June 12, 1934. A. A. BERG ET AL 1,962,890

PILOT LADDER

Filed Aug. 7, 1933 2 Sheets-Sheet 1

Fig. 1.

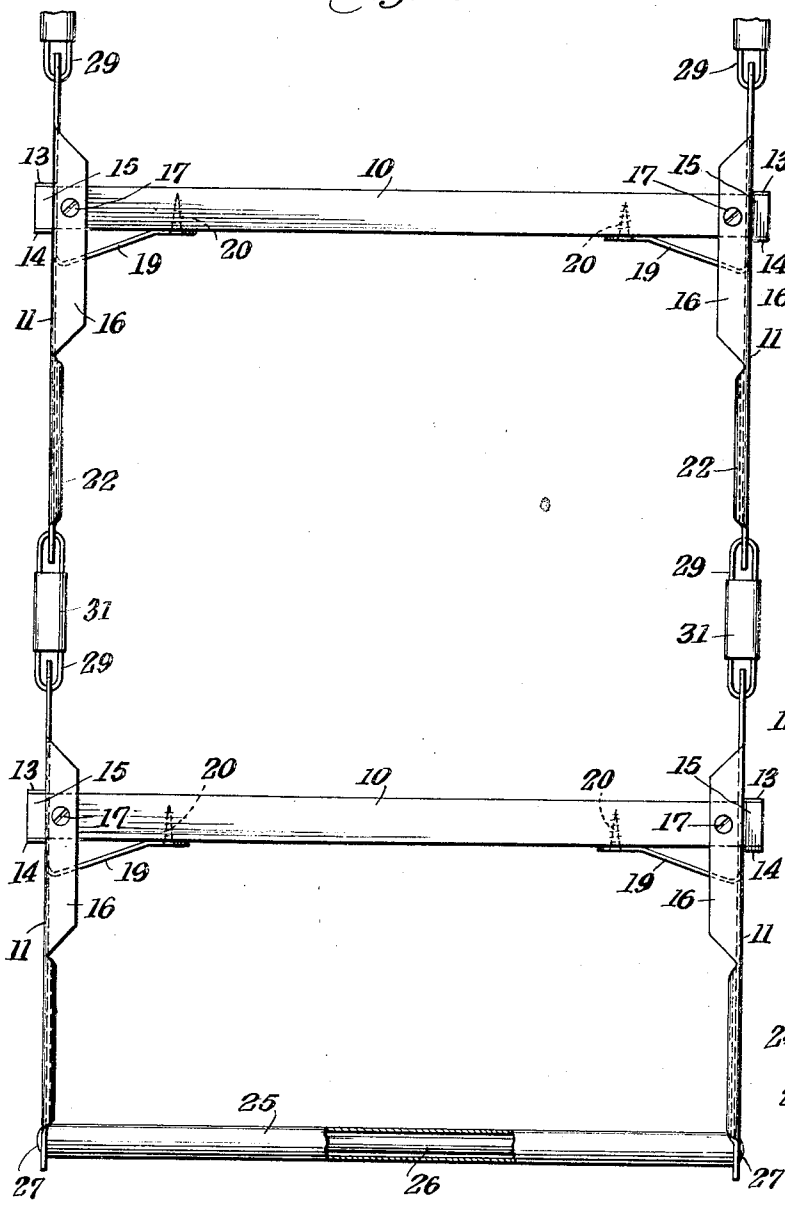
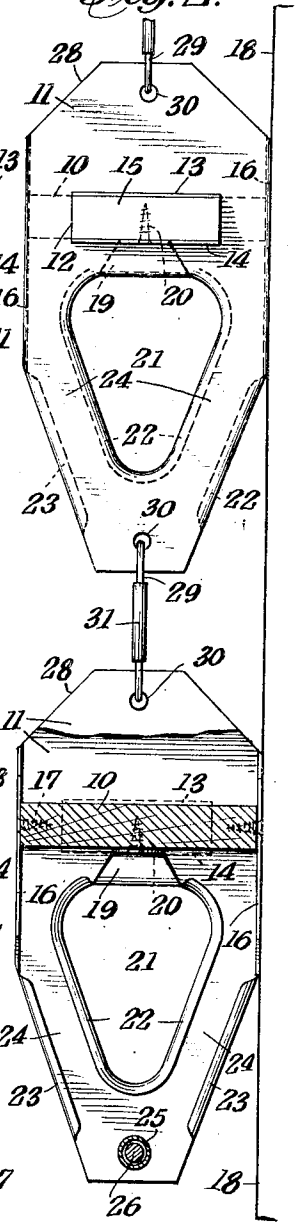


Fig. 2.



