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(11) Publication number:

0 636 762 A1

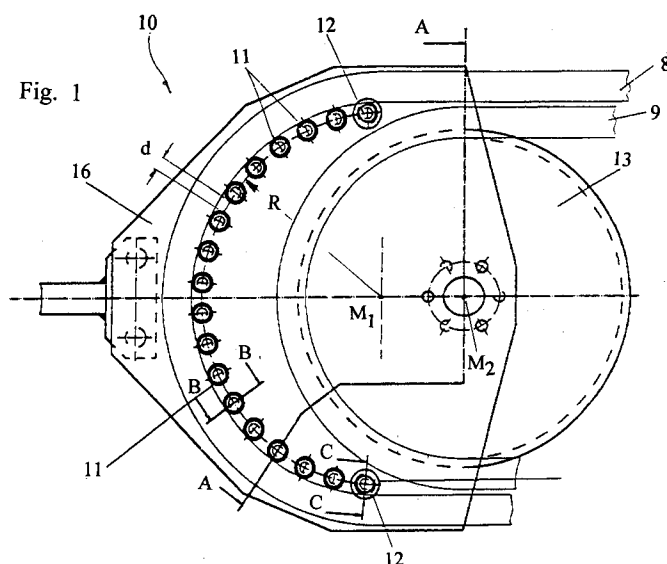
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EUROPEAN PATENT APPLICATION(21) Application number: **94111905.9**(51) Int. Cl.⁶: **E06C 5/04, B67D 5/365, A62C 33/04**(22) Date of filing: **29.07.94**(30) Priority: **30.07.93 DE 4325597**(43) Date of publication of application:
01.02.95 Bulletin 95/05(84) Designated Contracting States:
AT CH DE ES FR GB IT LI SE(71) Applicant: **IVECO MAGIRUS AG**
Nikolaus-Otto-Strasse 25-27
D-89070 Ulm (DE)(72) Inventor: **Hörsch, Heiner**
Brucknerweg 2
D-89179 Beimerstetten (DE)(74) Representative: **Cerbaro, Elena et al**
c/o Studio Torta, Via Viotti 9
I-10121 Torino (IT)

(54) **A turntable assembly with installed flexible guide ropes, particularly a turntable ladder of a fire-fighting vehicle.**

(57) 2. In a turntable assembly (1), particularly a turntable ladder of a fire-fighting vehicle, having a ladder assembly and flexible guide ropes (8, 9) laid to the top of the ladder and which are passed over deflection units (10) attached to the end faces of ladder diagonals (7), at least one deflection unit (10) has a row of rollers (11) disposed substantially in a semicircle, via which a guide rope (8) is guided

along the semicircular arc which determines the radius of deflection (R) of the guide rope (8), the rollers (11) having a radius (r) which is very small compared with the radius of deflection (R). By this means a very compact design of deflection unit for a plurality of guide ropes can be achieved, without the guide ropes being subjected to excessive bending.

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This invention relates to a turntable assembly, particularly a turntable ladder of a fire-fighting vehicle, having a ladder assembly and flexible guide ropes disposed substantially one above another and laid to the top of the ladder, which guide ropes are passed over deflection units attached to the end faces of ladder diagonals.

In a turntable assembly of the above-mentioned type, a double deflection of two guide ropes disposed one above the other is known, wherein two comparatively large single pulleys are seated one behind the other in a support bracket, which in turn is attached to the ladder diagonals. The single pulley facing the attachment point has a slightly larger diameter than the other, more remote single pulley, so that both guide ropes are situated comparatively closely one above the other but without contact. The large overall length of the deflection unit, which is determined by the two single pulleys disposed one behind the other, is a disadvantage. The known deflection unit is not suitable for use in a turntable assembly where space is very restricted. If, as in another constructional variant, both deflection pulleys are disposed not one behind the other but side by side in parallel, the space requirement increases in width. However, for turntable assemblies a narrow type of construction is exactly what matters, since the deflection units are situated in the region of the ladder diagonals of the ladder assemblies between the upper and lower beams and are also slightly inclined.

The object of the present invention is to create a turntable assembly of the type cited initially in which the deflection unit is constructed in a very space-saving manner.

