Aug. 6, 1929. R. H. IRELAND 1,723,938

EXTENSIBLE STEPLADDER AND CHAIR

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Fig. 2.

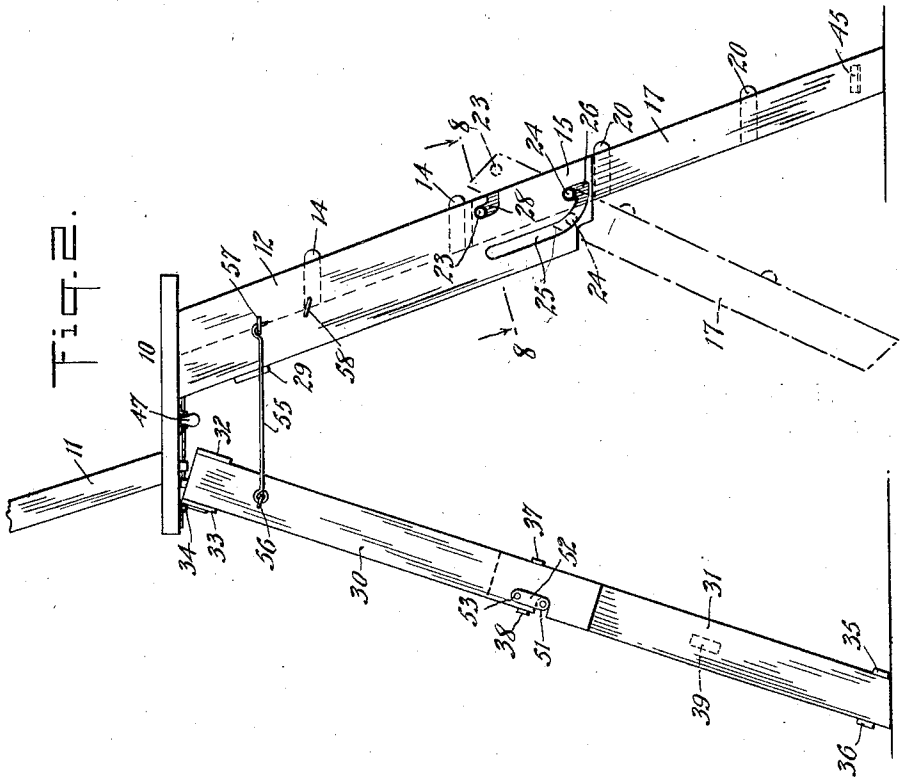
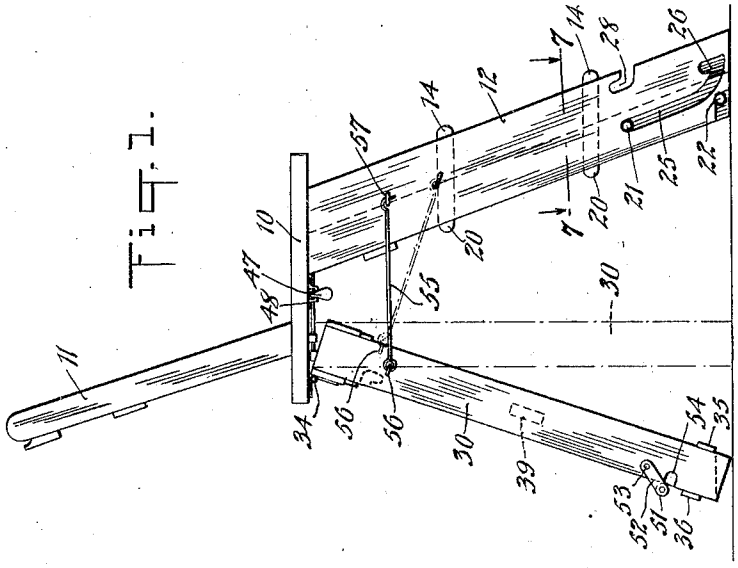


Fig. 1.



WITNESSES

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Fig. 5.

