(No Model.) 2 Sheets—Sheet 1.

C. C. PIERSON.

SECTIONAL LADDER.

No. 411,730. Patented Sept. 24, 1889.

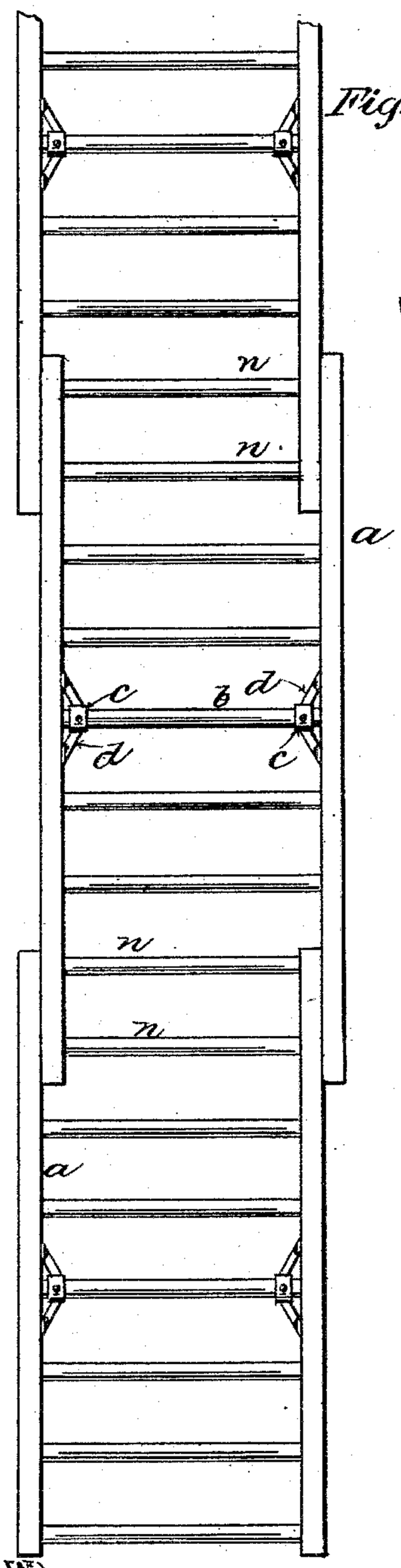

Fig. 1.

