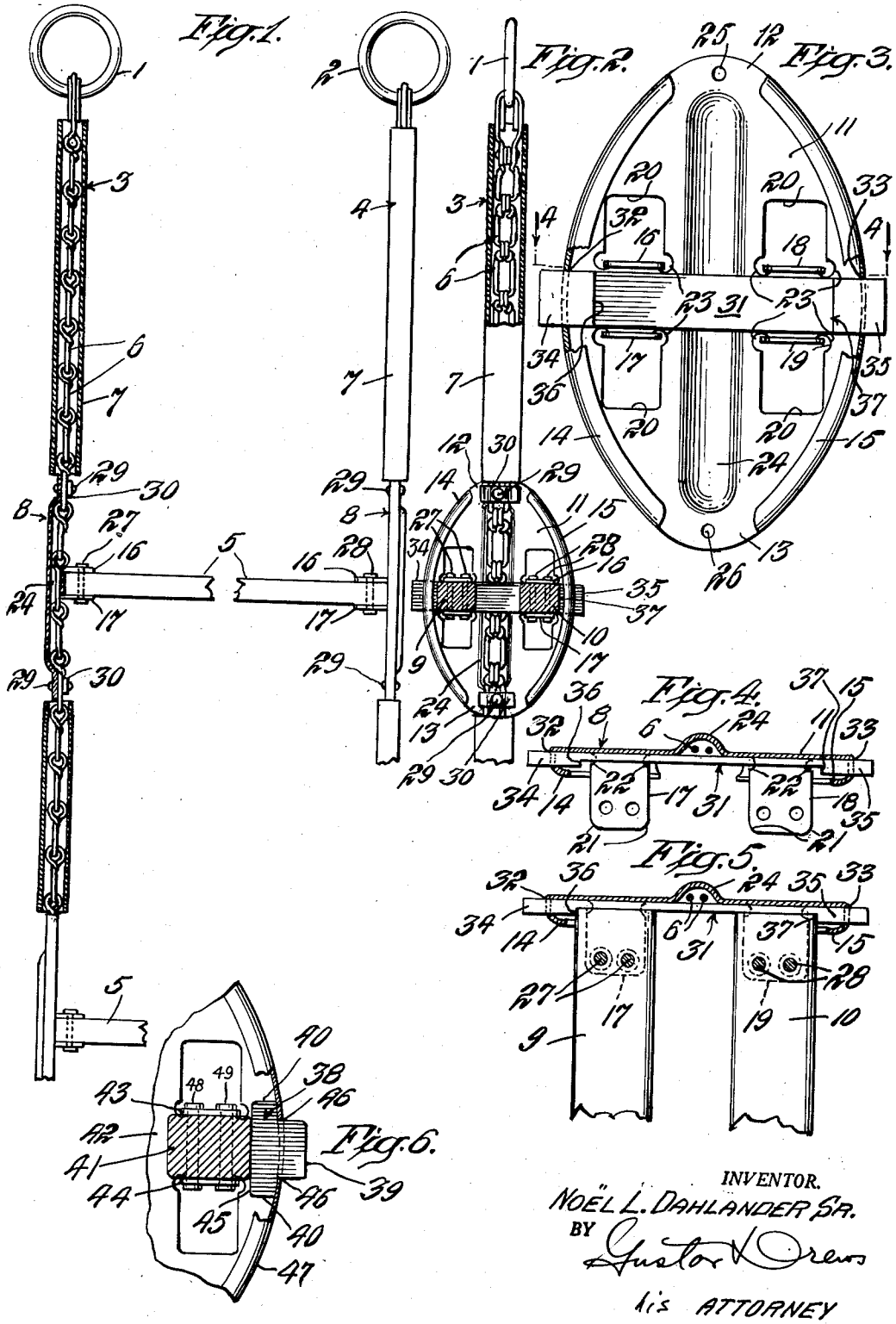
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SPACING DISKS FOR JACOB'S LADDERS

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SPACING DISKS FOR JACOB'S LADDERS

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This invention relates to marine ladders, such as Jacob's ladders in general, and more especially to the disks for spacing the ladders from the sides or walls of seagoing vessels.

Among the objects of the present invention, it is aimed to provide an improved spacing disk for marine ladders, and more particularly to spacing disks which engage the sides or walls of a seagoing vessel adjacent to which the ladder is suspended in order to protect the sides or walls engaged from being scratched, marked or injured by the spacing disks.

More specifically, the present invention aims to provide an improved spacing disk for a Jacob's ladder which is provided with a yieldable material where the disks engage the sides or walls of a seagoing vessel.

These and other features, capabilities and advantages of the invention will appear from the subjoined detailed description of specific embodiments of the same illustrated in the accompanying drawings, in which

Fig. 1 is a front elevation of one embodiment, partly in section and partly broken away.

Fig. 2 is a transverse section of the same partly broken away.

Fig. 3 is an enlarged side elevation of a disk made according to the embodiment illustrated in Fig. 1.

Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 3 with the rungs omitted.

Fig. 5 is an enlarged transverse section on the line 4—4 of Fig. 3.

