(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 442 245 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90830051.0**

(51) Int. Cl.5: **B61D 45/00**, B61D 3/18

(22) Date of filing: **12.02.90**

(43) Date of publication of application:
21.08.91 Bulletin 91/34

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

(71) Applicant: **KELLER S.p.A.**
Via Francesco Guardione, 3
Palermo(IT)

(72) Inventor: **Salatiello, Giovanni, c/o Keller S.P.A.**
Via Francesco Guardione 3
Palermo(IT)

(74) Representative: **Bardini, Marco Luigi et al**
c/o Società Italiana Brevetti S.p.A. Piazza di Pietra 39
I-00186 Roma(IT)

(54) Device for locking the wheels of vehicles on a vehicle wagon.

(57) A device for locking the wheels of vehicles on a railway waggon used for their transport, the waggon comprising a platform (1) with two parallel tracks, made of fretted sheet metal with grooves (4) extending trasversely in relation to its longitudinal axis. The device comprises locating means (11, 12) for one wheel of the vehicle, which rise up on said platform (1) and rest on it. At the base of said locating means (11, 12) there is provided a substantially tubular guide (14) slidingly engageable in one of the grooves (4) of the platform (1). A rod (8) extends within the guide (14) and for the entire length of the groove (4) in which the guide is engaged, the rod (8) is pivotally connected to an internal longitudinal edge (3) of a track of the platform (1). The rod (8) can be moved angularly in relation to the external longitudinal edge (2) of the same track form support position to a raised position with respect to the external edge (2). Means (20, 21) for locking the sliding of the guide (14) with respect to the rod which are operational when the rod is in said support position on the external edge (2).

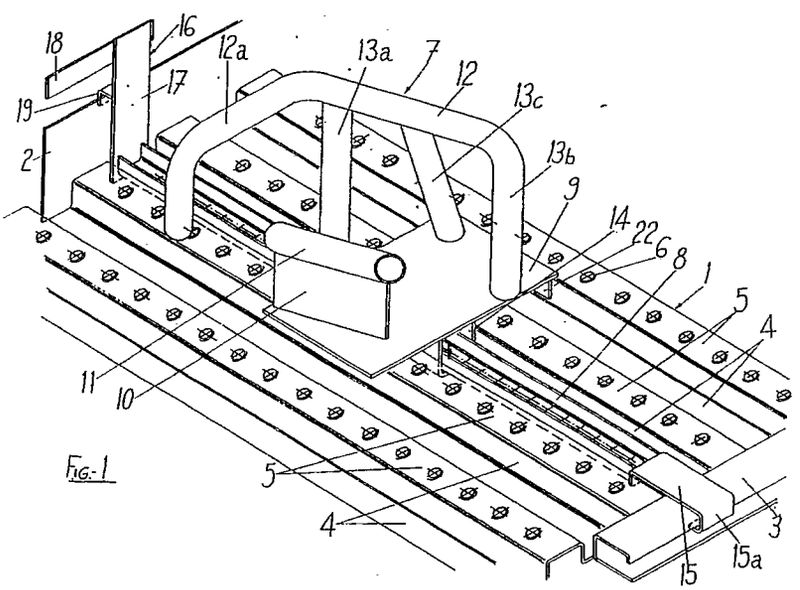

Fig. 1

EP 0 442 245 A1

The present invention relates to the sector of railway equipment and more specifically to a device for locking the wheels of vehicles on a railway waggon used for their transport.

For the transport by rail of various types of motor vehicles, special railway waggons with one or two levels are provided, which are equipped with a platform or floor on which the vehicles are arranged. The oldest system of locking the wheels of vehicles transported on such waggons is that of wedging by means of wooden or metal wedges nailed to the platform of the waggon. As a result of its laboriousness, this system, which presupposes the use of railway waggons with a wooden platform, offers a completely inadequate solution to current requirements with regard to, in particular, the speed of vehicle loading and unloading operations.

In modern railway waggons with a platform with two tracks made of sheet metal, various types of wheel-locking devices have been adopted. One of the most widespread devices for this application consists of a locating element for the wheel of the vehicle, which is hinged on the external longitudinal edge of the waggon with one of its ends and has a rigid rod hinged at one of its intermediate points, which can be coupled with its free end to the same edge of the waggon. When not in use, the locating element and the associated rigid rod are aligned one above the other along the external edge of the waggon, whereas when in use the locating element is moved angularly in relation to said edge until it engages under the wheel to be locked and the rigid rod is coupled to the edge on the opposite side of the wheel. In general, for the transport of heavy vehicles, a pair of such devices is provided for each wheel to be locked, which hold the wheel in front and behind and prevent it from rotating in either direction, whereas for medium-weight and light vehicles, one single device for each wheel may be sufficient. Devices of this type have, however, proved to be a cause of potential accidents for personnel and difficult to release, when the wheel is to be unlocked, especially in the event of ice, snow or a heavy accumulation of dirt being present.

Another known type of device for locking wheels, adapted for use on railway waggons with platforms made of fretted sheet metal, has a locating element for the wheel and a handle which is hinged to the latter and engaged with its ends on respective rack supports, by virtue of which the inclination of the locating element can be varied. The device is fixed to the platform by means of a bracket, on which the locating element is pivoted in such a manner that it can be moved angularly on the platform to the most convenient position for locking the wheel. When the correct positioning has been found, the device is fixed on the platform by means of a pin which engages in one of its grooves, preventing its further angular movement. This device, which has a complex structure in relation to the type of application, is not very practical to use and can be dangerous for the personnel employed.

