

(No Model.)

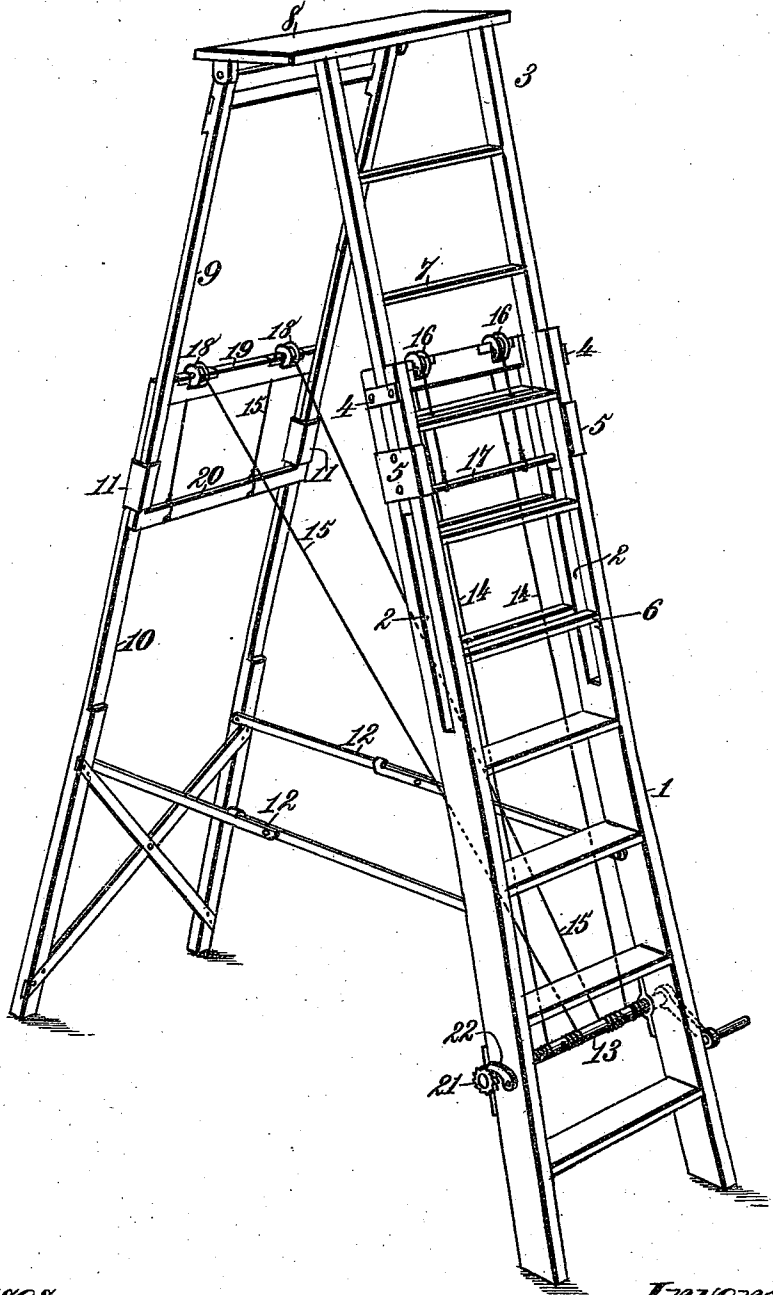
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C. T. CAMPBELL.
EXTENSION STEP LADDER.

No. 501,406.

Patented July 11, 1893.

Fig. 1.



Witnesses:
Robert Everett,
G. W. Rea.

Inventor:
Carl T. Campbell.
By
Amos L. Norris,
Atty.

(No Model.)

