(No Model.) 2 Sheets—Sheet 1.

C. G. UDELL.

STEP LADDER.

No. 309,323. Patented Dec. 16, 1884.

Fig. 1.

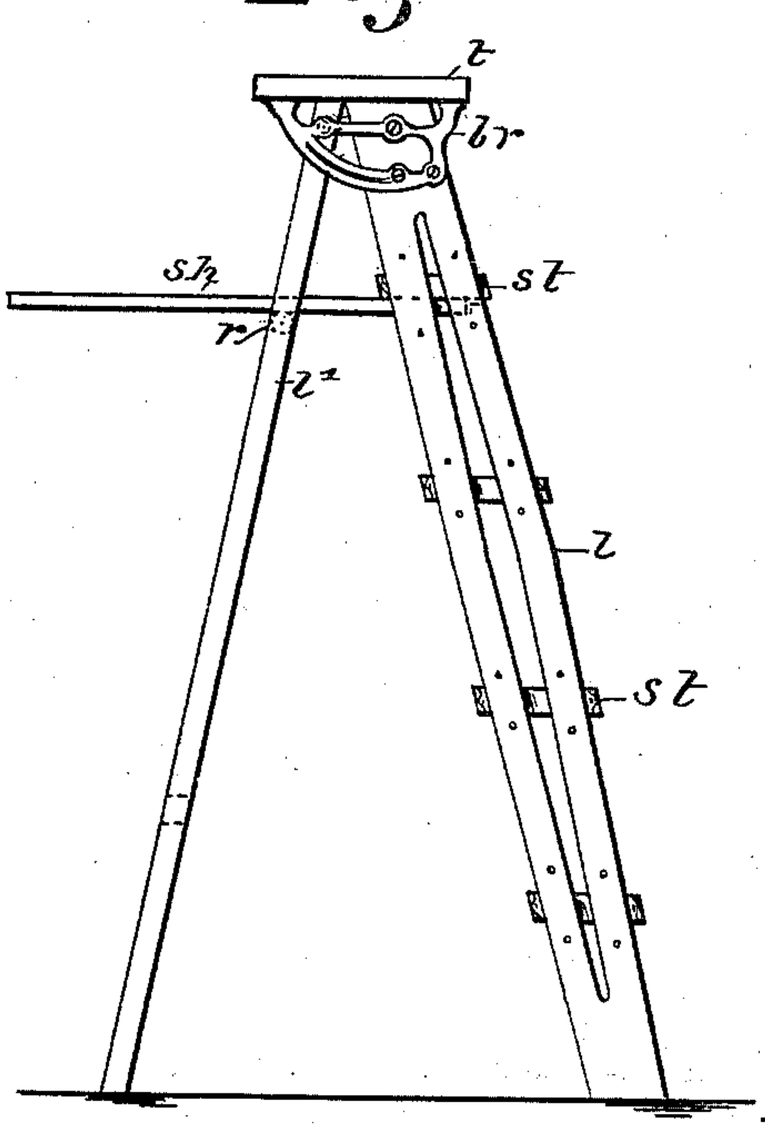


Fig. 2.

