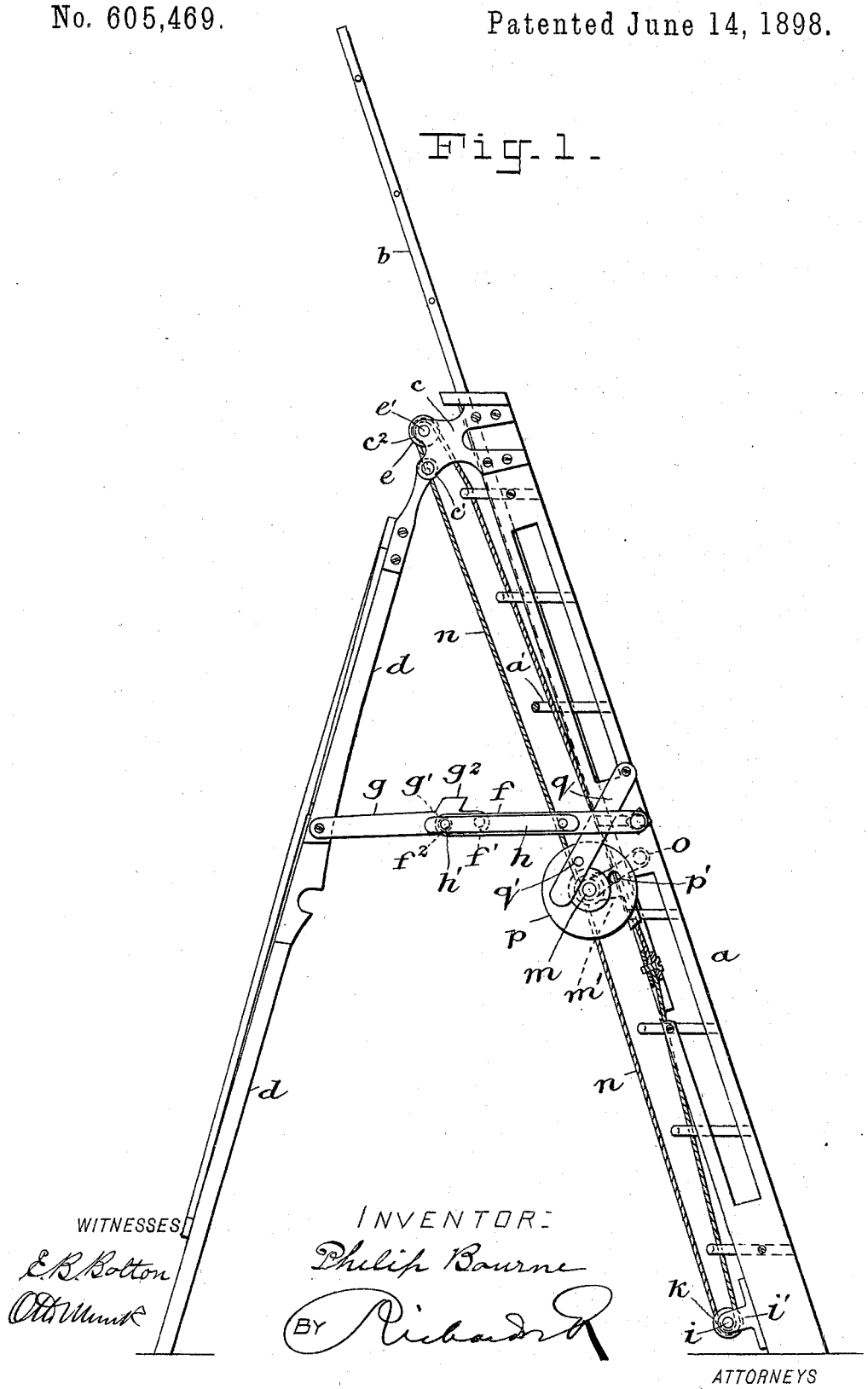
(No Model.). 2 Sheets—Sheet 1.

P. BOURNE.

EXTENSION LADDER.

No. 605,469. Patented June 14, 1898.

Fig. 1.



WITNESSES:

E. R. Bolton

Otto Munn

INVENTOR:

Philip Bourne

BY Richards & R

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

P. BOURNE.

EXTENSION LADDER.

No. 605,469. Patented June 14, 1898.

Fig. 3.

