

March 18, 1958

L. B. NAPOLITANO

2,827,216

TELESCOPIC STEP OR RUNG LADDERS

Filed May 25, 1955

2 Sheets-Sheet 1

Fig. 1

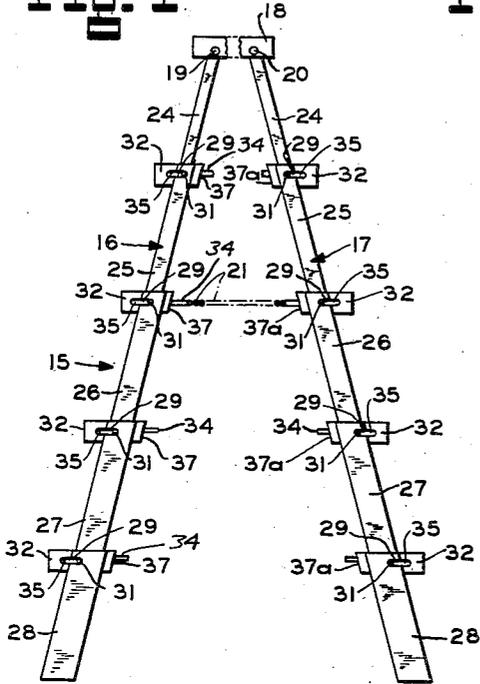


Fig. 2

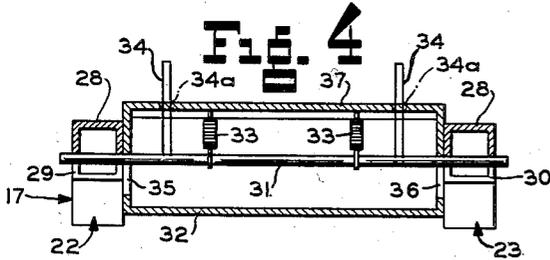
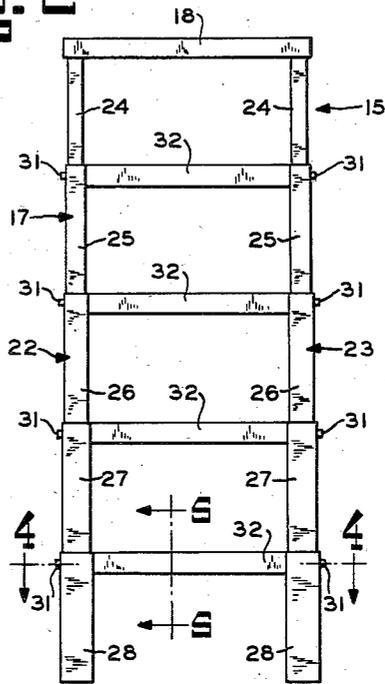


Fig. 3

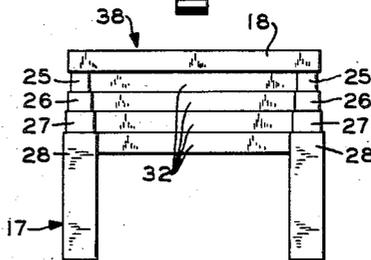


Fig. 5

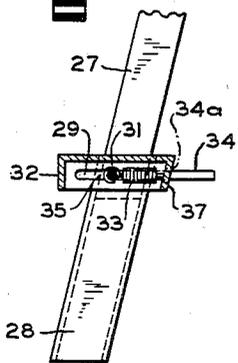
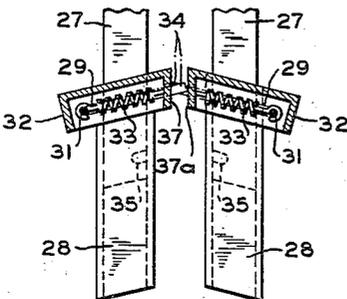


