

(No Model.)

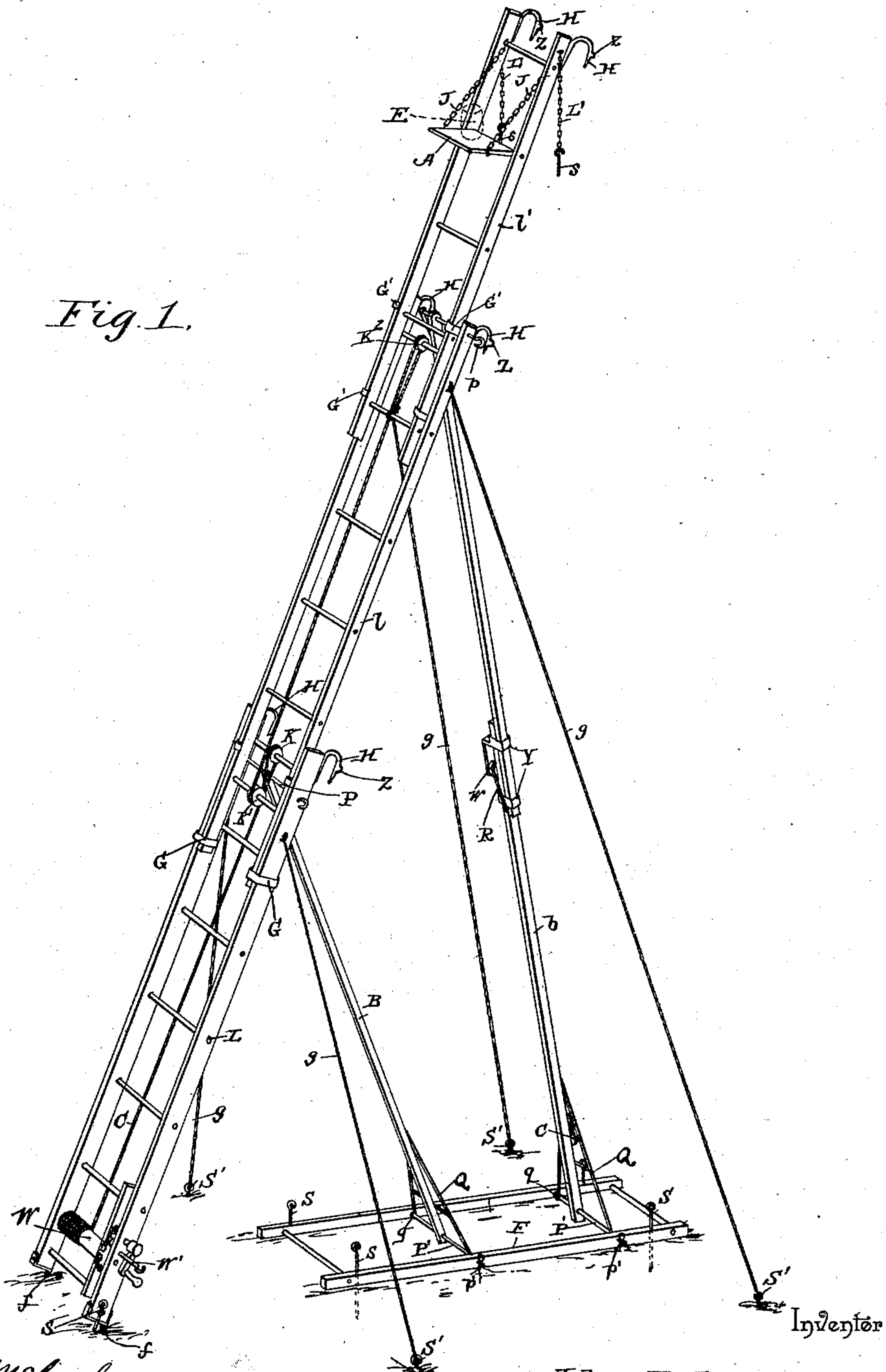
2 Sheets—Sheet 1.

J. B. HARVEY.
EXTENSION LADDER.

No. 441,872.

Patented Dec. 2, 1890.

Fig. 1.



Witnesses

Jas. L. McLathrum

N. L. Blawie

By his Attorneys,

John B. Harvey

C. A. Snow & Co.

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Fig. 3.

