(No Model.)

# A. A. SORG.

## EXTENSION LADDER.

No. 487,301. Patented Dec. 6, 1892.

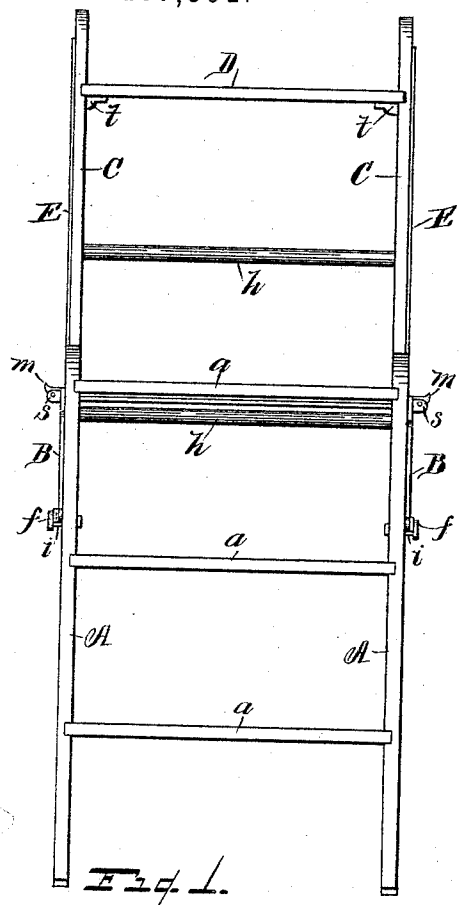

Fig. 1.

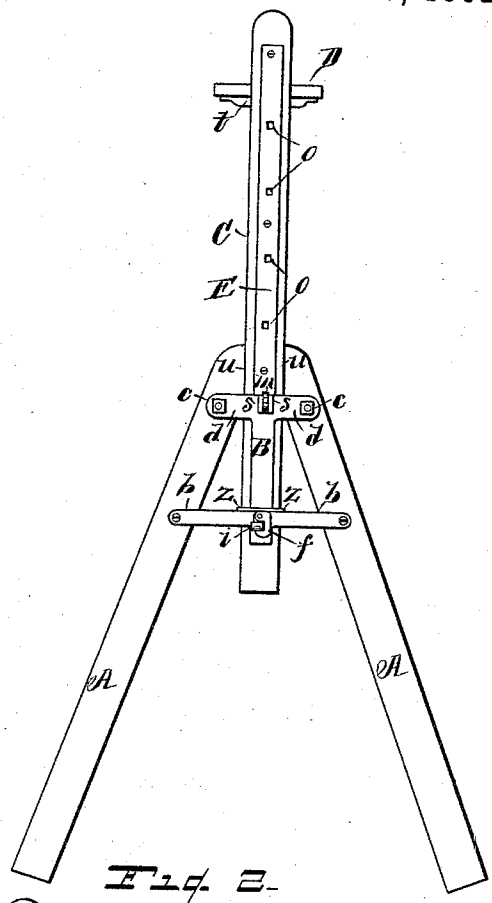

Fig. 2.

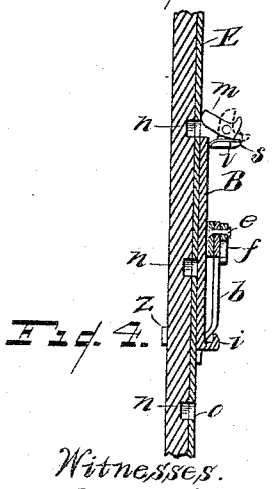

Fig. 4.

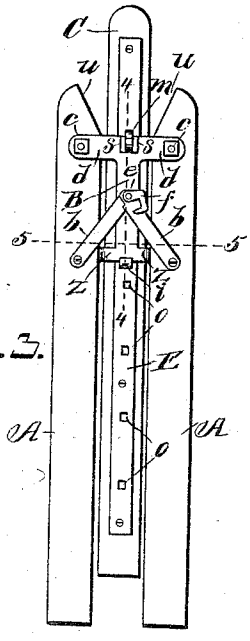

Fig. 3.

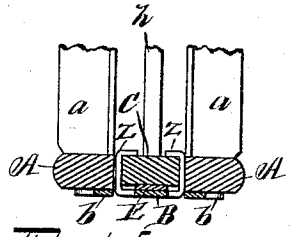

Fig. 5.

Witnesses.
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Inventor.
Albert A. Sorg
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# UNITED STATES PATENT OFFICE.

ALBERT A. SORG, OF ANN ARBOR, MICHIGAN, ASSIGNOR OF ONE-HALF TO GEORGE M. CLARKEN, OF SAME PLACE.

## EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 487,301, dated December 6, 1892.

Application filed September 26, 1891. Serial No. 406,880. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT A. SORG, a citizen of the United States, residing at Ann Arbor, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Extension-Ladders; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in extension-ladders; and it consists in a certain construction and arrangement of parts, as hereinafter fully set forth, the essential features of which being pointed out particularly in the claims.

The object of the invention is to produce a ladder that is light and compact when closed, that when spread is securely braced, and that is provided with a vertically-sliding section that may be readily adjusted to any degree of elevation to support a scaffold for ceiling work or interior finishing. This object is attained by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the ladder extended. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of the ladder closed. Fig. 4 is an enlarged vertical section on dotted line 4 4 of Fig. 3. Fig. 5 is an enlarged horizontal section on dotted line 5 5 of Fig. 3.