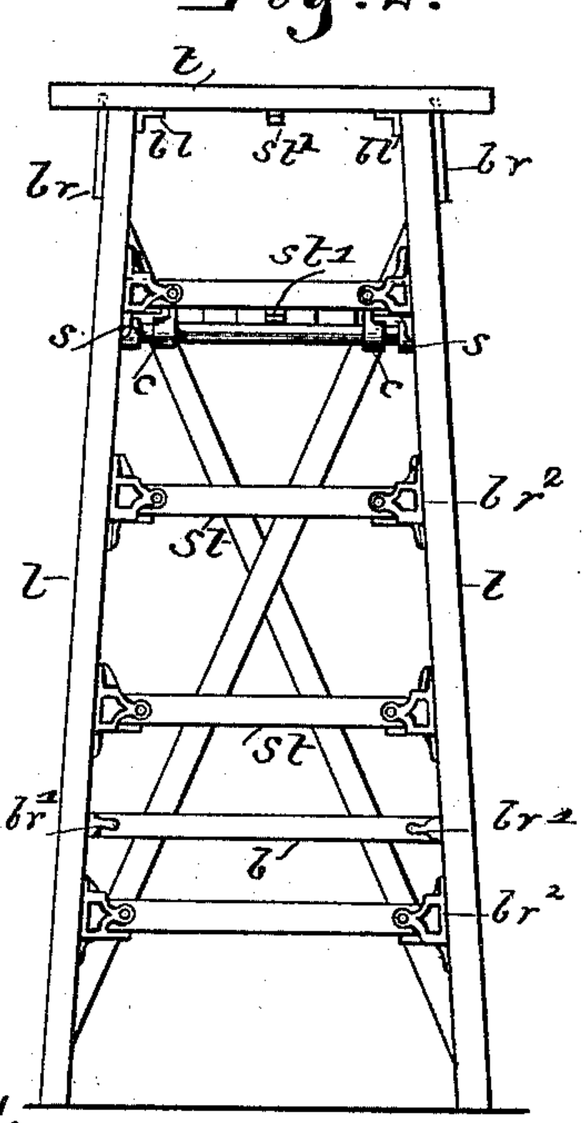


Fig. 3.

Fig. 4.

Fig. 5.

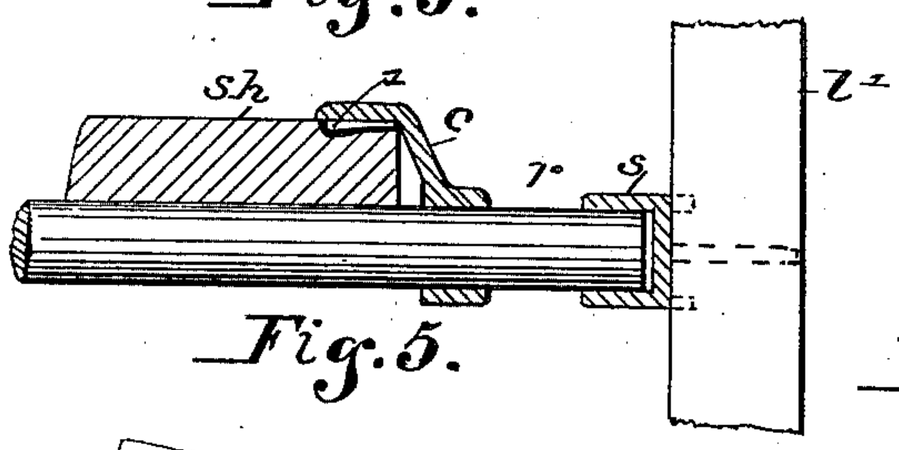


Fig. 6.

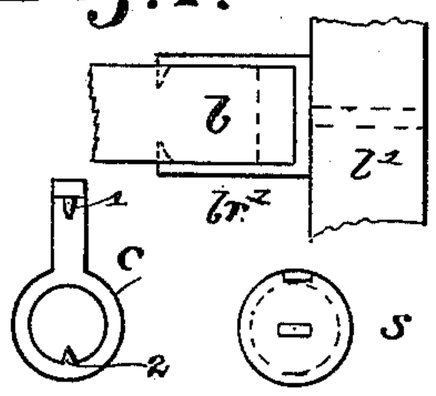


Fig. 7.

Fig. 8.

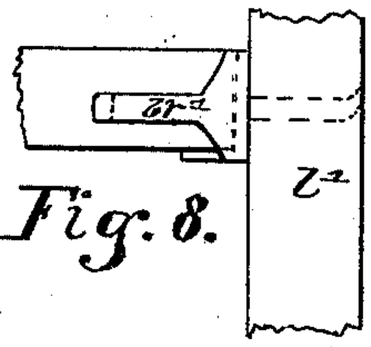


Fig. 9.

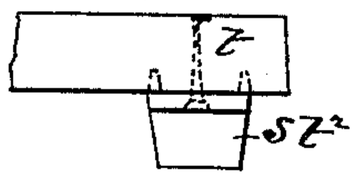
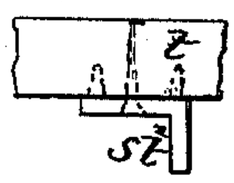


Fig. 10.



WITNESSES.

Jacob W. Soeper

W. C. Smith

INVENTOR.

Calvin G. Udell.

By C. F. Jacobs
Atty.

(No Model.) 2 Sheets—Sheet 2.

C. G. UDELL.

STEP LADDER.

No. 309,323. Patented Dec. 16, 1884.

Fig. 11.

