Dec. 21, 1926. 1,611,768

J. B. MITCHELL

SHIP LADDER

Filed March 5, 1923

Fig. 1

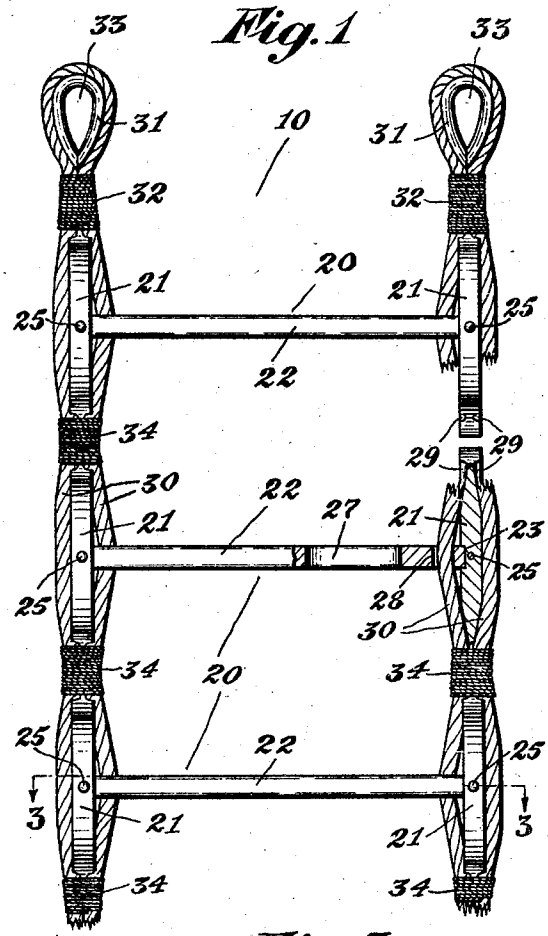


Fig. 2

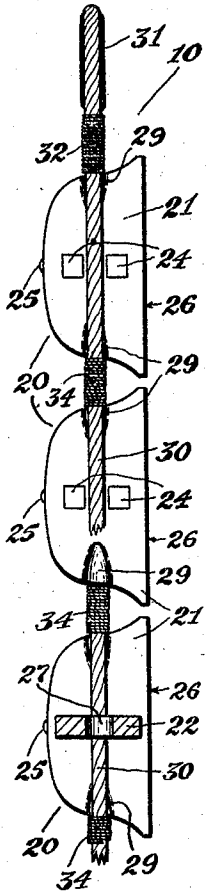


Fig. 5

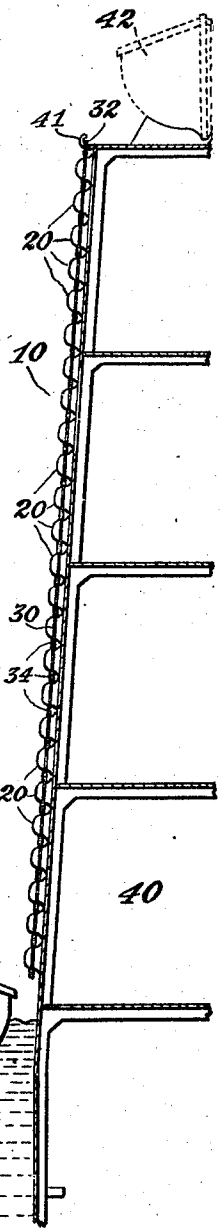


Fig. 3

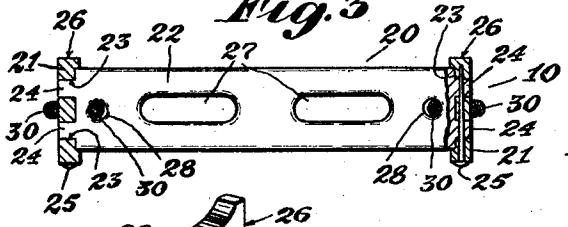
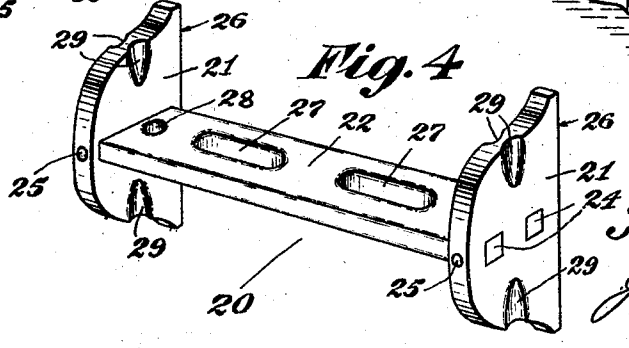


Fig. 4



INVENTOR
John B. Mitchell.
BY
James C. Sproll.
ATTORNEY

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UNITED STATES PATENT OFFICE.

JOHN B. MITCHELL, OF SEATTLE, WASHINGTON.

