

(No Model.)

2 Sheets—Sheet 1.

C. & R. H. ARNOLD.

EXTENSION LADDER.

No. 361,202.

Patented Apr. 12, 1887.

Fig. 1.

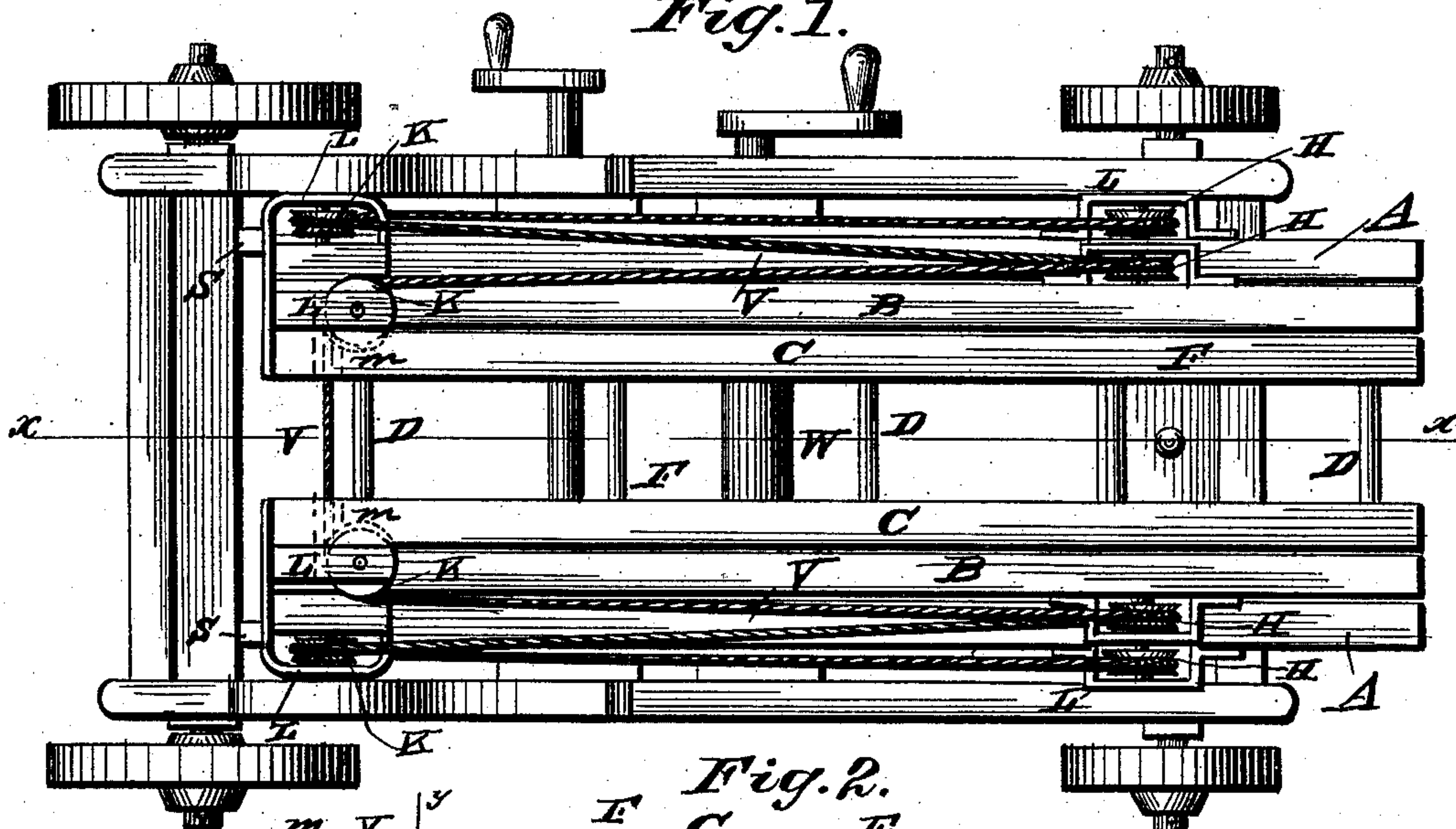


Fig. 2.