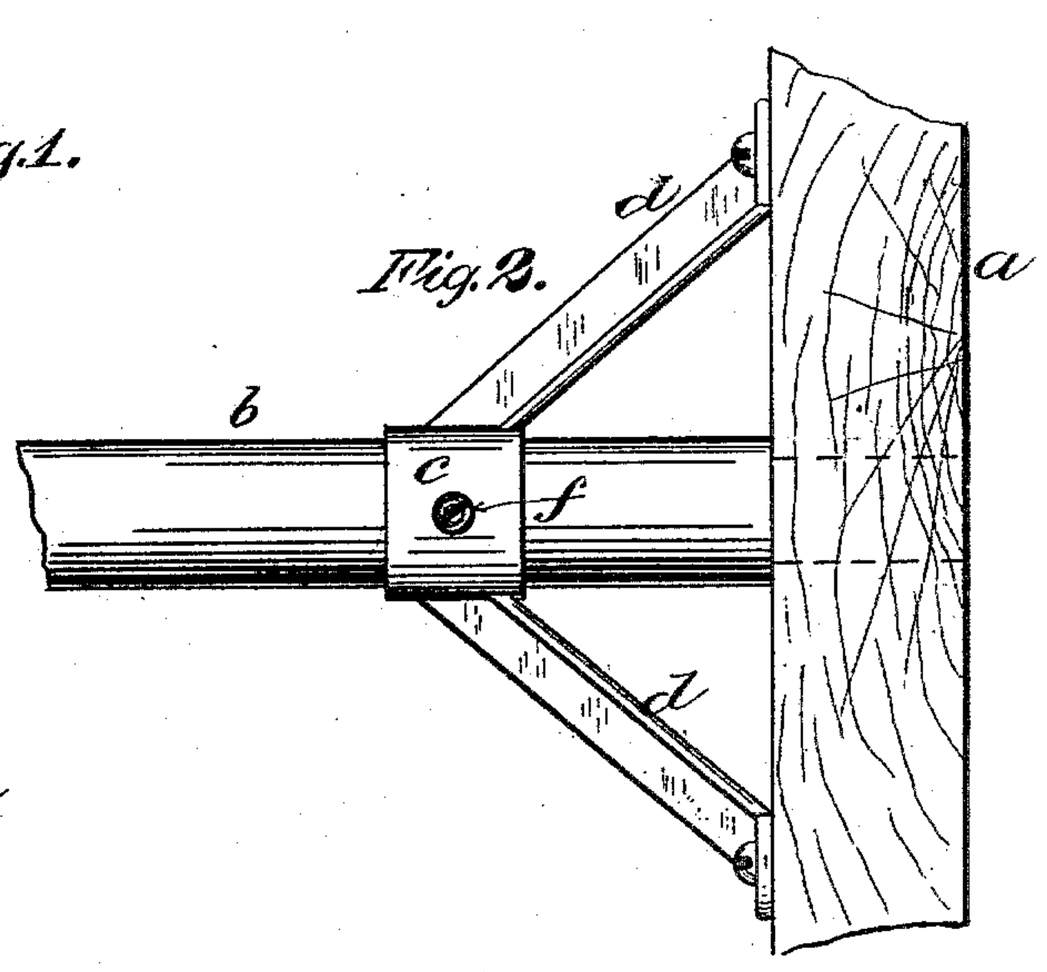

Fig. 2.

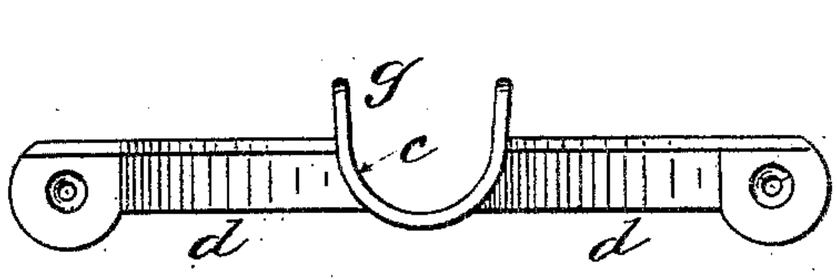

Fig. 3.

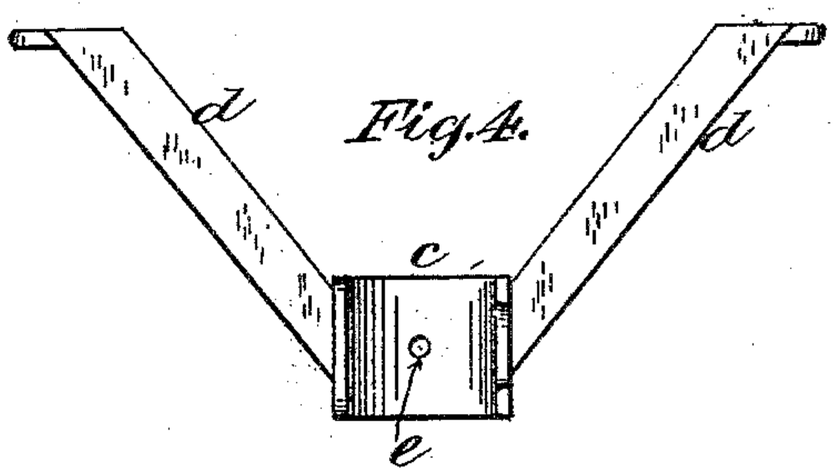

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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SECTIONAL LADDER.

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Fig. 5.

