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The invention relates to a traffic guide barrier for integration into a vehicle retaining system on a traffic route according to the pre-characterising part of claim 1, and also a vehicle retaining system with such a traffic guide barrier according to claim 5 10.

Apart from the purely visual clarification of traffic management by means of traffic guidance devices, passive protection devices in particular serve to stop a vehicle that is leaving the designated lane. In the form of mobile or stationary vehicle retaining systems such traffic guidance barriers thus effectively prevent crashes and 10 also possible collision with the oncoming traffic.

On the other hand a rapid opening of a section within this vehicle retaining system is necessary especially in emergency situations, so as to allow for example 15 unimpeded access to fire trucks or ambulances. Since these vehicle retaining systems constitute a structural separation and thus a barrier that cannot normally be crossed by a vehicle, corresponding devices are necessary for this purpose.

The vehicle retaining systems generally formed from concrete or metal guide barriers detachably joined to one another comprise for this purpose swivellable 20 sections in order to be able to remove at least in some sections the otherwise desired barrier effect if necessary. For this purpose individual guide barrier sections are formed as a traffic guide barrier, wherein the sections can be fixed on one side via a rotation axis and thus can be swivelled about this from a closed position to an 25 open position. Another opening principle of a traffic guide barrier is disclosed in EP 2 418 324 A1. In this case the lowerable crash barrier arrangement can be retracted and extended by a double scissor gear system and in the retracted state can be lowered sufficiently far so that vehicles can drive over it.

DE 10 2008 016 837 A1 discloses a traffic guide barrier for integration in a stationary 30 vehicle retaining system on a traffic route. The traffic guide barrier comprises for this purpose a guide body extending in its longitudinal direction, which is arranged on an end-located bearing region so that it can swivel horizontally about a vertical rotation axis. Furthermore the guide body has a coupling means on its front side

facing away from the bearing region, via which the guide body can be coupled to a section of the vehicle retaining system corresponding to the coupling means.

5 DE 20 2004 005 084 U1 discloses a crash barrier as part of a crash barrier arrangement, which is mounted at the end about a horizontal rotation axis. By releasing a latch device the crash barrier can thus be vertically swivelled when necessary, in order to allow passage through the crash barrier arrangement.

10 From CH 460 845 A a traffic guide barrier is known for integration in a vehicle retaining system on a traffic route. This comprises a first barrier body with a first end face and also a second barrier body, which has a second end face corresponding to the first end face. In this connection the two barrier bodies have coupling means in the form of holes and bolts that can be brought into engagement with one another. On one of the barrier bodies there is provided an end bearing arrangement
15 facing away from its end face, on which the barrier body is mounted about a horizontal rotation axis. In this way the barrier body can be swivelled vertically from a closed position to an open position. A gap located in the closed position between the two front sides of the barrier bodies is at least partially bridged by at least one side wall, which is arranged on one of the barrier bodies.

20 The systems known in this way have in principle proved their worth in practise. In order to maintain a sufficiently large opening when horizontally swivelling the traffic guide barrier designed for high impact loads, the employed base body must have a corresponding length. Particularly in the case of restricted spatial circumstances
25 only small opening widths can therefore be realised in some cases. Depending on the local circumstances this may result in that a sufficiently wide system cannot be realised in the necessary range. On the other hand the vertically swivellable crash barrier forms a system independent of the lateral spatial circumstances, which on account of its design is used in the case of smaller expected impact loads.

30 The still unpublished German application 10 2011 053 263.3 (subsequently published as DE 10 2011 053 263 A) shows a system for a vertically swivellable traffic guide barrier that can also reliably absorb high impact loads, which serves as part of a stationary vehicle retaining system. The traffic guide barrier has a first and
35 a second guide body, which comprise coupling means that can be brought into

engagement with one another. One of the coupling means includes in this connection a clip arranged at the end of the first guide body as well as pin-like projections, while the other coupling means comprises an insertion pocket arranged on the end face of the second guide body, with a bottom web provided with recesses.

In a closed position of the traffic guide barrier the clip can be brought into engagement at least in some regions with the insert pocket and also the projections can be brought into engagement at least in some regions with the recesses. To open the traffic guide barrier there is provided on at least one of the two guide bodies an end bearing arrangement facing away from its respective end face, on which the corresponding guide body is mounted about a horizontal rotation axis and can thus be vertically swivelled as necessary from a closed position to an open position. The gap in the closed position located between the two end faces of the guide bodies is at least partially bridged in certain regions by at least one side wall, which is fixed to one of the guide bodies.

Depending on the scope of use and in particular in the case of high impact loads correspondingly stringent safety requirements according to DIN EN 1317 ("Retaining systems on roads") govern the design and construction of such vehicle retaining systems. Specifically the openable sections form depending on the opening width a long lever arm, whose reaction to an impact is determined by measures different from the remaining guide barrier section for absorbing the resulting forces. In other words, on account of the swivelling ability more stringent requirements are placed on the movable connections and in particular the necessary coupling of the free end to the remaining vehicle retaining system, which form a potential weakness point.

Against this background the connection between the swivellable section and the stationary fixed elements also furthermore still shows room for improvements.

The object of the present invention is therefore based on further improving a vertically swivellable traffic guide barrier of the aforementioned type and also a vehicle retaining system with such a traffic guide barrier, so that the traffic guide barrier in its closed position has a fail-safe coupling and virtually unchangeable

bearing of its free end, in particular within a stationary vehicle retaining system, also in the case of very high impact loads acting in particular on its vertically swivellable end.

- 5 This object is achieved according to the invention in a traffic guide barrier for integration in a vehicle retaining system having the features of claim 1 and also in a vehicle retaining system for a traffic route having the features of claim 10.

10 A traffic guide barrier for integration in a vehicle retaining system on a traffic route is illustrated hereinafter, which comprises a first guide body with a first end face and also a second guide body with a second end face corresponding to the first end face. The guide bodies have coupling means that can be brought into engagement with one another. One of the coupling means includes a clip arranged on the first end face and also pin-like projections, wherein the correspondingly other coupling
15 means has an insertion pocket with a bottom web arranged on the second end face. The bottom web of the insertion pocket furthermore has at least one recess, preferably a plurality of recesses. In a closed position of the traffic guide barrier the clip can be brought into engagement with the insertion pocket and also the projections can be brought into engagement with one another at least in regions
20 with the recess or recesses.

As an advantageous arrangement the projections and the recesses are respectively arranged in the outer edge regions of the insertion pocket and the end face. In this way a stable connection between the guide bodies is ensured, which can also
25 withstand a high bending load perpendicular to the swivel axis of the guide body.

Furthermore there is provided on at least one of the two guide bodies an end-located bearing arrangement facing away from its end face, on which this guide body is vertically swivellably arranged about a horizontal rotation axis. In this way the guide
30 body can be vertically displaced from a closed position to an open position.

A gap located between the two oppositely facing end faces in the closed position is bridged at least in some regions by at least one side wall. In a preferred arrangement also two side walls can be provided, which at least in some regions
35 encompass in a bridging manner the gap between the two end faces of both sides.

The at least one side wall is arranged on the first guide body or on the second guide body.

5 The side wall forms a stop means, against which the respectively other guide body can be supported. Obviously also the guide body comprising the side wall can be supported against the respectively other guide body. In particular impact loads directed horizontally on the guide body can thus first of all be absorbed by one of the guide bodies, wherein its free end can be supported via at least one side wall against the free end of the other guide body. Owing to the transmission of the loads
10 between the guide bodies via the side wall the in each case free end of the guide body is fixed in its position.

In particular in the case of two side walls these can be arranged at the same time either on the first guide body or on the second guide body, wherein also in each
15 case one of the two side walls can be arranged on the first guide body, while the other side wall is arranged on the second guide body. Even though the side walls respectively arranged on one of the two guide bodies can be arranged on a common side of the two guide bodies, these are preferably in each case joined on only one side to one of the guide bodies.

20 Owing to the two-sided arrangement of the side walls in the region of the oppositely facing end faces of the guide bodies, their free ends are stabilised against one another. In particular in the case of an arrangement in which both guide bodies are vertically swivellable with respect to one another, the side walls serve to transmit
25 any moment away via the gap between the guide bodies.

According to the invention the first guide body has a claw arranged on its free end, which corresponds to an opening. The said opening is part of the second guide body, the opening being arranged in an upper side of the second guide body. The claw
30 and the opening are designed so that they can be brought into engagement by a vertical swivelling movement of one of the guide bodies. In this way the claw of the first guide body in the closed position engages at least in some regions in the opening of the second guide body. On the other hand the engagement of the claw in the opening in the open position of the traffic guide barrier is released.

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Depending on the requirements, the design of the claw may be such that in a limited vertical swivelling of the guide body an engagement of the claw in the opening is furthermore also possible.

- 5 For this purpose the claw can have a hook section whose length is adapted to the respective requirements, which engages correspondingly deep in the opening of the second guide body. In this way, also in the case of a limited lifting of the first guide body for example as the result of an impact, furthermore a stable connection between the two guide bodies is ensured by a combination of the claw and opening.

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- The particular advantage of the claw in combination with the opening lies in the fact that in this way not only can impact loads directed on the guide body be transferred, but the claw can form a tieback and/or pressure band between the oppositely facing guide bodies. In this way loads also extending in the longitudinal direction of one of the guide bodies can be transferred via the claw to the respective other guide body.
- 15 For this purpose the opening is preferably formed so that in particular the angled hook section in the closed position of the traffic guide barrier extends as close as possible to an edge of the opening. In this way merely a slight longitudinal offset or transverse offset between the guide bodies is required to activate the thereby
- 20 created connection.

- In a further arrangement the claw and opening can be matched to one another so that in the closed position of the traffic guide barrier these permanently have a mutual contact region at least over some sections. Depending on the requirements
- 25 the thereby created coupling between the opening and claw can be a frictional type engagement and/or a positive type engagement.

- The claw comprises a substantially horizontal side arm (bracket), the hook section being angled with respect to the said side arm. In this connection the side arm and hook section enclose an angle of 70° to 100°, preferably 90°, between them. In order to obtain as stable a connection as possible also in a horizontal plane transverse to the longitudinal direction of the traffic guide barrier, the side arm of the claw preferably has a width exceeding its height and extending in the horizontal plane. By means of this arrangement the moment of resistance of the claw about
- 30 the thereby formed strong axis is significantly improved against a horizontal impact
- 35

load, so that also during the impact a low-deformation and reliable coupling between the two guide bodies is achieved.

Advantageous developments of the basic concept of the invention are the subject
5 matter of the dependent claims 2 to 9.

According to this the second guide body can have a coupling plate arranged on its lower side and projecting beyond its second end face. The coupling plate can for example be the extension of a base plate of the second guide body. Obviously the
10 coupling plate can also be arranged as an individual component in the region of the plane of the lower side of the second guide body on the latter.

Depending on the design the coupling plate can be connected for example via releasable connection means to the guide body. In combination with the
15 arrangement of elongated holes any deviations from the planned spacing between the oppositely facing guide bodies can thus be compensated *in situ* by a position adjustment of the coupling plate. The coupling plate is preferably connected in a positive engagement manner to the second guide body, for example by means of a weld seam or via weld points.

20 Since the coupling plate projects beyond the second end face of the second guide body, this can at least partially grip underneath the first guide body in the closed position of the traffic guide barrier. A possible height offset of the first guide body thus lying at least in some regions on the coupling plate can be compensated for
25 example by an offset or a change in cross-section of the coupling plate. On the other hand the first guide body can also have a corresponding recess or an offset on its lower side in the region of its free end, so as to accommodate the thickness of the coupling plate in the closed position of the traffic guide barrier.

30 Depending on the design the coupling plate can be connected either via releasable connecting means or cohesively, for example via welding, to the second guide body. The advantage when using releasable connecting means is the fact that in this way any tolerances can be compensated *in situ*. In particular in combination with the arrangement of elongated holes any variations in the position of the directly
35 oppositely facing guide bodies can thus be compensated. Furthermore, if the

coupling plate has to be replaced owing to damage, it can easily be removed if releasable connecting means are used.

5 In order to make possible a coupling of the directly oppositely facing guide bodies by means of the coupling plate, this preferably has at least one reception opening, wherein the first guide body has on its lower side at least one foot arranged on the latter. Preferably a plurality of reception openings are provided in the coupling plate, while the first guide body can also have several feet. The at least one reception
10 opening and the at least one foot are provided so that in the closed position of the traffic guide barrier these can be brought into engagement with one another at least in some regions. In an alternative arrangement obviously also the coupling plate itself can have at least one such foot, while the first guide body has on its lower side at least one corresponding reception opening.

15 Preferably at least two reception openings and two feet are provided, which are arranged spaced from one another perpendicular to the longitudinal extension of the traffic guide barrier. By means of this arrangement also a moment resulting for example from an impact can be transmitted over the gap between the two end faces through the coupling plate to the respective other guide body. In addition tensile
20 and/or compressive loads acting in the longitudinal direction of the traffic guide barrier can also be transmitted in this way.

