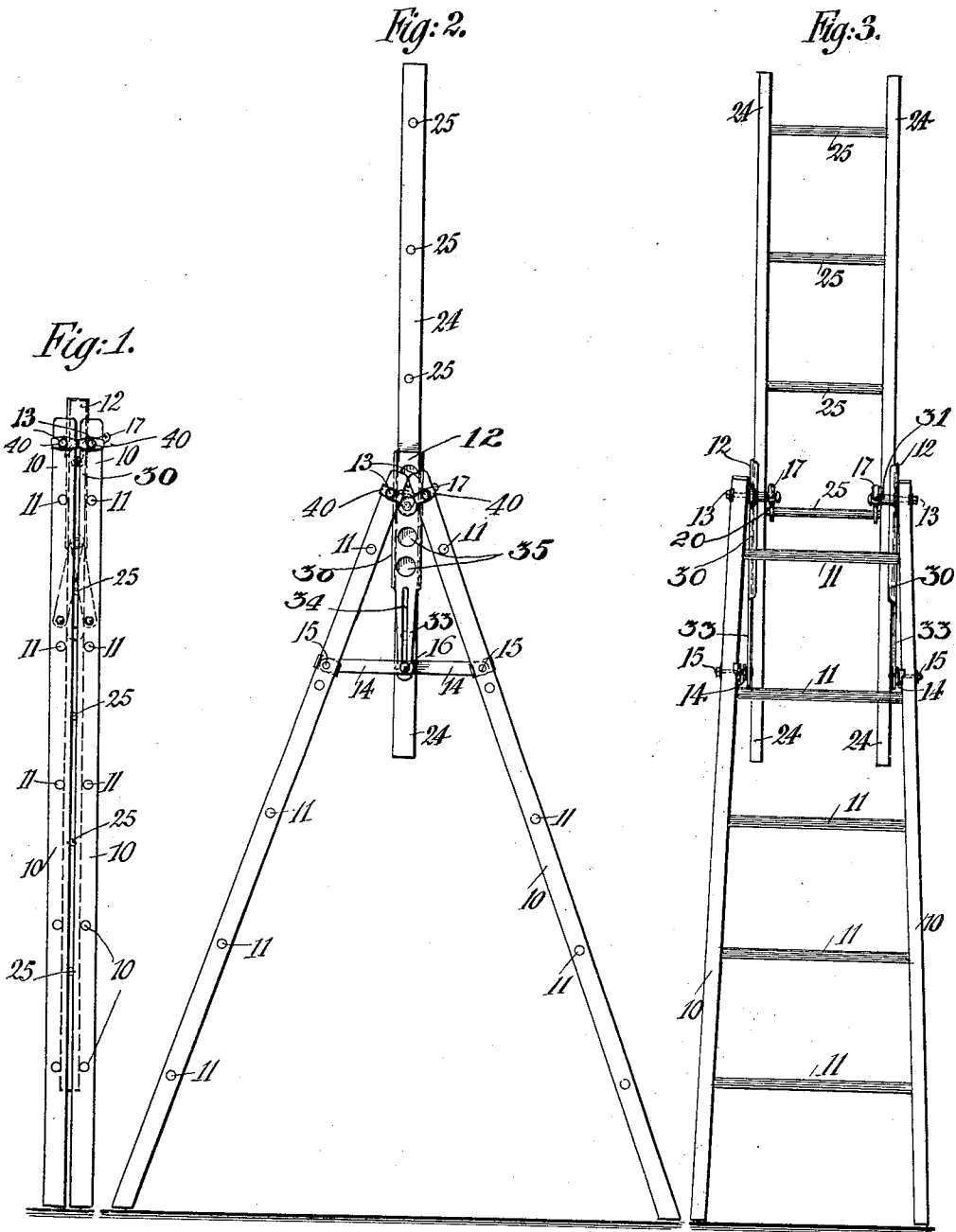


A. N. FAULKNER,  
FOLDING EXTENSIBLE LADDER,  
APPLICATION FILED JUNE 29, 1911.

1,069,403.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 1.



