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ROPE DRUM AND DRIVING GEAR ARRANGEMENT

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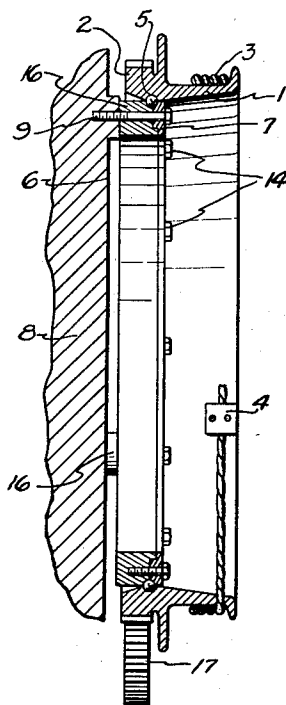


Fig. 1

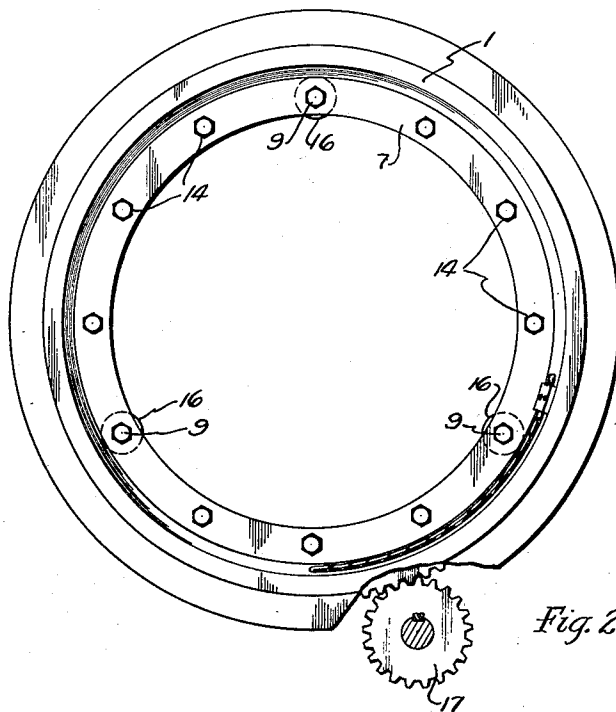


Fig. 2

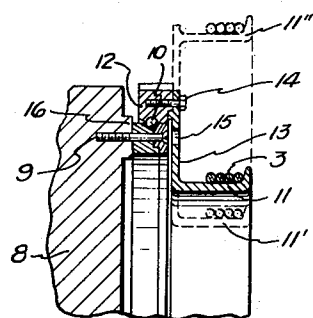


Fig. 3

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ROPE DRUM AND DRIVING GEAR ARRANGEMENT

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4 Claims. (Cl. 242—117)

This invention relates to an improved arrangement of the rope drum in winches and similar devices.

Hitherto, rope drums together with their driving gear were supported in plain or roller bearings arranged in spaced positions with a large distance therebetween. For instance, one of the bearings was disposed in the hub of the driving gear which is screwed to the hoisting drum and the other bearing was disposed in the hub at the opposite end of the rope drum, i.e. opposite to the driving gear. The two bearings generally are mounted on a stationary shaft fastened on the supporting construction, for example, a crane, which shaft may be supported at both ends or arranged in an overhung position.

In the construction of rope drums it is necessary to adhere to certain minimum diameters to avoid undue stressing of the rope. Large diameters of the rope drum extend the life of the rope. On the other hand, small drum diameters necessitate a large length of the drum which in many instances causes difficulties, for instance, in case of rotary cranes intended to travel on roads or in cases where several rope drums are provided for different purposes. Rope drums of a large diameter can be constructed with a short over-all length and permit an advantageous construction and bearing arrangement.

It is an object of the present invention to provide a simple, reliable and cheap construction of a rope drum arrangement embodying a rope drum of a large diameter.

With this and further objects in view according to the present invention the rope drum is supported in an overhung arrangement, by means of a single bearing in the form of an antifriction or ball bearing whose outer race ring is formed by the rim of the driving gear which is combined with its rope drum and whose inner race ring is secured to a suitable part of the stationary supporting construction. In this way it is possible to provide a drum having a large diameter and a short axial width. The ball-bearing therefore is loaded by a relatively small tipping moment only and owing to its large diameter it is subjected to a relatively low stress only. Therefore, the winch house may have a very small width.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and appear in the appended claims forming part of the application.

In the accompanying drawings several now preferred embodiments of the invention are shown by way of illustration and not by way of limitation.

Fig. 1 is an axial section of an arrangement having the invention applied thereto,

Fig. 2 is a front view thereof, on a smaller scale, and

Fig. 3 is an axial section showing a second embodiment.

Similar reference numerals denote similar parts in the different views.

Referring now to the drawing in greater detail and first to Fig. 1 it will be seen that the rope drum 1 is formed integral, for instance in the form of a single casting, with a gear 2 which is driven by a pinion 17.

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The rope 3 is secured in the interior of the drum by means of a clip 4 as known per se.

The rope drum is mounted for rotation on a ball-bearing 5 whose outer race ring is formed by the inner periphery of the rim of the gear 2. Cantilevered outwardly from the antifriction rollers 5 is the rope carrying portion of the rope drum. The inner race ring consists of two parts 6 and 7, the ball race being arranged in the parting line between the parts 6 and 7 to facilitate the introducing of the balls. The inner race ring 6, 7 is secured to the supporting construction 8 by screws and preferably by three screws 9 which are arranged in symmetrical positions, Fig. 2, and engage in female threads in circular bosses 16, Fig. 1, in order to secure the well known advantages of a three point-bearing. The drum together with the complete ball-bearing can be assembled and disassembled in the form of a unitary constructional part.

Referring to Fig. 3 it will be seen that the ball-bearing 10 in this case has a larger diameter than the rope drum 11 which is formed with a flange 13 which is screwed to the driving gear 12 by eight up to twelve symmetrically arranged screws 14 as indicated. Three further bores 15 in the flange 13 serve to permit access to the screws 9 without removal of the rope drum 11. This construction among others permits to use one standard bearing with the same diameter of the toothed wheel or gear 2 in connection with drums 11' or 11'' of different diameters adapted for the exertion of different forces by the rope.

While the invention has been described in detail with respect to certain now preferred examples and embodiments of the invention it will be understood by those skilled in the art after understanding the invention that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended, therefore, to cover all such changes and modifications in the appended claims.

I claim:

1. A crane hoist drum mount comprising a stationary support, an inner bearing ring of greater diameter than axial length secured flatly to said support and having an antifriction bearing raceway in its outer circumferential surface, an outer ring gear mounted on said bearing ring and having an antifriction raceway in its inner peripheral surface and gear teeth on its outer circumferential surface, antifriction rollers mounted in the raceways and between said bearing ring and outer ring gear, and a rope drum of greater diameter than axial length mounted on said ring gear and having a rope carrying portion cantilevered outwardly of said antifriction rollers.

2. A crane hoist drum mount as in claim 1, said inner bearing ring comprising a first part forming a portion of the raceway, and a second part removably attached to said first part and forming the remaining portion of the raceway.

3. A crane hoist drum mount as in claim 1, said rope drum being integral with said ring gear.

4. A crane hoist drum mount as in claim 1, further comprising a flange on said rope drum, and screw means for removably fastening said rope drum to said ring gear.

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