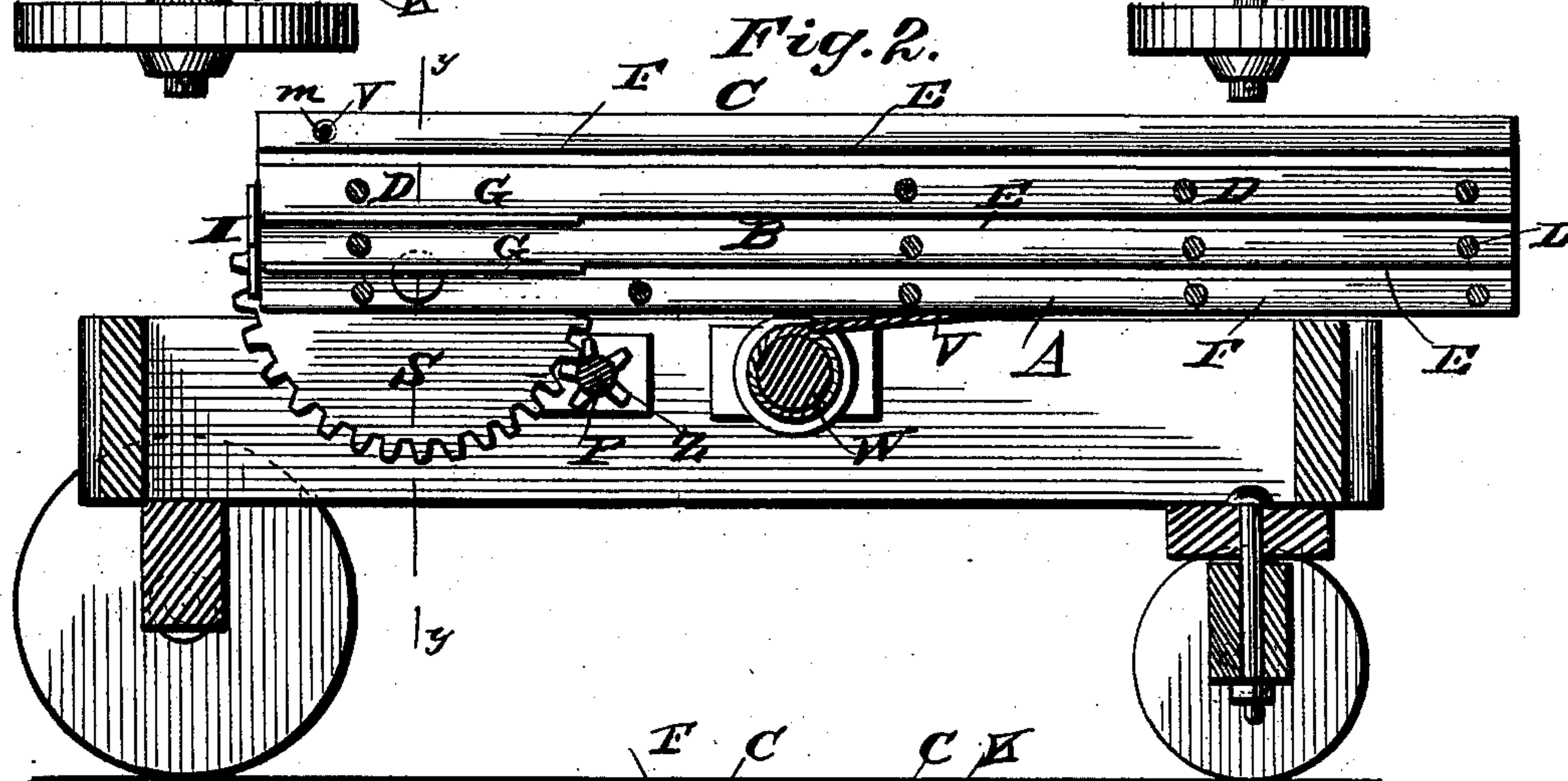
