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(54) **RISING TRAFFIC BOLLARD**

AUFSTEIGENDER VERKEHRSPFOSTEN

POTEAU DE TRAFFIC LEVABLE

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(56) References cited:
DE-U1-202015 004 858
FR-A1- 2 760 763
US-A1- 2014 147 201

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Description

[0001] The present invention relates to a rising traffic bollard that can be used to regulate the access of motor vehicles and motorcycles to areas with restricted traffic, such as pedestrian zones or restricted traffic zones, or to protect particular sensitive areas or sites with special security needs against unwanted intrusions.

[0002] Rising traffic bollards of known type as disclosed in DE 20 2015 004 858 U generally comprise a supporting structure, or frame, adapted to be embedded and cemented in the ground, at a passage which crossing is to be regulated, and a mobile bollard element between an extracted position, in which it projects from the ground to prevent the passage of vehicles, and a retracted position, in which the bollard element is lowered in the ground and thus allows the passage of the vehicles.

[0003] The upper face of the supporting structure is arranged at ground level. By means of specific actuators, the projecting bollard element may be lowered inside the supporting structure until its upper part - or head - is flush with the upper face of the supporting structure, and therefore flush with the ground.

[0004] The actuators used to move the bollard element generally are of the screw jack type, or of the pneumatic or hydraulic cylinder type.

[0005] Such rising traffic bollards of known type however are not free from drawbacks such as the fact that the cyclical sliding of the bollard element in the supporting structure often is the subject of frictions which over time wear and damage the components of the bollard that move relatively to one another, thus affecting the correct operation of the bollard itself. This results in costly maintenance activities which at times also require the replacement of the main components of the bollard.

[0006] Moreover, rising traffic bollards very often are subject to external stresses that, when they are not such as to irreparably damage the bollard, affect its correct operation. For example, a modest knock against the bollard element in extracted position by a motor vehicle often is sufficient to put the bollard element itself out of axis by just enough to drastically increase the frictions between the mobile components, and therefore, their wear.

[0007] In other situations, motor vehicles are parked at a bollard in retracted position. In these cases, the presence of the motor vehicle prevents the correct and complete extraction of the bollard element, while the actuator of the bollard element is subjected to stress. The stresses that occur between the mobile components often are sufficient to generate misalignments which over time affect the operation of the bollard itself, also when the actuator is promptly deactivated when a control threshold on the torque is exceeded.

[0008] Another drawback of such bollards of known type consists in the fact that often the side surface of the bollard element appears aesthetically damaged from scratches and marks due to the not always accurate sliding of the bollard element inside the supporting structure.

[0009] It is a primary task of the present invention to make a rising traffic bollard that resolves the technical problems disclosed above, obviates the drawbacks and overcomes the restrictions of the known technique by preventing the wear of the mobile components of the bollard itself.

[0010] Within the scope of this task, it is an object of the present invention to make a bollard the maintenance of which is simple and affordable to carry out.

[0011] Another object of the invention consists in making a bollard that allows quickly replacing the sole components subject to increased wear, thus ensuring an increased longevity of the bollard itself.

[0012] A further object of the invention consists in making a bollard that is capable of providing the broadest guarantees of reliability and security when used.

[0013] Another object of the invention consists in the fact of making a bollard that is easy to make and is economically competitive when compared with the known technique.

[0014] The task disclosed above, and also the objects mentioned and others which are more apparent below, are achieved by a rising traffic bollard as illustrated in claim 1.

[0015] Other features are provided in the dependent claims.

[0016] Further features and advantages shall be more apparent from the description of a preferred, but not exclusive, embodiment of a rising traffic bollard, illustrated by mere way of non-limiting example with the aid of the accompanying drawings, in which:

figure 1 is a perspective view of an embodiment of a rising traffic bollard, according to the invention, in extracted configuration;
figure 2 is a partially exploded perspective view of the bollard of figure 1, according to the invention;
figure 3 illustrates an enlarged portion of figure 2;
figure 4 is another partially exploded perspective view of the bollard of figure 1, according to the invention;
figure 5 is a top plan view of the bollard of figure 1, according to the invention;
figure 6 is a top plan view of the bollard of figure 1, according to the invention, with lid removed;
figure 7 is a cross-sectional view of the bollard of figure 1, according to the invention;
figure 8 is a top plan view of the side wall of the bollard element of the bollard of figure 1, according to the invention;
figure 9 illustrates two different operating configurations of certain components of the bollard of figure 1, according to the invention.

[0017] With reference to the mentioned figures, the rising traffic bollard, indicated as a whole with reference number 1, comprises a supporting structure 3 adapted to be embedded in the ground and a mobile bollard ele-

ment 5 between an extracted position, in which such bollard element 5 projects from the ground, and a retracted position, in which such bollard element 5 is lowered in the ground.

[0018] According to the invention, the supporting structure 3 comprises a plurality of skids 9 and the bollard element 5 comprises a plurality of sliding profiles 7 that extend along the length of the bollard element 5 and that are configured to slide with respect to such skids 9.

[0019] Advantageously, such skids 9 are adapted to guide the sliding of the sliding profiles 7.

[0020] Advantageously, the sliding profiles 7 have such a length whereby the contact with the skids 9 occurs for the whole extraction and retraction stroke of the bollard element 5.

[0021] The sliding profiles 7 may extend substantially along the whole length of the bollard element 5.

[0022] Advantageously, the contact between the supporting structure 3 and the bollard element 5 during the stroke of the bollard element 5 substantially occurs solely between the skids 9 and the sliding profiles 7.

