

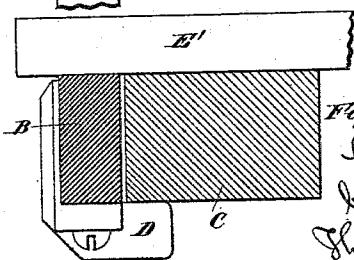
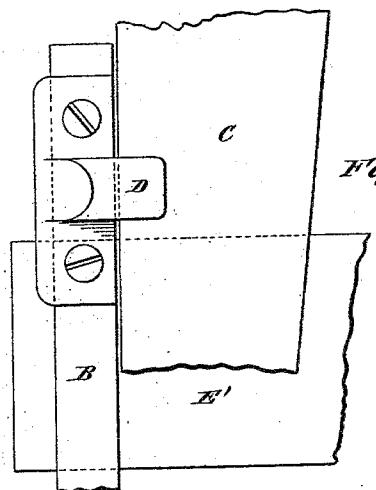
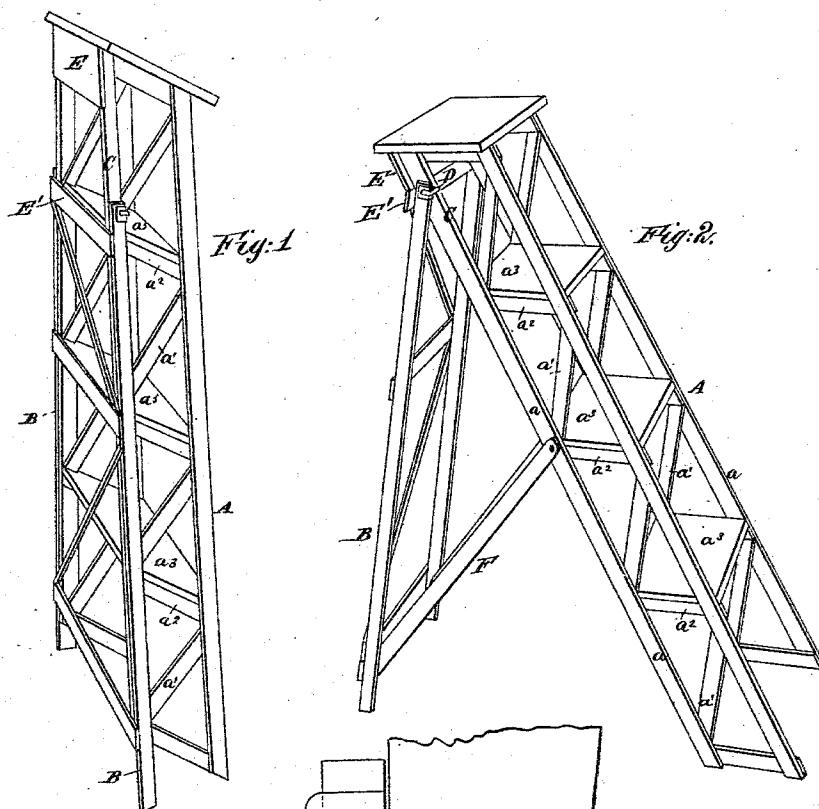
(No Model.)

C. A. JONES.

STEP LADDER.

No. 286,617.

Patented Oct. 16, 1883.



WITNESSES—

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# UNITED STATES PATENT OFFICE.

CHARLES ALLAN JONES, OF HATHERLEY COURT, GLOUCESTER, COUNTY OF GLOUCESTER, ENGLAND.

## STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 286,617, dated October 16, 1883.

Application filed December 9, 1882. (No model.) Patented in England August 16, 1882, No. 3,598.

*To all whom it may concern:*

Be it known that I, CHARLES ALLAN JONES, solicitor, a subject of the Queen of Great Britain, residing at Hatherley Court, Gloucester, 5 in the county of Gloucester, England, have invented a new and useful Improvement in Portable Steps or Self-Supporting Ladders, (for which I have obtained provisional protection in Great Britain, No. 3,298, bearing 10 date August 16, 1882,) of which the following is a specification.

My invention relates to that class of ladders which commonly consist of two principals, the upper ends of which are hinged or connected together, and the lower ends of which are capable of being spread apart, so as to form a wide base for the apparatus when erected, and insure its stability without supplementary support.

20 The objects of my improvements are to secure lightness, compactness when folded up, and increased firmness and safety when extended for use.

