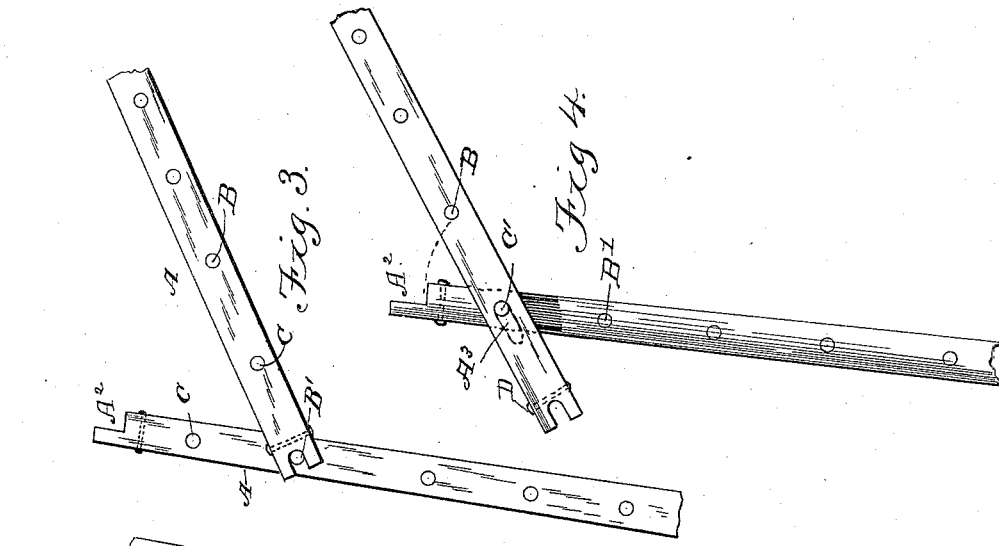
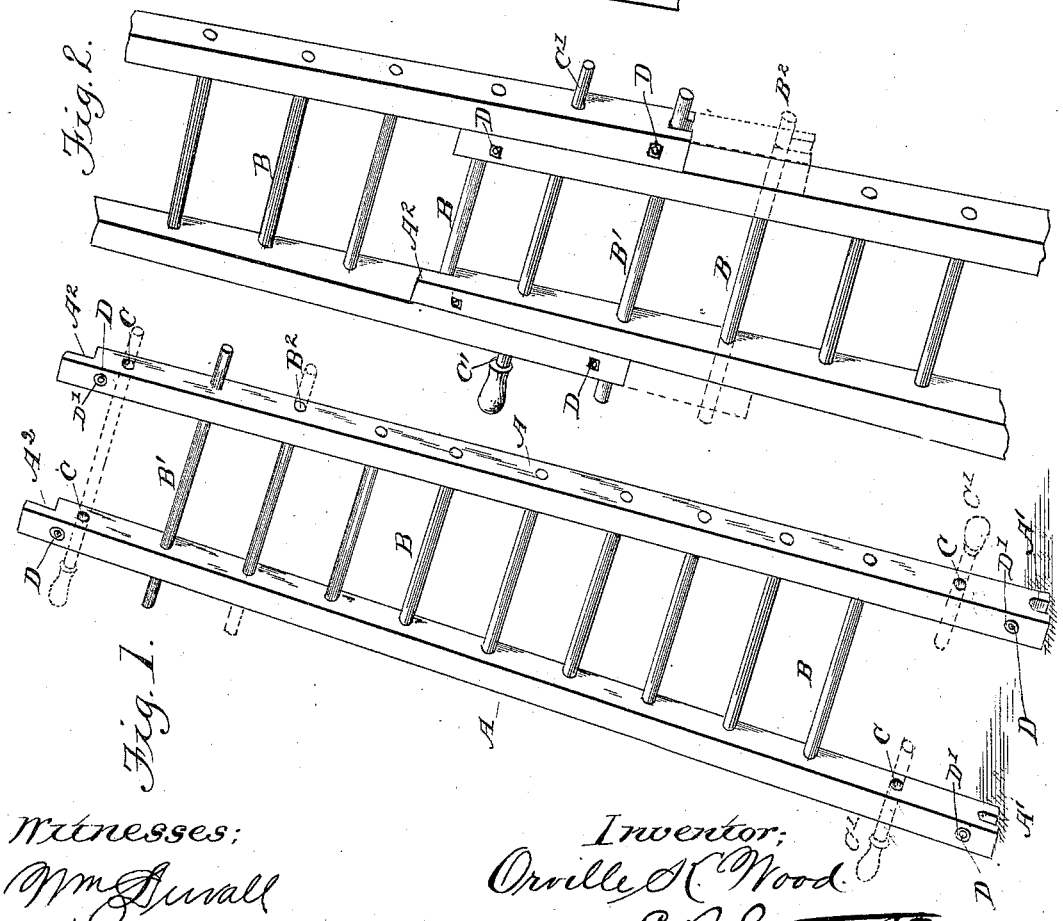
(No Model.)

