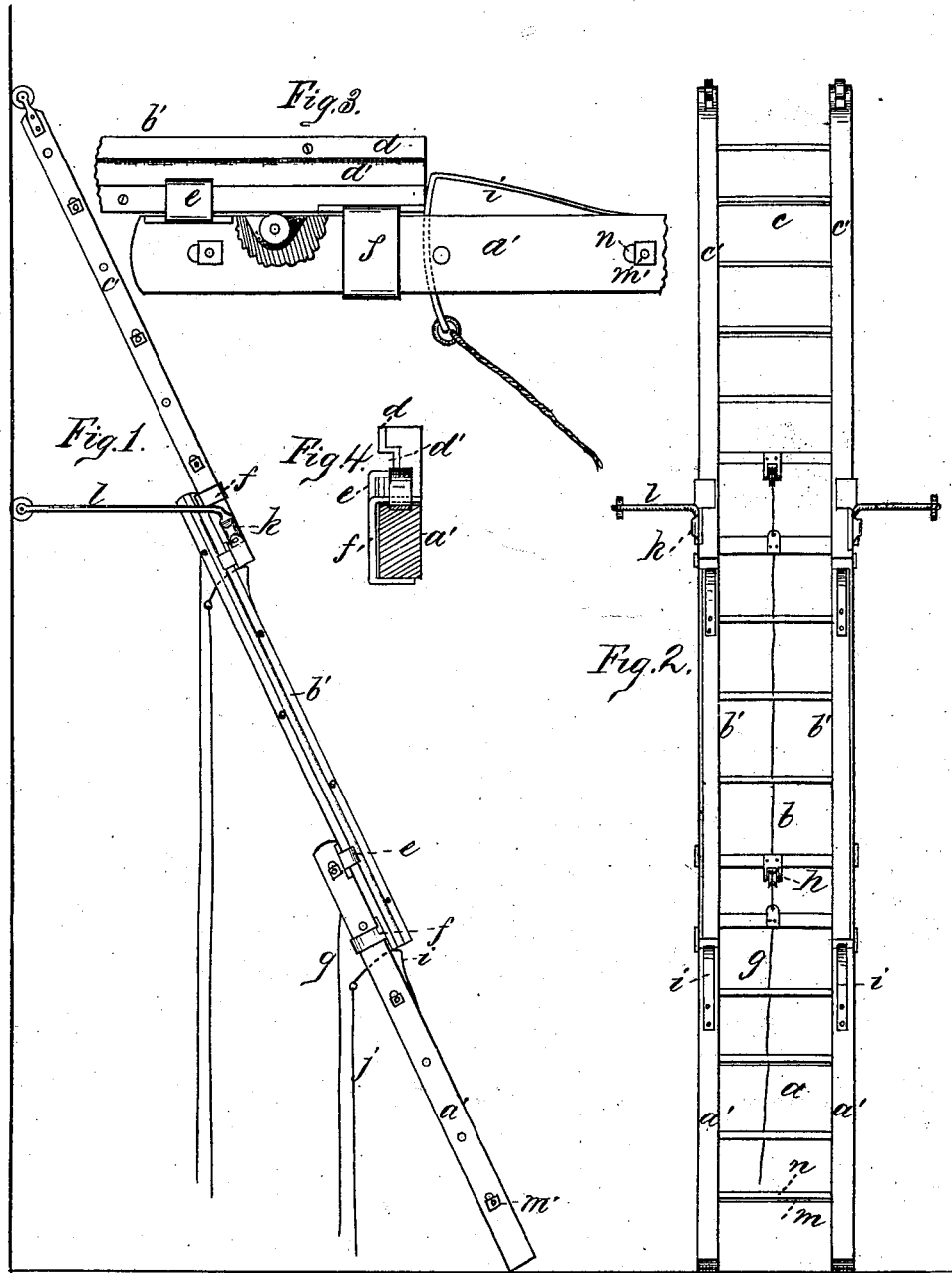


L. HAUERWAS.
Extension-Ladder.

No. 208,089.

Patented Sept. 17, 1878.



Witnesses:
R. F. Gaylord
John Ward

Inventor:
L. Hauerwas,
 By Wm. E. Simonds
 atty

UNITED STATES PATENT OFFICE.

LUDWIG HAUERWAS, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN EXTENSION-LADDERS.

Specification forming part of Letters Patent No. 208,089, dated September 17, 1878; application filed July 29, 1878.

To all whom it may concern:

Be it known that I, LUDWIG HAUERWAS, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements pertaining to an Extension-Ladder, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is a side view of a ladder embodying my improvements, elevated and extended. Fig. 2 is a front view of the same. Fig. 3 is a detail view, being an enlarged view of a portion of the side of the apparatus, illustrating the method of holding the lengths together; the ladder is supposed to be extended. Fig. 4 is an end view of the parts shown in Fig. 3.

Letters Patent No. 194,089, dated August 14, 1877, were issued to me for improvements pertaining to extension-ladders.

The present invention consists in improvements made on the device shown in my said former Letters Patent.

I show my ladder in the accompanying drawings in three lengths. The principle is applicable to any reasonable number of lengths or sections.

The letter *a* denotes the bottom or foot section; *b* the middle section, and *c* the top section, each as a whole. The rails *b'* *b'* of the middle or second section are faced on the outside, being themselves of wood, with metal plates or facings *d*, having a central groove, *d'*, running their whole length. The foot and top sections are furnished with clamp-fingers *e*, taking into these grooves. The middle section is furnished with clamp-fingers *f*, which embrace and slide upon the rails *a'* *c'*, respectively, of the foot and top sections. These clamp-fingers and the longitudinally-grooved facings *d* constitute the means for holding the sections together.

When the middle section has been elevated to the proper height, which is accomplished

by pulling on the cord *g*, which runs over the pulley *h*, it is held there by the catches *i*, which spring into place. In my former patent I show forked catches for this purpose. In the present instance they are not so forked. These catches can be pulled from under the middle section by means of the cord *j*. The top section is held to elevation in the same manner.

I have devised an improved intermediate support for the ladder. The letters *k* denote sockets fixed to the side of a section, and *l* removable supporting-arms, having lateral extension from the sides of the ladder, to avoid windows, ladders being commonly narrower than windows. These removable arms give the ladder greater compactness when folded up, and by having sockets therefor at different points one set can serve where more would be needed in my former plan.

I have devised a new means for at once holding the rails together and preventing the rounds from working endwise. The letter *m* denotes an iron rod next a wooden round, *n*. On the ends of this iron rod are nuts *m'*, abutting against the ends of the round, and also against the rails of the ladder.

I claim as my improvements—

1. The ladder-section *c*, provided with the sockets *k*, in combination with the laterally-extended and removable supports *l*, all substantially as described, and for the purpose set forth.

2. The ladder - rails *a*, the round *n*, the rod *m*, and the nuts *m'*, abutting on the ends of the round and also against the rails, all combined substantially as described, for the purpose set forth.

LUDWIG HAUERWAS.

Witnesses:

WM. E. SIMONDS,
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