

S. M. STEWART.

FIRE LADDER.

No. 249,416.

Patented Nov. 8, 1881.

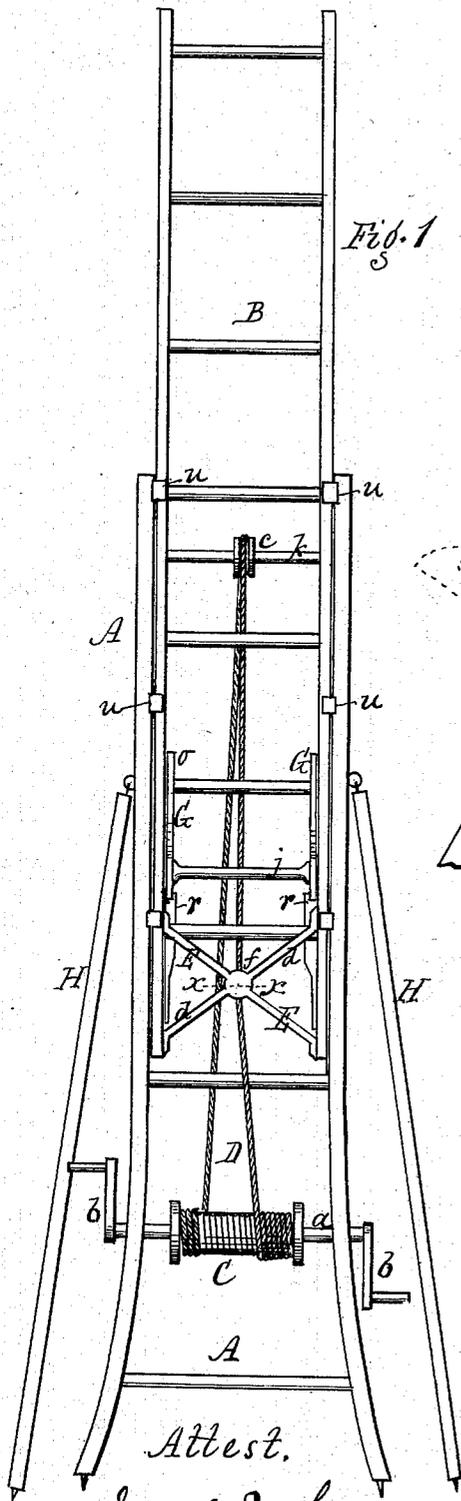


Fig. 1

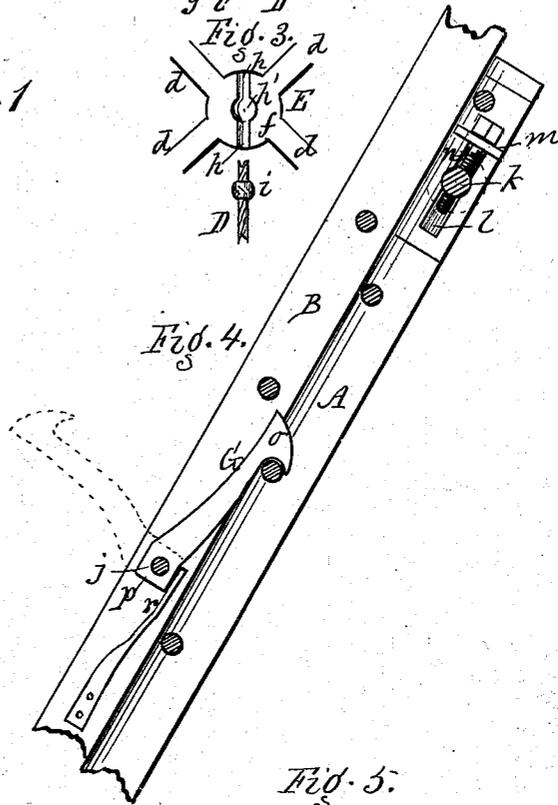
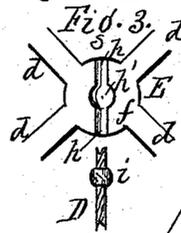
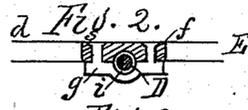


Fig. 4.

Fig. 5.

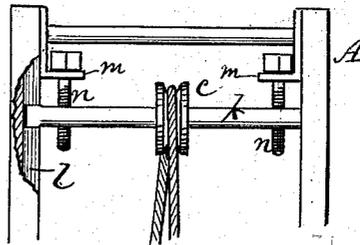
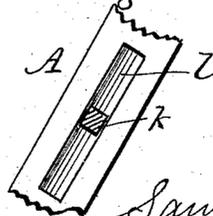


Fig. 6.



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# UNITED STATES PATENT OFFICE.

SAMUEL M. STEWART, OF ROCHESTER, NEW YORK.

## FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 249,416, dated November 8, 1881.

Application filed March 14, 1879.

