(No Model.)

D. PAGE.

STEP LADDER.

No. 292,041. Patented Jan. 15. 1884.

Fig. 1.

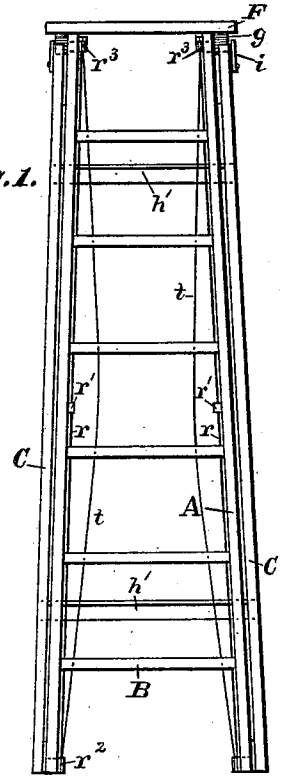


Fig. 2.

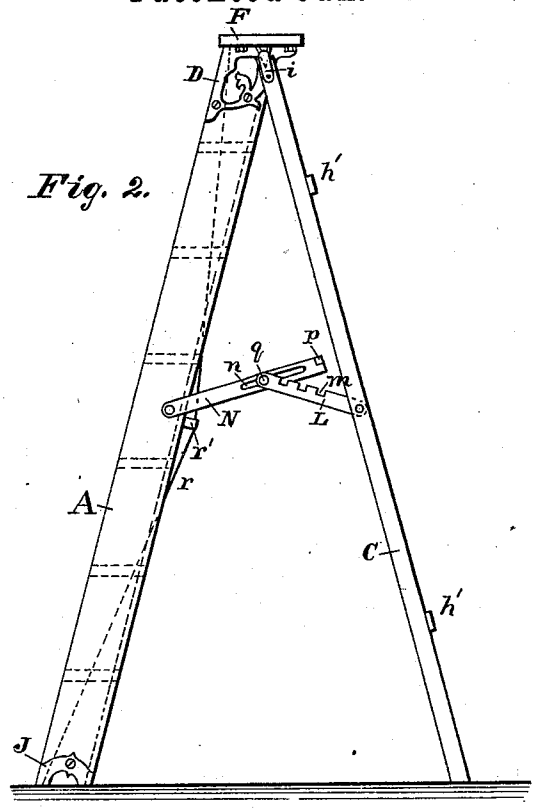


Fig. 3.

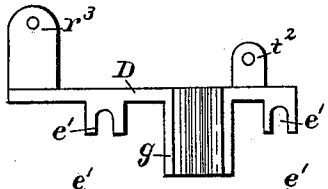


Fig. 4.

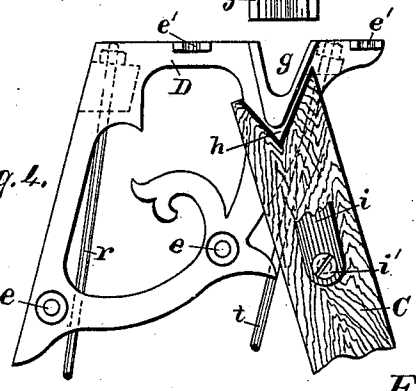


Fig. 5.

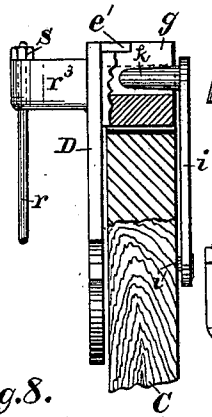


Fig. 6.

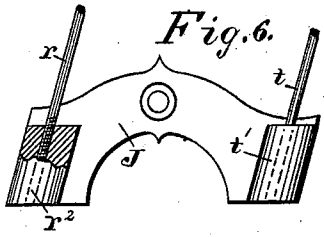


Fig. 7.

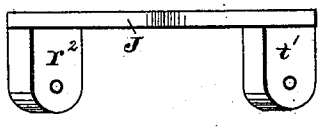
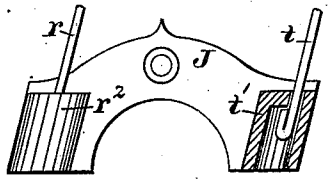


Fig. 8.



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UNITED STATES PATENT OFFICE.

DUDLEY PAGE, OF FREDERICK, MARYLAND.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 292,041, dated January 15, 1884.

Application filed October 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, DUDLEY PAGE, a citizen of the United States, residing at Frederick, in the county of Frederick and State of Maryland, have invented certain new and useful Improvements in Step-Ladders, of which the following is a specification.

The object of this invention is to provide a step-ladder of improved construction, whereby, without increasing the weight, great stiffness is imparted, thus enabling the ladder to stand firm.

In the accompanying drawings, which illustrate the invention, Figure 1 is a front view of the ladder. Fig. 2 is a side elevation. Fig. 3 is a top view of the top iron embracing part of the hinge. Fig. 4 is a side view of the top iron and the upper part of one leg. Fig. 5 is a view of the same parts as seen from the front, one part of the hinge being in section. Figs. 6 and 7 are inner side and top views, respectively, of the shoe or bottom iron. Fig. 8 shows a modification in the manner of fastening the wire to the shoe-lug.

