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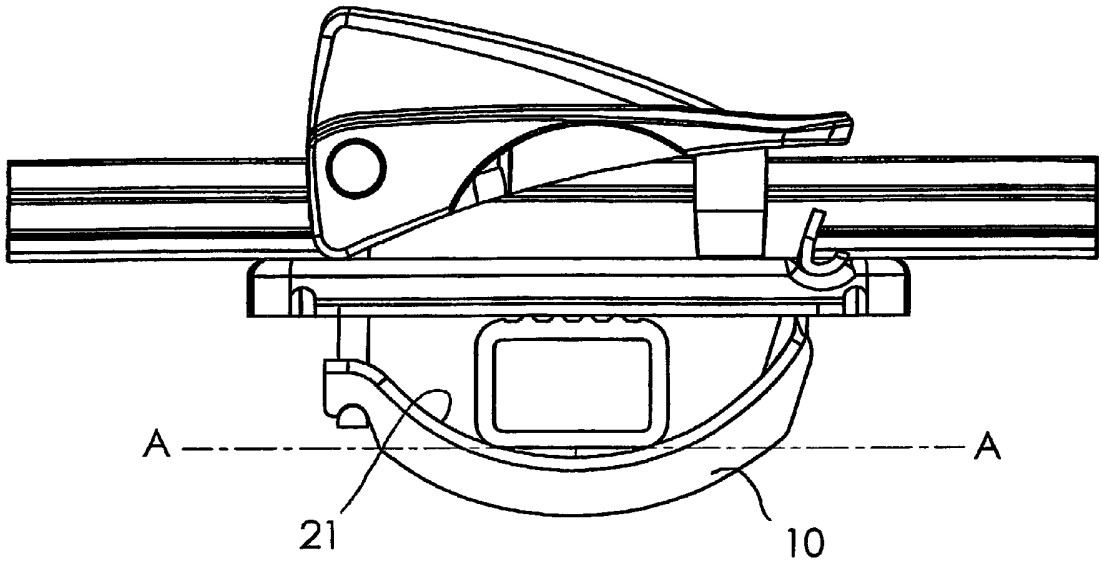
(54) Title: SECURING DEVICE



(57) Abstract: Securing device (4), which is used in conjunction with a load carrier (1) and with which the load carrier is attached to a load carrier bar (5) mounted on a vehicle, primarily the roof (7), by means of mounting devices (6), and which securing device comprises a base part (8) with an essentially flat face (9) designed to be placed on the load carrier bar and a clamping yoke (10) which encloses the load carrier bar and which, at a first end (11) with a pivot arrangement (12) is pivotably engaged with the base part and, at a second end, is attached to the base part by means of a tightening device (15) for the purpose of tightening the clamping yoke about the load carrier bar wherein the clamping yoke (10) is provided with a bow-shaped contact area (21) (Fig 10) for engagement with the load carrier bar (5).

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SECURING DEVICE

Technical field

The present invention relates to a securing device, which is used in conjunction with a load carrier and with which the load carrier is attached to load carrier bars mounted on a vehicle, primarily the roof, by means of mounting devices, and which securing device comprises a base part with an essentially flat face designed to be placed on the load carrier bar and a clamping yoke which encloses the load carrier bar and which, at a first end, is pivotably engaged with the base part and, at a second end, is attached to the base part by means of a tightening device for the purpose of tightening the clamping yoke about the load carrier bar.

State of the art

Securing devices of the type described are already known and are available in various designs. However, the disadvantage of these existing designs is that, in order to ensure tight and secure attachment of the securing device to the load carrier bar, the clamping yoke must be designed to fit the load carrier bar. This means that a number of different securing devices must be available since load carrier bars of various designs are available on the market. This creates the risk that a load carrier may be attached to a load carrier bar using a securing device which is not designed for the particular load carrier bar, which may easily occur if a load carrier is lent and which, in the worst case, may cause the load carrier to loosen from the load carrier bars.

Problem

Thus, there exists a need for a securing device of the type described in the introduction, which is designed in such manner that it can safely be attached to a load carrier bar regardless of the design of the load carrier bar.

Solution

The present invention overcomes the problem described above by means of a securing device of the type described in the introduction, which is characterised in that the clamping yoke is provided with a contact area of arched shape for engagement with the load carrier bar.

The present invention is also characterised in that the contact area is of circular shape

The present invention is further characterised in that the contact area is of pointed arch shape.
The present invention is yet further characterised in that the contact area of the clamping yoke begins and ends at points which, when the clamping yoke is tightened about the load carrier bar, are located respectively between the base part and the tangent to the point on the load carrier bar which is furthest from the base part.

Description of figures

The invention will hereinafter be described with reference to the appended figures, of which:
Fig. 1 is a general view showing a load carrier attached to load carrier bars mounted on a vehicle roof;
Fig. 2 is a general view showing a load carrier attached to load carrier bars and seen obliquely from above;
Fig. 3 is a detail view of a securing device in accordance with the present invention, in a fully open position;
Fig. 4 is a view corresponding to Fig. 3 in which the clamping yoke is connected to the tightening device;
Fig. 5 is a view corresponding to Fig. 3 in which the tightening device has tightened the clamping yoke into partial contact with the load carrier bar;
Fig. 6 is a view in which the tightening device is in the fully tightened position;
Figs. 7-8 are views showing alternative load carrier bar profiles;
Figs. 9-11 are views showing alternative clamping yoke shapes covered by the invention.

