May 16, 1933. J. SONETTO ET AL 1,909,231

LADDER

Filed June 11, 1931

Fig. 1.

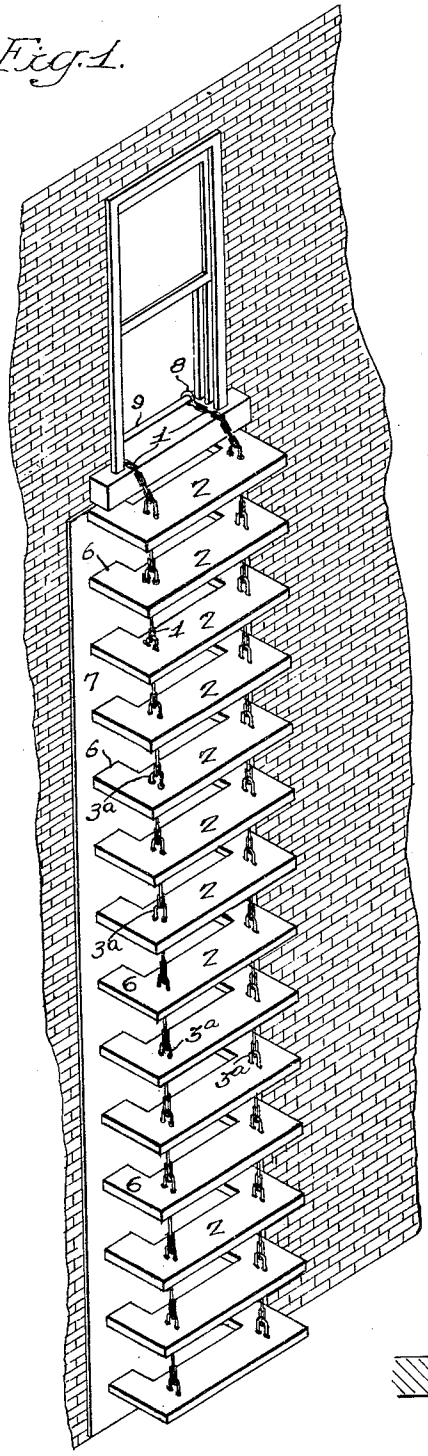


Fig. 2.

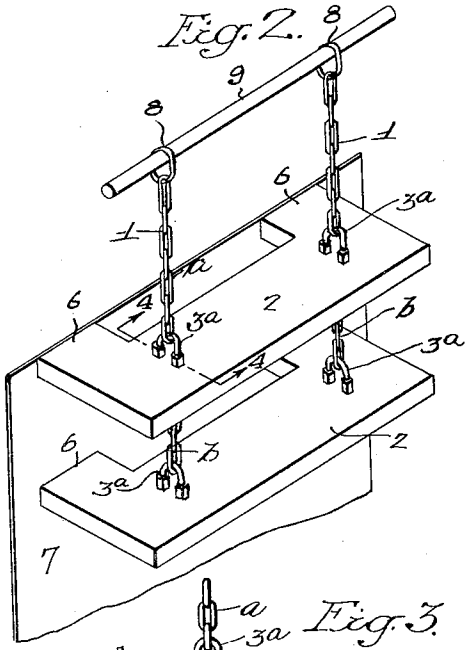


Fig. 3.

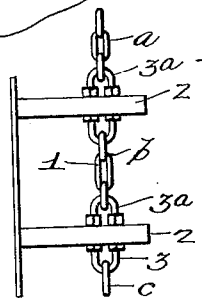


Fig. 5.

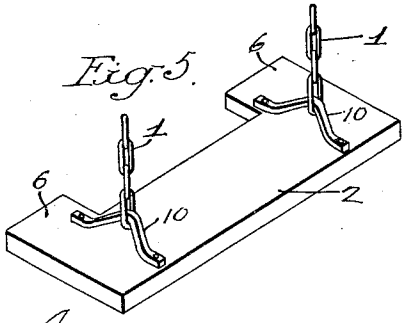
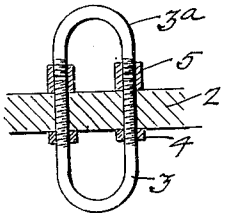


Fig. 4.



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UNITED STATES PATENT OFFICE

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LADDER

Application filed June 11, 1931. Serial No. 543,710.

This invention relates to new and useful improvements in ladders, and more particularly to ladders of the fire escape type.

An important object of the invention is to provide a ladder of the stated character, the component parts of which are impervious to destruction or damage by fire.

Another object of the invention is to provide a ladder of the stated character having novel means for securing the successive steps or rungs to the side runners.

Another object of the invention is to provide a ladder of the stated character which is flexible and which may be rolled or folded into a relatively small area for storage or transportation purposes.

Another object of the invention is to provide a ladder of the stated character which is novelly constructed to prevent the rocking of the steps thereof when in use.

Another object of the invention is to provide a ladder of the stated character having means disposed intermediate the ladder and a building to prevent flames attacking persons descending from the upper stories of the building by means of said ladder.

The invention further resides in certain novel features and details of construction set forth hereinafter and shown in the accompanying drawing, in which:

Figure 1 is a view in perspective of the device made and used in accordance with our invention;

Fig. 2 is a fragmentary view in perspective showing the method of securing the steps to the side runners;

Fig. 3 is a fragmentary side elevation of Fig. 2;

Fig. 4 is an enlarged sectional view on line 4—4, Fig. 2; and

Fig. 5 is a fragmentary view in perspective showing a modification for securing the steps to the side runners.

