

966,852.

L. M. NORTON.
LADDER BRACE AND BRACKET.
APPLICATION FILED APR. 23, 1909.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 1.

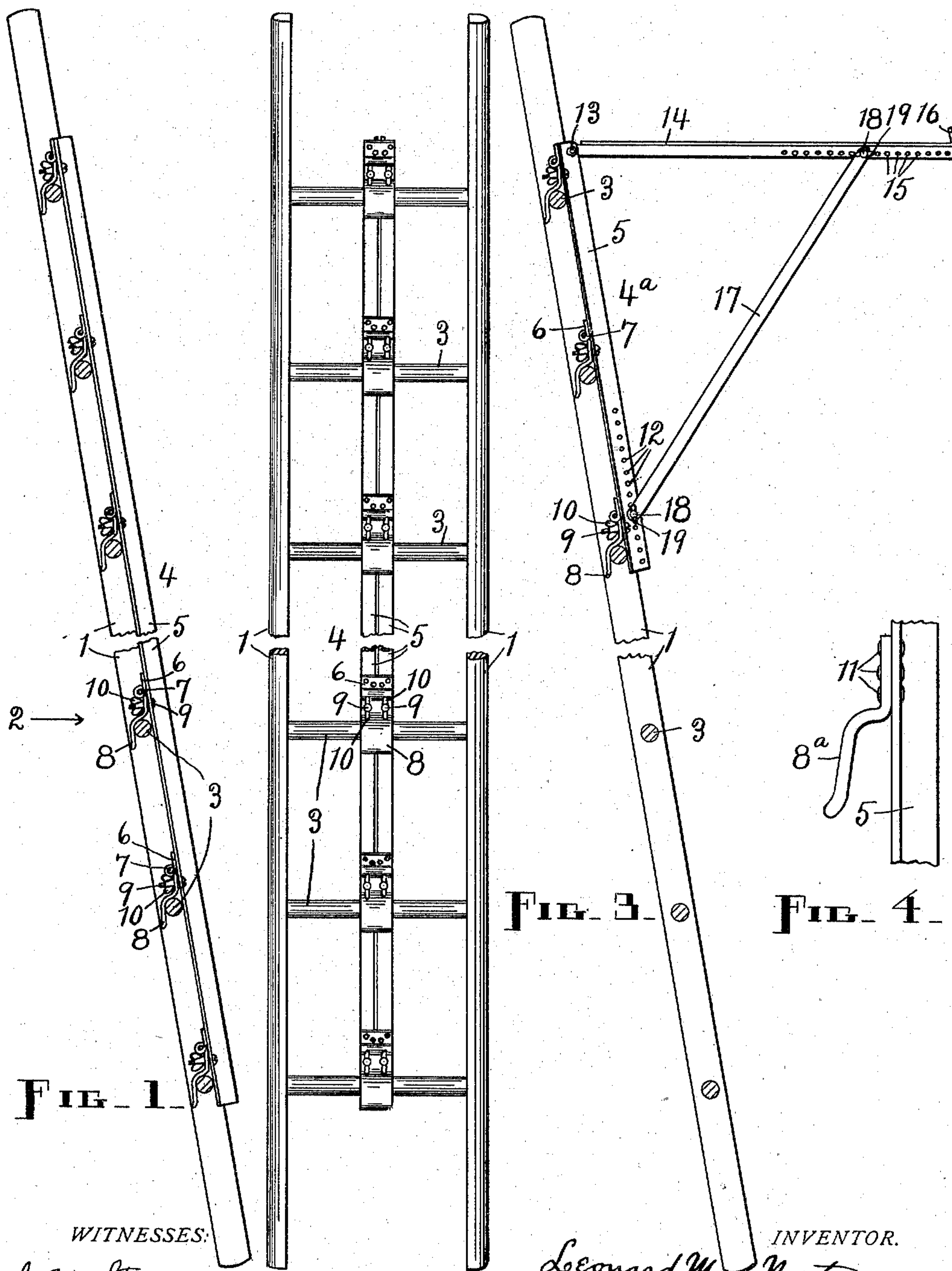


FIG. 1.

