

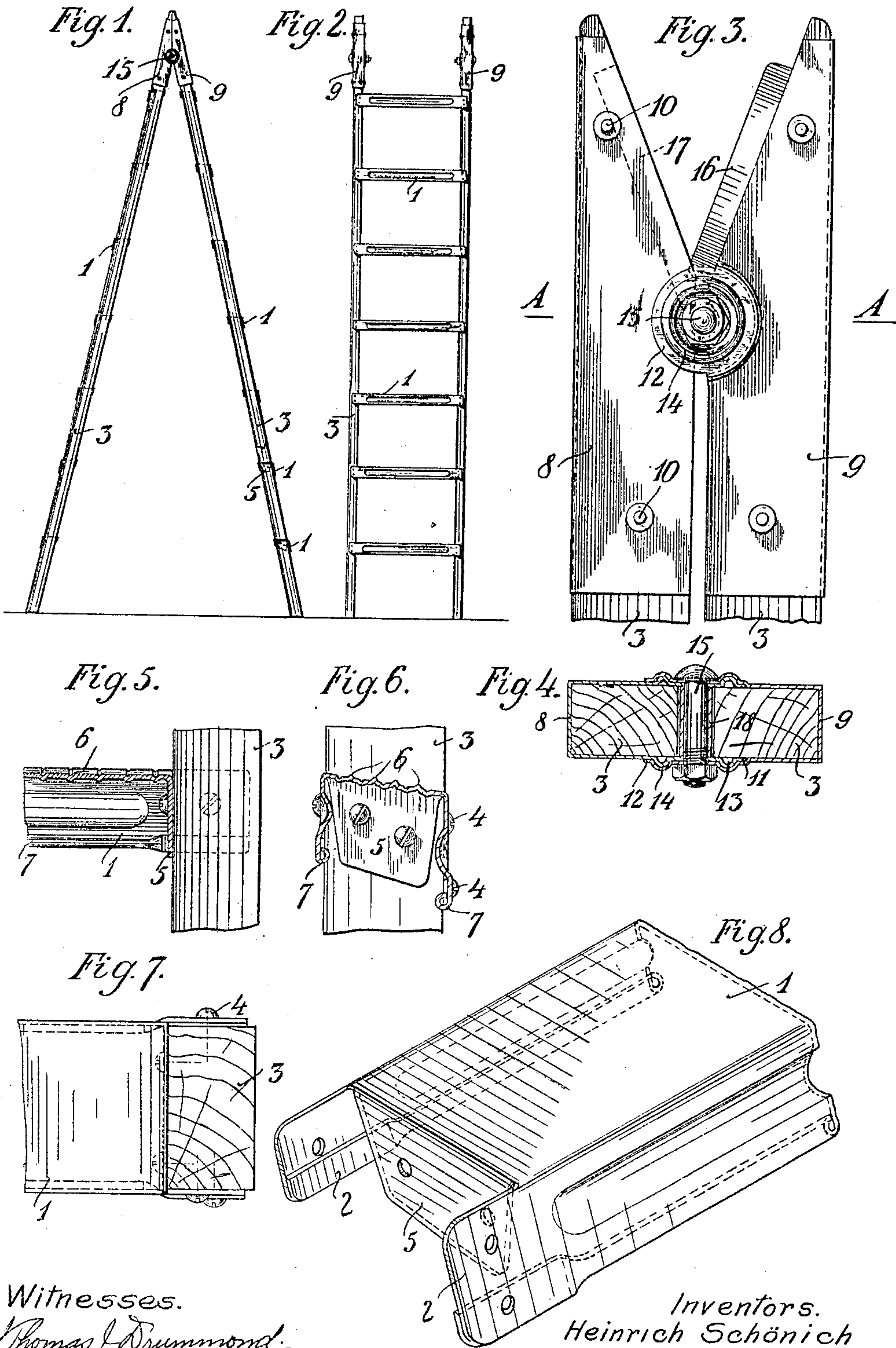
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LADDER.

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944,000.

Patented Dec. 21, 1909.



Witnesses.
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UNITED STATES PATENT OFFICE.

HEINRICH SCHÖNICH AND JOHANN LANGER, OF VIENNA, AUSTRIA-HUNGARY.

LADDER.

944,000.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed August 1, 1908. Serial No. 446,368.

