

No. 657,932.

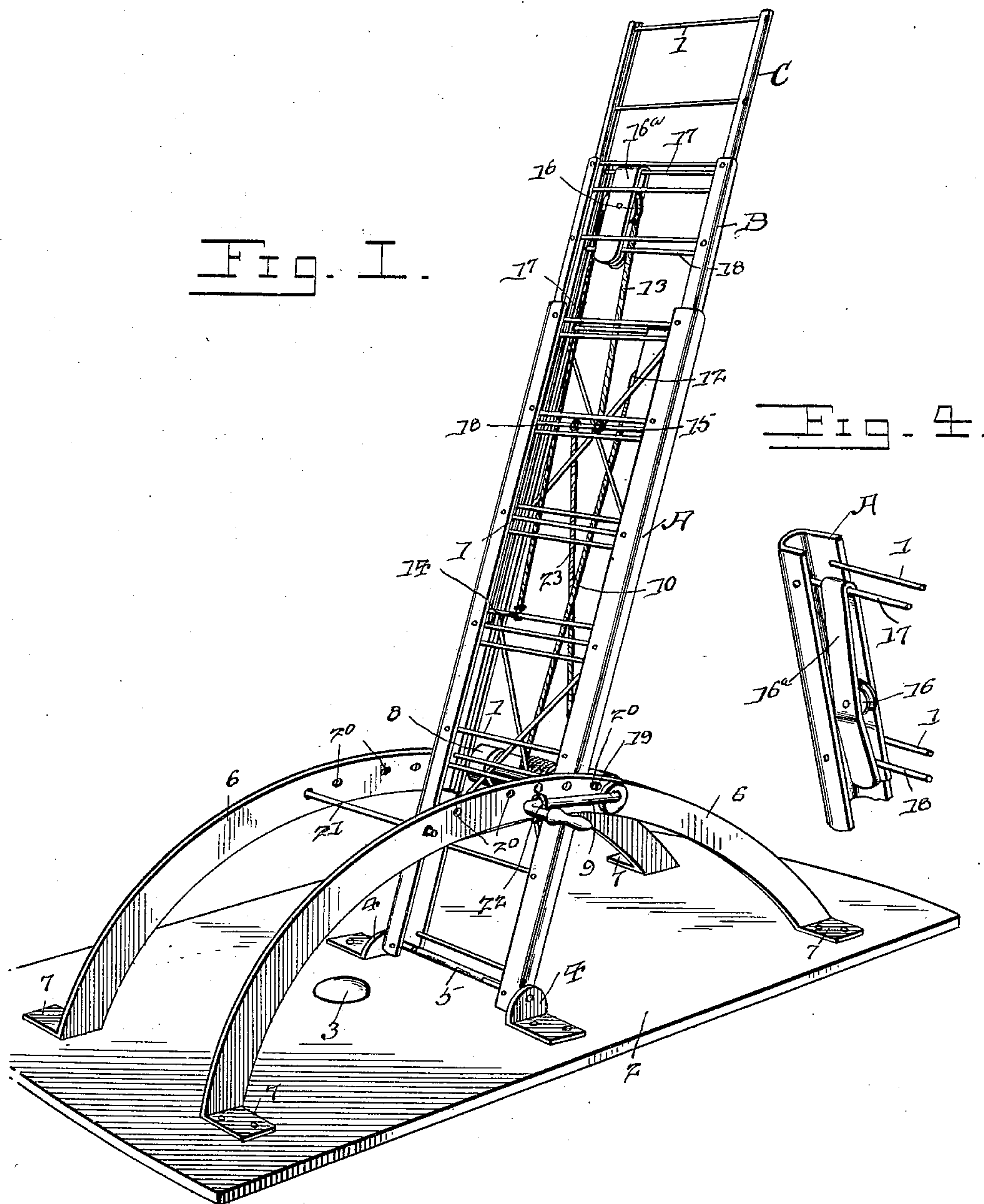
Patented Sept. 18, 1900.

