

C. J. BROWN.

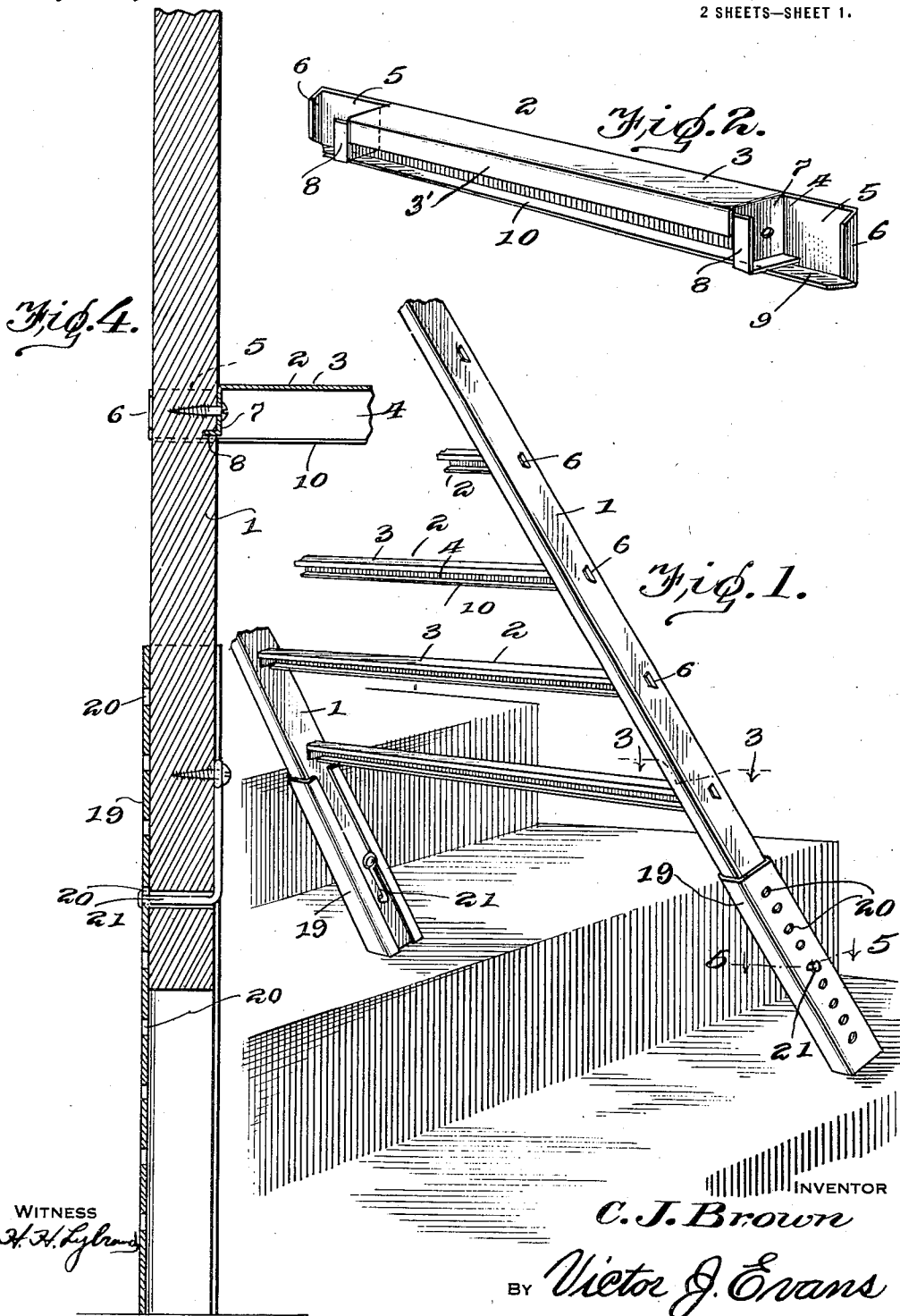
LADDER,

APPLICATION FILED JAN. 23, 1917.