The aim of the present invention is to provide a device for locking the wheels of vehicles on a railway waggon used for their transport, which has an extremely simple structure and can be operated with ease and without risks as far as the personnel is concerned.

The device according to the present invention is suitable for installation on railway waggons, for the transport of vehicles, with platforms with two tracks, made in particular of fretted sheet metal with grooves which extend transversely in relation to the longitudinal axis of the waggon, and comprises locating means for one wheel of each vehicle, which rise up on said platform and rest on it. The device according to the invention is characterized in that, at the base of said locating means, a substantially tubular guide is provided, which can be engaged by sliding in one of the grooves of the platform, a rod, which is rotatably connected to the internal longitudinal edge of one track of said platform and can be moved angularly in relation to the external longitudinal edge from a support position to a raised position in relation to this edge, extending in this guide and for the entire length of said groove, means also being provided for locking said guide in relation to said rod, which are operational when the rod is in the support position on the external edge.

By virtue of the solution explained above, which is structurally very simple, it is possible to carry out transverse adjustment of the locating means for a wheel, in order to arrange them in the most suitable locking position by means of the simple operation of raising and lowering the transverse rod arranged in a groove of the platform, in this manner achieving the unlocking and locking of the locating means which can, therefore, be moved transversely to the desired position.

In the device according to the invention, the possibility can also be provided of longitudinal adjustment of the position of the locating means, which has the advantage of both avoiding too frequent movement of the device from one groove to an adjacent groove of the platform and allowing a more accurate positioning of the locating means under the wheel.

. Further characteristics and advantages of the device for locking the wheels of vehicles on a railway waggon used for their transport will emerge more clearly from the description which follows of one of its embodiments, given by way of non-

limitative example with reference to the attached drawings, in which:

- Figure 1 shows in a perspective view a wheel-locking device according to the present invention, mounted on the track of a platform made of fretted sheet metal;
- Figure 2 is a lateral view in partial longitudinal cross-section of the device in Figure 1;
- Figure 3 is a plan view from above of the device in Figure 1;
- Figure 4 is a lateral view in partial transverse cross-section of the device in Figure 1;
- Figure 5 is a perspective view of a different embodiment of the device according to the present invention;
- Figure 6 is a lateral view in partial longitudinal cross-section of the device in Figure 5;
- Figure 7 is a plan view from above of the device in Figure 5;
- Figure 8 is a lateral view in partial transverse cross-section of the device in Figure 5.

With reference to Figures 1, 2, 3 and 4, a transverse piece of track from a platform of a railway waggon, of known type, for the transport of motor vehicles of various types, is indicated generically by 1, said track having an external longitudinal edge 2 and an internal longitudinal edge 3 which separates it from an identical track which constitutes the other half of the platform. The platform 1 is made from fretted sheet metal comprising a plurality of transverse grooves 4 which are delimited by as many projections 5 on each of which a row of holes 6 is made, which are drawn towards the outside with sharp edges in order to increase the grip of the tyres on the platform. At the bottom of the grooves 4, small drainage holes (not shown) are also made.

In the abovementioned figures, a device according to the present invention is also illustrated arranged on a piece of said platform, which essentially consists of locating means 7 for one wheel of a vehicle and a rigid rod 8 which interacts with these and extends in and for the entire length of one of the transverse grooves 4. The locating means 7 for a wheel consist of a base plate 9, resting on the platform 1, from which a vertical bracket 10 rises up, carrying along its free edge a locating element 11, which is in particular tubular, horizontal and inclined at approximately 45° in relation to the transverse direction of the grooves 4. A second locating element 12, which is parallel to the first, spaced apart from it and situated at a higher level in relation to the plate 9, is supported by two struts 13a and 13b, which rise up from the plate 9 itself, and buttressed by an inclined strut 13c. The second locating element 12 continues horizontally and laterally towards the first locating element 11 with one of its arms 12a which is perpendicular to the transverse direction and has its end bent downwards.

On that surface of the plate 9 which faces towards the platform 1, a tubular guide 14 is fixed, the shape and dimensions of which are substantially the same as those of the grooves 4, in which it is capable of engaging by sliding.

The rod 8 is inserted into the tubular guide 14 and accommodated in the corresponding groove 4. At one of its ends, a flat extension 15 is provided, which finishes in an edge 15a which is bent substantially into the shape of a C and engaged by rotation on the internal longitudinal edge 3, which is correspondingly bent, of the track of the platform 1 so as to produce a rotatable connection, which can in case of need be uncoupled easily, for the rod 8 about a horizontal, longitudinal axis. At the opposite end, the rod 8 has a control element 16 made up of a vertical arm 17, which is rigidly connected to the rod 8, with a handle 18 at its free end. From an intermediate point on the arm 17, moreover, an extension 19, which is bent substantially into the shape of an L and is capable of engaging on the edge 2 of the waggon in order to completely restrain the rod 8 with regard to any possibility of movement along the groove 4, extends towards the exterior of the platform 1.

As is shown more clearly in Figures 2 and 4, the rod 8 is a substantially C-shaped profile, along the entire bottom of which a row of holes 20 is made. From the bottom of the tubular guide 14, two pegs 21, which are aligned and engaged in two of said holes 20, correspondingly protrude. In this condition, the tubular guide 14, and thus the locating means 7 standing above, clearly become integral with the rod 8, since any relative sliding is prevented. In such a condition, moreover, the rod 8 becomes parallel to the bottom of the groove 4 and the extension 19 of the control element 16 rests on the edge 2 of the platform. The height of the rod 8 is sufficiently smaller than the corresponding height of the tubular guide 14 as to permit a raising movement of the rod 8 itself, which is sufficient to disengage the pegs 21 from the holes 20. In such a raised position, the rod 8 permits the transverse sliding of the locating means 7 along the transverse groove 4.