Preferred embodiment

Figs. 1 and 2 show a load carrier 1 on which a bicycle 2 is loaded. The load carrier 1 is provided with a rail 3 to which securing devices 4 for attaching the load carrier 1 to load carrier bars 5 are connected in a known manner. As shown schematically in Fig.1, the load carrier bars 5 are mounted on a vehicle roof 7 by means of mounting devices 6.
The securing device in accordance with the present invention is shown in detail in Figs. 3-6. The figures also show part of the rail 3, which is attached to the securing device in a manner known to one skilled in the art, but which will not be described in detail hereinafter since it is not of significance to the

invention. The securing device is provided with a base part 8 with an essentially flat surface 9, which is placed on a load carrier bar 5. Although the load carrier bar shown in the figures is of rectangular cross-section, the invention is independent of the cross-section of the load carrier bar. The base part 8 is provided with a clamping yoke 10. At one end 11, the clamping yoke is pivotably connected to the base part 8 by means of a pivot arrangement 12 consisting of a pivot pin 13, which consists of a section of the clamping yoke 10 formed into a U shape and which rests in a cradle 14 formed in the base part 8. At a second end, the clamping yoke 10 is attached to the base part by means of a tightening device 15, which consists of a pull rod 16 with a hook-shaped end 17 which engages in a shaped recess 18 in the clamping yoke 10. At the end 19 opposite to the hook-shaped end, the pull rod 16 is attached pivotably to the a lever arrangement 20 which enables the pull rod to be moved, in a known manner, in a direction toward and away from the base part 8, causing the clamping yoke 10, when engaged with the pull rod, to be tightened about the load carrier bar 5 in a manner which will be described below. The clamping yoke 10 is provided with a contact area 21, which is of arched shape and along which contact between the load carrier bar and clamping yoke will occur when the clamping yoke is tightened against the base part. The dash-dotted line A-A in Fig. 6 indicates the tangent to the point on the load carrier bar 5 which is situated furthest from the base part and, as can be seen, the contact area of the clamping yoke begins and ends at points located between the base part and the tangent A-A when the clamping yoke is tightened against the base part 8 (see Fig. 6).

Alternative versions of the load carrier bar 5 are shown in Figs. 7 and 8, in which the clamping yoke is seen in the tightened position corresponding to that shown in Fig. 6 and, as can be seen in this case also, the contact area 21 of the clamping yoke begins and ends at points located between the tangent A-A and the base part 8.

Figs. 9-10 show different versions of the clamping yoke 10. In Fig. 9, the contact area on the clamping yoke is circular in shape. In Fig. 10, the contact area on the left of the figure is of smaller radius than the area on the right of the figure, as indicated by the radii 'R' and 'r' respectively, and the contact area is, therefore, bow-shaped, whereas in Fig. 11, the contact area ispointed arch-shaped. As can be seen clearly from the figures, the different versions shown are also provided with contact areas which begin and end at points located between the base part 8 and the tangent A-A.

The operation of the securing device will hereinafter be described with reference to Figs. 1-6. To mount a load carrier 1 on the load carrier bars 5, the load carrier is lifted onto the load carrier bars and the base parts of the respective securing devices are placed on the load carrier bars. At this point, the clamping yoke 10 is disengaged from the pull rod 16 in the manner illustrated in Fig. 3. The clamping yoke 10 is then connected to the pull rod 16, see Fig. 4, causing the lever arrangement 20 to pivot in the manner shown in Figs. 5 and 6, and the clamping yoke 10 to turn about the pivot point 12 and move into contact with the base part 8. As shown in Fig. 5, the clamping yoke first comes in contact with the side of the load carrier bar located closest to the pivot point 12 and it will be clear to one skilled in the art that in order for the clamping yoke to be tightened to the position shown in Fig. 6, relative displacement must occur between the base part and the load carrier bar in such manner that the load carrier bar moves to the left in Fig. 5 relative to the base part 8, which may be achieved either by moving the entire load carrier or moving the base part along the rail 3. When the clamping yoke has been tightened to the position shown in Fig. 6, the arrangement will be clamped securely to the load carrier bar, regardless of the shape of the load carrier bar. As illustrated in the figures, the contact areas of the various clamping yokes are designed to extend along the entire length of the clamping yoke. However, as explained above, it is sufficient for the contact area to begin and end at points located respectively between the base part and the tangent to the point on the load carrier bar situated furthest from the base part.

CLAIMS

1. Securing device (4), which is used in conjunction with a load carrier (1) and with which the load carrier is attached to a load carrier bar (5) mounted on a vehicle, primarily the roof (7), by means of mounting devices (6), and which securing device comprises a base part (8) with an essentially flat face (9) designed to be placed on the load carrier bar and a clamping yoke (10) which encloses the load carrier bar and which, at a first end (11) is pivotably engaged with the base part by means of a pivot arrangement (12) and, at a second end, is attached to the base part by means of a tightening device (15) for the purpose of tightening the clamping yoke about the load carrier bar C H A R A C T E R I S E D I N T H A T the clamping yoke (10) is provided with a bow-shaped contact area (21) (Fig 10) for engagement with the load carrier bar (5).

2. Securing device in accordance with claim 1 C H A R A C T E R I S E D I N T H A T the contact area (21) is circular in shape (Fig.9).

3. Securing device in accordance with claim 1 C H A R A C T E R I S E D I N T H A T the contact area (21) is pointed arch-shaped (Fig.11).

4. Securing device in accordance with any of the foregoing claims C H A R A C T E R I S E D I N T H A T the contact area (21) begins and ends at points which, when the clamping yoke (10) is tightened about the load carrier bar, are located respectively between the base part (8) and the tangent (A-A) to the point on the load carrier bar (5) situated furthest from the base part (8).

