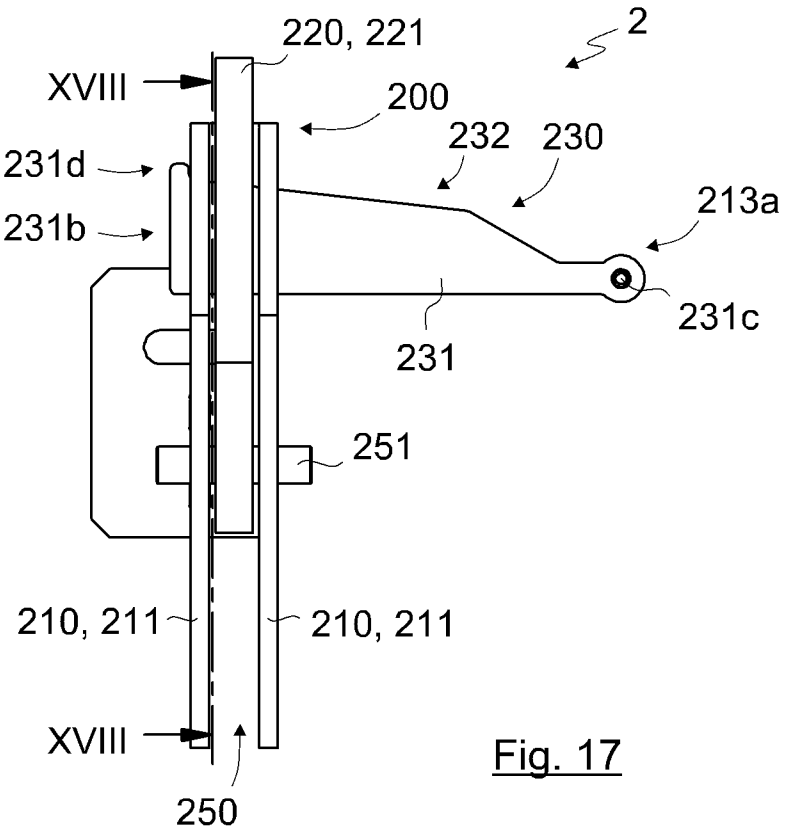
Fig. 16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232
230
231d
213a
231b
231c
231
251
210, 211
210, 211
XVIII
250

Fig. 17

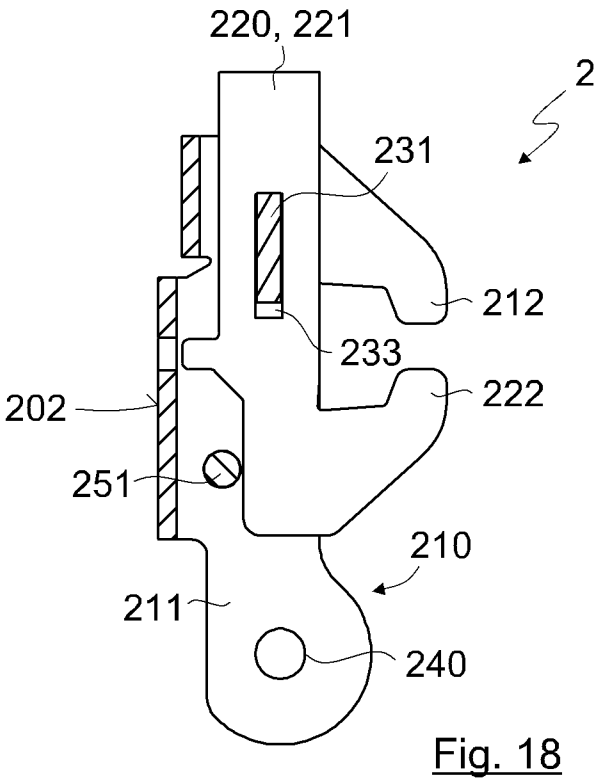
220, 221
2
231
212
233
222
202
251
210
211
240

