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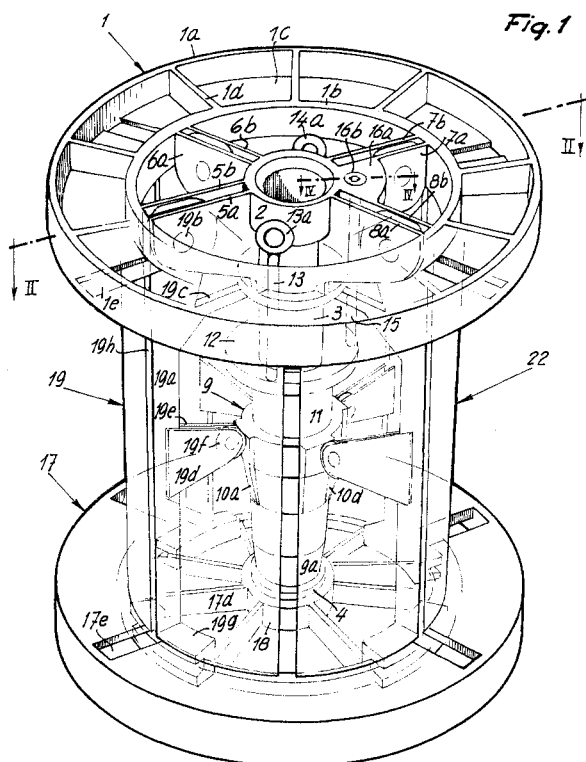
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(54) **Multipart reel for coil of wire**

(57) A multipart reel for a coil of wire, comprising: an upper flange (1) with spokes for connection to a first hub (2) which is connected to the end of a column (3) provided with a second hub (4) at its other end; a slider (9), which can slide on the column (3) and has at least one plurality of inclined planes and means for coupling to lifting means; a lower flange (17), provided with spokes

(17d) for connection to a hub (18) which is adapted to mate with the second hub arranged at the end of the column and shaped so as to form engagement means; a plurality of curved panels (19, 22), which are adapted to form a winding surface, are hinged on the spokes of the upper flange (1) and have engagement means at their lower end.



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Description

[0001] The present invention relates to a multipart reel for a coil of wire.

[0002] It is known that wire, at the output of the drawing machines where it is formed and in further steps of its production process, is wound in coils held on reels, and that in a very common embodiment such reels can be disassembled in order to allow to separate the formed coils, which are sent to shipping, while the reels remain on site and are reused after reassembly.

[0003] Conventional reels have characteristics which are not entirely satisfactory; accordingly, the aim of the present invention is to provide a multipart reel featuring constructive simplicity and good functional characteristics.

[0004] This aim is achieved by a multipart reel for a coil of wire, according to the invention, characterized in that it comprises:

- an upper flange, provided with spokes for connection to a first central hub which is monolithically connected to one end of a column with which a second hub is monolithically associated at the other end;
- a slider, which is slidingly associated with said column, comprises at least one plurality of inclined planes which slope downward, and is provided with means for coupling to lifting means;
- a lower flange, provided with spokes for connection to a central hub which is adapted to mate with the second hub arranged at the end of the column and shaped at the inner ring so as to form a plurality of engagement means;
- a plurality of curved panels, which are adapted to form, when arranged side by side, a surface on which the coil can be wound, said panels being hinged at their upper end on the spokes connected to the upper flange and being provided, at their lower end, with engagement means which are adapted to mate, following mutual approach and contact in a radial direction, with the engagement means comprised within the inner ring of the lower flange, each curved panel being provided with a wheel which is adapted to make contact with at least one of the inclined planes provided on the slider.

[0005] Further characteristics and advantages will become better apparent from the description of a preferred but not exclusive embodiment of the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a view of the reel, ready to receive a coil, with parts shown in phantom lines;

Figure 2 is a sectional view, taken along the line II-II, of Figures 1 and 3;

Figure 3 is a sectional view, taken along the line III-III of Figure 2;

Figure 4 is a sectional view, taken along the line IV-IV of Figure 1;

Figures 5 to 8 are views of different steps of the operation for disassembling the reel.

