

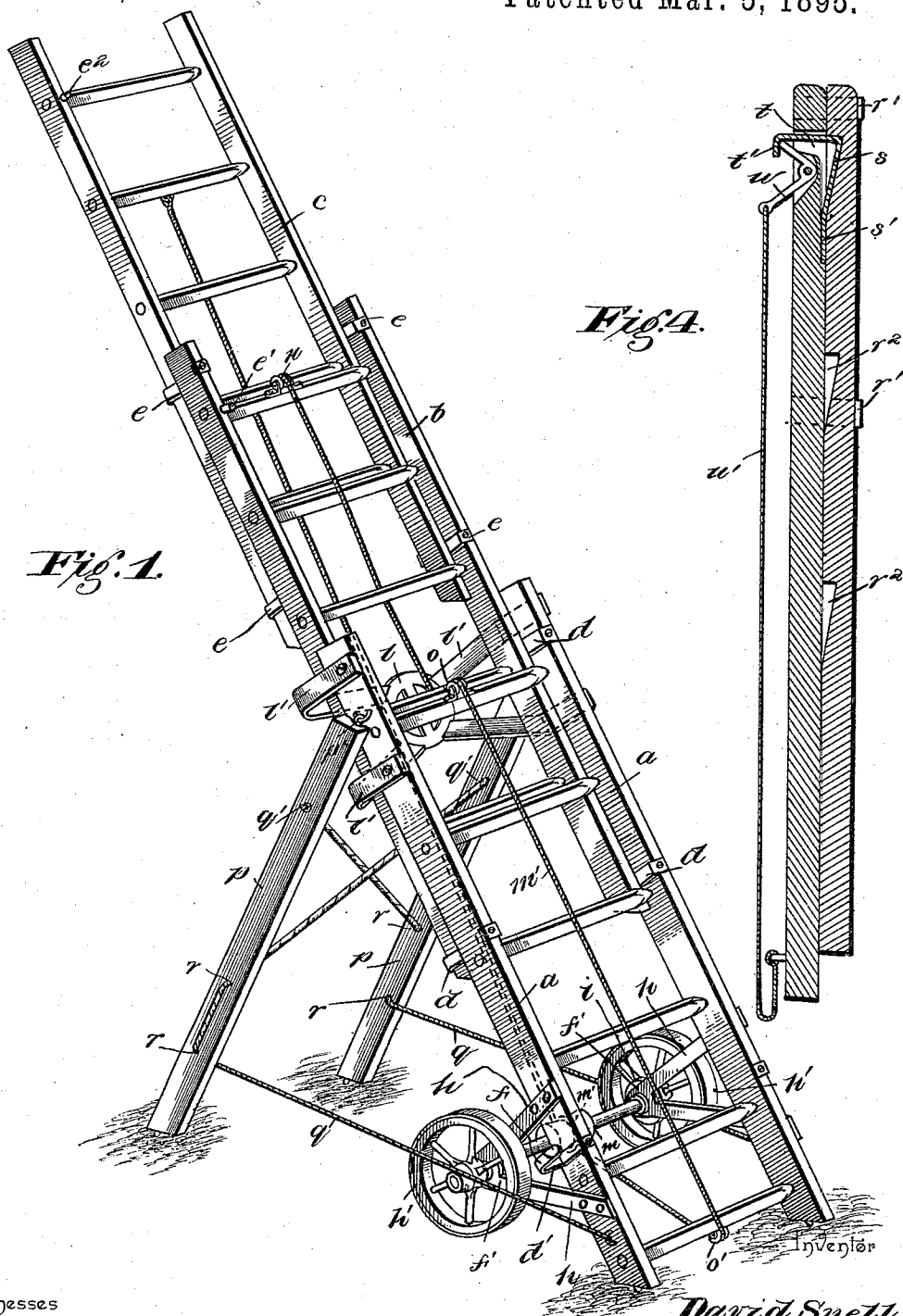
(No Model.)

2 Sheets—Sheet 1.

D. SNELL.
FIREMAN'S LADDER.

No. 535,082.

Patented Mar. 5, 1895.



Witnesses

John C. Shaw
H. B. Lewis

By *W. C.* Attorneys.

David Snell,
Inventor

Cashow & Co.

UNITED STATES PATENT OFFICE.

DAVID SNELL, OF MIDDLEPORT, NEW YORK.

FIREMAN'S LADDER.