The object forming the basis of the invention is achieved by the means cited in the characterising clause of claim 1.

The subject of the invention is advantageously developed further by the features of subsidiary claims 2 to 13.

The essence of the invention is that at least one deflection unit is provided with a row of rollers disposed substantially in a semicircle, via which a guide rope is guided along the semicircular arc which determines the radius of deflection of the guide rope, the rollers having a radius which is very small compared with the radius of deflection.

It is particularly advantageous if the small rollers are of substantially identical construction, wherein in an advantageous further development of the subject of the invention a profiled roller may be provided at each end of the semicircular arc, the radius of which profiled rollers corresponds to that of the other small rollers.

All the rollers may be spaced apart at the same distance from each other. The rollers are preferably situated closely one behind another in a

row on the semicircular arc, but without mutual contact between them.

The rollers have axes of rotation which run parallel to each other.

It is also advantageous for a roller according to the invention if the deflection unit additionally comprises a single central deflection pulley, which is large compared with the rollers, for the deflection of another guide rope. In this respect the profiled rollers are situated in close proximity to the large central deflection pulley or to the other guide rope guided on this large deflection pulley without contacting the latter.

The small rollers preferably consist of self-lubricating plastic material, and the bearing pins of the small rollers have tubular stainless steel elements, which are advantageously distance bushes which are disposed between the side cheeks of the support bracket of a deflection unit. The distance bushes are screwed down to fixed bearing bolts between the side cheeks of the support bracket.

If more than two guide ropes are to be deflected on a single deflection unit, an additional row of rollers of the above-mentioned type may be provided for a third, outer guide rope.

Therefore, by means of the invention at least one of the two flexible ropes to be deflected in the same region is not passed over a single pulley, the radius of which corresponds to the radius of deflection, but is passed over a row of rollers disposed in a circle, which results in an extremely space-saving arrangement. The centres of the radii of deflection are thereby displaced in parallel in order to permit the maximum radii of deflection for a given overall height of the deflection unit. Due to the extremely space-saving mode of construction, a plurality of flexible ropes can be accommodated using a single deflection unit.

The invention is described in more detail below in terms of an example of an embodiment and with reference to the accompanying drawings, where:

Figure 1 is a schematic vertical section through a deflection unit with two flexible guide ropes to be deflected;
 Figure 2 is a section through the deflection unit shown in Figure 1 along the line A-A;
 Figure 3 is a section along line B-B of Figure 1;
 Figure 4 is a section C-C from Figure 1;
 Figure 5 is a schematic vertical section through the right half of a five-piece ladder assembly, illustrating the installation of double deflection units in the region of the ladder diagonals at the side; and
 Figure 6 illustrates a prior art deflection unit similar to that of Figure 1.

As shown in Figures 1 to 5, a turntable assembly (1) is provided in the form of a turntable ladder of a fire-fighting vehicle, the ladder assembly having five individual ladder parts (2 to 6) as can be seen in particular from Figure 5. Each ladder part has horizontal rungs (18), a lower beam (19), an upper beam (20) and ladder diagonals (7) between the lower and upper beam. So that the individual ladder parts can be extended or telescopically retracted, the flexible (electrical and/or hydraulic) guide ropes, which are installed in the ladder assembly and which run from the lowest (largest) ladder part (6) to the uppermost (smallest) ladder part (2), have to be passed over deflection units (10) which are located in the region of the ladder diagonals (7). In particular, front and rear deflection units (10) for two guide ropes (8, 9) disposed one above the other are provided in each case on the second and fourth ladder parts (3 and 5). In this respect the front deflection units are inclined slightly to the left in relation to the vertical, and the rear deflection units (10) are inclined slightly to the right in relation to the vertical.

A single deflection unit (10) is illustrated schematically in Figure 1. It comprises a relatively large central single deflection pulley (13) for deflecting a guide rope (9) which deflection pulley is rotatably mounted in a support bracket (16) which is disposed substantially horizontally, the end of the support bracket (16) remote from the bearing point being attached to the associated ladder diagonal (7) between the upper and lower beams.

