(No Model.)

# P. POERTNER.

## EXTENSION STEP LADDER.

No. 492,992. Patented Mar. 7, 1893.

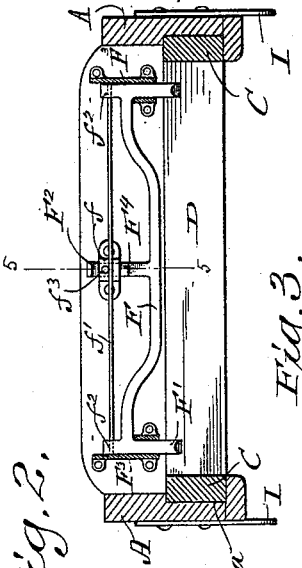

Fig. 2.

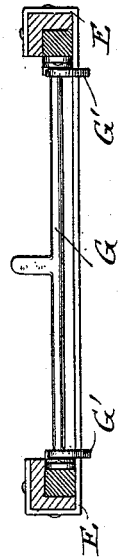

Fig. 3.

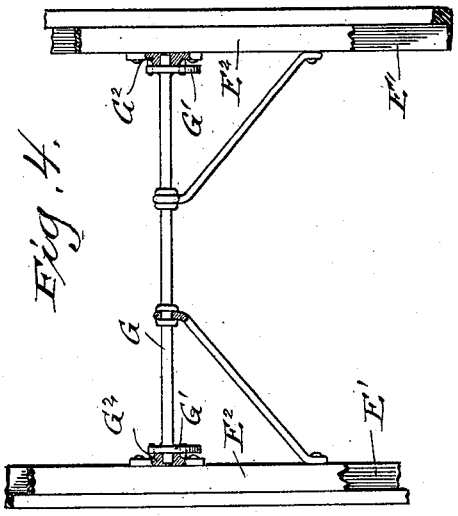

Fig. 4.

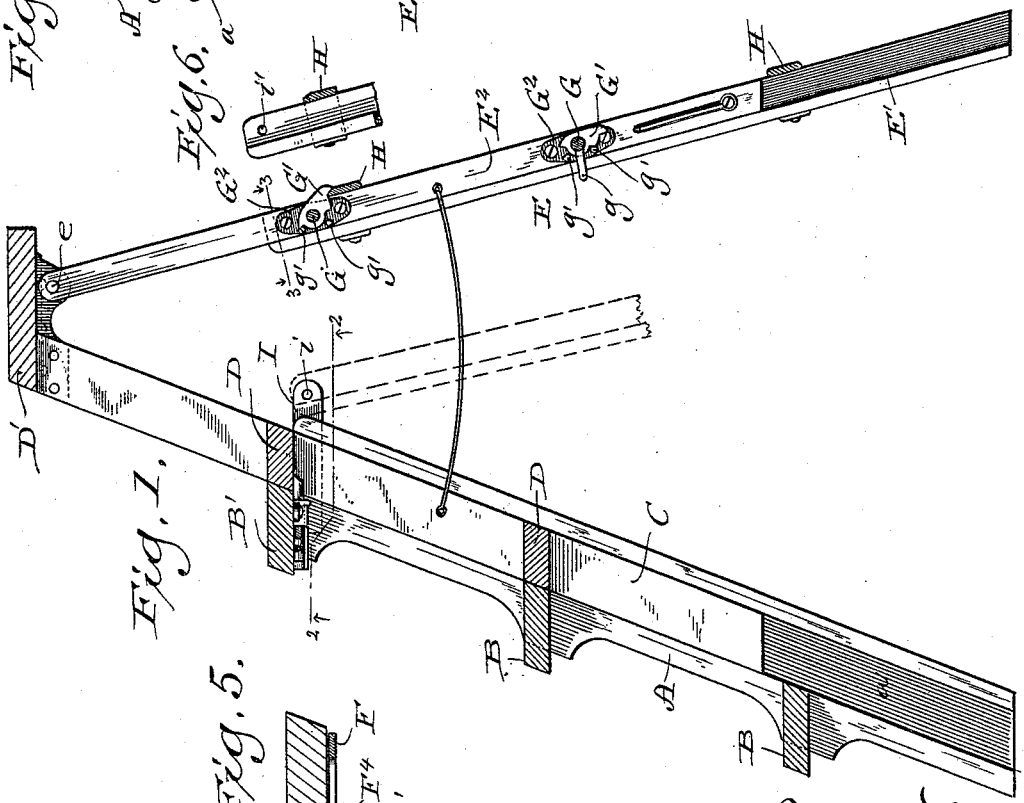

Fig. 1.

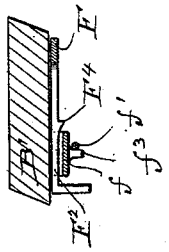

Fig. 5.



Fig. 6.

Witnesses
Geo. W. Young.
John E. Wiles.

Inventor
Peter Poertner
By H. G. Underwood.
Attorney

# UNITED STATES PATENT OFFICE.

PETER POERTNER, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO EMIL C. POERTNER, OF SAME PLACE.

## EXTENSION STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 492,992, dated March 7, 1893.

Application filed November 21, 1891. Serial No. 412,639. (No model.)

*To all whom it may concern:*

Be it known that I, PETER POERTNER, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Extension Step-Ladders; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in step ladders and more particularly to an improved form of extension step ladder, and it consists in the matters hereinafter described and pointed out in the appended claims.

The principal object of my invention is to provide an improved form of extension step-ladder of such a construction that it may be readily extended or shortened to form a ladder of the desired length and firmly secured in its adjusted position.

A further object of my invention is to provide means whereby my improved ladder may be separated into two or more sections each adapted to form a short ladder.