Depending on the desired interaction with the side wall and the remaining coupling means, the reception opening and the foot can be matched to one another so that
25 in the case of any deflection of a guide body these enable either a direct or a subsequent force redirection to take place. This interaction is largely determined by matching the respective shapes of the foot and the reception opening to one another. Thus, the reception opening can for example directly have an edge-side contact with the foot in the closed position of the traffic guide barrier. On the other
30 hand the dimensions of the foot can be smaller compared to the dimensions of the reception opening, so that the foot has a corresponding degree of play within the reception opening. In order then to make a force redirection and also force absorption possible in this way, first of all a deflection of at least one guide body is necessary in order to bring the foot and the reception opening into an edge-side
35 contact.

The foot and/or the reception opening can for example have a round or oval, in particular circular shape. In an advantageous arrangement the foot and/or reception opening can be polygonal. Thus, for example, a square or rectangular shape provides the greatest possible contact surface between an edge region of the opening and the foot. In this way the forces can be transmitted over as large a surface area as possible. Any radii or inclines between the edge regions meeting one another in the corners reduce a possible gap effect or notch effect during a loading. The larger the area between the reception opening and foot available for the transmission of forces, the smaller the respective stress loads.

In a development the foot and/or the reception opening can also have an inclination of at least one of its edge regions. Obviously the reception opening and/or the foot can also have a conical shape overall. Owing to the at least one inclined edge region, an immediate positive engagement connection and/or frictional connection between the reception opening and foot is made possible when the respective guide body swivels into the closed position.

The insertion pocket can be formed by a frontal metal impact panel, which is spaced from the second end face by means of two vertical webs. In order to allow as simple an engagement as possible, the metal impact panel is oriented preferably perpendicularly relative to the upper side of the second guide body.

The coupling means thus permit an automatic latching engagement of the guide bodies in the closed position, which is simultaneously released on swivelling to the open position. In this connection the tongue-shaped clip engages behind an undercut of the insertion pocket during swivelling into the closed position. Depending on the design of the coupling means large normal forces can thus be transferred virtually free of play between the guide bodies.

In an advantageous modification the bottom web can be an integral materially uniform component of the coupling plate. It is thereby simply necessary to arrange the coupling plate projecting beyond the second end face on the second guide body, on which are arranged the insertion pocket of one of the coupling means and also the at least one reception opening and/or the at least one foot. Obviously the bottom

web and the coupling plate can also be coupled to one another by means of releasable connecting means or by welding.

5 Preferably a displaceable latching element is arranged in or on one of the guide bodies, which element can be moved at least in sections through the end faces lying opposite one another in the closed position. In this way the guide bodies can be fixed to one another in the closed position via the latching element. Apart from the supportive action of the side walls in the case of transverse loads, for example in the event of an impact, in particular an undesirable swivelling of the guide body
10 from its closed position can be effectively prevented by the displaceable latching element. Since the invention envisages a manual, more specifically mechanical, swivelling of the guide body as well as a swivelling effected in some other way, in addition the unauthorised opening of the traffic guide barrier by swivelling it to the open position is also prevented by the displaceable latching element. In this
15 connection the displaceable latching element can have an access barrier, for example a closure device, which allows only authorised persons to unlatch it.

The first end face and an upper side of the first guide body can enclose an angle of inclination of less than 90° . Also, the second end face and a lower side of the second
20 guide body can enclose an angle of inclination of less than 90° . The horizontal rotation axis is in a first alternative embodiment arranged above the upper side of the guide body. In this way an ideal position as well as a contact free from play between the end faces of the guide bodies with respect to one another is made possible. In a second alternative embodiment the horizontal rotation axis can also
25 be arranged in the plane of the upper side of the guide body. The same positive effect is also achieved in this case. In contrast to a horizontal rotation axis arranged on the lower side of the guide body, according to the invention no support of the swivellable guide body on its upper side is necessary in order to prevent the guide body possibly tilting or being deflected during an impact. By ensuring as solid a
30 configuration as possible of the bearing arrangement in combination with a rotation axis arranged in the region of the upper side of the guide body, transverse forces occurring in the event of an impact are transmitted reliably and without causing an inclination of the upper side of the guide body directly to the bearing arrangement and thus to the ground.

The particular advantage consists in the combination of the inclined end faces and also the coupling means connecting the guide body together with the coupling plate and the at least one side wall. Provided that only a one-sided impact of a vehicle on the guide body is possible, only a single side wall need be arranged on the side of the possible impact.

Preferably the traffic guide barrier according to the invention is arranged centrally as a structural separation between two traffic lanes, so that a possible impact from both sides of the traffic guide barrier can be dealt with. In these cases preferably at least two side walls are arranged, which are situated on the oppositely facing sides of the guide barriers.

In particular the end faces inclined parallel to one another in the case of identical angles of inclination make possible a contact free of play between the guide bodies. In combination with the coupling means and the side walls laterally enclosing the guide bodies a virtually rigid connection is made possible, which can be released without any problem if necessary.

In the event of an impact the coupling means and the coupling plate in conjunction with the reception opening and the foot serve in particular to reliably absorb as normal forces between the guide bodies, the tensile forces occurring as a result of the bending or a deflection. In addition the occurring transverse forces parallel to the rotation axis of the swivellable guide body are reliably transmitted by the side walls between the first and the second guide bodies. Owing to the slight gap between the end faces preferably extending parallel to one another in the closed position, the required coupling means and the coupling plate and also the side wall can be designed short. In this way their loading due to occurring bending moments is reduced.

Owing to the connection free from play between the guide bodies, both the coupling means and also the side walls and the coupling plate together with the reception opening and foot are activated as early as possible in the event of an impact, so as to transmit the resulting forces. In other words, no relatively large deflection of the swivellable guide body or both guide bodies is necessary in order to initiate the retaining action of the coupling means and the side walls.

The angle of inclination between the end faces can be 65° to 85°. Preferably the angle of inclination is 70° to 80°. In a particularly preferred arrangement the angle of inclination is 75°.

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The largest preferred angle of inclination is obtained from the position of the horizontal rotation axis and the transition region of the inclined end face to the lower side lying opposite the upper side of the first guide body. In this connection the transition point between the first end face and the lower side of the first guide body describes the position of an inclination axis of the end face running parallel to the rotation axis, wherein the rotation axis and the inclination axis span a plane between them. The angle enclosed between this plane and the upper side of the first guide body corresponds when subtracted from 180° to the largest preferred angle of inclination. If this geometry is maintained an ideal parallel course of the end faces lying opposite one another in the closed position is made possible, with an appropriate gap size, more specifically spacing from one another. The spacing takes into account the expansion processes of the material of the guide bodies due to weathering and temperature changes, so that an opening and closure of the guide bodies is ensured at all times.

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In a preferred embodiment the bearing arrangement comprises a bottom plate with at least one limiter. The guide body can thus be laterally supported in the closed position by the limiter. In particular in combination with a horizontal rotation axis arranged in the region of the upper side of the guide body the guide body in the closed position and therefore also in the plane of its lower side is effectively supported against a possible avoidance in the event of an impact. If the traffic guide barrier according to the invention is arranged between traffic lanes on both sides, the bearing arrangement advantageously has one, preferably two limiters, wherein the limiters can be arranged in each case on both sides of the guide body down to the bottom plate of the bearing arrangement. The limiter can be configured differently and can be implemented for example as pins or stop means.

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In an advantageous embodiment the first and/or the second guide body can have a transverse metal plate in the region of the bearing arrangement. The said transverse metal plate extends in this case perpendicularly to the longitudinal

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direction of the respective guide body. Furthermore the transverse metal plate can be designed so that it has at least one cut-out section corresponding to the limiter. Also, the respective limiter is not fixed laterally on a guide body, but is located underneath the guide body on the bottom plate of the bearing arrangement.

5 Obviously the said bottom plate can also be fixed independently of the bearing arrangement directly on a respective base. In combination with the transverse metal plate arranged within the guide body its at least one cut-out section can surround the limiter at least in regions in the closed position of the traffic guide barrier.

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Preferably the limiter is arranged in the form of a flag-shaped metal panel on the bottom plate, which extends away from the bottom plate perpendicularly to the transverse metal plate and thus into the respective guide body.

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Even though the limiter can in this connection have a pencil shape, it is preferably formed as a plate, wherein the plate-shaped limiter extends in a plane parallel to the longitudinal direction of the traffic guide barrier. In this way the inevitably resulting swivelling movement of the cut-out section on a circular path about the horizontal rotation axis of the bearing arrangement can be configured so that the

20 cut-out section of the transverse metal plate is displaced from an edge of the limiter starting above the latter.

Owing to the width of the plate-shaped limiter extending in the longitudinal direction of the traffic guide barrier, it is ensured that the retaining action with respect to a

25 transverse loading of the guide body can also be ensured even if the guide body is raised a limited amount from the closed position, for example by an impact. Thus, even in the case of a severe impact in combination with a limited lifting of the guide body the retaining action of the limiter is still ensured.

30 In an alternative arrangement the invention envisages that both guide bodies have an end bearing arrangement, facing away from their end faces, with a horizontal rotation axis. According to the invention both guide bodies can thus be swivelled vertically from a closed position to an open position. As a result two guide bodies opposite one another in their mutual elongation and swivellable with respect to one

35 another are present, which despite each being of short construction together

provide as large an opening width as possible. In this way the guide body can be formed identically up to the arrangement of the coupling means and also the side walls and the respective inclination direction of the end faces.

5 Advantageously a guide rail, in particular a plurality of guide rails, are provided, which are arranged above the first guide body. In principle a guide rail can also be arranged above the second guide body. Above in this case means mounted directly on the guide body or spaced therefrom by appropriate arrangements. Whereas the first guide body and/or the second guide body forms/form the basic structure, the
10 guide rail first of all leads to a structural height increase and also a stiffening of the system. Depending on the intended use and required containment level several, in particular two guide rails arranged above one another, also can be provided. Obviously additional crash barriers can also be mounted on the guide rails, which then extend in their longitudinal direction.

15 The guide rails can be connected via tie rods to the guide bodies. For this purpose the tie rods are tensioned with the abutments provided within or on the guide bodies. The tie rods are preferably threaded rods, which have at least one section with a thread. By means of the thread the tie rod can by turning it be tensioned
20 with the abutment. Preferably the thread is an outer thread, in particular a coarse thread. The abutment is for this purpose provided with a corresponding inner thread. In this way the guide rail and the guide body are drawn towards one another and tensioned by turning the tie rod.

25 The actuation of the tie rod preferably takes place from an upper side of the guide rail. For this purpose the tie rod can have a rod head, on which a corresponding handle can be fixed for turning the tie rod. Advantageously the upper end of the tie rod thus passes completely through the guide rail.

30 In principle it is also possible to connect the guide rails or similar attachment bodies to the guide body in a cohesive manner, in particular by welding.

With regard to the displaceable latching element it is envisaged that this can be displaced manually as well as in an automated manner. In the latter case this can
35 be controlled for example via a central or local control means. Preferably the

latching element is displaced by means of an electromechanical drive. In principle also the swivellable guide body can be swivelled, for example hydraulically, pneumatically or electromechanically, via a corresponding drive. Preferably it is then also activated via the same central or local control means that is provided for
5 activating the latching element.

Preferably the end face lying opposite the guide body with the latching element has an opening. In this case the latching element in the closed position of the guide body can be moved at least in sections into this opening. For this purpose the
10 latching element can for example have a conical shape at its end, while the opening is formed circular. In this way a connection virtually free from play between the conical part of the latching element and the opening can be created, which improves the mutual connection between the base body and the counterpart.

15 In an alternative arrangement the also the claw can in relation to its angled hook section also have such an opening. In this way the latching element in the closed position of the guide body can be guided at least over sections through the openings in the end face and in the hook section. The particular advantage is that in this way an additional safeguarding of the guide body against any lifting in the event of an
20 impact is ensured.

As a result a traffic guide barrier is obtained, which in its closed position ensures a reliable and sustainable position fixing of its free end also under high impact loads. Owing to the connection of a plurality of retaining components in the form of
25 coupling means, side wall, bottom-side limiter and also the coupling plate in combination with the reception opening and the foot as well as the displaceable latching element, it is ensured that the respective guide body is fixed in relation to its ends with a high failure safety and virtually unchangeable bearing in the closed position. In this connection at least some of the holding components are formed so
30 that the connection is also then still active if one of the guide bodies is raised to a limited extent from the closed position.

In particular the combination of inclined end faces running parallel to one another permits a large area contact between the free end or ends of the guide bodies, more
35 specifically between their end faces, which advantageously allows a force

transmission over a large area. Together with the coupling means and the side walls a virtually rigid connection between the guide bodies is thus ensured, which has a positive effect on the possible containment levels that can be achieved.

