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FAIRLEAD FOR CABLES, ROPES, AND THE LIKE

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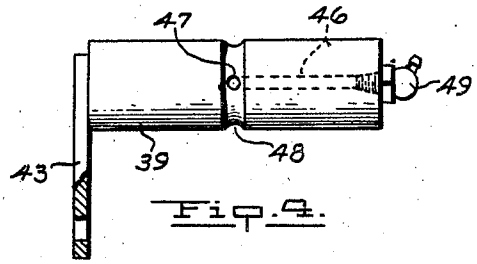


Fig. 4.

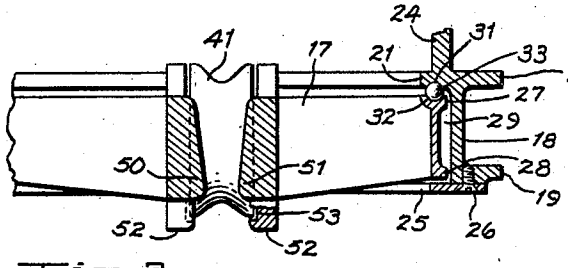


Fig. 3.

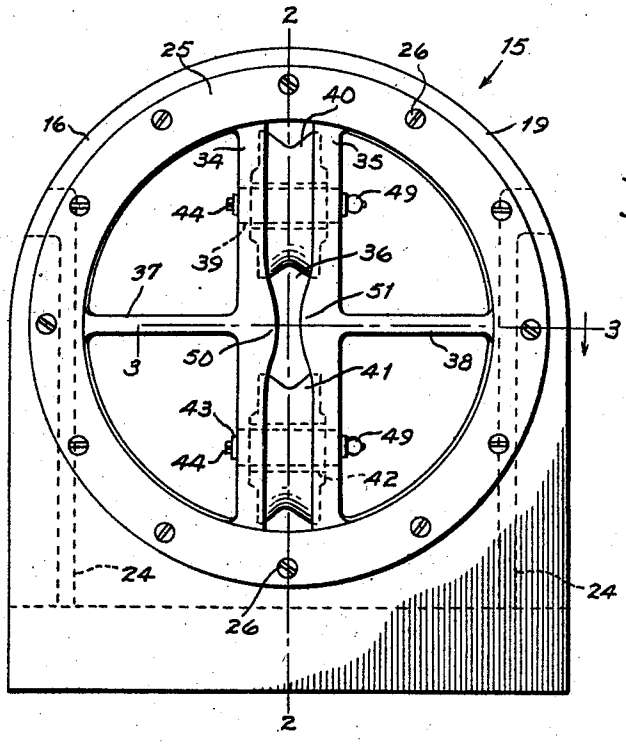


Fig. 1.

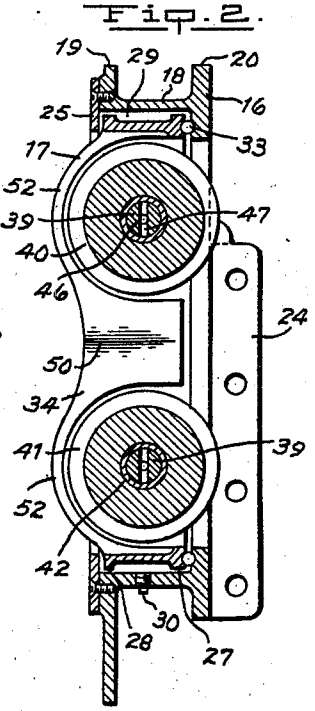


Fig. 2.

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FAIR-LEAD FOR CABLES, ROPES, AND THE LIKE

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4 Claims. (Cl. 254—190)

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This invention relates to fairleads for cables, ropes and the like and more particularly does it relate to devices of this character which are self aligning.

One of the objects of the present invention is to provide a device of this character wherein the fairlead automatically assumes a lead in the direction dictated by changing angles of applied tension of a cable, rope or similar means.

Another object of the invention is to provide a device of this character which will efficiently guide a cable, rope or other medium in its movement from one sheave to another during operation.

A further object of the invention is to provide a device of this character for use in ships and vessels where, without manual assistance, the tension or load applied by the cable will be squarely imposed upon the fairlead irrespective of the directional lead of the cable.

A still further object of the present invention is to provide a device of this nature which is weatherproof in character and will automatically and efficiently operate under salt or fresh water conditions in freezing temperatures or like unfavorable circumstances.

Yet a further object of the invention is to provide a device of this character which is simple and rugged in structure, safe and efficient in operation and one that will more satisfactorily perform the functions required of it.

Having regard to the foregoing and other objects and advantages which will become apparent as the description and the details become known, the invention consists essentially in the novel combination and arrangement of parts hereinafter described in detail and illustrated in the accompanying drawings in which:

Fig. 1 is a front elevational view of an embodiment of the present invention.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a section taken on the line 3—3 of Fig. 1, and

Fig. 4 illustrates a bearing shaft or pin for the sheaves which is shown detached.

Referring now to the accompanying drawings wherein a preferred embodiment of the present invention is disclosed and wherein like letters of reference designate corresponding parts in the different illustrations, the numeral 15 indicates the improved fairlead as a whole and broadly speaking includes a support member or casing 16 and a housing member 17 mounted for axial rotation within the support or casing.