[0023] Preferably, the contact between the supporting structure 3 and the bollard element 5 during the stroke of the bollard element 5 occurs solely between the skids 9 and the sliding profiles 7.

[0024] The bollard element 5 advantageously comprises at least a side wall 11 in which a plurality of longitudinal seats 13 is obtained, which house said plurality of sliding profiles 7.

[0025] On the inner side of the side wall 11, there may be provided a supporting tube 12, preferably made in a steel type material, adapted to ensure the bollard element 5 is provided with solidity and resistance to knocks.

[0026] Advantageously, the sliding profiles 7 and the skids 9 are distributed equally about a longitudinal axis passing through the centre of the bollard element 5.

[0027] For example, as illustrated in the accompanying figures, the bollard element 5 may have a substantially cylindrical shape and the side wall 11 may be tubular.

[0028] In the example illustrated in the accompanying figures, the device 1 advantageously has three pairs of sliding profiles 7 and related skids 9, which are angularly distributed about the central axis of the bollard element 5 at an angle substantially equal to 120°.

[0029] Advantageously, the sliding profiles 7 and the skids 9 are made of materials having increased sliding properties. Thereby, the frictions generated due to the related sliding movement between the profiles 7 and the skids 9 are significantly contained. Accordingly, the wear of such components is just as contained.

[0030] The rising traffic bollard 1 advantageously comprises a plurality of support bodies 15 which support the skids 9. Such support bodies 15 are mobile towards and away from the sliding profiles 7 to adjust the contact between the skids 9 and the sliding profiles 7.

[0031] Preferably, there are also provided means 21 for adjusting the distance of the skids 9 from the corresponding sliding profiles 7.

[0032] Such adjusting means 21 act on the support bodies 15 to approach and distance the skids 9 with respect to the sliding profiles 7.

[0033] The supporting structure 3 may comprise a lid 17 having a through opening 19 through which the bollard element 5 can pass during its stroke. Such a lid 17 is removable from the supporting structure 3 to allow the access to the adjusting means 21.

[0034] The adjusting means 21 may comprise one or more adjustment screws 22 for each support body 15.

[0035] As illustrated in figure 9, the distance of the skids 9 from the sliding profiles 7 can be adjusted as a function for example, of the wear of the skids 9 themselves.

[0036] Moreover, the independent adjustment of the distance of each skid 9 from the corresponding sliding profile 7 allows compensating for possible wear of one or more skids 9 to keep the alignment of the stroke of the bollard element 5.

[0037] In the same way, the independent adjustment of the distance of each skid 9 from the corresponding sliding profile 7 allows to restore the alignment of bollard element 5 regardless of the different wear of the individual skids 9, for example following a knock from a vehicle.

[0038] Advantageously, the bollard element 5 comprises a removable head 25 to allow the access to the longitudinal seats 13 of the sliding profiles 7 and the replacement of the sliding profiles 7.

[0039] As illustrated in figure 4, indeed the two components 250 and 252 of the head 25 may be removed so as to vertically remove the sliding profiles 7 from the side wall 11 in order to be replaced.

[0040] Advantageously, each support body 15 comprises a seat 150 for housing the related skid 9, which may be removed from such seat 150 and replaced with a new skid, as needed.

[0041] Advantageously, the support bodies 15, comprehensive of the related skid 9, may also be removed.

[0042] The sliding profiles 7 are advantageously made of a material capable of simultaneously providing increased sliding and resistance to wear, such as for example steel or plastic.

[0043] The sliding profiles 7 advantageously may be made of a thermoplastic polymer, preferably PVC, and preferably having additives capable of increasing their sliding properties and resistance to wear.

[0044] Advantageously, the sliding profiles 7 may be made through an extrusion process.

[0045] The skids 9 advantageously are made of a polymer material, preferably an acetal resin, and preferably having additives capable of increasing their sliding properties and resistance to wear.

[0046] Advantageously, the side wall 11 is made by extrusion of a metal material, preferably aluminium.

[0047] The bollard element 5 may be actuated by means of actuators, for example linear actuators, which advantageously are accommodated in the supporting structure 3 embedded in the ground.

[0048] The rising traffic bollard the object of the present

invention has the advantage of drastically reducing the wear phenomena of the mobile components of the bollard itself.

[0049] Another advantage of the bollard according to the invention consists in the fact of easily adjusting the axiality of the extracting and retracting movement of the bollard element in order to correct possible misalignments.

[0050] Another advantage of the bollard according to the invention consists in the fact of easily replacing the components subject to increased wear.

[0051] A further advantage of the bollard according to the invention consists in the fact of being particularly durable and of ensuring an optimal operating constancy.

[0052] The rising traffic bollard the object of the present invention has the advantage of having an increased durability because the elements subject to increased wear have such properties as to minimize the wear itself, and in any case may be easily replaced.

[0053] One more advantage of the rising traffic bollard according to the invention consists in the fact of also preventing aesthetical damage such as scratches and markings which often are encountered in the mobile bollard elements of the bollards of known type.

[0054] The rising traffic bollard thus conceived is susceptible to many modifications and variants, all falling within the invention as defined by the claims. In practice, the materials used, as well as their dimensions, can be of any type according to the technical requirements.

Claims

1. Rising traffic bollard (1) comprising a supporting structure (3) adapted to be embedded in the ground and a bollard element (5) mobile between an extracted position, in which said bollard element (5) projects from the ground, and a retracted position, in which said bollard element (5) is lowered in the ground, **characterized in that** said supporting structure (3) comprises a plurality of skids (9), said bollard element (5) comprises at least a side wall (11) in which a plurality of longitudinal seats (13) are obtained, which house a plurality of replaceable sliding profiles (7) that extend along the length of said bollard element (5) and that are configured to slide with respect to said skids (9).

