

No. 745,750.

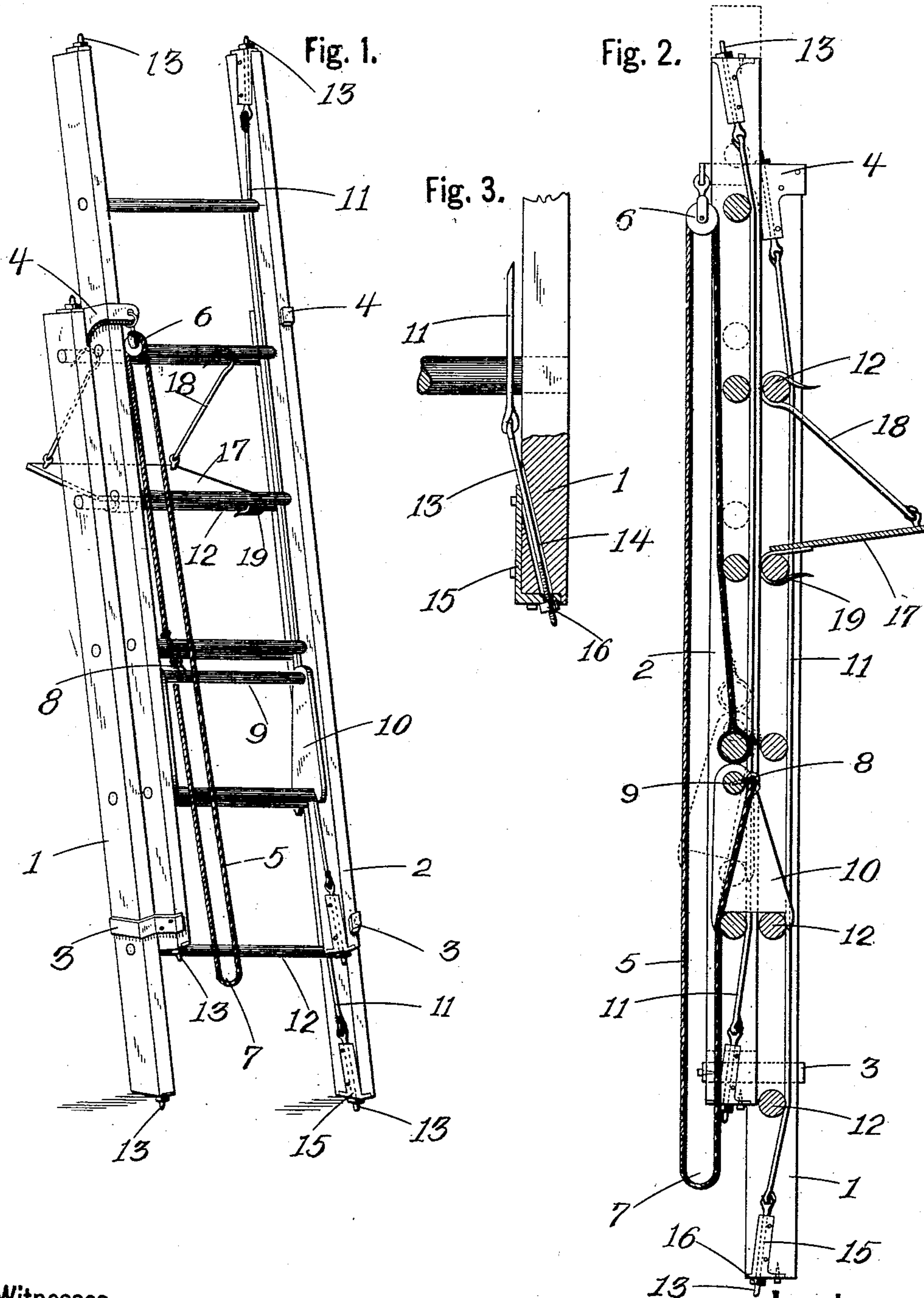
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B. H. ZIEGLER & D. BETZNER.

EXTENSION LADDER.

APPLICATION FILED NOV. 30, 1900.

NO MODEL.



Witnesses.

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EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 745,750, dated December 1, 1903.

Application filed November 30, 1900. Serial No. 38,280. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN HALLMAN ZIEGLER and DAVID BETZNER, subjects of the Queen of Great Britain, residing at Berlin, in the county of Waterloo and Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Extension-Ladders, of which the following is a specification.

Our invention relates to an improved extension-ladder; and the object of the invention is to simplify and cheapen the construction of the mechanism employed to adjust the movable member thereof and also to lock it in its adjusted position.

The invention also relates to a movable and adjustable device forming a shelf or ledge for the purpose of holding articles thereon which may be secured to either the stationary or movable member of the ladder at any desired point.

The invention further relates to truss devices attached to the ladder sides for strengthening the same and also to certain details of construction, and for a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The invention is susceptible to various changes in the form, proportion, material, and minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a front perspective view of an extension-ladder with our improved device attached thereto, showing the movable member of the ladder partly raised. Fig. 2 is a side sectional view of our improved extension-ladder, illustrating the operation of the locking device, showing it in its locked position in full lines and in its unlocked position in dotted lines, also showing the rope mechanism for raising and lowering the movable member of the ladder and for operating the locking device, also showing truss device and shelf or ledge. Fig. 3 is a front view of a fragment of the ladder, partly in section, showing the construction of truss device.

In referring to the drawings in detail like numerals indicate like parts.