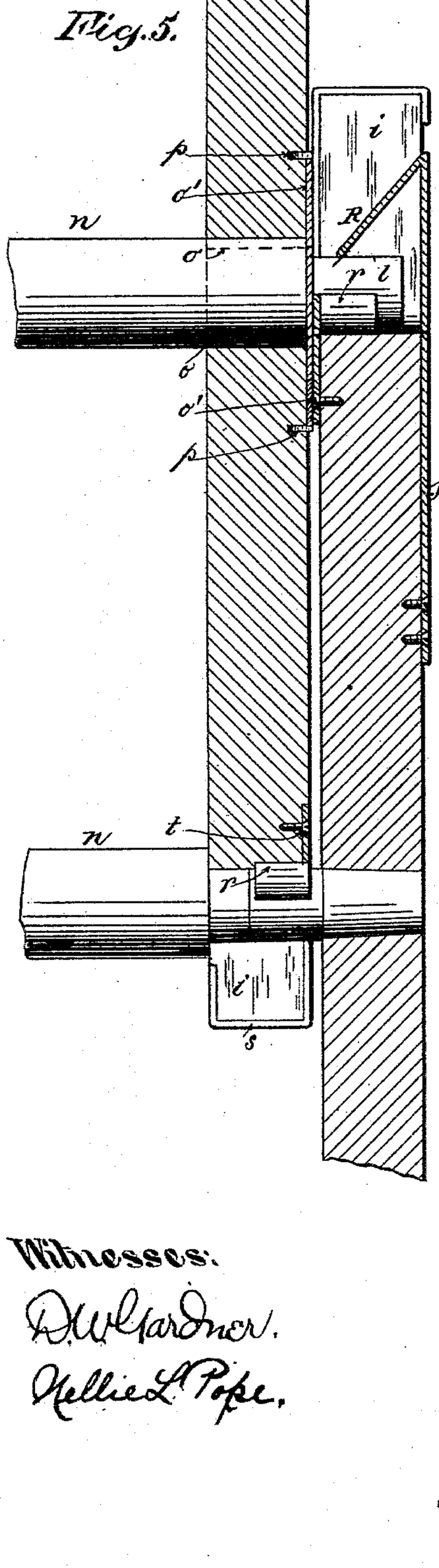


Fig. 6.

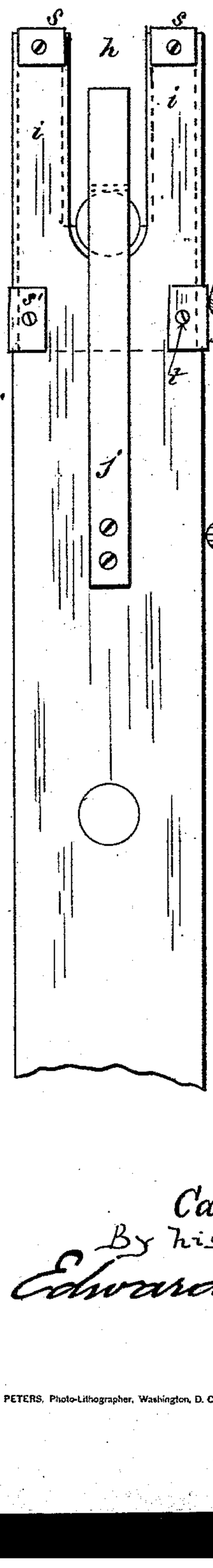


Fig. 7.

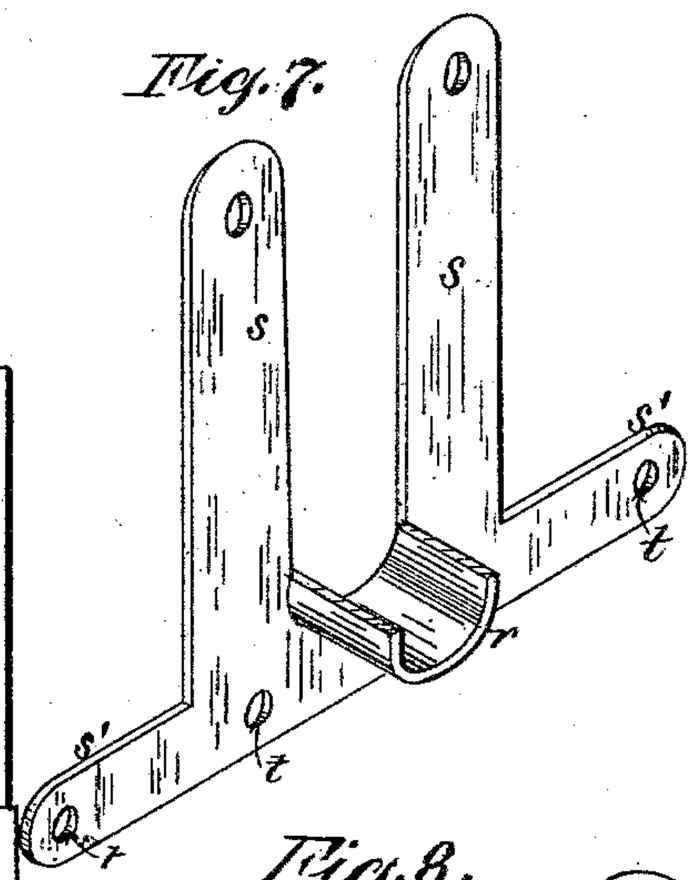


Fig. 8.