Fig. 18

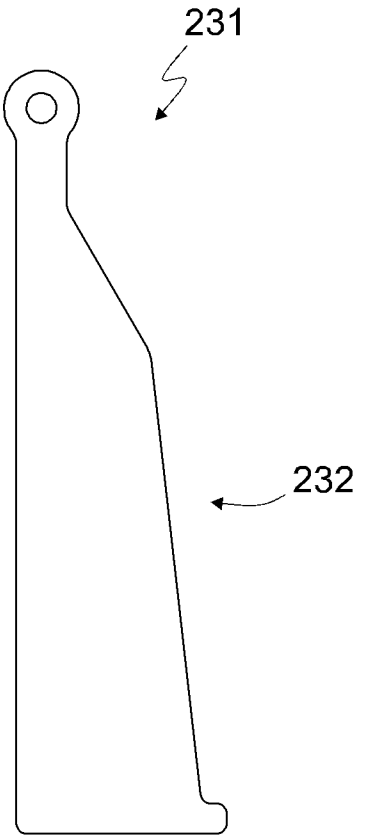

Fig. 19

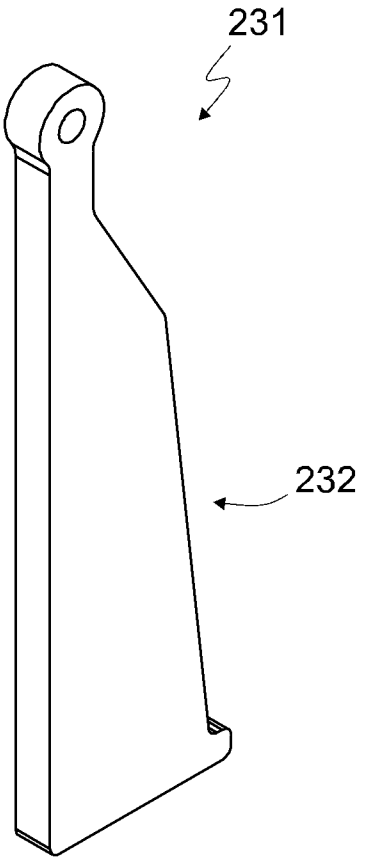

Fig. 20

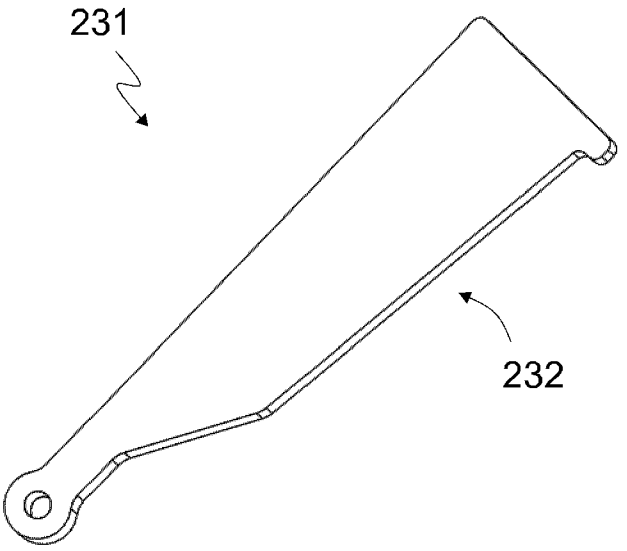

Fig. 21

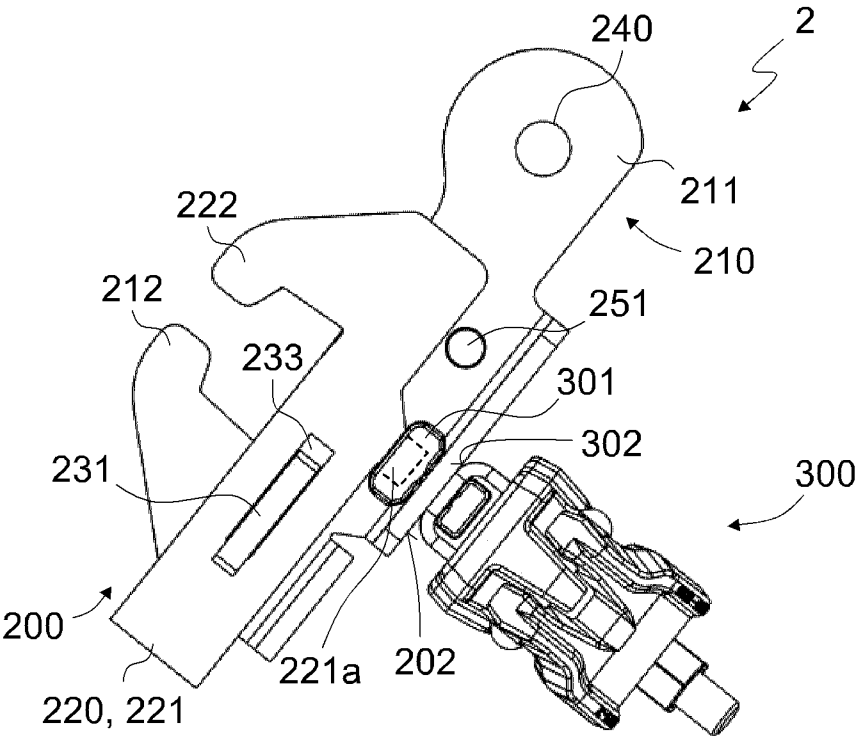