Our improved extension-ladder is composed of two members 1 and 2, the upper or movable member 2 being adjustably secured to the lower or stationary member 1 by means of cleats 3 and 4, which form slideways in which the members move to adjust themselves longitudinally with respect to each other, the cleats 3 being rigidly fastened to the lower ends of side bars of the member 2 and bending around the side bars of the stationary member 1 and the cleats 4 being rigidly fastened to the upper ends of the stationary member 1 and bending around the movable member 2. An operating-rope 5 is secured to one of the lower rungs of the upper member 2 and passes over a block-pulley 6, which is supported from an eye extension 5^a, projecting from one of the upper cleats 4, secured to the lower or stationary member 1, then passes downward to the lower portion of the ladder, and then upward to form a lower loop 7, and is finally secured to a screw-eye 8, which is secured into the shaft 9. The shaft 9 is journaled at its ends in the sides of the upper member 2, and locking devices or catches 10 are secured to said shaft at opposite ends thereof. The office of the rope 5 is to provide a simple and convenient means for elevating or lowering the movable member 2, the end loop 7 of said rope forming a convenient grasp for the hand of the operator, so that a downward pull will throw the locking devices 10 clear of the rungs of the lower member 1 when the movable member 2 is passing downward, said locking devices 10 being constructed so as to lock automatically into engagement with the rungs of the member 1 by means of gravitation when the upper member 2 is raised and the ladder is slightly inclined. The locking device may be made of either metal or wood.

To elevate the movable member 2, the rope 5 is pulled downward the proper distance to raise said member to the proper height. The rungs of the stationary member 1 as the movable member 2 rises move the locking devices to one side sufficiently to permit their passage, and when the required height is obtained the locking devices swing automatic-

ally by gravitation over the rungs of the stationary member 1.

To lower the movable member 2, the rope 5 is slightly pulled down to raise said member 2 by grasping the loop, which pulls downward on the end of the rope fastened to the locking devices and moves said locking devices to one side sufficiently to allow the rungs of the member 1 to pass. Then the end 10 of the rope fastened to the movable member is eased upward, thereby lowering the movable member 2.

By attaching the cleats 3 and 4 to the upper and lower ends, respectively, of the stationary and movable members the upper and lower cleats are always separated as widely as possible consistent with the relative position of the two members of the ladder and brace the ladder members as strongly as possible. 20

11 indicates steel wires which are secured to each end of the members 1 and 2 and pass to and from one end to the other of said members at the side and under the rungs 12, then toward the front of said ends of members, said wires 11 being pivotally secured to bolts 13, which pass through diagonal cavities 14 in the ends of the members and through a hole in a metal casting 15, secured to the end of the members, said casting serving the purpose of a washer and a plate for covering the cavity 14. The steel wires 11 are drawn taut by means of the nuts 16 on the ends of bolts 13 to the required tension for the purpose of forming a truss, thus strengthening and bracing the said members 1 and 2 and avoiding rear and side sway to a certain extent, thereby allowing lighter material to be used for the sides. The steel bracing-wires 11 extend 40 on one side of and brace the rungs of the ladder, being arranged to extend interior to and parallel with the sides of the ladder members. This brings the truss-wires between the ladder sides, so that they are protected and also partially support and strengthen the rungs. (See Figs. 1 and 3.) 45

17 is a detachable or removable shelf or ledge, which may be secured or adjusted on the rungs of the lower or upper members of the ladder at any desired point by means of metal straps 18 and metal hooks 19. The metal straps are pivotally secured at their lower end to the outer edge of the shelf, and their upper end bends or curves upon itself 55 to form a hook adapted to catch over one of the rungs. The metal hooks 19 project laterally from the upper surface of the inner

edge of the shelf, and their outer ends bend or curve upon themselves to form the hooks. In securing the shelf in place the hook ends 60 of the straps 18 are placed upon one rung and the hooks 19 are hooked upon the next lower rung. (See Fig. 2.) The purpose of this is to arrange a convenient detachable shelf upon the ladder for holding articles, such as a paint- 65 pail, &c.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. An extension-ladder comprising a stationary member, a movable member, cleats 70 rigidly attached to the upper ends of said stationary member and bending around the movable member, one of said cleats having an inwardly-extending portion provided with an eye, a pulley, a screw-eye attached to the pulley and engaging the cleat-eye, cleats rigidly secured to the lower ends of the movable member and bending around the stationary member, a shaft journaled in the movable member, locking devices attached to the shaft and 80 adapted to catch over the rungs of the stationary member, a screw-eye secured to said shaft, and a rope looped over the pulley and having one end secured to the movable member and the opposite end fastened to the screw-eye of the shaft, as and for the purposes set forth. 85

2. A ladder having side parts and rungs and having the ends of its side parts provided with diagonal cavities, metallic castings secured to the said ends and having openings registering with the cavities, bolts passing through said castings and cavities, and truss-wires pivotally secured at their ends to the bolts and extending parallel and interior to 95 the side parts and on one side of the ladder-rungs, and nuts on the ends of the bolts for tightening the truss-wires, substantially as set forth.

3. A ladder having side parts provided with 100 diagonal cavities in the ends thereof, bolts passing through said cavities, wires connecting at their ends to said bolts, and extending in proximity to said side parts and to one side of the ladder-rungs whereby the rungs are 105 partially supported by the wires and said wires are protected between said side parts, and nuts on the ends of said bolts for tightening said wires, substantially as set forth.

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