Oct. 11, 1927. 1,644,694

A. V. ROWE

LADDER AND METHOD OF PREPARING RUNGS AND RAILS THEREOF

Filed April 9, 1924

FIG. 1.

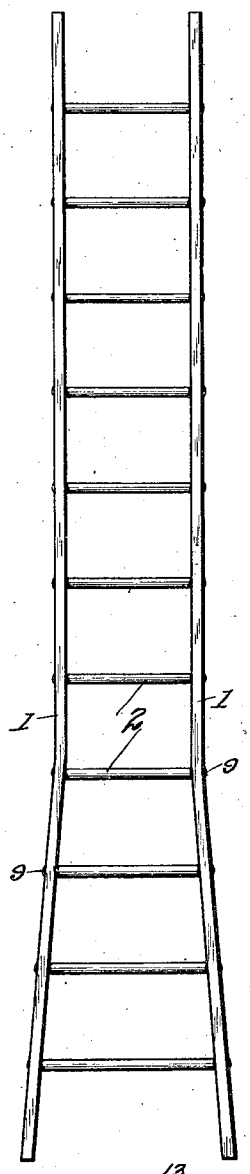
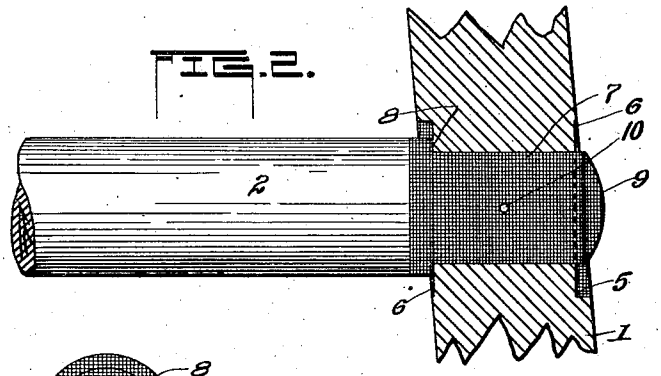


FIG. 2.



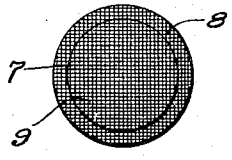


FIG. 4.

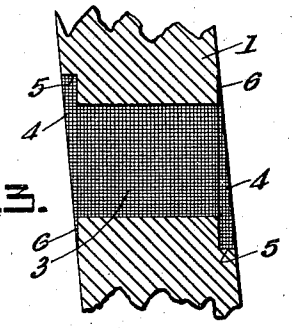
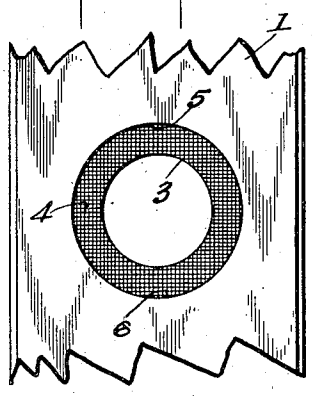


FIG. 3.

FIG. 5.



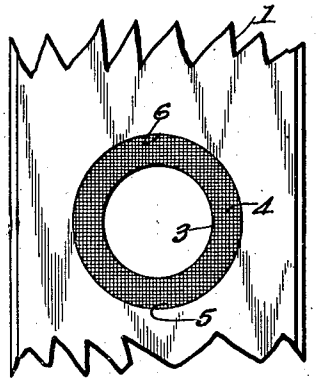
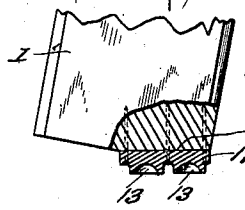


FIG. 6.

FIG. 7.



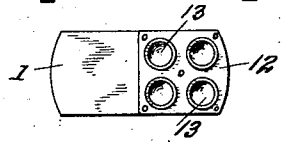


FIG. 8.

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UNITED STATES PATENT OFFICE.

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LADDER AND METHOD OF PREPARING RUNGS AND RAILS THEREOF.

Application filed April 9, 1924. Serial No. 705,225.

This invention has reference to the method of preparing the rungs, tenons and the mortises or openings in the side rails of wooden ladders to close the pores of the wood against the absorption of moisture, to prevent the rotting of the wood, and to the resulting ladders made in accordance with my method.

The method consists in searing the surface and shoulders of the tenons and the rungs immediately adjacent such shoulders, and also the mortises or openings in the side rails and the faces of the side rails surrounding such mortises; such searing being for the purpose of, first—smoothing the parts to make a more perfect fit, and second—to close the pores in the wood to seal the pores against the absorption of moisture and thereby prevent the rotting of the wood where these parts are joined.

The invention has for a further object to construct a ladder, the side rails of which converge, wherein the mortises or openings through the side rails for the tenons of certain of the rungs are at an acute angle to the inclination of the side rails, and where the surfaces of the rails surrounding the mortises are provided with counterbores to receive the shouldered ends of the rungs; such counterbores, due to the inclination of the rails forming a pronounced shoulder at one side of the rungs and disappearing in the surface at the other side to insure an absolutely square fit of the face of the shoulders of the rungs with the bases of said counterbores. The mortises or openings being bored clear through the rails and the ends of the tenons presenting a button effect on the outside of the rails.