FIG. 3.

FIG. 4.

FIG. 2.

WITNESSES:

J. M. Sterne
A. C. Fairbanks.

INVENTOR.

Leonard M. Norton,

BY

Webster & Co.,
ATTORNEYS.

L. M. NORTON.
LADDER BRACE AND BRACKET.
APPLICATION FILED APR. 23, 1909.

966,852.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 2.

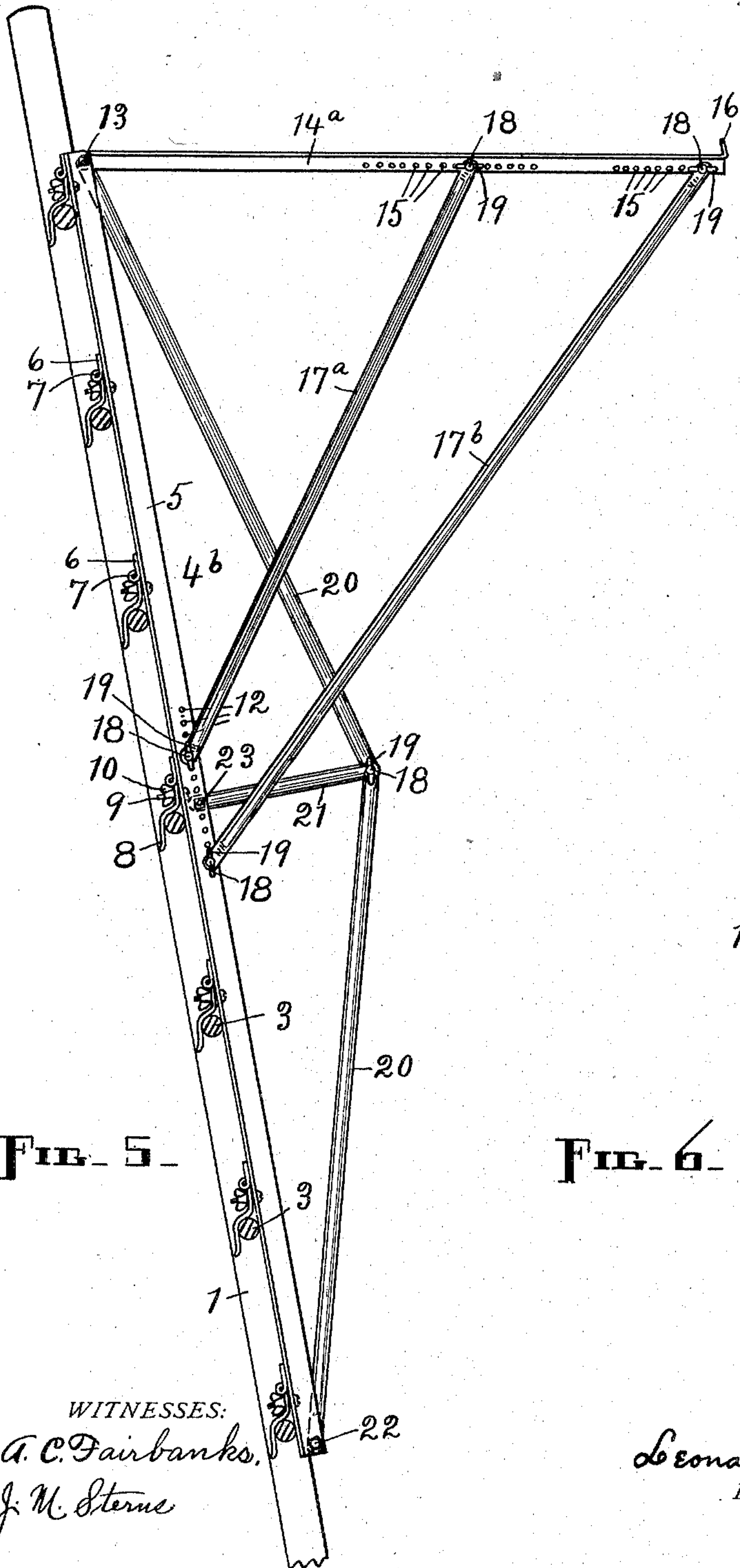


FIG. 5.