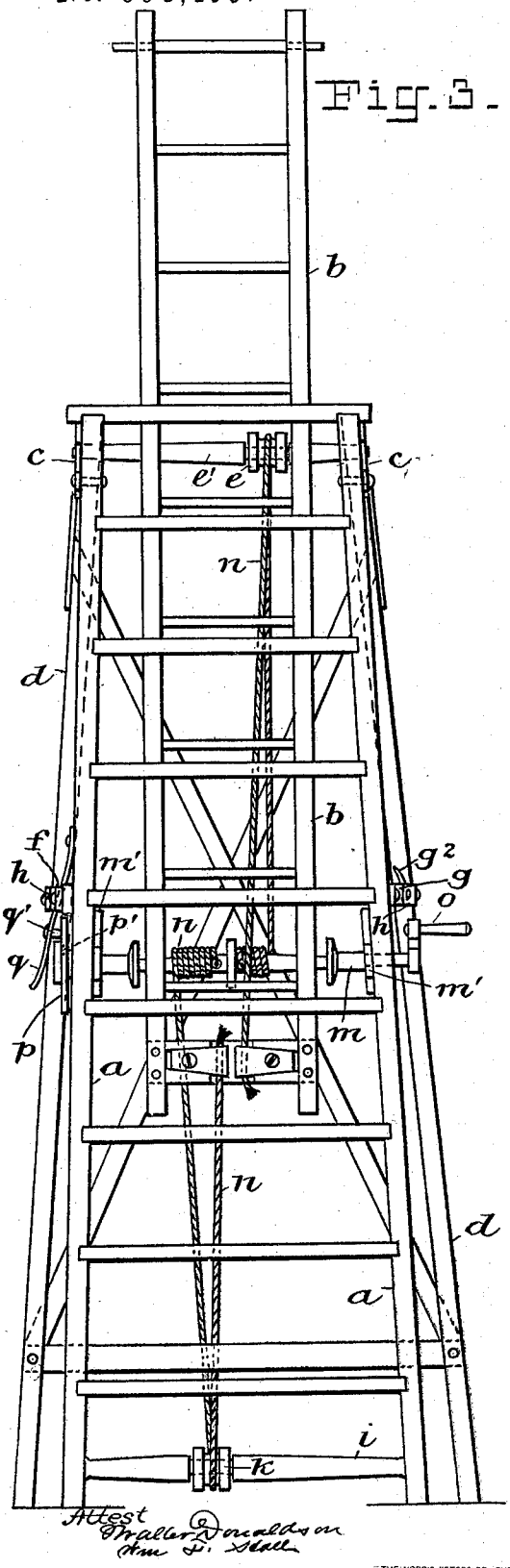
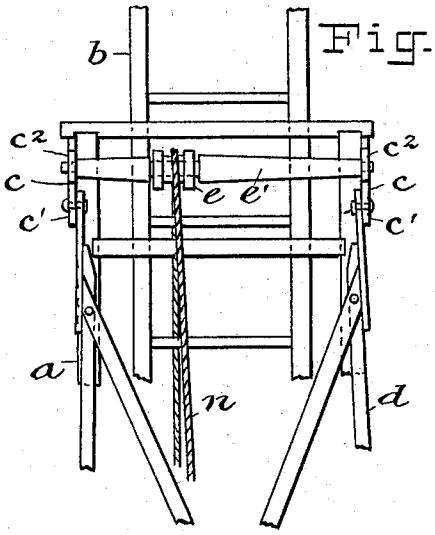


Fig. 4.



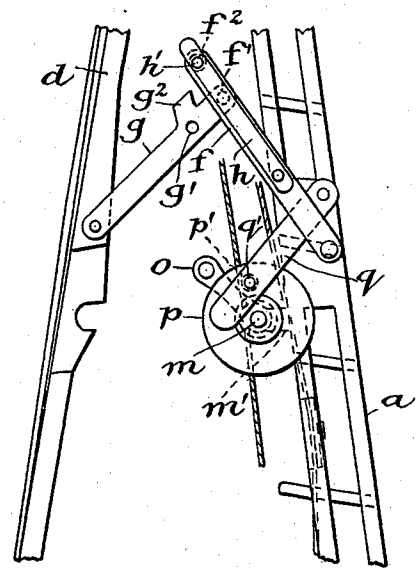


Fig. 2.

INVENTOR

Philip Bourne

BY Richardson

ATTORNEYS

Attest
Walter D. Donaldson
Wm. F. Stall

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PHILIP BOURNE, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF TO CHARLES L. DUBAR AND EUGENE F. VACHERON, OF NEW YORK.

EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 605,469, dated June 14, 1898.

Application filed August 18, 1897. Serial No. 648,677. (No model.)

To all whom it may concern:

Be it known that I, PHILIP BOURNE, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Extension-Ladders, of which the following is a specification.

This invention relates to extension step-ladders; and its object is to construct a simple portable extension step-ladder which will be firmly supported in position without danger of falling and which can be easily operated.

A further object is to prevent the ladder from closing up when installed in position.

The invention will be more particularly described with reference to the accompanying drawings, in which—

Figure 1 represents a side view, partly in section, of my improved step-ladder, showing the ladder fixed in its open position and the catch free to allow the upper ladder to be raised. Fig. 2 is a detail side view showing the locking-arms partly closed and the catch of the windlass locking the latter. Fig. 3 is a front view of Fig. 1, and Fig. 4 is a detail front view of the upper pulley and hinge of the ladder.

