March 20, 1945. N. L. DAHLANDER 2,371,609

LADDER

Filed Feb. 22, 1944

Fig. 1.

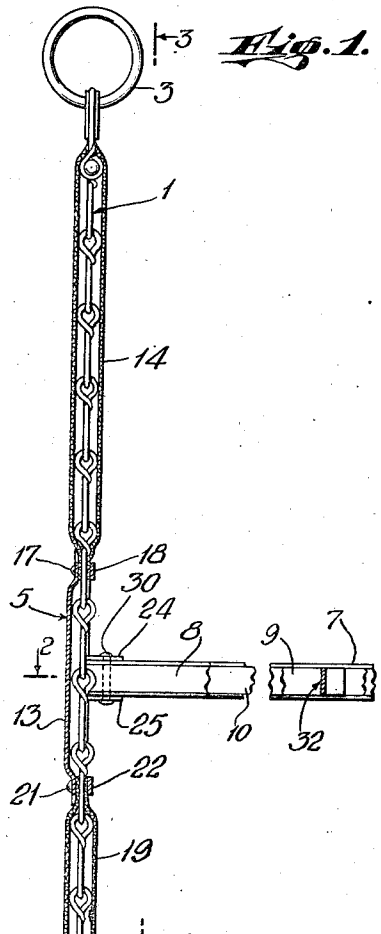


Fig. 3.

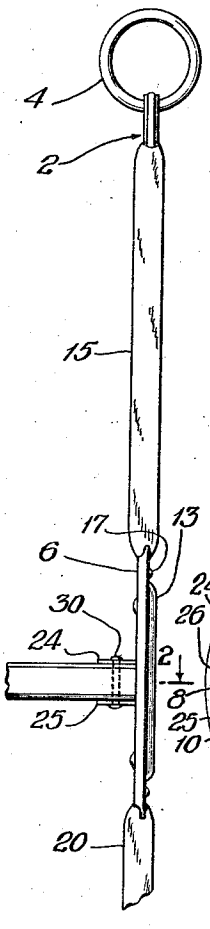


Fig. 4.

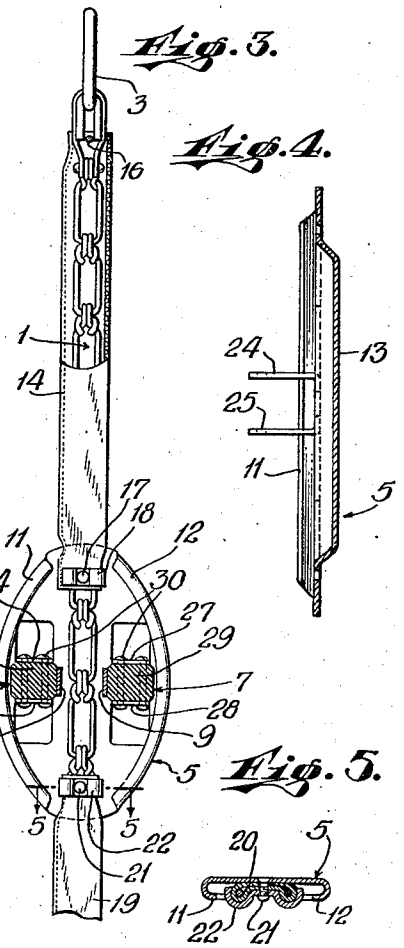


Fig. 5.

Fig. 7.

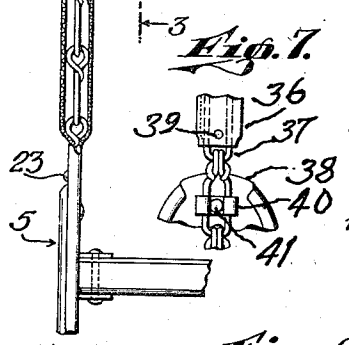


Fig. 2.