In Figures 2 and 3, the outline of a wheel R is also indicated, which bears against the locating element 12 and, according to the dimensions, against the second locating element 11 which is in front of the first in relation to the position of the wheel R. This latter furthermore bears laterally against the arm 12a. In order to centre the plate 9 on the platform and to prevent any longitudinal movement of the entire device in relation to the platform 1 itself, a stop element 22, which bears against one wall of a groove 4 adjacent to that in

which the tubular guide 14 and the rod 8 are engaged, is provided on the opposite side to the locating element 11 and on the other surface of the plate 9.

In the alternative embodiment illustrated in Figures 5, 6, 7 and 8, the possibility is provided of longitudinally adjusting the position of the locating means 7 in relation to the wheel of the vehicle on the platform 1. To this end, and with reference to the above-mentioned figures, the base plate of the device according to the invention is formed from two parts, a fixed part 9a, on the lower surface of which is fixed the tubular guide 14 which is engaged in a transverse groove 4, and a part 9b, which slides in a coplanar manner in relation to the first and supports the locating means 7 for the wheel. More particularly, the part 9a of the base plate has a cavity 27 into which the part 9b, which has two longitudinal rows of holes 23, is slidingly inserted. On the part 9a, a transverse drum 24 is rotatably mounted, from which two arms 25 extend radially, which have one end bent towards the part 9b and are capable of engaging in a pair of said holes 23 in order to lock the part 9b in relation to the part 9a, preventing their sliding after the correct positioning, in the longitudinal direction, of the locating means 7 for the wheel has been found. For raising and lowering the two arms 25, a handle 26 is provided above the part 9a of the base plate, which handle is not shown in Figure 5 for the sake of simplicity.

The locating means 7 for the wheel, which are integral with the sliding part 9b of the base plate 9, are formed, similarly to what has already been described in relation to Figures 1 - 4, by a first locating element 11, which extends along the edge of a bent end 28 of the part 9b, and by a second locating element 12, which is parallel to the first, situated at a greater height in relation to the level of the base plate, supported by two vertical struts 13a and 13b, which rise up from intermediate points on the sliding part 9b, and are buttressed by an inclined strut 13c. The second element 12 continues with a horizontal arm 12a which is bent perpendicularly and has one end bent towards the first element 11. In the present alternative embodiment of the device according to the invention, the locating elements 11 and 12 for the wheel, the outline of which is indicated by R in Figures 6 and 7, are arranged transversely and parallel to the grooves 4.

The practical methods of use of the device according to the present alternative embodiment of the invention are the same as previously described, except that in this case both transverse positioning, by sliding the base plate of the device in relation to the rod 8, and longitudinal positioning, by sliding the part 9b of the base plate, which supports the locating means 7 for the wheel, in relation to the fixed part 9a, must be carried out.

It is evident that, although the device according to the present invention is particularly suitable for use on platforms made from fretted sheet metal, it can also be used on platforms with gratings or with another structure.

Alternatives and/or modifications to the device for locking the wheels of vehicles on a railway waggon used for their transport are possible, without thereby departing from the scope of protection of the present invention.

Claims

1. Device for locking the wheels of vehicles on a railway waggon used for their transport, said waggon comprising a platform (1) with two parallel tracks, made in particular of fretted sheet metal with grooves (4) extending transversely in relation to its longitudinal axis, said device comprising locating means (7) for one wheel of said vehicle, which rise up on said platform and rest on it, and being characterized in that, at the base of said locating means, a substantially tubular guide (14) is provided, which can be engaged by sliding in one of said grooves of the platform, a rod (8), which is rotatably connected to an internal longitudinal edge (3) of one track of said platform and can be moved angularly in relation to the external longitudinal edge (2) from a support position to a raised position in relation to this edge, extending in this guide and for the entire length of said groove, means (20, 21) also being provided for locking said guide (14) in relation to said rod (8), which are operational when said rod is in said support position on said external longitudinal edge (2).

2. Device according to Claim 1, in which said means for locking said guide (14) in relation to said rod (8) consist of at least one row of equidistant holes (20) along the entire length of said rod and at least one peg (21) which rises up from the bottom of said guide and is capable of engaging in said holes when said rod is brought into its support position.

3. Device according to Claim 2, in which a pair of transversely aligned pegs (21) are provided in said guide (14), which are capable of engaging in two corresponding holes (20) in said rod (8).

4. Device according to the preceding claims, in which said rod (8) has at one of its ends an extension (15) with an edge (15a) which is bent substantially into the shape of a C and capable

of engaging by rotation on the internal longitudinal edge (3) of said track.

5. Device according to Claim 4, in which means of control (16) are provided at the opposite end of said rod (8), which comprise a handle (18) and a bent extension (19) which is capable of engaging by support on the external longitudinal edge (2) of said track.

6. Device according to the preceding claims, in which said rod (8) is a C-shaped section of a height which is substantially lower than that of said guide (8), so as to permit raising in order to disengage said pegs (21) from said holes (20).

7. Device according to Claim 1, in which a base plate (9) is provided, to one surface of which is fixed said substantially tubular guide (14), from the other surface of said base plate locating means (7) for a wheel rising up, which consist of a first locating element (11) and a second locating element (12) which are parallel and situated at heights above said plate (9).

8. Device according to Claim 7, in which said first and said second locating elements (11, 12) lie in horizontal planes parallel to the platform (1) and are arranged transversely and inclined with respect to the grooves (4) of the same.

