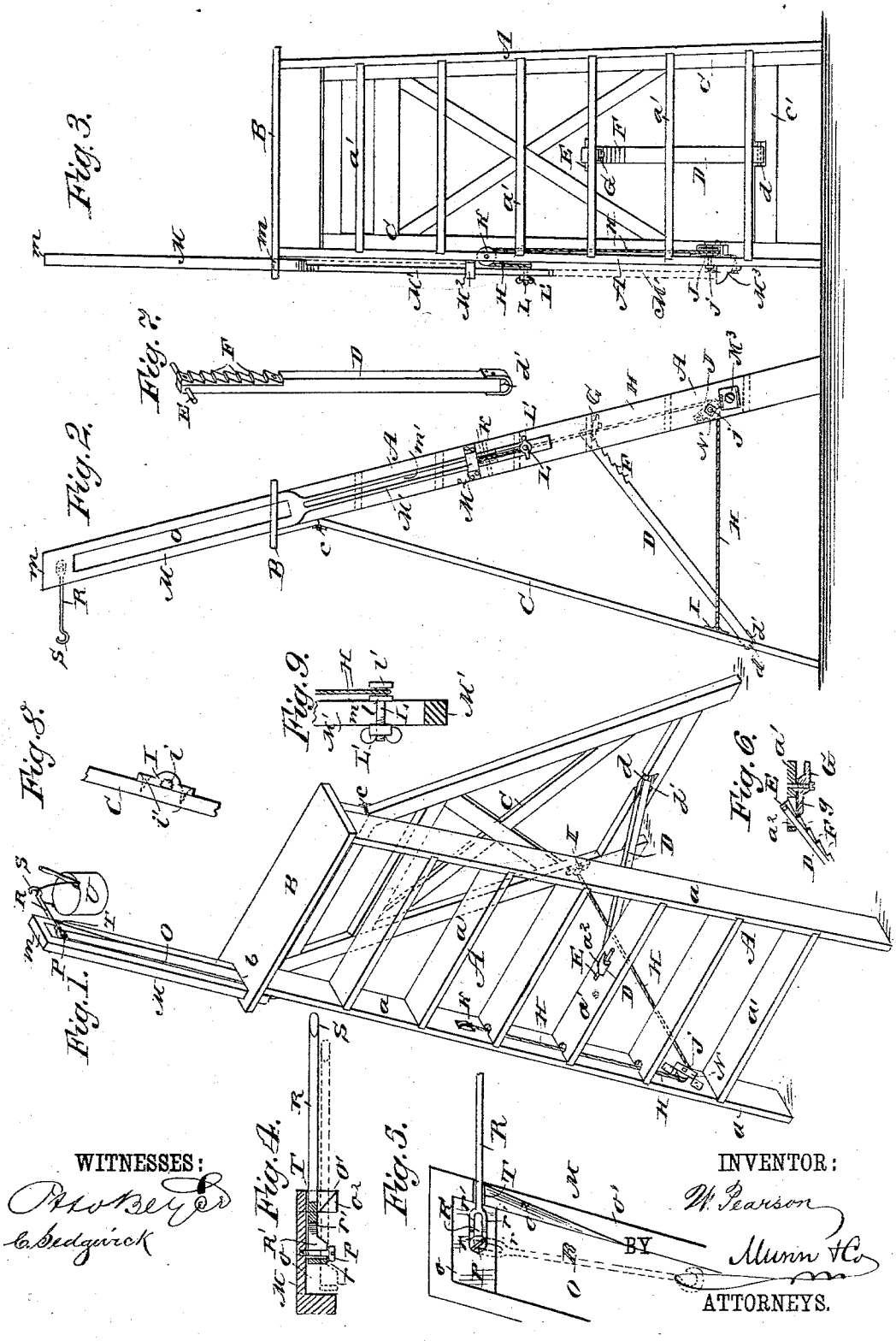
(No Model.)

W. PEARSON.

STEP LADDER.

No. 325,441. Patented Sept. 1, 1885.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WRIGHT PEARSON, OF JAMESTOWN, NEW YORK.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 325,441, dated September 1, 1885.

Application filed June 4, 1885. (No model.)