To all whom it may concern:

Be it known that I, SAMUEL M. STEWART, of the city of Rochester, county of Monroe, and State of New York, have invented a certain new and useful Improvement in Fire-Ladders; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a front view of the ladder partially extended. Figs. 2, 3, 4, 5, and 6 are detail views.

My improvement relates to extension fire-ladders which are operated by a wire cable and windlass.

The invention consists in the construction and arrangement of parts hereinafter more fully described.

In the drawings, A represents the base or bottom length, and B the upper or extension length. These parts rest one upon the other, the upper one sliding up and down in the ordinary manner.

C is the windlass, located near the bottom of the main length, and mounted on a shaft, *a*, the ends of which project beyond the ladder, and have cranks *b b*, as shown. When not in use the cranks may be attached on the inside of the ladder out of the way. The periphery of the windlass is grooved in one direction, as shown, so that the wire cable D will run thereon without overwinding, one length unwinding as fast as the other winds up. This cable is attached by its ends to the opposite ends of the windlass, one passing over and the other under, and the upper looped end of the cable passing around a pulley, *e*, attached at the top of the main length of the ladder.

E is a metallic spider, consisting of a center hub or boss, *f*, and four angular arms, *d d d d*, extending therefrom, and having feet at their outer ends attached to the inner sides of the upper ladder, near the bottom, as shown. It serves as a strong brace or stay to keep said sides of the ladder together and in proper position. The center boss, *f*, has on its under side a cap, *g*, which covers the bottom, and is secured thereto by clips, which pass up through the boss, and are secured at the top by riveting the ends, or by nuts screwing thereon. In the contiguous faces of the hub and the cap is formed a longitudinal passage, *h*, for the pas-

sage of the cable, and in the center of the passage is an enlargement or socket, *h'*, to receive a corresponding enlargement, *i*, formed by winding wire around the cable and soldering it in place, or by other suitable means, which, resting in said socket in the hub, prevents slipping of the cable through the same, and causes the upper section of the ladder to slide upward when the windlass is turned.

*k* is a cross-head at the upper end of the main ladder, on which the pulley *c* turns loosely. The ends of the cross-head are squared in cross-section, and rest in longitudinal grooves *l l* in the sides of the ladder, so that while said cross-head can slide freely up and down in said grooves it cannot turn axially.

*m m* are rigid lugs or bearings attached fast to the sides of the ladder above the cross-head, and *n n* are headed screws which pass loosely through holes in the said lugs and screw into holes in the cross-head. It will be seen that when the screws are turned the cross-head will be drawn up, and the cable will consequently be strained.

G G are hooks turning freely and independently on an iron rod, *j*, attached fast to the upper section, B. The head *o* of each hook is rounded, so as to ride over the rounds of the lower section, A, as the upper section is raised, but provided on the under side with a depression, which catches on said rounds as the upper section is lowered. The base of the hook, below its joint, has a square end, *p*, which rests on the end of a stiff spring, *r*, fastened by bolts or otherwise to the side of the upper section. The action of the hook and spring is similar to the blade and spring in a jack-knife. When the hook is thrown down, as shown in Fig. 4, the spring produces pressure to cause the hook to engage with the rounds as the upper section is elevated; but when the hook is thrown up, as shown by the dotted lines, the spring holds it there and allows the upper section of the ladder to run down free. Each of the hooks on the rod *j* is free and independent from the other, hence each is free to catch on the round, giving additional security.

H H are brace-arms, jointed to the sides of the main section in the ordinary manner. The upper section is held to the lower one by the usual lugs or flanges, *u u*.

I am aware that drums and cables are em-

ployed in extension-ladders, also devices at the top of the main ladder for straining the cable, one form being a rod to which the pulley is attached as a hanger, and operated by a screw and nut. Hooks of various forms for catching on the rounds are well known. In my invention the spider E serves the double purpose of bracing the upper section and forming an attachment for the cable, which is simple and easy to adjust, and obviates many of the objections where the cable is attached to a cross-piece or round. The employment of the cross-bar *k*, lugs *m m*, and adjusting-screws *n n*, located on opposite sides, provides a stiff attachment, which holds the pulley against swaying and prevents disengagement of the cable from the pulley. This attachment for straining the cable always retains its position when the ladder is inclined to one side.

20 What I claim as new is—

1. In an extension-ladder, the combination, with the section B and cable D, of the spider E, consisting of the angular arms *d d d*, attached

to the sides of the ladder, and forming a brace, and the central hub or boss, *f*, and the cap *g*, provided with a passage, *h*, to receive the cable, said passage having an enlarged socket to receive a corresponding enlargement on the cable, as herein shown and described.

2. In an extension-ladder, the combination, with the pulley *c* and cable D, of the cross-head *k*, extending across the ladder, its ends resting in guide-slots *l l*, the lugs *m m*, and the screws *n n*, on opposite sides, passing through said lugs and screwing into the cross-head, the whole forming a stiff adjusting attachment for producing tension on the cable, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

SAMUEL M. STEWART.

Witnesses:

R. F. OSGOOD,

CHAUNCEY NASH.