2. Rising traffic bollard (1), according to claim 1, **characterized in that** it comprises a plurality of support bodies (15) that support said skids (9), said support bodies (15) being mobile towards and away with respect to said sliding profiles (7) in order to adjust the contact between said skids (9) and said sliding profiles (7).

3. Rising traffic bollard (1), according to claim 2, **characterized in that** it comprises means for adjusting (21) the distance of said skids (9) from said sliding profiles (7).

4. Rising traffic bollard (1), according to one or more of the previous claims, **characterized in that** said supporting structure (3) comprises a lid (17) having a through opening (19) through which said bollard element (5) can pass, said lid (17) being removable from said supporting structure (3) in order to allow the access to said adjusting means (21).

5. Rising traffic bollard (1), according to one or more of the previous claims, **characterized in that** said bollard element (5) comprises a head (25) that can be removed to allow the access to said longitudinal seats (13) of said sliding profiles (7) and the replacement of said sliding profiles (7).

6. Rising traffic bollard (1), according to one or more of the previous claims, **characterized in that** said sliding profiles (7) are made of a thermoplastic polymer, preferably PVC.

7. Rising traffic bollard (1), according to one or more of the previous claims, **characterized in that** said side wall (11) is made by extrusion of a metal material, preferably aluminium.

8. Rising traffic bollard (1), according to one or more of the previous claims, **characterized in that** said skids (9) are made of a polymer material, preferably an acetal resin.

9. Rising traffic bollard (1), according to one or more of the previous claims, **characterized in that** said support bodies (15) each comprise a seat (150) for housing a relative skid (9), said skid (9) being removable from said seat (150) in order to be replaced.

Patentansprüche

1. Aufsteigender Verkehrspfosten (1), umfassend eine Stützstruktur (3), die dazu geeignet ist, in den Boden eingebettet zu werden, und ein Pfostenelement (5), das zwischen einer ausgezogenen Position, in der das Pfostenelement (5) aus dem Boden auskragt, und einer zurückgezogenen Position beweglich ist, in der das Pfostenelement (5) in den Boden abgesenkt ist, **dadurch gekennzeichnet, dass** die Stützstruktur (3) eine Mehrzahl von Kufen (9) umfasst, wobei das Pfostenelement (5) wenigstens eine Seitenwand (11) umfasst, in der eine Mehrzahl von Längssitzen (13) herausgearbeitet ist, in denen eine Mehrzahl von austauschbaren Gleitprofilen (7) untergebracht ist, die sich über die Länge des Pfostenelements (5) erstrecken und dazu ausgebildet sind, um in Bezug auf die Kufen (9) zu gleiten.

2. Aufsteigender Verkehrspfosten (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** er eine Mehrzahl von Stützkörpern (15) umfasst, die die Kufen (9) stützen, wobei die Stützkörper (15) zu und weg von den Gleitprofilen (7) bewegbar sind, um den Kontakt zwischen den Kufen (9) und den Gleitprofilen (7) einzustellen.

3. Aufsteigender Verkehrspfosten (1) nach Anspruch 2, **dadurch gekennzeichnet, dass** er Einstellmittel (21) zum Einstellen des Abstands der Kufen (9) von den Gleitprofilen (7) umfasst.

4. Aufsteigender Verkehrspfosten (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Stützstruktur (3) einen Deckel (17) mit einer Durchöffnung (19) umfasst, durch die das Pfostenelement (5) hindurchgeht, wobei der Deckel (17) von der Stützstruktur (3) abnehmbar ist, um den Zugang zu den Einstellmitteln (21) zu ermöglichen.

5. Aufsteigender Verkehrspfosten (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** das Pfostenelement (5) einen Kopf (25) umfasst, der entfernt werden kann, um den Zugang zu den Längssitze (13) der Gleitprofile (7) und den Austausch der Gleitprofile (7) zu ermöglichen.

6. Aufsteigender Verkehrspfosten (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Gleitprofile (7) aus einem thermoplastischen Polymer, vorzugsweise PVC, hergestellt sind.

7. Aufsteigender Verkehrspfosten (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Seitenwand (11) durch Strangpressen von metallischem Material, vorzugsweise Aluminium, hergestellt ist.

8. Aufsteigender Verkehrspfosten (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Kufen (9) aus einem Polymermaterial, vorzugsweise Acetalharz, hergestellt sind.

9. Aufsteigender Verkehrspfosten (1) nach einem oder mehreren der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Stützkörper (15) jeweils einen Sitz (150) zur Aufnahme einer relativen Kufe (9) umfassen, wobei die Kufe (9) von dem Sitz (150) abnehmbar ist, um ausgetauscht zu werden.

Revendications

1. Borne de circulation relevable (1) comprenant une structure de support (3) conçue pour être enfoncée dans le sol et un élément de borne (5) mobile entre une position extraite, dans laquelle ledit élément de borne (5) fait saillie par rapport au sol, et une position rétractée, dans laquelle ledit élément de borne (5) est abaissé dans le sol, **caractérisée en ce que** ladite structure de support (3) comprend une pluralité de patins (9), ledit élément de borne (5) comprend au moins une paroi latérale (11) dans laquelle une pluralité de sièges longitudinaux (13) sont obtenus, qui logent une pluralité de profilés coulissants remplaçables (7) qui s'étendent le long de la longueur dudit élément de borne (5) et qui sont configurés pour coulisser par rapport auxdits patins (9) .

