April 23, 1935. J. J. GANTESKI 1,999,017

EXTENSION STEPLADDER

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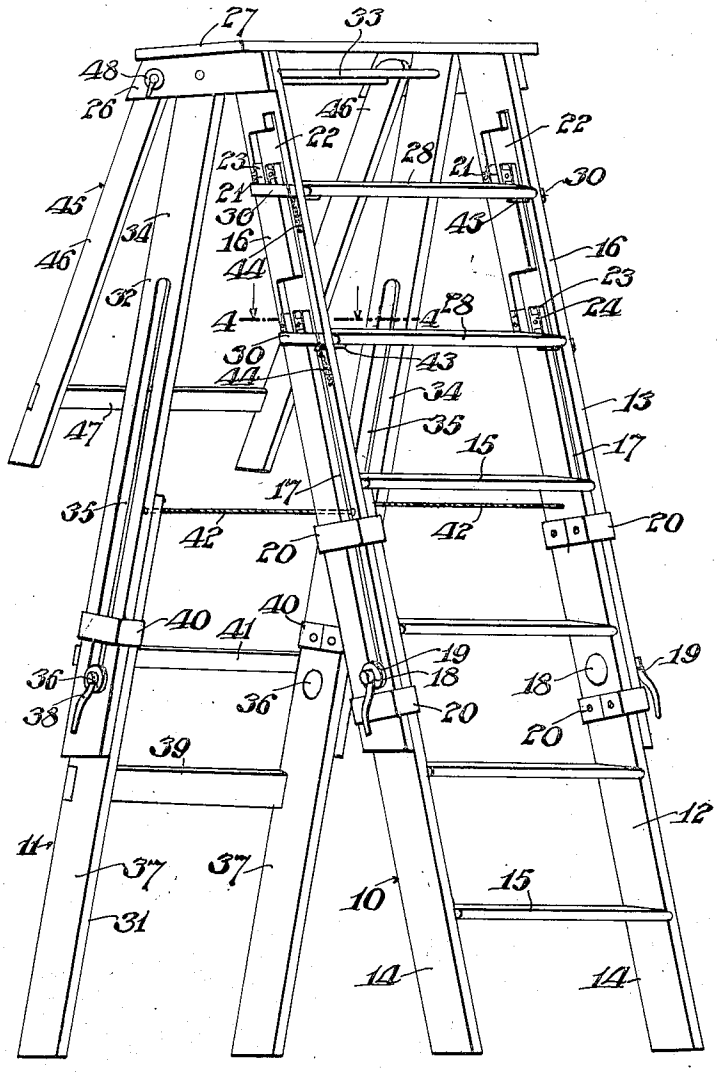


Fig. 1.

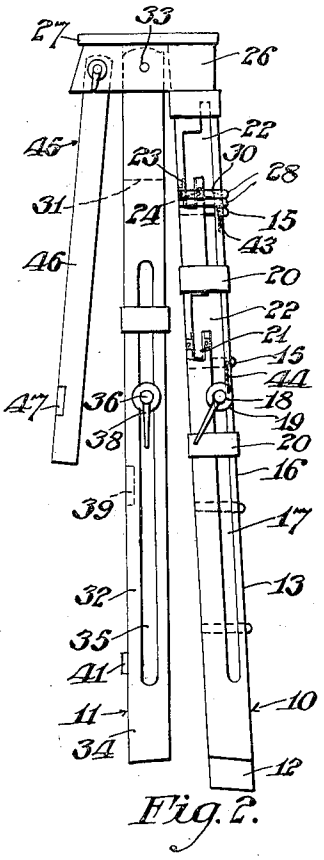


Fig. 2.

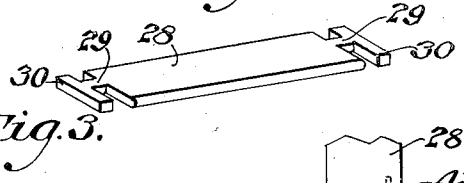


Fig. 3.

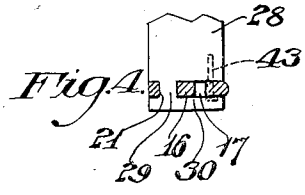


Fig. 4.