The deflection unit (10) is also designed for an additional guide rope (8) which is led round a row of small rollers disposed substantially in a semicircle, these small rollers having a very small radius (r) compared with the radius of deflection (R). On account of the multiplicity of small rollers the centre (M_1) of the semicircular arc or of the radius of deflection (R) can be placed in the vicinity of the centre (M_2) of the comparatively large central deflection pulley (13), so that a short overall length is achieved for a double deflection unit for two guide ropes. This short overall length is directly advantageous when space is very constricted, which is not the case for the prior art as shown in Figure 6, for example, in which two comparatively large single pulleys are responsible for the considerable overall length of the deflection unit, and the long overall length impairs the lateral guidance of a guide rope.

The rollers (11) for deflecting the guide rope (8) are of substantially identical construction, and in the embodiment illustrated are disposed on the semicircular arc at a uniform spacing (d) from each other. Whilst the majority of the rollers (11) are constructed as illustrated in Figure 3, the first and the last roller (12) of the semicircular arc, which are placed in the region of the guide rope (9), are of

profiled construction as shown in Figure 4 in order to ensure guidance run-in and run-out without problems, whilst the remaining rollers (11) inexpensively consist of standard plain bearings. A large number of rollers (11, 12) is employed, in order to keep the angle of deflection and thereby the bending stress on the guide rope (8) low. The deflection unit is of maintenance-free construction in that the rollers consist of self-lubricating plastics and the bearing pins consist of tubular stainless steel elements (14) which at the same time function as distance bushes which are braced between the side checks (16) by fixed bearing bolts (17) as supports.

The central deflection pulley (13) may optionally also be designed as a row of rollers of the type employed for the deflection of the guide rope (8). A third row of rollers for a third guide rope may also be disposed in the same deflection unit (10).

Even though a "semicircular arc" is mentioned for the invention, the rollers may be disposed according to the invention on a portion of an ellipse. The length of a semicircular arc does not have to be exactly half a circle.