In carrying out my invention each of the 25 said principals may comprise a flight of steps; but I usually prefer to adhere to the common practice of forming only one such principal, which I will call the "front" principal, as a flight of steps, and employing the other or 30 back principal as an inclined strut or support to the upper end of the front principal. In connecting these two parts together I adopt the following devices: Instead of hinging the 35 upper end of the back principal to the upper end of the front one, I arrange the said upper end of the former to slide longitudinally on a guide strip or strips formed on or attached to the latter. An equivalent mode of construction would consist in the use of pins working 40 in slots or grooves. Although the principals are by preference tapered longitudinally, the guide-strips on each side of the front are adjusted parallel to each other. I further connect the two principals by means of a stretcher 45 pivoted to the bottom of the back principal, as to one end, and as to the other to the middle, or thereabout, of the front principal. In erecting and extending the apparatus for use the upper end of the back principal slides on

the guide strip or strips of the front principal until stops fitted to the respective parts arrive in contact with one another and arrest further motion. At the same time the stretcher before referred to vibrates about its pivoted ends until it arrives in such a position relative to the two principals that it serves not only as a tie to prevent the farther spreading of their lower ends, but also becomes effective as a strut to prevent the accidental collapse of the apparatus in the event 50 of the user overbalancing himself in a forward direction. On the other hand, if the apparatus, when open, be tilted on the foot of the front principal as a pivot, collapse ensues, and the two principals and stretcher fold themselves compactly together. The foot of each principal remains level, however, with the other, so that the apparatus, when folded, is still capable of standing erect. In constructing a 55 principal comprising a flight of steps I form 60 the sides thereof of bars braced diagonally, and connected by cross-pieces, on which latter the treads are mounted. The back principal and stretcher are also, by preference, constructed 65 of bars struttied, tied, and diagonally braced 70 with a view to combining extreme lightness 75 with adequate strength.

In the accompanying drawings illustrative 80 of my said invention, Figure 1 represents in perspective a view of my improved portable 85 steps or self-supporting ladders when folded together, and Fig. 2 shows the same apparatus when extended ready for use.

The front principal, A, is formed as a flight 85 of steps, and the back principal, B, acts as an inclined strut or support to the upper end of the front principal when the apparatus is extended for use, as in Fig. 2, and also serves as one of the feet to support the apparatus when 90 folded and standing erect, as in Fig. 1. The upper end of the front principal is fitted on each side with a guide-strip, C, for receiving a projection or pin, D, formed on or attached to the upper end of the back principal or leg, B, and stops E E are provided at the upper 95 ends of the front and back principals, respectively, to limit the sliding motion referred to. The lower end of the back principal or leg, B,

is attached by means of a stretcher, F, to the front principal at or about the middle of its length. Each end of the stretcher is pivoted to the parts named, so as to be free to vibrate.

5 The points of attachment for the two ends of the stretcher should be relatively such that when the apparatus is extended for use the stretcher will assume an angle of about sixty degrees with the horizon, and also such that

10 when the apparatus is folded and stood erect the lower extremities of both principals will be in the same horizontal plane. If a more obtuse angle be employed, the stretcher will not act so effectively as a tie, and if the

15 angle be made much more acute than that above recommended the sliding motion will be inconveniently extended, or the space occupied by the base of the apparatus undesirably reduced. The front principal is formed

20 of bars  $a$ , braced by diagonals  $a'$ , and connected by cross-pieces  $a''$ , on which the treads  $a^3$  are mounted. It will be seen that the back principal and stretcher are somewhat similarly constructed of bars struttied, tied, and diagonally braced.

25 Figs. 3 and 4 represent in elevation and horizontal section, respectively, and to an enlarged scale, the manner in which I construct the sliding end of the leg B and the guide C. A plate

30 attached by screws or otherwise to the leg B carries a pin, D, projecting in front of and in contact with the guide-strip C, or the side of the front principal, if preferred. The back principal or leg, B, thus grasps the guide C between the pin D and the stop-piece E'; but it is

35 obvious that a similar result might be attained by a pin working in a slot, or by other equivalent mechanical means.

Having now described the nature of my said invention and the manner in which the same is or may be carried into effect, I would have it understood that I neither confine myself to the precise details hereinbefore described, and illustrated on the accompanying drawings, nor to the proportions of the various parts of the apparatus portrayed, as many of these may be modified or varied without departing from the principal of my invention; but

What I consider to possess novelty and utility, and therefore claim as my invention, and wish to secure by Letters Patent, is—

1. The portable steps or self-supporting ladders, consisting of two principals, A, B, connected at their upper ends by a sliding joint, and controlled as to their lower ends by a stretcher, F, which, in certain positions of the apparatus, operates as a tie and in others as a strut, substantially as described.

2. The step-ladder herein described, consisting of the front principal, A, having guide-rail C and cross-bar E, the back principal, B, having stop-piece E' adapted to slide along the back surface of the guide C and engage under the bar E when the device is in operation, and having also the pins D for holding the back principal in connection with the said guide, and the whole combined and operating substantially as and for the purposes set forth.

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