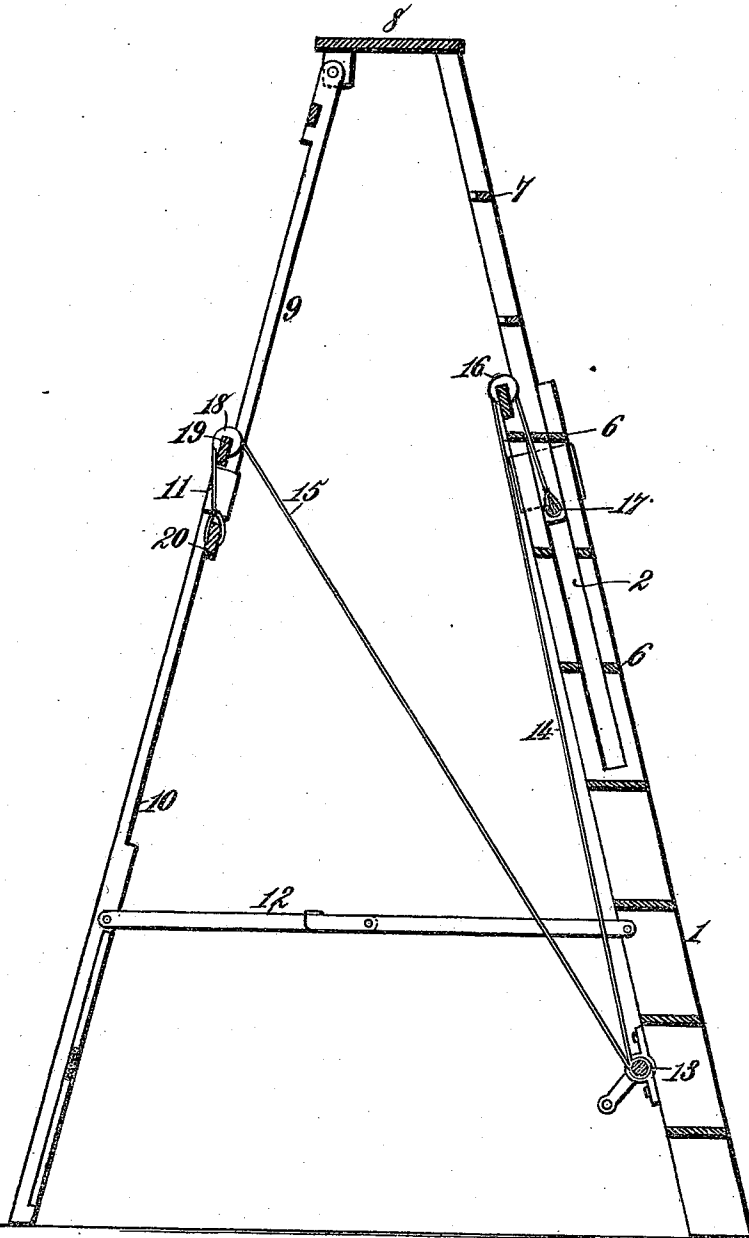
2 Sheets—Sheet 2.

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EXTENSION STEP LADDER.

No. 501,406.

Patented July 11, 1893.

Fig. 2.



Witnesses,
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Inventor,
Carl T. Campbell,
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UNITED STATES PATENT OFFICE.

CARL T. CAMPBELL, OF WARREN, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS
TO LEWIS M. CLARK AND ANDREW R. BEACK, OF SAME PLACE.

EXTENSION STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 501,406, dated July 11, 1893.

Application filed March 14, 1893. Serial No. 465,954. (No model.)

To all whom it may concern:

Be it known that I, CARL T. CAMPBELL, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented new and useful Improvements in Extension Step-Ladders, of which the following is a specification.

My invention relates to extension step-ladders and consists in the peculiar features of construction and novel combinations of devices for extending and folding the ladder and its extensible support as hereinafter described and claimed.

In the annexed drawings illustrating the invention:—Figure 1 is a perspective of my improved extensible step-ladder, partly extended. Fig. 2 is a vertical longitudinal section of the same.

The lower section 1 of the extension ladder is of the ordinary construction except that in the upper portion of each side rail is formed a longitudinal guideway 2 for reception of the side rails of the upper extensible ladder section 3 which is held from lateral displacement by stationary guides 4 attached to the outer sides of the lower side rails near their upper ends and by guides 5 attached to the outer sides of the lower ends of the side rails of the upper ladder section and which partly clasp the side rails of the lower ladder section.

Each ladder section is provided with a suitable number of steps and the uppermost steps 6 of the lower ladder section are divided lengthwise and spaced apart a sufficient distance to receive the narrow steps 7 of the upper ladder section. Thus, when the ladder is folded, the steps 7 of the upper section are flush with the divided steps of the lower section.