SHIP LADDER.

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The present invention relates to improvements in ship ladders, having more particular reference to the type generally known as Jacob's ladders, and has for a fundamental object the provision of a novel construction which is simple, durable, efficient and reliable in use and capable of being manufactured at a comparatively low cost.

With these ends in view the invention consists in providing a ship ladder embodying a plurality of interconnected steps having rectilinear inner edges adapted to rest evenly upon the supporting surface, to thereby effectually prevent tipping or rocking of the steps when the ladder is in use.

The invention further consists in the provision of a ship ladder embodying a plurality of steps interconnected, at the sides thereof, by supporting ropes or cables in such a manner as to positively prevent accidental dislodgment or detachment of the steps from their associated supporting ropes, with the consequent loss of said steps, which heretofore has occurred with ladders of this type.

The invention still further consists in the provision of a ship ladder embodying a plurality of flexibly connected steps which may be readily removed from the flexible supporting or connecting ropes when broken or worn and may be expeditiously replaced by new steps without materially affecting the contiguous steps or the supporting ropes.

The invention still further consists in the provision of a ship ladder embodying a plurality of steps interconnected by supporting ropes or cables secured upon the sides of said steps in medial relation thereto, to thereby dispose said ropes in spaced parallel relation to the supporting surface of the ladder when in use, to thus prevent and eliminate chafing of the ropes and undue wear thereon which has ocurred heretofore in ladders of this type.

The invention still further consists in the provision of a ship ladder embodying a plurality of interconnected steps having hand holds formed therein whereby the said ladder may be ascended or descended by the user with the maximum safety.

With the foregoing in view the invention resides in the structural features, combination, adaptation and arrangement of parts, as will be hereinafter described and succinctly defined in the appended claims.

Referring now to the drawings wherein is illustrated the specific form of the invention, as at present preferred:—

Figure 1 is a fragmentary front elevation of the upper end of a ladder fabricated in accordance with the invention, certain parts being shown in section and certain other parts broken away for clearness of illustration.

Fig. 2 is a fragmentary side elevation of such a ladder, certain parts being broken away and certain other parts being shown in section.

Fig. 3 is a horizontal section taken on the broken line 3—3 of Fig. 1.

Fig. 4 is a view in perspective of one of the steps of the ladder, and

Fig. 5 is a fragmentary transverse section of a ship illustrating my ladder operatively disposed thereon.

In the drawings like reference numerals designate like parts throughout the several views.

The reference numeral 10 designates the ladder comprising a plurality of interconnected steps 20, which are flexibly secured in spaced and contiguous relation adjacent the sides thereof by supporting ropes or cables 30.

Each of the steps 20 comprises side members 21 rigidly connected in spaced relation by a cross piece or tread member 22. Said side members 21 are provided, at a point substantially midway of the height thereof, with mortises 23 adapted to receive tenons 24 formed upon the ends of the cross piece 22, as shown more clearly in Fig. 3. To positively secure and retain the tenons 24 within their associated mortises 23 I have provided nails or spikes 25, which are driven into the curvilinear edges of the side members 21 in such a manner as to pass through the said tenons, substantially as shown at the right hand side of Fig. 3.

The side members 21 are preferably formed in the curvilinear shape shown and are provided with rectilinear rear or inner edges 26 adapted to abut and rest evenly upon the ladder supporting surface, to thereby

prevent tipping or rocking of the steps 20, when the ladder is in use, as will be readily apparent.

The cross piece 22 is provided with hand holds 27 disposed longitudinally thereof in spaced relation, as shown more clearly in Figs. 3 and 4, to thereby assure of the maximum safety for the user, while ascending or descending a ladder of this type.

The supporting ropes 30 are bent double at the upper ends thereof to form loops within which are inserted thimbles 31 adapted to be fixedly secured within said loops by seizings 32, to thereby form eyes 33 arranged for engagement with hooks or other means from which the ladder 10 may be suspended, when in use. As hereinbefore stated the supporting ropes 30 are bent double at the upper ends thereof, thus forming inner and outer legs, said inner legs extend downwardly along the inner sides of the side members 21 in medial relation thereto, and through openings or apertures 28 formed in the cross piece 22 adjacent the ends thereof, while the outer legs extend downwardly along the outer sides of said side members in medial relation thereto and in aligned relation to the said inner legs.

The steps 20 are fixedly secured in spaced relation upon the ropes 30 by seizings 34 interposed upon said ropes between said steps, as shown more clearly in Figs. 1 and 2.

The side members 21 are provided within their upper and lower curvilinear edges and upon the inner and outer sides thereof with aligned inwardly converging grooves 29 within which the inner and outer legs of the ropes 30 are arranged to seat, to thereby permit the said inner and outer legs of said ropes being drawn together by the seizings 34 when the steps 20 are disposed in close proximity as indicated in Figs. 1 and 2.

