Dec. 18, 1934. M. RASSMUSSEN 1,984,655

STEPLADDER

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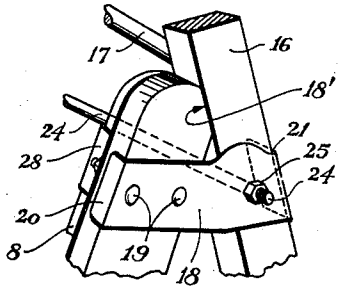


Fig. 4.

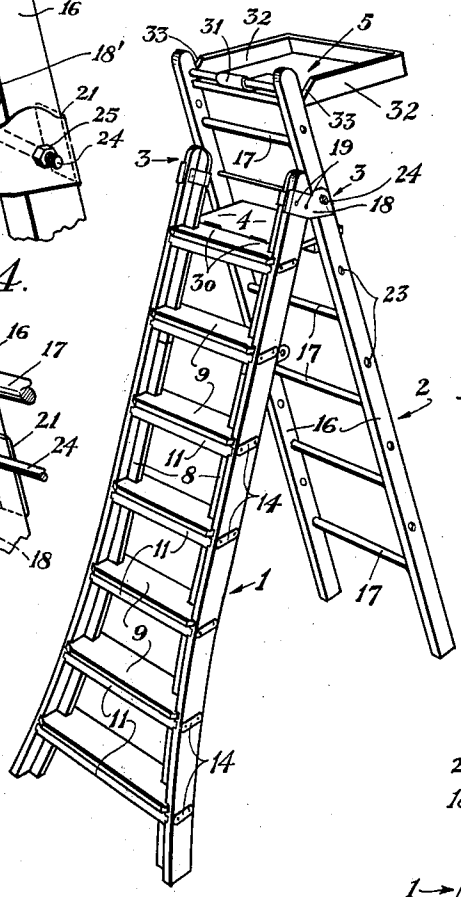


Fig. 1.

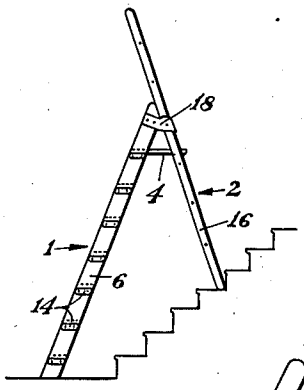


Fig. 2.

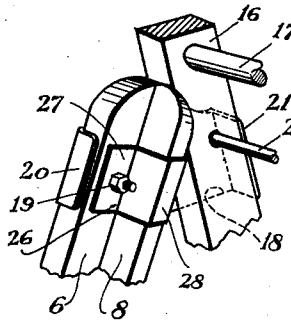


Fig. 5.

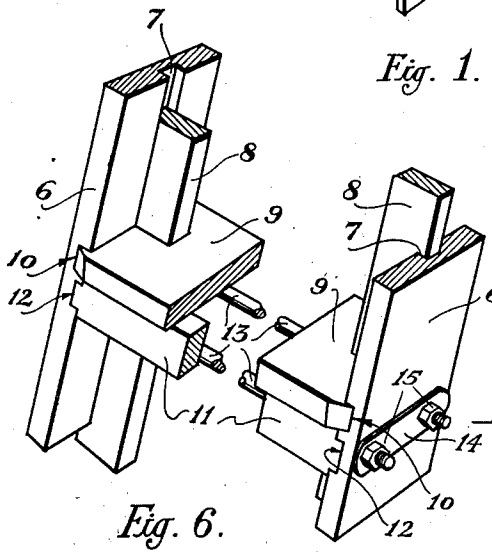


Fig. 6.

Fig. 3.

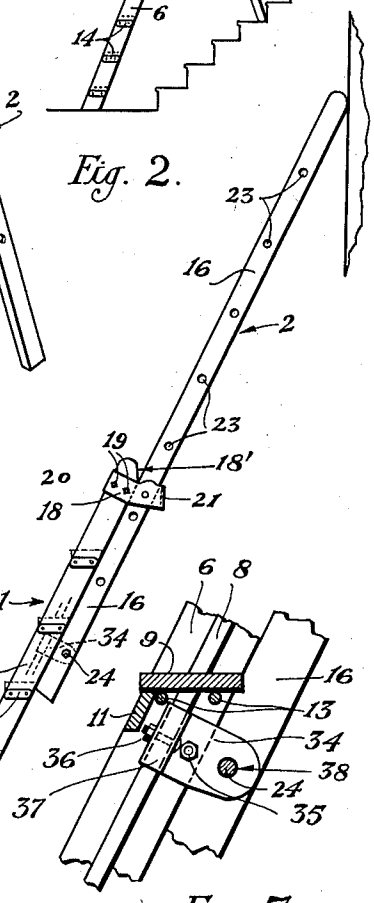


Fig. 7.

