

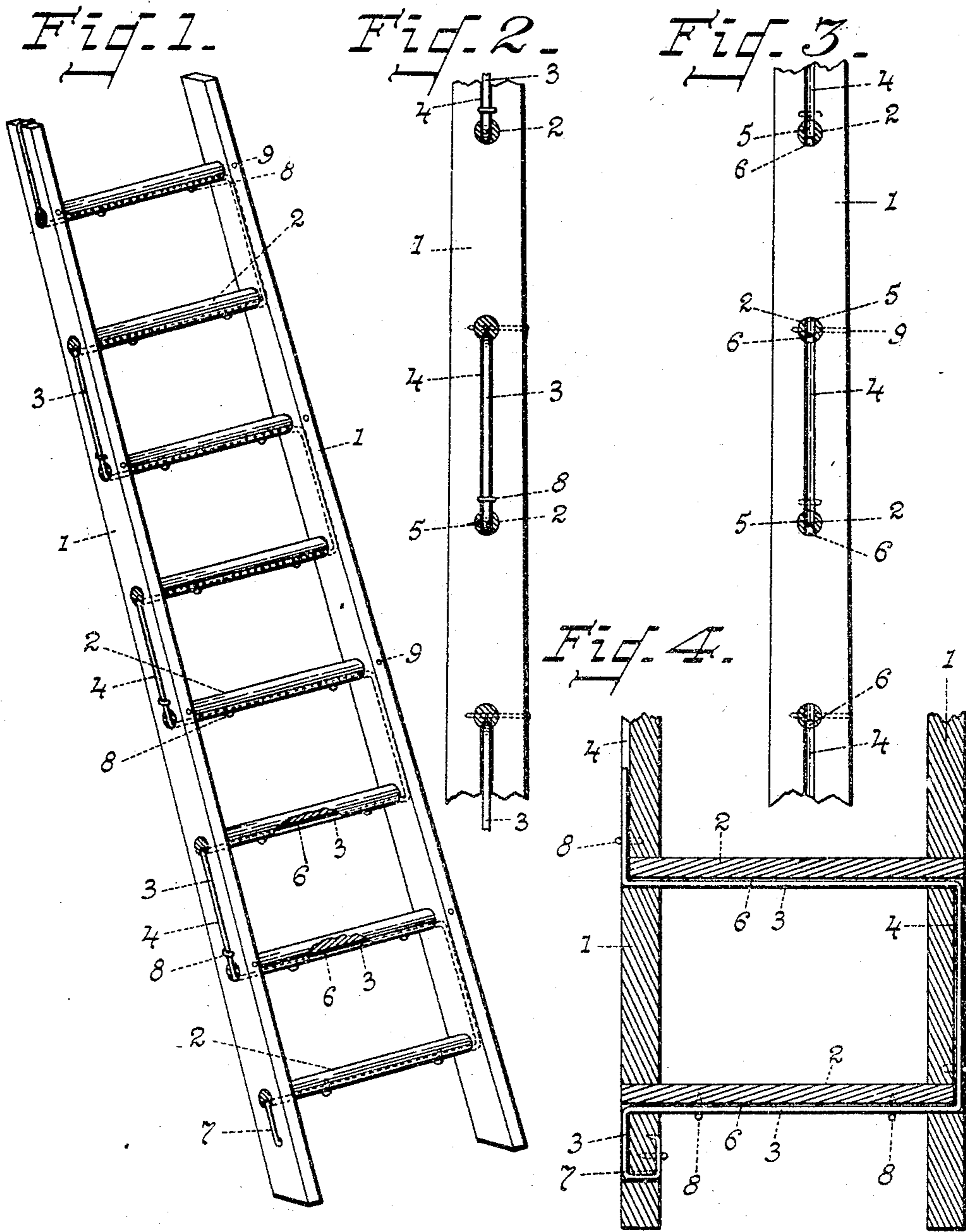
No. 773,582.

PATENTED NOV. 1, 1904.

M. MURPHY.
LADDER OR SIMILAR STRUCTURE.

APPLICATION FILED OCT. 30, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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LADDER OR SIMILAR STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 773,582, dated November 1, 1904.

Application filed October 30, 1903. Serial No. 179,151. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL MURPHY, a citizen of the United States of America, residing at Auburn, in the county of Cayuga and State of New York, have invented a new and useful Improvement in Ladders or Similar Structures, of which the following is a specification, reference being had to the accompanying drawings on one sheet, making part of this specification.

My invention relates to ladders and similar structures in which rounds, rungs, or steps are used for ascending and descending the same when placed in a proper position for such purpose; and the object of my improvement is to render the said ladders or similar structures safe, so that in case a "rung" or step gives way or breaks when being used as mentioned no resultant injury may befall the person using the same.