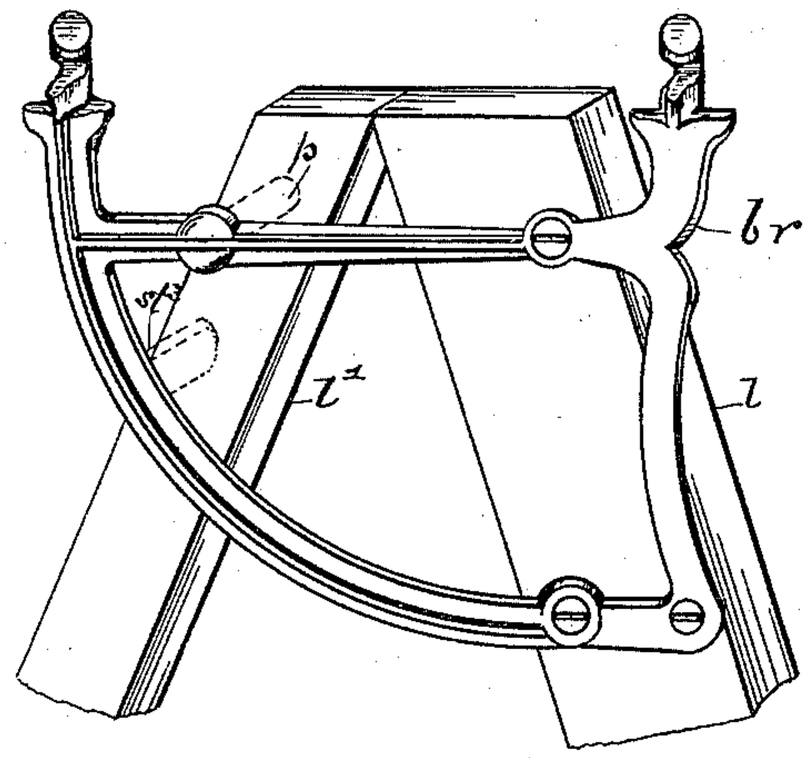


Fig. 12.

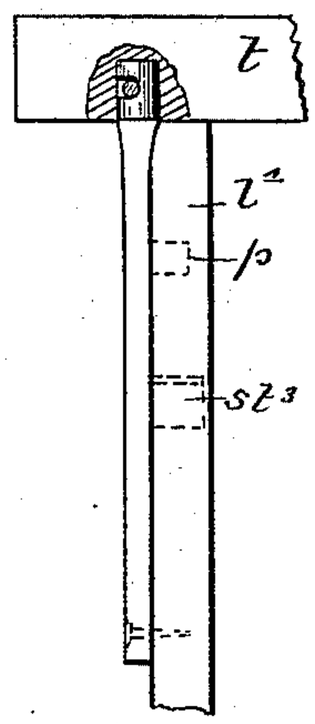


Fig. 13.