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In structure, the member 16 disclosed includes a support or casing composed of any suitable material having a cylindrical wall structure 18 with outwardly extending flanges 19 and 20 and inwardly protruding flange 21. Integrally formed bracket members 23 and 24 provide means for mounting and detachably securing the fairlead to the side plates or other appropriate structure of a ship, vessel or other structure while a cover plate 25 is detachably connected to the flange 19 by means of screws or the like 26. The cover member 25 is designed to operatively maintain the housing member 17 within the support member 16 in an axially rotatable position as will be later referred to.

The housing member 17 is of substantially cylindrical form and nests within the supporting member 16. The outer peripheral wall of the member 17 is provided with spaced shoulders or rib members 27 and 28 which form a peripheral channel therearound and when the member 17 is mounted within the support 16 the shoulders 27 and 28 define an annular pocket 29 between the two members for the reception of a lubricant, the lubricant being fed to the pocket 29 through a suitable opening which is closed by a detachable plug or the like 30 mounted in the base of the support. By virtue of the structural arrangement just described it will be seen that when the pocket 29 is filled with a lubricant, the housing is substantially floatingly supported within the casing 16 by the lubricant.

Arranged between the support and housing members 16 and 17 respectively in annular recesses 31 and 32, are ball or roller bearings 33. The purpose of the bearings is to reduce friction to a minimum and facilitate rotative movement of the housing within the support member during operation of the fairlead.

As more particularly observed in Figs. 1 and 3, the housing member 17 is provided with spaced supporting arms or webs 34 and 35 providing a rectangular opening 36 therebetween while cross arms 37 and 38 furnish reinforcement for the arm members 34 and 35. Rotatably mounted on bearing shafts 39 in spaced relationship to one another and to the axis of the housing member 17 are cable receiving sheaves or pulleys 40 and 41. Each sheave member is provided with a shaft bushing or the like 42 while the shafts upon which the sheaves are mounted are provided with outwardly extending arm members 43, such arms being secured to the support member 34 by bolt means or the like 44 for detachably securing the

bearing shafts and sheaves in an operative position in the opening 36.

As disclosed in Fig. 4, each bearing shaft is symmetrical in form and is provided with an axial bore 46 which, through a lateral opening 47, communicates with an annular lubricant receiving recess 48 located substantially midway of the bearing shaft or pin. For purposes of introducing a lubricating medium to the recess 48 for purposes of lubricating the sheaves, I provide the ends of the bearing shaft bores with any well known type of grease or other fitting which is indicated by the numeral 49.

Means for guiding a cable or other suitable mooring medium into the sheaves of the fairlead comprise opposed, integrally formed cable guide members 50 and 51. As particularly seen in Fig. 1, these guide members are elongated and of sweeping curve formation with their apices projecting inwardly of the opening 36 toward one another at a point substantially midway of the spaced sheave members and as disclosed in Fig. 3 gradually taper inwardly as from the front to the rear. In addition to the foregoing the arm members 34 and 35 curve outwardly as at 52 and are recessed at their inner sides as indicated at 53. This structure provides flanges which overlie the outer rims of the sheave members and not only prevent the cable from binding as between the sheaves and the arm members but cooperates in guiding the cable into the sheave groove. The purpose of the guide members 50 and 51 is to insure that a cable will be effectively and efficiently guided into one or the other of the sheave members during operation. Thus where the tension on the cable is suddenly altered, as is frequently the case in ship mooring operation, the cable will be efficiently led and guided over and into the grooves of one sheave or the other irrespective of the angle of tension or load imposed by the cable.

From what has been disclosed it will be seen that I provide novel fairlead structure of weatherproof character in which provision is made for substantially floatingly supporting the housing on a lubricant and wherein the several operative parts are readily accessible for removal, replacement or lubrication.

In the embodiment disclosed the invention is seen in new, novel and practical form. It will be understood however that the device may be embodied in other specific forms without departing from the spirit or essential characteristics of the invention. It is intended therefore that the present disclosure be considered in all respects as illustrative rather than restrictive and and that all changes coming within the meaning and range of equivalency of the claims are intended to be embraced therein.

I claim:

1. In a device of the character described, a support comprising an annular member having an inwardly directed flange around one edge thereof providing a central opening, a cover secured on the other edge of the annular member and having an aligned opening of less diameter than the diameter of the annular member, a housing comprising an annular member having spaced external flanges around its periphery forming a lubricant-retaining pocket therebetween, said housing being rotatably mounted within said support with said external flanges located between said first flange and said cover, means to introduce lubricant into the pocket between said external flanges, ball-bearings between said first flange and one edge of said housing member, sheave members rotatably mounted in said housing member in spaced relation to one another and to the axis of the housing member, and cable guide means carried by said housing member for guiding a cable into one of the sheave members.

2. In a device as claimed in claim 1, in which said sheaves are mounted to turn about parallel axes lying in a first plane perpendicular to the axis of the housing member and on opposite sides of such axis, said cable guide means including members having opposed surfaces on opposite sides of a second plane perpendicular to said sheave axes, said surfaces tapering away from each other on both sides of a point intermediate said sheaves, such tapering surfaces extending to the points of projection of said sheaves on a third plane parallel to the plane of said sheave axes.

3. In a device as claimed in claim 2, said surfaces tapering away from each other in the direction of the axis of the housing member and intersecting the plane of the sheave axes.

4. In a device as claimed in claim 1, in which said sheaves are mounted to turn about parallel axes lying in a first plane perpendicular to the axis of the housing member and on opposite sides of such axis, said cable guide means including members having opposed surfaces on opposite sides of a second plane perpendicular to said sheave axes, said surfaces tapering away from each other in the direction of the axis of the housing member and intersecting the plane of the sheave axes.

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