A further object of my invention is to prevent the said structures from spreading apart when they may have shrunk or otherwise become loosened from various causes.

I attain the above objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a ladder, showing my improvement applied thereon. Fig. 2 is an outside side view of a portion of one of the side rails of the ladder with my improvement shown in place thereon. Fig. 3 is a view similar to Fig. 2 and shows the grooves formed in the same at intervals thereof; and Fig. 4 is a sectional view of a portion of Fig. 1, taken from the lower or bottom end thereof.

In the several views mentioned similar figures of reference refer to similar parts.

In the perspective view shown in Fig. 1 the side rails 1 1 are connected together by a series of rungs or steps 2 2, which, especially in ladders, is the common form of construction. It not infrequently occurs that from long use or exposure to the weather the rungs of the ladder where they enter the side rails become decayed and weakened, which fault is not observable until they are brought to the test of use, when serious accidents are likely to occur to the person ascending or descending on

the same. I aim to remedy this objection not only in ladders, but in structures of a similar character, by the use of a strengthening wire or cable 3, for the placement of which the ladder is constructed in the following manner:

The side rails 1 1 are provided on their outer sides and intermediately between the rungs 2 2 with grooves 4 4, as plainly seen in Figs. 1 and 2. The ends of the rungs 2 2 are also provided with a groove 5, which is continuous with a groove 6, formed in the length of the said rung 2, as shown in Fig. 4. When the side rails and the rungs of the ladder are assembled, they are arranged so that the longitudinal grooves 6 6 shall be on the under sides of the rungs 2 2 and the grooves 5 5 of said rungs 2 2 continuous with the grooves 4 4, provided on the outer sides of the rails intermediately between said rungs, as already mentioned. This arrangement of grooves in the several parts of the structure is clearly shown in Figs. 1 and 3. The side rails 1 1 and the rungs 2 2 being arranged together, with the longitudinal grooves of the latter downward and the end grooves of the same in proper alinement with the grooves provided on the outer sides of the side rails, the wire or cable 3 is ready for placing in desired position.

Referring to Fig. 1, it will be observed one end of the wire or cable 3 is turned inwardly and through one of the side rails 1, near the bottom end thereof and below the lowest rung of the ladder, and there securely fastened in place, which is plainly shown in Fig. 4 at 7. The other end of the wire or cable 3 is next carried upward on the outside of the rail and into the groove 6 of the lower rung, passing completely through the same to the outer side of the opposite rail, and from thence upward in the groove 5 at the end of the rung and in the groove 4 of the rail to the longitudinal groove of the succeeding rung above, and so on continuously throughout the length of the ladder, the said wire or cable being properly laid in the grooves of the rails and drawn taut at each successive step of the operation, when the end is finally secured on the inner side of the top end of one of the side rails, as seen in Fig. 1. To further secure the wire or cable in its desired position and to prevent

any possibility of its sagging through temperature changes or becoming otherwise disarranged, staple-fastenings 8 are provided, as shown, and placed where thought necessary. In the drawings it will be observed I have shown staples 8 placed over the wire or cable in the groove of the rung and driven in the latter and also at intervals over the wire or cable in the grooves of the side rails. It will be evident, however, that such fastenings may be dispensed with, if deemed necessary. It will also be seen that the ends of each alternate rung of the ladder or like structure are secured to the side rails by a pin, as shown at 9 in the several figures. While this fastening is not absolutely necessary, it serves to further assure the stability of the whole, as is evident.

From the above description it will be observed that should any of the rungs of the ladder break or give way through the weight or otherwise of the person ascending or descending the same he is insured from falling or other injury by the intervention of the wire or cable placed continuously from one end of the ladder, where it is made fast upon the outside of the side rails and in the

grooves provided on the under side of the rungs or rounds and finally fastened at the opposite end of the side rail, as has been described, thus looping the side rails together, as it may be said, and providing an additional factor of safety for the person using the same and strengthening the whole structure.

Having thus described the construction and utility of my improvement in detail, what I claim as new, and desire to secure by Letters Patent of the United States, is—

In a ladder or similar structure the combination of the side rails 1, having outside intermediate grooves 4, and the rounds or rungs 2, having end grooves 5, and longitudinal grooves 6, with a wire or cable 3, laid in said grooves with suitable fastenings and secured at the top and bottom ends of said side rails 1, substantially in the manner and for the purpose herein specified and shown.

In testimony whereof I have hereunto set my hand, at Auburn, New York, this 21st day of October, A. D. 1903.

MICHAEL MURPHY.

In presence of—

HARRY D. BENHAM,
FRANK R. RATHBUN.