INVENTOR.
Martin Rassmussen.
BY Arthur L. Thacher
ATTORNEYS.

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STEPLADDER

Martin Rassmussen, Los Angeles, Calif.

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2 Claims. (Cl. 228—25)

This invention relates particularly to a type of ladder embodying two sections, each having steps, or rungs thereon, and so arranged that one of the sections may be optionally hinged to or extensibly supported on the other section, and when hingedly supported, so arranged that the extensible section may be fulcrumed at any one of a selected number of points. Thus, such a ladder may be either self supporting with one of the sections forming a brace for the other section, or when the two sections are adjusted and extended, one upon the other, the two sections will serve as an ordinary extension ladder adapted to rest against a wall or other supporting surface at its upper end.

Another object is to provide a ladder of maximum rigidity and durability wherein the side rails are provided on their inner sides with reinforcing ribs mortised into longitudinal grooves in the rails and arranged so that in cross section said ribs will be disposed at right angles to the rails, thereby providing side rails of T cross section.

A further object is to provide at the top of the main section of the ladder a platform which may be hingedly secured to the top step of the section and adapted to be additionally supported at an opposite edge thereof on a step or rung of the adjustable section, so that under certain conditions said platform may be used for supporting a workman for any desired purpose.

Other objects include: the provision of reinforcing cleats under the forward edges of the steps or treads; the provision of a shallow tray at the top of the adjustable section which is detachably supported and adapted to be used for supporting articles, tools, equipment, etc. in a position convenient to a workman using the ladder. Still other objects may appear as the description progresses.

In the accompanying drawing I have shown a preferred form of my invention, subject to modification within the scope of the appended claims without departing from the spirit thereof. In said drawing:

Fig. 1 is a perspective view of my improved ladder with the two sections hingedly connected, one of said sections having steps as in the well known braced type of domestic stepladder and the other section having rungs as usually provided in an extension ladder for external use.

Fig. 2 is a side elevation of the form of ladder shown in Fig. 1 with the adjustable section slightly elevated above the other section and hingedly connected therewith, as when the ladder is used on an inclined surface or when one section is supported at a point on a stairway above the level of the bottom of the other section.

Fig. 3 is a side elevation of the ladder with the two sections extended one upon the other to form an extension ladder.

Fig. 4 is an enlarged fragmentary perspective view of portions of the two sections and the means for adjustably connecting the same for use.

Fig. 5 is a perspective view of the structure shown in Fig. 4 as seen from the interior of the ladder.

Fig. 6 is a fragmentary view, in perspective, of a central portion of the main section showing details of the structure.

Figure 7 is a fragmentary section showing the two sections in extended positions and means for connecting the same together.

As preferably arranged the ladder embodied in this invention is arranged for internal and external use, and to that end embodies certain characteristics of the ordinary stepladder and an extension ladder. Accordingly I provide a main section 1 having the general appearance of a household stepladder and a relatively adjustable section 2 somewhat similar to a longer and different type of ladder used for outside purposes.

The two sections are hingedly and extensibly connected at points 3, 3 near the upper extremities thereof, and the main section 1 is provided with a platform 4 while a shallow tray 5 is carried on the upper end of the adjustable section 2.

The section 1 embodies side rails 6, 6, arranged edgewise, each of which is longitudinally grooved on its inner side at 7 to receive a rib 8 adapted to be permanently attached to the rail within said groove by suitable means, thereby providing a rigid rail at each side of the ladder section of T cross section. A plurality of steps, or treads 9 are attached at their ends to the rails 6, 6, preferably by grooving the rails transversely, as at 10, and at the front of the ladder section cleats 11, 11, etc. may be provided beneath the front edges of the treads 9 and attached at their ends to the rails 6 within grooves 12, as shown.

The rails 6, 6 are cross connected and rigidly tied together at a plurality of points immediately beneath the treads 9, 9, etc. by means of tie rods 13, 13 arranged in pairs, the ends of said rods being extended through the rails 6, 6 and plates 14, 14, etc. which are laid transversely of the rails. Nuts 15, 15, are tightly secured on the ends of the rods 13 externally of the plates 14, as shown in Fig. 6, for rigidly securing the parts of the assembled section 1 together.

The adjustable section 2 is of simple form with spaced rails 16, 16 and rungs 17, 17, etc. connecting and suitably secured to the rails at

their ends, but said section 2 may also be formed with horizontal steps or treads as in section 1 if desired, or otherwise. Preferably the rails 16, 16 are spaced laterally so as to correspond to and to overlie the rails 6, 6, of section 1 at least for a substantial distance, so that when the two sections are arranged in extended positions as shown in Fig. 3, the section 2 will be braced and supported by the section 1.