9. Device according to Claim 7, in which said first and second locating elements (11, 12) lie in horizontal planes parallel to said platform (1) and are arranged transversely and parallel to the grooves (4) of the same.

10. Device according to Claim 1, characterized in that said locating elements rise up from a first part (9b) of said base plate (9), which is telescopically slidable in the longitudinal direction in a second, fixed part (9a) of said base plate (9), to which said substantially tubular guide (14) is fixed, means (23, 25) being provided for locking said first, sliding part in relation to said second, fixed part in different operational positions.

11. Device according to Claim 10, in which said means of locking the first, sliding part (9b) in relation to the second, fixed part (9a) of said base plate (9) consist of two rows of holes (23) made in said sliding part and two corresponding hooks (25) which are mounted on said fixed part (9a) so as to rotate together about a horizontal axis (24) perpendicular to the direction of sliding and are each capable of engaging in a corresponding hole in one of said rows.

12. Device according to the preceding claims, in which the platform (1), on which it is mounted, has a plurality of holes (6) which are drawn towards the outside with sharp edges.

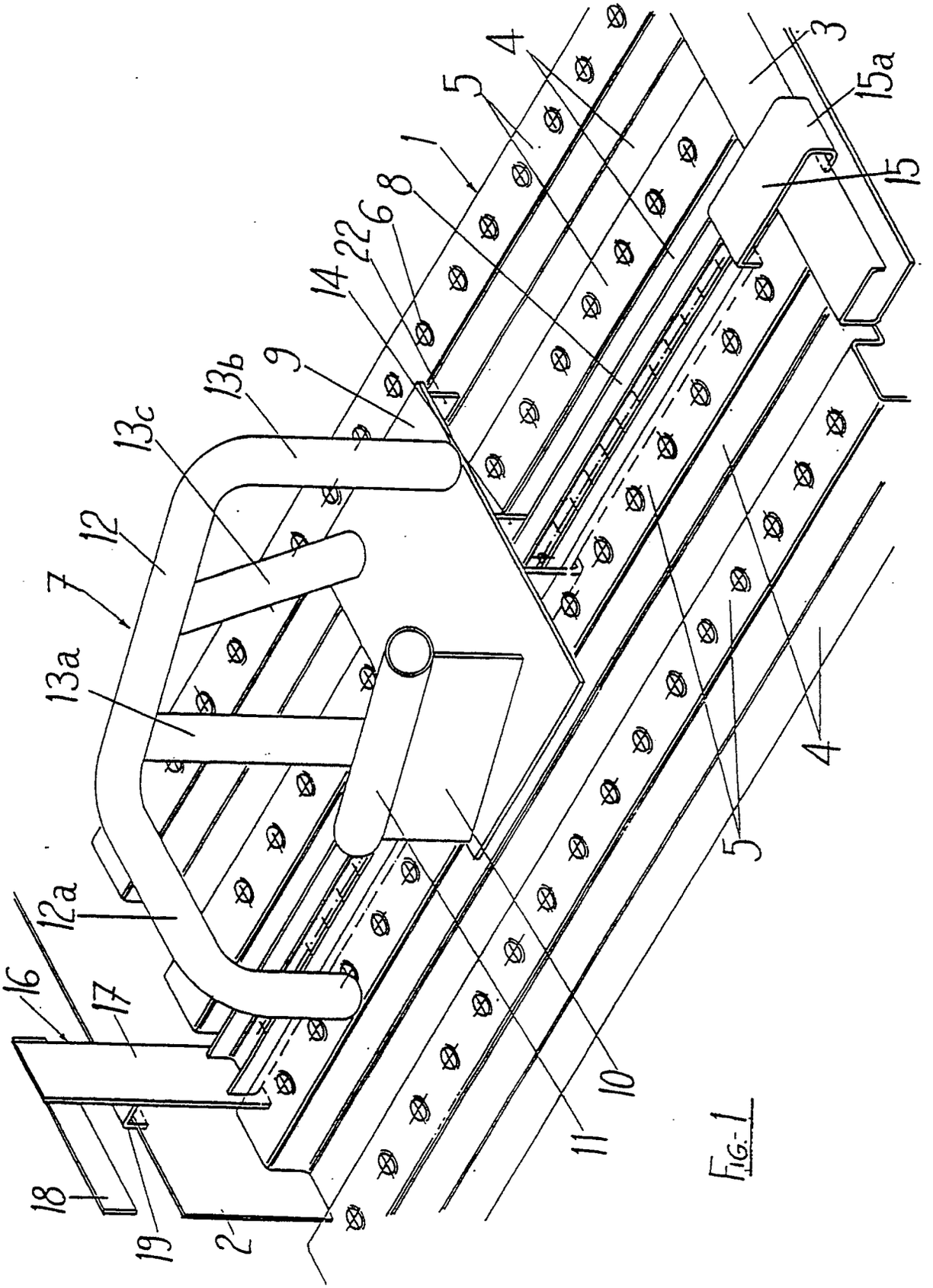

FIG. 1

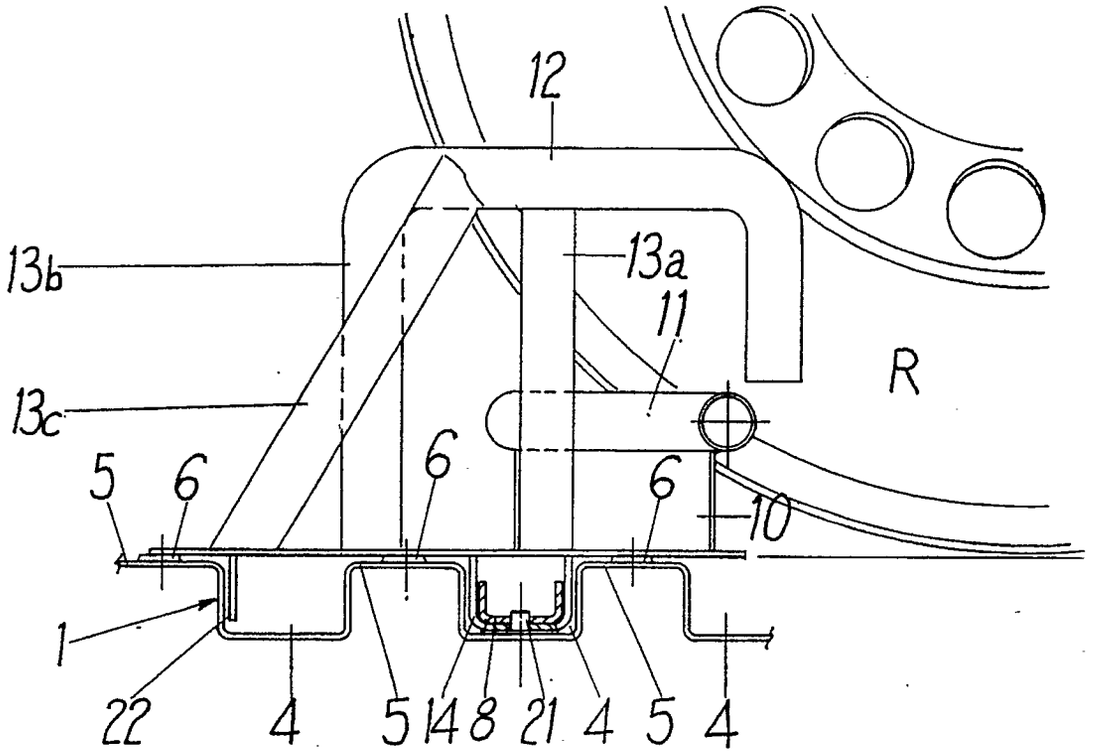
12
13b
13a
11
R
13c
5
6
6
6
10
1
22
4
5
14
8
21
4
5
4

FIG.-2

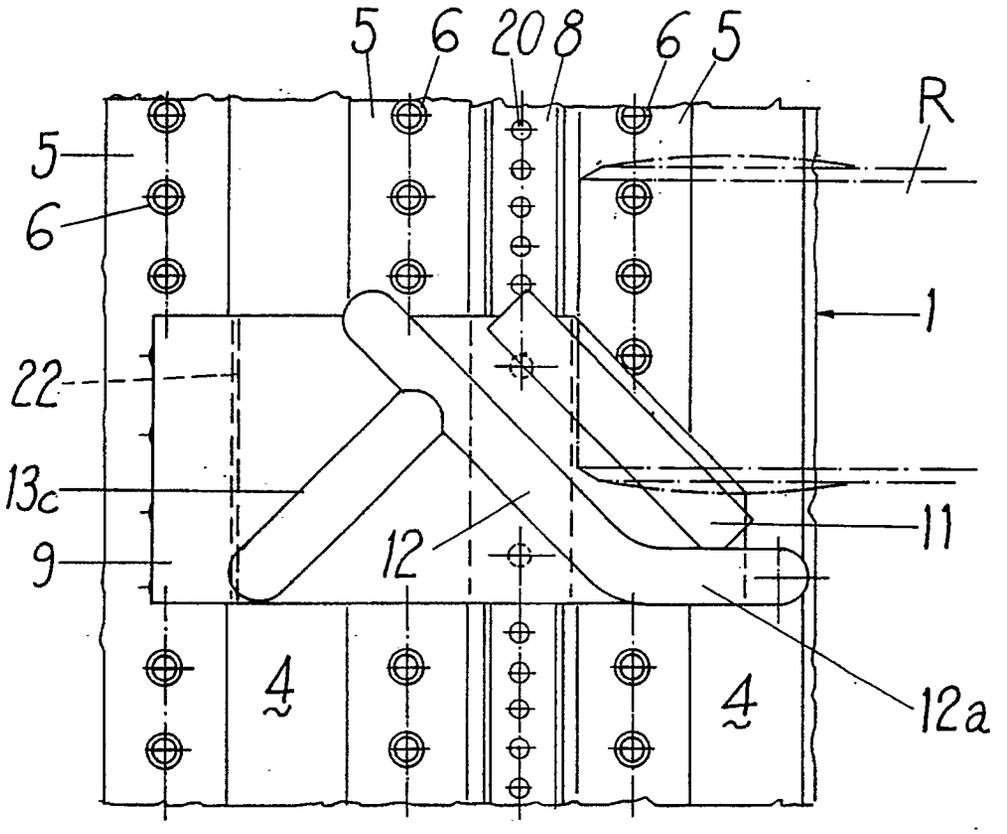
5
6
20
8
6
5
R
5
6
1
22
13c
9
12
11
4
4
12a