Fig. 6



INVENTOR,  
LEONARD B. NAPOLITANO  
BY  
*Joseph F. Ballon*  
ATTORNEY

March 18, 1958

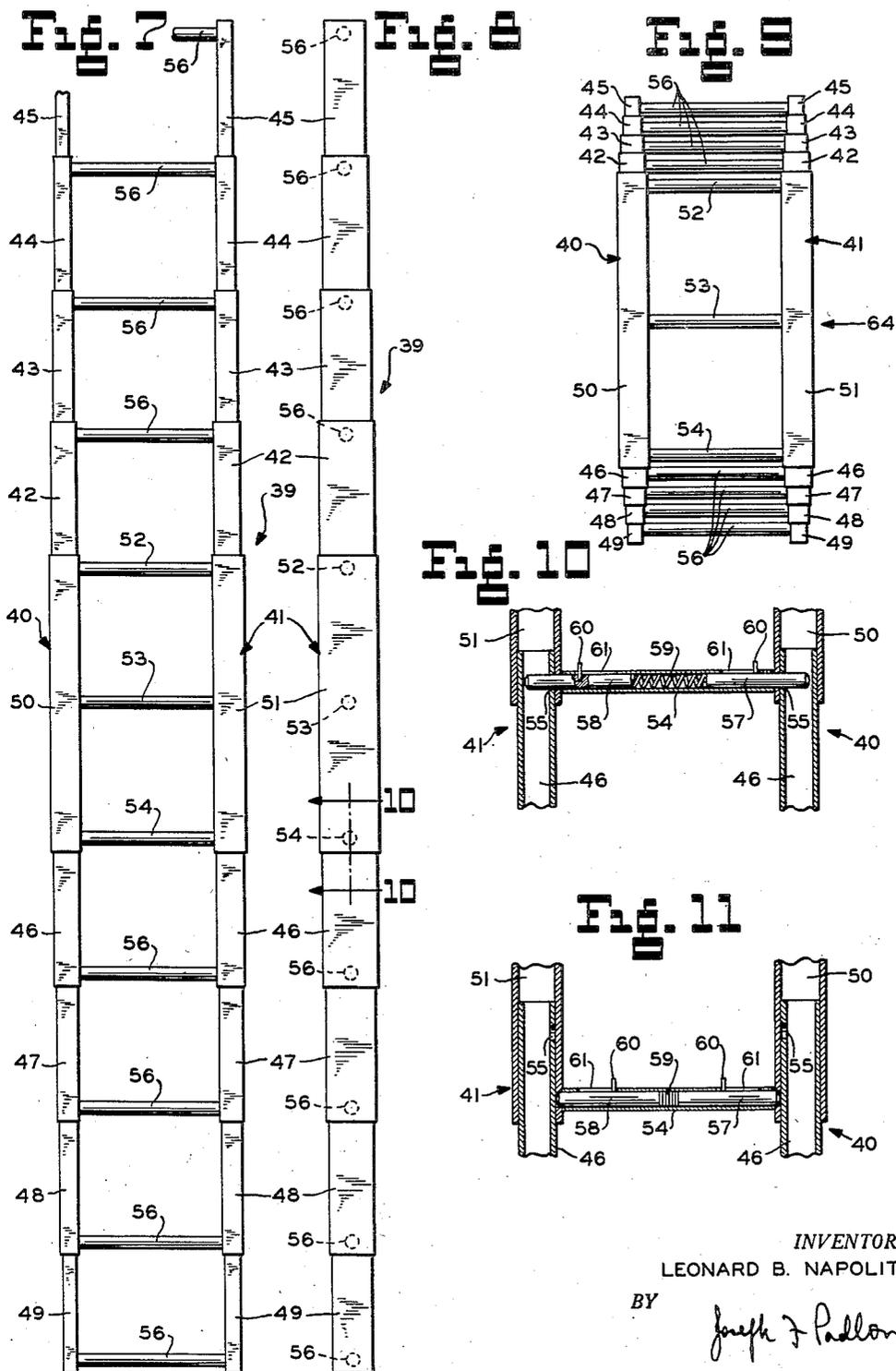
L. B. NAPOLITANO

2,827,216

TELESCOPIC STEP OR RUNG LADDERS

Filed May 25, 1955

2 Sheets-Sheet 2



INVENTOR.  
LEONARD B. NAPOLITANO  
BY *Joseph F. Padon*  
ATTORNEY

1

2,827,216

## TELESCOPIC STEP OR RUNG LADDERS

Leonard B. Napolitano, Brooklyn, N. Y.

Application May 25, 1955, Serial No. 511,074

2 Claims. (Cl. 228—39)

This invention relates to ladders, and, more particularly, to telescopic step or rung ladders.

An object of my invention is to provide a ladder which may be readily reduced in length to permit easy and economic storage in a limited space.