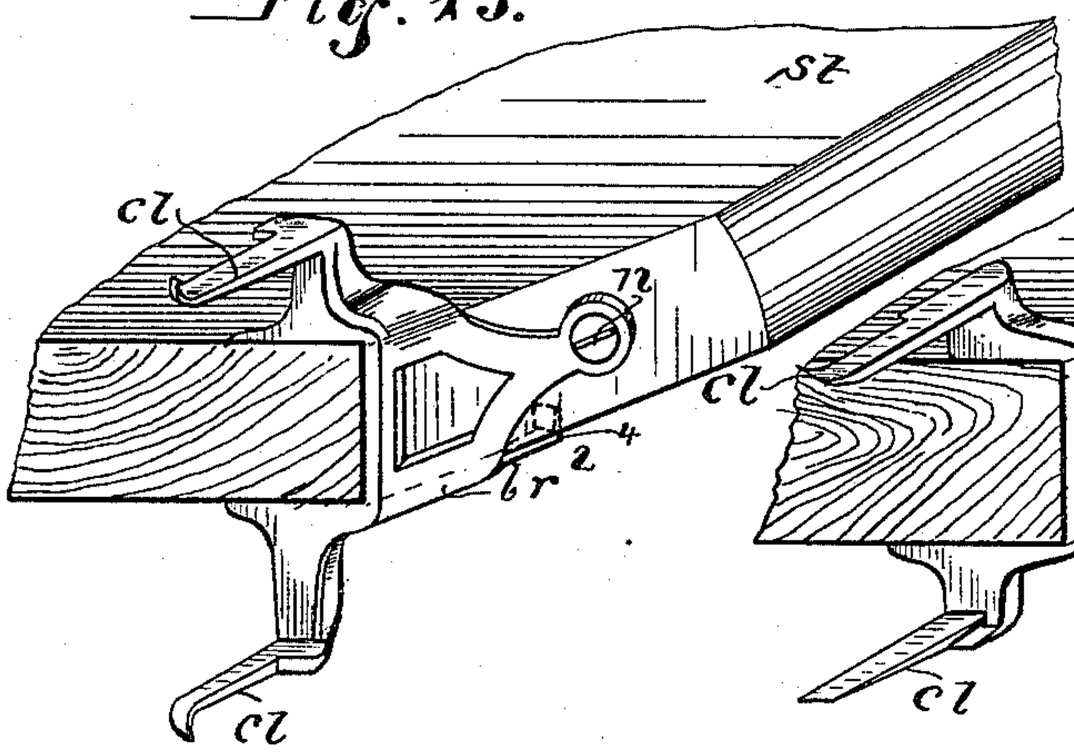
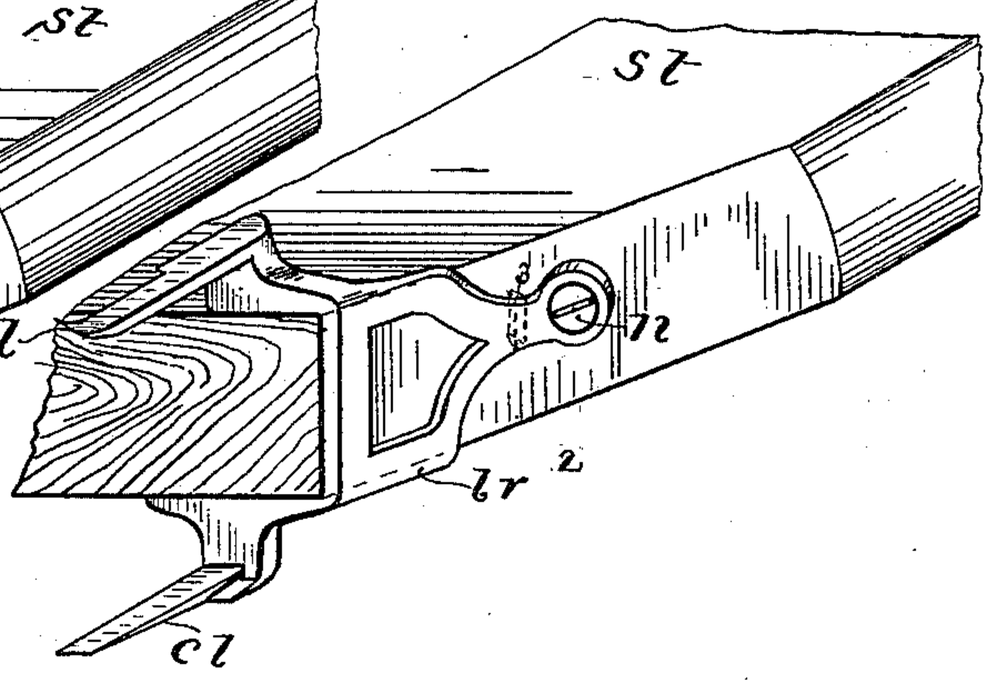


Fig. 14.



WITNESSES,

Jacob H. Loeper.

W. P. Smith

INVENTOR.

Calvin G. Udell.

By C. F. Jacobs

Atty.

UNITED STATES PATENT OFFICE.

CALVIN G. UDELL, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO MATTHIAS R. UDELL, OF ST. LOUIS, MISSOURI.

STEP-LADDER.

SPECIFICATION forming part of Letters Patent No. 309,323, dated December 16, 1884.

Application filed June 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, CALVIN G. UDELL, a resident of Indianapolis, Indiana, have made certain new and useful Improvements in Step-Ladders, a description of which is set forth in the following specification, reference being made to the accompanying drawings, in the several figures of which like letters indicate like parts.

My invention relates to the construction of step-ladders, and will be understood from the following description.

In the drawings, Figure 1 is a side view of a step-ladder embodying my improvements. Fig. 2 is a front view of the same. Fig. 3 is a sectional view of a part of one of the steps and the socket and clamp of the shelf-rods. Fig. 4 is a top view of brace *b* and its supporting-bracket. Fig. 5 is a top view of the device shown in Fig. 3. Fig. 6 is an end view of the rod-clamp. Fig. 7 is an end view of the rod-socket. Fig. 8 is a side view of the parts shown in Fig. 4. Fig. 9 is an end view showing the stop attached to the under side of the top. Fig. 10 is a side view of the same. Fig. 11 is a side view of the main bracket with the legs attached. Fig. 12 is a front view of the same with the top attached. Fig. 13 is a perspective view of a part of a step with its supporting-bracket, and Fig. 14 is a view of the same with a modified form of the bracket.

