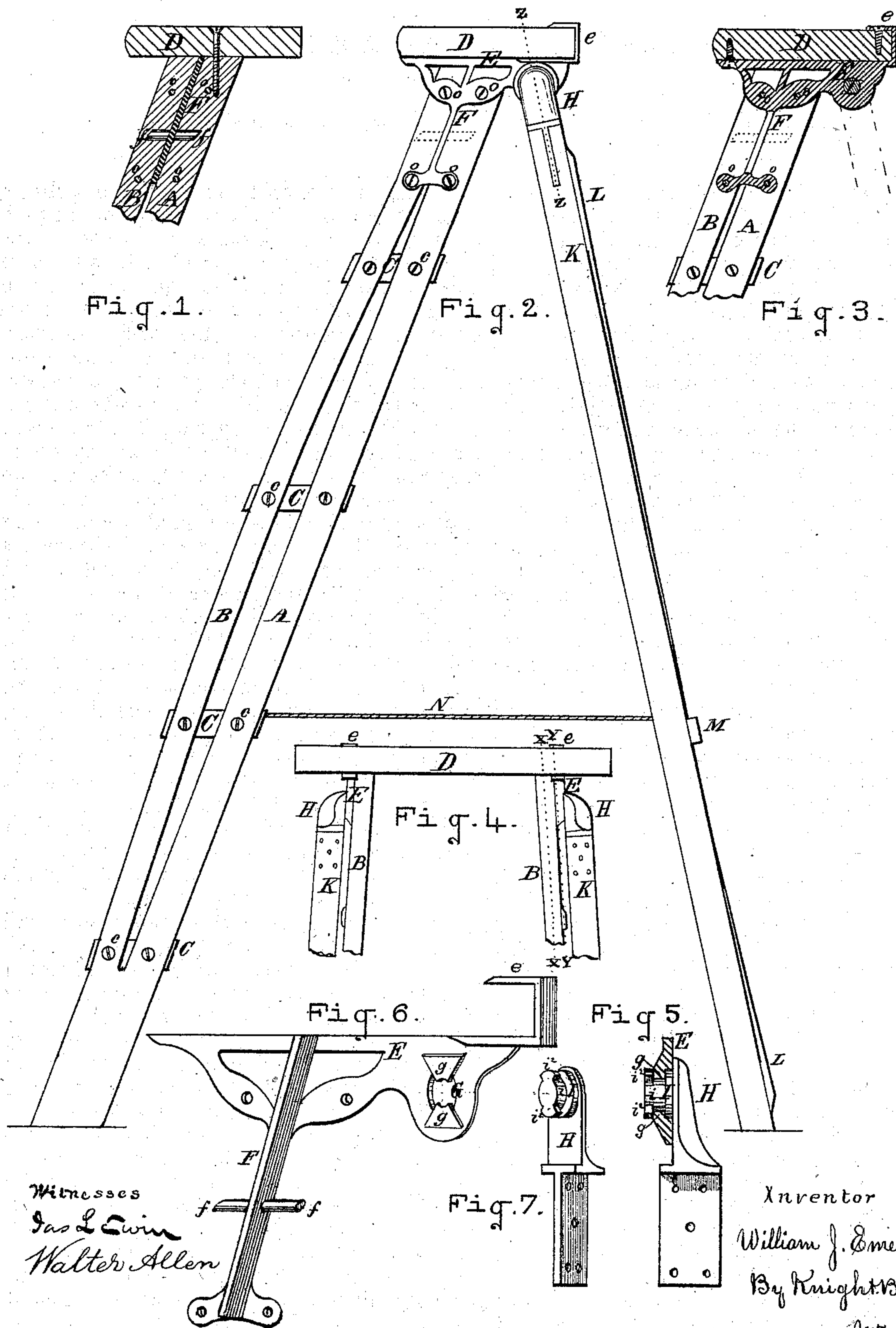


WILLIAM J. EMENS.

Improvement in Step Ladders.

No. 125,728.

Patented April 16, 1872.



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UNITED STATES PATENT OFFICE.

WILLIAM J. EMENS, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN STEP-LADDERS.

Specification forming part of Letters Patent No. 125,728, dated April 16, 1872.

I, WILLIAM J. EMENS, of the city and county of St. Louis and State of Missouri, have invented a certain Improved Step-Ladder, of which the following is a specification:

My improvement consists chiefly in the form of the bracket connecting the stiles and platform-step, in the construction of the bracket-hinge, and in the construction of the stiles.