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Fig. 3.

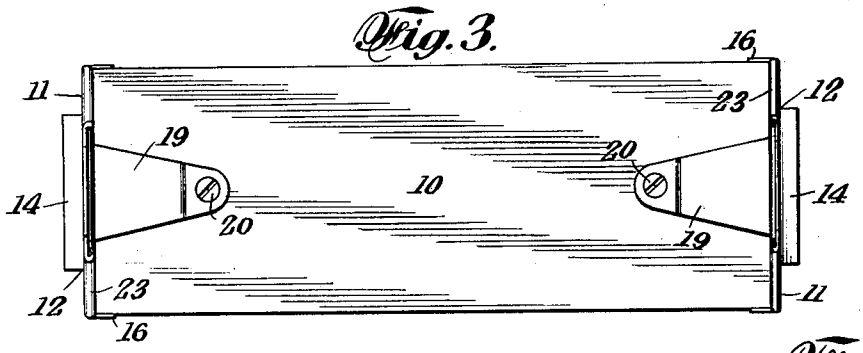


Fig. 4.

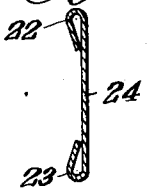


Fig. 7.

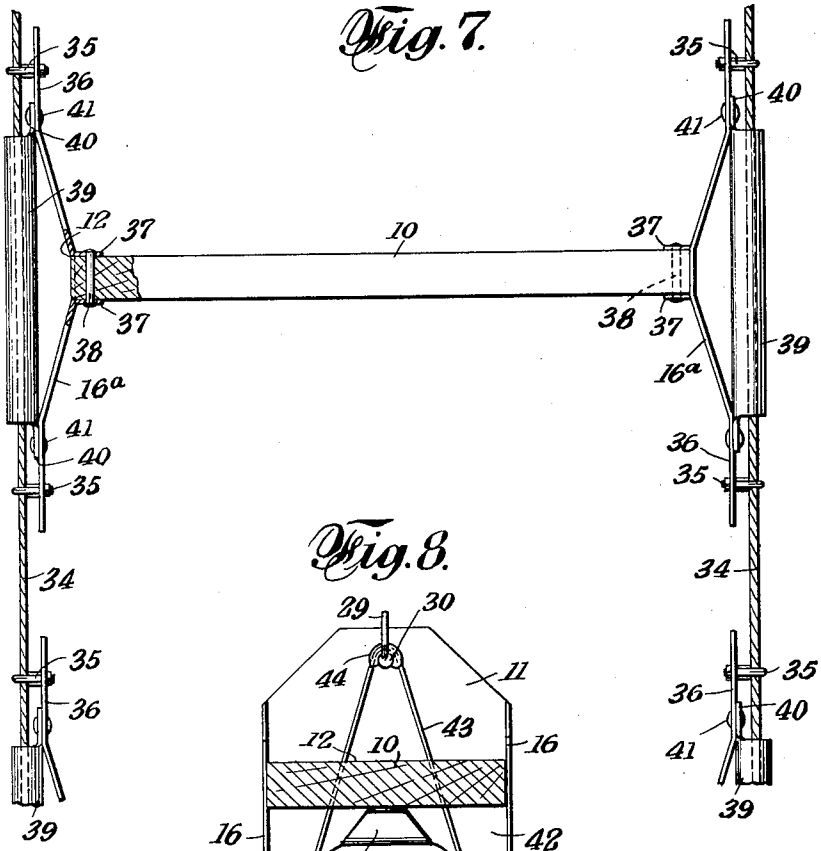


Fig. 5.

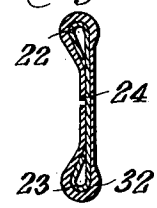


Fig. 8.

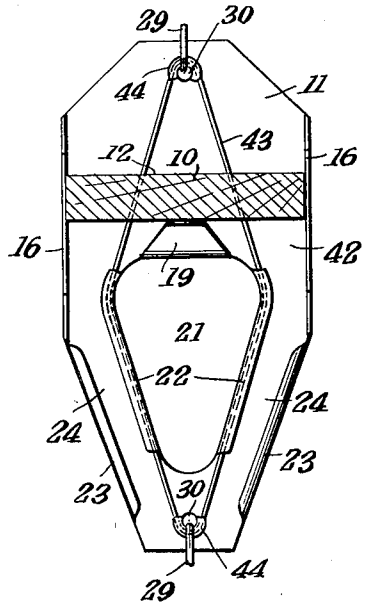
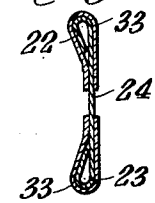


Fig. 6.