Another object of my invention is to provide a sturdy, relatively light weight, ladder which has telescopic stiles permitting easy collapsing of the ladder into a compact unit.

Still another object of my invention is to provide a lightweight, relatively economic, strong, easily collapsible ladder of the step or rung type.

A more specific object of my invention is to provide a self-supporting ladder wherein the uprights or stiles are in sections which can be readily telescoped or extended from each other and locked by means of interlocking means in the interconnecting rung members.

Other objects and advantageous features of my invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side view of a step ladder in extended or operable position and forming one embodiment of my invention;

Fig. 2 is a front view of Fig. 1, showing the sections of the ladder;

Fig. 3 is a front view of the ladder shown in Fig. 2 but in collapsed or compacted position;

Fig. 4 is a sectional, enlarged view taken on line 4—4 of Fig. 2;

Fig. 5 is a sectional enlarged view taken on line 5—5 of Fig. 2 showing the section locking means in engaging position.

Fig. 6 is a section showing the disengagement of the locking means before the collapsing action of the ladder;

Fig. 7 is a front view of an open or an extended rung ladder, forming another embodiment of my invention;

Fig. 8 is a side view of Fig. 7;

Fig. 9 is a front view of the ladder shown in Fig. 7, but in collapsed or compacted condition;

Fig. 10 is a detail taken on line 10—10 of Fig. 8 showing the positive action of the locking means in the rung; and

Fig. 11 is a sectional detail similar to Fig. 10, but showing the locking means in the rung in disengaged position.

Referring now to the drawings wherein like parts refer to like parts throughout, it will be noted that I show in Figs. 1—6, a step ladder, whereas in Figs. 8 to 11, I show a collapsible rung-type of ladder. Both of said ladders embody my invention.

The ladder 15 as shown in Figs. 1 to 3, inclusive, is a step ladder and consists of two relatively movable and collapsible parts 16 and 17, respectively, and which are of relatively similar construction, but are shown in mirror image relationship. Said two sections are each connected at their upper end to a flat top or shelf member 18 by means of pivoted members or hinges 19 and 20.

2

For purposes of brevity of description, the part 17 may be considered as the front of the ladder while the section 16 may be considered as the rear of the ladder. Furthermore, part 17 will be described and will apply also to part 16. Parts 16 and 17 are held in relatively spaced position by means of a link or chain stay or the like 21.

Part 17, as shown, has a pair of opposed vertical stiles 22 and 23, each consisting of a plurality of telescopic sections 24, 25, 26, 27 and 28, the number thereof depending upon the desired length of the ladder. It is to be noted that said sections, for purposes of illustration, are shown as rectangularly shaped, although I am not limited to such shape. Each section has at its ends connecting with the next succeeding section an upper slot or opening 29 and a lower slot or opening 30. Such slots or openings as shown may be of rectangular or other suitable shape and extend outwardly of the stile to permit the passage and lodging therein of a cross bar 31 which extends through each of said rungs 32 as shown. Said bar 31 in each rung interconnects the sections of said stiles 22 and 23, preferably at the location where the sections when extended for their respective slots or openings are in engageable alignment. As noted, the rungs will usually correspond with the number of sections so as to facilitate collapsing of the ladder or telescoping of the respective sections in each stile.

With respect to rungs 32, it will be noted that there is provided with the cross bar 31 one or more coil spring members 33 which are fixed at one end to the underside of each rung 32 and at the other end to the cross bar 31, said cross bar being preferably cylindrical in shape to facilitate easy movement of the same into the slots or openings 29 and 30 of the different sections. Each of said bars 31 is provided with at least one bar member 34 which is fixed to the bar 31 and extends through an opening 34a from the underside wall of each rung between the stiles. Each rung 32 is furthermore provided with laterally disposed end slots or openings 35 and 36 at the opposite ends thereof, so that when the stiles 16 and 17 are to be brought together in vertical arrangement, preparatory to collapsing the ladder, the protruding bar 34 will come into contact with the rear face 37 of each opposed rungs 37a on stile 17 so as to force the flat bar 34 inwardly against the action of springs 33 thereby releasing the cross bar 31 from locking engagement with the upper and lower rung sections, whereupon said sections will automatically collapse into the lowermost section 28 so as to form a compact unit 38, as shown in Fig. 3. The sections in the stiles 16 will also collapse, because the bar 34 pressing against the rear face 37 of the rungs 37a will push the rungs to the left of stile 16, in Fig. 1. Such compact unit can then be readily stored; for instance, in a closet or other small space.