O. K. WOOD.

LADDER.

No. 306,454. Patented Oct. 14, 1884.





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UNITED STATES PATENT OFFICE.

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LADDER.

SPECIFICATION forming part of Letters Patent No. 306,454, dated October 14, 1884.

Application filed July 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE K. WOOD, a citizen of the United States, residing at West Chazy, in the county of Clinton and State of New York, have invented certain new and useful Improvements in Ladders, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has relation to ladders of that class known as "sectional," which consists of ladder-sections constructed at both ends so as to be connected with other like sections, in order that a ladder of any desired length may be built up therewith, the principle of construction being in each section such as to adapt it to receive at one end and to be received at the other end by similar sections.

This invention appertains to certain improvements in such ladders of the class described as are made with straight or laterally divergent or spreading side rails, the lower and upper ends of the same being notched or slotted to embrace rungs of a section with which they are to be associated. Heretofore ladders of this class have been made with rectangular and round rungs projecting laterally through and beyond the side rails at one end of the section, and a similar rung at the lower end of the section to be associated, and it has also been common heretofore to provide a locking device—such as a pin, rod, or bolt—to be passed through the side rails of both sections after they have been associated, as described.

The invention in this instance consists in certain features of construction hereinafter described, and specifically set forth in the claims.

Referring to the drawings, Figure 1 is a perspective of a ladder-section constructed in accordance with my invention. Fig. 2 is a perspective of portions of two of such ladder-sections associated. Fig. 3 is a side elevation of portions of two of such sections, the upper one of which is inclined from the lower to form a bridge leading from the main ladder or section to an object—as a fruit-tree, a window, or other entrance to a building. Fig. 4 is another arrangement of portions of two of such sections, whereby they are adapted for the same or other purposes, as described.

Like letters indicate like parts in all the figures.

Among the objects of this invention is to produce a ladder comprising detachable and independent sections at the minimum of expense, and at the same time one that shall have the maximum of strength, as well as adaptability to various uses.

In constructing a ladder according to my invention, I form at the lower ends of the side rails, A, slots or notches A′, and at the upper ends of said rails I form a shoulder, A^2, which is in fact a half notch or slot, so that both ends of the ladder-section having its rails so formed are adapted to rest upon or to be connected with a rung of a similar ladder-section when the two are associated. At a distance from each end of each of the side rails, substantially equal to half the distance that the rungs B are from each other, I form holes C, for the reception of a locking pin or pins, bolt, or rod, C′, (see Fig. 2,) and I project or extend the upper rung, B′, of each section laterally beyond the rails A, to form trunnions upon which a section may be mounted and tilted, inclined, or oscillated, as hereinafter described.