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UNITED STATES PATENT OFFICE

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PILOT LADDER

Axel A. Berg, Brooklyn, N. Y., and Frank F. Townsend, Hoboken, N. J.

Application August 7, 1933, Serial No. 683,964

8 Claims. (Cl. 228—44)

This invention relates to ladders such as used by pilots in boarding and leaving ships and the objects of the invention are to provide a construction of this character which will be light enough to be easily handled and placed, rugged, safe and strong, which will lay close and firm against the ship's side and which will afford convenient readily grasped hand grips.

The foregoing and other desirable objects are attained by novel features of construction, combinations and relations of parts all as hereinafter disclosed, illustrated and broadly claimed.

The drawings accompanying and forming part of the specification illustrate certain practical embodiments of the invention, it being understood that the structure may vary as regards this present disclosure, all within the true spirit and broad scope of the claims.

Fig. 1 in the drawings is a broken part sectional face view of one form of the ladder.

Fig. 2 is a broken side view, partly in section.

Fig. 3 is a bottom plan view of one of the ladder sections.

Figs. 4, 5, 6 are enlarged cross-sectional details of the hand grip portion of the side plates.

Fig. 7 is a broken front elevation of a modified form of the invention.

Fig. 8 is a vertical sectional detail of another modification.

The ladder is made up of steps or ladder sections shackled or flexibly connected together and consisting each step of a rung or tread 10, carried by side members 11.

In Figs. 1 to 6, the side members or rung supports are shown as flat sheet metal plates having intermediate transverse openings 12, struck therethrough with flanges 13, 14, bent out at the upper and lower edges, said openings receiving the tongue portions 15, of the treads and the flanges 13, 14, overlying and underlying said tongues to provide lateral stability and support and to prevent cutting the material of the treads, which may be of wood.

Opposite edges of the rung supports are shown as flanged and bent inward as at 16, over opposite edges of the rungs and secured to the latter as by screws or fastenings 17. This construction fixes the rungs in the supports, braces opposite edges of the rungs, overcomes any tendency of the rungs to twist in the supports and provides elongated flat bearings causing the supports to lie flat against the ship's side indicated by the line 18 in Fig. 2.

For further bracing and reinforcing purposes, tongues 19, are shown struck inward from intermediate portions of the side plates, below the rungs and bent upward into engagement with the lower sides of the rungs and there secured as by screws or other fastenings 20. The openings 21 left by the in-bending of braces 19 provide for hand grips in the side supports below the rungs, the metal about such openings and along the outer edges of the plates being preferably curled inward as indicated at 22, 23, Figs. 4, 5, 6, to provide smooth rounded edges for the grip bars 24.

The openings 21 are shown as of generally triangular outline and the lower edge portions of the plates as inclined inward to the central plane of the ladder which, as indicated in Fig. 2, sets the grip bars 24, on downwardly convergent angles inclined for convenient grasp of the hands in ascending or descending the ladder. The rolled edges of the hand grip portions also reinforce the lower portions of the side plates.

The bottom step section may be finished off with a simple cross bar, convenient for grasping and shown as consisting of a spacing tube 25, between the lower ends of the plates secured by a through bolt 26, having its ends headed over the outer sides of the plates at 27.

The upper ends of the rung supporting plates also may be tapered, as indicated at 28, for enabling the step sections to be rolled together for storage.

The sections are suitably connected together as by the shackle links indicated at 29, and consisting of loops of wire or rod material passed through openings 30, in the lower and upper ends of adjoining side plates and secured by surrounding sleeve members 31.

The inclined grips may be covered, if desired, with suitable hand grip material, such as the split encasing cover of molded rubber 32, shown in Fig. 5, or separate cover strips 33, of shaped brass or the like, shown in Fig. 6, as slipped over the opposite curled edges 22, 23.

In the modification illustrated in Fig. 7, the shackles for the step sections are continuous and coextensive of the ladder, consisting of continuous lengths of chain or cable 34, or the like, to which the step plates are secured at the proper intervals as by means of the U-bolt clips indicated at 35.

