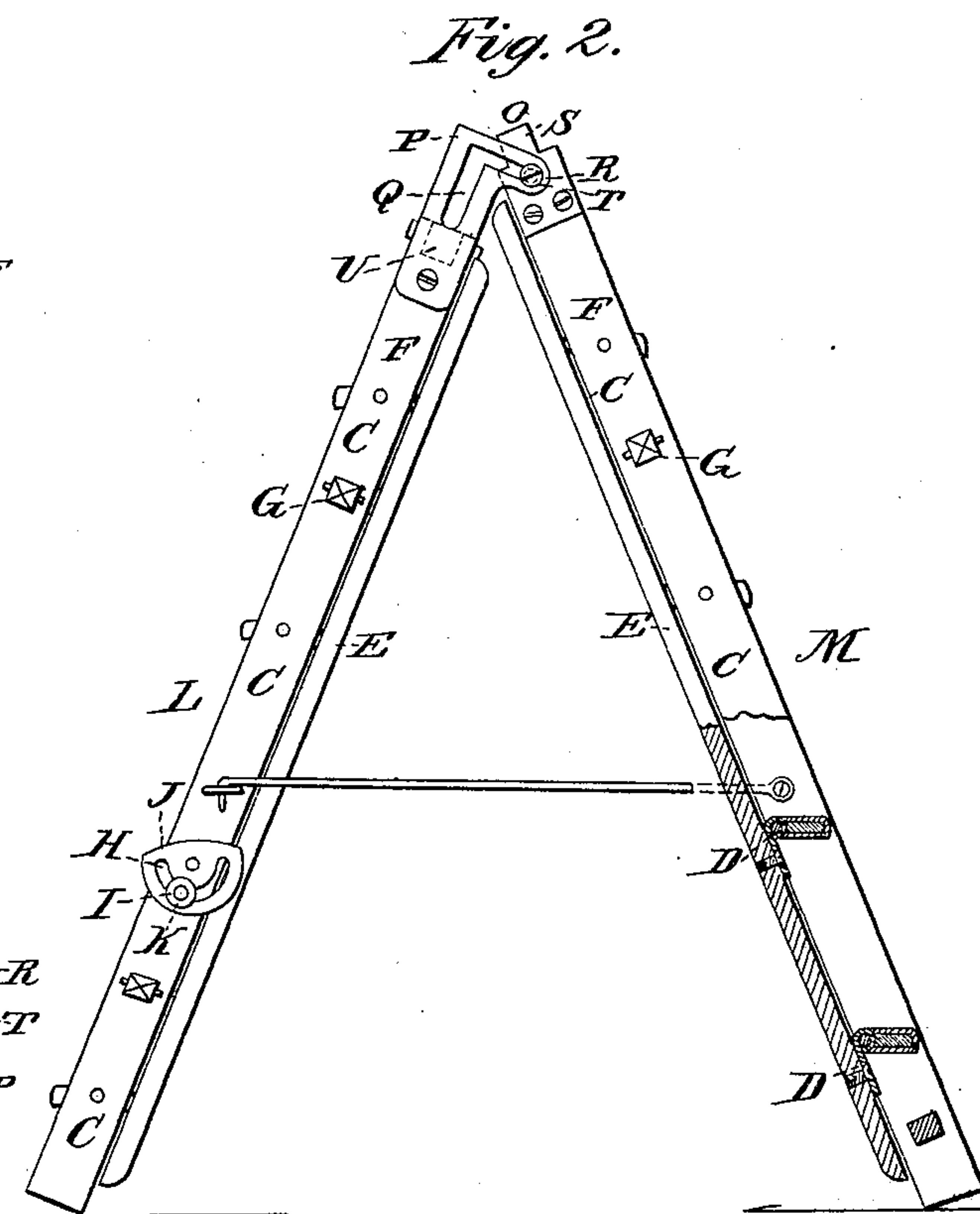
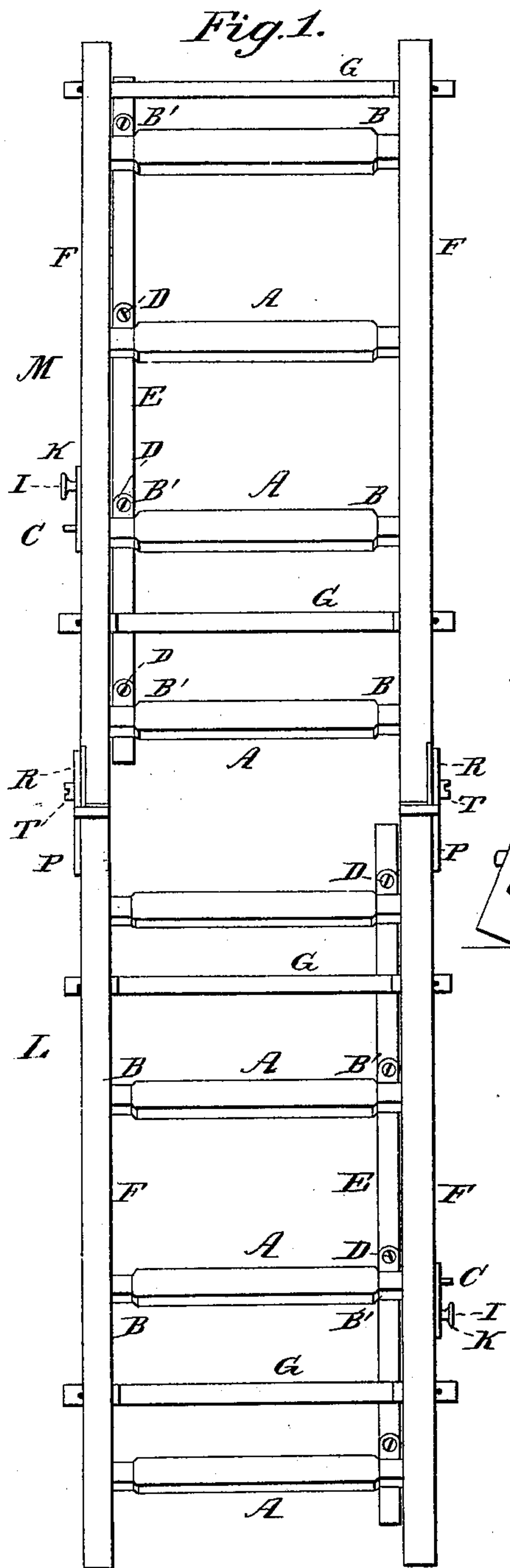