If it is desired to construct especially strong ladders or ladder-sections, the long rung B′ may be arranged second in the series of rungs from the top, as indicated in dotted lines at B^2, Fig. 1, in which construction I secure double rails on each side of the associated sections, which extend by each other to a greater distance, and therefore materially stiffen the ladder when formed of such sections. In such a case the upper rung, B′, is retained, although not projected from the side rails, in order that the series of rungs in the associated sections may be complete and regular.

In order to strengthen the ladder at its ends where it is slotted or shouldered, it is bored in close proximity and at a right angle to the slot or shoulder, and a bolt, rivet, or screw, D, is inserted—a common means whereby the side rails are prevented from splitting by reason of any strain placed thereon in ordinary use. By this construction I am enabled to still retain the side rails of ordinary width, notwithstanding the slotting or cutting away of the rails for the purposes above de-

scribed. In inserting a rivet, a washer, D′, would be preferably placed between the head of the rivet and surface of the rail, and upon the opposite surface of the rail, for heading the rivet or turning the nut of the bolt, whereby a broader bearing-surface is made, wearing away or splitting of the rail in riveting or turning the nut of the bolt is avoided, and in view of the tendency of the rails to shrink with age a bolt is perhaps preferable to a rivet, although the latter can be reupset or again riveted in such a contingency.

Taking the construction illustrated in Fig. 1, it will be seen that as the sides are inclined toward each other at the top they will snugly fit the bottom of a similar section, and that the notches A′ will rest upon the trunnions or projecting portion of the upper rung, B′, while the lower rung, B, of the upper section will rest in the shoulders A^2. The side rails, being either straight or inclined, are in line with each other, so that a locking pin or bolt, C′, may be passed through the side rails of each of the sections, and in this manner the two will be firmly connected to each other. Now, when weight is placed upon the ladder, the strain is distributed along the side rails on the lower rung, B, and the upper rung, B′, and upon the pins or rod C′. It is also apparent that when a ladder so constructed is inclined against any support—such as a tree or building—a locking-pin is not essential to a secure association of two of such sections, as a weight upon the ladder will cause the shoulders A^2 to press against the rung B, and the slots A′ to rest upon the projection of the rung B′, so that in such a use the pin C′ serves no essential purpose, its main object being to prevent a separation of the sections longitudinally one from the other.

By reference to Figs. 3 and 4 it will be seen that there are two methods of using ladder-sections constructed according to my invention for various purposes. In Fig. 3 I have illustrated the pin C′ removed, and an upper section tilted or inclined from a lower section. By reference to Fig. 4 it will be seen that the same arrangement of the two sections may be had while they are united by the pin C′ alone, and slots A^3 in each rail of one section permits tilting without removing the pin or pins. This latter method of using the sections is convenient for the purpose of making an ordinary step-ladder for indoor or outdoor use, and four of the sections may be employed in a like manner for staging purposes, a staging-plank being extended from one to the other of two pairs of said sections, each pair being arranged in **A** form. So, in a like manner, three of said sections may be employed, the middle one forming the staging, and the end sections forming the supports for said staging, so that by using the sections formed according to my invention a continuous straight ladder of any desired practicable height may be formed, and various arrangements and adaptations of two or more sections may be had.

Having described my invention and its operation, what I claim is—

1. A ladder-section comprising side rails and a series of round rungs, one of which is projected as described, the said side rails being notched and shouldered or half-notched to receive and rest against rungs, and perforated at each end for a locking-pin, substantially as shown and described.

2. The combination of the side rails, A, notched, as at A′, and shouldered or half-notched, as at A^2, and provided with the pin-hole C, with the rungs B and the upper projecting rung, B′, substantially as shown and described.

3. The combination of a ladder-section, the upper end of which is provided with a projecting round rung and with half-notches, with a similar section, the lower ends of the side rails of which are notched and rest upon said projecting rungs, and with a locking pin or pins, substantially as specified.

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

ORVILLE K. WOOD.

Witnesses:

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