FIG.-3

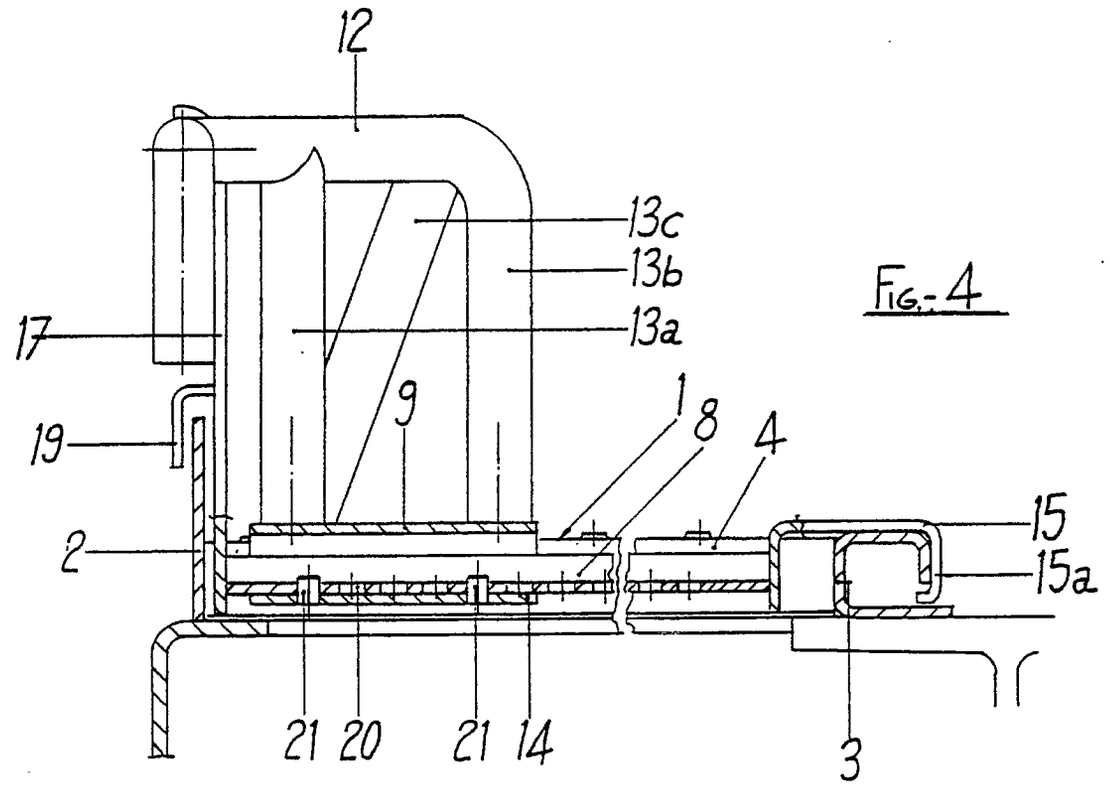
12
13c
13b
13a
17
19
9
1
8
4
15
15a
2
21
20
21
14
3

Fig.-4

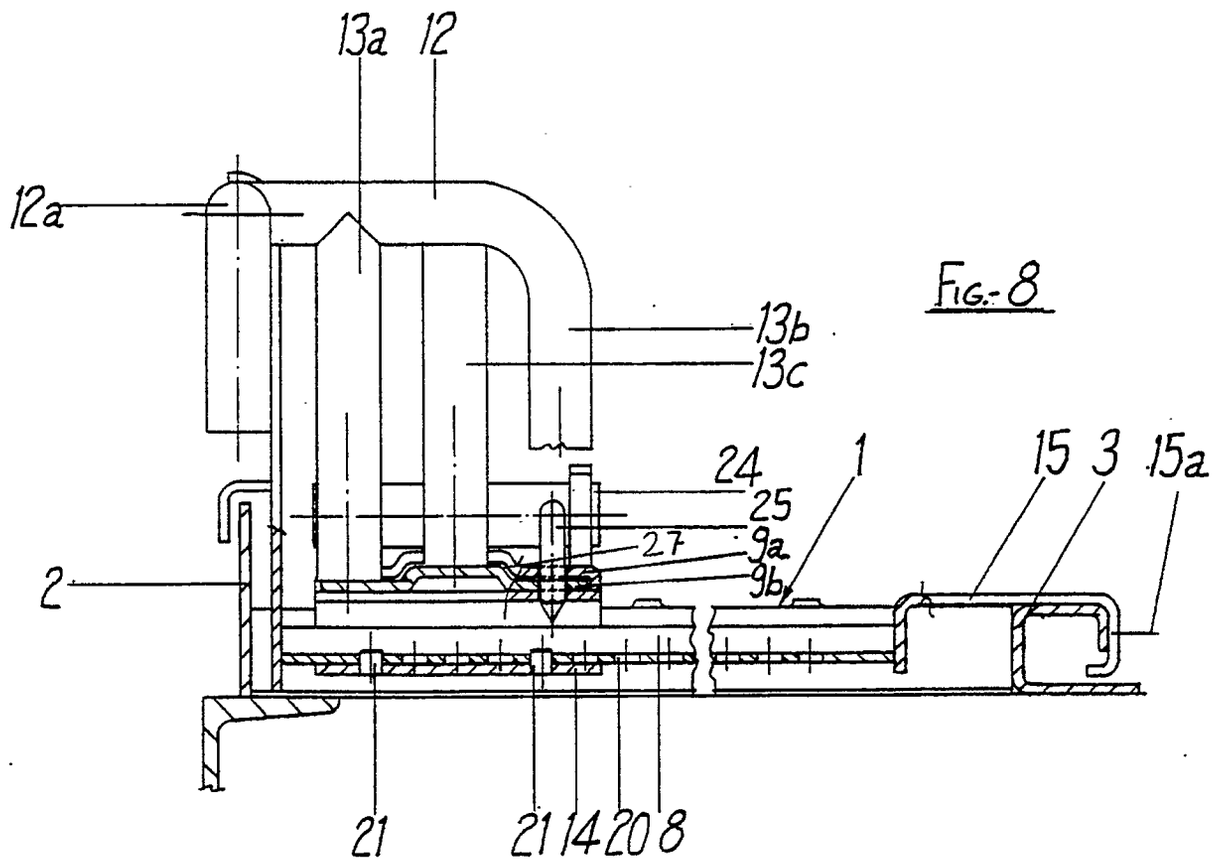
13a
12
12a
13b
13c
24
25
27
9a
9b
1
15
3
15a
2
21
21
14
20
8