In Figs. 3 to 14, inclusive, which are of details, the drawings are upon a larger scale than in Figs. 1 and 2.

In detail the step-ladder is formed of a pair of stiles or front legs, *l*, united by steps *st*, rear legs, *l'*, and a top piece, *t*. The main bracket *br* is screwed to the side of the front legs, *l*, as shown in Fig. 11, and enters holes in the top piece, and is secured by nails, and this method of fastening is shown in a former application made by me, originally filed June 20, 1883; refiled June 2, 1884; Serial No. 133,596; allowed June 9, 1884, and nothing is claimed for it here. The bracket is fastened to the front legs by screws, and to the rear legs by spurs or points *p*, driven into the wood, as shown in Figs. 11 and 12, and has a stop, st^3, against which the rear leg abuts when the ladder is opened, preventing any further movement in that direction. A shelf, *sh*, fastened to a rod or roller, *r*, by a ring-clamp, *c*, (see Figs. 6 and 3,) the rod being set in bearings in sockets *s* on either side, Fig. 2, is adapted thus to swing up out of the way, so that its outer end will pass under the top *t* and strike against a stop, st^2, secured to the under side of the top, and the same shelf, when dropped down to the position shown in Fig. 1, abuts its inner end against a stop, *st'*, fixed on the under side of a step, as shown in Fig. 2, thus acting as a brace to keep the legs of the ladder apart and firm. Brace-lugs *bl* are placed in the corners where the hind legs meet the top, as shown in Fig. 2, and the front and rear legs touch at their upper ends when the ladder is opened, as shown in Fig. 1, each bracing the other. The steps of the ladder are not gained into the stiles, but are set into brackets, as shown in Figs. 13 and 14. These brackets have spurs or prongs *cl*, which are driven through the stiles and clinched down on the outside of each stile, as shown in Figs. 1 and 13, and when these brackets have been fastened to the stiles the steps are put in and a nail, *n*, driven through an opening in an arm into the beveled edge of the step. In one form of this bracket, Fig. 14, this arm has a little spur, 3, which is driven into the edge of the wood for greater security, and in the other form, Fig. 13, an additional spur, 4, is cast on the under side; but these spurs, either or both of them, may be dispensed with, as otherwise both brackets are alike in providing a shelf in the bracket itself upon which the end of the step may rest, two brackets being used at each end, one in front and the other in the rear. Much strength is gained by using such a step-support. The old method of gaining the end of the step into the stiles greatly weakens the latter, and is a fruitful source of accident. The hind legs, *l'*, are connected by a brace, *b*, and the ends of this brace are not gained into the hind legs, but rest in supports at each end, provided by the brackets *br'*, as shown in Fig. 4. The ends or arms of this bracket, after the brace *b* has been set in, are driven down and enter the wood of the brace on each side, as shown in Figs. 4 and 8. This bracket *br'*

has spurs, which are driven and clinched into legs *l'*. The ring-clamp of the rod *r* has spurs 1 in the top and 2 in the ring, the latter preventing the rod from turning. (See Fig. 6.) The socket *s* has two short and one long spur, which are driven into the side of leg *l'*, the long one being clinched down on the other side. (See Figs. 3, 5, and 7.)

The whole combined structure makes a strong and cheap ladder.

What I claim, and desire to secure by Letters Patent, is the following, viz:

1. The bracket *br*, provided with stop st^3 on the inner side, in combination with top *t* and legs *l* and *l'*, substantially as described.

2. The shelf *sh*, fixed upon roller *r*, the legs *l l'*, steps *st*, top *t*, clamp *c*, socket *s*, and stop *st'*, all combined substantially as described.

3. The step-bracket br^2, secured to the leg *l* by spurs *cl*, and providing a support for the corner of the step, substantially as described.

4. The leg-bracket *br'*, providing a support for the end of the leg-brace *b*, substantially as described.

5. The bracket-support br^2, the step *st*, and legs *l*, all combined substantially as described.

6. The bracket *br'*, brace *b*, and legs *l'*, all combined substantially as described.

7. The legs *l l'*, top *t*, bracket *br*, steps *st*, brackets br^2, brace *b*, bracket *br'*, shelf *sh*, roller *r*, clamps *c*, sockets *s*, and stops *st'*, st^2, and st^3, all combined in a step-ladder, substantially as described.

Witness my hand this 31st day of May, 1884.

CALVIN G. UDELL.

Witnesses:
C. P. JACOBS,
JACOB W. LOEPER.