Patented Nov. 13, 1917.

2 SHEETS—SHEET 1.

1,246,709.



WITNESS
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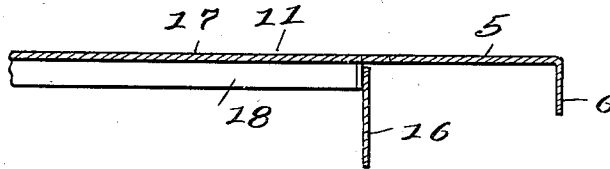


Fig. 7.

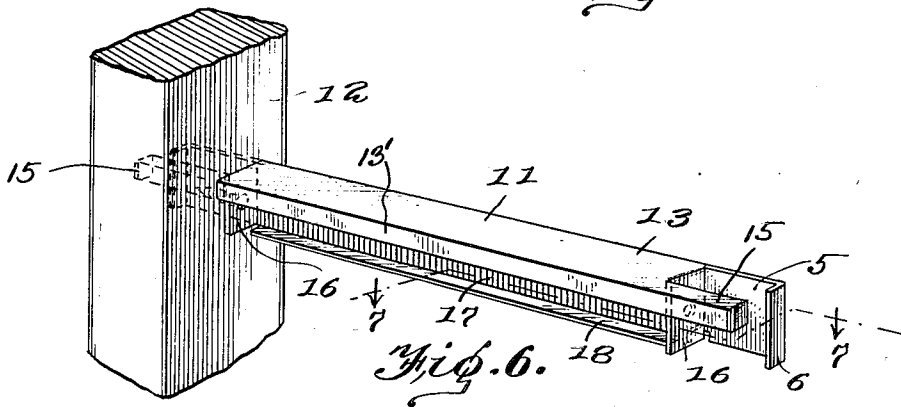


Fig. 6.

Fig. 5.

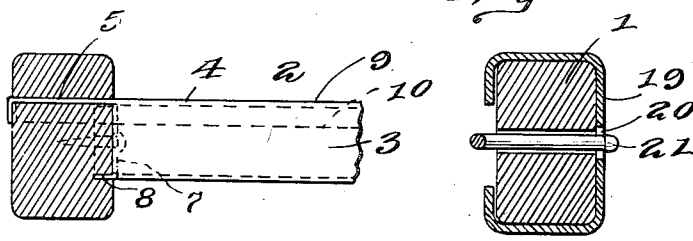


Fig. 3.

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LADDER.

1,246,709.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES J. BROWN, a native-born citizen of the United States, residing at River Falls, in the county of Pierce and State of Wisconsin, have invented new and useful Improvements in Ladders, of which the following is a specification.

This invention relates to ladders and has for its primary object the provision of a ladder having wooden rails and metallic rungs formed to extend through the rails and clamp thereto, thus forming a very rigid and strong construction.

Another feature of the invention is rungs of thin or sheet metal, said rungs being attached to the rails by tongues which extend through the rails and lips which clamp thereagainst, thus forming a rigid structure without weakening the rails to any appreciable extent.

A still further object of the invention is to provide a ladder having non-breakable rungs which can not be separated from the rails without the use of tools, which are wear resisting and which have flat tread surfaces which are easier to stand on than the common type of round wooden rungs.

With these and other objects in view as will become apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter fully set forth, illustrated and claimed.

In the drawings:—

Fig. 1 is a fragmentary rear perspective view showing the lower end of the ladder,

Fig. 2 is a perspective view of one of the rungs,

Fig. 3 is a transverse sectional view on the plane of line 3—3 of Fig. 1,

Fig. 4 is a vertical sectional view through the rail showing one end of a rung and one of the extension members,

Fig. 5 is a transverse section on the plane of line 5—5 of Fig. 1,

Fig. 6 is a fragmentary rear perspective view showing part of a rail and a modified form of rung connected thereto,

Fig. 7 is a section on the line 7—7 of Fig. 6.