Fig.-8

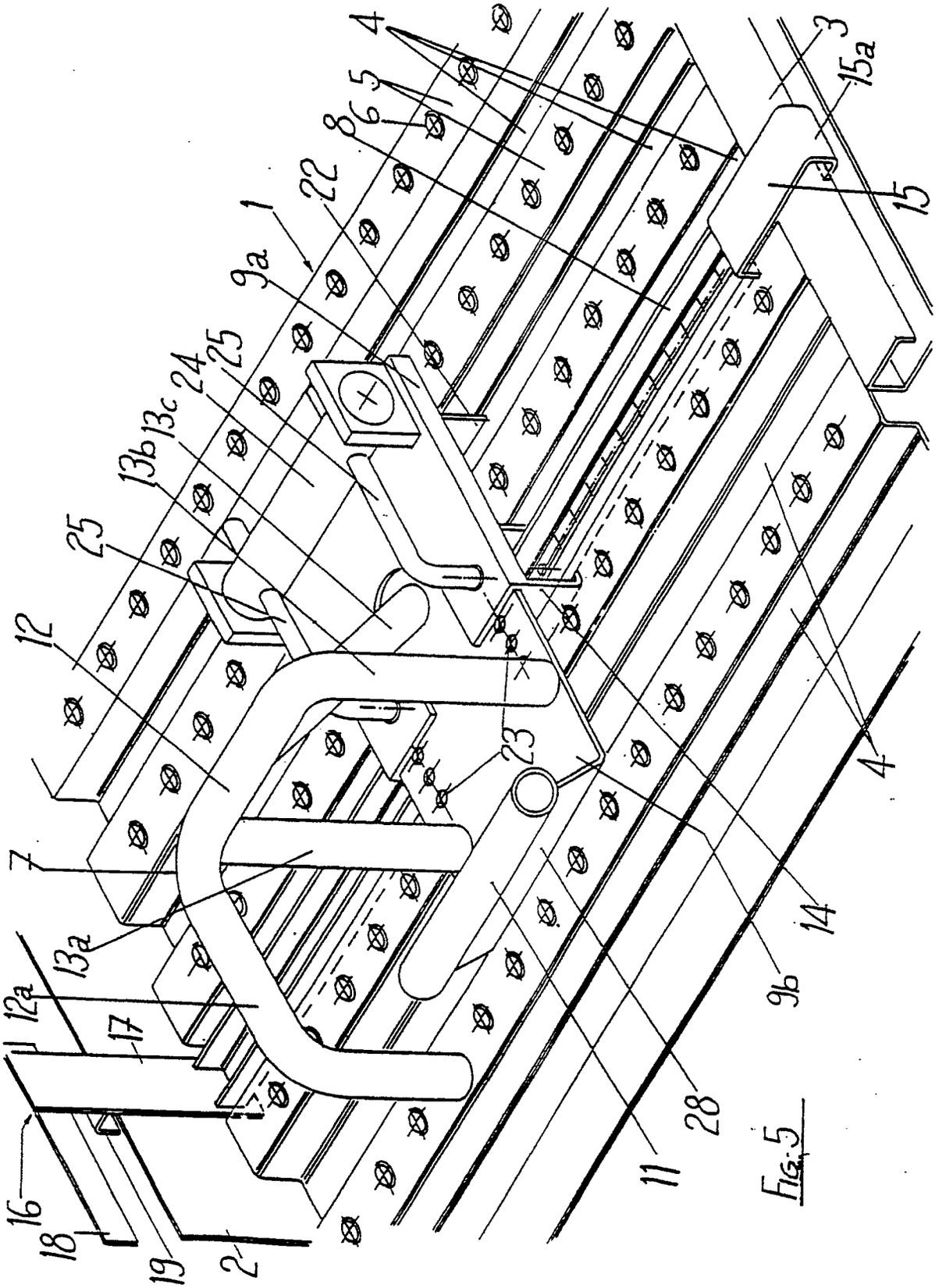
4
3
15a
5
6
8
22
1
9a
15
25
24
13c
13b
25
12
23
4
7
14
13a
12a
9b
17
28
16
11
18
19
2