In Figs. 7 to 11, inclusive, I show a rung ladder 39 preferably of tubular construction which has a pair of stiles 40 and 41, each consisting of upwardly extending sections 42, 43, 44 and 45, and downwardly extending sections 46, 47, 48 and 49, protruding from the central sections 50 and 51, respectively, which central sections have interconnecting fixed rungs 52, 53 and 54. The number of upwardly and downwardly extending sections may be varied depending on the desired length of the ladder.

Said central portions 50 and 51, as shown, are of the greatest outside diameter and are intended to support the upwardly extending and downwardly extending telescopic sections above indicated. Each of said sections 42, 43, 44, 45, 46, 47, 48 and 49, is provided at their upper and lower ends with an inner opening or slot 55 as shown, which openings are adapted to come into alignment with the opening of the next successive upper or lower section as the case may be.

3

Interconnecting each of the sections is a series of rungs 56 fixed to each opposed section, and through which extend a pair of bars 57 and 58 normally kept and spread apart, as shown in Fig. 10 by means of a tension spring member 59, whereby the ends of said bars extend through the openings or slots 55 into the section. It will be noted that said rungs are in the present instance shown as cylindrical and entertain the bars 57 and 58. Each of said bars 57 and 58 has a protruding pin 60 extending outwardly of the rung 56 through slots 61 in each rung.

In the event it is desired to collapse the ladder to a condition shown in Fig. 9, the operator of the ladder draws each of the pins 60 inwardly toward the center of each rung against the action of spring 59 so as to permit collapsing of each section to form a compact unit 64, as shown in Fig. 9 of the drawing.

From the foregoing description, taken in conjunction with the accompanying drawings, it will be noted that I provide a collapsible ladder having a multiplicity of well fitting telescopic sections, each of which can be readily connected or disconnected by interlocking means housed in each of the cross members or rungs. Also, in accordance with my invention the interlocking engaging and disengaging means are spring operable or releasable. The interlocking means provided in each rung act as stops for the sections affording sufficient rigidity and sturdiness to the ladder to accommodate the person of more than average weight. I furthermore show the component parts of the ladder as either rectangular or cylindrical in shape. However, I am not limited to such shape but may use any other shape in the formation of the different parts of the ladder. Said ladder is made of relatively light weight metal, such as aluminum, or aluminum alloys, which will afford sufficient sturdiness or strength to cope with the usual weights of users of the ladder. In accordance with my invention the sections in case of damage can be readily replaced.

By my invention it will be further noted that I may reduce the normal size of the ladder to about one-third its original length so as to facilitate easy and economic storage when the ladder is not in use. A ladder of the

4

type described and illustrated herein can be easily collapsed or extended to suit the needs of the user.

While preferred embodiments of my invention have been described and illustrated, it is to be understood that modifications as to form, arrangement of parts, and use of materials, may be made without departing from the spirit and scope of my invention as claimed herein.

I claim:

1. A collapsible step ladder, comprising a plurality of stiles, each having a multiplicity of telescopic sections, and a plurality of rungs interconnecting the stiles, each rung having disposed underneath the step portion releasable locking means extending across the rung for each of the sections, said locking means having protruding means adapted when a pair of said stiles are brought together in closed position to contact the opposed rungs thereon and automatically release the locking means thereon to permit telescoping of the sections.

2. An extensible step ladder comprising a pair of collapsible ladders in hinged connection with each other, each ladder having a pair of spaced telescopic stile section, each section containing a cross rung at the upper portion thereof, each stile section having a lateral slot therein at the rung portion so that when the sections are extended and each successive end comes into contact with each other, the respective slots are in relative alignment, said rung members having tensioned movable locking bar means adapted to slide into said openings and hold the sections in extended position in the ladder, and means in connection with the bar means adapted when the ladders are brought together to release the locking means and permit the sections to be collapsed.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

8,987	Salomon	June 1, 1852
1,576,625	Blodgett	Mar. 16, 1926
1,712,942	Smith	May 14, 1929
2,021,494	Zeman	Nov. 19, 1935
2,194,856	Kostuk	Mar. 26, 1940
2,542,398	Crumpton	Feb. 20, 1951