2. Borne de circulation relevable (1), selon la revendication 1, **caractérisée en ce qu'**elle comprend une pluralité de corps de support (15) qui portent lesdits patins (9), lesdits corps de support (15) étant mobiles en direction et en s'éloignant par rapport auxdits profilés coulissants (7) afin d'ajuster le contact entre lesdits patins (9) et lesdits profilés coulissants (7).

3. Borne de circulation relevable (1), selon la revendication 2, **caractérisée en ce qu'**elle comprend des moyens pour ajuster (21) la distance desdits patins (9) par rapport auxdits profilés coulissants (7).

4. Borne de circulation relevable (1), selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ladite structure de support (3) comprend un couvercle (17) ayant une ouverture traversante (19) à travers laquelle ledit élément de borne (5) peut passer, ledit couvercle (17) étant amovible de ladite structure de support (3) afin de permettre l'accès auxdits moyens d'ajustement (21).

5. Borne de circulation relevable (1), selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de borne (5) comprend une tête (25) qui peut être retirée pour permettre l'accès auxdits sièges longitudinaux (13) de lesdits profilés coulissants (7) et le remplacement desdits profilés coulissants (7).

6. Borne de circulation relevable (1), selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** lesdits profilés coulissants (7) sont constitués d'un polymère thermoplastique, de préférence de polychlorure de vinyle, PVC.

7. Borne de circulation relevable (1), selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ladite paroi latérale (11) est réalisée par extrusion d'un matériau métallique, de préféren-

ce d'aluminium.

8. Borne de circulation relevable (1), selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** lesdits patins (9) sont constitués d'un matériau polymère, de préférence d'une résine acétate.

9. Borne de circulation relevable (1), selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** lesdits corps de support (15) comprennent chacun un siège (150) pour loger un patin associé (9), ledit patin (9) étant amovible dudit siège (150) afin d'être remplacé.