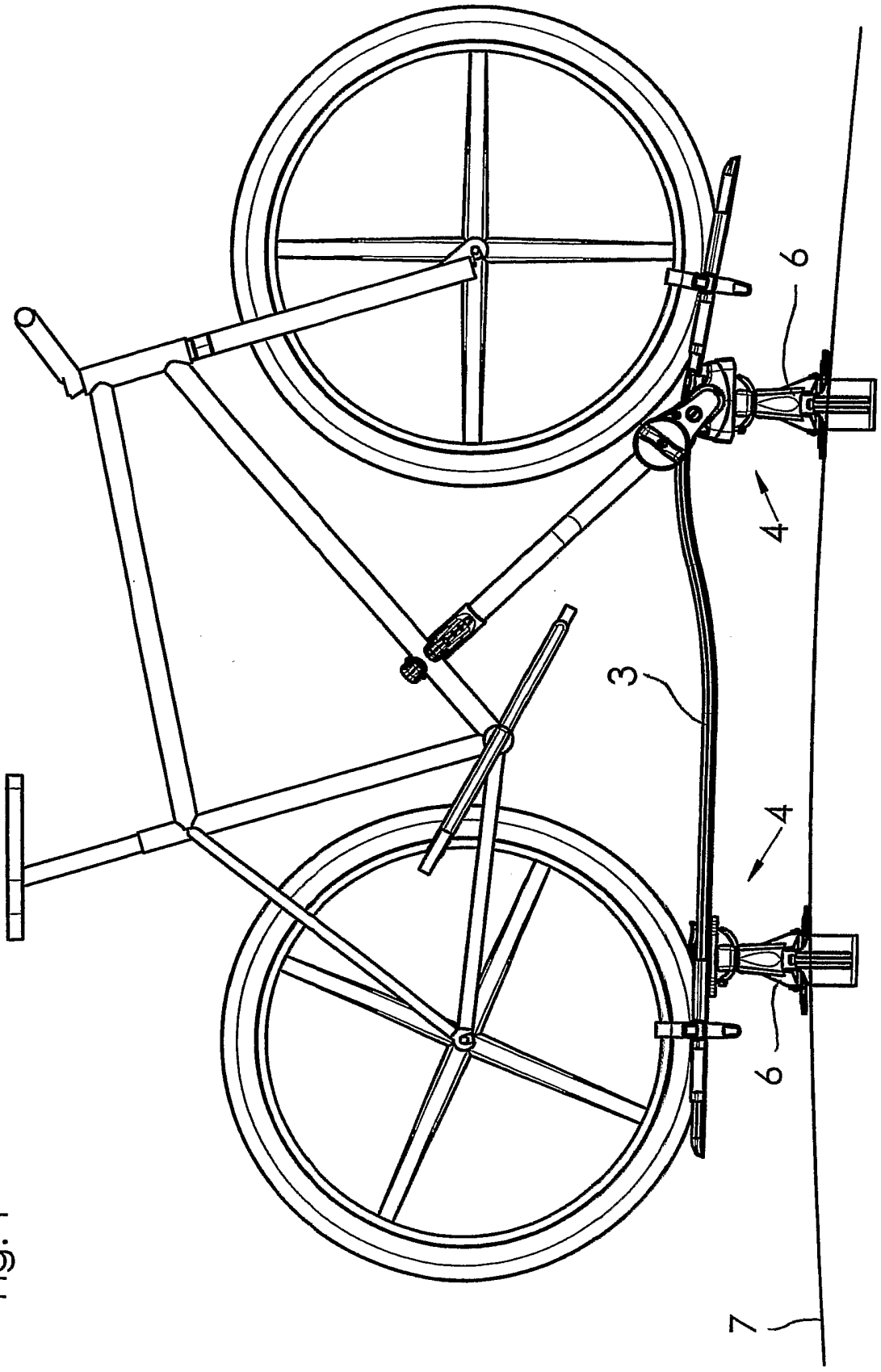


Fig. 1

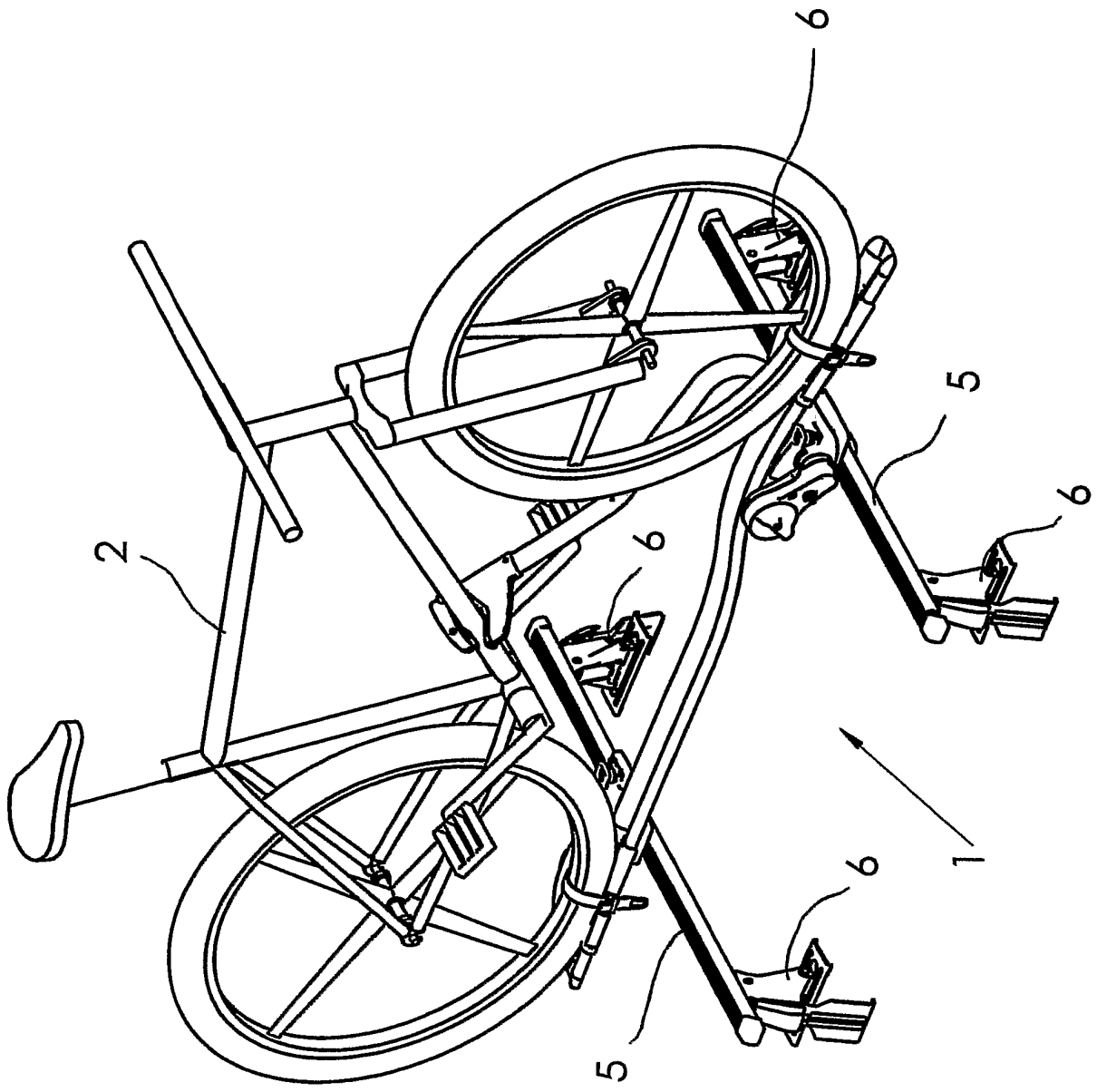


Fig. 2

Fig. 3

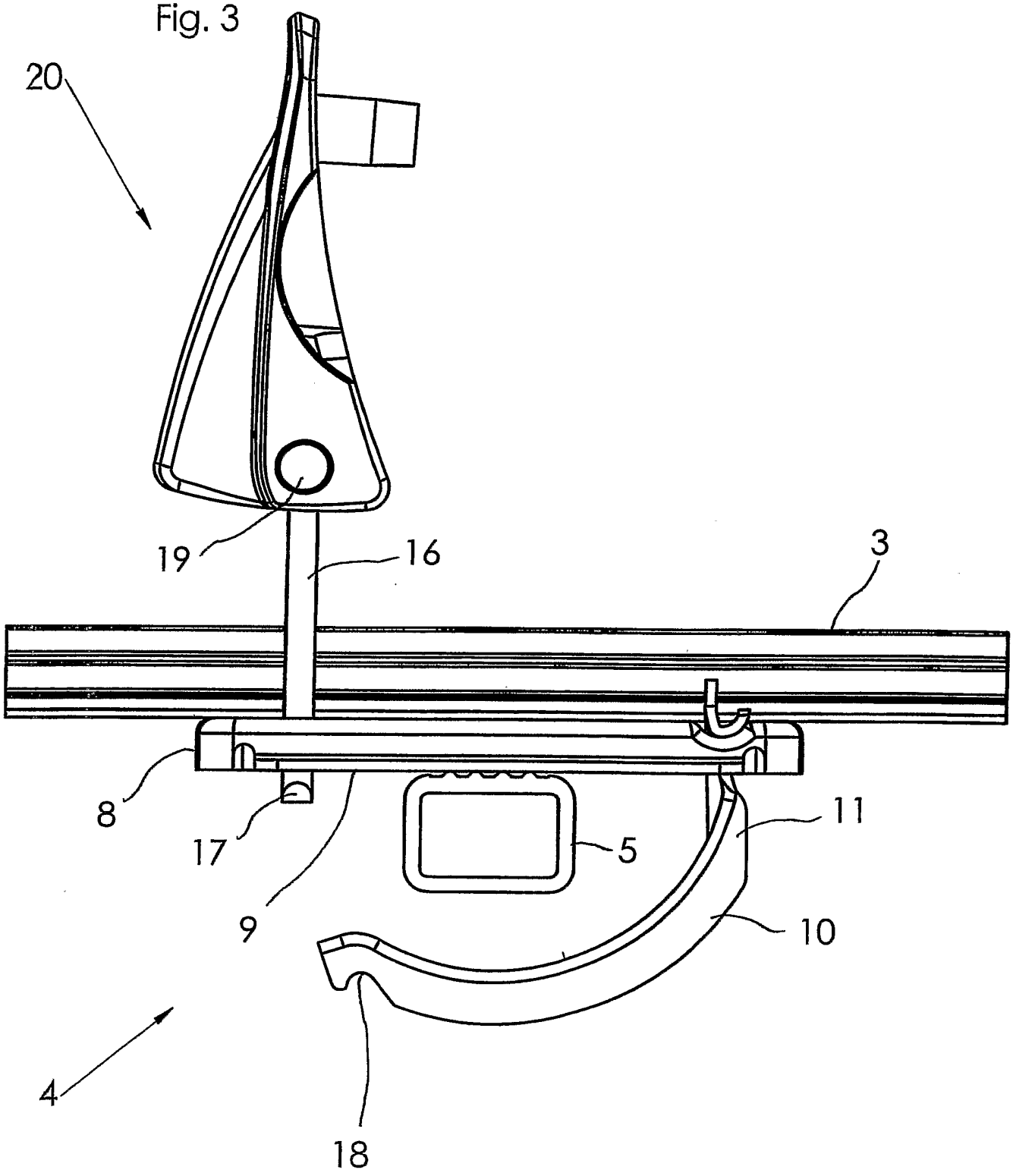


Fig. 4

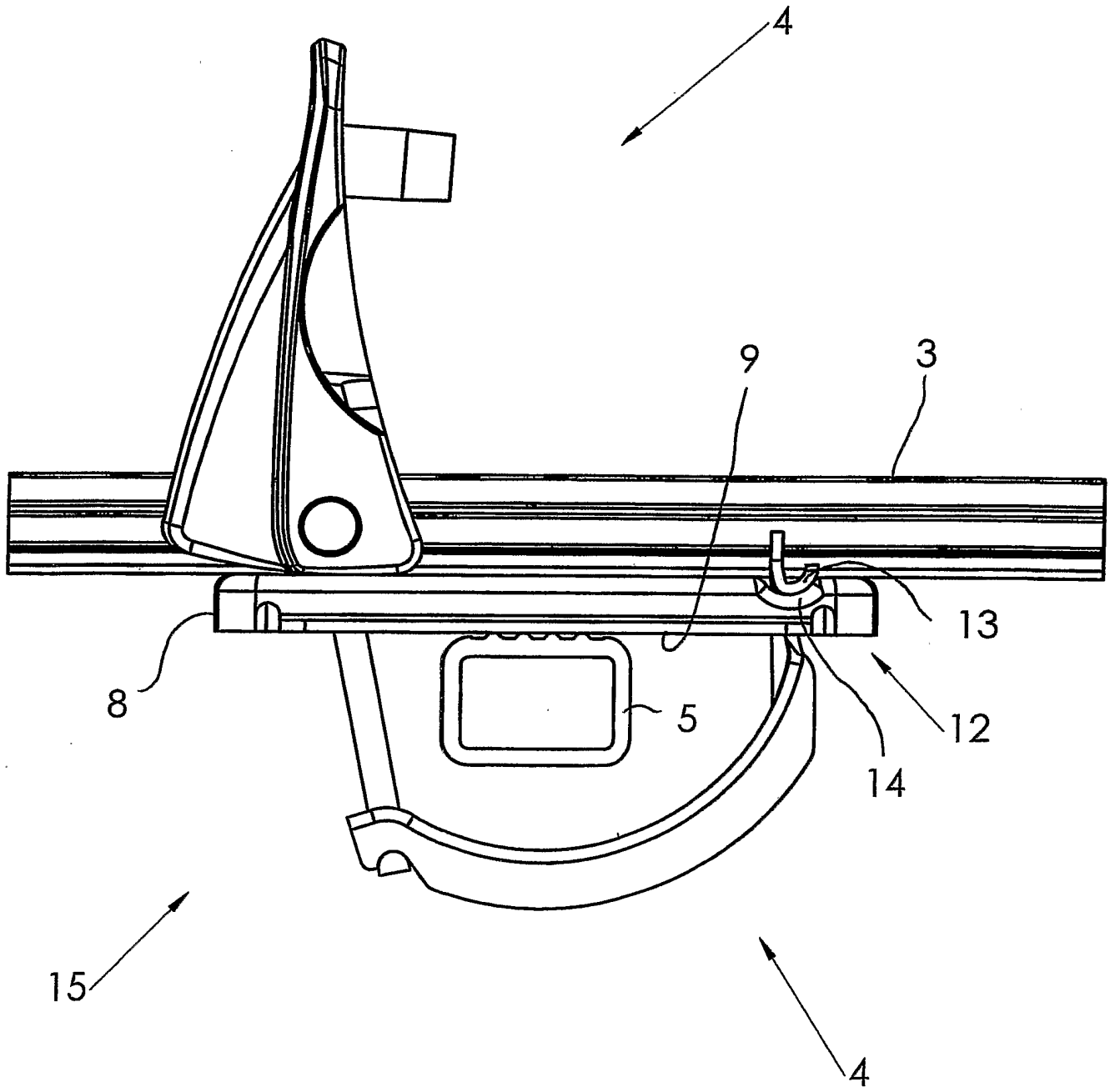


Fig. 5