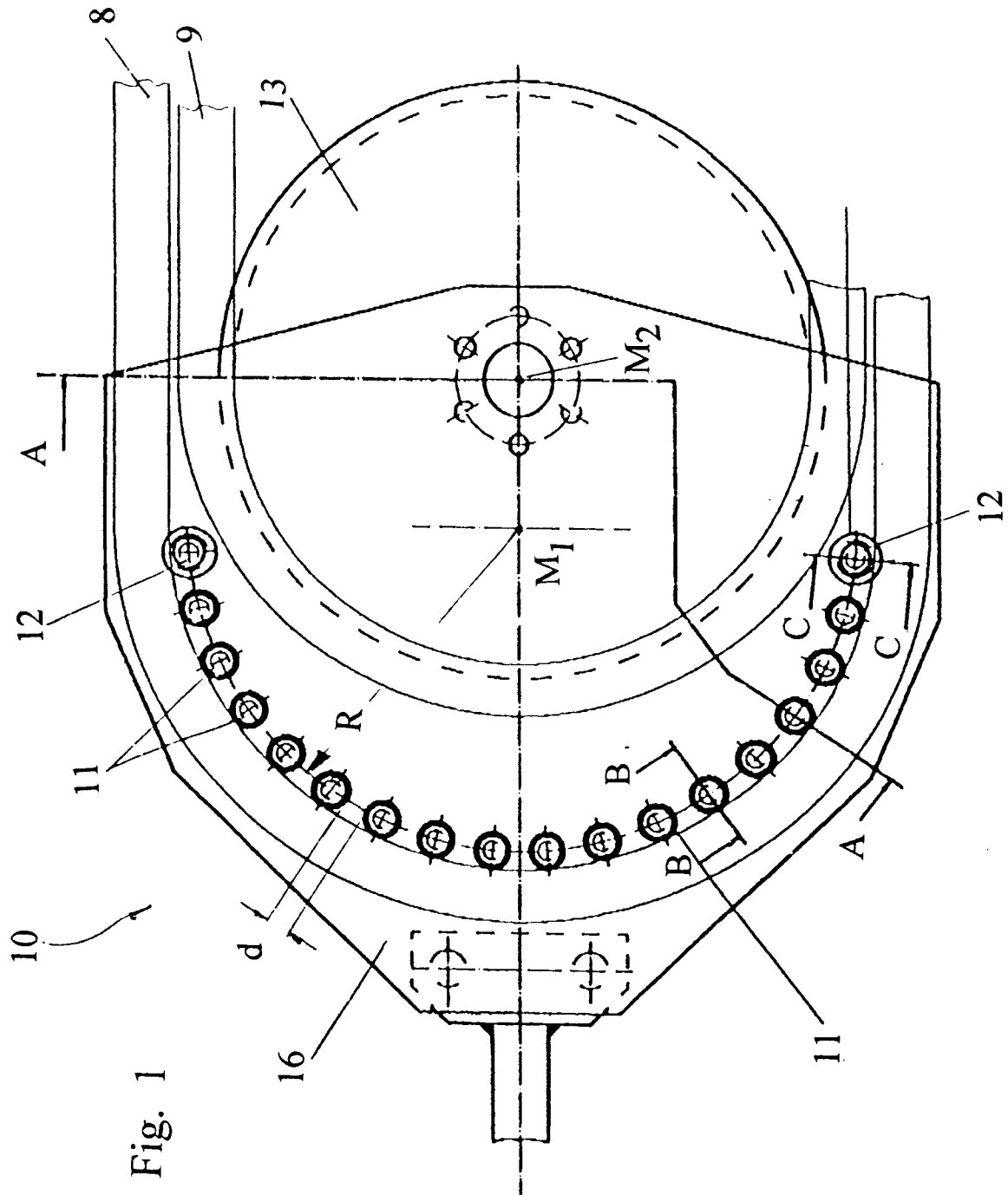
Claims

1. A turntable assembly (1), particularly a turntable ladder of a fire-fighting vehicle, having a ladder assembly (2 to 6) and flexible guide ropes (8, 9) disposed substantially one above another and laid to the top of the ladder, which guide ropes are passed over deflection units (10) attached to the end faces of ladder diagonals (7), characterised in that at least one deflection unit (10) is provided with a row of rollers (11) disposed substantially in a semicircle, via which a guide rope (8) is guided along the semicircular arc which determines the radius of deflection (R) of the guide rope (8), wherein the rollers (11) have a radius (r) which is small compared with the radius of deflection (R).
2. A turntable assembly according to claim 1, characterised in that the rollers (11) are of substantially identical construction.
3. A turntable assembly according to claim 1 or 2, characterised in that a profiled roller (12) is provided at each end of the semicircular arc, the radius of which roller corresponds to the radius (r) of the other rollers (11).
4. A turntable assembly according to claim 2 or 3, characterised in that the rollers (11, 12) are spaced apart at the same distance (d) from each other.

5. A turntable assembly according to any one of claims 2 to 4, characterised in that the rollers (11, 12) are situated in close proximity to each other but do not contact each other. 5
6. A turntable assembly according to any one of claims 1 to 5, characterised in that the rollers (11, 12) have axes of rotation which run parallel to each other. 10
7. A turntable assembly according to any one of claims 1 to 6, characterised in that the deflection unit (10) comprises a single central deflection pulley (13), which is large compared with the rollers (11, 12), for the deflection of another guide rope (9). 15
8. A turntable assembly according to claim 7, characterised in that the profiled rollers (12) are situated in close proximity to the large central deflection pulley (13) or to the other guide rope (9) but do not contact the latter. 20
9. A turntable assembly according to any one of claims 1 to 8, characterised in that the rollers (11) consist of self-lubricating plastic material. 25
10. A turntable assembly according to any one of claims 1 to 9, characterised in that the bearing pins of the rollers (11) have tubular stainless steel elements (14). 30
11. A turntable assembly according to claim 10, characterised in that the stainless steel elements are distance bushes which are disposed between the side cheek (15) of the support bracket (16) of the deflection unit (10). 35
12. A turntable assembly according to claim 10, characterised in that the distance bushes are screwed to fixed bearing bolts between the side cheeks (15) of the support bracket (16). 40
13. A turntable assembly according to any one of claims 1 to 12, characterised in that the deflection unit (10) has an additional row of rollers for the deflection of a third (outer) guide rope. 45