To all whom it may concern:

Be it known that I, WRIGHT PEARSON, of Jamestown, in the county of Chautauqua and State of New York, have invented a new and Improved Step-Ladder, of which the following is a full, clear, and exact description.

My invention relates to step-ladders; and it has for its object to promote safety and convenience, and economize time in the use of the ladders.

The invention consists in certain novel features of construction and combinations of parts of the ladder, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the step-ladder, shown open as in use. Fig. 2 is a side elevation of the ladder. Fig. 3 is a front view of the ladder, and Figs. 4 to 9 are detail views of parts of the ladder.

The letter A indicates the step-frame, which consists of opposite side bars, *a a*, and steps *a'* fixed thereto, the head-plate or platform B being attached to frame A in the usual or any approved way.

At C is shown the back or brace frame, which is hinged at *c* to the head of step-frame A, and to the frame C is hinged, in a recess of its lower cross-bar, *c'*, the back end of the brace-bar D, and preferably by means of a pin, *d*, passed through the eye or strap-loop *d'* of the bar D, the opposite or front end of which bar passes through a slot, a^2, of one of the steps *a'*, and has a pin, E, passed through it above the step to prevent withdrawal of the bar from the step, and also to limit the spread of the step and brace frames A B at the base of the ladder. (See Figs. 1 and 2.)

The bar D has a series of notches, F, formed in the lower side of its forward end, into any one of which notches may be turned the end *g* of a button, G, pivoted to the under side of the step, through which the brace-bar passes. (See Figs. 2, 6, and 7.)

The letter H indicates a strong cord, which is secured by a clamp-plate, I, to the face of brace-frame C, and is rove through a pulley, J, journaled on the inner face of one of the ladder-bars *a*, and passes thence upward through apertures in the intervening steps *a'* to and over a pulley, K, which is journaled transversely in the ladder-bar, and from the pulley K the rope passes outside of and along the ladder-bar, and, as shown, is connected by a bolt, L, and its thumb-nut L' with the lower stem portion, M', of the hand-rail M of the ladder.

The inner end of the bolt L has two collars, *l l'*, spaced apart to allow firm attachment of the end of cord H to the bolt between the collars, and the bolt passes through a slot, *m'*, in the stem M' of hand-rail M, and receives the nut L' outside of the rail, so that the rail-stem may be clamped tightly between the bolt-collar *l* and nut L'. (See Fig. 9.)

The upper or main part of hand-rail M is fitted to slide in a mortise, *b*, made through or at one end of the ladder-platform B, and its stem portion M' slides through a keeper, M^2, fixed to the side bar *a* of the step-frame.

With this construction it is evident when the brace-frame C is opened or spread from step-frame A, and when the bolt and nut L L' are tightened on the hand-rail stem M', that the cord H will be drawn upon by frame C, and the hand-rail M will be raised from its low and normal position indicated in dotted lines in Fig. 3 to the high position shown in full lines in Fig. 3, and also in Figs. 1 and 2, in which raised position the hand-rail may be taken hold of to support or steady the person using the ladder, and then may serve also to support various articles, such as paints or tools, and as hereinafter more fully explained.

When the brace-frame C again is folded flat against the step-frame A to stow away the ladder, the hand-rail M M' will drop down to normal position by its gravity as the rope H slackens or runs back over the pulleys K J, and until the lower end of the hand-rail strikes the stop-block M^3, fixed to the side bar of the ladder, at which time the upper end or extremity *m* of the hand-rail will stand level with or a little below the top of the platform B.

It also is obvious that when the nut L' of bolt L is loosened the hand-rail will not be raised when the brace-frame C is spread and pulls out the rope H, as the bolt L then will slide up along the slot *m'* of the hand-rail stem

M′, hence the hand-rail M may be raised or not, as desired and simply by tightening or loosening the bolt and nut L L′.

By fastening the bolt and nut L L′ at different places in the slot *m′* of the hand-rail stem M′ the hand-rail will be raised more or less, as the brace-frame C is drawn out to its full extent.

I fasten a suitable keeper, N, to the side bar *a* over the pulley J, said keeper guiding the rope H to and from the pulley, and also serving as an inner bearing to the bolt *j*, on which pulley J is journaled.