J. J. HARDENBROOK & S. BELFORD.

Adjustable Step-Ladders.

No. 139,004.

Patented May 20, 1873.



Witnesses.

J. F. Beale.
C. S. Chesney

Inventors.

John Joseph Hardenbrook
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their Attorney.

UNITED STATES PATENT OFFICE.

JOHN J. HARDENBROOK AND SAMUEL BELFORD, OF COLUMBUS GROVE, OHIO.

IMPROVEMENT IN ADJUSTABLE STEP-LADDERS.

Specification forming part of Letters Patent No. **139,004**, dated May 20, 1873; application filed April 5, 1873.

To all whom it may concern:

Be it known that we, JOHN JOSEPH HARDENBROOK and SAMUEL BELFORD, of Columbus Grove, in the county of Putnam, and State of Ohio, have invented a new and useful Improvement in Folding Extension Step-Ladders, which we denominate "The Adjustable-Step Folding Extension Step-Ladder," and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a view of ladder when extended, and Fig. 2 is a view of the same when used as a step-ladder.

This invention relates to an improvement in folding extension step-ladders; and consists of a step made adjustable within the side pieces of the ladder, so that the step can be placed at any inclination, irrespective of the inclination given to the ladder as a whole; also, of a semi-continuous lever secured to the end pin of the adjustable step, and provided with a thumb-nut for locking it, the object being to retain the step at any desired angle; further, in combination, a rod secured to the corresponding edges of a series of adjustable steps, one of which is provided with the semi-continuous lever having the locking-nut, the object being to operate the entire series of adjustable steps uniformly and at one and the same time.

In the accompanying drawing, the adjustable steps A are provided with bands or straps B B' to prevent the end pins C from splitting them. The straps B' are provided with hinge-joints D for securing the rod E thereto. The end-pins C work in the side-pieces F, which are strengthened and held in position by braces G. The semi-continuous lever H is secured to the end-pin C of one of the adjustable steps A. The end of a screw-pin, I, fixed in the side-piece F passes through a segmental slot, J, in the plate of the semi-continuous lever H, and a thumb-nut, K, thereon serves to lock the lever, thus retaining the step A in the desired position. The ladder is constructed in two similar divisions, L and M, connected by extension-joints O. The extension-joint O is composed of the plate P, provided with the right-angled slot Q, and the plate R having

the projection S. The plates P and R are connected by screws T passing through the slots Q into the plates R just below the bases of the projections S.

The operation of the ladder is as follows: To adjust the steps A, turn them by taking hold of one or two of them, or by grasping the rod E; as they turn the lever H turns with them. When they are at the desired angle, turn the thumb-nut K until it binds the plate of the lever H tightly. The steps A will then retain their position until the pressure of the thumb-nut K is relaxed.

To convert the ladder into an extension ladder you place the divisions L and M into a position to cause the corresponding side-pieces F to form a continuous line; insert the projections S into the recesses U made between the plates P and the side-pieces F and the divisions are united. The usual braces and hook are used to prevent spreading when the ladder is used as a step-ladder. When not in use it can be folded so as to occupy but little space.

Having thus described our joint invention, what we claim as new and useful, and desire to secure by Letters Patent, is—

1. The step A made adjustable within the side-pieces F, substantially as and for the purpose hereinbefore set forth.

2. The semi-continuous lever H provided with the thumb-nut K, in combination with the step A provided with the strap B, and made adjustable within the side-pieces F, substantially as and for the purpose hereinbefore set forth.

3. In combination, the rod E provided with hinge-joints D, a series of adjustable steps, A, provided with straps B B', and the semi-continuous lever H provided with the thumb-nut K, substantially as and for the purpose hereinbefore set forth.

In testimony that we claim the foregoing improvement in folding extension step-ladders, as above described, we have hereunto set our hands and seals this 31st day of March, 1873.

JOHN J. HARDENBROOK. [L.S.]
SAMUEL BELFORD. [L.S.]

Witnesses:

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