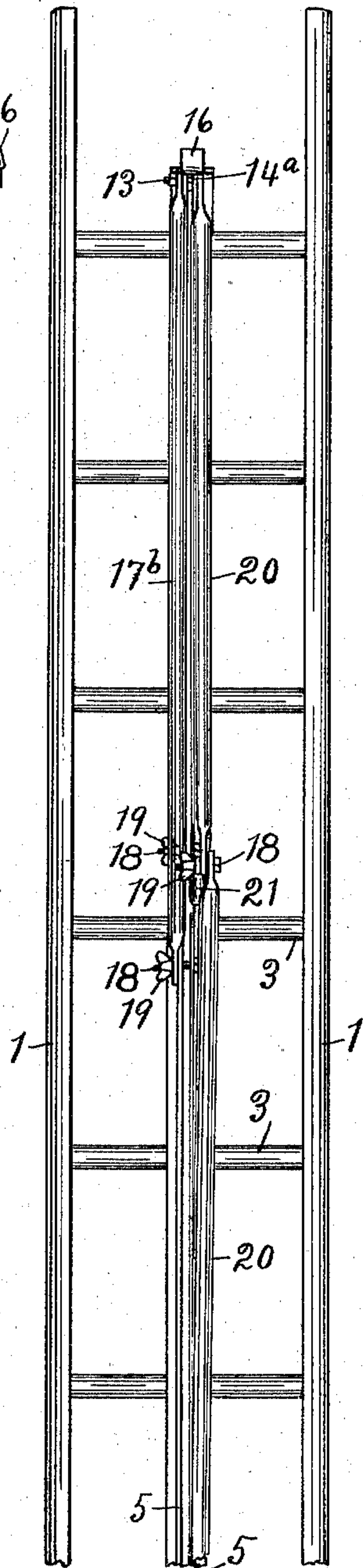


FIG. 6.

WITNESSES:

A. C. Fairbanks,
J. M. Sterne

INVENTOR.

Leonard M. Norton,
BY
Webster & Co.,
ATTORNEYS.

UNITED STATES PATENT OFFICE.

LEONARD M. NORTON, OF NORTHAMPTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
TO ALFRED G. CARLEY, OF NORTHAMPTON, MASSACHUSETTS.

LADDER BRACE AND BRACKET.

966,852.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed April 23, 1909. Serial No. 491,755.

To all whom it may concern:

Be it known that I, LEONARD M. NORTON, a citizen of the United States of America, residing at Northampton, in the county of Hampshire and State of Massachusetts, have invented a new and useful Ladder Brace and Bracket, of which the following is a specification.

My invention relates to improvements in ladder attachments in which I make use of a certain peculiar brace adapted to be attached to the rungs of a ladder, and of an adjustable bracket suitably supported by and from such brace, together with additional strengthening members when necessary, all as hereinafter set forth.

The objects of my invention are, first, to provide means for stiffening a ladder and preventing the same from breaking, such means comprising a portable brace adapted to engage the rungs between the side-rails of said ladder from either the front or the back side of the ladder; second, to afford means for securely attaching such brace to rungs of any size; third, to furnish in connection with the aforesaid brace a bracket and appurtenances whereby said bracket can be properly adjusted regardless of the angle at which the supporting ladder for the bracket stands or whether such bracket be on the front or the back thereof, and, fourth, to produce a comparatively light but strong and durable equipment for ladders, such as is outlined above, that can be used with any ladder, including a double or extension ladder, since it does not interfere with raising and lowering the extension member of such last-mentioned ladder, and can be compactly folded and stored in a small space when not in use. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is an edge view of a brace which embodies my invention, such brace being attached to a ladder only one side-rail and the rungs in cross-section of which appear; Fig. 2, a rear elevation, looking in the direction of the arrow 2, in Fig. 1, of such brace and the ladder upon which it is mounted; Fig. 3, a view similar to the first excepting that here a short brace is shown with a bracket fastened thereto and supported thereby; Fig. 4, an enlarged edge or side elevation of a fragment of a brace having a

modified form of clamp-hook secured thereto; Fig. 5, a side elevation of a truss-brace and a long double-supported bracket mounted on the upper portion of a ladder, the latter being in section as in Figs. 1 and 3, and, Fig. 6, a front elevation of the members appearing in the preceding view.