Fig. 5

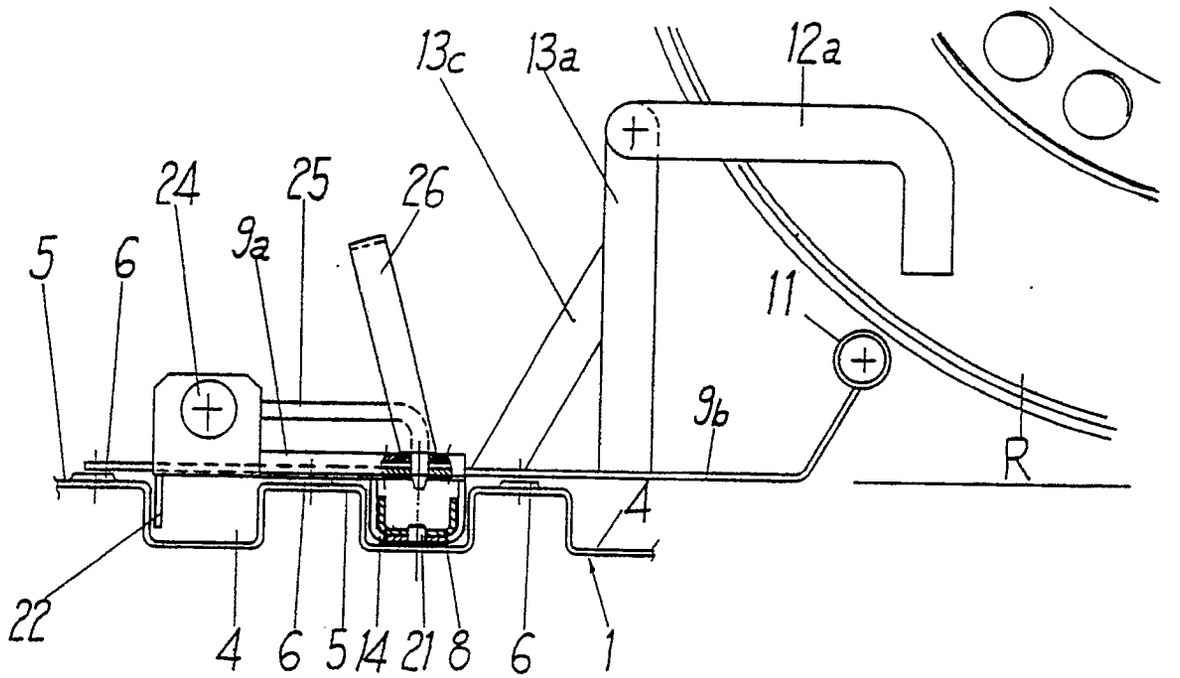
13c
13a
12a
24
25
26
9a
5
6
11
9b
R
4
22
4
6
5
14
21
8
6
1

FIG.-6

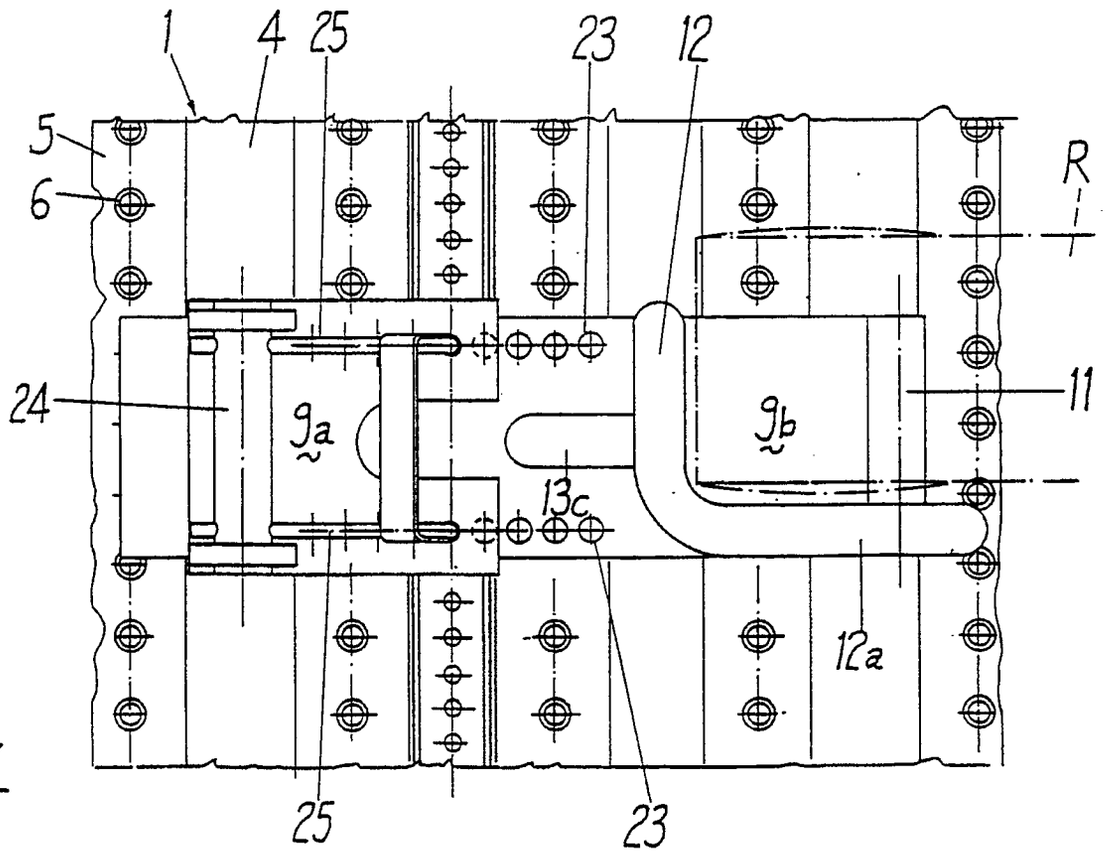
1
4
25
23
12
5
6
R
24
9a
9b
11
13c
12a
25
23

FIG.-7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 83 0051

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 372 806 (MOYER) * Abstract; column 3, line 50 - column 7, line 52; figures 1-3 *	1,3,12	B 61 D 45/00 B 61 D 3/18
A	US-A-4 836 726 (ROBERTSON et al.) * Abstract; figures 4-6 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 61 D

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	12 November 90	SCHMAL R.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention

E: earlier patent document, but published on, or after the filing date
D: document cited in the application
L: document cited for other reasons

&: member of the same patent family, corresponding document