The bracket has a plate or flat bar occupying the space between the upper ends of the two members of the stile, inclined studs projecting from said plate entering the stiles to hold them in position. The rear end of the bracket ends in a clip embracing the rear edge of the platform, to prevent splitting of the latter. The socket part of the hinge has inwardly-extending lugs, which, when the ladder is in use, engage behind two projecting wings of the pin to hold the pin steadily in position.

The stiles consist of two members, the under one of which is nearly or quite straight, and the upper one is bowed upward, the two being held in their relative positions by the inclined studs upon the bracket-plate, and by the steps and bracket-screws.

The ladders are made of various sizes, chiefly between the lengths of three and twelve feet. The brackets may be of the same dimensions for all sizes—say about seven or eight inches in horizontal length—Figs. 1, 2, and 3 being drawn to a scale of one-fifth.

Figure 1 is a section at the line *xx*, Fig. 4. Fig. 2 is a side elevation of the ladder. Fig. 3 is a section at the line *yy*, Fig. 4. Fig. 4 is a front elevation of the platform and part of the stiles. Fig. 5 is a section of the hinge at the line *zz*, Fig. 2. Fig. 6 is an inside perspective view of the bracket. Fig. 7 is a perspective view of the pin-head of the hinge.

A is the lower member of the stile, which is nearly or quite straight. B is the upper member of the stile, sprung into an arched form, except for a short distance at each end. These members are preferably made of one piece of timber, being connected at the bottom, but separated at the top to allow the upper end of the member B to be slipped somewhat downward on the piece A when bending it upward. C are the steps let into gains in the stiles and secured by screws *c*. D is the platform-step, attached to the stiles by the bracket. The bracket has a horizontal bar, E, upon which

the platform lies, said bar ending in a clip, *e*, that extends around the rear edge of the platform, to which it is secured by a screw. Descending obliquely from the bar E is a bar or plate, F, inserted between the upper end of the members A and B of the stile. *f* are studs extending obliquely from the bar F, and entering holes in the members A and B, the studs serving, by their inclined position, as shown, to hold the upper ends of the members in position when the part B is sprung into the bowed form. The socket G of the hinge, by which the prop K is connected to the bracket, has two inwardly-extending lugs, *g*, whose inner ends may be formed in arcs of a smaller circle than the socket G. The pin part H of the hinge has a cylindrical part, I, fitting the socket G, and a part, *i*, of smaller diameter, fitting in the arcs of the lugs *g*, although it is not required that this fit of the part *i* should be perfect, and the ends of the lugs may be made straight or convex in place of being concave. Upon the end of the pin are lugs or wings *i*², which, when the parts of the hinge are being put together, pass between the lugs *g*; but when the ladder is in use the wings *i*², by contact with the lugs *g*, hold the pin firmly in position. L are cross-braces of the prop K, and M is a tie-bar, connected by a cord, N, to the step C. *o* are screws by which, in addition to the studs *f*, the bracket is secured to the stiles.

Some advantages of this step-ladder over those heretofore known may be stated as follows: The construction of the stiles is such that there is no side or lateral strain upon the cord A, tending to break the same at the screw-holes, as is the case when the cord is sprung. The members of the stile do not depend on the steps and screws to hold them in their relative position, but are held primarily by the studs *f*.

The platform-step has heretofore been liable to have a portion of its back part split off by the falling of the ladder, the inclination of the platform to the stiles being such that the blow is received rather on its under edge when falling. The platform, being broad, has also been subject to warp. These evils are entirely overcome by my clips *e*, that are carried around the rear edge of the platform.

Hinges have before been used for many purposes having a lug projecting from one side of the pin and a notch in the socket to allow the

lug to pass through in putting the parts together, the said lug being turned to another part of the socket when in use. But these hinges are imperfect in two particulars. First, the pin has not a perfect bearing all around the socket, owing to the notch therein; and, second, the lug has a bearing upon only one side, so that the pin is not held firmly in position. With my hinge the part I of the pin fits neatly all around in the socket G, and the wings *i*² rest against the lugs *g* upon opposite sides, so that the hinge is perfectly steady in operation; as much so as any undetachable hinge, but can be readily taken apart and put together, and is cheap to manufacture, consisting of but two parts, and having no intricacies.

The plate F considerably strengthens the head of the ladder in a part that has been found subject to transverse fracture.

I claim—

1. The stiles, consisting of a straight under member, A, and an upper member, B, sprung outwardly from the member A, and held in position partially by studs *f* at the upper end, all substantially as set forth.

2. The bracket, consisting of bars E and F, studs *f*, and clip *e*, combined and arranged substantially as set forth.

WILLIAM J. EMENS.

Witnesses:

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