In each of the first three views, the middle portion of the ladder is broken out, and the same thing is true of the brace shown in each of the first two views.

Similar figures refer to similar parts throughout the several views.

The ladders represented in the drawings are of usual construction and comprise two side-rails 1 and rungs 3. There is a standard distance between ladder rungs, which is seldom departed from, and in the examples herein appearing the standard is adhered to and the rungs 3 are spaced apart regularly and uniformly in all cases.

The brace, which constitutes an essential part of my invention, whether long enough to extend approximately the full length of the ladder or not, always serves as a stiffening and strengthening medium for so much of the ladder as such brace is applied to, and this is true as well when the bracket is provided as when the brace is used without the bracket, so that this element and its function as above outlined are present in every instance and the brace becomes the first or foundation feature of my invention.

Any suitable material may be employed for the several members of my invention, hence I do not intend to limit myself to the angle-irons, tubes with flattened ends, and flat irons illustrated in the drawings.

In Figs. 1 and 2, a brace 4 is shown which comprises two parallel angle-irons 5 spaced apart and arranged with two of their sides extending forward and adjacent to each other. The angle-irons 5 are rigidly held in place relative to each other by means of a plurality of straps or cross-pieces 6 securely riveted to said angle-irons, said cross-pieces being placed against the rear surfaces of the angle-irons. These angle-irons joined together in this manner may be said to constitute the backbone of the brace. Pivotally attached at 7 to each cross-piece 6 so as to form a hinge is a hook 8. The hooks 8 are designed to fit over the rungs 3, therefore such hooks must be spaced apart

to correspond with said rungs. Two bolts 9 pass through openings in the angle-irons 5, in front of each cross-piece 6, and through openings in said cross-piece to receive thumb-nuts 10—10 on their rear ends. It will now be seen that the hinged hooks 8 constitute clamps, owing to the presence of the bolts 9 and the thumb-nuts 10, and that such clamp-hooks when engaged with the rungs 3 not only suspend and support the angle-irons 5 thereon, but also are made to grip said rungs firmly when said thumb-nuts are screwed tightly against said hooks. This construction also provides for adapting the hooks to rungs of various sizes. The thumb-nuts have to be loosened, of course, before removing the brace from the ladder.

From the foregoing it is clear that the brace 4 consists of the angle-irons 5, the cross-pieces 6, and the clamp-hooks 8 including the bolts 9 and the thumb-nuts 10. But a brace may be made which consists in part of fixed hooks instead of hinged hooks, such a hook being shown at 8^a, in Fig. 4. The hook 8^a is riveted at 11 to the angle-irons 5 or other long member or members of the brace, and the free terminal of such hook, which may or may not be more or less resilient, is preferably inclined outward so as to afford a good grip on the rung when the same is wedged in between said angle-irons or other member or members and said free terminal. The hook 8^a, therefore, may in a way be a clamp-hook as well as the hook first described.

The brace 4 is of sufficient length to engage every rung 3 of the ladder to which said brace is attached, and such ladder is in consequence greatly stiffened and strengthened.

Although the brace 4 is placed with its angle-irons 5 or backbone against the front of the rungs 3, the brace might just as well be placed with said backbone against the back of said rungs, and the same thing is true of the braces which are provided with brackets and which will now be described.