[0006] With reference to the figures, the reference numeral 1 generally designates the upper flange, which comprises an outer ring 1a and an inner ring 1b, connected by a flat metal plate 1c in the presence of reinforcement ribs 1d, and is provided with spokes for connection to a central hub 2, which is monolithically connected to a column 3, with which a central hub 4 is monolithically associated at the other end.

[0007] More specifically, the connecting spokes are divided into four pairs: a first pair, formed by the spokes 5a and 5b; a second pair, formed by the spokes 6a and 6b; a third pair, formed by the spokes 7a and 7b; and a fourth pair, formed by the spokes 8a and 8b.

[0008] The result is a monolithic assembly formed by the flange 1, by the four pairs of spokes, by the first central hub 2, and by the column 3, with the second central hub 4.

[0009] Moreover, the reference numeral 9 generally designates a slider which is slidingly associated with the column 3 and comprises first of all a main body in which four inclined planes, designated by the reference numerals 10a, 10b, 10c and 10d respectively, protrude from an overlying cylindrical portion and slope downward; said body has, after a cylindrical portion, a conical end 9a; in any case, it is clarified that a conical surface might equally be provided instead of the four inclined planes, and that likewise four inclined planes arranged consecutively to the planes such as 10a might be provided instead of the conical end 9a.

[0010] An abutment disk 12, whose function will be clarified hereinafter, is monolithically associated with the main body of the slider 9, with the segment 11 interposed; two diametrically opposite stems 13 and 14 for supporting eyes 13a, 14a for coupling to hooks of a lifting means protrude monolithically from said disk.

[0011] A stem 15 also protrudes monolithically from the disk 12 and is inserted, at its upper end, in a cavity 16 formed in a gusset 16a that connects the spokes 7a, 8b rigidly coupled to the upper flange 1, and is adapted to make contact, during the operating steps described hereinafter, with an actuation cylinder 16b, which is associated by threaded coupling with the wall of the cavity 16.

[0012] The reference numeral 17 generally designates the lower flange, which comprises an outer ring 17a and an inner ring 17b, which are connected by a flat plate 17c in the presence of reinforcement ribbing, and is provided with spokes such as 17d for monolithic connection to a central hub 18, which is adapted to mate with the hub 4 at the end of the column 3: the particular shape of the inner ring 17b constitutes an engagement means which will be described hereinafter. The reel according to the invention comprises four curved panels

19, 20, 21, 22, which are adapted to form, when arranged side by side, a cylindrical surface on which a coil 23 can be wound.

[0013] The curved panel 19 is provided with a central rib 19a, which is monolithically connected thereto, fits between the spokes 5a and 5b and is pivoted thereto at 19b, with the tab 19c, which is adapted to make contact with the abutment disk 12 of the slider 9, and with jaws 19d, 19e welded thereto; such jaws support a wheel 19f, which is adapted to make contact with the inclined plane 10a and with the conical end 9a of the slider 9; at its lower end, the curved panel 19 has a ring portion 19g, whose cross-section is complementary to the cross-section of the inner ring 17b of the lower flange, so as to engage it following approach in a radial direction.

[0014] As regards the curved panel 19, it is also noted that it is provided with a longitudinal groove 19h at the radial openings 1e on the flange 1 and 17e of the flange 17, so as to allow the passage of straps for closing the coil of wire.

[0015] As clearly shown by the figures, the other curved panels 20, 21, 22 have the same configuration and accordingly are not described in detail.

[0016] Finally, attention is called to the presence, in the invention, of reference elements which are adapted to prevent unwanted mutual rotations of the various components.

[0017] With reference to Figures 5 to 8, operation of the invention is now described starting from the situation of Figure 5, in which it is assumed that a coil of wire is wound onto the cylindrical surface formed by the four curved panels.

[0018] The lifting means are activated and cause the upward sliding of the slider 9 on the column 3, with consequent movement of the wheels such as 19f, which abandon the cylindrical portion on which they rest and slide on the inclined planes such as 10a: this produces an inward rotation of the curved panels such as 19, caused by the energy accumulated in the coil of wire, which in this manner is gradually discharged until it is substantially eliminated when the situation shown in Figure 6 is reached, i.e., when the wheels such as 19f have covered the entire length of the inclined planes such as 10a.