- 5 Within the scope of the invention a vehicle retaining system for a traffic route is also disclosed, which has guide barrier detachably joined to one another and a traffic guide barrier according to the previous implementations. Preferably the guide barriers have coupling means and/or reception openings formed similarly to the traffic guide barriers and also feet, whereby these can be replaced and can be
- 10 coupled to one another without any problem according to a modular principle. Also, the fixed guide body can have at its end facing the end face coupling means corresponding to the coupling means of the guide barriers, so that it can be integrated within the vehicle retaining system. The same also applies to the arrangement of the coupling plate (reception opening, foot). Furthermore also the
- 15 bearing arrangement can have on its region facing towards the guide barriers a corresponding coupling means, which corresponds to the coupling means of the guide barriers, so that the guide barriers can also be brought into engagement with the bearing arrangement.
- 20 In a preferred arrangement the guide bodies correspond in their cross-section to the cross- section of the guide barriers. In this way an optically virtually seamless transition between the guide barriers and the guide bodies is made possible, at least in the closed position. Depending on the configuration the bearing arrangement can also be matched to the cross-section of the guide barriers. If the bearing
- 25 arrangement has dimensions differing from the cross-section of the guide barriers, the transitions between the bearing arrangement and guide barriers are preferably smoothed or rounded surface transitions, so as to form as few projecting regions as possible or even no such regions. The aim is to deflect and possibly stop a vehicle impacting the vehicle retaining system that takes place in particular at an acute
- 30 angle on the vehicle retaining system, with the smallest possible loads for the occupant or occupants, without the risk of a collision with any projecting regions of the vehicle retaining system.

- 35 A vehicle retaining system for a traffic route is described herein, which is composed of easily jointly connectable guide barriers and also at least one traffic guide barrier.

The guide barriers and also guide bodies starting on the bottom side and extending upwardly perpendicular to the plane of the traffic route provide a self-contained and continuous barrier, which if necessary can be opened locally by swivelling at least one guide body. In particular the arrangement of the mutually corresponding end
5 faces of the guide body permits the use of the traffic guide barrier also in the case of high necessary containment levels.

The present invention is described in more detail hereinafter with the aid of some exemplary embodiments illustrated schematically in the drawings, in which:

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Fig. 1 shows a traffic guide barrier according to the invention in the closed state in a side view;

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Fig. 2 shows the traffic guide barrier of Fig. 1 in a partially open position in the same representation;

Fig. 3 shows a detailed view of the traffic guide barrier of Fig. 2 in the same representation;

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Fig. 4 shows an alternative to the closed traffic guide barrier of Fig. 1 in a side view;

Fig. 5 shows the traffic guide barrier of Fig. 4 in the open position as an alternative to the traffic guide barrier of Fig. 2 in the same representation;

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Fig. 6 shows the traffic guide barrier of Figs 4 and 5 in a top view;

Fig. 7 shows a cross-section through the traffic guide barrier of Figs 1 and 2;

Fig. 8 shows a cross-section through the traffic guide barrier of Figs 4 to 6;

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Fig. 9 shows a section of the connection between the fixed and the swivellable part of the traffic guide barrier of Figs 4 to 6 in a perspective representation;

Fig. 10 shows the connection of Fig. 9 in a side view;

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- Fig. 11 shows a detail of the connection of Fig. 10 in the same representation;
- Fig. 12 shows an alternative arrangement of the detail of Fig. 11 in the same representation;
- 5 Fig. 13 shows a further detail of the connection of Fig. 10 in the same representation;
- Fig. 14 shows a front view of an element of the traffic guide barrier;
- 10 Fig. 15 shows a top view of a free end of part of the traffic guide barrier;
- Fig. 16 shows a front view of a further element of the traffic guide barrier;
- 15 Fig. 17 shows the element of Fig. 16 in a perspective representation;
- Fig. 18 shows a detail of the bearing of the traffic guide barrier in a perspective representation;
- 20 Fig. 19 shows a variant of the bearing of Fig. 18 as a detailed section in the same representation;
- Fig. 20 shows a section of a vehicle retaining system according to the invention with a traffic guide barrier in a side view;
- 25 Fig. 21 shows an alternative arrangement of a vehicle retaining system according to the invention of Fig. 20 in the same representation;
- Fig. 22 shows the alternative vehicle retaining system of Fig. 21 in a top view;
- 30 Fig. 23 shows the vehicle retaining system of Figs 21 and 22 in a perspective representation;
- Fig. 24 shows a detailed section of the vehicle retaining system of Fig. 23 in a side view;
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Fig. 25 shows a further detailed section of the vehicle retaining system of Fig. 23 in a side view;

5 Fig. 26 shows part of the vehicle retaining system illustrated in Fig. 23 in the open state in the same representation;

Fig. 27 shows the other part of the vehicle retaining system illustrated in Fig. 23 in the open position in the same representation, and

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Fig. 28 shows a detail of the bearing of the traffic guide barrier in the open state of Figs 26 and 27 in a side view.

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Fig. 1 shows a side view of a traffic guide barrier 1 according to the invention. The traffic guide barrier 1 comprises a first guide body A and a second guide body B, which are arranged with their lower sides 2 on the bottom on a base 3, shown in a sectional representation, of a traffic route not illustrated in more detail. Two guide bodies A, B lie with their end faces 4a, 4b opposite one another, wherein a gap 5 located between the end faces 4a, 4b is bridged by a side wall 6a. Since the gap 5 is located behind the side wall 6a it is not directly visible in Fig. 1.

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The mutually corresponding end faces 4a, 4b are aligned in parallel, wherein the first end face 4a and an upper side 7 of the first guide body A lying opposite the lower side 2 enclose an inclination angle c_1 between them of less than 90° . On the other hand also the second end face 4b and the lower side 2 of the second guide body B enclose between them an inclination angle c_2 , which is also less than 90° . In the present case the two end faces 4a, 4b are aligned parallel to one another, so that the two inclination angles c_1 , c_2 of the end faces 4a, 4b are identical. In this embodiment the inclination angle c_1 , c_2 is 15° .

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An end bearing arrangement 8 is provided on the first guide body A, which is arranged on the end 9 of the first guide body A facing away from the first end face 4a. The first guide body A is swivellably mounted at its end 9 about a horizontal rotation axis 10 at the bearing arrangement 8. With reference to the representation

of Fig. 1, the first guide body A of the traffic guide barrier 1 is in a closed position a1.

5 The second guide body B is here a fixed part of the traffic guide barrier 1, which is connected via anchors or anchor cages, not illustrated in more detail, to fixed immovable foundations 11a, 11b, 11c. The foundations 11a, 11b, 11c lie in the plane of the lower side 2 at the same height as the ground 3 and are at the same time integrated in the latter. On the other hand the first guide body A lies not fixed
10 11d to the traffic route, not illustrated in more detail. The foundation 11d of the bearing arrangement 8 is in this connection arranged underneath the ground 3, wherein a recess 12 is formed in the latter in the region of the bearing arrangement 8, within which the bearing arrangement 8 is arranged on the foundation 11d. The bearing arrangement 8 is also connected via anchors or anchor cages, not illustrated
15 in more detail here, to the foundation 11d.

Fig. 2 shows the traffic guide barrier of Fig. 1 in an open position a2. In this case the first guide body A is swivelled about the horizontal rotation axis 10. Accordingly the free end 13 of the first guide body A facing opposite the bearing arrangement
20 8 projects above the ground with its first end face 4a detached from the second end face 4b of the second guide body B. Owing to the swivelling of the first guide body A about the horizontal rotation axis 10 an opening 14 is formed, which for example allows a vehicle on the ground 3 to pass through the traffic guide barrier 1. In the completely open position the guide body A is swivelled vertically upwards and
25 assumes an angle to the horizontal of up to 90° and possibly even more.

As can be seen by referring to the bearing arrangement 8, this has a frame 15, which connects to the first guide body A to the horizontal rotation axis 10. The frame 15 is formed as a rigid corner. The horizontal rotation axis 10 is arranged above the
30 upper side 7 of the first guide body A, and rests on a column 16 of the bearing arrangement 8. The column 16 is fixed vertically on a bottom plate 17 extending parallel to the ground 3, via which the bearing arrangement 8 is connected to the foundation 11d. In order to enable the swivelling of the first guide body A, a manipulator 18 in the form of a cylinder is arranged between the frame 15 and the

bottom plate 17, which by lengthening and shortening its dimensions pivots the frame 15 and thus the first guide body A about the horizontal rotation axis 10.

5 In the representation of Fig. 2 it is furthermore apparent that the side wall 6a is fixed to the first guide body A in the region of its first end face 4a. In principle the construction of the first and second guide body A, B envisages that the lower side 2 runs parallel to the upper side 7.

10 Fig. 3 shows a detailed section of the two free ends 13 of the guide bodies A, B in a slightly open position a2. The schematic representation clarifies the arrangement of a claw 18a on the first guide body A, by making the side wall 6a transparent. The claw 18a extends in this case parallel to the upper side 7 beyond the first end face 4a of the first guide body A. On the other hand the second guide body B has an opening 18b arranged in its upper side 7. The opening 18b is provided so as to
15 accommodate at least in regions the claw 18a in the closed position a1 of the traffic guide barrier 1. Accordingly the claw 18a of the first guide body A in the closed position a1 engages at least in regions in the opening 18b of the second guide body B, in a manner not described in more detail here.

20 Fig. 4 shows an alternative arrangement in the form of a traffic guide barrier 1a, which is based on the traffic guide barrier 1 of Figs 1 and 2. Here the traffic guide barrier 1a has additional guide rails 19, which are arranged on the upper side 7 of the first and second guide body A, B. The guide rails 19 hereby first of all lead to an increase in height of the overall traffic guide barrier 1a, which can be adapted in
25 height according to requirements by the arrangement of the guide rails 19. Thus, if required also two or more guide rails 19 can be arranged above one another on the guide bodies A, B. The coupling of the guide rails 19 is effected by means of tie rods 20, which are guided through the guide rails 19 into the guide bodies A, B. It can readily be seen that the oppositely facing end faces 21a, 21b of the guide rails 19
30 in the region of the gap 5 are matched to the inclination angle c1, c2 of the end faces 4a, 4b of the guide bodies A, B. Following the height increase due to the guide rails 19 the covering of the gap 5 is also adapted via a correspondingly lengthened side wall 6b.

In this variant the guide rails 19 should be regarded as components of the guide bodies A, B. These can consequently include the guide rails 19 by a reference to the guide bodies A, B.

5 In order to create transitions that are as smooth as possible and that serve to guide any impacting vehicle, the traffic guide barrier 1a between the bearing arrangement 8 and the first guide body A swivellably mounted thereon has a shape-adapted transition covering 22. Correspondingly the bearing arrangement 8 is enclosed in the manner of a hood by a likewise shape-adapted covering 23. In this view also
10 those connecting elements are illustrated that couple the bearing arrangement 8 to the foundation 11d, which are arranged in the form of anchors 24 within the foundation 11d and brace the bearing arrangement 8 with the foundation 11d via corresponding openings in the bottom plate 17. Similarly to the guide rails 19 arranged behind one another on the guide bodies A, B, also the guide bodies A, B
15 are formed in the present case from standard elements arranged behind one another and connected to one another in a manner not described in more detail.

Compared to the closed position a1 of the traffic guide barrier 1a illustrated in Fig. 4, Fig. 5 shows its open position a2.

20 Fig. 6 shows the traffic guide barrier 1a of Figs 4 and 5 in a top view. In principle this view corresponds, after omitting the guide rails 19, to the top view of the traffic guide barrier 1 of Fig. 1. In this top view it can be seen that in the region of the gap between the first and second guide body A, B, side walls 6b are arranged on both
25 sides. Accordingly the gap 5 is bridged on both sides by the side walls 6b. In addition to the foundations 11a, 11b, 11c extending transversely to the longitudinal direction of the guide bodies A, B, in the present case also the dimensions of the foundation 11d laid underneath the bearing arrangement 8 are evident. Furthermore the covering 23, which is broader compared to the dimensions of the guide bodies A, B,
30 can be recognised, which is adapted by the transition covering 22 to the dimensions of the first guide body A. Furthermore it can also be seen from the top view that the guide bodies A, B have on a lower side 2 a larger width compared to the dimensions of the guide rails 19.

Also the traffic guide barrier 1a in the present case has a connection between its guide bodies A, B in the form of the claw 18a and the opening 18b corresponding to it. In a schematic representation it is hereby illustrated that the said arrangement of the claw 18a and of the opening 18b can take place in the guide bodies A, B themselves as well as in the guide rails 19 arranged on the latter.

Fig. 7 shows a cross-section through the guide bodies A, B of Figs 1 and 2. The guide bodies A, B have legs 25a, 25b extending from the lower side 2 to the upper side 7, which are connected to the upper side 7 by a web 26. From the upper side 7 to the lower side 2 the legs 25a, 25b have a shape broadening out to the lower side 2, wherein the legs 25a, 25b on the lower side 2 include outwardly directed bent sections 26a, 26b. Due to the bent sections 26a, 26b, which extend substantially parallel to the ground 3, a corresponding width and thus a large floor area is created, which makes a stable placement of the guide bodies A, B possible.