Witnesses:  
C. M. Dorman  
John Murtagh

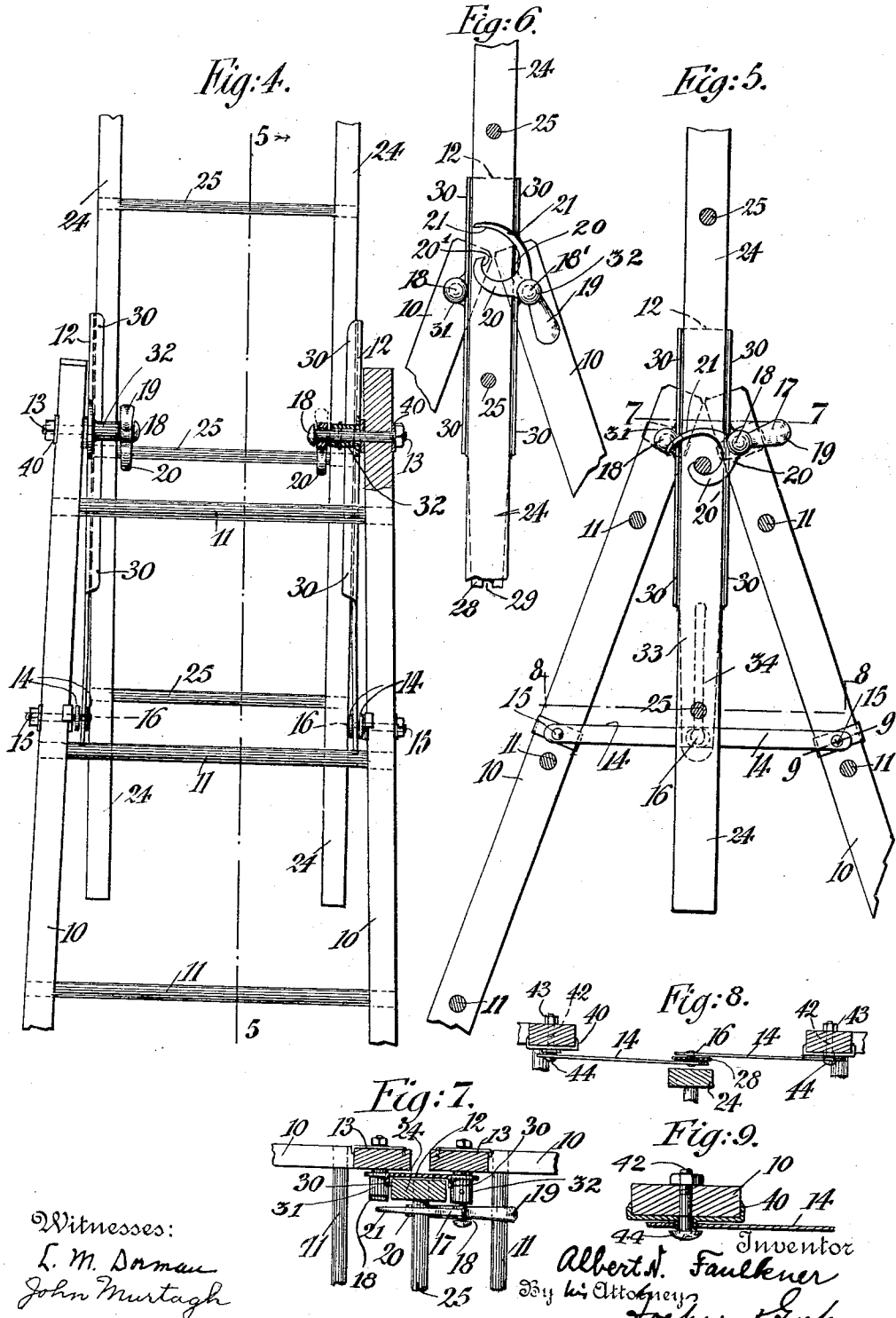
Inventor  
Albert N. Faulkner  
By his Attorneys  
Scherer & Seipel

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 John Murtagh

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 Albert N. Faulkner  
 By his Attorneys  
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# UNITED STATES PATENT OFFICE.

ALBERT N. FAULKNER, OF NEW YORK, N. Y., ASSIGNOR TO THE CHESEBRO, WHITMAN COMPANY, A CORPORATION OF NEW YORK.

## FOLDING EXTENSIBLE LADDER.

1,069,403.

Specification of Letters Patent.

Patented Aug. 5, 1913.

Application filed June 29, 1911. Serial No. 636,012.

*To all whom it may concern:*

Be it known that I, ALBERT N. FAULKNER, a subject of the King of England, and a resident of New York city, in the borough of Manhattan, county of New York, and State of New York, have invented certain new and useful Improvements in Folding Extensible Ladders, of which the following is a specification.

This invention relates to folding extensible ladders comprising two folding supporting or base ladders and an extension ladder sliding between and supported by said folding base ladders.

The object of the invention is to provide an extensible ladder of this class wherein the sliding extension member may be freely moved upwardly and downwardly and automatically arrested and held in any desired position by simply changing the speed of its movement.