[0019] The disengagement of the curved panels such as 19 from the lower flange 17 has thus begun.

[0020] As the upward sliding movement of the slider 9 on the column 3 continues, the wheels such as 19f make contact with the conical end 9a, consequently allowing the curved panels such as 19 to perform a further inward rotation up to the position in which the abutment disk 12 makes contact with the tabs such as 19c; this contact determines a final portion of the rotation of the curved panels, which is allowed by the end of contact between the wheels such as 19f and the conical end 9a and places said curved panels in the position in which they are fully disengaged from the lower flange 17, shown in Figure 7.

[0021] In its further upward motion, the slider 9 carries with it the entire reel, with the only exception of the lower flange 17, which at this point is separate from the rest, as shown in Figure 8, and remains on the ground with the coil of wire rested on it, ready for removal.

[0022] The reel must now be reassembled: by way of the descent of the slider 9, the steps described above are repeated in reverse until the situation of Figure 6 is almost reached; from this situation, one achieves the fully open condition of the curved panels with final permanent engagement of the lower flange 17, shown in Figure 5, by manual action on the actuation cylinder 16, which had been removed in order to allow the stem 15 to exit upward from the cavity 16.

[0023] The cylinder 16b is thus returned to its seat and screwed in, producing a downward thrust on the stem 15 until the slider 9 connected thereto reaches the stroke limiting position which attains, by acting on the wheels such as 19f, the intended position in which the curved panels are fully open, with the wheels such as 19f resting on the cylindrical portion of the slider, and the lower flange 17 is engaged.

[0024] The described invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; thus, for example, the number of curved panels can advantageously vary between three and six, and the slider 9 may comprise only inclined planes such as 10a, the end being cylindrical and having such a length as to allow the curved panels to perform the final movement determined by the contact of the corresponding tabs such as 19c with the abutment disk 12; the disk 12 can further be replaced with a plurality of abutments at the tabs of the curved panels.

[0025] In the practical execution of the invention, all the details may be replaced with other technically equivalent elements: for example, wheels such as 19f might be connected to the slider 9, while the inclined planes meant to make contact with them might be rigidly coupled to the corresponding curved panels.

[0026] The disclosures in Italian Patent Application No. MN00A000011, from which this application claims priority, are incorporated herein by reference.

[0027] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. A multipart reel for a coil of wire, **characterized in that** it comprises:

