F. E. VAN HOUTEN.

STEP LADDER.

APPLICATION FILED JUNE 6, 1914.

1,135,336. Patented Apr. 13, 1915.

Fig. 1

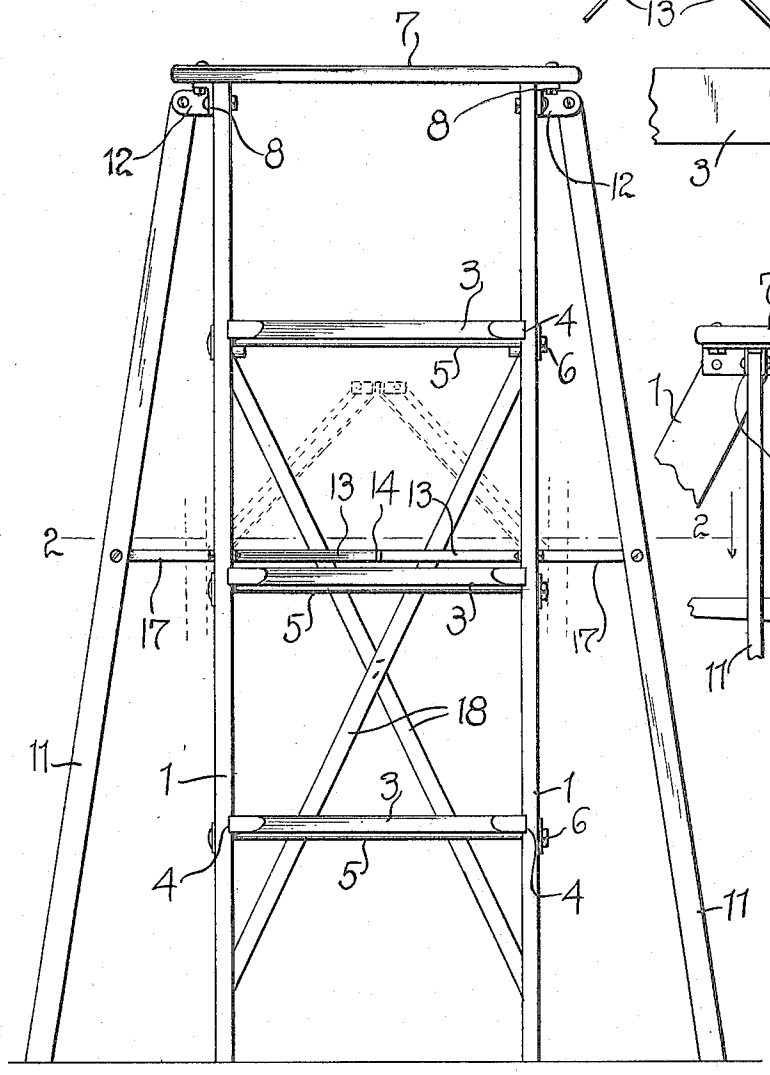


Fig. 2

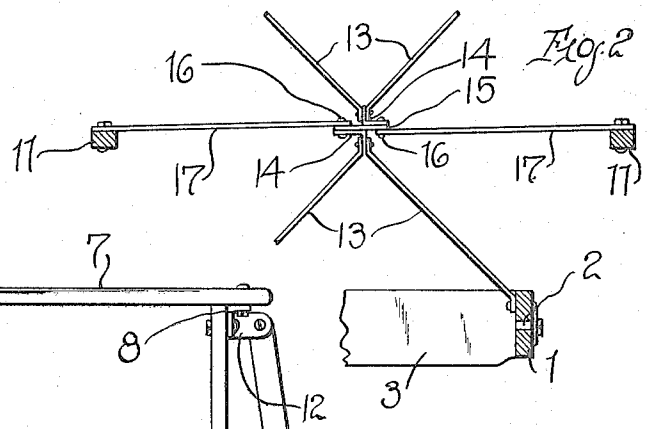
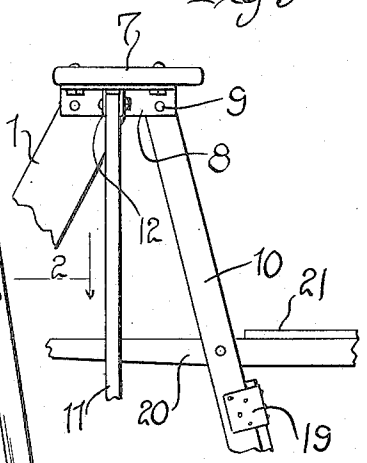


Fig. 3



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STEP-LADDER.

1,135,336. Specification of Letters Patent. Patented Apr. 13, 1915.

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To all whom it may concern:

Be it known that I, FRED E. VAN HOUTEN, a citizen of the United States, residing at Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Step-Ladders, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to new and useful improvements in step ladders and more particularly to a ladder of this character which is provided with side bracing means, whereby to prevent lateral tilting movement of the ladder after being set in its effective position.

A further object of the present invention is the provision of a step ladder of the above character having side bracing legs and further provided with interlocking brace members arranged between the folding portions of the ladder and adapted to be disposed in a horizontal position to support the parts of the ladder when arranged in their upright position, said bracing members being so arranged as to materially assist one in retaining the parts in their effective positions.

