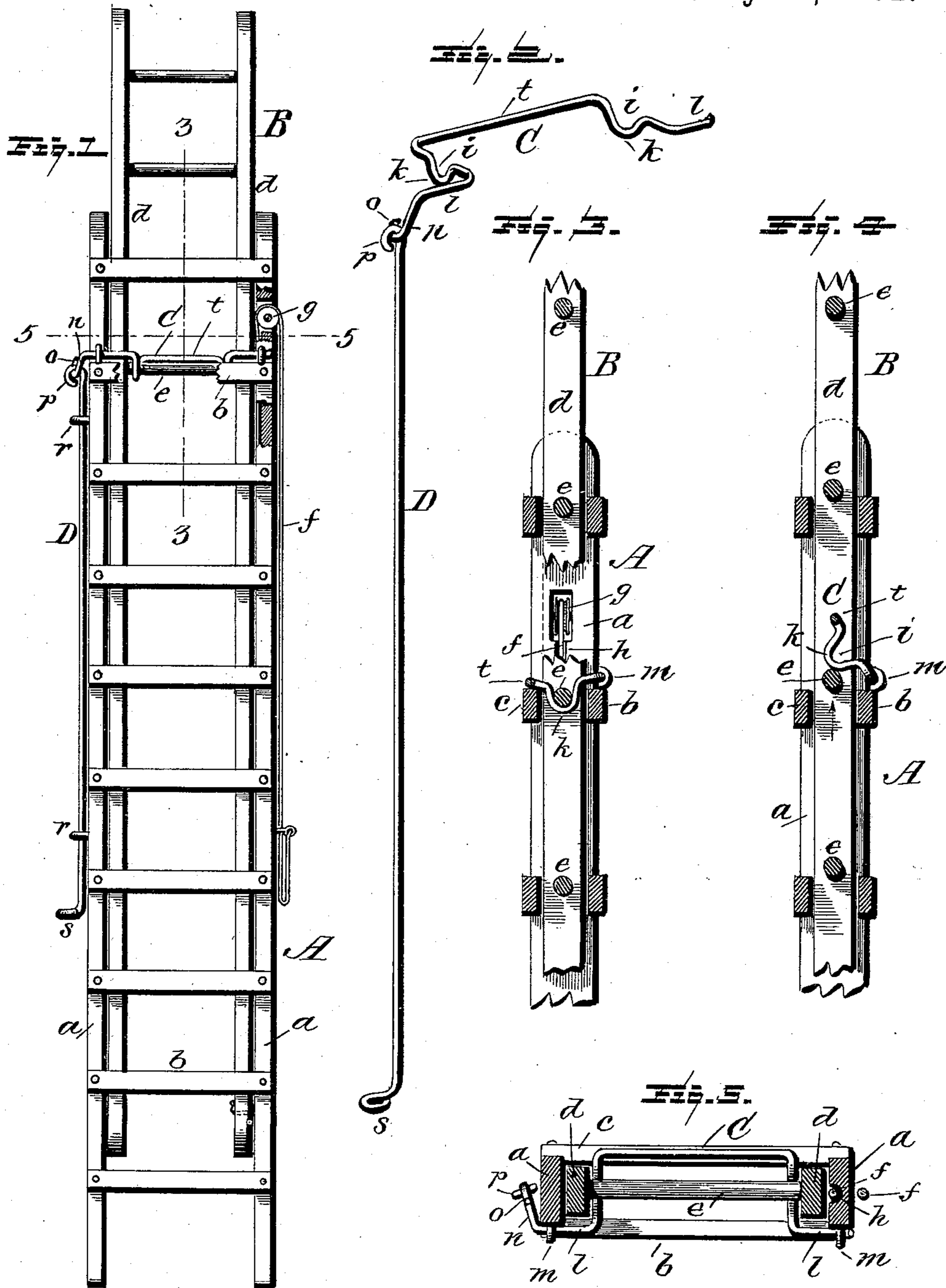


(No Model.)

W. J. ROBERTSON & J. B. GENIN.  
EXTENSION LADDER.

No. 478,969.

Patented July 12, 1892.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 478,969, dated July 12, 1892.

Application filed June 10, 1890. Serial No. 354,935. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM J. ROBERTSON and JOHN B. GENIN, citizens of the United States of America, residing at the city of St. Albans, in the county of Franklin and State of Vermont, have invented a new and useful Improved Extension-Ladder, of which the following is a full, clear, and exact description.

The present invention has relation to that class of extension-ladders wherein are employed one or more extensible ladder-sections and means for elevating such section and holding it in its adjusted position with relation to the ladder-section which rests upon the ground.

It is the object of the present invention to improve the device heretofore in use for holding and supporting the movable ladder-section in its extended or adjusted position, whereby it will be more firmly held in place and a wide tread secured by having all the rungs of the two ladder-sections come on the same horizontal plane; also, in improving the construction of this class of extension-ladders, whereby their value will be materially enhanced and their strength and durability greatly increased. These several objects above enumerated are attained by the construction substantially as shown in the drawings, and hereinafter described and claimed.

Figure 1 of the drawings represents a front elevation of our improved ladder, partly in broken section; Fig. 2, a detail view, in perspective and upon an enlarged scale, of the device for supporting and holding the movable and extensible ladder-section in its adjusted position; Fig. 3, a vertical section, on an enlarged scale, taken on line 3 3 of Fig. 1, showing the device for sustaining or holding the extensible section in position and the rung resting in the U-shaped seat thereof; Fig. 4, a similar view showing the device raised by contact therewith of the rung of the extensible ladder-section; Fig. 5, a horizontal section taken on line 5 5 of Fig. 1.