G. W. GARDNER.
EXTENSION LADDER.

(Application filed June 1, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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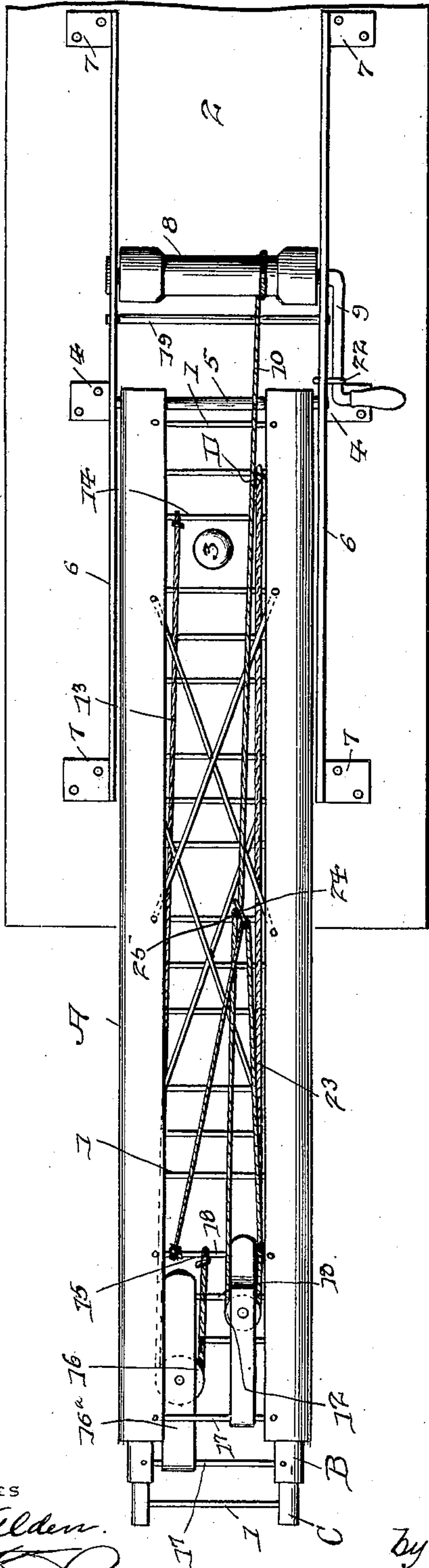
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2 Sheets—Sheet 2.

Fig. 2.

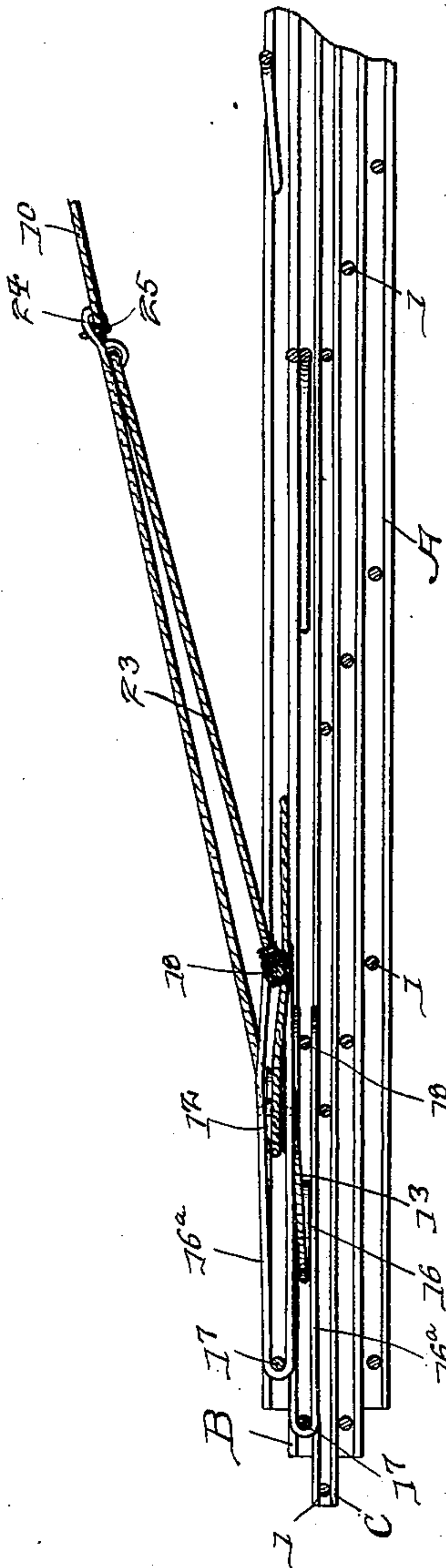


Witnesses

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Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON GARDNER, OF BOWLING GREEN, KENTUCKY.