The guide bodies A, B have at least one internally arranged metal connecting sheet 27, which joins together the legs 25a, 25b in the upper third of the guide bodies A, B. Furthermore friction-increasing adjustable feet 28 are arranged on the lower side 2 of the guide bodies A, B, which counteract with a corresponding resistance a possible displacement of the guide body A, B on the ground 3.

Fig. 8 shows the traffic guide barrier 1a of Figs 4 and 5 also in a sectional representation. Based on the guide bodies A, B already illustrated in Fig. 7, this also has guide rails 19 additionally arranged on the upper side 7. The guide rail 19 is connected via the guide rod 20 to the guide bodies A, B. For this purpose an abutment 29 is provided on the metal connecting sheet 27 of the guide body A, B, within which is arranged the tie rod 20. In this connection the tie rod 20 has at its end an outer thread, not shown in more detail, which engages with an inner thread arranged within the abutment 29, and also not illustrated in more detail. Preferably the thread is a coarse thread, in order to provide as rapid a tightening as possible and also to enable the release of the guide rails 19 on the guide bodies A, B.

The end region of the tie rod 20 lying opposite the abutment 29 comprises a rod head, which can be engaged via a corresponding handle. The rod head can for example be a hexagonal head, which can be coupled to a conventional tool, not

shown here in more detail, for example an open-ended spanner or ring spanner, or also a slip-on socket. By means of the rotational movement that can be initiated in the tie rod by means of the tool the guide rail 19 is braced with the guide body A, B or is released from the latter.

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In order to produce as simple and secure a connection as possible between the guide rail 19 and the guide bodies A, B, the web 26 of the guide body A, B is provided with a corresponding branch 26a, which extends in the longitudinal direction of the guide body A, B and can be encompassed by feet 30a, 30b of the guide rail 19. In this way a non-slip placement of the guide rail 19 on the guide body A, B parallel to the ground 3 is made possible.

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Fig. 9 shows a perspective view of the traffic guide barrier 1a in the region of the end faces 4a, 4b of the guide bodies A, B lying opposite the gap 4. In order to clarify the construction the side region otherwise covering the guide bodies A, B, more specifically their legs 25a, 25b, is shown transparent. Furthermore also the transition between the guide rails 19 and the guide bodies A, B, more specifically their upper side 7, is shown largely transparent. In this view it is clear that the guide bodies A, B at their ends are first of all closed by front sides 31a, 31b extending perpendicularly to the longitudinal direction of the guide bodies A, B. Perforated metal connecting sheets 32a, 32b extend between the end faces 4a, 4b of the guide bodies A, B, which join the front faces 31a, 31b to the end faces 4a, 4b and thus jointly form a four-sided closed box profile in each case.

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On the other hand also the guide rails 19 lying opposite the gap 5 have end connecting pieces 33a, 33b, which are formed in the manner of a frame. The likewise inclined end faces 21a, 21b of the guide rails 19 are arranged between the oppositely facing connecting pieces 33a, 33b of the guide rails 19.

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As can be seen, in the present case the claw 18a is arranged in the region of the guide rail 19 of the first guide body A. The same also applies to the opening 18b corresponding to the claw 18a, which is likewise arranged in the guide rail 19 of the second guide body B. This illustration serving for purposes of clarification can obviously also be applied to the arrangement of the claw 18a and the opening 18b directly in the guide bodies A, B with the omission of the guide rails 19.

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The claw 18a is formed from a flat iron bar, which includes a bracket 18c extending in the longitudinal direction of the traffic guide barrier 1a and also an oppositely angled hook section 18d. The angled hook section 18d is in this connection bent with respect to the bracket 18c and the claw 18a, so that in the closed position a1 illustrated here it engages in the opening 18b.

A displaceable latch element 34 is arranged within the guide rail 19 arranged on the first guide body A, which latch element can be displaced at least in regions through the end faces 21a, 21b here lying opposite one another in the closed position a1. The latch element 34 is connected to an electromechanical drive 36 via a connecting frame 35 arranged around the tie rod 20. The latch element 34 can thus be displaced by means of the electromechanical drive 36 in the longitudinal direction of the guide rail 19.

If the guide bodies A, B are provided with guide rails 19 arranged on them, then the said guide rails 19 form parts of the guide bodies A, B in the meaning of the invention. In this connection the end face 21b of a guide rail 19 is also regarded as part of the end face 4b of the second guide body B, so that also the end face 21a of a guide rail is part of the end face 4a of the first guide body A in the meaning of the invention. In this way for example also the displaceable latch element 34 can be arranged in one of the guide bodies A, B, and also, if present, in one of the guide rails 19, so that this within the meaning of the invention can in principle be displaced at least in regions through the end faces 4a, 4b.

Furthermore it can be seen from Fig. 9 that the adjustable feet 28 are connected via a cross member 37 to the first guide body A. On the other hand although the second guide body B does in fact also comprise a cross member 37, this is however not connected to the adjustable feet 28, since the second guide body B is in any case stationary and is thereby fixed via the foundations, not illustrated here.

Fig. 10 shows the connection, already illustrated in Fig. 9, of the traffic guide barrier 1a in the region of the guide bodies A, B lying opposite its ends faces 4a, 4b as a section in a side view. In this case it is clear that the guide bodies A, B can have additional coupling means 38 that can be brought into engagement. The coupling

means 38 are implemented in the region of the lower side 2 on the end faces 4a, 4b. One of the coupling means 38 includes a clip 39 arranged on the first end face 4a, while the other coupling means 38 has an insertion pocket 40 arranged on the second end face 4b. The clip 39 is aligned at right angles with respect to the upper side 7 of the first and second guide body A, B. In the closed position a1 illustrated here the clip 39 and the insertion pocket 40 are brought into engagement with one another.

As can be seen, the claw 18a has an opening 18e in its angled hook section 18d. This configuration is necessary if the claw 18a and the latch element 34 at least in some regions are arranged in a position where they touch one another. The opening 18e of the hook section 18d serves in this case to receive the latch element 34 in its displaced position. In this way an additional security between the two guide bodies A, B is ensured, in which the first guide body A is locked by the latch element 34 to the second end face 4b and/or to the end face 21b, and also to the angled hook section 18d.

Fig. 11 clarifies the construction of the coupling means 38 in the form of a section of Fig. 10. The insertion pocket 40 is formed by a splice plate 41, which is connected via a bottom web 42 to the second end face 4b. Whereas the bottom web 42 extends parallel to the ground 3, more specifically to the lower side 2 of the guide bodies A, B, the splice plate 41 is aligned at right angles with respect to the upper side 7 and also the lower side 2. In principle the clip 39 and the splice plate 41 can also be inclined in a range from 0.1° to 5° with respect to the upper side 7 of the guide bodies A, B, in order to facilitate their mutual engagement. As illustrated, in the present case the clip 39 forms a one-piece component of the first end face 4a.

The arrangement of a coupling plate 42a already follows from Fig. 10. The coupling plate 42a is arranged on the second guide body B, more specifically in the region of its lower side 2. In this connection the coupling plate 42a projects beyond its second end face 4b, where in the closed position a1 it at least partially grips the first guide body A underneath.

With regard to Fig. 11 it is clear that the coupling plate 42a in the form of an extension of the bottom web 42 can be arranged in the region of the insertion pocket

40. Here this comprises a bent part, from which the second end face 4b and the bottom web 42 and also the splice plate 41 are formed. In the present embodiment the coupling plate 42a is connected cohesively to the insertion pocket 40. In a manner not illustrated in more detail the coupling plate 42a can obviously also be
5 connected to other regions of the insertion pocket 40. Thus, the insertion pocket 40 can for example at least in some regions lie on the coupling plate 42a.

An alternative implementation of the coupling plate 42a can be seen in Fig. 12, which here is a one-piece, materially integral part of the bottom web 42. In other
10 words, in this case the second end face 4b and the coupling plate 42a are formed from a common bent part, while the bottom web 42 is formed by a region of the coupling plate 42a. The bottom web 42 is thereby bounded by the splice plate 41, which here is arranged perpendicular to the coupling plate 42a. The connection of the splice plate 41 and the coupling plate 42a is preferably a cohesive connection.

15 A further detail of Fig. 10 is shown in Fig. 13, which illustrates the free end region of the coupling plate 42a. In this view it is clear that the coupling plate 42a includes at least one reception opening 42b. On the other hand the first guide body A illustrated in a slightly raised position has on its lower side 2 at least one foot 42c.
20 The reception opening 42b and the foot 42c are formed so that these co-operate with one another. In this way the foot 42c and the reception opening 42b in the closed position a1 of the traffic guide barrier 1, 1a can be brought into engagement at least in some regions. In the present case the foot 42c is connected via a web 42d to the first guide body A. The web 42d thus extends in a manner not illustrated
25 in more detail transverse to the longitudinal direction of the traffic guide barrier 1, 1a.

Fig. 14 shows a view of the second guide body B looking at its second end face 4b. As can be seen, the splice plate 41 located in front of the end face 4b matches in
30 shape the configuration of the legs 25a, 25b and also the bent sections 26a, 26b. In addition further coupling means 38 can be seen, which are arranged in the form of recesses 43 in the bottom web 42. Furthermore the splice plate 41 is spaced via two indicated vertical webs 44 from the second end face 4b. In other words, the vertical webs 44 illustrated in Fig. 11 lie between the splice plate 41 and the second
35 end face 4b, and the recognisability of the recesses 43 and the vertical webs 44 is

in this case attributed to the fact that the splice plate 41 is shown transparent for the sake of clarification.

Fig. 15 shows a top view of the second guide body B. In this view the vertical webs 44 are again evident, by means of which the splice plate 41 is spaced from the second end face 4b. In addition the coupling plate 42a can be recognised as a lower-side extension of the second guide body B. This view also allows the reception opening 42b, in the present case two such openings, arranged in the coupling plate 42a to be seen. As can be recognised, the reception openings 42b are of rectangular shape, the reception openings 42b being rounded off in their end regions.

Fig. 16 shows a view of the first end face 4a of the first guide body A. Here it is evident that the clip 39 is formed by two slits from the first end face 4a that are spaced apart and run parallel to one another. In addition the first end face 4b comprises pin-like projections 46 arranged in the region of the bent sections 26a, 26b, which extend to the lower side 2 of the first guide body A. The projections 46 correspond to the recesses 43 illustrated in Figs 14 and 15, wherein the projections 46 and the recesses 43 are provided so that they can engage with one another at least in some regions in the closed position a1 of the traffic guide barrier 1, 1a.

Fig. 17 shows the first end face 4b already illustrated in Fig. 16 in a perspective representation. It can readily be seen that the first end face 4b is bent with respect to the bent sections 26a, 26b and the clip 39. In the closed position a1 of the traffic guide barrier 1, 1a the vertical webs 11 illustrated in Fig. 11 come into engagement with the slits 45 of the first end face 4a, in order to reinforce the coupling between the guide bodies A, B.

Fig. 18 shows the bearing arrangement 8 already illustrated in Figs 1 and 2 in a section in a perspective view. In order to further clarify the construction of the bearing arrangement 8, its covering 23 projecting from Figs 4 and 5 is removed, although the detachable transition covering 22 is still visible. The guide body A extends to an adapter unit 50 on the swivel bearing side. The bottom plate 17 has a limiter 47, which is arranged in the form of a flag-shaped metal sheet on the bottom plate 17, and from there extends over its edge in the direction of the transition covering 22.

The limiter 47 serves to laterally support the swivellable guide body A in the closed position a1. This is achieved in that the limiter 47 is arranged at least on one side of the frame 15, which is connected to the first guide body A. Preferably the limiter
5 47 is arranged on both sides of the frame 15 on the bottom plate 17 in the plane of the lower side 2 of the base bodies A, B, so that a lateral support is provided on both sides. The lateral support is accordingly lifted at the moment the first guide body A is swivelled from its closed position 1a to the open position a2. The frame 15 fixed to the column 16 thus swivels about the horizontal rotation axis 10 and is
10 thereby released from the lateral embrace by the limiter 47.

A variant of the traffic guide barrier 1, 1a in the region of its bearing arrangement 8 can be seen in Fig. 19. For this, the first guide body A has a transverse metal sheet 47a, which is arranged in the interior of the first guide body A between its
15 legs 25a, 25b. The transverse metal sheet 47a extends in this case transversely to the longitudinal direction of the first guide body A.

As can be seen, the transverse metal sheet 47a has cut-out sections 47b directed towards the lower side 2 of the first guide body A. The cut-out sections 47b begin
20 at an edge region of the transverse metal sheet 47a directed towards the lower side 2 and extend upwards to a limited extent. In the present case two such cut-out sections 47b are arranged spaced apart from one another in the transverse metal sheet 47a.