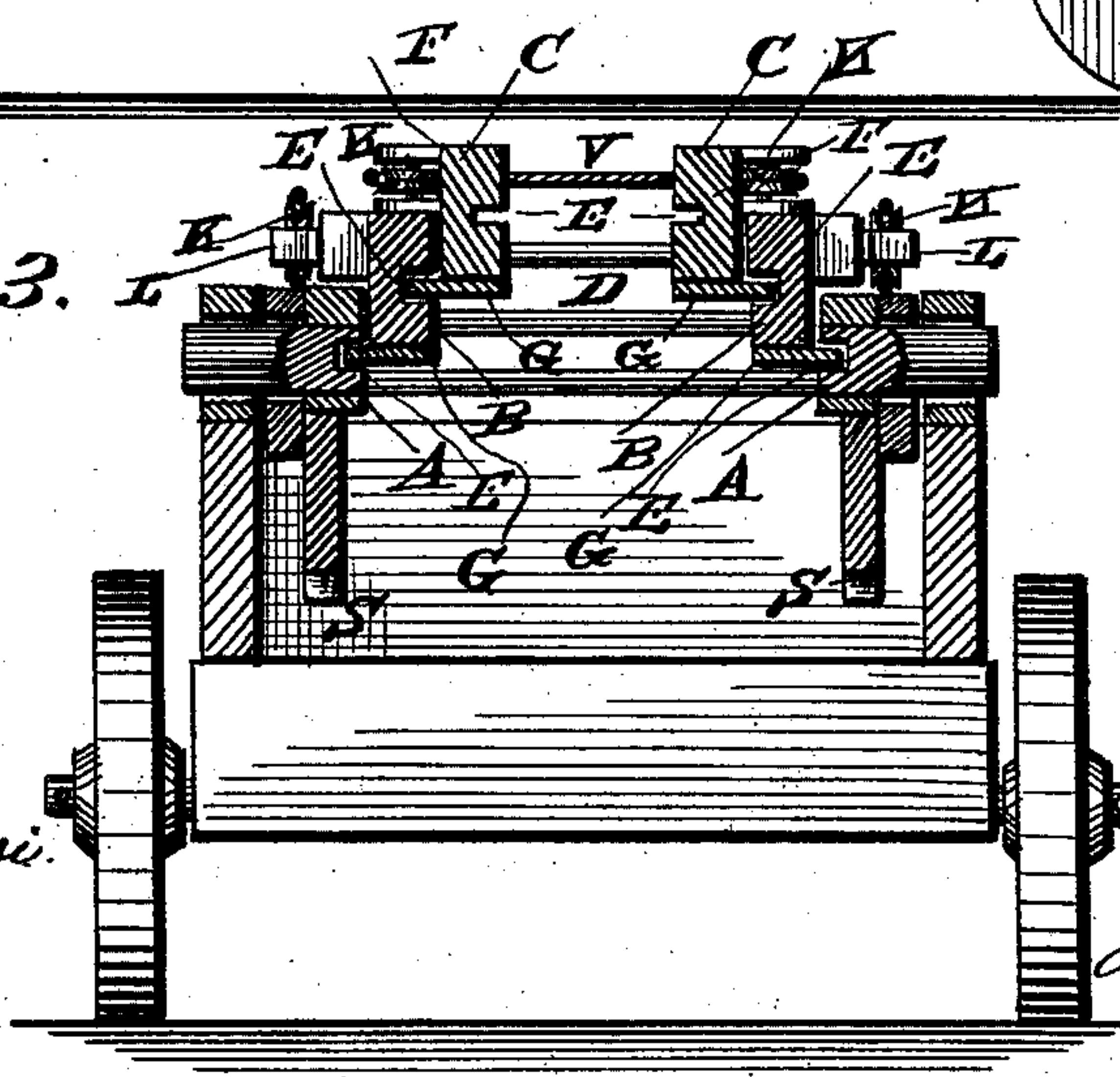