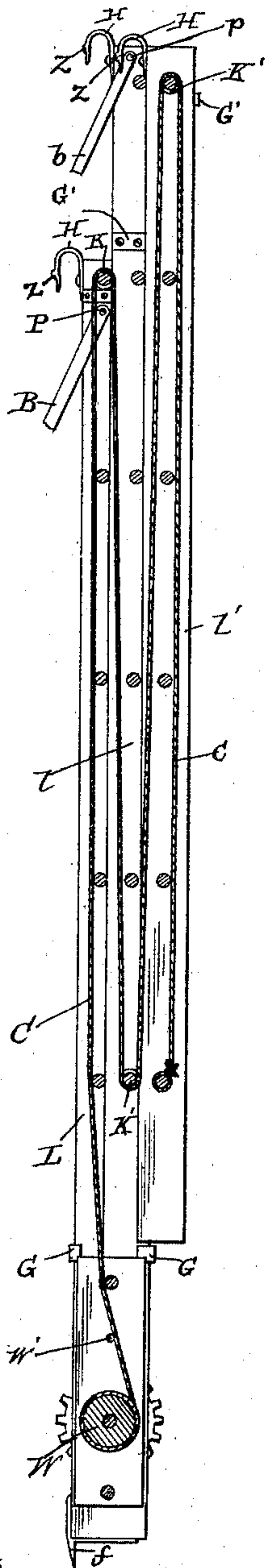


Fig. 2.