On the other hand limiters 47c corresponding to the cut-out sections 47b are fixed to the bottom plate 17 of the bearing arrangement 8. The limiters 47c are formed as flag-shaped metal sheets, which stand on the bottom plate 17 and extend into the first guide body A. Preferably the limiters 47a are connected cohesively to the bottom plate 17, for example by means of welding. In the illustration of Fig. 19 it
25 can be seen that the limiters 47c and the cut-out sections 47b of the transverse metal sheet 47a engage with one another provided that the first guide body A is in the closed position a1. Accordingly the limiters 47c are at least laterally encompassed in some regions, in a manner not illustrated in more detail, in the closed position a1 by the cut-out sections 47b.
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As can be seen, in the first guide body A there are present two transverse metal sheets 47a arranged parallel behind one another, wherein the bottom plate 17 also comprises two rows of limiters 47c arranged behind one another. Accordingly in the present case a total of four limiters 47c are available, which in the closed position a1 of the traffic guide barrier 1, 1a come into engagement, at least in some regions, with the cut-out sections 47b in the transverse metal sheets 47a. In this way any transverse loads acting on the first guide body A in the region of the bearing arrangement 8 are absorbed via the horizontal rotation axis 10 in the region of the upper side and also via the limiters 47c in combination with the cut-out sections 47b of the transverse metal sheets 47a in the region of the lower side 2. In this way any torsion of the first guide body A about its longitudinal axis in the event of an impact is effectively prevented.

Fig. 20 shows a side view of a vehicle retaining system 48 according to the invention, which comprises guide barriers 49 detachably connected to one another and a traffic guide barrier 1a according to Figs 3 and 4. The guide bodies A, B, correspond in their cross-section according to Figs 6 and 7 to the cross-section, configured similarly to Fig. 6, of the guide barriers 49. Furthermore the guide barriers also have coupling means, not illustrated in more detail, which make possible a reliable connection to one another and to the traffic guide barrier 1a. In addition the vehicle retaining system 48 also has guide rails 19 arranged on the guide barriers 49, which are likewise identical in their cross-section and are thus implemented similarly to the representation shown in Fig. 7. As can be seen, the traffic guide barrier 1a according to the invention makes possible a seamless integration in a string of guide barriers 49 and also guide rails 19, so that for example already existing systems can be augmented without any problem by such a traffic guide barrier 1a.

In practice the traffic guide barrier 1, 1a according to the invention is thus integrated in a string of guide barriers 49 and guide rails 19 to form a vehicle retaining system 48. In the closed position a1 of the first guide body A the latch element is displaced by means of the electromechanical drive 36 through the oppositely facing end faces 21a, 21b as an extension of the end faces 4a, 4b of the guide bodies A, B, in order to fix these to one another. Depending on the configuration, in this case the claw 18a too is locked by the displaceable catch element 34, in which the catch element

is also guided through the opening 18e in the hook section 18d of the claw 18a. If necessary the displaceable latch element 34 is now retracted with the aid of the electromechanical drive 36 from this position, so that it becomes possible to swivel the first guide body A. For this the manipulator 18 is activated, which as a result of its subsequent extension lifts the frame 15 with respect to the bottom plate 17 and swivels the thereby connected guide body A together with the possibly installed guide rails 19 about the horizontal rotation axis 10 of the bearing arrangement 8 to the open position a2.

In particular in the closed position a1 of the traffic guide barrier 1, 1a the coupling means 38 in combination with the claw 18a and the limiters 47, 47c and also the coupling plate 42a serve to provide a perfectly stable connection between the oppositely lying guide bodies A, B. In addition to the clip 39 that is thereby engaged in the insertion pocket 40, the pin-like projections 46 in particular lie within the recesses 43, while the hook section 18d of the claw 18a engages in the corresponding opening 18b. In this way an almost rigid connection is produced between the end faces 4a, 4b, which is reinforced by the side walls 6a, 6b. Apart from their guiding function, the side walls 6a, 6b serve in particular to transfer any possible transverse loading of the first guide body A, for example due to the impact of a vehicle, over a relatively large area directly to the second guide body B fixed to the ground 3.

Particularly advantageous in this connection is the shape of the guide bodies A, B in combination with the guide rails 19 mounted if necessary, since these can be constructed largely in the form of a modular system. Thus, the guide bodies A, B can be constructed from already existing guide barriers 49, which need to be adapted simply in the region of the gap 5, as can be seen in particular from Fig. 8.

Obviously the end faces 4a, 4b, 21a, 21b of the guide bodies A, B and guide rails 19 separated from one another in the present case can be formed in one piece. Furthermore also the latch element 34 as well as the electromechanical drive 36 coupled thereto via the connecting frame 35 can be arranged in or on one of the guide bodies A, B.

Within the context of the invention it is proposed that the second guide body B of the traffic guide barrier 1, 1b can also swivel. Accordingly the second guide body B can also be swivellably arranged on a bearing arrangement 8, whereby despite in each case small dimensions of the two guide bodies A, B an opening 14 of large width can be realised.

Fig. 21 shows such an alternative arrangement of a double-section traffic guide barrier 1b of a further vehicle retaining system 48a. As is already known from Fig. 20, the vehicle retaining system 48a illustrated in Fig. 21 comprises the first guide barrier A and the second guide barrier B, which are in each case swivellably mounted via bearing arrangements 8a on their ends 9 facing opposite the gap 5. As can be seen, the alternative vehicle retaining system 48a is also composed of guide barriers 49 and the first guide body A and the second guide body B, on which respectively individual guide rails 19 are arranged and are connected to the latter via tie rods 20.

As already shown in Figs 7 to 10, the two guide bodies A, B in the presently closed state are supported on the ground 3 by their adjustable feet 28. On the other hand the guide barriers 49 adjoining the guide bodies A, B in their longitudinal direction are detachably connected via bolts 24a to the ground 3. A guide rail 19 mounted on the first guide body A has in the region of the gap 5 a maintenance flap 51, via which the electromechanical drive 36 illustrated in Figs 9 and 10 can be accessed if necessary. Additional side walls 6c are arranged in the region of the end-side bearing arrangements 8a of the traffic guide barrier 1b, which like the side walls 6a, 6b in the region of the gap 5 between the two guide bodies A, B also serve to bridge the gap between the guide barriers 49 and the first guide body A and also the second guide body B.

Fig. 22 shows the vehicle retaining system 48a of Fig. 21 in a top view. In this top view it can be seen that the guide barriers 49 have like the two guide bodies A, B lateral bent sections 26a, 26b, as is shown with reference to the two guide bodies A, B in Figs 7 and 8 and also Figs. 14 to 16. Those bolts 24a connecting the guide barriers 49 to the ground 3 are in this connection passed respectively on both sides of the guide barriers 49 through their lateral bent sections 26a, 26b.

Fig. 23 shows the vehicle retaining system 48a of Figs 21 and 22 in a perspective view of its closed position a1. In order to clarify the construction of the end-side bearing arrangements 8a of the two guide bodies A, B and also their configuration in the region of the gap 5, the two guide bodies A, B and also the guide rails 19 are shown transparent in some regions in the form of sections. The interior of the vehicle retaining system 48a is thereby revealed. Their respective contents are the subject of the following figures 24 and 25.

Fig. 24 shows a section of the left-hand bearing arrangement 8a in a partially transparent representation, with reference to the illustrations of Fig. 23. As already explained with regard to Figs 1 and 2 and also Fig. 18 of the traffic guide barriers 1, 1a according to the invention, here too the illustrated bearing arrangement 8a of the alternative traffic guide barrier 1b has a horizontal rotation axis 10, about which the second guide body B can vertically swivel. The construction illustrated here applies correspondingly also to the bearing arrangement 8a of the first guide body A shown in Fig. 23. As can be seen, a column 16 bearing the horizontal rotation axis 10 is also present, while the second guide body B is connected to a rotation element 52. The horizontal rotation axis 10, which is supported on the column 16, passes through the said rotation element 52. The connection between the rotation element 52 and the second guide body B is in this case implemented so that a rotation of the rotation element 52 about the horizontal rotation axis 10 produces the vertical swivelling of the second guide body B about the horizontal rotation axis 10. In other words, the rotation element 52 and the second guide body B are for this purpose rigidly connected to one another.

As can be seen from looking at the guide barrier 49 of Fig. 24, this also has at least one maintenance flap 51a, which can be opened as necessary, for example via releasable connecting means. A connection, not illustrated in more detail here, between the rotation element 52 and a suitable drive can be located behind this maintenance flap 51a, the articulated connection of the drive being accessible in this way by opening the maintenance flap 51a for any maintenance or service work.

A section of the combination of the closed traffic guide barrier 1b in the region of the oppositely facing guide bodies A, B with their end faces 4a, 4b can be seen in Fig. 25. Owing to the partially transparent representation it is possible to see the

interior, in this connection with reference to the comments previously made at this point in relation to Fig. 10.

5 In addition a metal side sheet 53 matching the side wall 6a can be seen, which in the present case is arranged on the second guide body B. The metal side sheet 53 is arranged flat on the lateral branch 25b of the second guide body B. Preferably the metal side sheet 53 is cohesively connected, at least in some regions, to the lateral branch 25b, for example by a weld seam. The metal side sheet 53, whose thickness perpendicular to the surface of the side leg 25b is adapted to the side wall
10 6a, is provided in order to protect the side wall 6a against any possible bending in the event of an impact. For this purpose the side wall 6a and also the metal side sheet 53 lie with their outer faces parallel to the leg 25b at least approximately at the same height. In this way a possible penetration by areas of a vehicle colliding with the vehicle retaining system 48a is effectively prevented, especially in the case
15 of an impact at a flat angle on the traffic guide barrier 1b.

Figs 26 and 27 show the vehicle retaining system 48a closed in Fig. 23 with open traffic guide barriers 1b. In the present open position a2 first of all the first guide body A was swivelled, followed by the second guide body B. In order to return to
20 the closed position illustrated in Fig. 23, this procedure is carried out in the reverse order, wherein first of all the second guide body followed by the first guide body A are swivelled back to the ground 3. This sequence is necessary on account of the arrangement of the side walls 6a, 6b, which in the closed position a1 enclose at least in regions the second guide body B in the region of its end face 4b and also in
25 the present case in the region of the end face 21b of the guide rail 19 arranged on the second guide body B.

Furthermore this sequence is necessary in order first of all to make it possible to place the coupling plate 42a of the second guide body B, engaging the first guide
30 body A underneath in some regions in the closed position a1, on the ground 3.

Looking at Fig. 26, this again allows a view of the lower side 2 of the second guide body B, which shows the cross members 37 already illustrated in Figs 9 and 10 with their adjustable feet 28 arranged thereon. As can be seen, the cross members 37
35 extend transversely to the longitudinal direction of the second guide body B. The

said cross members 37 together with the adjustable feet 28 arranged thereon are present, in a manner not illustrated in more detail, also on the first guide body A on its lower side 2 visible in Fig. 27.

5 Whereas the adjustable feet 28 allow a placement on and lifting of the two guide bodies A, B from the ground 3, the guide barriers 49 extending from the traffic guide barrier 1b away from the two bearing arrangements 8a are firmly connected to the ground 3 by the bolts 24a.

10 The bottom plate 17 shown in Fig. 19 with the limiters 47c arranged thereon can again be recognised in Fig. 26 and also in Fig. 27.

Fig. 28 shows a view of the bearing arrangements 8a of Figs 26 and 27. On account of the structurally equivalent bearing arrangement 8a arranged on the first guide
15 body A in Fig. 27 and also on the second guide body B in Fig. 26, the bearing arrangement 8a illustrated in Fig. 28 shows its respective construction also in a partially transparent representation.

As is already apparent in Fig. 24, here the respective guide body A, B is coupled to
20 the rotation element 52. In this view it is clear that the rotation element 52 has a bracket in the form of a lever arm 54, which extends away from the horizontal rotation axis 10. The lever arm 54 and the longitudinal direction of the respective guide body A, B then enclose an angle c_3 between them, which is less than 90° .

25 In the present case the angle c_3 is executed with an inclination of 45° . On an end region of the lever arm 54 opposite the horizontal rotation axis 10 this comprises an engagement point 55 for a drive, not illustrated here in more detail. The said drive is preferably a linear drive, which is coupled via the engagement point 55 to the lever arm 54, wherein by a limited rotation of the lever arm 54 about the
30 horizontal rotation axis 10 the respective guide body A, B is likewise swivelled about the horizontal rotation axis 10. The said drive, which is not illustrated in more detail, is then preferably accessible via the maintenance flaps 51a.

As a result a modular and lightweight traffic guide barrier 1, 1a, 1b is illustrated as part of a vehicle retaining system 48, 48a, which especially in its connecting region provides a sufficient coupling so that it can be used also for high containment levels.