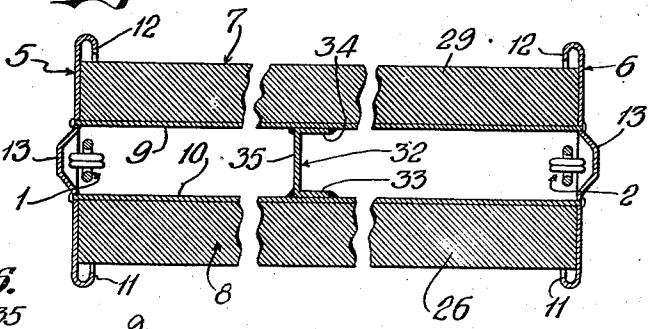
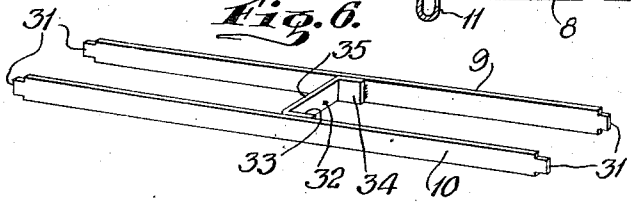


Fig. 6.



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LADDER

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Application February 22, 1944, Serial No. 523,418

11 Claims. (Cl. 228—40)

This invention relates to ladders in general and more especially to single ladders such as Jacob's ladders.

Among the objects of the present invention it is aimed to provide an improved ladder having two suspensory elements and a broad tread such as disclosed in applicant's co-pending application for patent, Ser. No. 500,603, filed August 31, 1943.

Specifically, it is an object of the present invention to provide an improved chain ladder in which a double wood tread and suspensory elements composed of chain links are anchored to one another by end disks, known as toe plates or spacer disks, provided with a metal supplemental rung member that would leave the ladder intact with at least skeleton rungs, should conflagration occur and some or all of the wood portions of the rungs be consumed or injured.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of specific embodiments thereof illustrated in the accompanying drawing in which

Figure 1 is a fragmental front elevation.

Fig. 2 is an enlarged section on the line 2—2 of Fig. 1.

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

Fig. 4 is an enlarged vertical section of one of the spacer plates.

Fig. 5 is a section on the line 5—5 of Fig. 3.

Fig. 6 is a perspective of the supplemental emergency rung member.

Fig. 7 is a fragmental front elevation of a modified form of a part of a ladder.

In the embodiment shown the suspensory members 1 and 2 are preferably composed of "lock link" chain links connected at their upper ends to the lash rings 3 and 4 and intermittently connected to toe plates or spacer disks 5 and 6, which in turn are connected to the wood rung elements 7, 8 and supplemental metal rung elements 9, 10.

The spacer disks 5, 6 are preferably elliptical in shape, each having its major axis extending vertically, their lateral edges 11, 12 rolled over or curved as shown toward the rungs and a vertically extending depressed extension 13 formed centrally thereof in part serving to stiffen or reinforce the disk 5, 6, and in part serving to clear a suspensory element 1, 2 disposed adjacent thereto.

Preferably as shown, the portions of the suspensory elements between the lash rings 3, 4 and the first spacer disks 5, 6 are covered with envelopes or socks 14, 15, composed of a non-metallic substance or material such as cotton fabric or the like. In the present instance, the upper ends of the socks 14 and 15 are secured in place by pins or rivets such as the rivets 16.

The lower ends of the socks 14 and 15 are secured in place by the rivets 17 extending through the clips 18 and then into the spacer disks 6 above the depressed extensions 13. Similarly all portions of the suspensory elements 1 and 2 between any two succeeding spacer disks 5, 6 are covered with envelopes or socks such as the socks 19, 20 in which case the upper ends of the socks are connected by the rivets 21 to the clips 22 and the lower ends of the spacer disks 5, 6 below the extensions 13, and the lower ends of the socks 19 and 20 are in turn secured in place by similar rivets 23 connected to clips associated with the next succeeding lower spacer disks 5, 6.

Preferably, in part at least to reduce the weight of a disk 5, 6, the flanges 24, 25 are bent therefrom to form anchoring ears for one of the wooden rung portions 26, and also flanges 27 and 28 cut and bent therefrom to form anchoring ears for the wooden rung portion 29. These ears 24, 25, and 27, 28 are secured to the rung portions 26, 29, respectively, by screws or rivets 30.