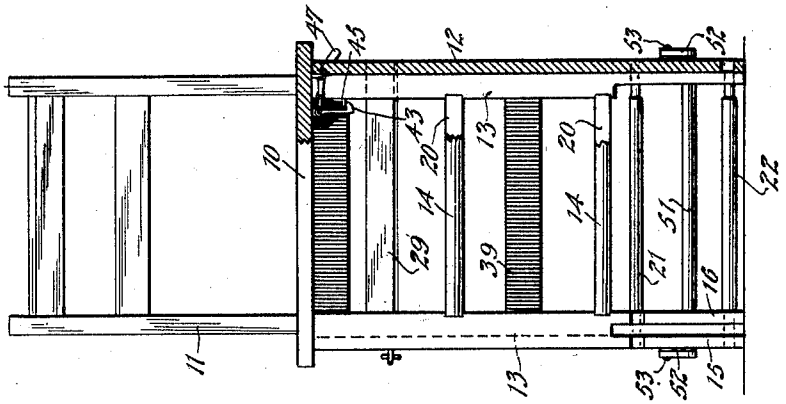


Fig. 4.

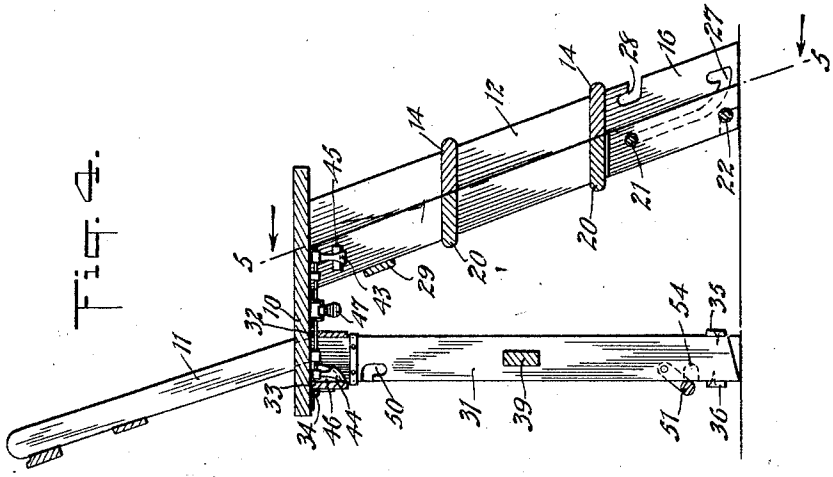
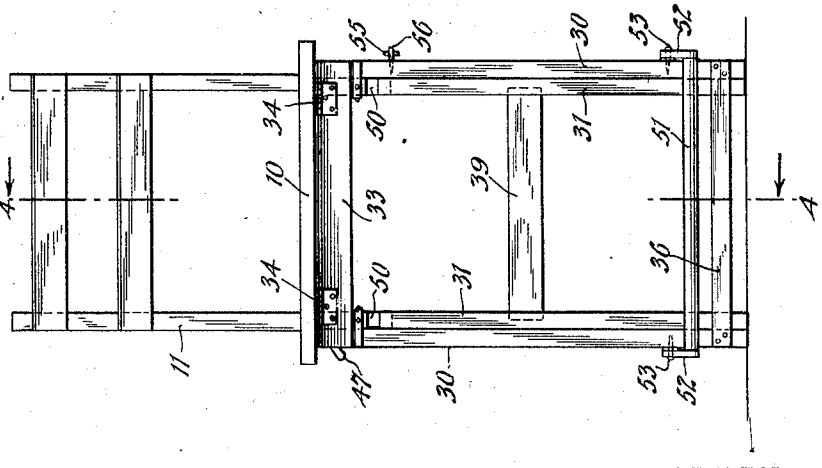


Fig. 3.



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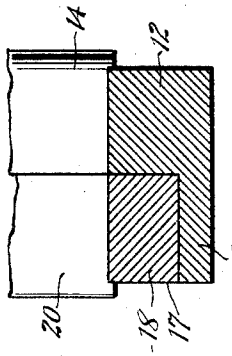


Fig. 7.