In the accompanying drawing, Figure 1 shows a side-view of my folding extensible ladder with the extension-ladder in thrust-in position, and the folding ladder folded. Fig. 2 is a side-view of the supporting-ladders and the extension-ladder in outward position. Fig. 3 is a front-view of the ladder in extended position. Fig. 4 is an enlarged front view of the upper part of the supporting-base and the lower part of the extension member when the extension-member is in its upward position. Fig. 5 is a vertical section on line 5-5, Fig. 4. Fig. 6 is a detail side-view showing the pivoted hook in inoperative position. Fig. 7 is a transverse section taken on line 7-7 of Fig. 5. Fig. 8 is a section taken on line 8-8 of Fig. 5. Fig. 9 is a detail view.

Similar reference numerals indicate corresponding parts throughout the several figures of the drawing.

The folding supporting base of this extensible ladder comprises two similar ladders 10 having the usual rungs or bars 11. These ladders are disposed face to face and have a link connection at their upper ends being adapted to fold parallel in collapsed position and to straddle apart when in position for use. Two similar guideways 30 are disposed face to face opposite each other at the junction of the base ladders 10 and a sliding extension ladder 24 having rungs 25 narrower than the base ladders 10, is movable up and down in said guideways. Each

of these guideways is preferably formed of a plate 12 having longitudinal flanges along its opposite edges and is provided on one edge in its upper part with a short lateral eye 31 and correspondingly on its opposite edge with an elongated lateral eye 32. Each plate is also provided at its lower end with a downward extension 33 having a longitudinal slot 34. These parts are preferably constructed in a single casting and in skeleton form, holes 35 being left to save material. Short pivot bolts 18 pass through the short eyes 31 of the two guideways 12 and through bolt holes near the upper ends of the side rails of one of the base ladders 10, and elongated pivot bolts 18' pass through the elongated eyes 32 and through bolt holes near the upper ends of the opposite side rails of the other base ladder 10. The elongated bolts project inward beyond the inner ends of the elongated eyes and beyond the inner faces of the side rails of the sliding ladder 24, forming trunnions on which the automatic stops for said sliding ladders swing as hereinafter described. Clips 13 are preferably disposed on the outer faces of the base ladders and serve as washers for the nuts at the outer ends of the pivot bolts. These clips are provided with bolt holes through which said pivot bolts pass and with end flanges which engage the opposite edges of the ladder.

The folding base ladders 10 are connected lower down preferably on both sides by two pairs of toggle links 14. The outer ends of each pair of toggle links are pivoted to the inner faces of the side rails of the folding ladders 10 by means of bolts 42 having heads 44 and nuts 43. Plates 40 are preferably interposed between the outer ends of the toggle links and said rails, and these plates are flanged at their ends and embrace said rails, being provided with bolt holes for the passage of said bolts. A pivot stud 16 connects the inner ends of each pair of toggle links and constitutes the toggle joint thereof. This pivot stud slides in the slot 34 of the downward extension 33 of the guideway 30 when the base ladders are opened or closed.

Automatic suspension hook stops 20 are pivoted to the stationary folding base section composed of the ladders 10 and operate to hold the sliding extension 24 at any desired height in said base section. These

stops are so constructed as to permit the extension 24 to slide freely up and down under the manipulation of the operator and under such manipulation to engage the under side of any rung supporting said extension ladder at the desired elevation. Preferably two such suspension stops are employed, one at each side of the ladder, but one is sufficient to render the extensible ladder operative and for convenience of expression these parts will hereinafter be generally referred to in the singular. This suspension hook stop is preferably pivoted on the inner trunnion end of the elongated bolt 18' which constitutes a part of the link connection of the base ladders. The stop comprises a short simple downward hook 20' on the inner side of the pivot, an upward elongated guard finger 21 above said downward hook and in fixed relation thereto and a balance weight or tail 17 on the outer side of the pivot. The weighted tail is adapted to hold the device in horizontal or approximately horizontal position so that its hook and finger are normally in the path of the rungs of the sliding ladder 24. The downward hook 20' has an upturned outer end and is adapted to grasp a sliding ladder rung on the under side thereof and hold the sliding ladder by suspension.

This folding extensible ladder when not in use, may be stored in compact collapsed position as shown in Fig. 1, the base ladders 10 being swung together, the sliding ladder depressed between them and the automatic stops 20 engaging the top rung of the sliding ladder.