Referring to the letters of reference, A designates the supporting-legs of the ladder, which are joined in pairs by the steps *a*, as shown in Fig. 1.

B designates T-shaped metal plates. These plates are located one on each side of the ladder and are coupled to the legs A by means of the bolts *c*, passing through the horizontally-extending portions *d* thereof, whereby said legs are pivotally attached to said plates, enabling the lower ends of said legs to be readily spread or contracted, as desired.

To support the legs A when spread, the brace-arms *b* are employed, the outer ends of which are pivotally attached to the legs A some distance below the point of attachment of said legs to the plate B, the inner ends of said arms being pivotally coupled by means of the bolt or rivet *e*, whereby when the legs A are spread the arms *b* will extend horizontally, firmly bracing said legs in that position, as shown in Fig. 2, and when said legs are closed said arms will fold, as shown in Fig. 3.

*f* designates a gravitating catch that is eccentrically pivoted on the bolt or rivet *e*, that couples the inner ends of the arms *b*, and which is adapted to engage under the hook *i*, projecting from the lower end of the plate B, into which the coupled ends of the arms *b* drop when extended to their horizontal position, as shown in Fig. 2, in which position said parts are securely locked by the engagement of said catch *f* with the hook *i*. The tendency of said catch to swing downward keeps it in engagement with said hook and prevents said parts becoming unlocked by any jar or motion of the ladder.

The extendible section of the ladder is composed of the rails C, coupled by the rounds *h*, and is provided at the upper end with the step or platform D, mounted on the brackets *t*, secured to the rails C, (clearly shown in Figs. 1 and 2,) said section being adapted to slide vertically between the supporting-legs A and within the plates B. The outer faces of the rails C are provided with a metal plate E, extending from the top to the bottom thereof. Said plate is provided with a series of notches or apertures *o*, that register with corresponding recesses *n* in the face of the rails C, as shown in Fig. 4.

*m* designates a spring-controlled dog or detent that is pivoted between the ears *s*, formed at the upper end of the plate B, the free end of said detent being adapted to engage in the notches or apertures *o* in the plate E of the adjustable section and support said section at any degree of elevation, as shown in Figs. 1 and 2.

Located between the ears *s* and bearing against the under edge of the detent *m* is a spring *v*, (see Fig. 4,) the tension of which causes the free end of the detent to bear against the plate E, so as to be in position to automatically engage in the succeeding

notches therein as the adjustable section is raised, and when said detent is thrown outward to a vertical position, as shown by dotted lines in Fig. 4, said spring will retain it in that position, when it is restrained from engagement with the plate E, permitting the adjustable section to be freely lowered. The upper ends of the legs A are chamfered, as shown at *u*, the angle being such that when said legs are spread to the limit of the arms *b* their chamfered ends will stand parallel with the vertical edges of the rails C of the adjustable section and support said section between their adjacent faces, as shown in Fig. 2, the lower ends of said rails C being supported by the bent arms *z*, formed integral with the lower end of the plate B, that embrace said rails, as shown in Fig. 5, and through which the rails are adapted to slide as the adjustable section is raised and lowered.

In the operation of this improved device when it is desired to set up the ladder the lower ends of the legs A are spread apart the limit of the arms *b*, in which position they are locked by the catch *f*, as before described. The adjustable section is then raised to any desired height, when it will be supported by the detents *m*, engaging in the notches in the rails C, and afford means for sustaining a plank or scaffold at any degree of elevation. To lower the adjustable section, the detents *m* are thrown outward to the dotted position shown in Fig. 4, when said section may be freely lowered. To close the supporting-legs A, the catch *f* is disengaged from the hook *i* of the plate B, when the arms *b* will fold, permitting the legs to close, as shown in Fig. 3, in which position the ladder is compact and occupies but a small space.

It will be seen from the construction shown that the supporting-legs may be opened or closed without affecting the position of the adjustable section and that said section may be raised and lowered regardless of the position of the legs. It will also be seen that this improved device will serve as an ordinary step-ladder when desired.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an extension-ladder, the combination of the side plates, the supporting-legs pivotally coupled to said plates, the vertically-adjustable section mounted between said legs, and the detents for supporting said section when elevated, substantially as specified.

2. In a ladder, the combination of the T-shaped plate, the supporting-legs pivoted thereto, the dog or detent mounted on said plate, and the adjustable section adapted to slide vertically between said legs and having notches or apertures to receive said detent, substantially as set forth.

3. In a ladder, the combination of the pivotally-coupled supporting-legs, the brace-arms attached at their outer ends to said legs and pivotally coupled at their inner ends, and the gravitating catch for locking said arms when in their horizontal position to brace said legs, as set forth.

4. In a ladder, the combination of the T-shaped plates, the legs pivoted thereto, and the detents mounted on said plates, the adjustable section adapted to slide vertically between said plates and having notches or apertures in which said detents engage, the brace-arms attached at their outer ends to the legs and pivotally coupled at their inner ends, the hooks or lugs on the lower ends of said plates, upon which said arms are adapted to rest when extended, and the catch adapted to engage said hooks to lock said arms, substantially as specified.

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

ALBERT A. SORG.

Witnesses:
GEORGE CLARKEN,
ARTHUR BROWN.