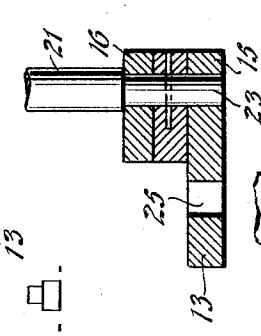


Fig. 8.

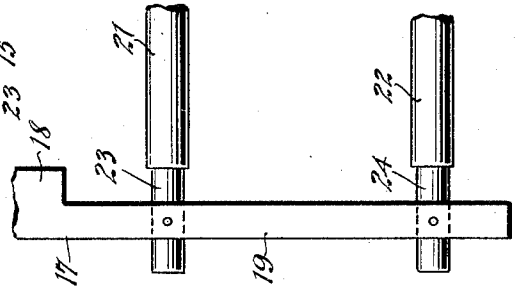


Fig. 9.

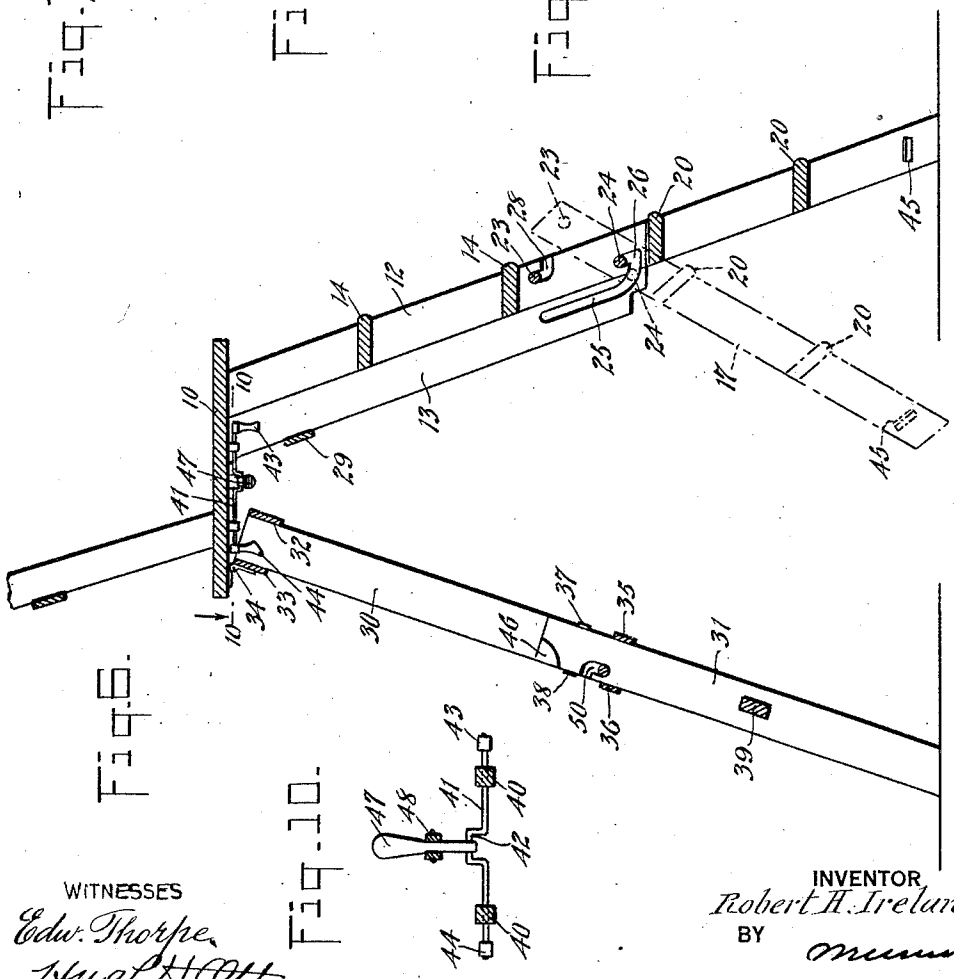


Fig. 6.

Fig. 10.

WITNESSES

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Patented Aug. 6, 1929. 1,723,938

UNITED STATES PATENT OFFICE.