In the use of this folding extensible ladder, the base ladders 10 are spread apart at their lower ends, their upper ends swinging on the pivots of the yoke guides 30 and the connecting toggle joints 16 sliding down in the slots 34 and assuming the bracing position shown in Fig. 2. The folding base is thus locked in standing position.

An extension of this folding ladder is effected by two motions of the sliding ladder 24 in conjunction with the automatic action of the suspension stop or stops 20 pivoted on the base or stationary part of the structure. These motions are first a rapid finally retarded upward movement followed by a short downward movement. Assuming that the folding base ladder 10 is locked in standing position as aforesaid, the sliding ladder 24 is moved upward. The top rung 25 thereof is thus lifted out of the short hook 20' and coming in contact with the under side of the elongated finger 21, swings the automatic stop 20 upward and outward approximately into vertical position and the succeeding rung coming in contact with the under side of said short hook 20' swings said stop 20 farther outward beyond the path of the succeeding rung of the sliding ladder.

If the stop 20 should during the rapid upward movement of the ladder 24 swing downward into the path of the rungs it will be knocked out again by the next up coming rung. When the extension ladder has reached the desired height and the rung which is to be made to engage the suspension stop 20, approaches said stop, the upward movement of the ladder is retarded or made slow and the under side of the short hook 20' falls into contact with the rung to be locked. As said rung continues upward it passes the end of said short hook and the elongated finger 21, which projects beyond said hook, strikes said rung and in falling against it gives a sound or signal which warns the operator that it is time to reverse the sliding ladder. The sliding ladder is then moved slightly downward, the stop 20 swings inward and the short hook 20' engages the rung referred to on its under side and operates to hold the ladder by suspension firmly in position.

For adjusting the ladder 24 in a lower position, four motions are required, first an upward movement which releases the engaged rung from the automatic stop 20, thence a downward movement until the desired rung to be engaged passes below said automatic stop, thence a slow upward movement which brings said rung first into contact with the under side of the short hook 20' and then into contact with the under side of the elongated finger 21, thence a short downward movement which causes said rung to rest in and be suspended by the short hook 20'.

In the construction shown a single casting may serve to constitute a yoke for connecting the ladder members of the folding base support, a flanged guideway for the sliding ladder and a guide for the toggle joint of the toggle links connecting said folding base members.

It is obvious that changes may be made in the construction without departing from the spirit of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of a supporting base, a guideway thereon, a sliding extension ladder movable in said guideway, and an automatic balance suspension stop pivoted on said base at one side of said guideway and having a short simple downwardly curved hook terminating in an upturned end and an elongated finger extending over said hook in fixed relation thereto and terminating beyond said upturned end.

2. A folding extensible ladder comprising a folding base, a guideway thereon, a sliding ladder movable freely in said guideway, and an automatic balance suspension stop pivoted on said base at one side of said

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guideway and having a short simple downwardly curved hook terminating in an upturned end and an elongated finger extending over said hook in fixed relation thereto and terminating beyond said upturned end.

5 3. The combination of two base ladders, a guideway pivoted at its opposite sides to the upper ends of said base ladders and constituting a link connection therefor, an adjustable sliding ladder movable in said  
10 guideway, and a stop for holding said sliding ladder in adjusted position supported on an elongated pivot of said guideway.

15 4. The combination of two base ladders, a guideway provided on its sides with bolt eyes, bolts passing through said bolt eyes and through the upper ends of said base ladders, an adjustable ladder movable in said  
20 guideway, and a stop for holding said sliding ladder in adjusted position supported on an elongated pivot of said guideway.

25 5. The combination of two base ladders, a guideway pivoted at its opposite sides to the upper ends of said base ladders and constituting a link connection therefor, said  
guideway having a downward slotted extension, toggle links connected at their outer ends to said base ladders and at their inner ends by a pivot stud which slides in said

30 slotted extension, an adjustable sliding ladder movable in said guideway, and a stop for holding said sliding ladder in adjusted position.

6. The combination of two base ladders, a guideway provided on one side with a  
35 short bolt eye and on the other side with an elongated bolt eye, a short bolt passing through said short bolt eye and through the upper end of one of said base ladders, a long bolt passing through said elongated  
40 bolt eye and through the upper end of the other base ladder and projecting inward beyond said elongated bolt eye, a sliding ladder movable in said guideway, and an automatic suspension hook stop pivoted on said  
45 long bolt and adapted to permit the free movement of said sliding ladder upward and downward and to engage the under side of a rung thereof for holding it in adjusted  
50 position.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ALBERT N. FAULKNER.

Witnesses:

L. J. MURPHY,  
JOHN MURTAGH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."