Fig. 6 is an enlarged fragmental section of a disk made according to a second embodiment.

With marine ladders known as Jacob's ladders, the stiles are flexible and the rungs as a rule are rigid. Consequently, whether the ladder is suspended outboard adjacent the outer surface of the seagoing vessel, or inboard adjacent the inner face of a wall of the vessel, due to the movement of the vessel when in the water, whether the vessel is at a dock or on the high seas, the ladders will whip against the adjacent faces of the vessel. For this reason, whether the vessel is rolling or pitching, depending upon the location of the ladders, it has been found desirable to equip these ladders with so-called spacing disks so that the users of the ladders when engaging the stiles or rungs of the same will not have their hands and feet impinged between the ladder and the sides or walls of the vessel. These spacing disks have been effective in producing excellent results in so protecting the users of the ladders. However, due to the vigorous striking against the sides of the vessel by the spacing disks, it has been found that the sides and walls of seagoing vessels are frequently very badly scratched and marked and even dented in some instances. While yieldable cushions and bumpers are extensively used in protecting the outer faces of seagoing vessels, a problem was presented in properly equipping these spacing disks with yieldable cushions or bumpers. After extensive study and experiment, it was discovered that with spacing disks made according to the disclosure in applicant's

prior Patent No. 2,371,609, yieldable cushions or bumpers could be secured by cooperation of the rungs and rolled edges of the disks and apertures formed in the rolled edges through which portions of the yieldable cushions or bumpers would project for engagement with the sides or walls of the seagoing vessel, whereby no independent securing means would be required to anchor the cushions or bumpers to the spacing disks, thereby making it possible to reduce the cost of production to a minimum and provide a construction which would be practically fool-proof against being dislodged due to wear of extraneous securing means.

In the embodiment shown in Figs. 1 to 5, inclusive, there are provided two rings 1 and 2 secured at the upper ends of the suspensory members 3 and 4 constituting the stiles of the ladder, to which stiles in turn there are secured at their ends the rungs 5. The stiles 3 and 4 are flexible, being composed of chain links 6 covered with protective coverings or flexible boots 7, preferably composed of canvas, fabric, plastic or the like, which boots 7 as shown extend from the rings 1 to the uppermost rung 5, and then from one rung to the other successively to protect the hands of the users from coming in contact with the chain links, and either injured by the links due to the movement between the successive links relative to one another or due to the injury that will result if the chains are used in extremely cold weather, or in case of a fire. Reference of course here is had to the fact that when the temperature of metal is reduced below freezing point, the contact of the same by the bare hands of the users may cause serious injury. In turn, in case of a fire, due to the rapid heat conductivity of most metals, if the chain links were heated to excessively high temperatures, contact with the same by the bare hands of the users would in turn also cause serious injury to the users of these ladders.

The chain links 6 of the stiles 3 and 4 are intermittently connected to spacing disks 8 which serve not only to space the ladder from the sides of the vessel, but also as anchoring means for the rungs 5. The rungs 5 may be composed of single bars or a plurality of bars. In the present instance, the rungs 5 are illustrated as consisting of two bars 9 and 10, preferably composed of wood or the like low heat conductive material in the interest of protecting the hands of the users when brought into direct contact with the same during extreme heat or cold temperatures. The disks 8 are substantially identical to the disks illustrated in applicant's aforesaid Patent No. 2,371,609, see Fig. 3, consisting of an oval-shaped base 11 with the diminished end 12 at the top and the diminished end 13 at the bottom. Preferably the edges of the base 11 between the ends 12 and 13 are rolled over into the arcuate flanges 14 and 15. The portions 16, 17, 18 and 19 of the base 11 are stamped or cut out and folded up parallel to one another leaving the openings 20. Preferably the outer corners of the portions 16 to 19, inclusive, are rounded at 21, see Fig. 4, and the inner ends of the outer edges of the portions are recessed as indicated at 22 in Fig. 4. The recesses 22 are actually continuations of the recesses 23, see Fig. 3. By means of the recesses 22 and 23, sharp corners are avoided between the portions 16 to 19, inclusive, and the base portion 11, and thereby the danger of fracture at such corners materially minimized.

In the interest of strengthening the disks 8 in a longitudinal direction they are depressed, forming the depressed portions 24, extending from the narrow upper end 12 to the narrow lower end 13 of each disk. The narrow ends 12 and 13 are in turn provided with openings 25 and 26, respectively, to receive the ends of the adjacent links 6 of the stiles 7.

The portions 16 and 17 complement one another to

grip the ends of the bar **9**, and the portions **18** and **19** complement one another in turn to grip the ends of the bar **10**. These portions **16** and **17** are then connected to one another and to the bar **9** by any suitable means such as screws or bolts **27** or the like, and in turn the portions **18** and **19** are connected to one another and to the bar **10** by the screws or bolts **28**, see Fig. 5.