List of reference numerals:

- 1 - Traffic guide barrier
- 1a - Traffic guide barrier
- 5 1b - Traffic guide barrier, double section
- 2 - Lower side
- 3 - Ground
- 4a - End face of A
- 4b - End face of B
- 10 5 - Gap
- 6a - Side wall
- 6b - Side wall
- 6c - Side wall
- 7 - Upper side
- 15 8 - Bearing arrangement
- 8a - Bearing arrangement
- 9 - End
- 10 - Horizontal rotation axis
- 11a - Foundation
- 20 11b - Foundation
- 11c - Foundation
- 11d - Foundation
- 12 - Recess
- 13 - Free end
- 25 14 - Opening
- 15 - Frame
- 16 - Column
- 17 - Bottom plate
- 18 - Manipulator
- 30 18a - Claw
- 18b - Opening
- 18c - Bracket of 18a
- 18d - Hook section of 18a
- 18e - Opening in 18d
- 35 19 - Guide rail

- 20 - Tie rod
- 21a - End face of 19
- 21b - End face of 19
- 22 - Transition covering
- 5 23 - Covering
- 24 - Anchor
- 24a - Bolt
- 25a - Leg
- 25b - Leg
- 10 26 - Web
- 26a - Branch
- 26b - Branch
- 27 - Metal connecting plate
- 28 - Adjustable foot
- 15 29 - Abutment
- 30a - Foot
- 30b - Foot
- 31a - Front side
- 31b - Front side
- 20 32a - Metal connecting plate
- 32b - Metal connecting plate
- 33a - Connecting piece
- 33a - Connecting piece
- 34 - Latch element
- 25 35 - Connecting frame
- 36 - Electromechanical drive
- 37 - Cross member
- 38 - Coupling means
- 39 - Clip
- 30 40 - Insertion pocket
- 41 - Splice plate
- 42 - Bottom web
- 42a - Coupling plate
- 42b - Reception opening
- 35 42c - Foot

- 42d - Web
- 43 - Recess
- 44 - Vertical web
- 45 - Slit
- 5 46 - Projection
- 47 - Limiter
- 47a - Transverse metal sheet
- 47b - Cut-out section
- 47c - Limiter
- 10 48 - Vehicle retaining system
- 48a - Vehicle retaining system
- 49 - Guide barrier
- 50 - Adapter unit
- 51 - Maintenance flap
- 15 51a - Maintenance flap
- 52 - Rotation element
- 53 - Metal side sheet
- 54 - Lever arm
- 55 - Engagement point
- 20
- A - First guide body
- a1 - Closed position
- a2 - Open position
- B - Second guide body
- 25 c1 - Inclination angle
- c2 - Inclination angle
- c3 - Angle

Patentkrav

1. Trafikstyringsbarriere til integrering i et køretøjstilbageholdelsessystem (48, 48a) på en trafikrute, omfattende et første styringslegeme (A) med en første endeflade (4a), og et andet styringslegeme (B) med en anden endeflade (4b) der
5 passer til den første endeflade (4a), hvor styringslegemerne (A, B) har et sammenkoblingsorgan (38) der kan sættes i forbindelse med hinanden, hvoraf et af sammenkoblingsorganerne (38) omfatter en klip (39) indrettet på den første endeflade (4a) og et stift-lignende fremspring (46), og det andet sammenkoblingsorgan (38) har en indsættelseslomme (40) indrettet på den
10 anden endeflade (4b) og med en nederste bro (42), hvor den nederste bro (42) har indsnit (43) og, i en lukket position (a1), kan klippen (39) sættes i forbindelse med indsættelseslommen (40) og fremspringene (46) kan sættes i forbindelse med indsnittene (43), i det mindste i områder med hinanden, hvor, på mindst det første styringslegeme (A) eller det andet styringslegeme (B), tilvejebringes en
15 slutlejeindretning (8, 8a) der vender væk fra dens første eller anden endeflade (4a, 4b), hvorpå styringslegemet (A, B) monteres omkring en horisontal rotationsakse (10) og kan vippes vertikalt fra den lukkede position (a1) til en åben position (a2), hvor et mellemrum (5) der ligger mellem de to endeflader (4a, 4b) i den lukkede position (a1) forbindes i det mindste i områder via mindst en
20 sideflange (6a, 6b) der er indrettet på det første styringslegeme (A) eller på det andet styringslegeme (B), **kendetegnet ved at** det første styringslegeme (A) har en klo (18a) og det andet styringslegeme (B) har en åbning (18b) indrettet på dets overside (7), hvor kloen (18a) af det første styringslegeme (A) griber ind i mindst områder i åbningen (18b) af det andet styringslegeme (B) i den lukkede
25 position (a1).

2. Trafikstyringsbarriere ifølge krav 1, **kendetegnet ved at** det andet styringslegeme (B) har en sammenkoblingsplade (42a) indrettet på undersiden (2) og som rager ud over dens anden endeflade (4b), der mindst delvist griber ind
30 i det første styringslegeme (A) i den lukkede position (a1), hvor sammenkoblingspladen (42a) omfatter modtagelsesåbninger (42b) og det første styringslegeme (A) har fødder (42c) indrettet på undersiden, der kan bringes i forbindelse i det mindste i områder med modtagelsesåbningerne (42b) i den

lukkede position (a1).

3. Trafikstyringsbarriere ifølge krav 2, **kendetegnet ved at** fødderne (42c) og/eller modtagelsesåbningerne (42b) er udformet polygonalt.

5

4. Trafikstyringsbarriere ifølge et hvilket som helst af kravene 1 til 3, **kendetegnet ved at** indsættelseslommen (40) er dannet af et frontalt anslagspanel (41) der er adskilt fra den anden endeflade (4b) ved hjælp af to vertikale broer (44), hvor anslagspanelet (41) er orienteret vinkelret i forhold til
10 oversiden (7) på det andet styringslegeme (B).

5. Trafikstyringsbarriere ifølge et hvilket som helst af kravene 2 til 4, **kendetegnet ved at** den nederste bro (42) er en i det væsentlige integreret ensartet komponent af sammenkoblingspladen (42a).

15

6. Trafikstyringsbarriere ifølge et hvilket som helst af kravene 1 til 5, **kendetegnet ved at** et forskydeligt aflåsningselement (34) er indrettet i eller på styringslegemet (A), hvilket element kan flyttes mindst i afsnit gennem endefladerne (4a, 4b) der ligger modsat hinanden i den lukkede position (a1),
20 således at styringslegemerne (A, B) kan fastgøres til hinanden ved hjælp af aflåsningselementet (34).

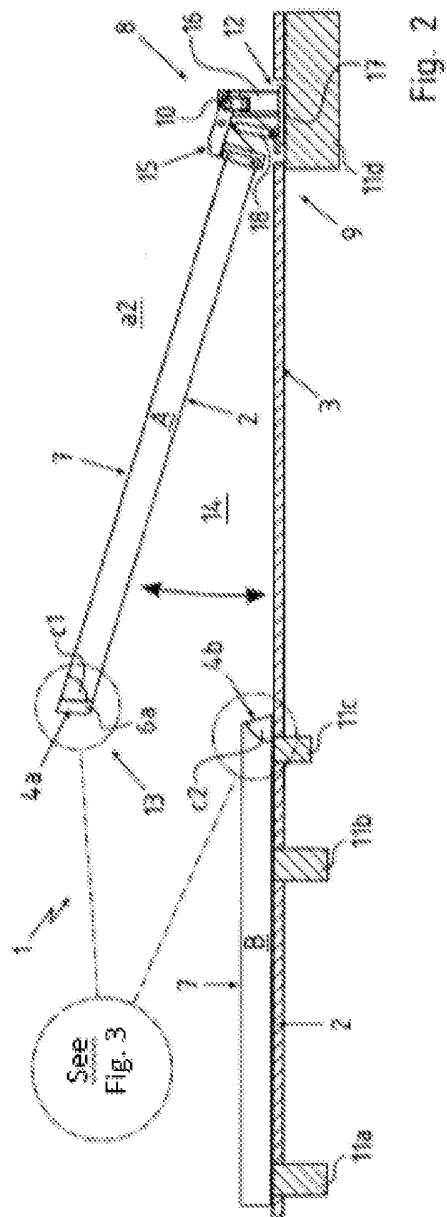
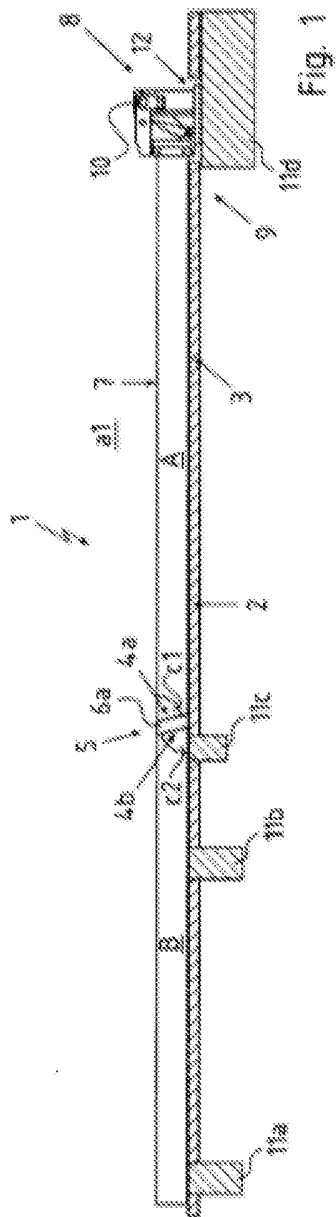
7. Trafikstyringsbarriere ifølge et hvilket som helst af kravene 1 til 6, **kendetegnet ved at** den første endeflade (4a) og en overside (7) af det første
25 styringslegeme (A), og den anden endeflade (4b) og undersiden (2) af det andet styringslegeme (B), respektivt danner en hældningsvinkel (c1, c2) på mindre end 90° mellem dem.

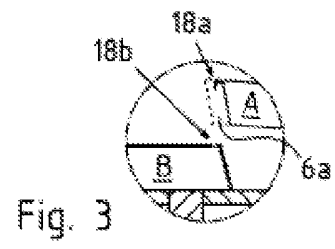
8. Trafikstyringsbarriere ifølge et hvilket som helst af kravene 1 til 7, **kendetegnet ved at** lejearrangementet (8, 8a) har en underplade (17) med
30 mindst en begrænser (47, 47c), idet styringslegemet (A) er sidelæns støtteligt af begrænseren (47, 47c) i den lukkede position (a1).

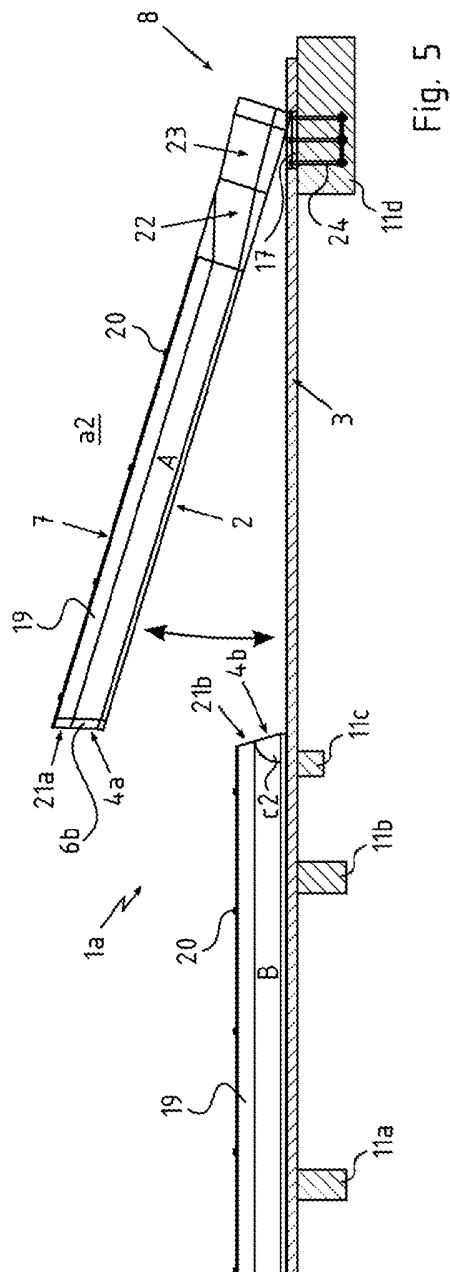
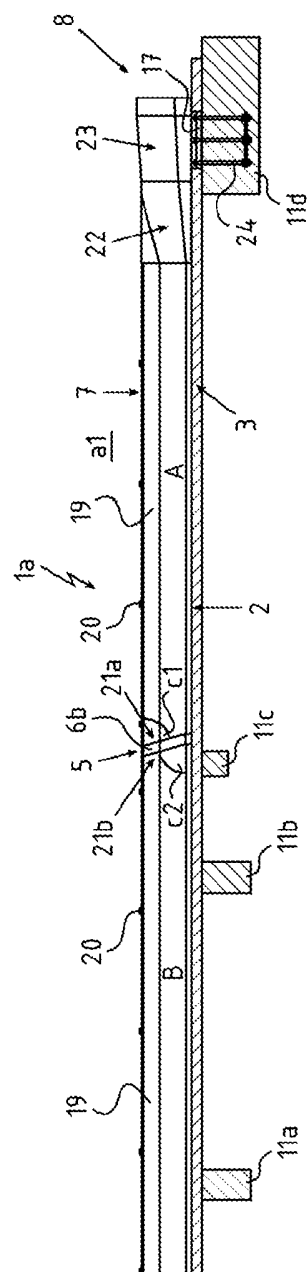
9. Trafikstyringsbarriere ifølge krav 8, **kendetegnet ved at** det første
35 styringslegeme (A) og/eller det andet styringslegeme (B) har et tværgående panel