SPECIFICATION forming part of Letters Patent No. 535,082, dated March 5, 1895.

Application filed February 23, 1894. Serial No. 501,202. (No model.)

To all whom it may concern:

Be it known that I, DAVID SNELL, a citizen of the United States, residing at Middleport, in the county of Niagara and State of New York, have invented a new and useful Fireman's Ladder, of which the following is a specification.

My invention relates to certain improvements in those ladders which are adapted for use by firemen; and the primary object contemplated by me is to so improve these devices that they may be more easily and quickly transported and applied, and at the same time simple and durable.

A further object is to provide a ladder wherein the sections may be joined in a more efficient manner, and one having a system of securing ropes, by which they may be held intact and when so desired, moved longitudinally so as to effect the extension.

To these ends my invention consists of certain improvements in construction, combination and arrangement of parts which will be more fully described hereinafter and finally embodied in the claims.

Referring to the accompanying drawings:—Figure 1 represents a perspective view of my ladder extended and in operative position. Fig. 2 is a longitudinal section taken through the device when folded. Fig. 3 is a diagrammatical view illustrating the arrangement of securing-ropes. Fig. 4 is a sectional view of a modified form brace. Fig. 5 is a cross section; Fig. 6, a view of the device for keeping telegraph wires off the ladder.

The device is here shown as having three sections, *a*, *b*, and *c*, and these are of the same length, while each is reduced in size so that they will fit one between the beams of the others, and with the upper edges of their beams bearing against the rungs of the section above it. This is shown in Fig. 5. The main section, *a*, is provided with three retaining-hooks, *d* and *d'*. The hooks *d* are four in number, two for each beam, and are secured to the inner sides of the section beams and projecting downwardly, so as to embrace the lower edge of the beams of section *b*, thus securing the section *b* to section *a*, so that it will be capable only of longitudinal movement thereon. The section *b* is provided with

the four hooks *e*, which are also two for each beam, and which project downwardly so as to embrace the beams of section *c*, thereby securing the last or top section to the section *b* in a way similar to the manner of securing said section *b*.

The sections *b* and *c* are each provided on their left hand beam and near their upper ends with the studs *e'* and *e''*, which are adapted to engage the top rung of the sections *a* and *b* respectively, and by which the sections are prevented from moving too far down when the ladder is folded.

The means for carrying the ladder consists of the axles *f* and *g*. The axle *f* is mounted in the boxes *f'*, and these are in turn secured to the arms *h*, which are secured to the section *a*. By this means the axle *f* is revolvably journaled in the boxes. Mounted loosely on this axle are the wheels *h'*.

Fixed to the axle *f*, directly adjacent to one of the wheels *h'* is the disk *i*, and this disk has formed therein the opening *j'*, which matches with the opening *k* of the wheel adjacent to it, the pin *k'* being provided and adapted to pass through the two, whereby they are locked to each other and the wheel made to revolve with the axle.

The axle *g* has the wheels *g'* mounted thereon, in any preferred manner, and the axle is connected to the fifth wheel *l*, which is secured rigidly to the forward end of section *a*, by means of the arms *l'*. The fifth wheel, *l*, is provided with a removable king-bolt, whereby the axle and the ladder portion of the fifth wheel may be detached.

Mounted upon the axle *f*, and arranged to revolve therewith, is the reel or drum *m*, over which the chain or cable *m'* is adapted to operate. This chain *m'* is the securing rope referred to hereinbefore, and is so connected to the ladder sections that they may be folded or extended without affecting the tension of the chain or rope, the rope operating all the time to keep the sections in the proper relation, and to furnish a means for extending and folding them. Thus the rope is first secured to the lower rung of section *c*, and is then passed over a pulley *n* on the rung of section *b* next to the top rung of said section. From this point the rope proceeds to a pul-

ley n' on the lower rung of section b , and thence over the pulley o , of the section a , from whence it proceeds downwardly to the pulley o' on the lowest rung of said section, over which it passes to the reel or drum m . When this point is reached, the rope is wound around the drum for a number of times, sufficient to give it a firm hold thereon, and after passing over the drum the rope proceeds to the section c , to which it is finally secured. With the rope so arranged, by operating the drum m , the ladder sections may be extended or folded, since power applied to the drum so as to draw the rope over the pulley o' will result in the lifting of section b , until the pulleys o and n' are opposite each other. Then the section c begins to move up, and this continues until the lower rung of section c is opposite the pulley n . When this stage is reached, the ladder will have been extended as far as possible.