Near the upper extremities of rails 6, 6, I provide attaching plates 18, 18 which are secured to the rails 6 permanently by means of bolts 19, 19, etc. and have flat body portions which overlie the outer sides of rails 6 and 16 at each side of the ladder. Said plates have flanges 20 and 21 at their opposite ends which are bent to lap over the front edges of the rails 6, 6 and the rear edges of rails 16, 16, respectively. Said flanges are formed at angles to conform to the angularity of the ladder sections 1 and 2 when they are connected as shown in Figs. 1 and 2. Rails 6, 6 are cut at their upper extremities on lines 18', 18' and paralleling the flanges 21 so as to abut the front edges of rails 16, 16 when the two sections of the ladder are disposed as shown in Fig. 1.

The rails 16, 16, of section 2 are provided with horizontally opposite perforations 23, 23, etc., at regularly spaced points intermediate their ends for receiving a detachable hinge rod 24 which is normally carried by the plates 18, 18 and is adapted to be extended through a selected pair of the perforations 23 in the rails 16, 16, for hinging the section 2 to section 1 of the ladder at a selected elevation. When properly positioned the rod 24 is held by means of a nut or nuts 25 attached to one or both ends of the rod, one nut only being necessary when the rod is provided with a head at its other end.

The rails 6, 6, internally are provided with reinforcing plates 26 opposite the plates 18 and attached to the rails by means of the bolts 19 extending through the plates 18 and rails and which also hold the plates in position. Plates 26 have feet as at 27 engaging the inner side of the rail 6, in each case, and central U shaped portions 28 which overlie the ribs 8.

Section 1 is provided with a foldable platform 4 which is hinged at its forward edge to the uppermost step 9 of the section by means of hinges 30, 30, and the rear edge portion thereof is supported on one of the rungs 17 of the adjustable section 2 when the platform is positioned for use, as shown in Fig. 1. When not in use the platform may be folded upwardly against the ribs 8, 8, inasmuch as the platform is of such a width that it may be moved or rest between the rails 16, 16 of section 2.

Section 2 may be provided with a shallow tray 5 which is preferably detachable and is adapted to be supported on any one of the rungs 17, but preferably the top rung, as shown. The tray has a flat attaching member 31 of semicircular cross section centrally held thereon and extended forwardly so as to detachably engage one of the rungs 17. The tray has ends 32, 32 which are disposable in the planes of the rails 16, 16 and the forward edges thereof are beveled as at 33 to permit the tray to be swung upwardly behind the rails 16, 16, in order to hook the member 31 on the rung 17. Thereafter the tray is moved downwardly until the ends 32, 32 engage the rails 16, 16 and prevent the disengagement of the member 31 from the rung 17.

At one or more points below the upper extremity of section 1 the rails 6, 6, are provided with plates 34, which are attached to the rails by means of bolts 35 and additionally, if necessary, by means of bolts 36 extended through the ribs 9 and through U shaped portions 37 of the plates which extend around said ribs, as shown in Fig. 7. Said plates 34 are attached to the inner sides of the rails 6, 6, and extend rearwardly from the rails for engagement with the outer sides of the rails 16, 16, of the section 2 of the ladder. The extended portions of the plates 34 have perforations 38 adapted to receive a tie rod, as at 24, thus holding the lower portion of section 2 snugly and firmly against the rear edges of the rails 6, 6, of section 1 when the ladder is used as an extension ladder as shown in Fig. 3. In such case the flanges 21 of plates 18 engage the rear edges of rails 16, 16 at the upper extremity of section 1 and prevent the disengagement of the two sections.

The tie rod 24 which connects the sections 1 and 2 when the sections are arranged as shown in Fig. 1, may be removed from the plates 18 and connected with the plates 34 when the sections are arranged as shown in Fig. 3, the rod 24 being threaded through the perforations 23 at a selected elevation and the nut 25 attached thereto for preventing the disengagement of the two sections.

It will be observed from the foregoing description and the drawing illustrating my invention that I have provided a ladder which is adaptable to many uses either inside or outside of a building for domestic and industrial purposes.

What I claim is:

1. A ladder comprising a main section and a relatively adjustable section, each having a pair of rails with treads at spaced intervals thereon, the rails of the two sections being correspondingly spaced apart, attaching members secured to and extended rearwardly of the rails of said main section for hingedly and slidably receiving the rails of the adjustable section, said attaching members having portions adapted to extend around the rails of the adjustable section, a rod for cross connecting the rails of the two sections and insertible through said attaching members, the rails of the adjustable section being provided with correspondingly positioned orifices for receiving said rod, whereby the adjustable section may be hingedly connected with the main section at any one of a plurality of points intermediate the ends of the adjustable section, for providing a self supporting ladder structure.

2. A ladder as characterized in claim 1 including fixtures secured to and extended rearwardly from the rails of said main section at corresponding points intermediate the ends of the main section for engagement with the rails of the adjustable section, whereby when said rod is removed from said attaching members and attached to said fixtures said attaching members and said fixtures will serve to support said sections in longitudinal alinement as an extension ladder.

MARTIN RASSMUSSEN.