The clamp-plate I, which holds the rope H to the brace-frame C, has a half-round recess, *i*, provided with teeth or serrations which bite the rope resting in said recess and hold it firmly to the frame, and the plate I is fastened to the frame by screws *i′*, allowing the plate to be loosened for drawing the rope H through it for taking up any unnecessary slackness of the rope at any time required, and by this means, also, the height to which the hand-rail M is raised may be regulated.

As shown clearly in Figs. 2, 4, and 5, the head portion of the hand-rail or the hand-rail proper has formed in it a central longitudinally-ranging slot, O, and above the slot the rail M is recessed at the inner face, as at *o*, and in this recess is held by a headed screw, P, the arm or hook R, the screw passing through an elongated slot or eye, R′, of the arm. The thickness of the arm R at the back end of the slot R′ is greater than at the other end of said slot, raised shoulders or faces *r* thus being formed, against which faces the head of screw P bears snugly, so that when the arm R hangs down within the slot O from the screw P, as in dotted lines in Fig. 5, and which is the normal position of the arm when it is not in use, the screw-head will hold the arm against swinging sidewise beyond the opposite side faces of the hand-rail, so that the arm will not catch on the platform B as the hand-rail moves up and down through the platform-slot *b*.

When it is desired to extend the arm R from the hand-rail in position to support a paint-vessel or tool-box by its end hook, S, as indicated in Fig. 1, the hanging arm will be raised on the screw P until the low shoulders or faces *r′* next the forward end of the slot R′ will stand beneath or inside of the screw-head, and the arm then may be swung up past the side piece, *o′*, of the hand-rail until it can be set into a notch or recess, T, in the face of the rail, and the arm will then be drawn outward until the high shoulders or faces *r* rest under or inside of the head of screw P, which prevents the slipping of the arm R from the notch T. (See Figs. 1, 4, and 5.) The inner face of the side piece, *o′*, of the hand-rail preferably is chamfered or beveled, as at *o²*, Figs. 4 and 5, to allow the arm R to be swung upward and downward more easily to and from the slot T; but the arm may be made of spring metal, so as to bend and not require the beveling of the rail at *o²*.

It is evident that the hand-rail, whether raised or lowered, may be taken hold of for safety by a person ascending the ladder, and that when the hand-rail is raised it will serve to steady a person standing on top of the ladder, and a water, paint, or calsomine vessel, U, or a tool-box, may be suspended from the extended hook-arm R, so as to facilitate the cleaning of windows or paints, or the refinishing of walls or ceilings, or the adjustment or oiling of shafting in factories, or, in fact, for any overhead work, which thus may be performed with greater safety and in less time.

With short ladders the stem M′ of the hand-rail will be dispensed with, and the rope H will be connected directly with the foot of the main part M of the hand-rail, as will readily be understood.

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

1. A ladder comprising a step-frame, A B, a brace-frame, C, pivoted thereto, a hand-rail guided at the side of the step-frame, and a rope, H, between the frame C and hand-rail, substantially as described, whereby when the brace-frame C is spread the hand-rail will be raised, as herein set forth.

2. A ladder comprising a step-frame, A B, a brace-frame, C, pivoted thereto, a hand-rail supported in guides on the step-frame, and a rope, H, or its equivalent, connected to the frame C, and connected also to the hand-rail by an adjustable device, substantially as described, whereby the hand-rail may be raised or not at will as the brace-frame is spread, as herein set forth.

3. The combination, in a ladder, of the step-frame A B, brace-frame C, hand-rail M, guided on the step-frame, rope H, pulleys J K, and bolt and nut L L′, substantially as herein set forth.

4. The combination, with the step-ladder frame A B, of a movable hand-rail, M, keeper M^2, and a stop-block, M^3, on the ladder-bar, pivoted brace-frame C, and rope H, between said hand-rail and brace-frame, substantially as herein set forth.

5. A ladder constructed with a hand-rail, M, provided with a slot, O *o*, a face-notch, T, and a hook-arm, R, supported on a pin, so as to hang normally within the slot O and adapted to be swung into the notch T, substantially as herein set forth.

6. The combination, with the ladder hand-rail, slotted at O *o*, and the headed screw or pin P, of the hook-arm R, having an elongated slot, R′, and high and low faces, *r r′*, at the slot, substantially as herein set forth.

Witnesses: WRIGHT PEARSON.
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