(No Model.)

D. PARKS.

FLEXIBLE EXTENSION LADDER.

No. 385,874. Patented July 10, 1888.

Fig.1.

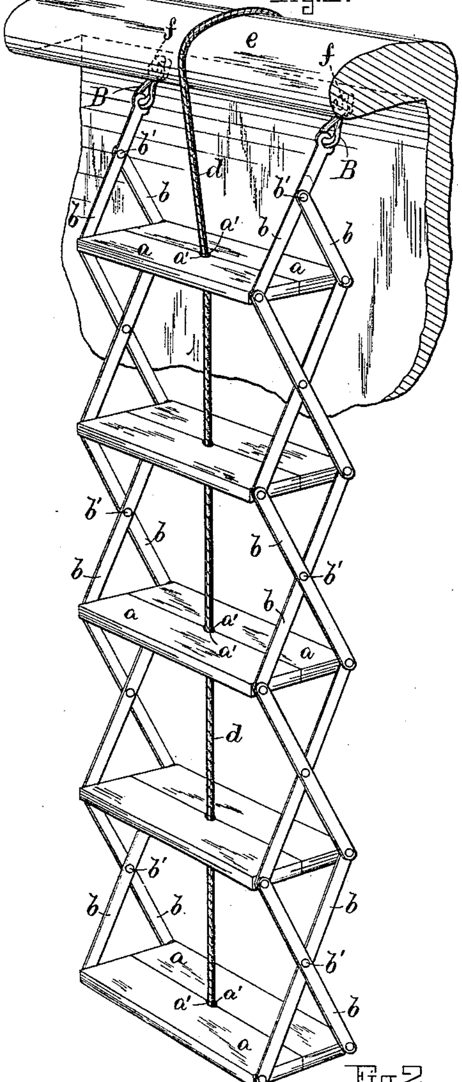


Fig.3.

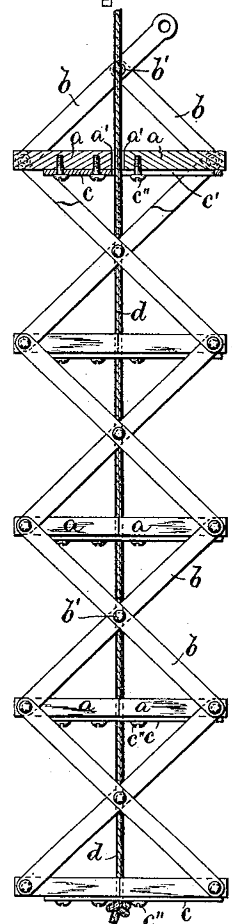


Fig.2.

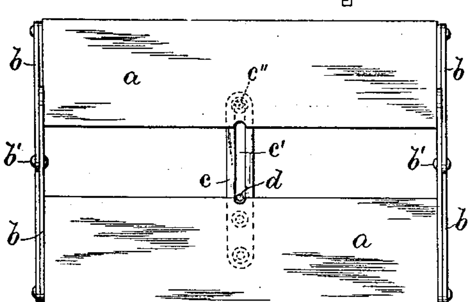
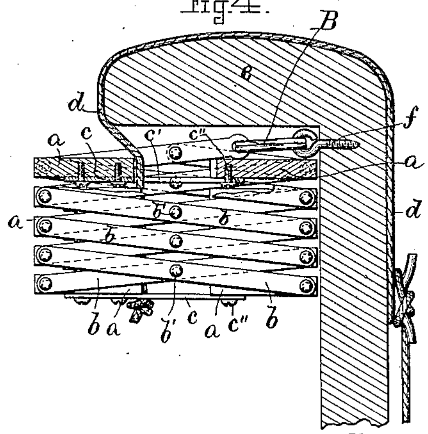


Fig.4.



Witnesses.
Henry Chadbourn.
Charles H. Fogg.

Inventor,
Dana Parks.
by Alban Andrén, his atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

DANA PARKS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE LAND AND SEA SAFETY LADDER COMPANY, OF MAINE.

FLEXIBLE EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 385,874, dated July 10, 1888.

Application filed November 5, 1887. Serial No. 254,379. (No model.)

To all whom it may concern:

Be it known that I, DANA PARKS, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Flexible Extension-Ladders, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in flexible extension-ladders, particularly designed for ships' use, although it may to equal advantage be used as a fire-escape or for other purposes, as may be desired.