A still further object of the present invention resides in the provision of a device of the above character which will possess advantages in points of efficiency and durability, is inexpensive to manufacture and, at the same time, is simple in construction and operation.

With the above and other objects in view, the invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the accompanying drawing forming a part of this application, Figure 1 is a front elevation of a step ladder constructed in accordance with my invention. Fig. 2 is a transverse sectional view taken on the line 2—2, Fig. 1; and Fig. 3 is a detail side elevation.

Referring more particularly to the drawing, the step portion of the ladder includes the spaced parallel side bars 1 having formed therein the central elongated slots 2 and arranged transversely between the side bars are the step members 3 which are securely held in position by means of the transverse grooves 4 which extend inwardly through the side bars and into the ends of the step members. The step members are further supported by means of the transverse bolts 5, said bolts extending entirely across the space between the side members and project through the slots 2, nuts 6 being threaded upon the ends thereof to securely retain the bolts in their effective positions beneath each of the step members.

Mounted upon the upper ends of the side bars 1, is a top member 7 which is securely retained in position upon the side bars by means of the angular plate 8, said plate having its vertical portion rigidly secured to the upper ends of the side bars, while the horizontal portion is arranged beneath the ends of the plates 7 and secured thereto by means of the bolts 9. The parallel side bars 1 are supported in an effective position by means of the props 10, the upper ends of which are pivotally connected to one of the ends of the plates 8, while the lower ends thereof are adapted to be arranged in spaced relation with the lower ends of the props to support the same in their upright positions. The side bars 1 and the props 10, when arranged in an effective position, are securely retained against any lateral tilting movement by means of the lateral props 11, the upper ends of which are pivotally connected to the angular plates 8 by means of the U-shaped members 12, the intermediate portions of which are connected to the vertical portions of the plates 8, while the parallel side portions thereof are arranged upon opposite sides of the upper ends of the props 11 and bolted or otherwise secured thereto. The intermediate portions of the props 11 and 10 are pivotally connected to the intermediate portions of the side bars 1, by means of a plurality of braces adapted to be pivotally connected, so as to fold into a compact form when the props are folded inwardly toward the side bars 1.

Secured to the intermediate portions of the props 10 and the side bars 1, are the convergent bars 13, the inner ends of which are arranged in spaced parallel relation and disposed upon opposite sides of one end of the angular connecting members 14, the other ends of said connecting members being arranged in parallel relation with the bar 15 and securely held in place by means of the transverse bolts 16 which extend through the inner ends of the brace members 17 and through the ends of the bars 14 and 15, the members 17 having their outer ends

secured to the intermediate portions of the props 11. The rear props 10 are securely held against spreading movement by means of the cross braces 18, the ends of which are secured to the brace members 10 by means of metal clips 19 so as to securely retain said braces in their effective positions.

It will be noted that the angular connecting members 14 are pivotally connected by means of a longitudinal link 14'. This link member, it will be noted, indirectly connects the inner ends of all of the brace members.

It will be noted that by the pivotal connection herein shown and described, the ladder when set up for use, will set upon an uneven surface and still be in a position so that it can be easily used. The improved spider connection for the brace members, as I have shown and described the same will fold in a more compact form than any other device of this character.

Pivotally secured to the props 10 are the supporting arms 20, the outer ends of which are connected by means of the transverse platform member 21 adapted to be disposed in a horizontal position or fold inwardly between the brace members. The inner ends of the arms 20 are adapted to abut beneath one of the said members 3 when in a horizontal position to limit the pivotal movement of the platform 21.

It will be apparent from the foregoing that I have provided a simple and durable step ladder which is provided with additional bracing means in the form of the lateral props 11 which are securely held against outward spreading movement by means of the brace bars 17. Furthermore it will be seen that I have provided a simple and durable ladder which can be quickly and readily set up for use and will be retained against any lateral spreading movement and which, at the same time, can be manufactured and placed upon the market at a comparatively low cost.

While I have shown and described the preferred form of my invention, it will be obvious that various changes in the details of construction and in the proportions may be resorted to for successfully carrying my invention into practice, without sacrificing any of the novel features of the invention, or departing from the scope thereof, as defined by the appended claims.

Having thus described this invention, what I claim is:—

1. A step ladder including front and rear legs, and means to connect said legs at their tops, side braces, means to pivotally connect the side braces to the top, brace members having their outer ends pivotally connected to the front and rear supporting legs, angular connecting members having one of their ends disposed between the inner ends of said brace members, a link member arranged between the angular members and pivotally connected to the other ends thereof, and further brace members having their outer ends pivotally connected to the side braces and their inner ends pivotally connected to opposed ends of the link member.

2. A step ladder including front and rear legs, a top, means to connect the legs to the top, side braces having their ends pivotally connected to the front and rear legs, angular connecting members arranged between the inner ends of said brace members and pivotally connected thereto, a link member arranged parallel with the inner ends of the connecting members, said connecting members being disposed upon opposite sides of the link at each end thereof and further brace members having their outer ends connected to the side braces and their inner ends arranged parallel with the link upon the sides opposite the connecting members, whereby to fold into compact form, as and for the purpose set forth.

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

FRED E. VAN HOUTEN.

Witnesses:
F. R. EATON,
W. H. CHASE.

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