-- an upper flange, provided with spokes for con-

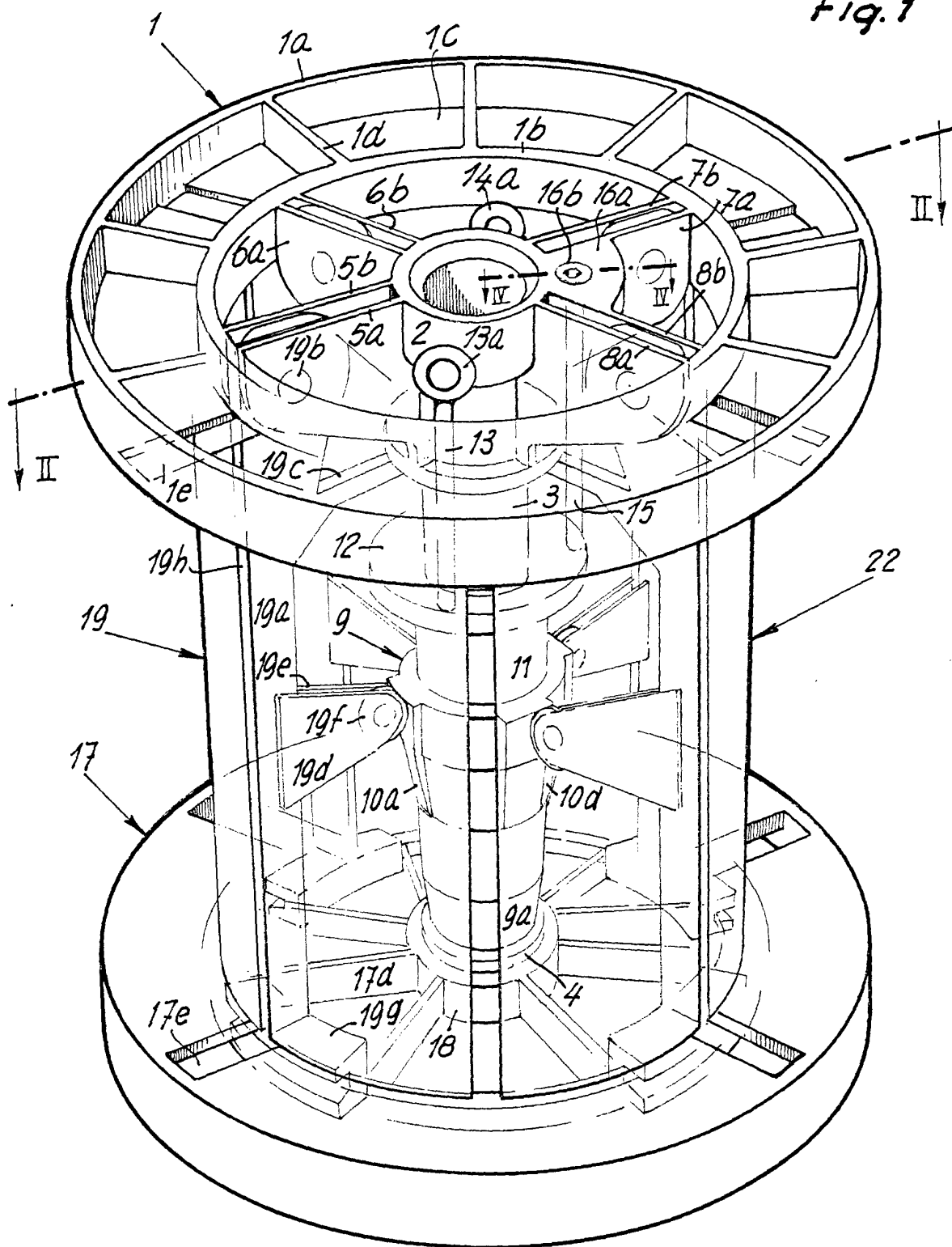
nection to a first central hub which is monolithically connected to one end of a column with which a second hub is monolithically associated at the other end;

- a slider, which is slidably associated with said column, comprises at least one plurality of inclined planes which slope downward, and is provided with means for coupling to lifting means; 5
 - a lower flange, provided with spokes for connection to a central hub which is adapted to mate with said second hub arranged at the end of said column and is shaped at the inner ring so as to form a plurality of engagement means; 10
 - a plurality of curved panels, which are adapted to form, when arranged side by side, a surface on which the coil can be wound, said panels being hinged at their upper end on the spokes connected to the upper flange and being provided, at their lower end, with engagement means which are adapted to mate, following mutual approach and contact in a radial direction, with the engagement means comprised within the inner ring of said lower flange, each curved panel being provided with a wheel which is adapted to make contact with at least one of the inclined planes provided on said slider. 20 25
2. The reel according to claim 1, **characterized in that** each curved panel is provided with a tab which is adapted to make contact, at its lower surface, with an abutment provided on the slider during the last steps of the upward sliding of said slider on said column. 30 35
 3. The reel according to one or more of the preceding claims, **characterized by** the presence of means adapted to determine the simultaneous rotation of the curved panels in the last steps for forming the surface on which the coil is to be wound and for engaging the lower flange. 40
 4. The reel according to claim 1, **characterized in that** the slider comprises a plurality of abutments which are incorporated into a single disk located at the upper end of said slider, two diametrically opposite stems protruding from said disk and supporting end eyes. 45
 5. The reel according to one or more of the preceding claims, **characterized in that** the slider comprises two pluralities of inclined planes which slope downward and follow each other with a small interval, the upper plurality of inclined planes protruding from an overlying cylindrical portion. 50 55
 6. The reel according to one or more of the preceding claims, **characterized in that** it comprises at least

three curved panels.