Fig. 3.



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(No Model.)

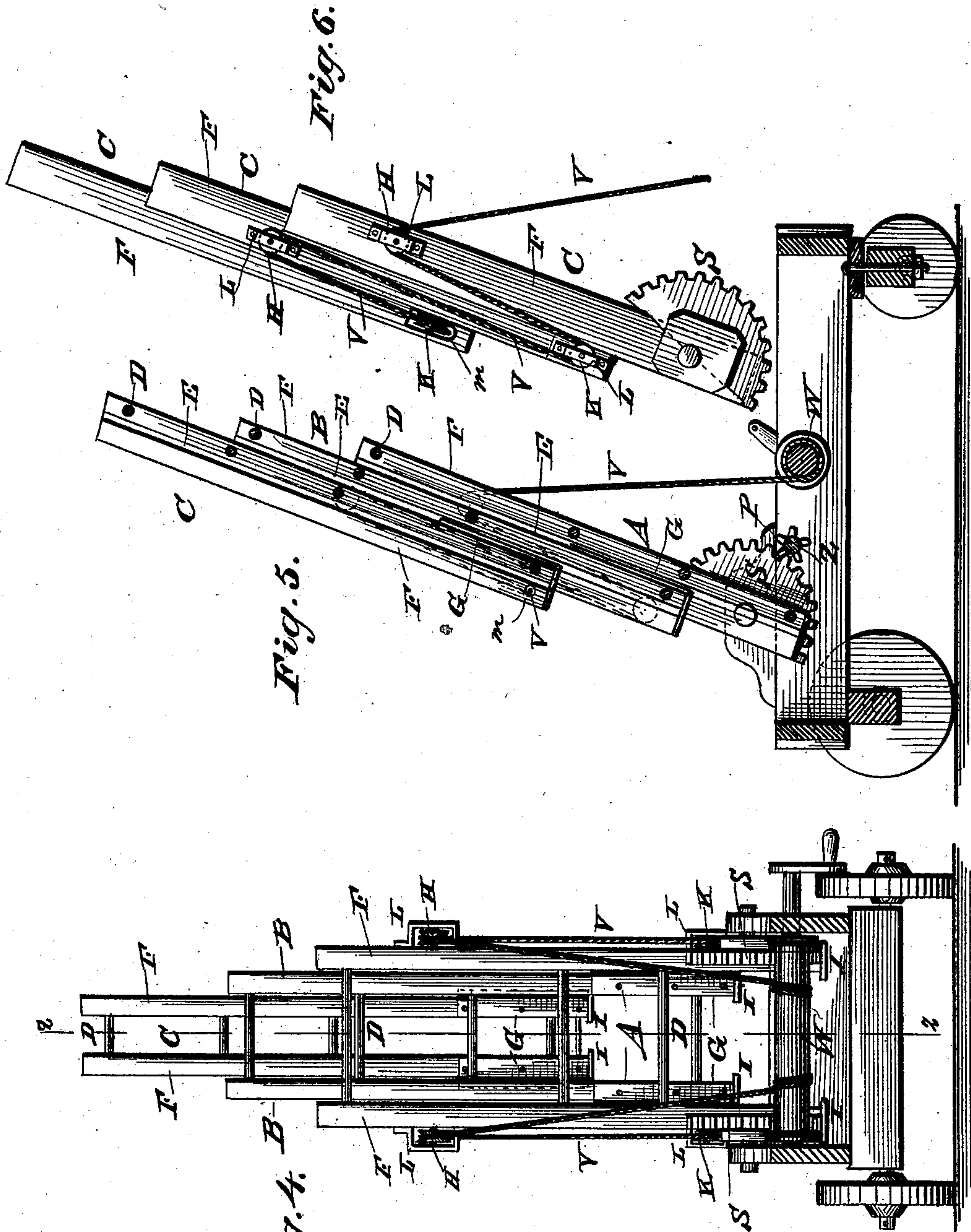
2 Sheets—Sheet 2.

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WITNESSES

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UNITED STATES PATENT OFFICE.

CALEB ARNOLD AND ROLLIN H. ARNOLD, OF HONEOYE, NEW YORK.

EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 361,202, dated April 12, 1887.

Application filed June 30, 1886. Serial No. 206,736. (No model.)