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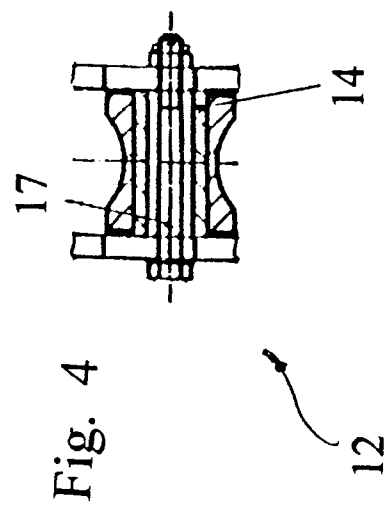
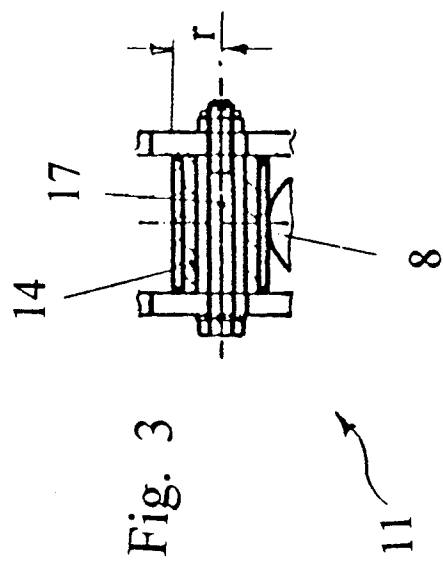
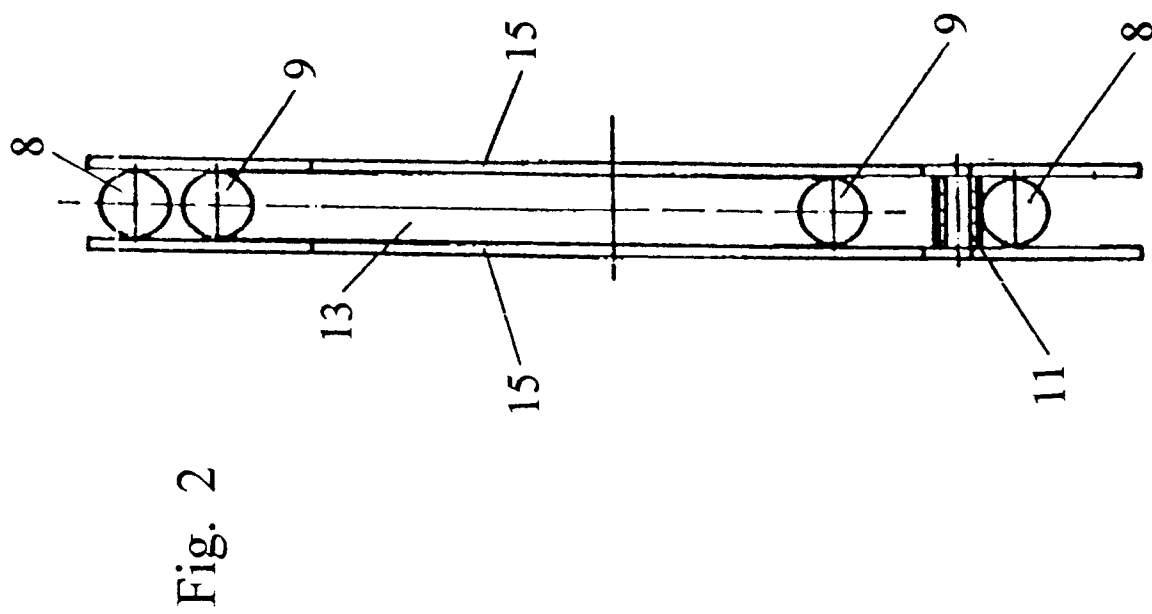