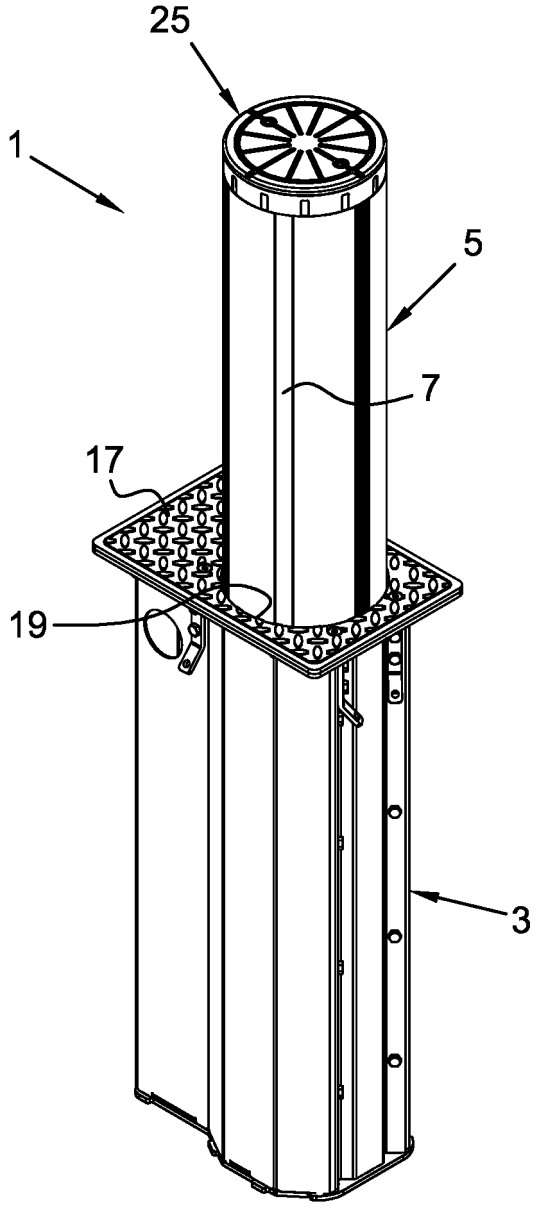


Fig. 1

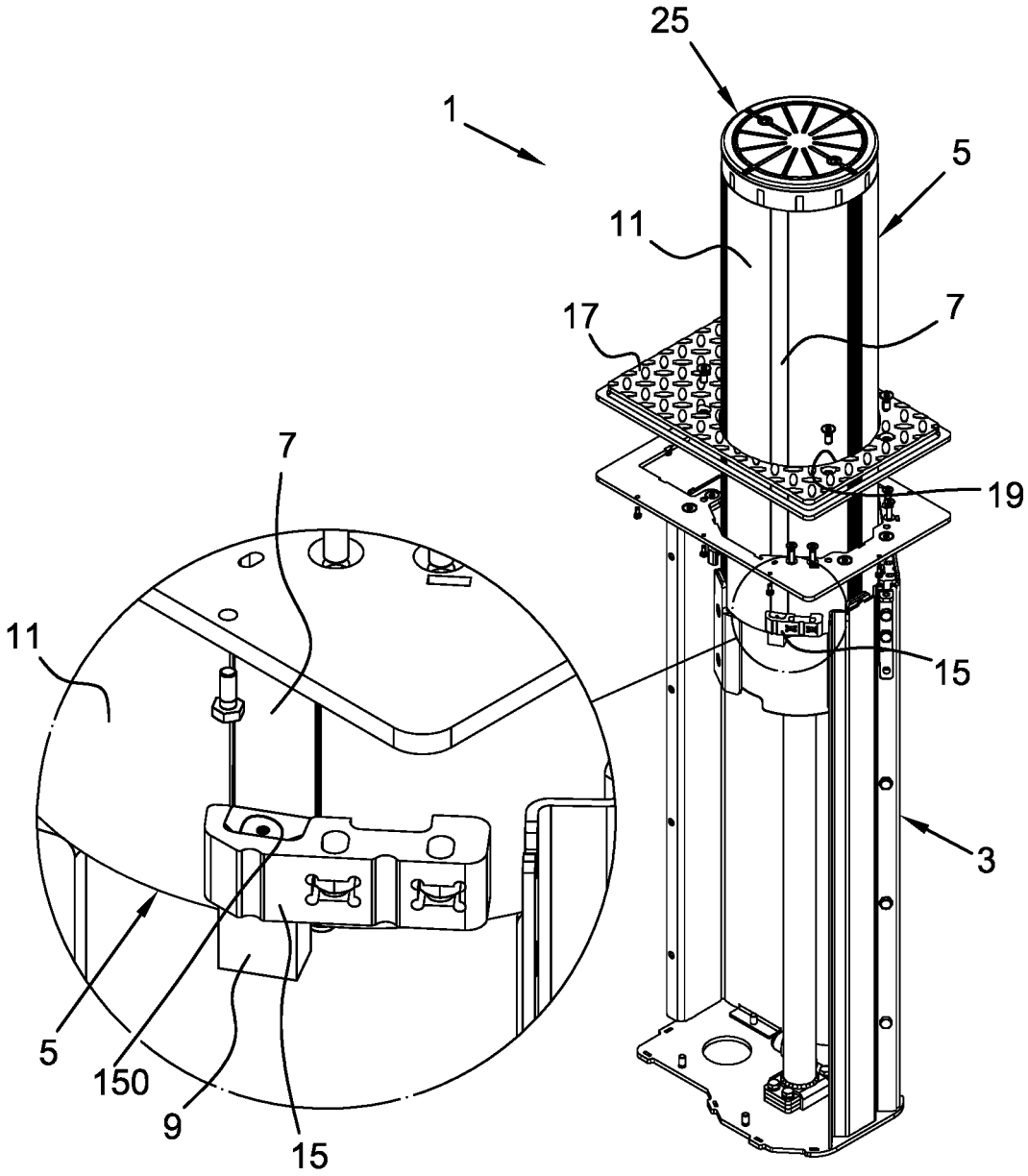


Fig. 3

Fig. 2

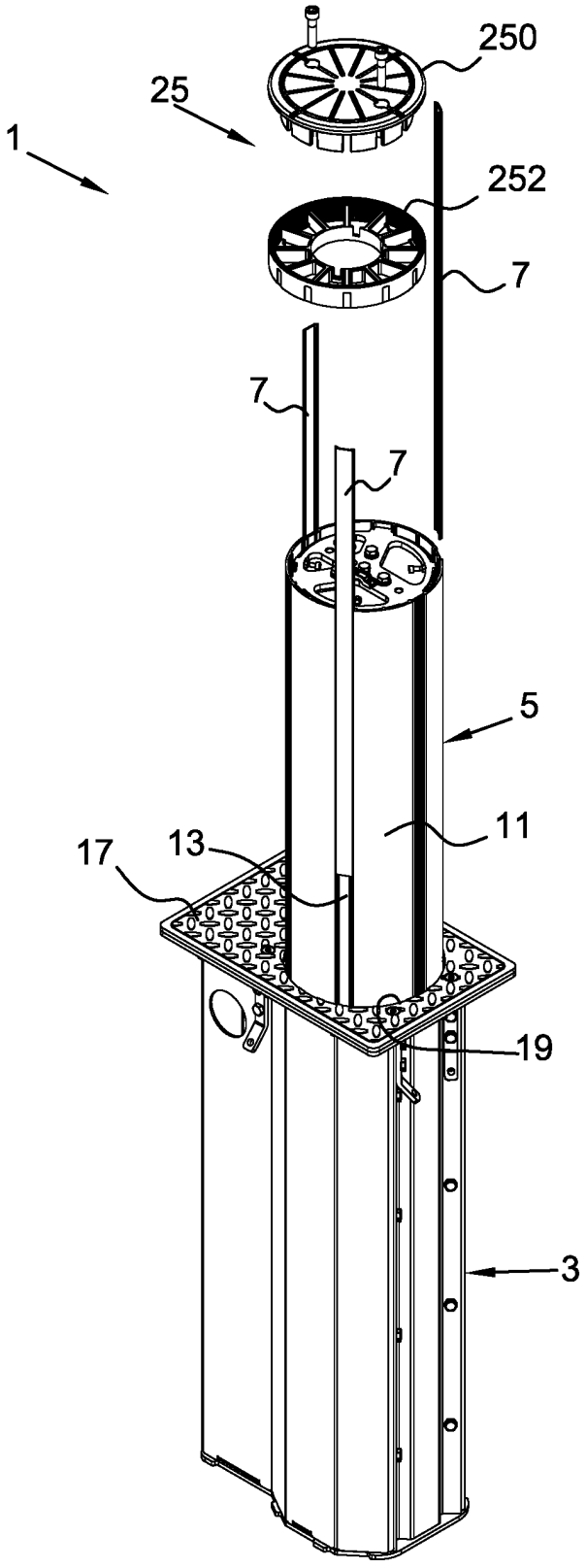