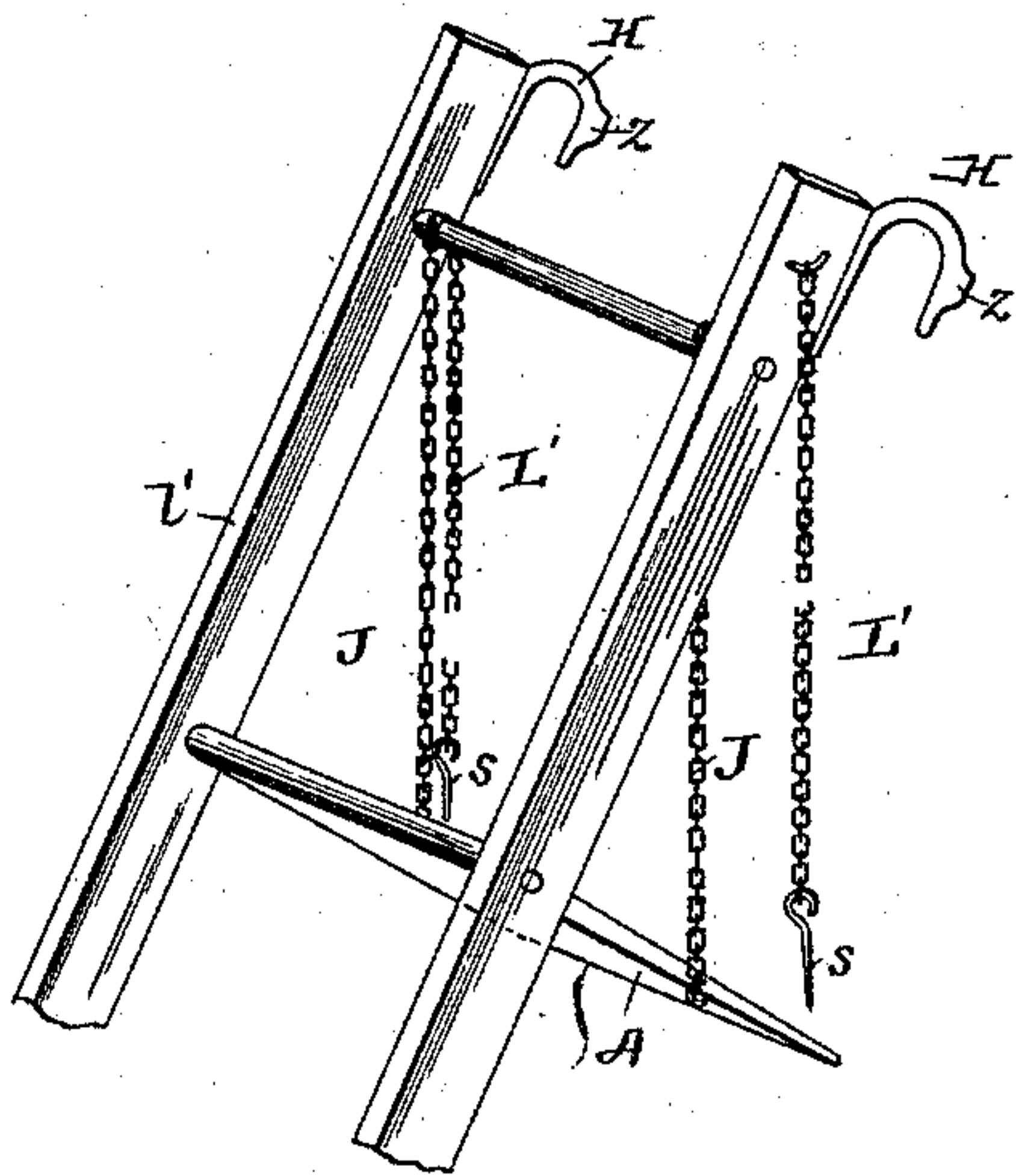


Fig. 5.

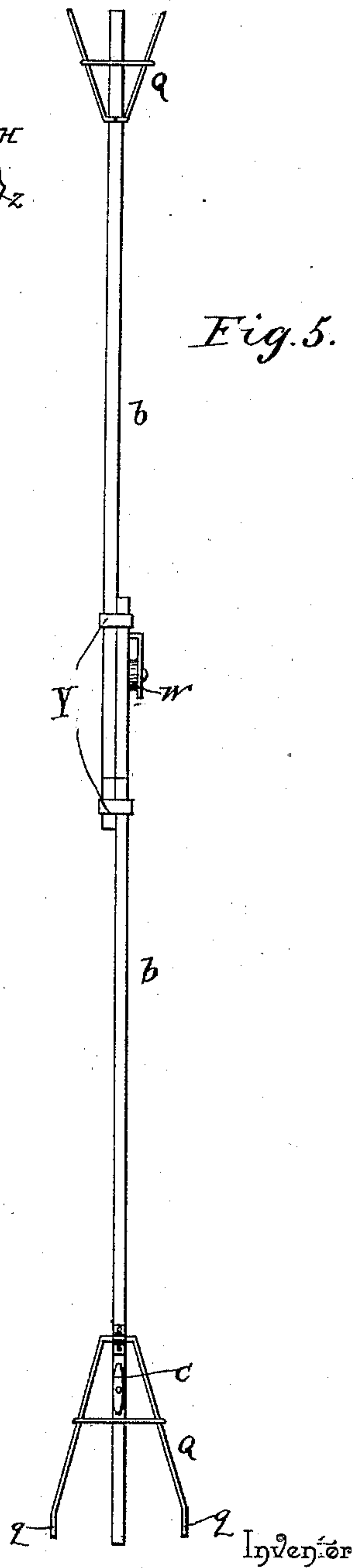
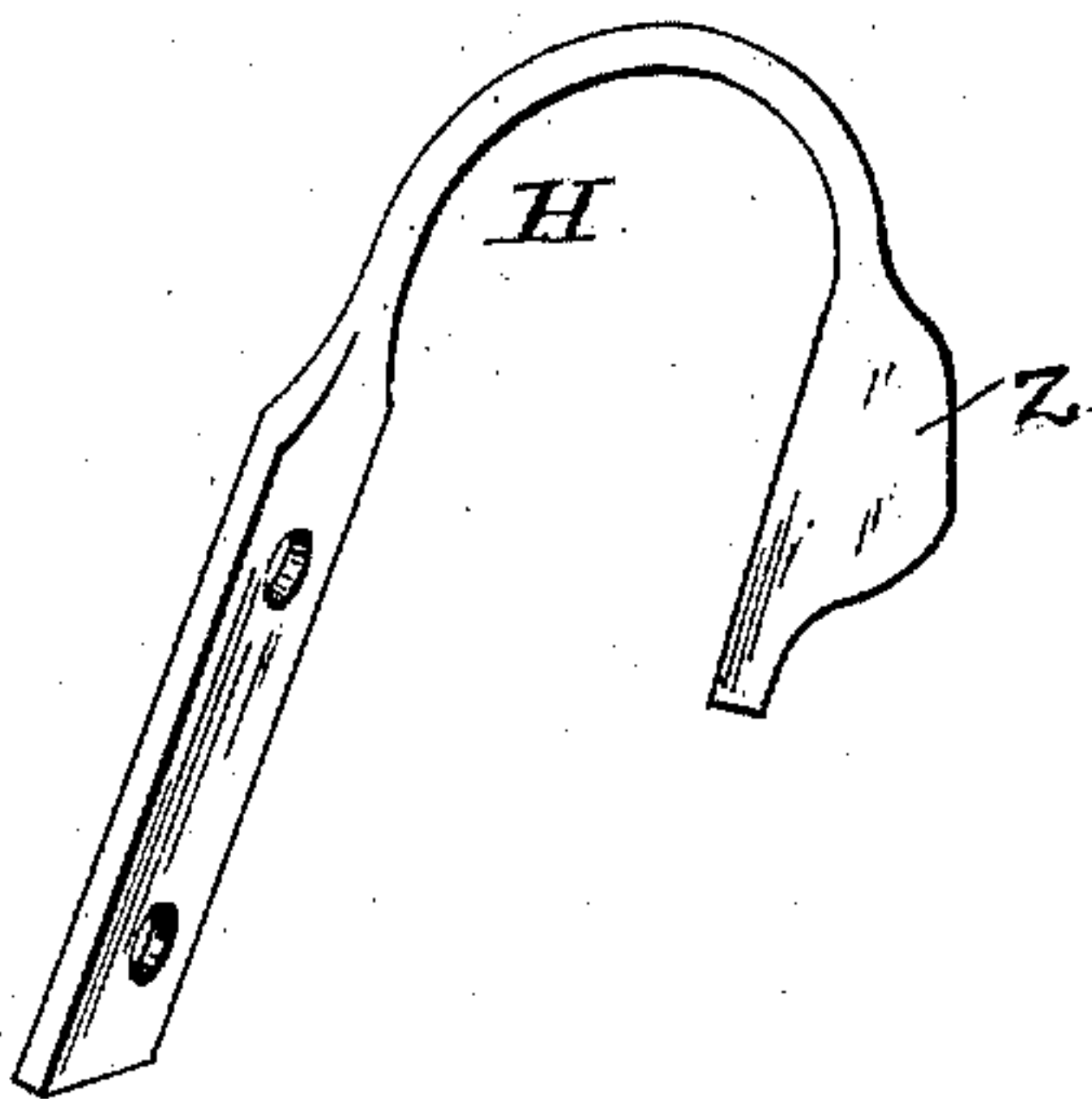