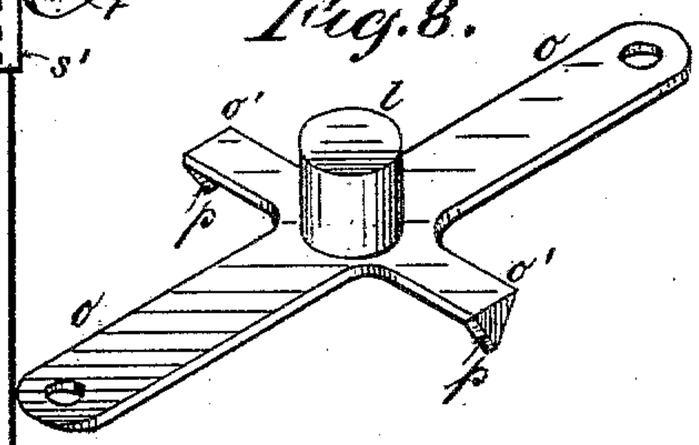
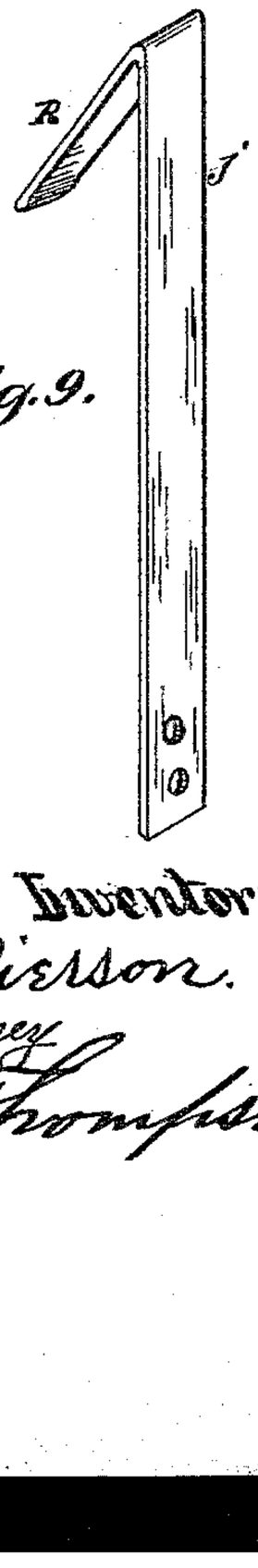


Fig. 9.



Witnesses:
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Nellie L. Pope.

Inventor:
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UNITED STATES PATENT OFFICE.

CALEB C. PIERSON, OF ELIZABETH, NEW JERSEY.

SECTIONAL LADDER.

SPECIFICATION forming part of Letters Patent No. 411,730, dated September 24, 1889.

Application filed June 18, 1889. Serial No. 314,749. (No model.)

To all whom it may concern:

Be it known that I, CALEB C. PIERSON, a citizen of the United States, residing at Elizabeth, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Sectional Ladders, of which the following is a specification.

My invention relates to the mechanical construction of sectional ladders.

The object of the invention is to provide a ladder in which there is no danger in the sections falling apart when once put together for use, and in which the manipulation in putting the sections together and taking them apart is simplified.

The general object of the invention is therefore to produce a stronger and simpler ladder for the use of painters, carpenters, and domestic use.

The construction of the device is represented in every detail in the accompanying drawings, in which—

Figure 1 is a general view, and Figs. 2, 3, and 4 are detail views, of that part of the ladder involving one portion of the invention, Fig. 2 being an enlarged view of the particular means of clamping or bracing the middle rung, Fig. 3 being a rectangular view of the brace shown in Fig. 2, and Fig. 4 being an opposite view of the brace in reference to the view thereof shown in Figs. 2 and 1. Figs. 5, 6, 7, 8, and 9 are various views of that part of the invention relating to the joints between the sections of the ladder, Fig. 5 being a sectional view of the joint between the ends of two sections in so far as are concerned two of the sides of the sections, Fig. 6 being a side view of one end of a side of the ladder, showing the spring and a rung of another section located in the slot of the end of the said side, Fig. 7 being a perspective of the casting employed to form a sheathing about the slot, Fig. 8 being a perspective view of the casting provided with the metallic rung-extension, and Fig. 9 being a perspective view of the spring for retaining the metallic rung-extension in the slot.