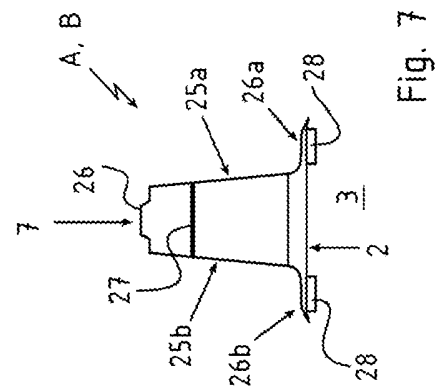
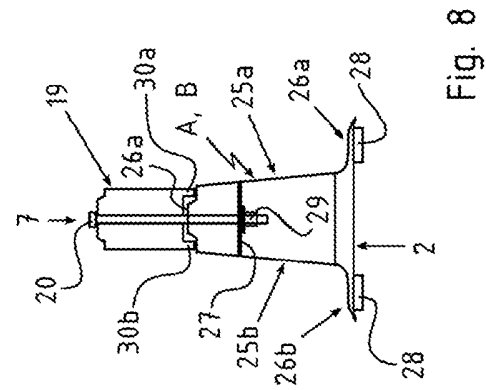
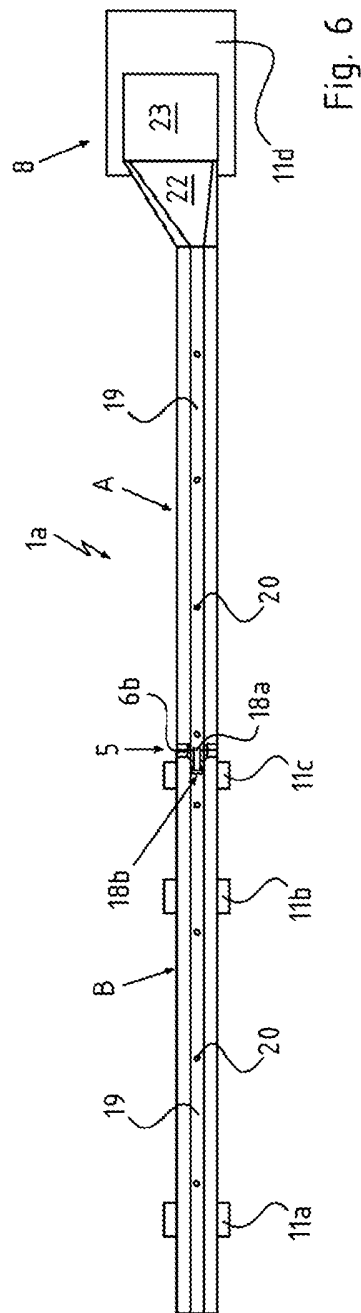
(47a) der har mindst et indsnit (47b) der passer til begrænseren (47c), hvor indsnittet (47b) lukker rundt om begrænseren (47c) i det mindste i områder i den lukkede position (a1).

- 5 **10.** Køretøjstilbageholdelsessystem (48, 48a) til en trafikrute, der har trafikstyringer (49) aftageligt placeret på hinanden og en trafikstyringsbarriere (1, 1a, 1b) ifølge et hvilket som helst af de foregående krav 1 til 9.









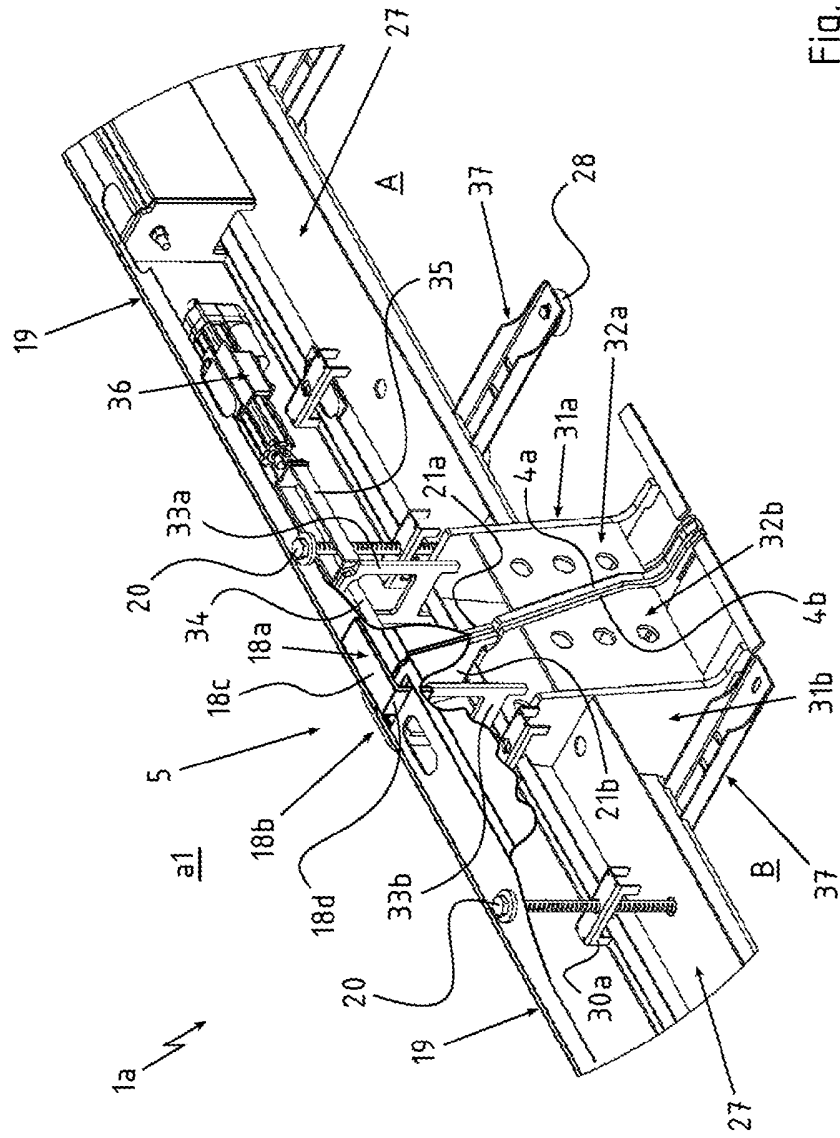
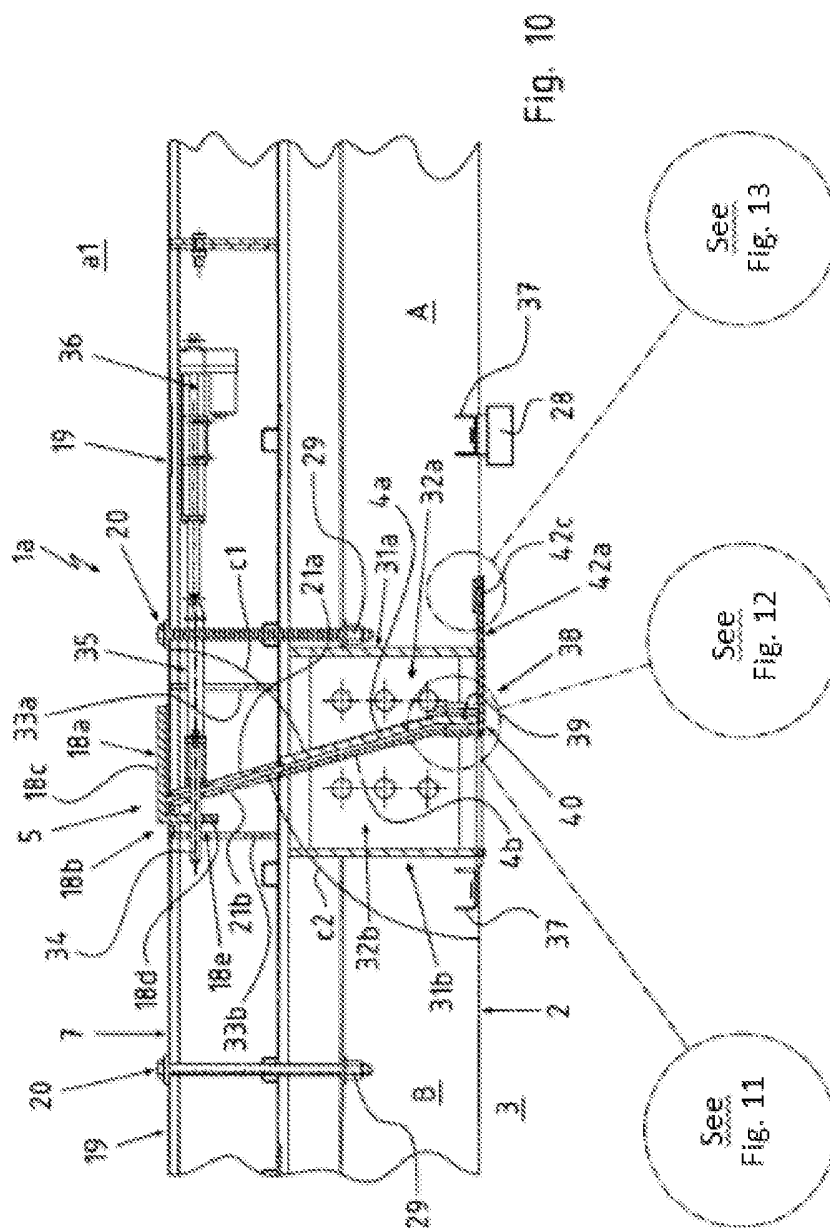
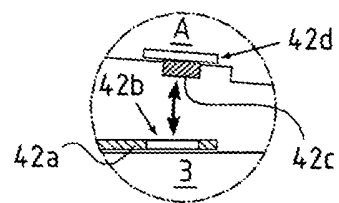
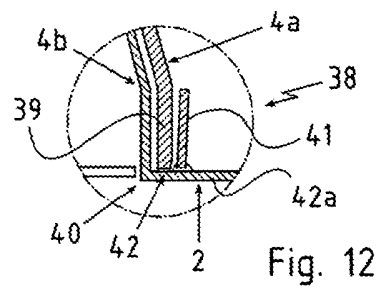
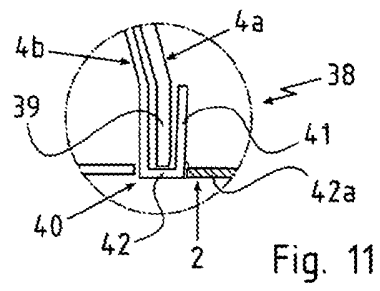