Fig. 4

Fig. 5

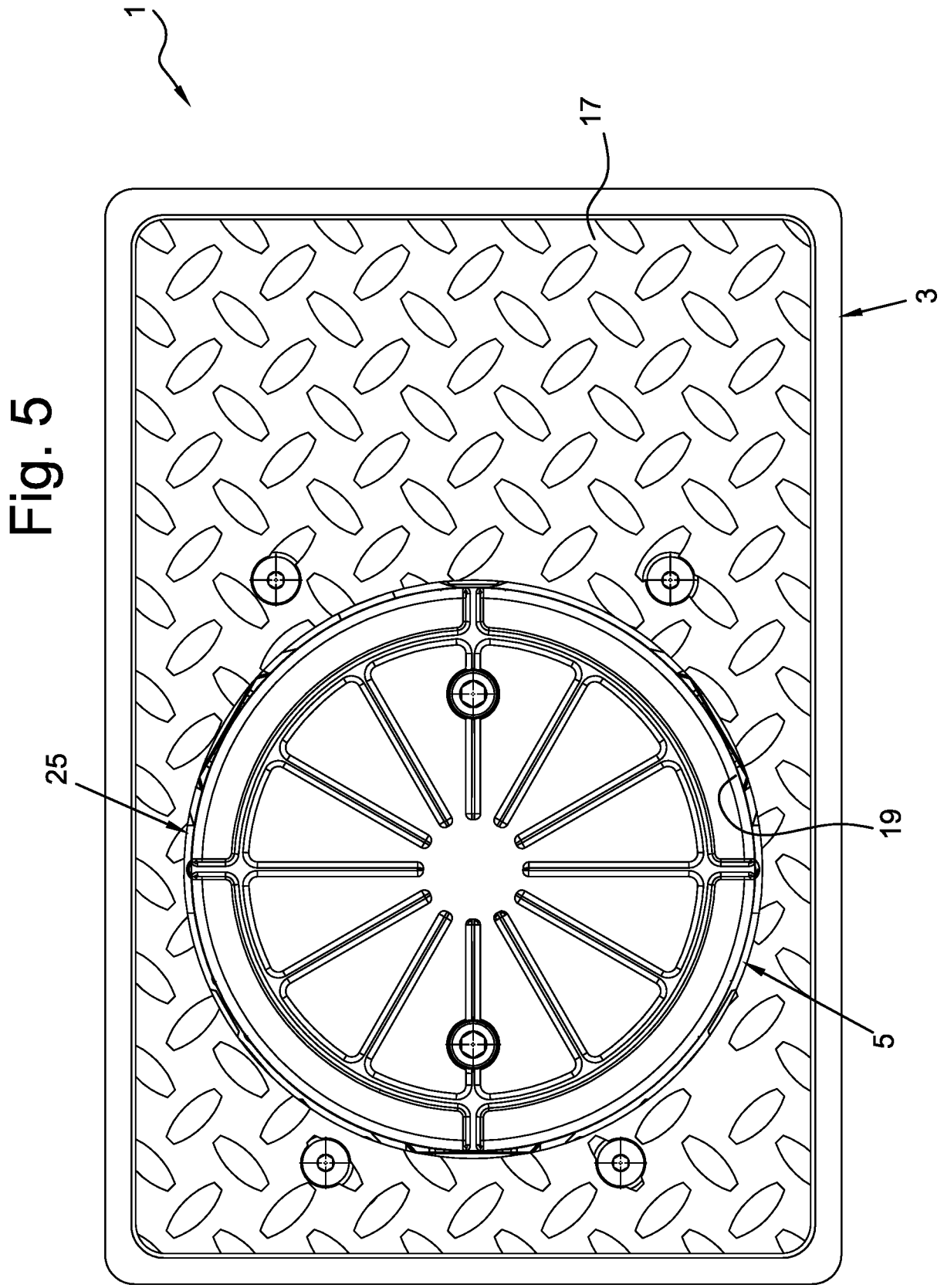


Fig. 6

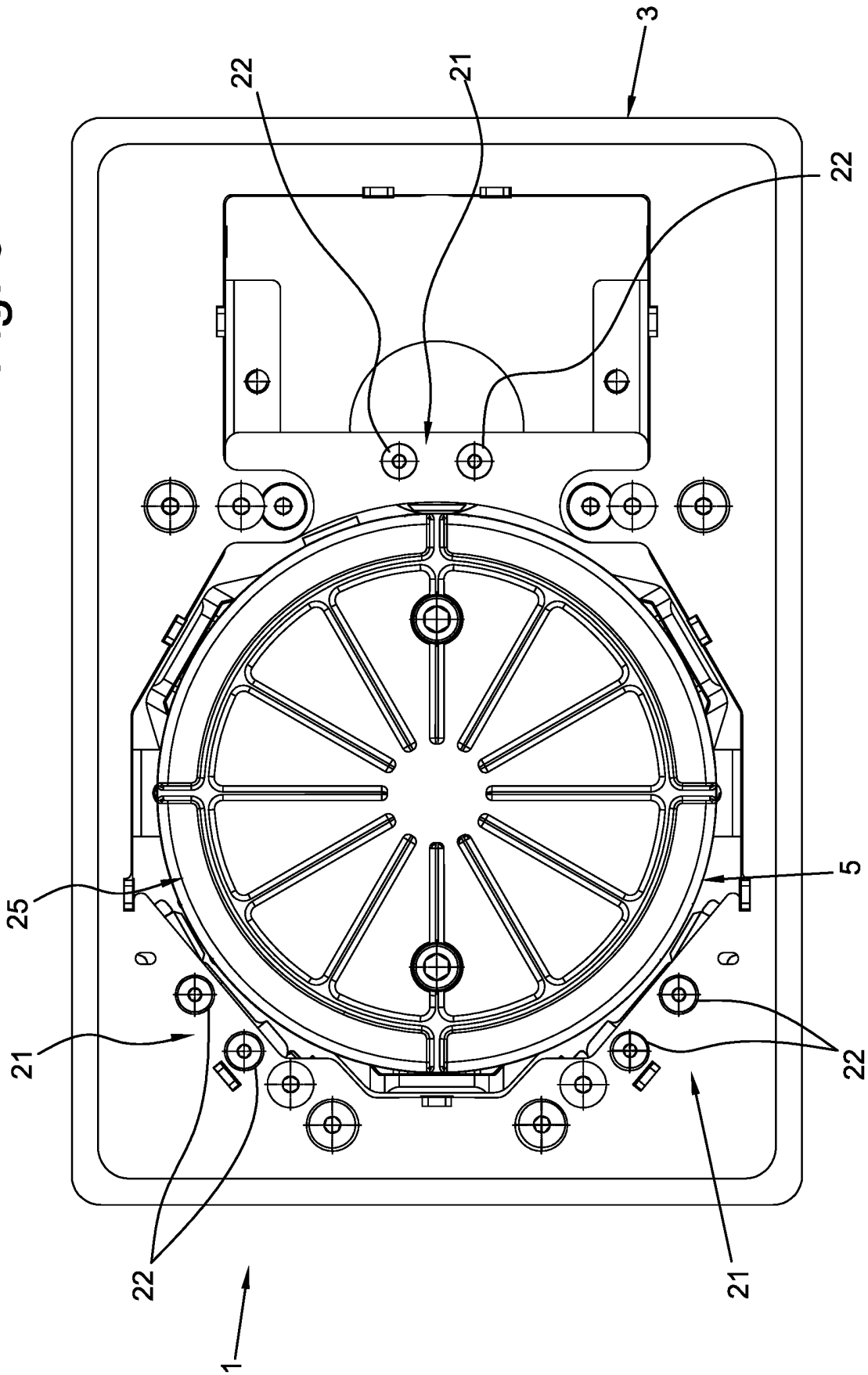


Fig. 7