That the invention may be more fully understood, reference is had to the accompanying drawings, illustrating a preferred embodiment of the invention, in which:—

Figure 1 is a face view of a ladder embodying my invention;

Figure 2 is a detail in section showing part of a side rail, rung and tenon and showing the searing of the parts;

Figure 3 is a view of the rail in Figure 2, the rung being omitted;

Figure 4 is an end view illustrating the button effect of the rung and tenon;

Figure 5 is an inside face view of a rail;

Figure 6 is an outside face view of a rail;

Figure 7 is a detail sectional view illustrating a grip for the lower ends of the rails, and

Figure 8 is a bottom plan view of said grip.

Like characters of reference denote corresponding parts throughout the figures.

Wooden ladders are made single and extension and are composed of side rails connected by rungs. In single ladders the side rails are preferably tapered at the rate of about one quarter inch to the foot. And in extension ladders, the lower part, for the first three or four feet the rails are tapered at the rate of about one inch to the foot. It has been the custom in the manufacture of wooden ladders to drill the mortises or openings in the side rails to receive the tenons of the rungs and leave these mortises or openings untreated, and likewise in making the tenons they are left untreated, and both are naturally more or less rough, due to the exposing of the fibre, leaving the pores in the wood open and as a result moisture will creep in and soon decay the wood and the ladders finally become wabbly and loose-jointed. It is to obviate these defects that my invention is directed.

In Figure 1 a section of an extension ladder is shown, including the side rails 1 and the rungs 2. It will be observed that the lower end of the ladder, for a portion of its length is tapered at about one inch to the foot. In other words the side rails converge from their lower ends upward.

The side rails 1 at pre-determined points are provided with mortises or openings 3 bored completely therethrough. In the tapered ends of said side rails these openings are preferably at an acute angle to the inclination of such rails, and in the remaining portions of said rails these mortises or openings are disposed at right angles to said rails. The arrangement of the mortises or openings in the tapered ends of the side rails, illustrates substantially the construction of mortises or openings in the tapered rails of ordinary single ladders. The opposite, inside and outside faces of the rails at the mortises or openings 3 are counterbored, as at 4 to provide ring-like-seats on one face of each rail for the shouldered ends of the rungs and on the other face to present a button effect of the ends of the tenons protruding through said mortises or openings and to present a significant marking for the ladders made in accordance with the invention. These counterbores, especially in the tapered rails, are concentric to the mortises

or openings 3, and they being at an acute angle to the inclinations of the rails form pronounced shoulders, as at 5 and merge into the surfaces of the rails, as at 6. Such structure, results in giving an equal bearing for the rungs all around the shoulders of the tenons and insures an absolutely square fit of the shoulders of the tenons of the rungs against the inside faces of the rails, see Figure 2.

The rungs 2 are provided at their opposite ends with tenons 7 and squared shoulders 8. The ends of the tenons having a button-like appearance, as at 9.

The mortises or openings 3 as well as the counter-bores 4 are seared by the use of some suitable tool or machine, and likewise the complete tenons 7, the face of the shoulders 8 and that portion of the ends of the rungs 2 immediately adjacent the shoulders 8 are also seared by some suitable tool, the effect of which is to smooth as well as insulate the surfaces so treated, and in so doing to close the pores in the wood which will act to seal the same against the absorption of moisture and thereby prevent the wood from rotting, insuring a more perfect fit and increase the life of the ladder. I prefer that the counterbores 4 in the rails shall be of a greater diameter than the rungs and tenons which will protect the surfaces of the rails surrounding the rungs on the inside faces of the rails and the surfaces of the rails surrounding the rungs on the outside faces of the rails, and said outside counterbores and button ends of the tenons giving a distinctive appearance to ladders made in accordance with my invention.

The tenons may, if it is deemed desirable, be secured in the side rails of the ladder by means of galvanized cement coated nails passed through the rails and openings 10 in the tenons, see Figure 2.

The lower ends of the rails 1 are cut off at an angle, as at 11, which become the flat faces of the ends of the rails to rest on the ground when the ladder is inclined against an object, and to provide a suction grip to prevent slippage of the rails such faces 11 have attached thereto the rubber plates 12 having vacuum cups 13 which grip the surface on which they rest.

What I claim is:—

A wooden ladder including side rails, having openings therethrough and counterbored seats in the opposite faces thereof, the openings, and the seats being seared to close the pores in the wood and rungs having shouldered tenons fitted in said openings, the tenons, the shoulders, and the peripheries of the rungs adjacent the shoulders being each seared to close the pores in the wood, and the ends of the tenons of the rungs being rounded and being seared and extending into the counterbored seats in the outer faces of the rail, the counterbored seats of the rails being of greater diameter than the bodies of the rungs and of the rounded ends of the tenons.

In witness whereof, I have hereunto affixed my hand this 5th day of April, 1924.

ALVIN V. ROWE.