Referring in detail to the drawings by numerals, 1 designates the rails of the ladder which are preferably formed of wood and which are connected by a plurality of rungs

2 preferably formed of thin or sheet metal. Each of these rungs comprises a tread 3 and a depending riser 4 formed integrally therewith. The riser is extended through each of the rails as indicated by the numeral 5 and the extending portions are projected beyond the outer faces of the rails and bent into engagement therewith to form clamping lips 6. The metal is cut and the thread bent down to form the abutments 7 which stand at right angles to the riser and tread to assist in supporting and bracing the same. These abutments squarely engage the inner faces of the rails 1 and are held engaged therewith by lips or tongues 8 which enter said faces. The lower edge of each riser has an intumed flange 10 whose ends 9 extend entirely through the rails and cooperate with the abutments 7 to rigidly secure the rungs in position hence the structure and method of connection provide a very strong and substantial ladder. The rails 1 are not materially weakened by the passage therethrough of the extensions 5 and 9 inasmuch as these members are formed of relatively thin metal and therefore a great improvement is effected over the common type of ladder wherein the rails are deeply notched to receive the rungs. The rear edge of the tread between the rails is bent downwardly in a flange 3' and the lower edge of the riser between the rails is bent inwardly at 10 to provide a better finish to the rung and further strengthen the same.

In the modified form of the invention the rung 11 is connected to the rail 12 in a slightly different manner from that heretofore described. In this form the rung comprises a tread 13 having a down-turned flange 13' along its rear edge, and a riser 17 depending from its front edge and itself having its lower edge bent inwardly or rearwardly in to a flange 18. As in the former construction, the ends of the riser are extended as at 5 beyond the ends of the tread, the extending portions being projected through the rails and formed with lips 6 bent into engagement with the outer faces thereof. Also the ends of the tread are bent sharply downward into abutment 16 which squarely engage the inner faces of the rails as seen at the left of Fig. 6, but in the present instance the abutment is bent down from the forward portion of the tread while the rearward portion thereof and the flange 13' 110

are continued beyond the abutment behind the extension 5 in the form of a tongue 15 which passes into or through the rail 12 as seen at the left of Fig. 6. Thus the modified type of my invention utilizes the rear flange 13' and a portion of the tread in place of the tongues 8 and extension 9 of the other type.

It will be apparent that my metal rung is capable of various modifications other than the one shown and that instead of using angle iron I might equally as well employ T iron or U iron.

The extensions 19 are for the purpose of adjusting the ladder to uneven or inclined surfaces and they each consist of a split sleeve or housing having a plurality of aligned openings 20 in its outer wall into which a spring stop or catch 21 may be projected to hold the extension against longitudinal movement.

From the foregoing description taken in connection with the accompanying drawings it will be apparent that I have provided a very strong, simple and practical ladder which may be cheaply manufactured and which is capable of various modifications.

While I have shown the preferred embodiment of my invention other forms may be used without departing from the scope and spirit of the invention as claimed.

What I claim is:—

1. A ladder made up of rails of wood and rungs of sheet metal, each rung bent into a flat tread with a depending flange at its rear edge, an upright riser depending from the front edge of and longer than the tread, its extended portions passing through the rails and bent into lips resting against the outer faces thereof, abutments depending integrally from the ends of the tread and resting squarely against the inner faces of the rails, and integral tongues projecting beyond said abutments and entering said rails.

2. A ladder comprising upright rails and transverse rungs of sheet metal, each rung bent into a flat tread with a depending flange at its rear edge, an upright riser depending from the front edge of the tread and having a rearwardly projecting flange at its rear edge, the riser being longer than the tread and its extending portions projecting through the rails and bent into lips on their outer faces, integral abutments depending from the ends of the tread at its forward portion and resting against the inner faces of the rails, and integral tongues projecting from the ends of the tread at its rearward portion and extending into said rails.

In testimony whereof I affix my signature.
CHARLES J. BROWN.