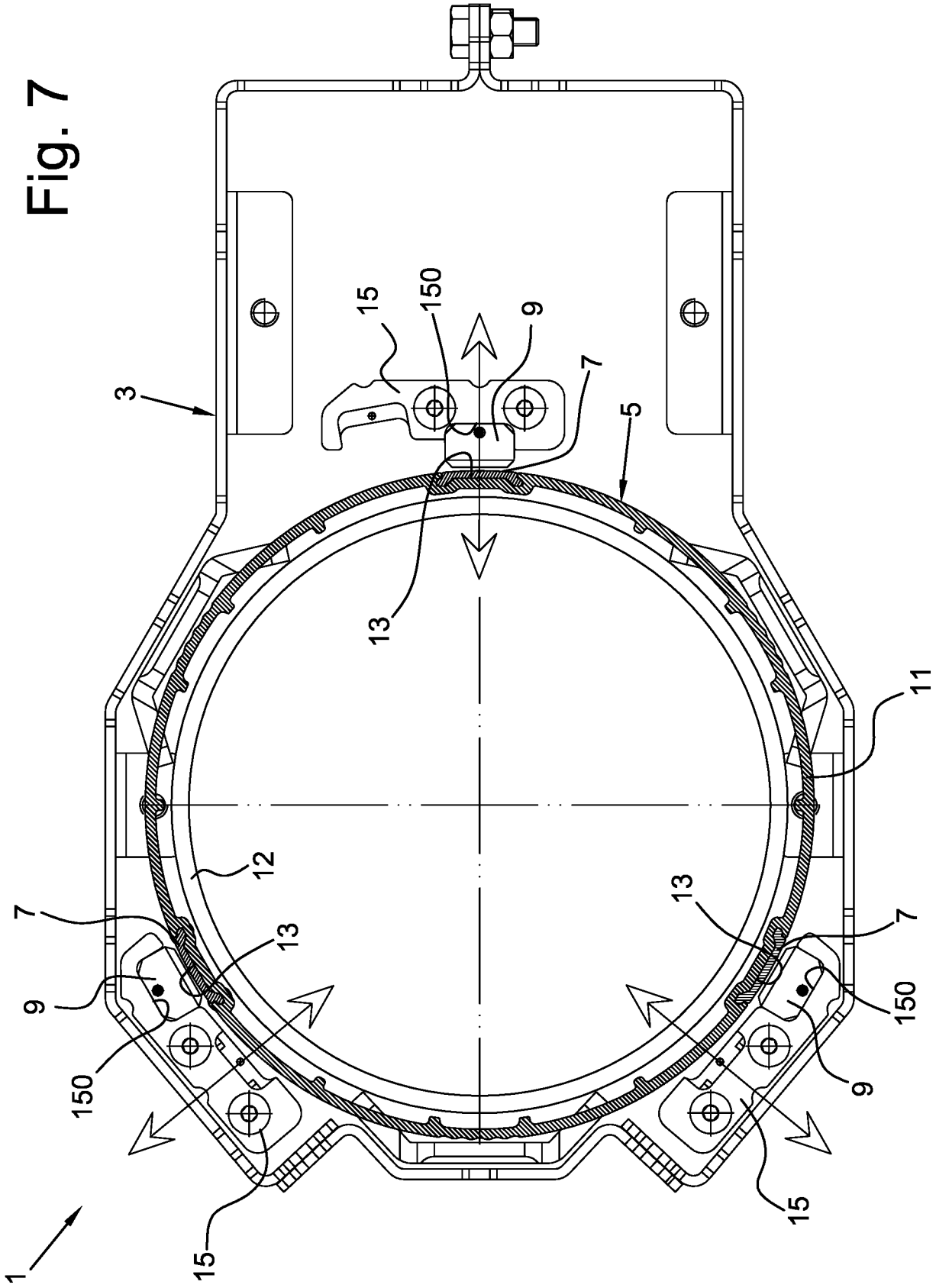


Fig. 8

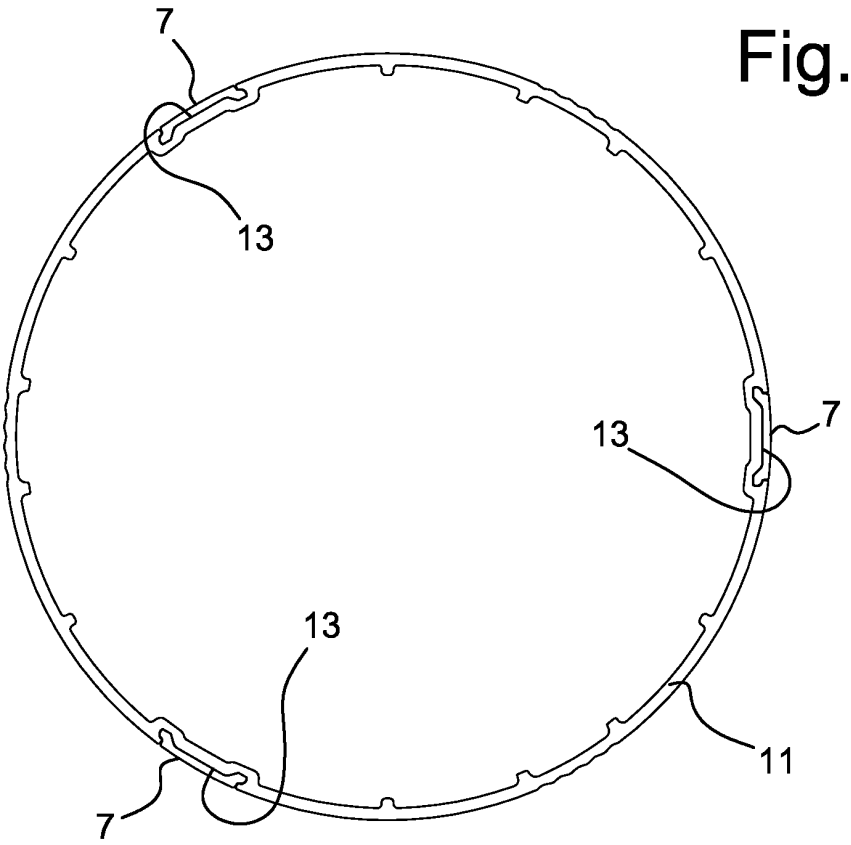
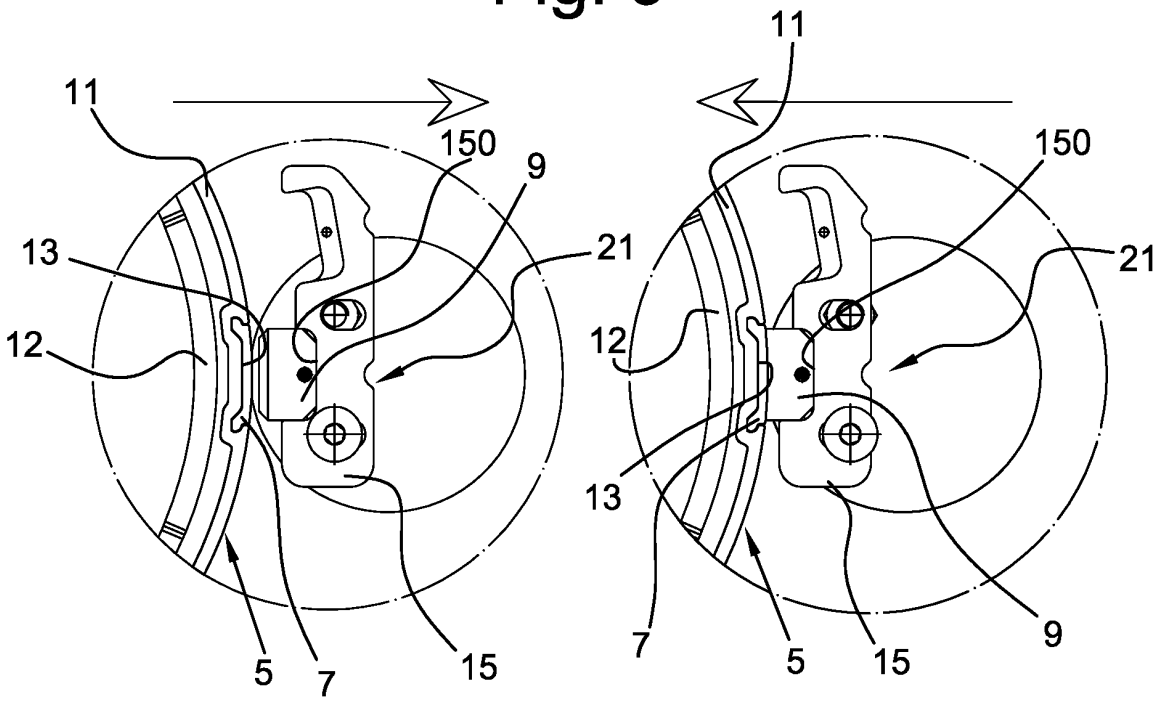


Fig. 9



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Patent documents cited in the description

- DE 202015004858 U **[0002]**