EXTENSION-LADDER.

SPECIFICATION forming part of Letters Patent No. 657,932, dated September 18, 1900.

Application filed June 1, 1900. Serial No. 18,773. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WASHINGTON GARDNER, a citizen of the United States, residing near Bowling Green, in the county of Warren and State of Kentucky, have invented a new and useful Extension-Ladder, of which the following is a specification.

This invention relates to ladders, and has for one object to provide an improved extension-ladder which is especially arranged to be mounted upon a fire-truck so that it may be turned in any direction and also folded flat upon the body of the truck when not in use. It is also designed to provide an improved telescopic arrangement of the ladder-sections, so that when folded the entire ladder may lie within the compass of a single section, so as to be conveniently accommodated upon the truck.

Another object resides in the provision of a single cable for extending the sections and for raising the ladder from its flat inoperative position to its upright position, the several sections being connected, so that the movement of one section is imparted to the others, whereby but a single cable is wound upon the operating-drum which is employed for handling the ladder.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a perspective view of an extension-ladder constructed in accordance with the present invention. Fig. 2 is a top plan view thereof in its collapsed and folded position. Fig. 3 is an enlarged detail sectional view of Fig. 2. Fig. 4 is a detail sectional perspective view illustrating the manner of mounting one of the pulleys for the elevating-cable.

Corresponding parts are designated by like characters of reference in all of the figures of the drawings.

In the accompanying drawings the present form of ladder has been illustrated as having three sections A, B, and C, although a greater number of sections may be employed as desired.

The side beams of the respective ladder-sections are of substantially U shape in cross-section, as plainly illustrated in Figs. 1 and 4 of the drawings, and the rounds 1 are secured to the inner sides of corresponding edges of the side beams, so that the outer sides of the ladder may be free from projections. It will of course be understood that the base-section A has transversely-larger side beams than the other sections, and the latter are proportioned so as to telescopically slide one within the other, and thus all of the sections may be collapsed within the compass of the single base-section.

In order that the ladder may be folded downwardly into a horizontal position, the lower end of the base-section is hingedly connected to a platform 2, which is in the form of a turn-table having a pivot bolt or pin 3, whereby the platform may be swiveled upon the upper side of the body of a suitable truck, so as to accommodate the ladder for the uses of fire-department services. To the upper side of the platform there is provided a pair of transversely-aligned upstanding bearing-ears 4, between which is received the lower end of the base-section A, and a pivot pin or rod 5 is passed transversely through the ears and the opposite side beams of the ladder to hingedly connect the latter to the platform. Opposite upwardly arched or bowed guides and braces 6 are located at opposite sides of the ladder and have their opposite ends provided with feet 7, which are secured to the platform, and the ladder is designed to swing between said guides when being folded or raised into an upright position.

To extend the ladder-sections, there is provided a drum 8, which is journaled between the opposite braces 6 and is provided with an operating crank-handle 9, located upon the outer side of one of the braces. One end of a suitable cable 10 is wound upon the drum 8, and the opposite end of the cable is secured to the lower end of the second ladder-section—as, for instance, by being tied to the lower-

most round thereof or to a suitable transverse bar, as indicated at 11—the intermediate portion passing over an idle pulley 12, mounted upon the upper end of the base-section. Thus as one end of the cable is connected to the second ladder-section and also passes over a stationary pulley upon the base the second section may be raised by winding the cable upon the drum, as will be readily understood. The third ladder-section is elevated by means of a cable 13, which has its lower end connected, as at 14, to one of the lower rounds or a transverse bar provided at the lower end of the third section, and its opposite end is connected, as at 15, to one of the upper rounds or a cross-bar of the base-section, the intermediate portion of the cable passing over an idle pulley 15, carried by the upper portion of the second ladder-section, so that the upward movement of the latter section carries the third section upwardly. By this arrangement it will be seen that but one cable is wound upon the drum, and the movable ladder-sections are connected by means of cables and pulleys, so that the upward movement of each section imparts a corresponding motion to the next above section, there being as many sections as may be desired.

