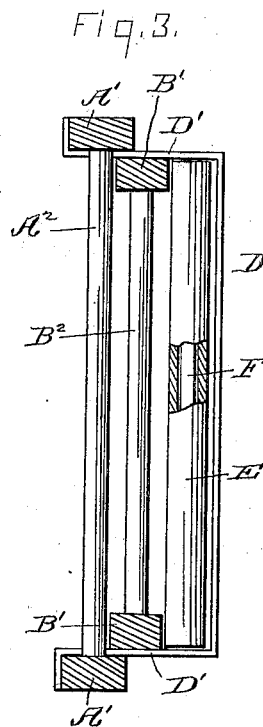
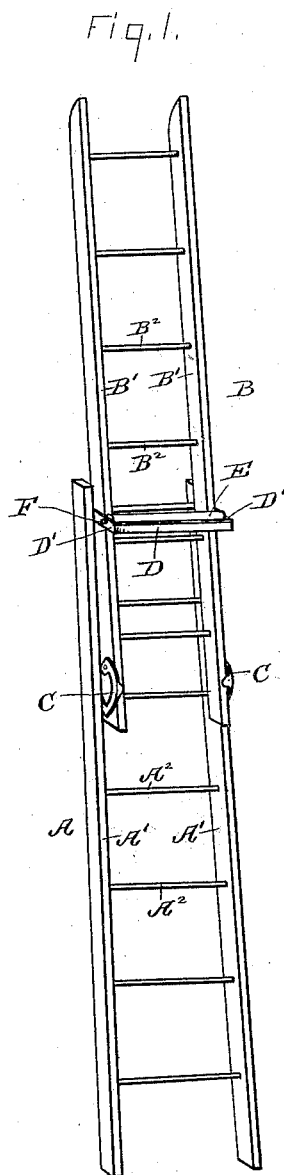
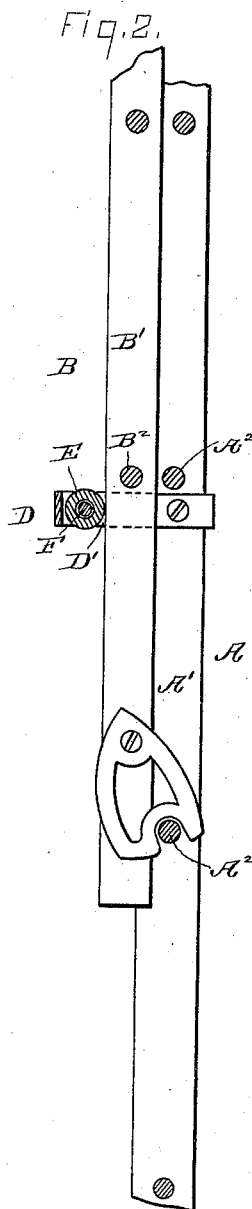


(No Model.)

J. C. GARDNER.  
EXTENSION LADDER.

No. 382,871.

Patented May 15, 1888.



WITNESSES—  
*Charles H. Roberts.*  
*John T. Long*

INVENTOR—  
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*by Cyrus Ketch.*  
Atty.

# UNITED STATES PATENT OFFICE.

JAMES C. GARDNER, OF CHICAGO, ILLINOIS.

## EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 382,871, dated May 15, 1888.

Application filed May 12, 1887. Serial No. 237,972. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. GARDNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Extension-Ladders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to portable extension-ladders in which a movable section overlies the section standing on the ground, and is adapted to be moved upwardly through varying distances over the lower section, thus increasing the length of the ladder.

The object of my invention is to provide for an easy action of the movable section. The manner of accomplishing this will appear from the following description.

In the accompanying drawings, Figure 1 is a perspective view of my improved ladder. Fig. 2 is a vertical section. Fig. 3 is a transverse section.

A is the lower section of the ladder. It is composed of the side rails, A' A', and rungs A<sup>2</sup>.

B is the upper and movable section, composed of the side rails, B' B', and rungs B<sup>2</sup>. Said section B is sufficiently narrow to lie loosely between the side rails and upon the rungs of the section A.

C C are swinging stirrups attached to the outer sides of the side rails of the section B, and constructed to engage the rungs A<sup>2</sup> from above, thus retaining the section B in its elevated position.

D is an iron yoke extending transversely over the section B and fixed by its ends upon the side rails, A' A'.

The parts thus far mentioned have been heretofore used and are not my invention. The yoke D has been placed near enough to the section B to serve as a guide and stay for the latter. As the section B is pushed upward by a man standing upon the section A, the upper

end of section B resting meanwhile against a wall or other object, the yoke D binds upon the front sides of the rails B' B' so tightly that in many cases it is impossible for the man to raise the section. To obviate this difficulty I lengthen the arms D' D' of the yoke D sufficiently to make room for the roller E between the yoke and the front faces of the rails B' B'. Said roller is preferably long enough to reach from one arm D' to the other, and is hollow through its axis to receive and be supported by the bolt or shaft F, the latter having its ends secured in the arms D' D'. In pushing upward on the section B the roller E turns readily and allows the section to be moved with ease. It has been heretofore attempted to attain this result by the use of a roller located over each rail B' B' and supported by a bracket attached to the side rails, A' A'; but this construction has been defective and unsatisfactory, for the reason that under strain the brackets would yield laterally and allow the upper section of the ladder to become displaced. This would result from the weakness of the brackets themselves and their attachment to the side rails and from the flexibility of the rails. By combining the yoke, rails, shaft, and roller as I have described, the roller is so firmly supported that it will not yield under any strains to which it is subjected in use.

I claim as my invention—

The combination of the sections A and B, the latter lying upon the rungs and between the side rails of the former, a yoke, D, extending transversely across said section B, and having its arms D' D' passing along the side rails of said section, and secured to the side rails of the section A, and joined above such section B by a shaft, F, extending from one to the other, a roller loosely surrounding said shaft, and stirrups C C, to engage the rungs A<sup>2</sup>, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES C. GARDNER.

Witnesses:

CHAS. FAWKES,

CHARLES H. ROBERTS.