Fig. 5

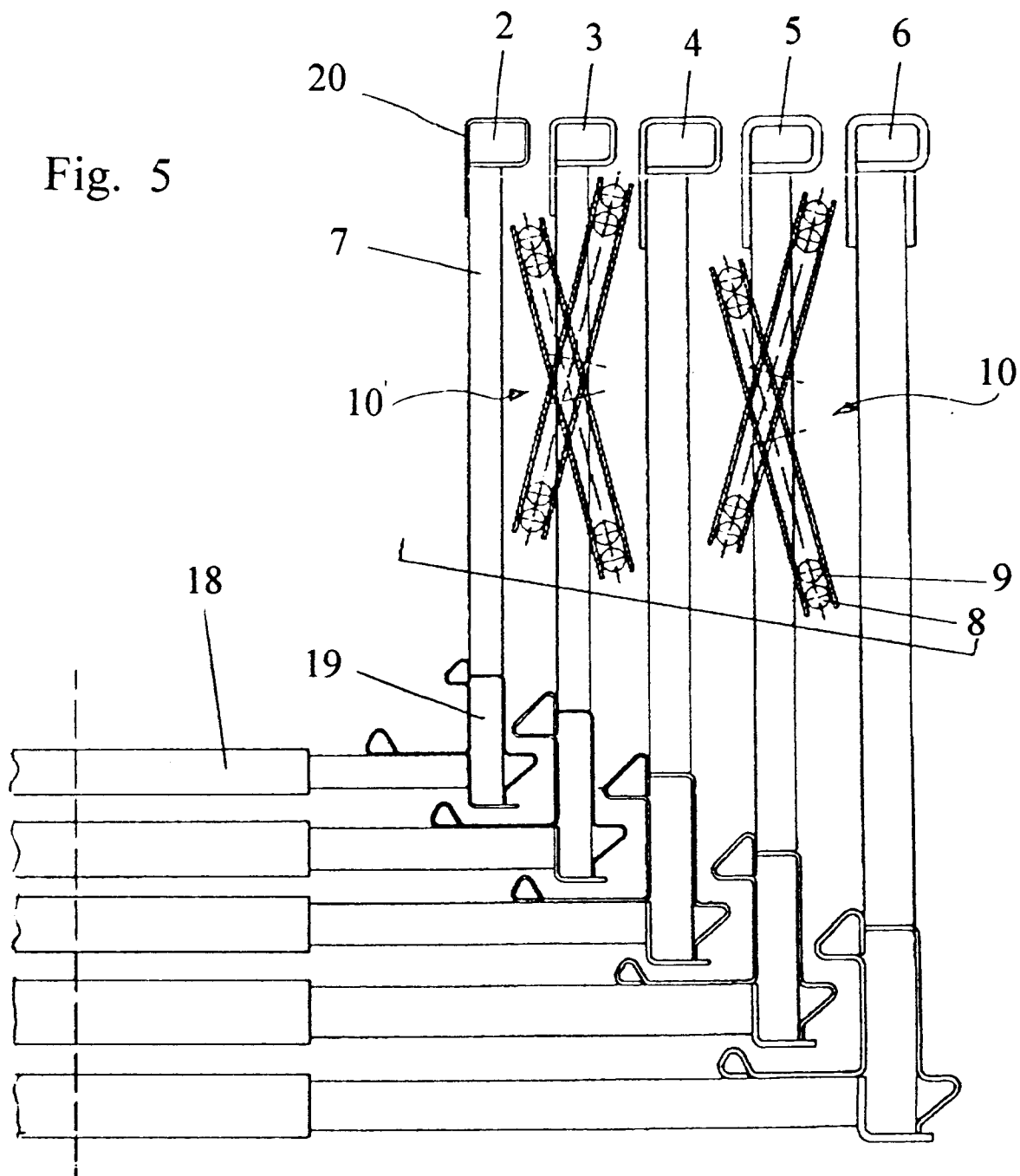
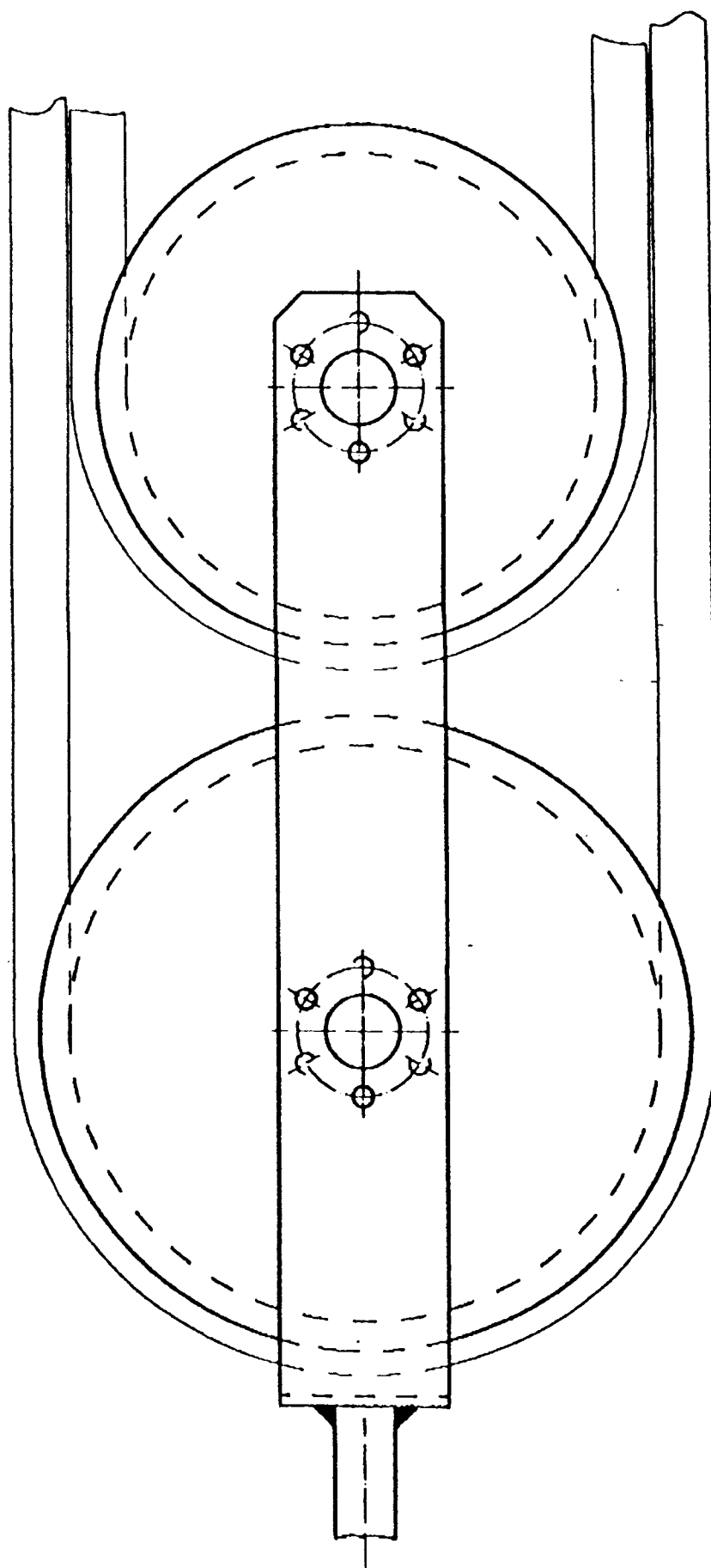


