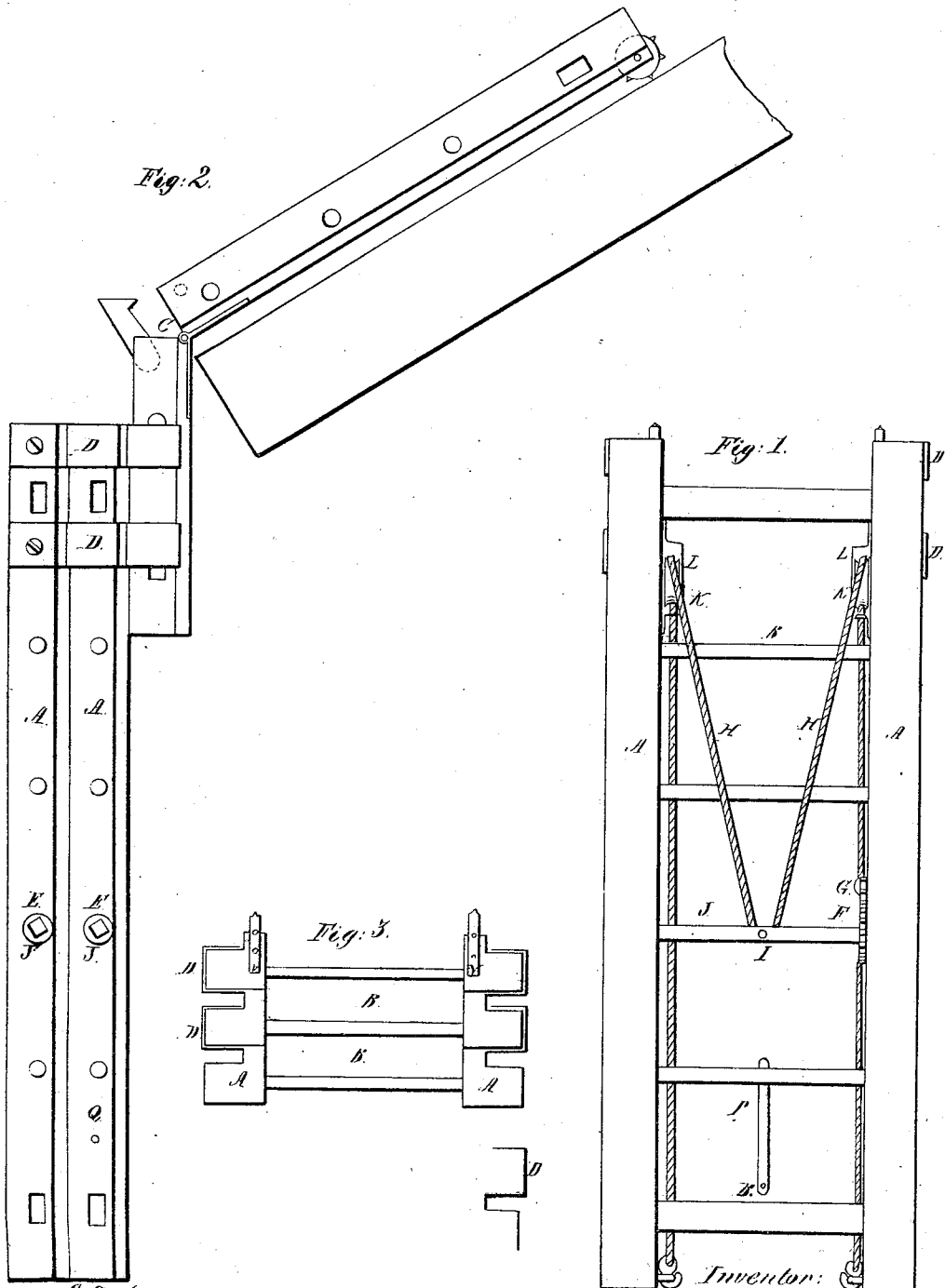


F. Willis.

Extension Ladder.

No. 37,470.