The letter A designates the side uprights; B, the steps, constructed as usual or in any desired manner; and C, the legs.

One of the features of my invention is in the hinge for the legs. A part of this hinge is integral with the top iron, D, which is made fast to the side upright by screws entered at *e*, and to the top platform, F, by screws entered at *e'*. This part of the hinge consists of a V-shaped lug, *g*, which projects from the side of the top iron. The upper end of each leg C has a V-shaped notch, *h*, faced with metal. (See Fig. 4.) The spread of the notch is greater than the breadth of the lug. Thereby, when the lug sets in the notch, sufficient space is left therein to afford to the legs the requisite movement. The two legs are held together by the cross-bars *h'*. It will be understood that the ladder is sustained wholly by the lugs, one on each side, having their bearings in the notches on the upper end of the legs. Upon the side of each leg at the upper end a plate, *i*, is pivoted by a screw, *i'*. This plate has a pin, *k*, which projects laterally and occupies the depression on the upper side of the V-lug, which, in Fig. 5, is sectioned to show the position of the pin. This pin serves, when the ladder is moved about, to keep the legs connected, or, in other words, the pin binds the two parts of the hinge together. The lug *g* and the notch *h*, together with the pin *k*, form the hinge. An extensible jointed brace is employed to connect the side uprights with the legs and to limit the spread of the latter. One arm, L, of the brace has its end pivoted to the leg, and is provided with notches *m*, formed on its upper edge. The other arm, N, has its end pivoted to the side upright, and is provided with a slot, *n*, extending lengthwise, and at its extremity with a side projecting lug, *p*. The two arms are jointed together by a pin, *q*, entering the end of one arm and passing loosely through the slot of the other arm, thereby these jointed ends may slide or extend on each other. The lug *p* on the one arm is then adapted to rest in one of the notches *m* on the other arm. By thus jointing the arms together and providing for their jointed ends to slide, the arms may fold against each other, whereby the arm-pivots on the leg and side upright may be at an equal distance from the leg-hinge, and after the arms have been stretched open the legs may be spread more or less, as required.

In order that the side uprights may be made light and yet have the requisite strength, a steel wire, *r*, has its upper end suitably fastened to or near the front edge of the upright, and its lower end also to or near the front edge, and at the center the wire sags to or just beyond the rear edge, as seen in Fig. 2, where a king-post, *r'*, fixed to the upright, projects beyond the rear edge, and over which the wire passes. When the wire is drawn taut, it serves to brace and strengthen the side uprights against the ordinary strain of a load.

As shown in Fig. 2, the line of the wire from one end to the center, and thence to the other end, forms an angle at the center; but it may be arranged so that the line of the wire shall form a curve.

To fasten the wire truss in a superior manner I provide a metal shoe, J, for attachment to the bottom of each side upright. In the present instance the shoe is attached by a center screw on the outer side of the upright, and the shoe has a lateral lug, r^2, at its front end, which projects through a mortise or cut made

in the lower end of the upright. This lug is tapped and threaded, and the lower end of the truss-wire is screwed into it, as seen in Fig. 6. The top iron also has at its front end a lateral lug, r^3, which projects through a mortise or cut in the upper end of the upright, and has a hole drilled for the passage of the upper end of the truss-wire. A nut, *s*, on the upper side of the lug, as seen in Fig. 5, enables the truss-wire to be tightened. This arrangement of shoe and top iron with one end of the truss-wire securely fastened to each, gives great stability to the ladder. The shoe, in addition to its function of holding the wire, may also be shaped to serve as a protector to the extremity of the wood upright.

To strengthen the ladder against a lateral or sidewise strain, two wire braces, *t*, are employed. The lower end of each of these braces is fastened to a lug, t', integral with the shoe at its rear end. The upper end of each wire brace is fastened to a lug, t^2, at the rear end of the top iron. These braces at their center curve or project toward each other, as seen in Fig. 1, and are secured to the steps B.

Instead of cutting a thread in the shoe-lug r^2 or t' and screwing therein the truss-wire, the latter may be fastened as shown in Fig. 8, where the end of the wire is bent and doubled back on itself, thereby forming an enlargement which occupies a socket in the lug.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A step-ladder having the improved leg-hinge, consisting of a lug at the top of the side upright, having a depression on its upper side constituting one part, a notch at the upper end of the leg in which the lug has bearing, and which constitutes the other part, and means to bind the said two parts together, as set forth.

2. A step-ladder having a brace to limit the spread of the legs from the side uprights, consisting of two arms, one of which is pivoted to the leg and the other to the side upright, and the said arms hinged or jointed together to permit them to fold against each other, and adapted for the hinged ends to slide or extend on each other, as set forth.

3. A step-ladder having attached to the lower end of each side upright a metal shoe provided with a lug having a hole, and at the upper end a top iron provided with a lug having a hole, and a wire truss, one end of which is passed into the hole of the shoe-lug and the other end into the hole of the top iron lug, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

DUDLEY PAGE.

Witnesses:
WM. H. MILLER,
R. H. STOKES.