Fig. 4.



Witnesses

Jas. L. McElathran

N. J. Roseman

By his Attorneys,

C. A. Snow & Co.

John B. Harvey

UNITED STATES PATENT OFFICE.

JOHN B. HARVEY, OF STEAMBURG, OHIO.

EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 441,872, dated December 2, 1890.

Application filed August 23, 1890. Serial No. 362,803. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. HARVEY, a citizen of the United States, residing at Steamburg, in the county of Ashtabula and State of Ohio, have invented a new and useful Extension-Ladder, of which the following is a specification.

This invention relates to fire-escapes and ladders, and more especially to that class thereof known as "shooting ladders."

The object of the invention is to effect improvements in devices of this same general character heretofore constructed. To which end the invention consists in the specific details of construction hereinafter more fully described, and illustrated in the drawings, in which—

Figure 1 is a perspective view of this improved ladder in its distended condition. Fig. 2 is a perspective detail showing the ladder-platform in inoperative position. Fig. 3 is a longitudinal section of the three ladder-sections in their assembled position. Fig. 4 is a perspective detail of one of the grappling-hooks. Fig. 5 is a rear elevation of the longer brace.

Referring to the said drawings, the letter F designates a frame-work adapted to rest upon the ground, to which it may be spiked by spikes S, as shown in Fig. 1, and in this frame-work are journaled two braces B and b. The brace B extends upwardly to the upper end of the lower ladder-section L, to which it is pivoted on a transverse pin P, and the brace b extends to the upper end of the second ladder-section l, to which it is pivoted on a similar pin p. This longer brace b is composed of two members, which lap by and slide upon each other, and are held in alignment by the yokes Y. The lower member carries a wheel w, over which passes a cord or rope R, which is connected to the lower end of the upper member, and after the two members are distended, as in Fig. 1, this rope is drawn tight and fastened at its lower end around the cleat C. By this means the closing up of the two members is prevented and the two upper sections of the ladder are rigidly held in proper position. The lower ends of the braces B b are pivotally connected to the frame-work F by transverse pins P', which are held in the frame-work by split pins p', as shown, and

when these pins are withdrawn the braces and ladder can be removed from the frame-work, as will be clearly understood.