To the under side of the broad top step 8 of the upper ladder section 3 is hinged an extension leg or support composed of an upper section 9 and a lower sliding section 10 said section being connected by slides 11 that clasp their side rails.

The lower ladder section 1 and the lower section 10 of the extension leg or support are connected on each side by sectional centrally hinged braces 12 the ends of which are preferably pivoted to the inner sides of the side rails.

In order to provide a convenient and easily operated means for simultaneously unfolding the ladder sections and their extension support a single crank shaft or windlass 13 is mounted in suitable bearings on the rear lower portion of the main ladder section. Attached to this windlass 13 are two sets or pairs of ropes or cords 14 and 15 for extending the upper ladder section and the upper section of the ladder support. The ropes 14 for extending the upper ladder section 3 are passed up over pulleys 16 mounted on the rear upper portion of the main ladder section 1 and are then secured to a cross bar 17 at the lower end of the upper ladder section 3. The ropes 15 for extending the upper section 9 of the ladder support are passed up and over pulleys 18 mounted on a cross bar 19 at the upper end of the lower leg section 10 and are then secured to a cross bar 20 at the lower end of the upper section. By rotating the windlass 13 in the proper direction so as to wind the ropes 14 and 15 thereon the ropes 14 will draw on the cross bar 17 and thereby raise or extend the upper ladder section 3 while the ropes 15 draw on the cross bar 20 and simultaneously extend the sectional ladder support or leg.

One end of the windlass 13 is provided with a ratchet wheel 21 for engagement with a pawl or catch 22 on the outside of the lower or main ladder section and by which the windlass is securely held so as to enable the ropes 14 and 15 to support the upper extensible sections 3 and 9 at any height to which the ladder may be extended.

When the ladder is in a folded position and it is desired to make it ready for use it is only necessary to set it upright, throw the hinged leg or support backward and force down the sectional hinged braces 12 into proper position. The windlass 13 can then be turned in the proper direction to wind the ropes 14 and 15 and thereby simultaneously raise or extend the ladder and its extension support or leg, the arrangement of the ropes being such that only one windlass or crank shaft is required for this purpose. By employing only one windlass for simultaneously operating the extension ladder and its extension leg or support the construction is very much simplified and the proper extension of the ladder is ef-

fected with greater facility and in such a manner that the ladder can be readily operated by one person. When it is desired to lower the ladder it is only necessary to disengage
 5 the pawl 22 from the ratchet wheel 21 so as to release the windlass and thus slacken the ropes 14 and 15 when the upper sections of the ladder will gradually descend by gravity. The pulleys 16 and 18 should be deeply
 10 grooved or have flanges of such width as will retain the ropes 14 and 15 in place on said pulleys.

The ladder may be constructed of wood or metal in such manner as to be light, strong
 15 and durable, and as its operating parts are few and simple and comprise only one windlass or crank shaft it is obvious that it can be easily and quickly operated by one person and without liability of getting out of order.

20 What I claim as my invention is—

1. In an extension step-ladder the combination with the extensible ladder sections and a hinged leg or support composed of extensible sections, of a windlass mounted on the
 25 lower ladder section and having two sets or pairs of ropes secured thereto, one set of said ropes being passed over pulleys mounted at the top of the lower ladder section and then secured to the bottom of the upper ladder

section, and the other set of ropes being passed
 30 over pulleys at the top of the lower leg section and then secured to the bottom of the upper leg section, and a pawl and ratchet for holding the windlass, substantially as described.

2. In an extension step-ladder, the combination with the extensible ladder sections and a hinged leg or support composed of extensible sections, of a windlass mounted on the lower
 35 ladder section and provided with pawl and ratchet holding mechanism, ropes that connect said windlass with the lower end of the upper ladder section and with the lower end
 40 of the upper section of the leg support, pulleys mounted at the top of the lower ladder section and top of the lower leg section, respectively, and over which said ropes are
 45 passed, guides for the extensible ladder sections and for the extensible sections of the hinged leg or support, and hinged braces that connect the lower ladder section and lower
 50 leg section, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL T. CAMPBELL.

Witnesses:

JAMES W. WIGGINS,
GEO. N. FRAGINE.