240
2
211
222
210
212
251
233
301
302
231
300
200
221a
202
220, 221

Fig. 22

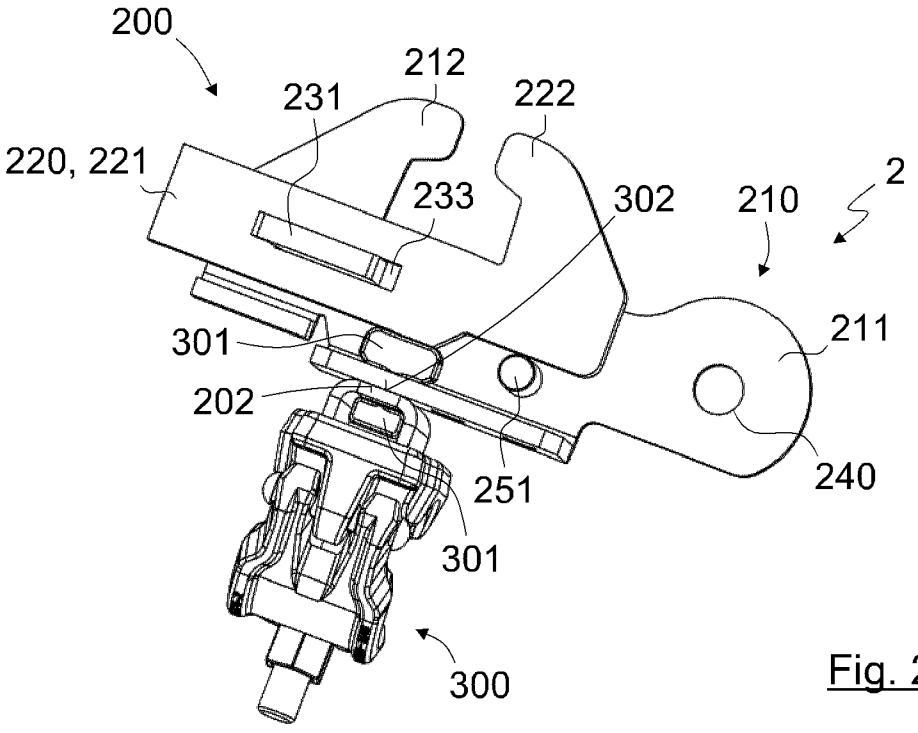
200
212
231
222
220, 221
233
302
210
2
211
301
202
240
251
301
300