The rolled flanges **14** and **15** are spaced from one another at the upper narrow ends **12** of the disks **8** and are similarly spaced from one another at the lower narrow ends **13** of the disks **8** in order to clear the stiles **3** and **4**, see Figs. 1 and 2. Preferably as shown in Fig. 2, the ends of the boots **7** when composed of a flexible plastic material extend to the narrow ends **12** and **13** of the disks **8**, being sufficiently rigid to support themselves in place. In turn, the disks **8** are connected by rivits or the like **29** extending through the plates **30** into the openings **25** and **26**, respectively, of the disks **8**. The depressed portions **24** thus also serve as a clearance for the stiles **3** and **4**.

In the embodiment of Figs. 1 to 5, inclusive, the bumper or cushion is illustrated as composed of a slab of rubber **31** which extends transversely across each disk **8** protruding through the openings **32** and **33** in the rolled flanges **14** and **15**. Preferably as shown the slab or strip of rubber **31** has two raised portions **34** and **35**, one at each end, to form the shoulders **36** and **27**, respectively. In actual practice with a disk of about 9½ inches long by about 5½ inches wide, the rubber slab would be about 6½ inches long, about one inch in width, to correspond to the width of the openings **32** and **33** in the rolled flanges **14** and **15**, respectively, about one-eighth of an inch in thickness between the raised portions **34** and **35**, and about one-quater of an inch in thickness at the raised portions **34** and **35**. When assembling the ladder, the rubber slab or strip **31** is first inserted to project through the openings **32** and **33** of the rolled flanges **15** and **16**, respectively, with the raised portions **34** and **35** facing inwardly. Thereupon the end portions of the bars **9** and **10** are positioned on the slab **31**, the end of the bar **9** between the portions **16** and **17** and adjacent the shoulder **36**, and the end of the bar **10** between the portions **18** and **19** and adjacent the shoulder **37**, see Fig. 5. In place of the slab **31**, see the embodiment of Fig. 6, there are provided two plugs **38** which may be composed of rubber, and in dimensions with a disk of about 9½ inches by 5½ inches, are about one-quarter of an inch in thickness with the diminished projecting portion **39** about one inch in width, and the enlarged inner portion **40** about 1¾ inches in width. In the present embodiment, the end of the bar **41** will engage the face of the disk **42** between the flange portions **43** and **44** and engage the face **45** of the enlarged portion **40** of the plug **38**. In assembling the second embodiment the plugs **38** will of course first be inserted in the openings **46** formed in the rolled flanges **47** of the disk **42**, and then the end portions of the bars **41** inserted in position between the flange portions **43**, **44**, and the enlarged portions **40** of the plugs **38**, and thereupon the rivets **48** and **49** pass through the ends of the bars **41** and the portions **43** and **44** to secure the bars **41** in position.

Preferably the links **6** are "lock link" metal chain links and the disks **8** composed of metal. While the strip or slab **31** and its raised portions **34** and **35** and in turn the plugs **38** may be composed of rubber, they could also be composed of yieldable plastic material such as polyethylene, or any other suitable yieldable material which when striking the hull of a vessel or the wall

of a vessel will cushion the shock and protect the vessel from being scratched, marked or dented.

Excellent results have been achieved when the boots **7** are composed of a substantially non-inflammable, transparent plastic material such as polyvinyl chloride acetate, since a boot composed of such plastic material is sufficiently rigid to maintain its position on the stiles **3**, **4** without being attached to the stiles, rungs or spacing disks. Obviously, however, the boots may also be composed of a semi-rigid substance such as rubber or plastic tubings which are not necessarily transparent.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. The spacing disk for a Jacob's ladder having flexible stiles and rigid rungs having end portions characterized by flanges at the lateral edges of the disk, extending inwardly from said disk and having openings through said flanges in alinement with said rungs, yieldable devices engaging said disk and having portions extending through said openings in a direction substantially parallel to said disk and at substantially right angles to the rungs and projecting from the outside of said flanges to form bumpers, and means for connecting the end portions of the rungs to said disks, the end portions of the rungs when so connected engaging said yieldable devices, the yieldable devices when so engaging said disk and end portions of the rungs being captured to anchor said bumpers in place.

2. The spacing disk for a Jacob's ladder having flexible stiles and rigid rungs characterized by flanges at the lateral edges of the disk and having openings through said flanges, a yieldable strip extending across said disk and having raised portions at the ends thereof, said raised portions extending through said openings in a plane substantially parallel to said disk and at substantially right angles to the stiles and projecting from the outside of said flanges to form bumpers, said raised portions having inner shoulders, and means for connecting the rungs to said disks, the rungs when connected engaging said yieldable strip and cooperating with said inner shoulders to anchor said bumpers in place.

3. The spacing disk for a Jacob's ladder having flexible stiles and rigid rungs characterized by flanges at the lateral edges of the disk and having openings through said flanges, yieldable plugs each having a diminished portion extending through one of said openings in a plane substantially parallel to the disk and at substantially right angles to the stiles and projecting from the outside of its adjacent flange to form a bumper, said plugs each having an enlarged inner portion engaging the inner face of its adjacent flange, and means for connecting the rungs to said disks, the rungs when connected engaging the enlraged portions of said plugs to anchor said bumpers in place.

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