One of the difficulties connected with sectional ladders is that the rungs become loose in their sockets and the ladder becomes therefore dangerous and soon useless. I have studied and experimented upon the subject and find that braces applied to the opposite ends of the middle rung of each section serve to strengthen the whole ladder in such a manner and to such a degree that the ladder is wonderfully improved and at a very little expense. This improvement renders ladders of long length and sectional ladders perfectly safe and adapted to be built to greater length than when not so equipped with braces. The brace suitable to be thus applied consists of the semicircular collar *c*, adapted to fit upon the rung *b* substantially at the middle of the section and provided with arms *d*, which are secured by screws or nails to the sides of the ladder in such a manner that the two arms point, respectively, toward the top and the bottom of the ladder. The open part *g* of the collar may be hammered about the rung to grasp the same in an effective manner. As in the ordinary sectional ladder, I have provided at the ends of the sides slots *h*, formed by the arms *i*. Considerably below this slot in each section is applied, by means of screws or in any equivalent manner, a spring *j* to the outer surface of the side of the ladder, the spring having an extension R, which presses upon the rung-extension *l*, which is hereinafter described. This spring in practice is less than the length or distance between the two rungs of the ladder, but greater than half of that distance, so as to obtain a long spring action. In putting the sections together it becomes necessary to bend this spring outward to admit the rung-extension. The screws holding the spring are applied at about midway between the rungs *n* of the ladder. Rungs in ladders of this class usually are of wood; but such would not be applicable here in so far as the extension *l* is concerned, for the metal spring projection *k* would soon wear out the extension. I have provided a useful form of extension applicable to the side of the ladder. The upper rung *n* in Fig. 5 ends at the outer surface of the side of the section to which it is attached. Beyond this is the metal extension *l*. The extension *l* is provided with two arms *o*, which are secured to the side of the ladder, and also two extensions *o'*, having sharp ends *p*, which are driven into the sides of the ladder, (the dotted lines *o* in Fig. 5 represent one of the arms *o*,) the arms *o* being suitably bent around the edges of the side of the lad-

der. It may be seen now that the metallic rung-extension *l* is an improvement upon the usual wooden extension, and that the construction of the means for holding the same to the side is simple. Now, it is evident also that this metallic rung-extension should not rest in the slot whose sides are of wood, but that some means should be provided for lining this slot with iron. I do this in a novel manner. I provide a semicircular bearing *r* in the end of each side and fitting into each slot, as represented, the said bearing being provided with two arms *s*, which are bent over the ends of the arms *i* and fastened thereto, and with two other arms *s' s'*, which are fastened to the side of the ladder by means of screws passing through the holes *t*.

Description of the remaining parts of ladder is omitted, as they are well known in the art, my improvements relating to details of construction.

The functions of the several parts of my invention having been hereinbefore stated, what I claim is as follows:

1. In a sectional ladder, the combination of sections provided with slots in the ends of the sides of the sections, metallic bearings applied to the said slots, metallic rung-extensions fitting in said bearings, and metallic springs pressing upon the said rung-extensions, the direction of pressure being in the direction of the length of the ladder.

2. In a ladder, the combination of collars applied to the opposite ends of the rungs of the ladder at the middle of the said ladder, and arms on said collar secured to the sides of the ladder.

3. In a ladder, the combination of rungs, sides, and collars partially surrounding the middle rung, and arms connected to each collar and attached to the ladder-sides.

4. In a ladder, the combination, with the side of the ladder, of a rung-extension having arms which are attached to the ladder-sides.

5. In a ladder, the combination of ladder-sides provided with slots at the ends of the sides, the slot being formed by arms *i* and metallic bearings in said slots, and having arms *s* secured to the ladder-sides and bent over the arms *i*.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 14th day of June, 1889.

CALEB C. PIERSON.

Witnesses:

FREDERICK P. WOODRUFF,

BENJ. M. OGDEN.