Fig. 23

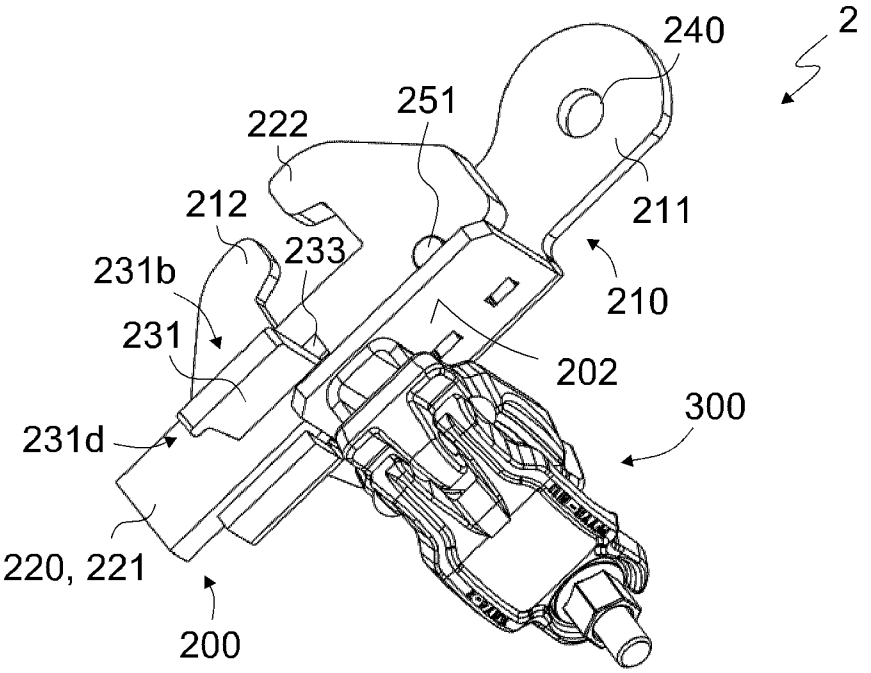
2
240
251
222
212
211
233
231b
210
231
202
300
231d
220, 221
200

Fig. 24

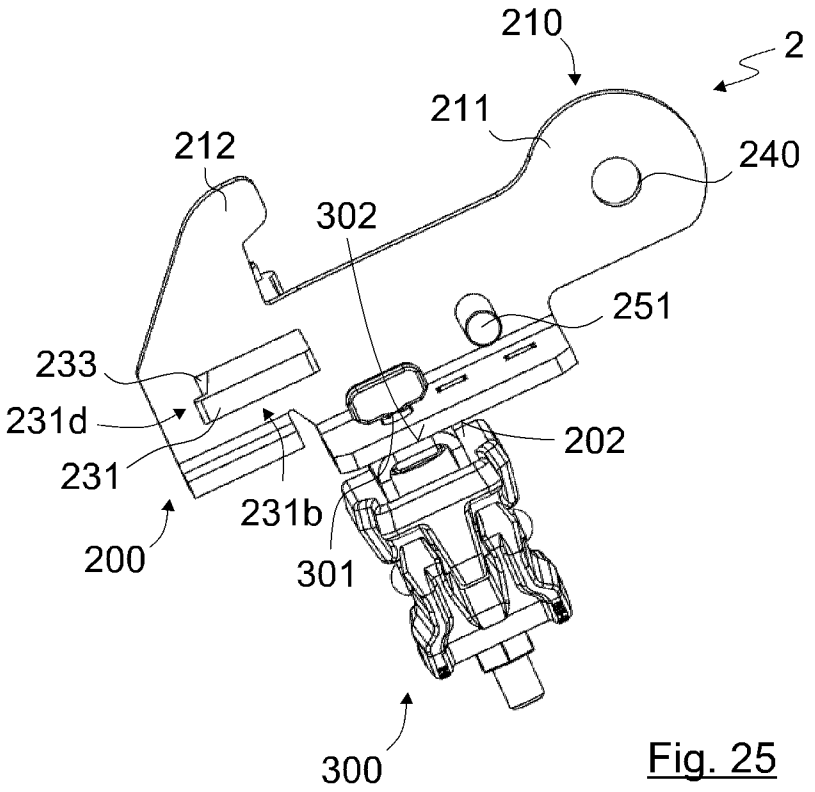
210
2
211
212
240
302
251
233
231d
202
231
231b
200
301
300