The various features of my invention will be more fully hereinafter described with reference to the accompanying drawings, in which;—

Figure 1 is a central vertical section of an extension step-ladder constructed in accordance with my invention. Fig. 2 is a horizontal detail section of the same on line 2—2 of Fig. 1. Fig. 3 is another detail section on line 3—3 of Fig. 1. Fig. 4 is a detail elevation of a portion of my improved ladder. Fig. 5 is a detail sectional view taken on line 5—5 of Fig. 2. Fig. 6 is another detail view of one of the parts.

In said drawings;—A A represent the side pieces or rails of the main or lower portion of the ladder provided with a series of steps B B and B′, and C C the side pieces or rails of the upper section of the ladder, provided with a series of steps D D and D′.

E E represent the supporting legs or braces comprising lower sections E′ E′ and upper sections $E^2$ $E^2$, the latter being pivotally engaged with the upper step D′ at the top of the upper section of the ladder as at *e e*.

As illustrated in the drawings, the main or lower sections A A of the side rails are provided with grooves or channels *a a* in their surfaces, within which the sections C C are arranged to slide lengthwise. The lower sections E′ E′ of the supporting legs E E are similarly grooved and the upper sections $E^2$ $E^2$ are arranged to slide lengthwise in said grooves.

Any convenient stop device is provided at a convenient point upon one of the sections, as upon the top step B′, of the main section of the ladder. This stop device is conveniently constructed in the form of a sliding bar F provided with projections F′ F′ adapted for engagement beneath any desired one of the steps D D or D′ of the upper section of the ladder. A forwardly projecting arm $F^2$ is provided upon the central portion of the bar F and is provided with a downwardly directed handle by means of which the bar F may be moved so as to bring the projections F′ F′ into or out of engagement with the steps D D D′. The projections F′ F′ are guided in their movement by suitable bearings $F^3$ $F^3$ upon the under side of the step B′ and the arm $F^2$ is similarly guided in its movement by means of a clip *f*. Upon the arm $F^2$ is provided a notch $F^4$ adapted to engage with said clips at times as will be presently explained.

A spring bar or rod *f′* is engaged at its ends as at $f^2$ $f^2$ with the forward ends of the portions F′ F′ of the locking device and at its central part is engaged with a stud $f^3$. upon the clip *f*. This spring bar or rod is slightly bent or bowed by being passed over the clip *f* at its central part and serves by its engagement with the ends $f^2$ $f^2$ of the parts F′ F′ to hold said ends away from the under surface of the step B′. When the bar F is drawn forward so as to disengage the projecting portions F′ F′ from the steps of the upper section of the ladder, the spring bar or rod *f′* will operate to depress said ends $f^2$ $f^2$ and the forward end of the arm $F^2$ so as to bring the notch $F^4$ into engagement with the clip *f*, and hold the locking device out of engagement.

Any desired or convenient form of locking devices may be provided upon the upper sections $E^2$ $E^2$ or the lower sections E′ E′ of the legs or braces E E so as to hold the sections of said legs in their adjusted positions. In

the particular form illustrated in the drawings, the upper sections $E^2$ $E^2$ are provided with transverse rods or bars G G each having one or more notched plates G′ G′ secured thereto. The rods or bars G G are revolubly secured in plates $G^2$ $G^2$ located upon the inner or opposed faces of said sections $E^2$ $E^2$ and each of said rods is provided with a projecting handle or lever $g$ by means of which it may be turned. Upon the lower sections of said legs are located suitable transverse bars H H adapted for engagement with said notched plates G′ G′. Suitable stops $g'$ $g'$ on the plates $G^2$ $G^2$ serve to limit the movements of the rods G G and the plates G′ G′.

Upon the upper ends of the sections A A are located suitably shaped projecting ears I I provided with apertures $i$ $i$ and adapted to embrace the outer surfaces of the legs, and the upper ends of the lower sections E′ E′ of said legs are provided with apertures $i'$ $i'$ as shown more particularly in Fig. 6.

The operation of my improved device is as follows;—When it is desired to extend the ladder, the bar F is withdrawn so as to move the projecting portions F′ F′ out of engagement with the step of the upper section when said section is elevated to the desired position and said bar is again moved into position so as to engage said projections with one of the steps. The legs are similarly extended and one of the rods G is operated so as to move the plates G′ G′ carried thereby into engagement with one of the bars H. By this means, the upper and lower sections of the ladder will be securely held together in their adjusted position.

If it is desired to convert the device into two shorter ladders, convenient for paper hangers' use, the upper sections C C of the side rails are lifted out of engagement with the lower sections A A and the upper sections of the legs are similarly detached from the lower sections. The upper section of the ladder comprising the side rails C C and sections $E^2$ $E^2$ of the legs, thereby forming a complete ladder. The lower sections E′ E′ of the legs are then brought into the position indicated in Fig. 1 by the dotted lines with their upper ends between the ears I I and pins are inserted through the apertures $i$ $i'$ to secure the parts together. In this manner, the extension ladder is readily converted into two independent ladders of shorter length.

It is obvious that my improved form of ladder may be made in more than two sections if desired, which may when occasion requires be converted into as many independent smaller ladders.

Having thus described my invention, what I claim is—

An improved step-ladder comprising side rails formed from two or more sections each provided with steps and slidingly engaged with each other, legs or braces also formed from a like number of sections and slidingly engaged with each other, a sliding bar secured to the upper step of the lower section and provided with projections adapted for engagement with the steps of the other section, transverse bars secured at intervals to the lower sections of said legs, and one or more transverse rods revolubly supported in the upper sections of said legs and carrying detents adapted for engagement with said transverse bars to lock said legs in their adjusted positions, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

PETER POERTNER.

Witnesses:
JOHN E. WILES,
MATT. F. WARNER.