Fig. 6





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EUROPEAN SEARCH REPORT

Application Number
EP 94 11 1905

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.6)
Y A	DE-A-21 23 419 (KLÖCKNER-HUMBOLDT-DEUTZ) * page 3, last paragraph - page 5; figures * ---	1,2,4-6 3,7-13	E06C5/04 B67D5/365 A62C33/04
Y A	EP-A-0 379 742 (KOPPENS B.V.) * column 2, line 21 - line 47; figures 1-3 *	1,2,4-6 3,7-13	
A	AU-B-520 084 (ABBEY ENG.) * page 15 - page 16; figures * ---	1	
A	US-A-2 732 992 (E. J. ARPS) * column 4, line 4 - line 24; figures 3,4 *	1	
A	US-A-2 660 337 (W. M. HARKS) * figures * ---	1-6,9-11	
A	US-A-2 601 073 (B. WAGNER) * figures 6-10 * ---	1-6,8-10	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	DE-B-10 14 452 (GILBERT & BARKER) * figures * ---	1-6, 8-10,12	E06C B67D A62C B66D
A	US-A-2 776 093 (J. H. COX ET AL.) * figures * ---	1	
A	GB-A-2 143 885 (IVECO MAGIRUS) * abstract; figures * -----	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 October 1994	Examiner Righetti, R
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