The pulleys are duplicates in construction and mounting, and, as best shown in Fig. 4, each pulley 16 has a block or housing formed by a substantially U-shaped metal strap 16^a, which is hooked over a transverse rod 17, carried by the side beams of the respective ladder-section and located opposite the rounds thereof, the lower opposite ends of the strap embracing another similar transverse rod 18, so as to prevent lateral swinging of the pulley, while it is free to be adjusted transversely upon the rods 17 and 18.

It is preferable to wind the cable 10 upon the inner side of the drum or between the latter and the ladder, so that the cable may draw directly downward from the pulley, and thereby prevent binding of the cable. Also the ladder is held out of contact with the drum by means of a removable transverse rod 19, which is passed through corresponding perforations 20, formed in the arched braces 6, said rod being located between the ladder and the drum. This rod may be fixed and another movable rod 21 employed to hold the ladder at different inclinations, or both of the rods may be movable, so as to be located at opposite sides of the ladder to insure a proper holding of the same.

In order that the sections may be held at any adjusted extension, the crank-handle of the drum is provided with a hook 22, which is designed to be engaged with either the lower edge or the upper edge of the adjacent brace 6, according to which side of the ladder the crank may be, whereby the drum is held against being unwound by the weight of the sections, and the latter are fixed against downward movement.

For convenience in raising the ladder from its horizontal position, and vice versa, there is provided a cable 23, which has its upper end connected to the upper end of the base-section, preferably to the transverse rod 18, and its opposite lower end is provided with a hook 24 for detachable engagement with a knot or stop 25, formed in the main elevating-cable 10, so that the latter is then fixedly connected to the base-section, and by operation of the drum the entire ladder may be swung upon its hinged connection with the platform either to raise the ladder to an upright position or to lower it to a horizontal position without extending or otherwise longitudinally moving the other sections. After the ladder has been raised to its upright position the hook is detached from the cable 10, and the drum may then be operated to extend the sections. Thus the main cable is employed both to raise and lower the ladder and also to extend the sections thereof.

From the foregoing description it will be seen that the present invention provides an exceedingly-simple and easily-operated extension-ladder, the sections of which are firmly connected, so as to readily slide upon each other, and the folding and extending of the ladder is accomplished by means of a single operating-drum, so that it does not require any great degree of skill to manipulate the ladder.

What is claimed is—

1. In a foldable and extensible ladder, a hingedly-mounted base-section, extensible sections carried thereby, a common operating device for folding and extending the ladder, extending means connecting the operating device with the extensible sections, and means for folding the ladder upon its hingedly-mounted base-section, said means being carried by the base-section and also having a detachable connection with the extending means.

2. In a foldable and extensible ladder, a hingedly-mounted base-section, extensible sections carried thereby, a common operating-drum for folding and extending the ladder, a main cable wound upon the drum and connected to the extensible sections for extending the latter, and a cable for folding the ladder carried by the base-section, and having a detachable connection with the main cable.

3. In a foldable and extensible ladder, a hingedly-mounted base-section, extensible sections carried thereby, a common operating-drum for folding and extending the ladder, a main cable for extending the sections, said cable being wound upon the drum and also connected to the sections, a stop carried by the main cable, and a cable for folding the ladder, said cable being carried by the base-section, and also having a hook for detachable engagement with the stop carried by the main cable.

4. In an extensible ladder, the combination

with a fixed base-section, and a plurality of
telescopically-connected sections, of a single
operating device, a main extending-cable con-
nected to the operating device, and also con-
5 nected to one of the movable sections, a pul-
ley carried by the base-section and receiving
the main cable, another cable having one end
connected to the fixed base-section and its op-
posite end connected to another movable sec-
10 tion, and a pulley carried by the first-men-

tioned movable section and receiving the in-
termediate portion of the other cable.

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

GEORGE WASHINGTON GARDNER.

Witnesses:

WM. D. MCELROY,
R. W. MCSWINE.