To all whom it may concern:

Be it known that we, HEINRICH SCHÖNICH, plumber, and JOHANN LANGER, locksmith, both subjects of the Emperor of Austria-Hungary, and resident of XIII/6 St. Veitgasse 34, Vienna, in the Empire of Austria-Hungary, have invented Improvements in Ladders; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to ladders and an important object is to provide a ladder which is distinguished from ladders known heretofore by its firmness, stability and lightness. These advantages are obtained on the one hand by a special shape of step and on the other hand by the construction of the hinge of the ladder.

In order that the invention may be clearly understood, reference will be made to the accompanying drawing in which one embodiment is represented by way of example and in which:

Figure 1 is a side elevation of a ladder according to the invention, and Fig. 2 is a front elevation of the same; Fig. 3 is a side elevation on an enlarged scale of the hinge of the ladder with parts of the side-rails, and Fig. 4 is a section through the hinge in the plane A—A in Fig. 3; Figs. 5, 6 and 7 show one end of a step with a portion of the side-rail in longitudinal section, cross-section and plan respectively; whereas Fig. 8 shows one end of a hollow step in perspective.

Referring to the drawing, the step 1, which is made of sheet metal, is hollow and has a flat upper-surface which is formed U-shaped in the constructional form represented so as to obtain a flat tread. This tread may be provided with elevations or bosses 6 in the material of the steps and arranged in rows one beside another, in order to prevent the foot and the hand from slipping and being injured. The two ends of the step are provided with one or more attachment lugs which, in the form represented, form a fork, so that the steps can easily be pushed on to the side-rail 3 with the aid of the prongs 2 of the fork, and can be fastened by means of screws 4 or the like. The bifurcation of the ends of the steps is obtained or the attachment lugs are made by incisions being made in the ends of the steps,

and the tongue 5 which is thus formed is bent round, whereby a fork, which is closed at the root, is formed having three attachment lugs, namely the two lateral lugs 2 and the central flap 5. Owing to the bifurcation of the ends of the steps, the placing the steps in position and their attachment on the side-rail is facilitated, and consequently it is also possible to easily exchange the same.

The lower edges are turned inward at 7 and the side-walls, as shown clearly in Fig. 6 in cross-section, are bulged inward. In this manner, on the one hand the rigidity and firmness of the steps are increased, and on the other hand sharp edges are done away with, and consequently injury to the hands, etc., is prevented.

The hinge represented more particularly in Figs. 3 and 4 consists of two case-like parts 8, 9, which, particularly, are U-shaped in cross-section. The ends of the side-rail 3 are inserted into these parts and both ends are connected together by screws 10 or the like. The side-walls of the parts 8, 9 of U-shaped cross-section extend into the lugs or flaps 11, 12, and at the place where they lap over one another they serve for connecting the two parts of the hinge by means of the bolt 15. The lugs 11 of the one part are provided with an annular collar or roll 13, and those of the other part with a corresponding annular hollow. If the parts of the hinge are connected by the bolt 15, the annular rolls 13 engage in the annular hollows 14, whereby a good hinge-connection is formed around the bolt of the hinge. In order to be able to firmly screw up the bolt 15, a spacing sleeve 18 acting like a stay-bolt is inserted between the flaps on both sides.

In order to increase the stability of the ladder at the hinge, a projection 16 is arranged longitudinally on one of the side-rails above the hinge, a suitable groove 17 being provided in the other side-rail. One part of the projection 16 always engages in the groove 17, and, according as the ladder is opened or extended much or little, the projection 16 engages more or less in the groove 17, so that the hinge and with it the whole ladder is effectively prevented from shaking or trembling in the direction of the axis of the hinge.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In a ladder, the combination with two wooden side-rails, of a hollow metal step

having one central and two lateral attachment lugs forming a fork at each end, means for securing the lugs at one end of the step to one side-rail, and means securing the lugs
5 at the other end of the step to the other side-rail, substantially as described.

2. In a ladder, the combination, with two side-rails, of a case-like part of a hinge at the end of one side-rail, a like case-like part
10 of a hinge at the end of the other side-rail, said case-like parts each having a lug provided with a hole, one of said parts having an annular roll around said hole, the other part having a corresponding annular hollow,

and a bolt passing through said holes in said 15 case-like parts, substantially as described.

3. In a ladder, a hollow step, substantially as shown, having at each end one central and two lateral lugs, substantially as described.

In testimony whereof we have signed our 20 names to this specification in the presence of two subscribing witnesses.

HEINRICH SCHÖNICH.
JOHANN LANGER.

Witnesses:

ADELAIDE FUNK,
AUGUST FUGGER.