In Fig. 3 a brace 4^a is shown, which differs from the brace 4 only in that it is shorter, so that it engages but three of the rungs 3, and has a number of holes 12 through the lower portions of the forwardly-extending sides of the angle-irons 5. Having its inner end pivoted at 13 to the upper end of the angle-irons 5 of the brace 4^a, is an arm or bracket 14. The bracket 14 in this case consists of a T-iron having a number of holes 15 in the outer portion of its central section. The top section of the bracket 14 is extended a short distance beyond the central section and turned up, as at 16, to provide a lug or stop between which and the ladder a plank or other staging member (not shown) which the bracket is designed to support will be safely held. An oblique sup-

port 17, fastened by means of two bolts 18 and two thumb-nuts 19 at opposite ends respectively to the angle-irons 5 and the bracket 14, retains the latter in a horizontal position. One of the bolts 18 passes through two of the alining holes 12 in the angle-irons 5 and a suitable opening in the lower terminal of the support 17, and the other bolt 18 passes through one of the holes 15 in the bracket and a suitable opening in the upper terminal of said support, and it is due to the presence of the plurality of such holes 12 and 15 that said bracket can always be positioned horizontally, regardless of the inclination given the ladder or the side of the ladder upon which the attachment may be placed, it having already been made clear that this or any similar brace, either with or without a bracket, can be located on the back side of the ladder, if desired, as well as on the front side thereof.

In the last two views, a brace 4^b appears, which is longer than the brace 4^a, but not as long as the brace 4, and in which the holes 12 are situated intermediate of its ends. A bracket 14^a, provided in this case, is also longer than the bracket 14, and there are two sets of holes 15 therein, but said bracket is pivoted to the brace in the same manner as in the other case, and is similarly constructed to said bracket 14. Two supports, 17^a and 17^b, for the bracket 14^a, are employed instead of one, for the sake of greater strength, such supports being adjustably attached to the brace and bracket by means of bolts 18 and thumb-nuts 19, as before. This device is for use where heavy staging is required or where an unusual weight is to be upheld, and the strength of the brace 4^b can be augmented, when deemed necessary, by adding to the structure two tie-pieces 20 and a center-piece 21. The extreme ends of the tie-pieces 20 are pivoted respectively at 13 and 22 to the angle-irons 5 of the brace 4^b, and the adjacent ends of said tie-pieces are connected with the outer end of the center-piece 21 by means of a bolt 18 and thumb-nut 19, while said center-piece has its inner end pivoted at 23 through two of the alining holes 12 to said angle-irons. By using the bolt 18 and thumb-nut 19, in this as in the other cases, convenient means is afforded for disconnecting the parts held together by the same. When these brackets are not in use, some of the thumb-nuts 19 are unscrewed from their bolts 18, the latter are removed, and the pivoted bracket members are folded against the braces, so that they take up very little room whether the devices be left on the ladders or be taken therefrom and stored away. By removing the bolts and thumb-nuts from both ends of any one of the supports 17, 17^a, or 17^b, the support will be entirely disconnected from the rest of the structure. The removal of a single thumb-nut with its bolt

enables the auxiliary brace members 20 and 21 to be folded against the brace 4^b, as will be readily seen.

5 It has already been intimated that various changes may be made in my invention, and in addition to those noted especially others which relate more particularly to size, shape, and minor details of construction and which will readily occur to one skilled in the art
10 may also be made, and all without departing from the nature of said invention. Attention is called to the fact, too, that hooks need not be provided for every rung in range of the backbone.

15 What I claim as my invention, and desire to secure by Letters Patent, is—

20 1. The combination, in a ladder brace, with a suitable backbone, of one or more hooks each hinged at one end to said backbone and adapted to receive between it and the backbone the rung of a ladder, and screw-threaded members arranged to retain

said hooks with their free terminals at proper distances from the backbone and capable of forcing the hooks against the ladder 25 rungs between them and the backbone, substantially as shown and described.

2. As an improved article of manufacture, a ladder brace consisting of angle-irons arranged side by side, cross-pieces connecting 30 and fastening together said angle-irons at the back, hooks each hinged at its upper end to one of said cross-pieces and being adapted to receive between it and the angle-irons the 35 rung of a ladder, and screw-threaded members arranged to retain said hooks with their free terminals at proper distances from said angle-irons and capable of forcing said hooks against the ladder rungs between them and said angle-irons.

LEONARD M. NORTON.

Witnesses:

A. G. CARLEY,
F. A. CUTTER.