The lower ladder-section L has sharpened feet f at its lower end, which embed the ground when the ladder is in place and prevent the slipping of the same. The second section is somewhat narrower than the first and slides inside the same, and to this section are attached guides G, which slide loosely along the side bars of the lower section and keep the sections in alignment. The uppermost section l' is in turn narrower than the second, and is guided thereon in substantially the same manner that the second is guided on the first. Near the lower end of the lower section is a windlass W, driven by a crank extending beyond one side of the ladder, and upon this windlass is wound a large rope or chain C, which extends behind the lower section over a pulley-block K, attached to the uppermost rung thereof, under a similar block K', attached to the lower rung of the second section, thence up along the face of said section over a block K², attached to the upper rung thereof, and is connected with the lower rung of the upper section. When the crank is turned by hand or otherwise, the rope C is drawn upon and the sections are extended to the condition shown in Fig. 1. A pin w' is provided, which may be inserted through the lower section to prevent a retrograde movement of the windlass, as shown; or any other suitable means may be employed for this purpose. The lower end of the lower section L is preferably provided with eyes, through which may be passed spikes S, as shown in Fig. 1, although this is not necessary.

Guy-ropes g may be attached to the upper ends of the first and second ladder-sections, and may carry spikes S' at their other ends, which may be driven into the ground at remote points, whereby the ladder when distended will be braced against lateral movement. Grappling-hooks H may be fastened to the upper ends of the second third sections and project to the rear thereof, which hooks are obviously for the purpose of catching upon window-sills or other available articles for obvious use in supporting the ladder against a building. The outer ends of these hooks are preferably provided with sharp pro-

jections or wings Z, which will embed a brick or frame building when the ladder is pressed against the same. One of the rungs near the upper end of the upper section turns in the side bars thereof, and between its ends it carries a small platform A, adapted to support a water-barrel E or other article, as shown. This platform is supported in horizontal position by chains J, extending from its outer corners to a point above and connected with the ladder, and when it is not desired to use the platform it can be turned over to the position shown in Fig. 2. The upper end of the upper ladder-section may be provided with other chains L', having small spikes s at the ends thereof, which may be carried by the firemen into a building and driven by hand into the wood-work thereof in order to more firmly hold the ladder in place. In order that the second ladder-section may better telescope into the first and occupy less space in this position, the rungs of the lowermost section are located near the rear edge of the side bars, and the second section l slides upon said rungs, but does not project beyond the upper edges of said side bars. In order that the upper ladder-section may slide upon the second section without interfering with the sliding of the latter upon the first section, the guides G' between these sections are secured to the inner faces of the side bars of the second section, and the upper section slides through them. In order to prevent the braces B and b from having a lateral motion, brackets Q are secured to them at their upper and lower ends, and have eyes q journaled upon the pins which support said end. Various modifications and changes may be made in the construction of these details; but I consider the forms thereof described and illustrated the best and most serviceable for the uses to which they are to be put.

What is claimed as new is—

1. The combination, with a ladder and with a frame-work adapted to be spiked to the ground, of a brace, brackets secured to the ends of said brace and having diverging arms provided with eyes in their outer ends, pivotal pins P', inserted through the side bars of the ladder and frame-work, respectively, and

through the opposite ends of said brace and the eyes in the brackets thereon, and split pins p', inserted through the ends of said pivotal pins, as and for the purpose set forth.

2. The combination, with a frame-work adapted to be spiked to the ground and with an extensible ladder, of a brace b, comprising two members having diverging ends at their outer ends, pivoted to said ladder and frame-work, respectively, and lapping each other at their meeting ends, yokes Y upon the extremities of each of said meeting ends, embracing the bodies of the other members, a wheel W in the lower member, a rope R, connected to the lower end of the upper member and leading over said wheel to the ground, and a cleat c upon the lower member near its lower end, as and for the purpose set forth.

3. In a ladder, the combination, with the ladder proper, having sharpened feet f at its lower end, of the frame-work F, spikes S for securing the same to the ground, and braces pivotally connected to said frame-work and ladder, as and for the purpose set forth.

4. The combination, with a ladder, of the grappling-hooks H, secured to the rear thereof at its upper end, said hooks having sharpened wings Z on the rear side of their outer ends, as and for the purpose set forth.

5. The combination, with a ladder one of whose rungs near its upper end is journaled in the side pieces thereof, of a platform A, carried by said rung, and chains J, extending from the outer corners of said platform and connected with the ladder at points above, as and for the purpose set forth.

6. The combination, with an extension-ladder and means for distending and supporting it, of chains L, connected to the upper end of the upper ladder-section, and handspikes s at the ends of said chains, as and for the purpose hereinbefore set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN B. HARVEY.

Witnesses:

FRANK E. ANDERSON,
W. H. COOK.