In the accompanying drawings, A represents what is termed the "stationary" ladder-section, or the section which is to rest upon the ground or floor or other like support, and

consists of the usual side pieces *a* and connecting-rungs *b c*, which are connected to the side pieces so that they will be opposite each other and on the same horizontal plane.

The side pieces *a* are of sufficient width so that when the rungs are secured thereto the required space will be left between the rungs *b c* to admit the extensible ladder-section B to freely move between them when raised or lowered. This extensible ladder-section consists of the usual side pieces *d* and rungs *e*, the same vertical space being left between said rungs as between the respective pairs of rungs *b c*, so that when the extensible ladder-section is adjusted the three rungs *b c e* will be on the same horizontal plane, and thereby present a wide tread for the foot.

In order to conveniently raise or elevate the extensible ladder-section B, a suitable hoisting-rope *f* is provided, one end of which is attached to the lower end of said section and the opposite end to one of the side pieces of the stationary ladder-section A. This hoisting-rope passes over a grooved pulley *g*, which has its bearings in the upper end of one of the side pieces of the ladder-section A, as shown in Figs. 1 and 3, and this side piece has a longitudinal groove *h* for the hoisting-rope to work in, as shown in Fig. 5, thus forming a guide therefor and preventing frictional contact of the extensible ladder-section B against said rope when the same is moved up or down.

Any other preferred and well-known means may be provided for raising or elevating the extensible ladder-section, although the means shown is considered the most simple and practical; but we reserve the right to make such changes or modifications in the several details of construction as would come within ordinary mechanical skill, and this without departing from the principle of our invention.

The support C is especially constructed to firmly sustain the rung at both ends, so that said rung of the extensible ladder-section will be firmly supported and capable of bearing more weight and also enabling said rung to be disposed on the same horizontal plane with the respective pairs of rungs of the lower or stationary ladder-section, so as to present a

wide tread. To attain this object, the support C is constructed of wire of the desired strength, and is bent to form a transverse horizontal connecting-bar  $t$ , said bar at its 5 ends being bent at right angles and also bent to form U-shaped seats  $i$ . It will be noticed that the transverse bar  $t$  is of sufficient length to nearly equal the length of the rungs  $e$ , and the U-shaped seats  $i$  are at the extremity or 10 ends of the bar, thereby supporting the rung at both its ends and not at the center, thus giving greater sustaining power thereto. The transverse bar  $t$  also forms a long bearing when resting upon one of the rungs  $e$ , and 15 consequently the sustaining power of the support C also increased, and by the employment of the U-shaped seats the rung when resting therein will be on the same horizontal plane with the respective pairs of rungs of the sta- 20 tionary or lower ladder-section. The three rungs being thus on the same horizontal plane, a wide tread for the foot is provided, and consequently the rung  $e$  does not receive the entire weight, but, on the contrary, is distributed 25 over the three rungs and the pressure and weight materially taken off the support.

The U-shaped seats  $i$  serve an additional purpose in presenting to the rungs  $e$  as the ladder extension B is raised a rounded shoul- 30 der  $k$ , and as the rungs successively come in contact therewith the support will be automatically raised until the rungs pass beyond the support, when the latter will fall by gravity to its normal position ready to receive the 35 rung immediately above it, and thus hold the extensible ladder-section in its elevated position; the three rungs, as previously stated, being on the same horizontal plane to form a broad bearing or tread for the feet.

40 The support C is bent to form laterally-extending arms  $l$ , which have their bearings in suitable eyes  $m$  upon the edge of the side pieces  $a$  of the stationary ladder-section.

Any suitable and well-known means may 45 be employed for pivoting the support C to the stationary ladder-section A; but that shown

is considered to be the most simple and effective.

One of the arms  $l$  of the support C has a downward extension  $n$ , which terminates in 50 an eye  $o$  for engaging with an eye  $p$  upon the upper end of an operating-rod D, said rod passing through guides  $r$  upon one of the side pieces  $a$  of the ladder-section A. This operating-rod extends down a sufficient distance 55 to be in convenient reach of a person on the ground and has a suitable handle  $s$  at its lower extremity for operating it.

Having now fully described our invention, what we claim as new, and desire to secure by 60 Letters Patent, is—

1. In an extension-ladder, a ladder-section having rungs arranged in pairs connected to the section upon opposite sides thereof and an extensible ladder-section located between the 65 rungs forming the pairs, in combination with a pivoted support consisting of a transverse horizontal connecting-bar having at each end a U-shaped seat to sustain the rung of the extensible ladder-section at both its ends and 70 on the same plane with the rungs of the respective pairs, substantially as and for the purpose described.

2. In an extension-ladder, a ladder-section having rungs arranged in pairs and connected 75 thereto upon opposite sides and an extensible ladder-section located between the rungs forming the pairs, in combination with a pivoted wire support consisting of a transverse connecting-bar having a U-shaped seat at 80 each end and operating-rod connected to the support and a rope and pulley for raising the extensible ladder-section, substantially as and for the purpose specified.

In testimony whereof we have hereunto set 85 our respective hands in the presence of two subscribing witnesses.

WM. J. ROBERTSON.

J. B. GENIN.

Witnesses:

WM. G. SHAW,

ALBERT P. CROSS.