It will be seen that the extension of the sections will immediately result in a release of the rope m' , and the slack so caused is taken up, as fast as given, by the upward movement of section c , as will be apparent from Fig. 3.

To fold the ladder the drum m is revolved in the reverse direction, which will result in a reversal of the pressure on the rope m' , and a consequent folding of the ladder. The drum m is revolved by means of the disk i , which being rigidly fixed to the axle f may be secured to the wheel adjacent to it, and by applying power to the wheel it may be transmitted to the drum m .

p indicates a pair of legs or braces for supporting the ladder in an upright position, and these are pivotally connected to the upper end of the section a , by means of the hooks p' . Ropes q are provided and secured, primarily, to the legs at the point q' , from which they extend downwardly through the openings r , on the opposite legs, and are attached at their remaining ends to the section a . This prevents the legs from spreading or moving too far out and the ropes may be easily adjusted to the desired length, and when not in use the legs are held by the hooks d' described hereinbefore.

Fig. 4 illustrates a modified form of brace, and the principal advantage of this form is that the length of the leg may be adjusted to suit the disposition of the ground surface, and the angle at which it is desired to arrange the ladder. This device is constructed of two sections, duplicates of each other, and one is provided with the two yokes r' , which embrace the companion section and allow it a longitudinal movement thereon. Formed in one side of the section not having the yokes, or the movable section, are a series of notches r^2 , which are provided at their upper ends with abrupt shoulders, while their lower ends gradually taper or slope outwardly to the

side of the section. These openings co-operate with the pawl s , which consists of the spring-plate secured at s' to the lower section, and projecting upwardly and outwardly when it is bent rearwardly, and extends through the opening t , to the outer side of the section. Here the end is bent to form the hook t' , which engages one arm of the bell crank u . This device, bell crank u , is fulcrumed to the lower section, and has its remaining end connected to the cord u' , which extends downwardly to the lower end of the section. By this means the pawl s may be moved in and out of engagement with the notches r^2 , and by means of the peculiarly shaped notches, the movable section may be moved up without operating the pawl, and is incapable of moving downward without releasing said pawl.

In use, the ladder, supposing that the fire is distant and the arrangement must be taken there, the disk i is disengaged from its wheel, and the attachments of axle g put in working order. The ladder will now be free to move on its wheels, and by this means it is transported. When the fire is reached, and it is desired to establish the ladder extended, the front wheels are removed as before explained, and the ladder, with its sections folded, is swung on its rear wheels, until the spurs w of the lower end of the section a , engage the ground, whereupon the braces or legs p are removed from their racks and placed in position to support the ladder. The disk i is then made to positively engage the wheel adjacent to it, and by operating the wheel the rope m' may be moved to extend the ladders. The invention is now ready for use. When its use has been completed the operation of the drum m is reversed, and the ladder returned to its normal position.

Fig. 6 illustrates an appliance for keeping telegraph wires from fouling with the ladder, and this consists of the bar or rod q^2 , provided at its upper end with the hook r^3 , whereby it may be secured to the rungs of the ladder at the desired point, and with the pivoted brace or leg s^2 . This latter device, leg s^2 , is adapted to project downwardly and to engage the rung below the end of rod q^2 , by means of the fork l^2 . By this means the rod q^2 may be raised to the desired height, and the interfering wires disposed of. This is plainly illustrated in the drawings.

Having thus described my invention, I claim—

1. An extensible ladder, comprising the combination of a series of sections arranged to be folded or extended at will, a rope connected to the sections whereby they may be operated, an axle, wheels for carrying the ladder and mounted loosely on the axle, a disk fixed to the axle, means for connecting and disconnecting the disk and one wheel, and a drum or reel on the axle and over which the rope is wound, whereby the rope may be operated

and the ladder extended or folded, substantially as described.

2. A leg or brace for extension ladders and consisting of two sections slidably connected
5 to each other, one of said sections having notches formed thereon, a bell-crank lever fulcrumed in a cavity in the remaining section, a spring plate arranged in the cavity and having a tendency toward the first section, the
10 lever being connected to the said plate, and a

cord connected to the lever by which it may be operated, substantially as described.

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

DAVID SNELL.

Witnesses:

LEWIS H. SPALDING,
FRANK S. A. COON.