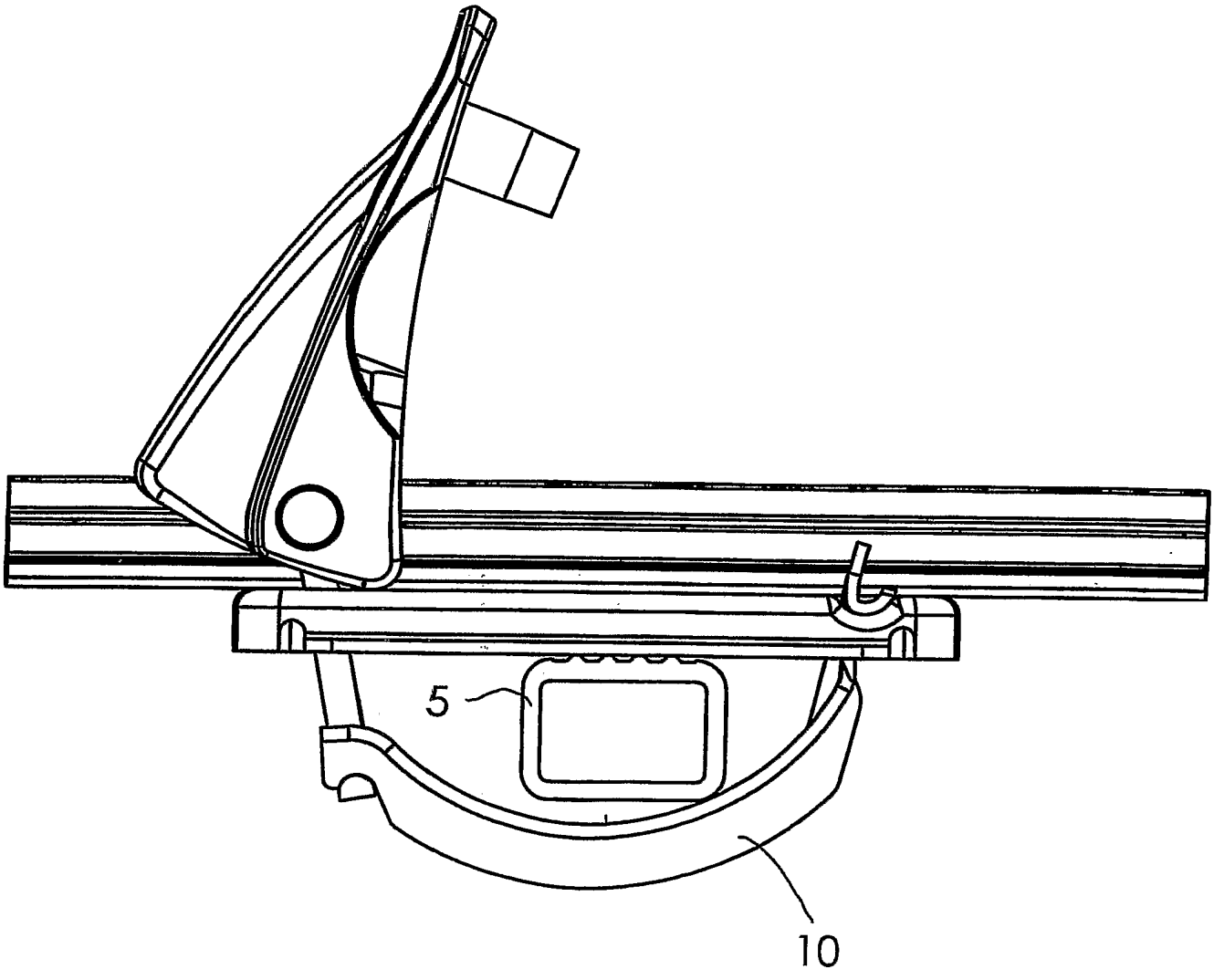


Fig. 6

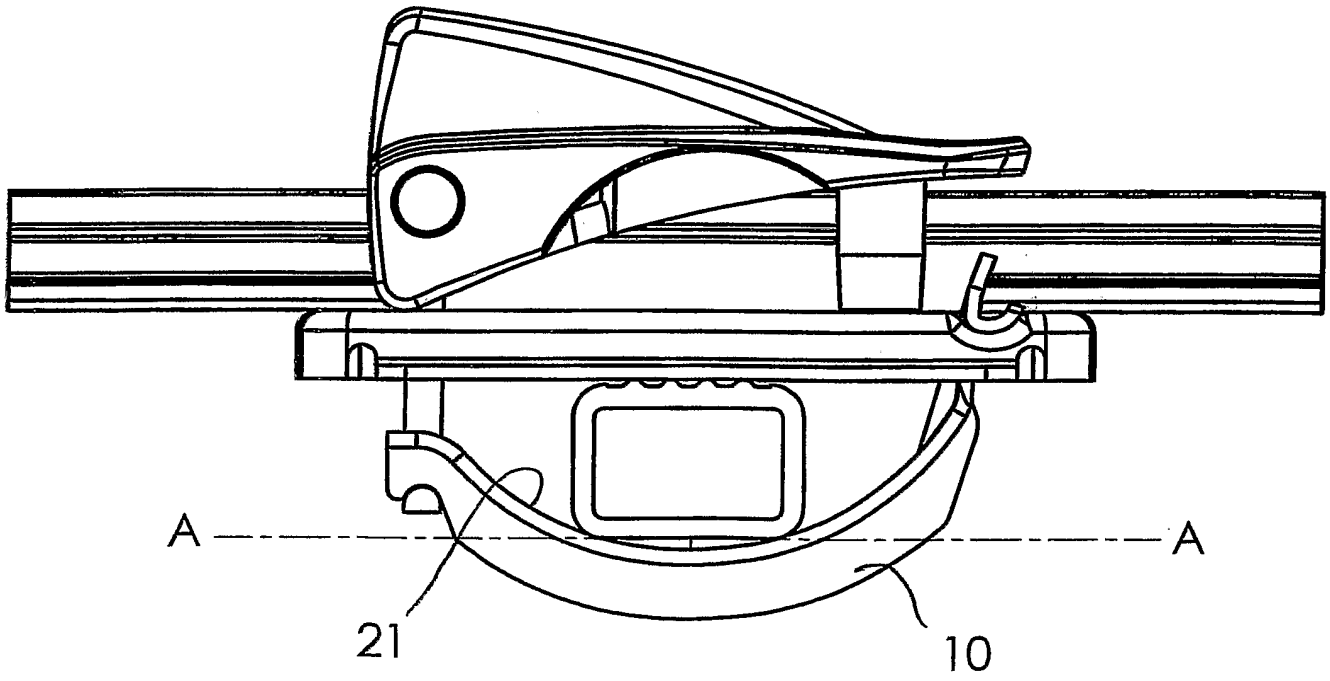


Fig. 7

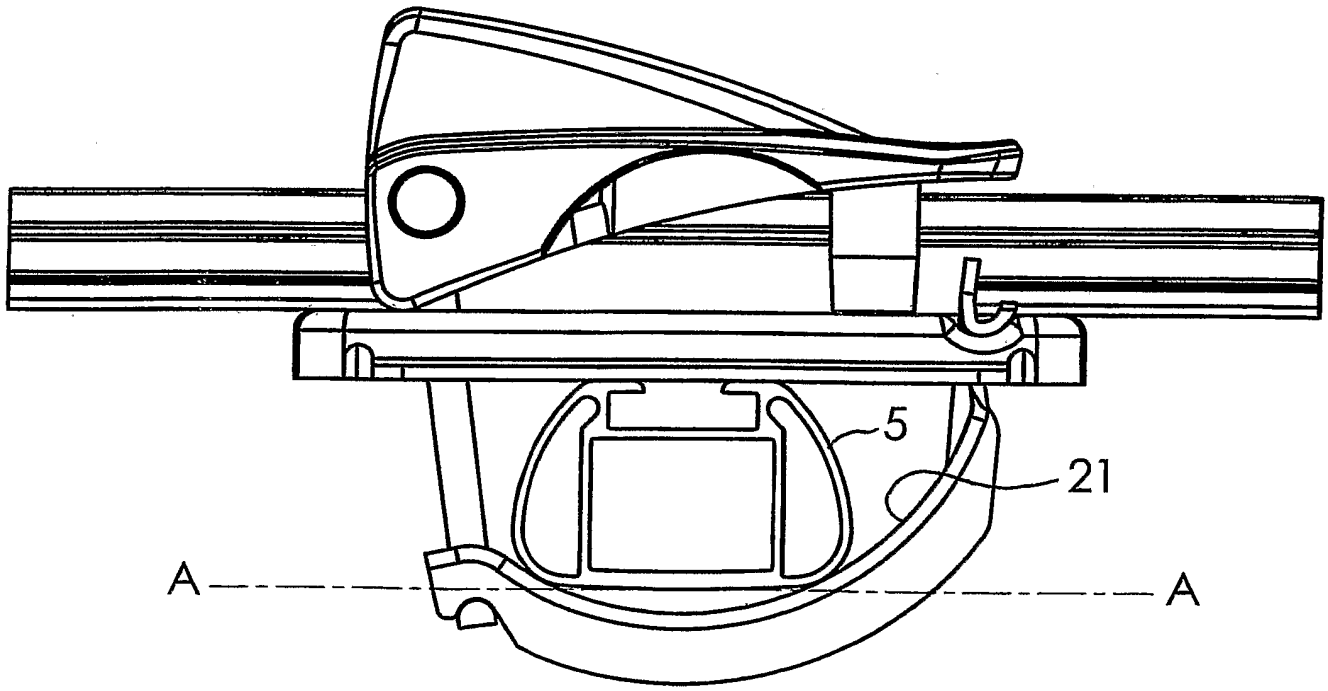


Fig. 8

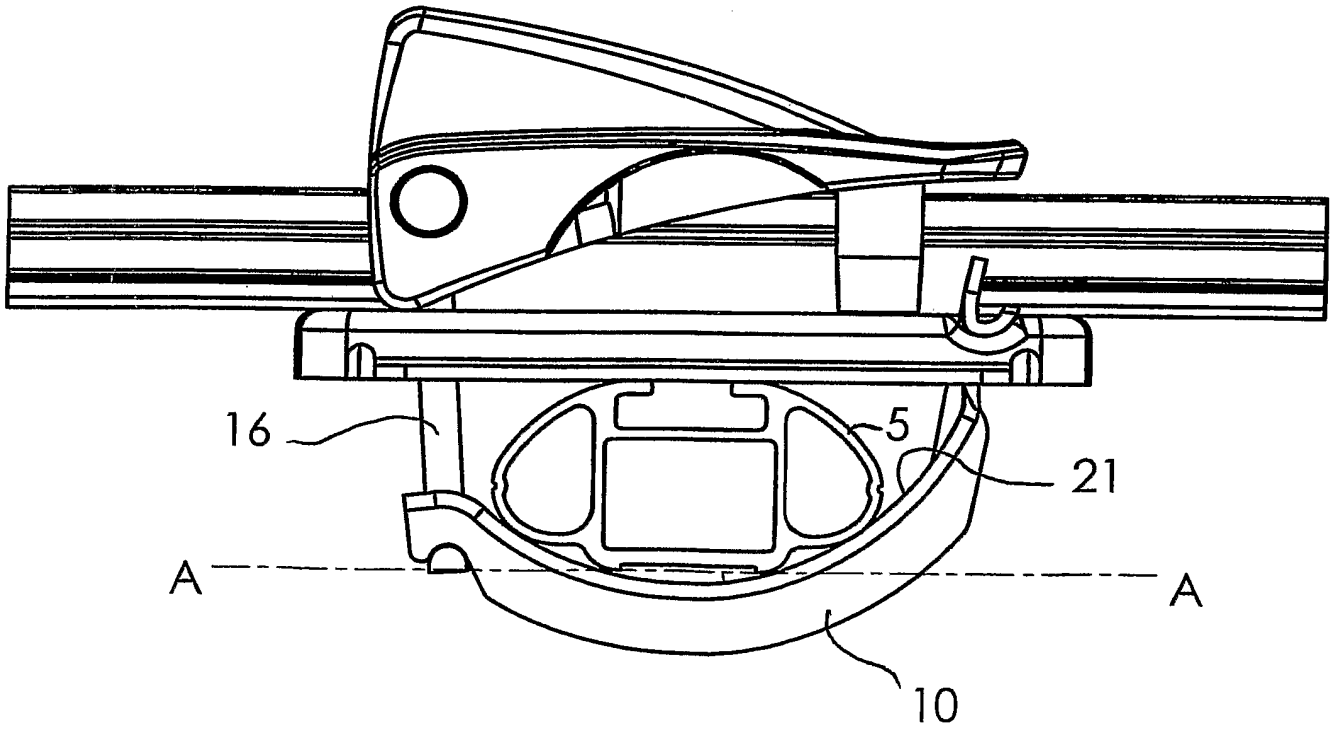


Fig. 9

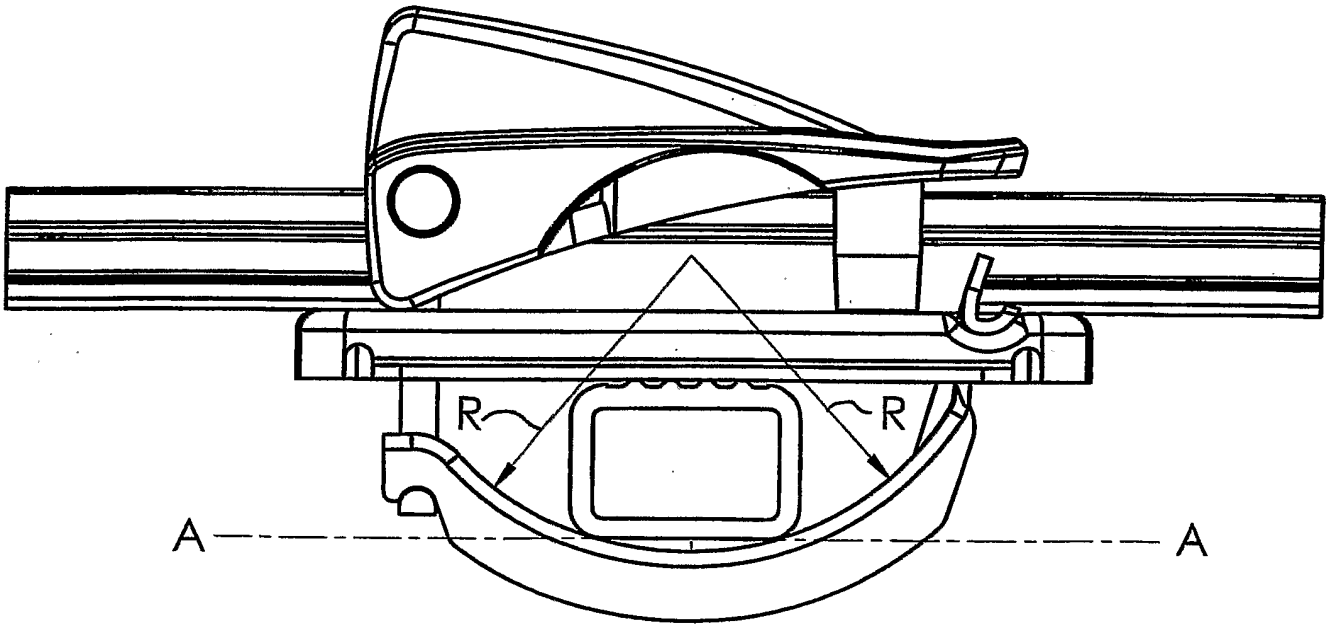