Referring to the drawings by letter, *a* represents the lower part of the ladder, which in most respects is substantially similar to step-ladders in common use, except that suitable openings or guides *a'* are provided in the steps to allow a second or extension ladder *b* to slide up and down therein. At each side of the upper end of the ladder is a forked lug *c c*, in the lower end *c'* of which the legs of the support *d* of the ladder are pivoted and in the upper end c^2 of which fork is mounted a shaft *e'*, upon which a pulley *e* is carried. At suitable points intermediate the ends of the lower ladder *a* and the support *d* are pivoted arms *f* and *g*, pivoted together at the point *f'*, the end of arm *g* being pivoted to arm *f* a short distance from the extremity thereof, and the extremity of arm *f* being provided with an opening f^2, adapted to correspond with a similar opening *g'* in arm *g* when the ladder is in open position. A spring-clip *h*, carried by arm *f*, is provided with a lug *h'*, arranged to slip into and through both openings f^2 and *g'* when the latter two correspond. In order to facilitate the operation of fixing the arms together when in position and make such operation automatic, I provide an angular projection g^2 on arm *g* above the opening *g'*, whereby the lug *h'*, projecting through the opening f^2, will strike against the projection and be guided into opening *g'*. At the lower part of the ladder a shaft *i* is mounted in bearings *i'*, and a pulley *k* is carried on shaft *i*. At a convenient point in the lower ladder a windlass-shaft *m* is mounted in bearings *m' m'*. The windlass is divided into two parts, and a cord or chain *n* is wound on the respective parts of the windlass, and the respective ends of the cord lead over pulleys *e* and *k* and are fastened to the lower end of the ladder. Upon one end of the windlass-shaft is a crank *o* to turn the same, and upon the other is a face-plate *p*, provided with an opening. A spring-clip *q* is fixed to the ladder and provided with a lug *q'*, adapted to engage with and enter opening *p'* to lock the windlass and prevent the latter from turning. To insure a free movement of the windlass when desired, the clip may be swung so that the lug will be moved out of the path of the opening.

The operation of the ladder above described is substantially as follows: The ladder is moved to the position where it is desired to be operated and the support swung outward in the usual manner. As the support moves outward the arms are opened, and clips *h h* cause the lugs *h'* to project through the openings in the arms and lock the same in position. The locking-clip *q* is then swung out of the path of movement of the opening in the face-plate *p* and the windlass turned by crank *o* in the proper direction to wind the cord over pulley *e*, which draws up the extension-ladder *b* to the desired height, when clip *q* is moved to bring the lug *q'* into engagement with opening *p'*, which locks the extension-ladder in position and prevents it being moved up or down.

Having thus described my invention, I claim—

1. In a step-ladder, the combination with

the ladder and support, of two arms pivoted respectively to the ladder and the support, and the end of one of said arms pivoted to the other arm intermediate the extremities thereof, there being openings in said arms adapted to correspond with each other when the arms are in extended position, a spring-clip carried by one of said arms and provided with a lug adapted to enter both openings when the same correspond, and an angular projection upon the other arm adapted to guide said lug into the opening upon the arm provided with the angular projection, substantially as described.

2. In a step-ladder, the combination of an extension-ladder adapted to slide therein, a windlass mounted upon said step-ladder, pulleys at the upper and lower ends of the step-ladder, and a cord wound on said windlass and having its ends leading respectively over said pulleys and fastened to the lower end of the extension-ladder, substantially as described.

3. In a step-ladder, the combination of an extension-ladder adapted to slide therein, a windlass mounted upon said step-ladder, pulleys at the upper and lower ends of the step-ladder, a cord wound on said windlass and having its ends leading respectively over said pulleys and fastened to the lower end of the extension-ladder, a face-plate fixed to one end of the windlass-shaft and provided with an opening therein, and a spring-clip fixed to the ladder and having a lug adapted to engage with said opening, substantially as described.

4. In a step-ladder, the combination of an extension-ladder adapted to slide therein, a windlass mounted upon said step-ladder, pulleys at the upper and lower ends of the step-ladder, a cord wound on said windlass and having its ends leading respectively over said pulleys and fastened to the lower end of the extension-ladder, a face-plate fixed to one end of the windlass-shaft and provided with an opening therein, a spring-clip fixed to the step-ladder and having a lug adapted to engage with said opening, a support pivoted to said step-ladder, two arms pivoted respectively to the step-ladder and the support and the end of one of said arms pivoted to the other arm intermediate the extremities thereof, there being openings in said arms adapted to correspond with each other when the arms are in extended position, a spring-clip carried by one of said arms and provided with a lug adapted to enter both openings when the same correspond, and an angular projection upon the other arm adapted to guide said lug into the opening upon the arm provided with the angular projection, substantially as described.

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

PHILIP BOURNE.

Witnesses:
WM. L. MATHOT,
LOUIS MATHOT.