To all whom it may concern:

Be it known that we, CALEB ARNOLD and ROLLIN H. ARNOLD, citizens of the United States, and residents at Honeoye, in the county of Ontario and State of New York, have invented certain new and useful Improvements in Extension-Ladders; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a plan view showing ladder folded. Fig. 2 is a vertical longitudinal section of the same on line $x x$, Fig. 1. Fig. 3 is a transverse vertical section of the same on the line $y y$, Fig. 1. Fig. 4 is a rear sectional elevation showing ladder raised. Fig. 5 is a vertical longitudinal section of the same on line $z z$, Fig. 5; and Fig. 6 is a detail side elevation of the ladder detached, showing the course of the pulleys and rope or chain.

This invention relates to extension-ladders; and it consists in the construction and novel combination of parts, as hereinafter described, and pointed out in the claim.

In the drawings, the letter A designates the lower ladder-section; B, the next section above, and C the succeeding section. Others may be added. The lower section is wider than that which succeeds it, as the side bars of the latter work next to the inside surfaces of the side bars of the former, and this relation extends throughout all the sections, each succeeding section being of less width than that which precedes it.

In each section the letter D indicates the rounds, and E E longitudinal grooves made in the inner wall of the side bars or rails, F, between the rounds and the edges of the rails, as shown. The first or lower section does not rise or move upward, and may be termed the "base section," while the other sections are rising or elevated sections. Each of the latter sections is provided with the slide-plates G G, which are secured to the lower edges of the rails at their lower end portions and extend outward sufficiently to engage the rail-grooves

of the section next below when said sections are in connected position. The length of these slide-plates is sufficient to provide a strong purchase when the ladder is in extended position.

The sections are provided with upper pulleys, H, and lower pulleys, K, said pulleys having guards L, to prevent the disconnection of the ropes. The lower pulleys may be omitted from the base section and the upper pulleys from the top section. The lower pulleys are placed at or near the lower ends of the rails of each section, on the outside thereof, and the upper pulleys, also placed on the outside, are located at a distance from the upper ends of the rails about equal to the length of the slide plates, so that the upper portion of each groove forms a stop-seat, and there is no liability of the disconnection of the sections. Stop-pins I may be employed in the grooves, at the bottoms of the sections, to prevent the latter from sliding down too far. A rope or chain, V, extending through transverse perforations m at the lower ends of the rails of the upper section, engages all the pulleys of the ladder, and is connected by its ends to a windlass, W, which may be seated in bearings of the lower section, or may be connected to a wagon-base. In the latter case it is designed to pivot the lower ends of the base section to side bearings of the wagon, so that the ladder may lie upon the wagon in horizontal position when being transported.

In order to provide means for raising the ladder, the lower ends of the base section are provided with large segment-gears S, which engage the pinions P of the shaft Z, which is seated in bearings of the wagon-frame. When the shaft Z is turned, the latter is raised to upright or nearly upright position, and then by turning the windlass the sections can be successively elevated.

Keys or dogs may be used to secure the shafts in place when the ladder has been raised to the desired position.

In some cases the grooves may be made in the outer walls of the side rails, and the slide-plates secured to the upper ends of said rails, this construction being the equivalent of that hereinbefore described.

We are aware that the several parts of our

apparatus are old when separately considered, and that many of them have been combined in the manner herein described; but we are not aware that all of the parts have ever been
5 brought together in the precise manner hereinbefore pointed out.

Having described this invention, what we claim, and desire to secure by Letters Patent, is—

10 The improved extension-ladder and means for operating the same, herein described, consisting of the main frame having the windlass journaled in the side walls thereof, the shaft carrying the pinion, also journaled in the said
15 frame, the base ladder-section, A, journaled at its lower end in the arc-rack to engage the said

pinion, the sliding ladder-sections having the inner sides of their rails longitudinally grooved and provided with stops at the top and bottom, the bearing-plates secured to the said side 20 rails on their under side and bearing in the adjacent grooves, as described, the pulleys on the ladders, and the ropes passing through the pulleys and wound upon the windlass, substantially as shown and described. 25

In testimony whereof we affix our signatures in presence of two witnesses.

CALEB ARNOLD.

ROLLIN H. ARNOLD.

Witnesses:

EUGENE UNDERHILL,

SAMUEL B. SMITH.