Fig. 9





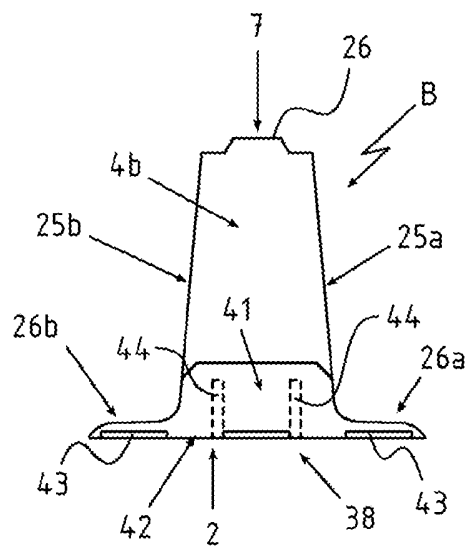


Fig. 14

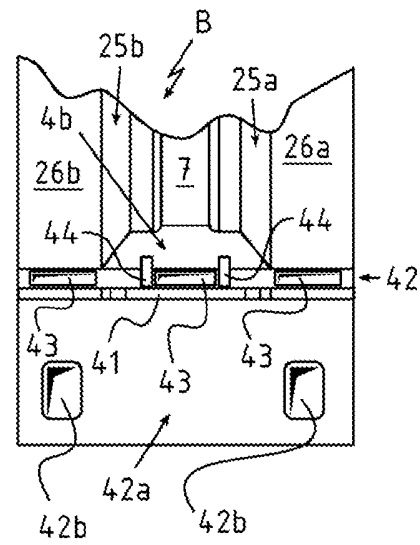


Fig. 15

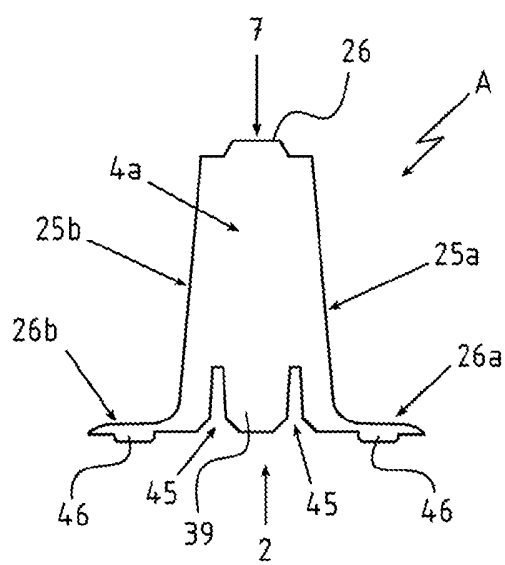


Fig. 16

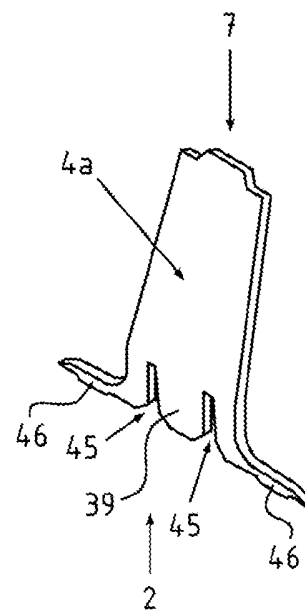


Fig. 17

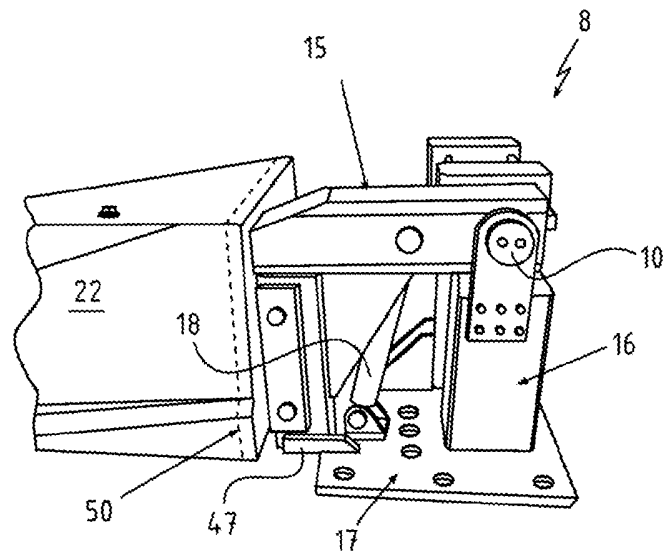


Fig. 18

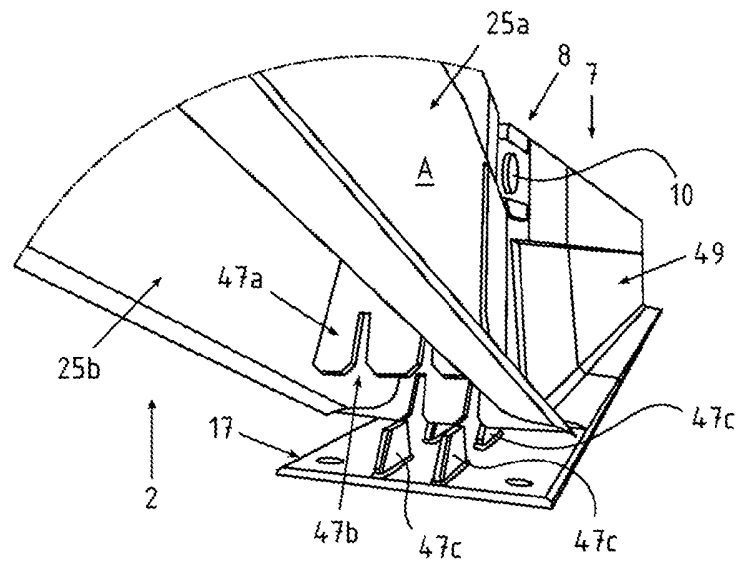


Fig. 19

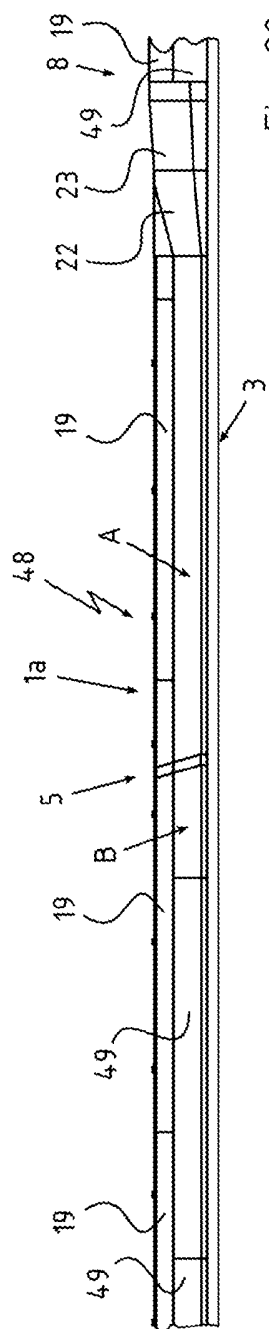


Fig. 20

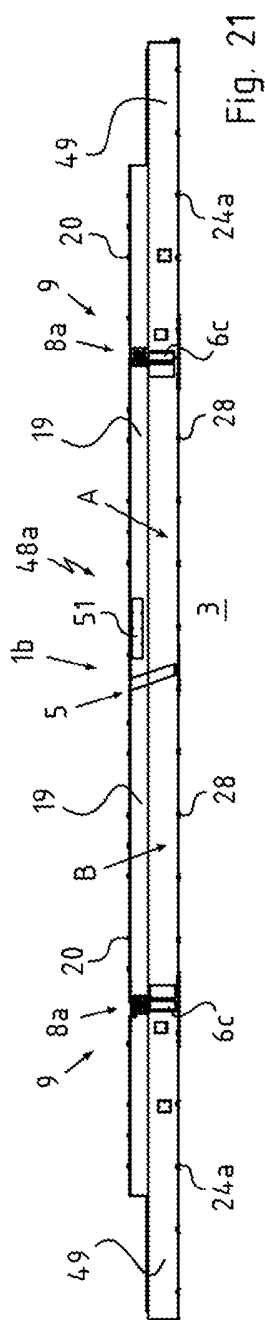


Fig. 21

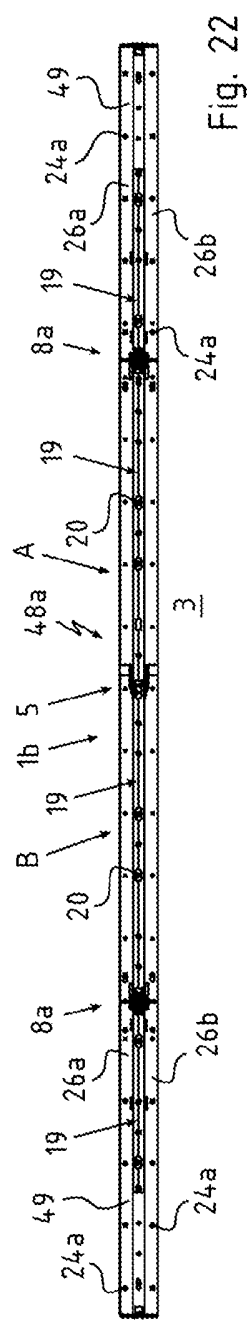


Fig. 22

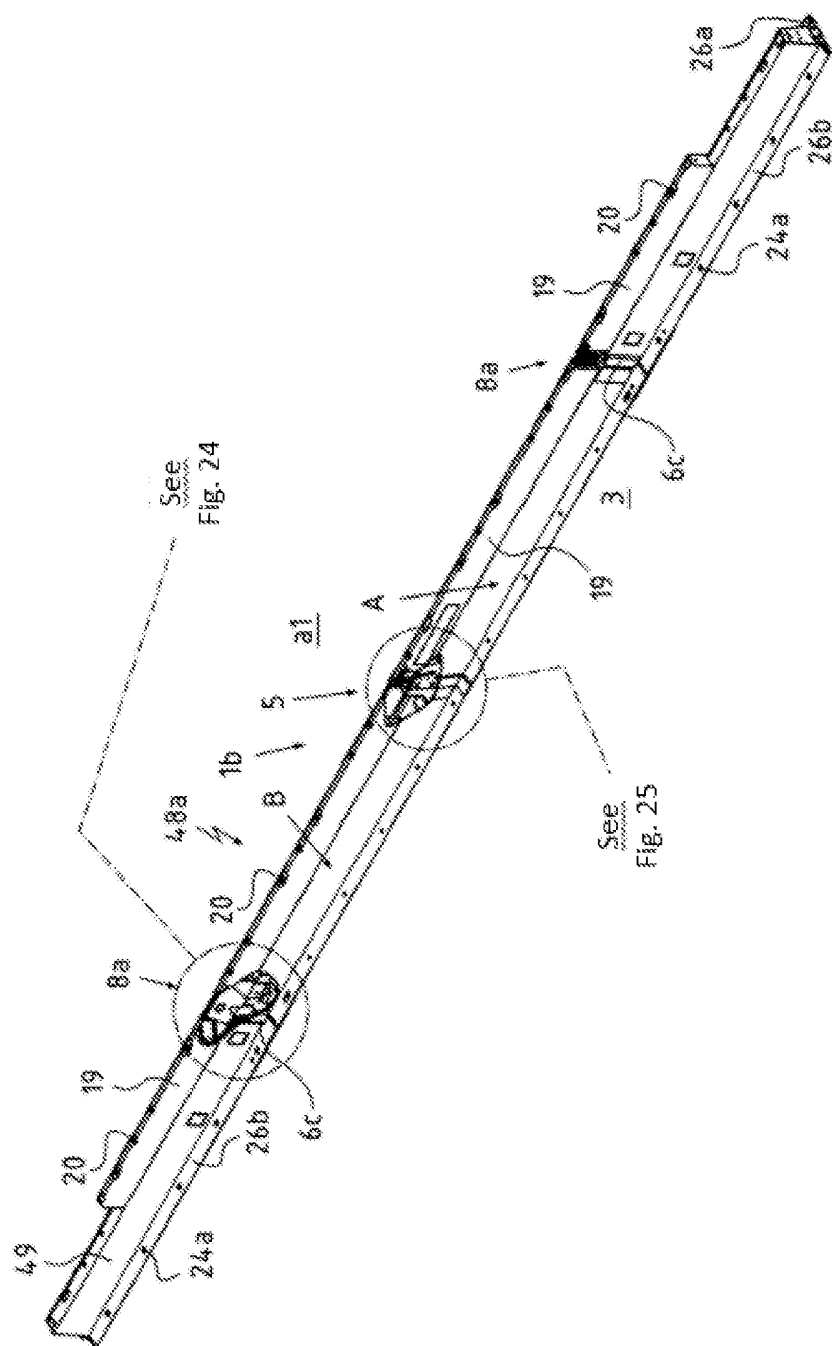


Fig. 23

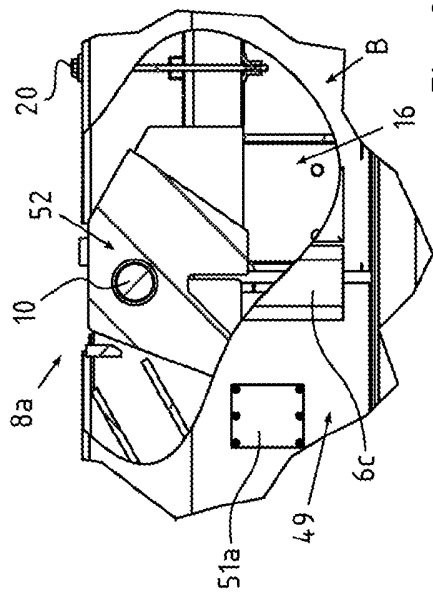


Fig. 24

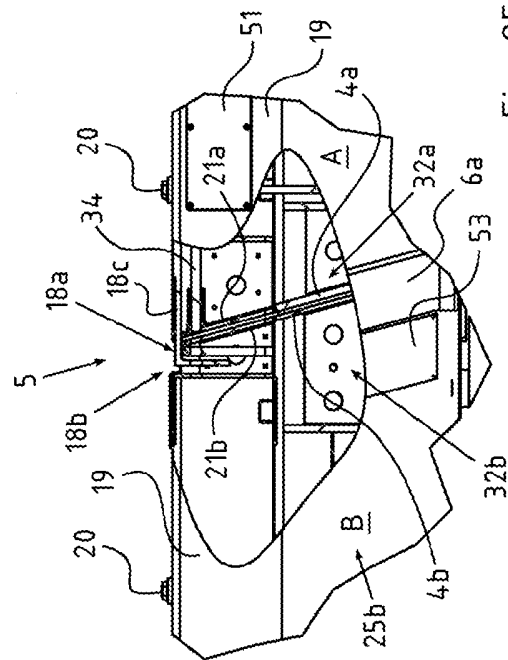


Fig. 25