Patented Jan. 20, 1863.



*Witnesses: J. E. Dennis
Chas. Rowland*

*Inventor:
Frederick Willis
Atty. J. Dennis Jr.*

UNITED STATES PATENT OFFICE.

FREDERICK WILLIS, OF MARATHON, NEW YORK.

IMPROVEMENT IN EXTENSION-LADDERS.

Specification forming part of Letters Patent No. 37,470, dated January 20, 1863.

To all whom it may concern:

Be it known that I, FREDERICK WILLIS, of Marathon, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Extension-Ladders; and I do hereby declare that the same are described and represented in the following specifications and drawings.

To enable others skilled in the art to make and use my improvements, I will proceed to describe their construction, use, and operation, referring to the drawings, in which the same letters indicate like parts in each of the figures.

Figure 1 is a front elevation of my extension-ladder. Fig. 2 is a side elevation showing part of it lying on the roof of a house.

The nature of my invention and improvements in extension-ladders consists in making a joint or hinge some distance from the upper end, so that when the ladder is put against a house the ladder may be bent at the joint and the part above the joint laid on the roof to enable the firemen to rescue persons from dormer-windows or from the ridge of the roof.

In the accompanying drawings an extension-ladder of three sections is shown; but they may be made with as many additional sections as may be required or desired.

A A are the sides of the ladder; B B, the bars connecting the sides, which sides are made with a rabbet, as shown in Fig. 3. The first or upper section is made in two parts, connected by the hinges C, so that when the joint of the hinge is raised a little above the eaves of the roof the hooks which hold the sides straight are raised and allow the part above the hinges to fall on the roof or be let down by a rope fastened to the upper end, which is provided with rollers, as shown in Fig. 1, which roll readily up the side of the house, and may be pulled out by a rope, so as to pass the eaves and run up as far as required. There are some iron guides, D D, (shown separately in Fig. 4,) fastened at and near the upper end of each section, except the first, to hold and guide the section next above it as it is run up. One of the bars in each of the sections, except the first, is made of iron, and fitted to turn freely by a crank applied to the end E. These bars are provided with a ratchet-wheel, F, and pawl G, to hold the bar and prevent it from turning back when the rope H is wound up to raise or push out a section of the ladder. The middle of the rope H is put over the pin I in

the rotating bar J, and the two ends of the rope are carried over pulleys K K, which turn in brackets L L, fastened to the sides A A, as shown in Fig. 1. The rope, after passing over the pulleys K K, passes down between the sections and is fastened to the lower end of the next section, so that as the bar J is turned and the rope drawn over the pulleys and wound around the bar the section next below or under the one in which the bar is turned is pushed out or raised up until the lower ends come opposite the pulleys which the rope runs over. The pawl, falling into the ratchet-wheel as it is turned, holds the bar and rope and the section as fast as it is run out. The second section carries up the first, and the third the second and first, and so on through the whole series.

The hooks N N, which hold the first section straight at the joint, may be unhooked before it is raised, and the section held straight by the rope fastened to the top until the joint is above the eaves of the house.

The hook P may be driven into the roof to hold the ladder against the house.

The ladder may be lowered and the sections run together by raising the pawls from the ratchet-wheels and turning the bars back to unwind the rope and let it run over the pulleys.

I have described the joint as being made in the upper or first section; but it may be made in the second or third or in each of the three upper sections, if preferred.

Q is a hole in the side, so that when the section is run up a pin may be put in the hole when it is above the guide D, to prevent the section from running down if the rope should break.

I believe I have described and represented my improvements in extension-ladders so as to enable any person skilled in the art to make and use them without further invention.

I will now state what I desire to secure by Letters Patent, to wit:

1. Making a hinge-joint in the upper section of the ladder, so that the part above the joint may be laid on the roof of a house, substantially as described.

2. In combination with the jointed section, the other sections provided with the devices described for raising or pushing them up in succession, substantially as described.

Witnesses: FREDERICK WILLIS.

OSCAR F. BURGESS,
LA FAYETTE HOAG.