Referring now more particularly to the drawing, a ladder made in accordance with this invention comprises a pair of longitudinal runners 1, 1, each of which in the present instance we prefer to construct with a series of aligned broken chain sections designated as *a*, *b*, *c*, etc.

A plurality of parallel steps 2 are transversely disposed one below the other intermediate the successive chain sections of the longitudinal runners 1, 1 as shown in Fig. 1 of the drawing.

An important feature of the invention resides in the manner in which we secure the steps 2 to the adjacent ends of two corresponding successive sections of the longitudinal runners 1, 1 and, to this end, we prefer to secure the said steps by means of U-shaped elements 3 and 3*a* which, as shown in Fig. 4 of the drawing are oppositely disposed and in alignment with respect to each other, the ends of the lower of the said elements passing upward and entirely through the step 2 and being secured at the under side of the steps by a threaded collar 4, the upper ends thereof being joined to the downwardly extending U-member 3*a* by means of a threaded sleeve 5. The adjacent ends of the two successive chain sections are secured respectively to the U-elements as shown in the drawing.

In using the U-shaped elements in a manner shown in Fig. 1 of the drawing, I prefer to have the extremities thereof spaced a suitable distance with respect to each other at the point where the said extremities engage the steps 2 for the purpose of preventing as far as possible, the rocking of the steps 2 when the weight of a person is resting thereon. To further steady the steps 2 and eliminate the rocking thereof, the said steps are provided with the outwardly extending portions 6, which are adapted to contact with the outer wall of the building when the ladder is in position to enable persons to escape from the upper stories thereof.

Often times in descending from the upper stories of a building by means of ladders of the character herein set forth, the person must pass outwardly of a window in a lower story of the building and should flames be issuing therefrom, the person is likely to be injured. To normally prevent the occurrence of such a catastrophe, we provide a flexible asbestos curtain 7 extending the entire length of the ladder and secured to each of the extending portions 6 of the steps 2

throughout its length, the said curtain normally residing between the steps of the ladder and the wall of the building.

For the purpose of securing the ladder in position and preventing the dropping thereof when disposed outwardly from the window of a building, the upper extremities of the uppermost chain sections are provided with an enlarged annular ring 8, of sufficient diameter to permit a bar or rod 9 to be inserted therein, the said bar 9 being of sufficient length to engage the inner surface of the moulding of the window from which the said ladder is projected.

A modification of the manner in which we secure the chain sections to the parallel step elements 2 is shown in Fig. 5 and consists in securing V-elements 10 to the upper and lower surfaces of the steps adjacent the ends thereof, the adjacent extremities of the successive chain sections being secured thereto in a manner similar to that described above for securing the chain sections to the U-elements 3 and 3*a*.

It will be noted that by constructing the ladder comprising the longitudinal runners 1, 1 and transverse steps 2 of metal or other suitable fire impervious material, we provide a device which is very desirable for use in the home. Furthermore, by employing chain sections in accordance with our invention, the slight increase in the weight of the ladder effects a substantial steadying tendency to the said ladder when suspended outwardly from the window of a building for purposes of escape.

While we have set forth the embodiment of our invention for the purpose of description, it will be apparent that we are not limited in the construction thereof, except as set forth in the appended claims.

We claim:

1. In a ladder of the character described, a pair of flexible fire impervious runners, each comprising a plurality of aligned successive sections, a plurality of horizontally disposed steps having extending portions for bracing purposes, and a plurality of U-elements secured to said steps adjacent the ends thereof and in opposed relation, the said elements arranged for connection with the adjacent ends of the said aligned runner sections.

2. In a ladder of the character described, a pair of flexible fire impervious runners, each comprising a plurality of aligned successive sections, a plurality of horizontally disposed steps having extending portions for bracing purposes, and a plurality of V-elements secured to said steps adjacent the ends thereof and in opposed relation to each other, the said elements arranged for connection with the adjacent ends of the said aligned runner sections.

3. In a ladder of the character described, a pair of flexible fire impervious runners each comprising a plurality of aligned successive sections, a plurality of horizontally disposed steps having extending portions for bracing purposes, a plurality of U-elements secured to said steps adjacent the ends thereof and in opposed relation, the said elements arranged for connection with the adjacent ends of the said aligned runner sections, threaded means for securing said U-elements to said steps and a fire impervious curtain extending the entire length of the ladder and secured to the extending portions of the steps.

4. In a ladder of the stated character, comprising a pair of runners each comprising a plurality of aligned successive sections, means for securing a plurality of horizontally disposed steps intermediate said sections, said means comprising oppositely disposed U-members, one of which extends through the said step, and threaded means for securely joining the opposed extremities of the said members, the adjacent ends of said aligned successive sections being secured to said U-members.

5. In a ladder of the character described, a pair of runners, each comprising a plurality of aligned successive sections, a plurality of step elements, members extending through the steps adjacent the ends thereof in opposed relation transversely with respect to said steps, and means securing said members to said steps, the said members being arranged for connection with the adjacent ends of the aligned runner sections.

6. In a ladder of the character set forth, runner members comprising a plurality of aligned successive sections, a plurality of steps, members extending through the steps adjacent the ends thereof in opposed relation, and threaded means securing said members to said steps, the said members being arranged for connection with the adjacent ends of the aligned runner sections.

7. In a ladder of the type described, runner members comprising a plurality of aligned successive sections, a plurality of steps, members extending through the steps adjacent the ends thereof in opposed relation and transversely with respect thereto, and threaded means securing said members to said steps, the said members being arranged for connection with the adjacent ends of the aligned runner sections.

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