Fig. 25

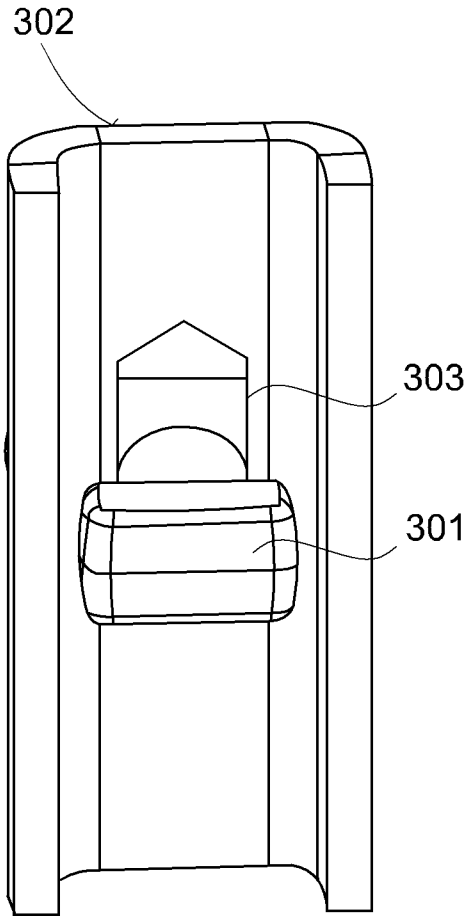

Fig. 26

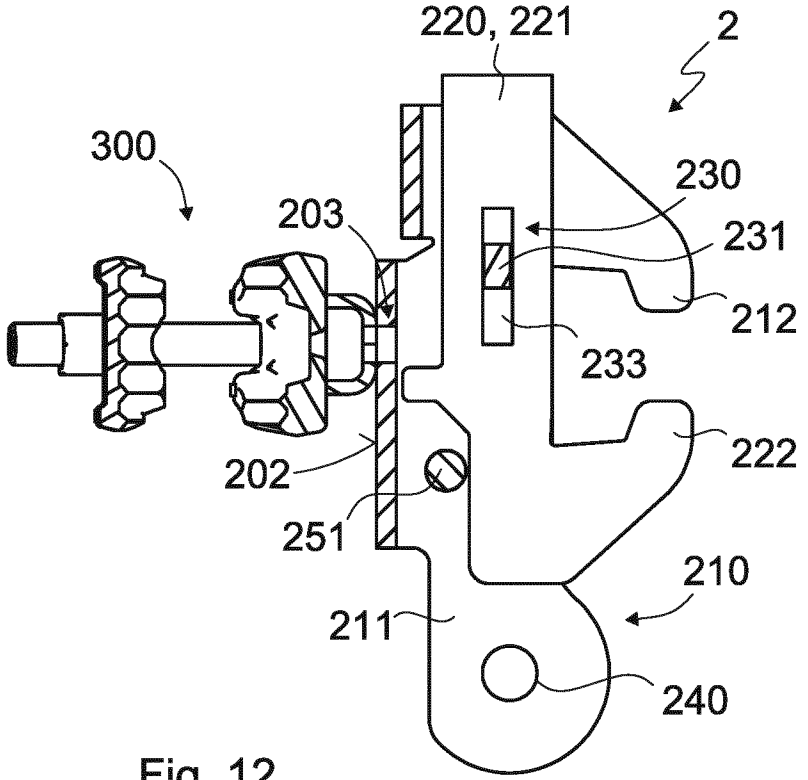

Fig. 12