A. S. RICHES.

FOLDING-LADDERS.

No. 194,467. Patented Aug. 21, 1877.

Fig. 1.

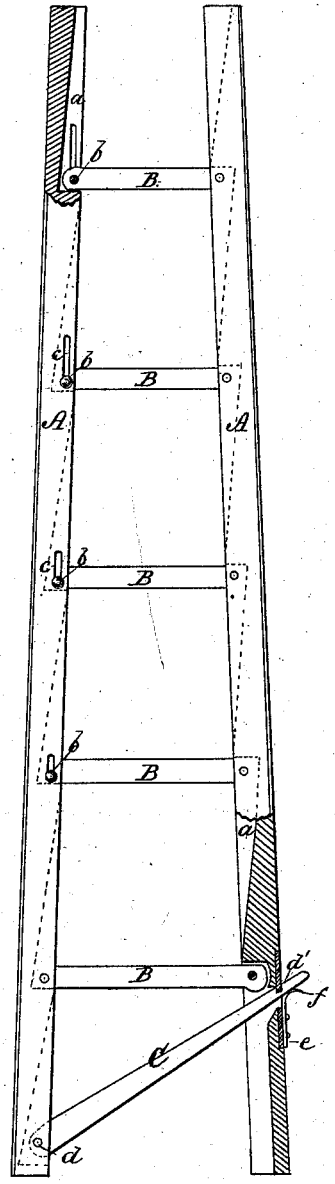
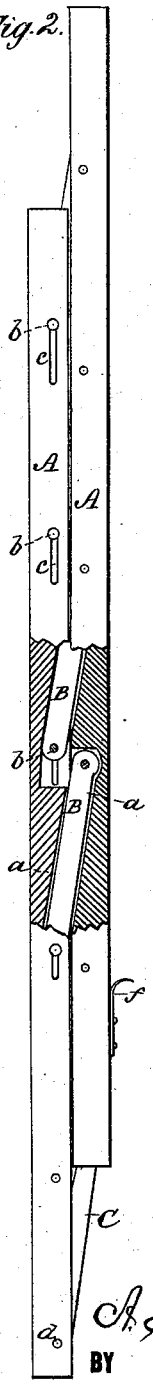


Fig. 2.



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ALGERNON S. RICHES, OF GLENBEULAH, WISCONSIN.

IMPROVEMENT IN FOLDING LADDERS.

Specification forming part of Letters Patent No. **194,467**, dated August 21, 1877; application filed July 7, 1877.

To all whom it may concern:

Be it known that I, ALGERNON S. RICHES, of Glenbeulah, in the county of Sheboygan and State of Wisconsin, have invented a new and Improved Folding Ladder; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front view of the ladder disposed for use, with parts broken away. Fig. 2 is a front view of the ladder when folded, with parts broken away.

My invention relates to an improved folding ladder designed for easy transportation, convenient handling, and compact storage, and especially adapted, by reason of such qualities, to use in stores, shops, or dwellings, where the ordinary form of ladder could not well be used.

The improvements are upon that form of ladder in which the rounds are pivoted to the side bars, so as to allow the latter to be folded into a parallel adjacent position; and they consist, first, in forming inclined recesses in the inner sides of the side bars, so as to receive the rounds when the ladder is folded, and allow the side bars to be immediately adjacent to and flush with each other, and the rounds hidden from view, which recesses also form supporting-shoulders when the ladder is disposed for use; secondly, in slotting one of the side bars at its pivot-connections with the rounds, in order to permit the side bars to be arranged convergently at the top; and, thirdly, in the combination, with the side bars and the rounds, of a locking-brace for holding the ladder stiff and rigid when the same is in use, as hereinafter more fully described.

In the drawings, A A represent the side bars, and B the pivoted rounds, of my improved folding ladder. Said side bars are formed upon their inner sides, at *a*, with a series of recesses corresponding to the number of rounds, which recesses have inclined bottoms. These recesses have, in one side bar, their deepest end at the bottom, and in the other side bar the deepest end at the top, so that in folding the ladder the recesses in the two side bars with reversely-inclined bottoms come together and form a chamber of uniform transverse dimension, occupying a diagonal position with relation to the side bars, as shown in Fig. 2, into which chamber the several rounds pass, moving radially into the same, and becoming thereby completely inclosed from view, leaving the adjacent edges of the two side bars flush and parallel. The rounds B are permanently pivoted at one end in the deepest portion of the recesses *a* in one of the bars, but at the other end have each a bolt or pin, *b*, which pivots loosely in slots *c*, formed on the other bar. The object of this arrangement is to permit the ladder to be constructed with converging side bars at the top, for a greater supporting-base at the bottom, increased strength, and more shapely appearance, and yet to permit said side bars to be folded into parallel adjacent position, for it will be obvious that with converging side bars the rounds at the bottom would be longer, and would impart a greater throw to the bars in moving radially and closing, than the rounds at the top, and hence, if the rounds were fixedly pivoted at each end, a ladder with converging side bars would not fold. The slots, it will be seen, compensate for this difficulty by increasing in length toward the top, and thus supplementing the diminished throw of the shorter rounds. In order that the rounds may have a firm support at the loosely-pivoted end, the said loosely-pivoted ends are arranged in the bottom or the deeper parts of the recesses in the slotted side bars, so that said recesses form shoulders that support the rounds upon the side.

To hold the ladder stiff and rigid in its opened position when disposed for use, a locking-brace, C, is provided, which is pivoted at *d* to one of the side bars, and is provided at its other end with a notch, *d'*. This notched end of the locking-bar is free from the side bar, but is adapted to be passed through a slotted plate, *e*, in said bar, and have its notch forced to engagement with the edge of said plate by means of a curved spring, *f*. The locking-brace thus occupies an angular position, with respect to the side bars and rounds, of about forty-five degrees, and holds the parts rigidly together against the radial movement of the rounds.

In closing the ladder, all that is necessary to disengage the locking-brace is to bear down

upon the protruding end against the pressure of the spring, which removes the notch from the slot-plate and allows the part to be folded.

Having thus described my invention, what I claim as new is—

1. The side bars A, having recesses *a*, with reversely-inclined bottoms, in combination with the pivoted rounds, as and for the purpose described.

2. A ladder having convergent side bars and pivoted rounds, with one set of ends of the rounds permanently pivoted to one of the side bars, and the other ends loosely pivoted to the other side bar by means of slots, as and for the purpose described.

3. The combination, with the side bars A and the pivoted rounds B, of the locking-brace C, the slotted plate *e*, and the spring *f*, substantially as and for the purpose described.

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Witnesses:
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