The rung portions 26, 29, as shown in Fig. 2 supplement one another to form a broad rung and are preferably spaced from one another as shown in the interest of forming a fairly broad rung. The space between the wooden portions 26 and 29 preferably slightly exceeds the width of a wooden portion 26, 29 and in the present instance the wooden portions 26, 29 have their opposing faces disposed adjacent to the metal portions 9, 10 of the supplemental metal rung portion. This supplemental metal rung element consists of the rung portions 9 and 10 preferably composed of flat stock about twelve gauge with diminished ends 31 to fit into openings formed in the spacer disks 5, 6 to either side of the extension 13. The diminished portions 31 are just long enough to extend through and beyond the disks 5, 6 so that they protrude from the outer face thereof. The protruding ends of the diminished portions 31 are preferably distorted or burred to anchor the metal rung element in position.

In the interest of reinforcing one another, the portions 9 and 10 are connected to one another by the U shaped metal bracket 32 having a flange 33 welded to the metal portion 10 with the intervening web 35 extending from one metal portion 9 to the other.

It is to be noted that the metal strips 9 and 10, see particularly Fig. 3, are narrower than the

depth of the rung elements 26 and 29. When so positioning the metal strips 9 and 10 between the wood portions 26 and 29 and making them narrower than the wood portions 26 and 29, the usefulness of the wood rung portions in extremely cold weather will not be impaired and the metal portions 9 and 10 in no way militate against the use of these ladders in extremely cold weather. It is obvious from the co-pending application that the wooden rung elements as well as the socks 14, 15, 19 and 20 are provided primarily to protect the hands of the users from engaging metal in extremely cold temperatures. On the other hand, due to the fact that the suspensory elements 1 and 2 composed of metal chain links and the emergency metal rung members composed of the strips 9 and 10 are directly connected to the spacer disks 5, 6, in case of a fire, even though the socks 14, 15, 19 and 20 and the wooden rung portions 26 and 29 are consumed, there will still remain a usable ladder frame.

In the interest of greater flexibility and protection against corrosion, the ends of the socks 14, 15, 19, 20, may be attached to the suspensory elements 1, 2 instead of to the spacer disks 5. As shown in Fig. 7, the sock 36 is attached to the link 37 adjacent the disk 38 by a rivet 39 and the clip 40 merely anchors the link 41 to the disk 38 by means of the rivet 42.

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 combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions, spacer disks, means connecting the links of said suspensory elements to said disks, flanges bent from said disks and secured to said wood rung portions, and a supplemental emergency metal rung member for each rung disposed adjacent to said wood rung portions and secured at its ends to said spacer disks.

2. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions, means including spacer disks for connecting the wood rung portions to said suspensory elements, the wood rung portions of each rung being spaced from one another to form a wide tread, and a supplemental emergency metal rung member disposed in the space between said wood rung portions and removed from engagement by the user, the ends of said supplemental emergency metal rung member being secured to said spacer disks.

3. The combination of two suspensory elements composed of chain links, rungs each composed of two wood rung portions spaced from one another to form a wide tread, means including spacer disks for connecting the wood rung portions to said suspensory elements, and narrow supplemental emergency metal rung strips engaging the inner opposing faces of said wood rung portions and secured at their ends to said spacer disks, said metal strips when so secured adjacent to the opposing faces of two wood portions are also removed from the upper and lower faces of said wood portions to protect the user from engagement with the same during extreme temperatures.

4. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions spaced from one another to form a wide tread, means including spacer disks for connecting the wood rung portions to said suspensory elements, a supplemental emergency metal rung member composed of two narrow parallel strips of metal engaging the opposing faces of the two wood rung portions of a rung and secured at their ends to said spacer disks, and a U shaped bracket connecting the two strips to one another at their middle to serve as a reinforcement, the edges of the metal strips being removed from the upper and lower faces of the wood rung portions and when disposed in the space between the two wood rung portions being ready for use in case of a fire and yet not in any way interfering with the use of the wood rung portions in extreme temperatures where it is dangerous for the user to engage the exposed metal portions.

5. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions spaced from one another to form a wide tread, means including spacer disks for connecting the wood rung portions to said suspensory elements, a supplemental emergency metal rung member composed of two narrow parallel strips of metal engaging the opposing faces of the two wood rung portions of a rung and secured at their ends to said spacer disks, a U shaped bracket connecting the two strips to one another at their middle to serve as a reinforcement, the edges of the metal strips being removed from the upper and lower faces of the wood rung portions and when disposed in the space between the two wood rung portions being ready for use in case of a fire and yet not in any way interfering with the use of the wood rung portions in extreme temperatures where it is dangerous for the user to engage the exposed metal portions, clips, links of said suspensory elements secured between said clips and said spacer disks, and rivets for anchoring said clips in place.

6. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions spaced from one another to form a wide tread, means including spacer disks for connecting the wood rung portions to said suspensory elements, a supplemental emergency metal rung member composed of two narrow parallel strips of metal engaging the opposing faces of the two wood rung portions of a rung and secured at their ends to said spacer disks, a U shaped bracket connecting the two strips to one another at their middle to serve as a reinforcement, the edges of the metal strips being removed from the upper and lower faces of the wood rung portions and when disposed in the space between the two wood rung portions being ready for use in case of a fire and yet not in any way interfering with the use of the wood rung portions in extreme temperatures where it is dangerous for the user to engage the exposed metal portions, clips, links of said suspensory elements secured between said clips and said spacer disks, rivets for anchoring said clips in place, and non-metallic envelopes enclosing said suspensory elements.

7. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions spaced from one another to form a wide tread, means including spacer disks for connecting the wood rung portions to said suspensory elements, a supplemental emergency metal rung member composed of two narrow parallel strips of metal engaging the opposing faces of the two wood rung portions

of a rung and secured at their ends to said spacer disks, a U shaped bracket connecting the two strips to one another at their middle to serve as a reinforcement, the edges of the metal strips being removed from the upper and lower faces of the wood rung portions and when disposed in the space between the two wood rung portions being ready for use in case of a fire and yet not in any way interfering with the use of the wood rung portions in extreme temperatures where it is dangerous for the user to engage the exposed metal portions, clips, links of said suspensory elements secured between said clips and said spacer disks, rivets for anchoring said clips in place, fabric envelopes enclosing said suspensory elements to protect the user from contact with the metal portions thereof in extreme temperatures, and rivets anchoring the ends of the envelopes to the links of the suspensory elements.

8. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions, spacer disks, means connecting the links of said suspensory elements to said disks, flanges bent from said disks and secured to said wood rung portions, a supplemental emergency metal rung member for each rung disposed adjacent to said wood rung portions and secured at its ends to said spacer disks, clips, links of said suspensory elements secured between said clips and said spacer disks, and rivets for anchoring said clips in place.

9. The combination of two suspensory elements composed of chain links, rungs, each composed of two wood rung portions, spacer disks, means connecting the links of said suspensory elements to said disks, flanges bent from said disks and secured to said wood rung portions, a supplemental emergency metal rung member for each rung disposed adjacent to said wood rung portions and secured at its ends to said spacer disks, clips, links of said suspensory elements secured between said clips and said spacer disks, rivets for anchoring said clips in place, fabric envelopes enclosing said suspensory elements to protect the user from contact with the metal portions thereof in extreme temperatures, and rivets anchoring the ends of the envelopes to the links of the suspensory elements.

10. The combination of two suspensory elements composed of chain links, rungs, each rung including a plurality of rung portions composed of a material such as wood, means including spacer disks for connecting the rung portions to said suspensory elements, the rung portions of each rung being spaced from one another to form a wide tread, and a supplemental emergency metal rung member for each rung disposed adjacent to said rung portions and secured at its ends to said spacer disks.

11. The combination of two suspensory elements composed of chain links, rungs, each rung including a plurality of rung portions composed of a material such as wood, means including spacer disks for connecting the rung portions to said suspensory elements, the rung portions of each rung being spaced from one another to form a wide tread, and a supplemental emergency metal rung member disposed between said rung portions and removed from engagement by the user, the ends of said supplemental rung member being secured to said spacer disks.

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