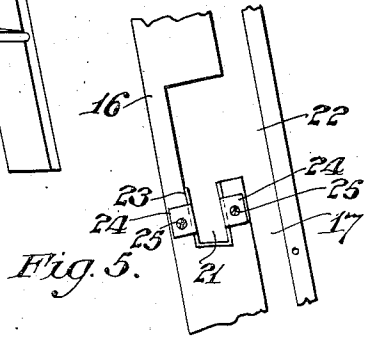


Fig. 5.

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1,999,017

EXTENSION STEPLADDER

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Application October 20, 1934, Serial No. 749,242

4 Claims. (Cl. 228—21)

My invention relates to new and useful improvements in an extension step ladder, and has for one of its objects to provide an exceedingly simple and effective device of this character that will be strong and durable and efficient for the purpose for which it is intended.

The invention contemplates a structure in which certain sections are adjustable relative to other sections whereby the same may be extended to provide a relatively tall or high ladder and collapsed or telescoped to provide a shorter ladder for use as such and also for the purpose of providing a small, compact parcel which will require but little space for storage and transportation.

Another object of the invention is to provide adjustable and removable steps which permit one section of the ladder to be telescoped or collapsed relative to another section although the side pieces are arranged side by side or face to face in contradistinction to an assembly where the sections are imposed upon one another.

Another object of this invention is to fashion the side panels of the upper section of the step portion so as to produce slots with offset step seats to permit adjustment of the steps.

Another object of the present invention is to provide an adjustable step of unique construction.

Another object of the invention is to provide wear plates for the seats of the adjustable steps.

A further object of my invention is to provide a detachable stair brace which, when attached to the ladder, makes it possible to use the ladder on the stairs of buildings.

A still further object of the invention is to produce a ladder of the kind described which will be rugged in construction and capable of many uses not possible with the ordinary step ladder.

With the above and other objects in view, this invention consists of the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains, may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawing in which:—

Fig. 1 is a perspective view of an extension step ladder constructed in accordance with my invention and illustrated in an extended condition and open for use, also showing the stair brace attached thereto.

Fig. 2 is a side elevation of the ladder shown telescoped or collapsed and folded or closed.

Fig. 3 is a perspective view of one of the adjustable and removable steps.

Fig. 4 is a fragmentary sectional view on the line 4—4 of Fig. 1, and

Fig. 5 is an enlarged fragmentary side elevation of one of the side pieces illustrating a wear plate in a step seat.

In carrying out my invention as herein embodied, 10 represents the step portion and 11 the brace portion of the extension step ladder.

The step portion 10 consists of a lower section 12 and an upper section 13. The lower section 12 comprises side pieces 14 with steps 15 secured between them and the top step is preferably superimposed on the upper ends of said side pieces.

The upper section 13 of the step portion also comprises side pieces 16 which are imposed on the outer side faces of the side pieces 14 of the lower section and have longitudinal slots 17 for registration with bolts 18 carried by the side pieces 14 of the lower section and on said bolts are threaded the lever nuts 19 for clamping the upper section in any selected adjustment lengthwise of the lower section.

Guide bails 20 are fixed to the side pieces of the lower section through which the side pieces of the upper section slide to maintain the sections in proper alignment.

In the side pieces 16, adjacent their upper ends are formed longitudinally spaced step seats 21, offset relative to the slot 17 and communicating with said slot through a gap 22. If found desirable the step seats may be protected by wear plates 23 which are U-shaped strips of metal fitted in the seats and provided with wings 24 contacting faces of the side pieces and secured thereto by fastening devices 25.

Hinge members 26 of any desirable formation are secured to the upper ends of the side pieces 16 of the upper section of the step portion and across the upper ends of said side pieces is mounted a top step or platform 27.

Between the side pieces 16 are located adjustable and removable steps 28 having restricted necks 29 at both ends, which necks carry heads 30 spaced from contiguous ends of the steps a distance equal to the thickness of said side pieces 16. The necks slide in either the slots 17 or the seats 21 and therefore the adjustable steps 28 can be arranged in their operative positions, as in Fig. 1, or they can be nested on the top step 15 of the lower step section 12 when the ladder is to be collapsed or telescoped, as shown in Fig. 2. When the adjustable steps 28 are nested, the necks 29 will be in the slots 17 and

to prevent said steps from protruding they may be inverted. By making the slots 17 as wide as the thickness of said steps, the latter may be actually removed from the side pieces 16.