In Fig. 5 I have illustrated the ladder 10 as it would appear when operatively disposed or suspended from the boat deck of a ship, as 40. In this instance the ladder 10 is suspended, by the eyes 33, from hook members 41 rigidly secured to said boat deck, said ladder being shown as resting upon the side of the ship 40 and extending downwardly to a boat, as 42, from which the ship may be boarded or left.

When not in use the ladder 10 may be rolled or wound into a compact form for handling or storage in any suitable space, as for example, between the lifeboats where it is available and readily accessible in any emergency.

It will be apparent from the foregoing and by referring to the drawings that the steps 20 cannot become dislodged or displaced from the supporting ropes 30 and that by disposing the said ropes medially of the said steps and out of contact with the ladder supporting surface or side of the ship, that chafing and undue wear on the ropes is eliminated, thus materially increasing the life of the same.

When it is desired to remove and replace one of the steps 20 for any reason, as for example, when the same has become useless through wear or is broken, the adjacent seizings 34 are unwound, the nails 25 are withdrawn and the side members 21 removed from their associated cross piece 22, the portions of the said cross piece between the tenons 24 and the holes 28 are then cut away to release the inner legs of the ropes 30 from the crosspiece. To position and secure a new step 20 upon the ropes 30, the portions of the crosspiece 22, of the new step, between the tenons 24 and the holes 28 thereof are first cut away to permit of the ready entrance of the inner legs of the ropes 30 therein and the positioning of the said crosspiece thereon, whereupon the associated side members 21 are inserted between the inner and outer legs of the ropes 30 and the tenons 24 of said crosspiece inserted within the mortises 23 of said side members. The nails 25 are then driven into the curvilinear edges of the side members 21, as hereinbefore described, and the seizings 34 are rewound upon the ropes 30, to thereby secure the new step 20 in proper position thereon.

While I have herein shown and described my invention with sufficient detail to enable those skilled in the art to which it pertains to understand the mode of construction and the principles involved, it is to be understood that there is no intentional limitation to the specific form and precise details of construction of the invention, as herein shown and described, except as expressly defined by the appended claims, and that various modifications of said construction may be resorted to without departing from the invention or the benefits derivable therefrom.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. As an article of manufacture, a non-tilting step for a ship ladder comprising mortised side members provided with elongated rectilinear rear edges and curvilinear forward edges and having rectangularly recessed inner faces, and a tenoned rectangular crosspiece of a width substantially equal to the depth of said side members rigidly connecting the same in spaced relation with the rectangular ends thereof seated within said recessed inner faces and the tenoned terminals of said crosspiece fitting within said mortised side members.

2. In a ship ladder, in combination, spaced parallel supporting ropes each doubled to form an inner and an outer leg, a plurality of non-tilting steps secured to said ropes in spaced relation embodying side

members having elongated rectilinear rear edges, and rectangular crosspieces of a width substantially equal to the depth of said side members rigidly connecting the same in spaced relation and having openings adjacent the ends thereof through which said inner legs extend.

3. In a ship ladder, in combination, spaced parallel supporting ropes each doubled to form an inner and an outer leg, a plurality of non-tilting steps secured to said ropes in spaced relation embodying side members having elongated rectilinear rear edges and recessed inner faces, and rectangular crosspieces of a width substantially equal to the depth of said side members rigidly connecting the same in spaced relation with the rectangular ends thereof seated within said recessed inner faces and having openings therein adjacent said seated rectangular ends through which said inner legs extend.

4. In a ship ladder, in combination, spaced parallel supporting ropes each doubled to form an inner and an outer leg, a plurality of steps secured to said ropes in spaced relation embodying side members having rectilinear rear edges and curvilinear forward edges and having the upper and lower edge portions upon the inner and outer faces thereof medially grooved to receive and seat therein said inner and outer legs of said supporting ropes, and crosspieces rigidly connecting said side members having medially disposed openings formed therein adjacent the ends thereof through which said inner legs are arranged to extend.

5. In a ship ladder embodying supporting ropes each looped and secured at the upper end thereof to form an engaging eye therefor and extending downwardly to form an inner and an outer leg, a plurality of steps disposed in spaced relation upon said inner and outer legs, said steps comprising curvilinearly shaped side members having rectilinear rear edges and adapted to medially receive upon the inner sides thereof the aforesaid inner legs of the supporting ropes and to similarly receive upon the outer sides thereof the aforesaid outer legs of the said supporting ropes, crosspieces rigidly connecting said side members having hand holds formed therein and means to secure said side members to the said inner and outer legs of said supporting ropes.

6. In a ship ladder, in combination, spaced parallel supporting ropes each doubled to form an inner and an outer leg, a plurality of steps secured to said ropes in spaced relation each comprising side members, and a crosspiece rigidly interconnecting said side members having openings adjacent the ends thereof through which said inner legs extend.

In testimony whereof I affix my signature.

JOHN B. MITCHELL.