The invention is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a perspective view of the improved ladder, shown as extended while in use. Fig. 2 represents a plan view of one of the steps in position when the ladder is folded together. Fig. 3 represents an end view of the ladder while extended for use, showing one of the steps in section; and Fig. 4 represents a sectional end elevation of the latter, shown as folded together while not in use.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In carrying out my invention I make use of a series of steps, each composed of a pair of boards or plates, *a a*, as shown in the drawings. To the outer ends of the steps *a a* are pivoted the lazy-tong levers *b b*, which are arranged diagonally between the successive steps, as shown in Figs. 1 and 3. Each pair of lazy-tong levers *b b* is hinged midway between its ends at *b'*, as shown in said Figs. 1 and 3.

The object of making each step in the ladder of a pair of boards or plates, *a a*, is to permit the latter to expand in a lateral direction one from the other when the ladder is folded together, as shown in Figs. 2 and 4, to compensate for the folded position of the lazy-tong levers *b b*, as shown in said figures.

For the purpose of guiding one of the step-boards relative to its mate in the series of steps, I secure to the under side of one of the plates *a* in each step a bar or plate, *c*, having a slotted perforation, *c'*, through the end of which passes the bolt or screw *c''*, that is secured to the other plate *a* in the step, as shown in Figs. 2 and 3.

I do not wish to limit myself to the use of one guide-bar for each pair of step-plates *a a*, as two or more may be used, if so desired. Neither do I wish to confine myself to the precise construction and arrangement of such guide-bars; but in practice I prefer to make them as shown and described.

d is the hoisting-rope for the ladder, the upper end of which may be passed over the railing *e* of a vessel and secured to it or to the deck-hull or other part of the vessel when the ladder is hoisted up outside of the vessel, as shown in Fig. 4.

The hoisting-rope *d* passes through semicircular recesses *a' a'* in the abutting edges of the boards *a a* in each step, as shown in the drawings, and said hoisting-rope also passes through the slots *c' c'* in the guide bars or plates *c c*, as shown in Figs. 2 and 3, by which arrangement the plates *a a* are prevented from a longitudinal motion, one relative to the other in each step, when the ladder is extended for use, as shown in Figs. 1 and 3. The lower end of the rope *d*, after passing through the recesses in the lowest step in the series and its slotted bar *c*, is suitably secured to the latter, as shown in Figs. 3 and 4.

The upper end of the ladder may be permanently or temporarily secured to the railing, hull, or other portion of a vessel, or to the window-sill or other part of a building if used as a fire-escape, in any suitable or convenient manner, and I do not wish to confine myself to any precise arrangement for this purpose.

In Fig. 1 of the drawings I have shown two of the lazy-tong levers *b b* of the top step as connected to hooks or eyes *f f*, secured to the hull or railing or other part of the vessel or building by means of sister hooks B B, or hooks or clasps of other well-known construction.

When not desired for use, the ladder can be folded together in a very small compass simply by pulling upward on the hoisting-rope *d* and suspended in such closed position outside of the vessel or building; or, if so desired, it

may be removed and packed away on deck of the vessel or within the room of a building, to be ready for use when so desired.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. The herein-described extension-ladder, consisting of the divided steps *a a a a*, connected together by means of the lazy-tong levers *b b*, as and for the purpose set forth.

2. The divided steps *a a a a* and the slotted guides *c c'*, as described, in combination with the lazy-tong levers *b b*, pivoted to the ends of the said divided steps *a a*, substantially as and for the purpose set forth.

3. In an extension-ladder, the divided steps *a a*, having recesses *a' a'* at their meeting edges, and the hoisting-rope *d*, passing through such recesses and secured to the lowest plate in the series or its connections, combined with the lazy-tong levers *b b*, pivoted to the ends of the divided steps *a a*, as and for the purpose set forth.

4. In an extension-ladder, the divided steps *a a*, having recesses *a' a'* at their meeting edges, as described, and slotted guides *c c'*, in combination with the hoisting-rope *d*, arranged as described, and the lazy-tong levers *b b*, pivoted to the ends of the divided steps *a a*, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 24th day of October, A. D. 1887.

DANA PARKS.

Witnesses:
ALBAN ANDRÉN,
F. E. C. BRYANT.