The brace portion 11 also comprises a lower section 31 and an upper section 32, the latter being hinged to the hinge members 26 in any desirable manner but preferably by a rod 33 which passes through both hinge members 26 and the upper ends of the side pieces 34 of said upper section 32 of the brace portion 11.

The side pieces 34 of the upper brace section 32 have longitudinal slots 35 for registration with bolts 36 fixed in the side pieces 37 of the lower brace section 31. Lever nuts 38 are screwed on the bolts 36 to clamp the brace sections together in any selected adjustment. The side pieces 37 of the lower brace section 31 have a strut 39 secured thereto and mortised in the edges thereof and said side pieces have guide bails 40 fixed to them through which the side pieces of the upper brace section slide for holding the parts in proper alignment. The side pieces 34 of the upper brace section are also supported by a strut 41 which is fastened to edges of said side pieces.

Flexible ties 42 are attached to the step and brace portions 10 and 11 respectively to prevent undue spreading of said portions when the ladder is in use.

From the foregoing it will be obvious that when the lever nuts 19 and 38 are loosened, the brace and step sections may be extended any desirable distance within the limits of the slots 17 and 35 and the parts then clamped in the selected adjustment by said lever nuts. One or more of the adjustable steps 28 are then assembled in their respective seats and the ladder is ready for use. In order to overcome any possibility of the adjustable steps tipping when a person stands on them, pins 43 are projected through holes in the side pieces 16 just underneath the operative positions of said adjustable steps. These pins 43 may be attached to chains 44 or their equivalent which are anchored to the side pieces to prevent the pins from being lost or misplaced.

The extensibility of the ladder enables a person to adjust the same for use in various localities and to reach different heights without the necessity of employing two or more ordinary ladders thereby saving expense and eliminating the carrying or transportation of a number of different sized ladders.

To collapse or telescope the ladder, the lever nuts are released and the adjustable steps are removed from their seats and shifted into the longitudinal slots 17 and the sections then slide lengthwise until the lower sections of both the step and brace portions are practically within the upper sections. In this condition the adjustable steps 28 will be resting upon the top step 15 of the lower section and therefore do not interfere with the telescoping action of the step portion sections.

When the sections are fully collapsed, the ladder will occupy a very small amount of space and can be readily carried or transported from place to place with little difficulty.

In order that the ladder may be used on stairs of a building I provide a stair brace 45 consisting of a pair of legs 46 to which a strut 47 is secured for strengthening purposes. The stair brace is detachably connected with the ladder and more particularly to the hinge members 26 by any suitable fastening means 48 which may be quickly removed for attaching said stair brace to the ladder when occasion requires it or for detaching the same whenever its use is not necessary or the ladder is to be folded for storage or transportation. During use of the stair brace, the step portion 10 and the brace portion 11 are folded together in a manner similar to the illustration in Fig. 2 and said step and brace portions adjusted to suit the conditions.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is;—

1. An extension step ladder including a pair of step sections, one of said sections consisting of two side pieces with stationary steps mounted between them, clamping means carried by said side pieces the other of said sections including two side pieces having laterally disposed longitudinal slots for registration with the clamping means and further provided with step seats communicating through gaps with the slots, adjustable steps mounted between the side pieces of said other section and having means selectively disposable in the slots or seats, hinge members fixed to the upper ends of the side pieces of said other section, and an extensible brace portion connected to said hinge members.

2. The structure in claim 1, in combination with U-shaped wear plates mounted in the step seats and having wings by which said plates are secured in place.

3. In a device of the character described, a step portion including two telescoping sections, a brace portion consisting of two telescoping sections, means to which said portions are connected to form a step ladder, one of the sections of the step portion having longitudinal slots with offset step seats in its side pieces, adjustable steps between the slotted side pieces, necks on the ends of said steps for selective registration with the slots and seats, and heads on the outer ends of said necks for disposal outside of the side pieces.

4. The structure in claim 3, in combination with pins temporarily projected through the side pieces and disposed beneath the adjustable steps when the latter are positioned with their necks in the step seats.

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