Fig. 10

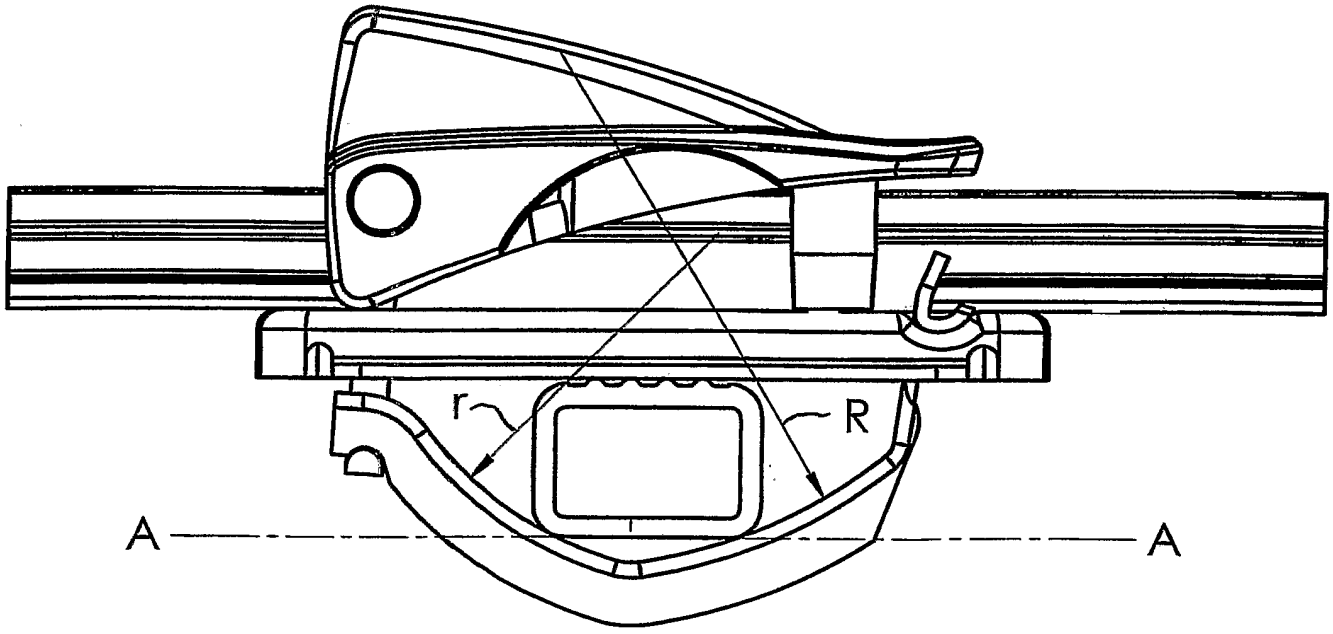
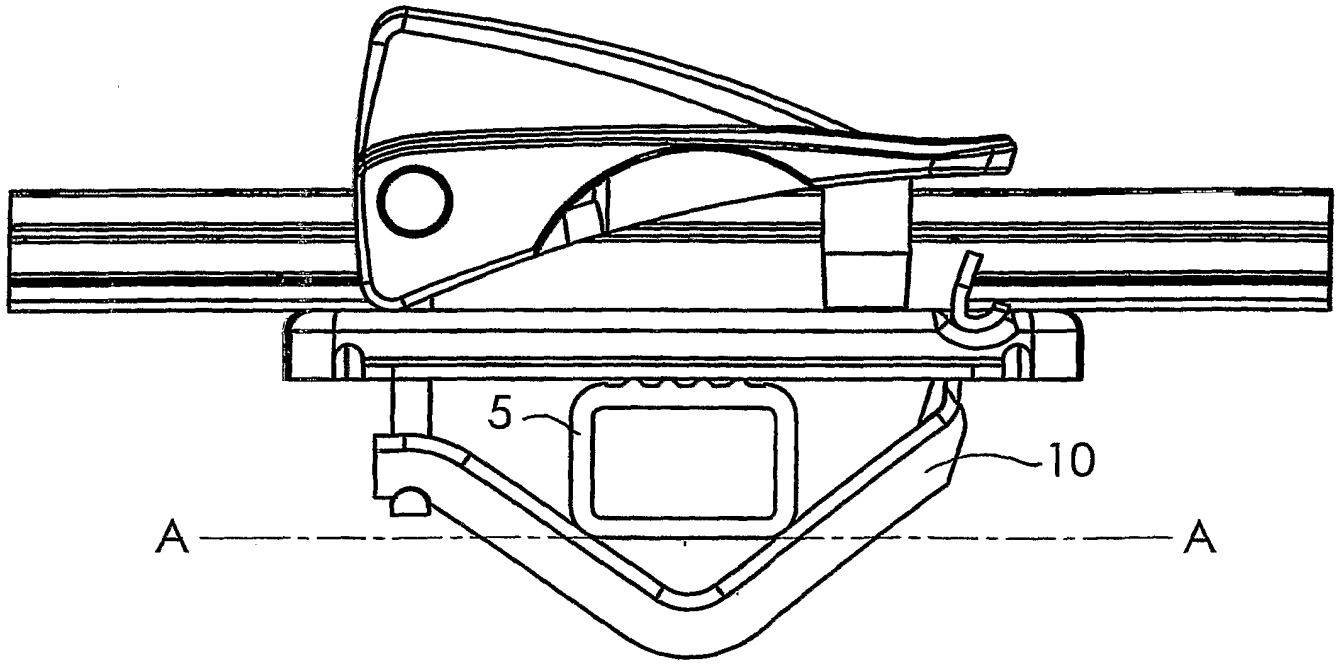


Fig. 11



INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 03/01468

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B60R 9/045
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 20020125282 A1 (LAVERACK ET AL), 12 Sept 2002 (12.09.02) --	1-3
A	US 6422441 B1 (SETTELMAYER ET AL), 23 July 2002 (23.07.02) --	1-3
A	EP 1260430 A2 (JAC PRODUCTS INC), 27 November 2002 (27.11.02) -- --------	1-3

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
2 December 2003	10 -12- 2003
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Hans Nordström/EK Telephone No. +46 8 782 25 00

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INTERNATIONAL SEARCH REPORT
Information on patent family members

06/09/03

International application No.
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