7. The reel according to one or more of the preceding claims, **characterized in that** the curved panels have longitudinal grooves at radial openings provided in the flanges for the passage of straps for closing the coil of wire.
8. The reel according to one or more of the preceding claims, **characterized in that** the means adapted to determine the simultaneous rotation of the curved panels in the last steps of the formation of the cylindrical surface comprise a stem which protrudes monolithically from the slider and is inserted, at its upper end, in a cavity which is rigidly coupled to the upper flange and is adapted to make contact with an actuation cylinder associated with the wall of said cavity by threaded coupling.

Fig. 1



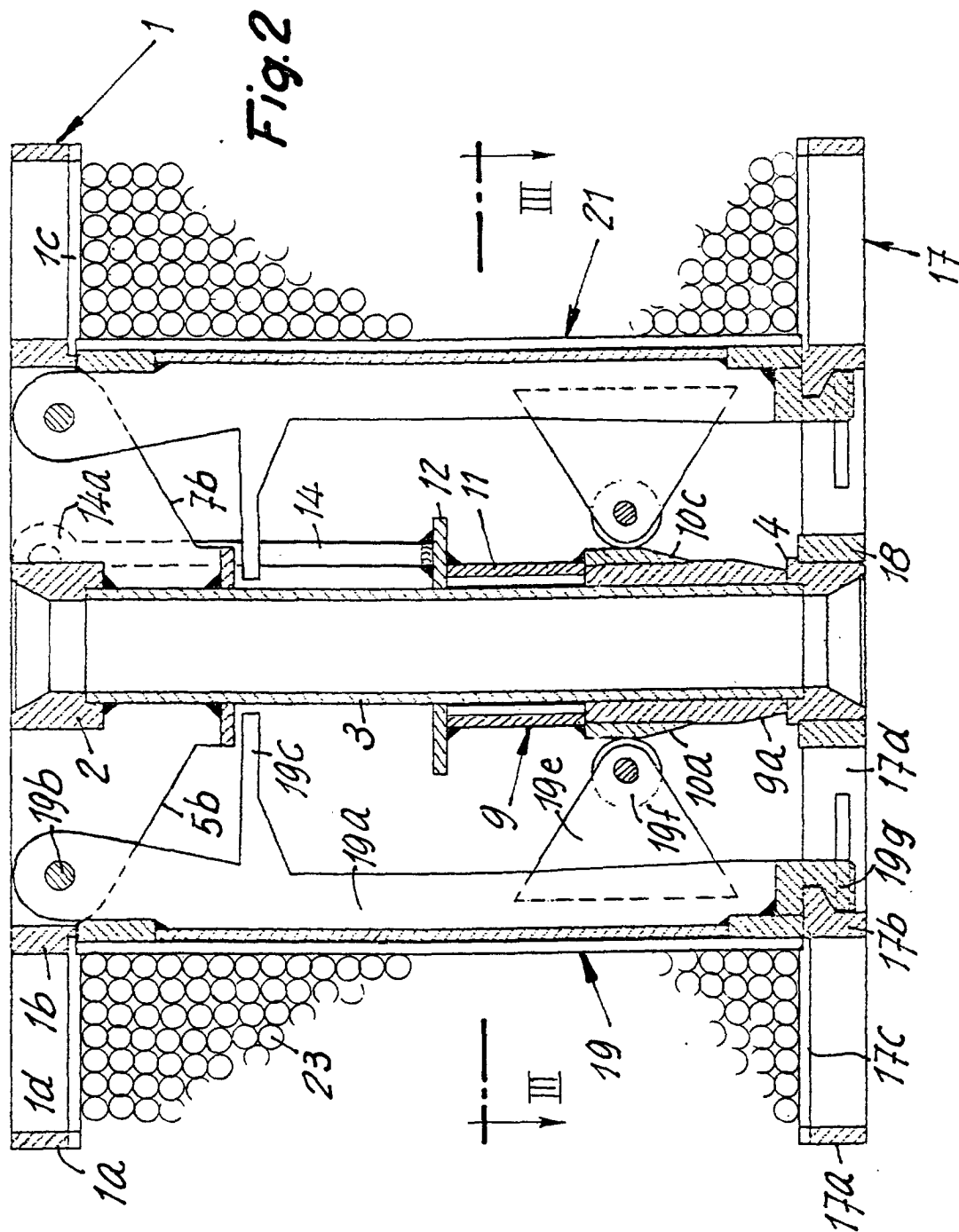


Fig. 3

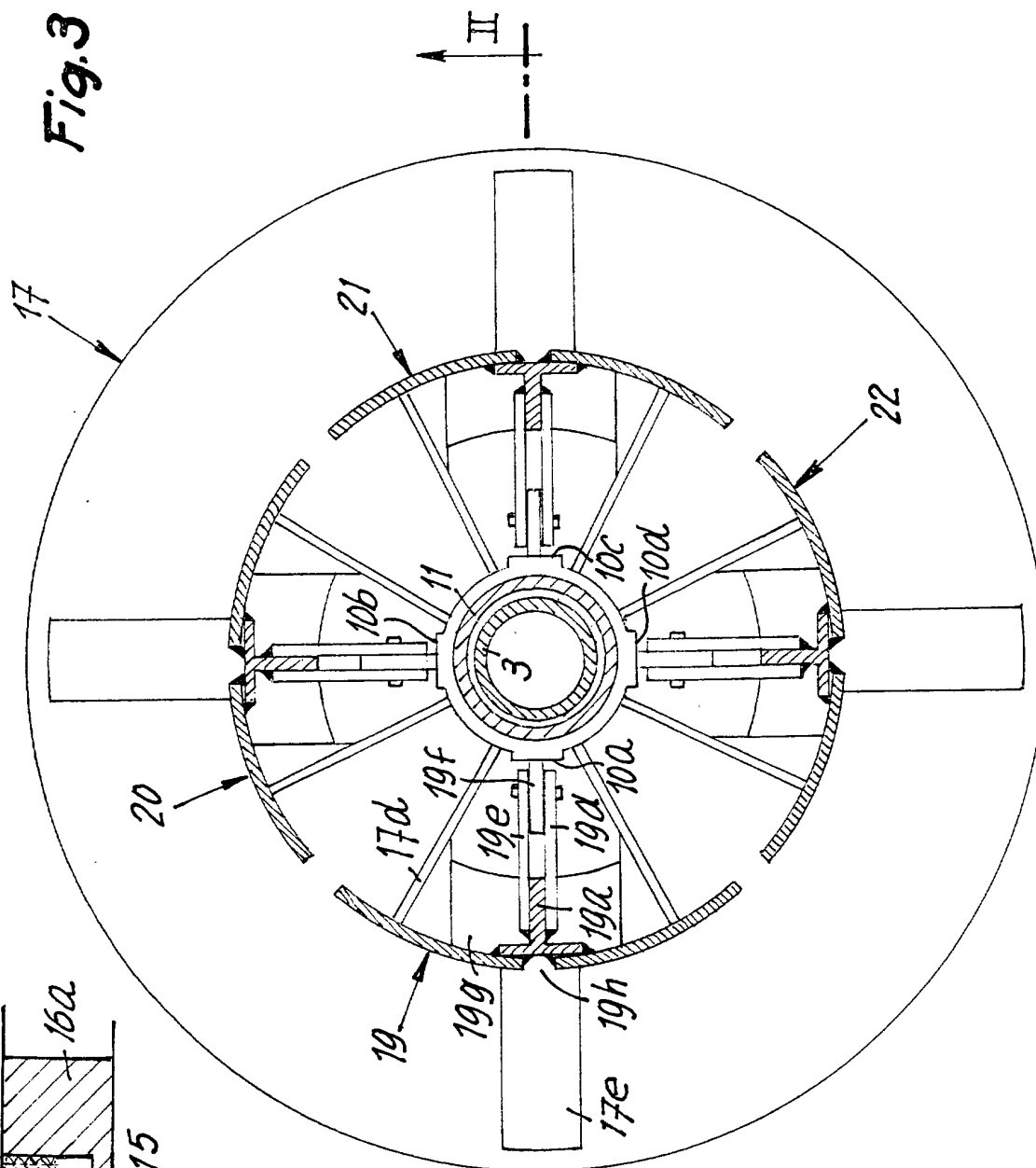


Fig. 4

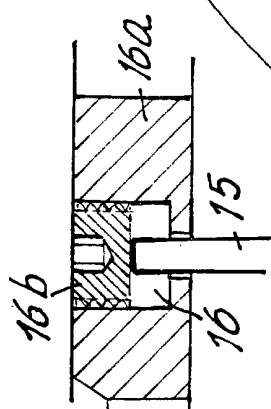


Fig. 5

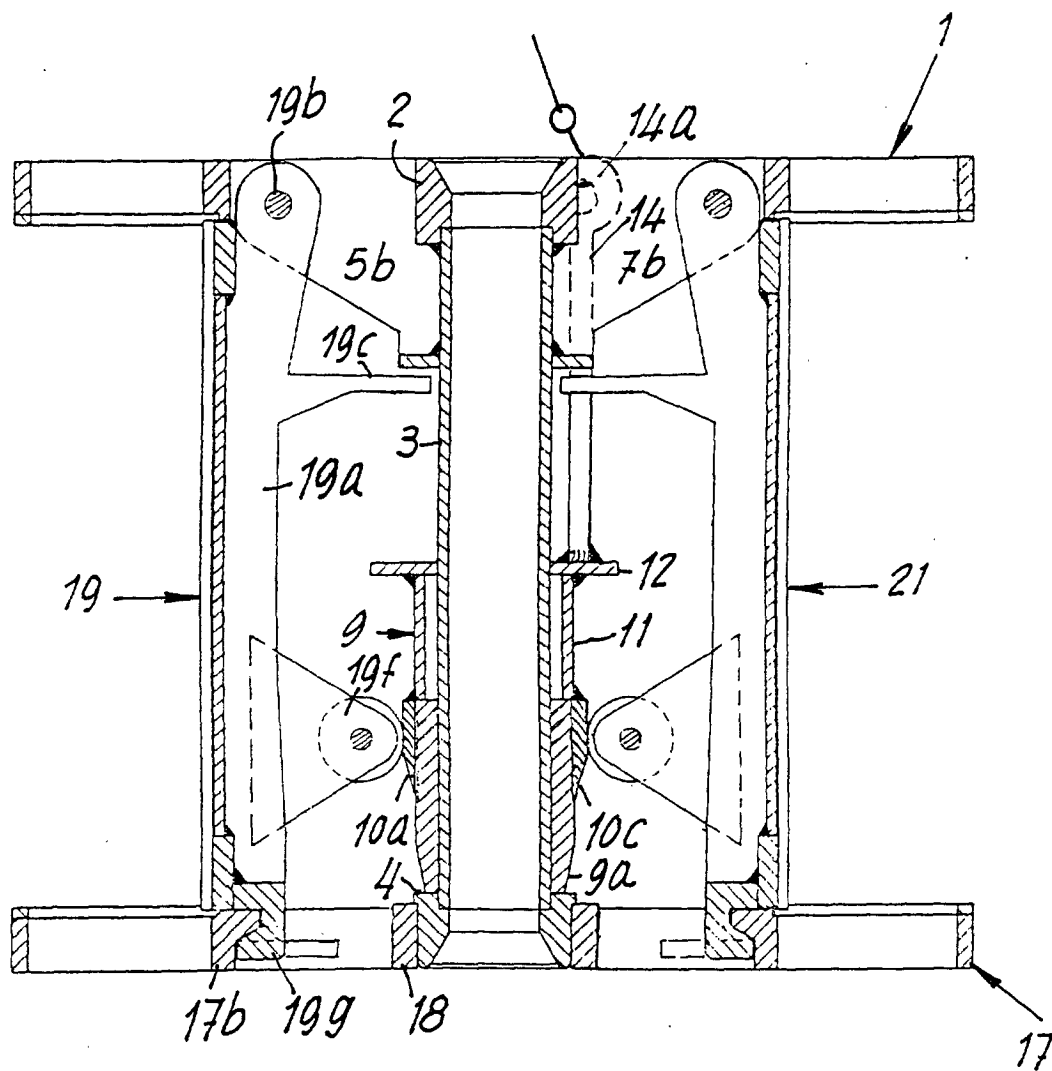


Fig. 6

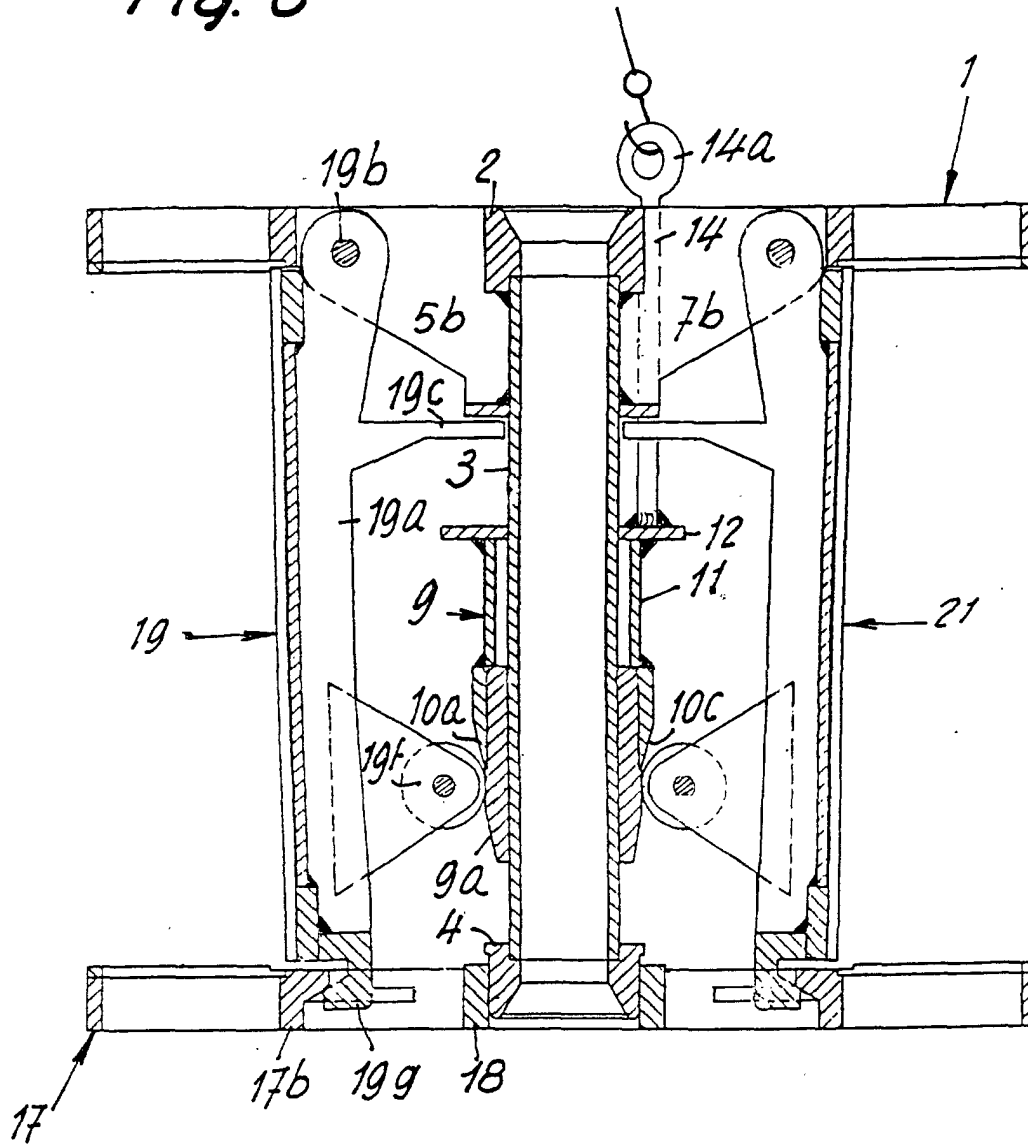


Fig. 7