The side plates are in this instance designated 36, and they are shown as having the flanges 37, at the rung openings bent inward instead of outward and as secured together, through the rungs by rivets or like fastenings 38.

Also, in the construction under consideration, the rung supporting plates are arched inward in

their step carrying portions and the upper and lower ends of these arches are connected by tubular elements 39, surrounding the continuous ropes, chains or side cables 34, and providing hand grips offset from the ends of the steps.

The tubular hand grips 39 may be lengths of pipe cut with end legs 40, riveted or otherwise suitably secured to the side plates at 41, these grips then acting as trusses bracing the arches of the side plates.

The side plates may be made of other materials than sheet metal. Thus in Fig. 8, a side plate 42 is shown constructed of cast metal, such as aluminum for the sake of lightness. This casting is shown as reinforced by a link or loop 43, of wire or rod material shown as caught beneath the inturned flanges 22, of the hand grips and extending around flanges 44, of the shackle openings 30, so as to reinforce and aid in carrying any load on the ladder.

The structure may be modified and different materials may be employed according to different or special requirements. While wood is a suitable and practical material for the rungs, these may also be of metal, providing if desired, an "all metal" construction. The oppositely tapering form of the side plates enables the ladder to be readily rolled and unrolled, the elongated bearings cause the ladder to lie flat and stable against the side of the ship and the symmetrical form of the ladder with opposite edges alike, enables the ladder to be faced either way against the ship. The hand grips are conveniently located and sufficiently exposed so that they may be readily and firmly grasped and are independent of the treads, so there is not the danger of the grip of one person being broken by a second person on the ladder. The bracing effect provided by the angle braces 19, in the Fig. 1 construction, is to an extent present also in the Fig. 7 construction, where the inwardly arched portions of the side plates and the extended flanges 37 secured to the treads have an equivalent angular bracing effect. In a construction like that shown in Fig. 7, the arched portions of the side plates above and below the treads may be made flat and of sufficient extent to form the bearing edges 16*a* equivalent in effect to the bearings 16 in the first form of the invention. In all forms of the invention disclosed, the hand grips are combined as trusses strengthening and reinforcing the side plates.

What is claimed is:

1. A pilot ladder, comprising flexibly connected side plates, rungs secured between and supported by said side plates, said side plates having substantially triangular openings therethrough providing convergently related hand grips adjoining the ends of the rungs.

2. A pilot ladder, comprising flexibly connected side plates of sheet material, rungs secured between and supported by said side plates, said sheet material side plates having substantially triangular openings therethrough leaving convergent hand grips and the material from said openings being struck inward from said hand grip providing openings and secured to the rungs as braces therefor.

3. A pilot ladder, comprising flexibly connected side plates, rungs secured between and supported by said side plates, said side plates having substantially triangular openings therethrough beneath said rungs and providing downwardly convergent hand grips.

4. A pilot ladder, comprising flexibly connected side plates, rungs secured between and supported by said side plates, said side plates having substantially triangular openings therethrough providing convergently related hand grips adjoining the ends of the rungs, said side plates being constructed of sheet material and said material being rolled about the edges of said openings to form extended rounded gripping surfaces along said hand grips.

5. A pilot ladder, comprising flexibly connected side plates, rungs secured between and supported by said side plates, said side plates having substantially triangular openings therethrough providing convergently related hand grips adjoining the ends of the rungs and rounded hand grip guards applied to and covering the edges of said hand grips so provided.

6. A pilot ladder, comprising flexibly connected side plates, rungs secured between and supported by said side plates, said side plates having substantially triangular openings therethrough providing convergently related hand grips adjoining the ends of the rungs, the material surrounding said openings being curled over and reinforcement loops extending about said openings and secured by said curled over edge portions.

7. A pilot ladder, comprising side plates having rung openings, rungs seated in said openings, flanges at opposite edges of said side plates engaged over opposite edges of said rungs, said side plates having substantially triangular openings therethrough intermediate said edge flanges and forming inclined hand grips.

8. A pilot ladder, comprising side plate members flexibly shackled together and provided with rung openings therethrough, rungs seated and secured in said rung openings in said side plate members and said side plate members having hand openings therethrough adjoining opposite ends of the rungs and rounded hand grip surfaces at said hand grip openings and whereby hand receiving openings and grips are provided in conveniently accessible position at the flexibly connected rungs.

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