ROBERT H. IRELAND, OF NEW YORK, N. Y.

EXTENSIBLE STEPLADDER AND CHAIR.

Application filed December 21, 1927. Serial No. 241,638.

This invention relates to household accessories and comprehends a combined step-ladder and chair which is especially useful in kitchens, pantries and the like.

One of the principal objects of the present invention resides in the extensible feature of the step-ladder, which facilitates the increase in the height of the same.

The invention furthermore comprehends an extensible step-ladder, the height of which when folded is materially increased by the mere act of lifting the same clear of the floor while releasing a latching means.

As a further object the invention comprehends automatically operable means for positively locking the foldable or collapsible leg sections in their extended condition so as to prevent accidental collapsing or folding of the ladder when in use.

Other objects reside in the comparative simplicity of construction and mode of operation of the ladder, the economy with which the same may be produced, and the general efficiency derived therefrom.

With the above recited and other objects in view, reference is had to the following description and accompanying drawings in which there is exhibited one example or embodiment of the invention, while the appended claims define the actual scope of the invention.

In the drawings—

Figure 1 is a side view of the ladder in its folded or collapsed condition either for use as a chair or as a low step-ladder;

Fig. 2 is a similar view illustrating the ladder in extended condition for materially increasing the height of the same;

Fig. 3 is a rear view of the ladder in folded condition as illustrated in Fig. 4;

Fig. 4 is a vertical sectional view illustrating the same in folded condition with the rear leg structure in a vertical position;

Fig. 5 is a front view with parts broken away and shown in section.

Figure 6 is a vertical sectional view of the ladder in extended or opened condition, illustrating in broken lines the manner in which the lower front leg section is moved from its closed to opened position or vice versa.

Figure 7 is a horizontal fragmentary sectional view taken approximately on the line 7—7 of Figure 1.

Figure 8 is a similar view taken approximately on the line 8—8 of Figure 2.

Figure 9 is a fragmentary front view of the swingable lower section of the front leg structure.

Figure 10 is a horizontal sectional view taken approximately on the line 10—10 of Figure 6, of the latch mechanism.

Referring to the drawings by characters of reference, 10 designates a horizontal platform which may constitute a chair seat and which may be provided with a back rest 11 adjacent its rear edge. Carried by the under side of its forward edge is a front leg structure including a pair of laterally spaced upper sections 12 rigidly attached to the platform and extending downwardly and forwardly at an angle thereto. The sections 12 are provided with rearwardly projecting flanges 13 of a reduced thickness while the main portion of the sections are connected by transverse steps 14. The lower ends of the sections 12 are bifurcated and form outer and inner furcations 15 and 16, the former being of substantially the same thickness as the flanges 13. The front leg structure includes swingable lower sections 17, the upper ends 18 of which are of a width and thickness to nest within the angle formed by the sections 12 and their flanges 13, while the remaining lower portions 19 are reduced and are of a thickness to snugly fit between the furcations 15 and 16. The sections 17 are connected by transverse steps 20 and are further connected by cross bars 21 and 22 having reduced terminals 23 and 24 which extend through the reduced lower portion 19 of the section 17 to constitute trunnions. The trunnions 24 extend through slots 25 formed in the flanges 13 and having bayonet slotted terminals 26 extending into the outer furcations 15. The inner furcations 16 have similarly formed bayonet slots 27 in transverse registry therewith and extending inwardly from their rear edges. At the forward edges the furcations 15 and 16 have alined bayonet slots 28 reversely disposed with respect to the bayonet slot terminals 26 and the bayonet slots 27. Under this arrangement the lower sections of the front leg structure are swingably connected with the upper sections of the front leg structure in such a manner that when the lower sections are in an upwardly swung position and engage behind the transverse cleat 29 which is attached to the rear edges of the flanges 13, elevation or lifting of the structure from the floor or other supporting surface will

permit the lower sections to initially slide downwardly by gravity to a point where the same is disengaged from behind the cross cleat 29 and thence swung downwardly by gravity to a position in prolongation with the upper sections, after which engagement of the lower ends of the lower sections with the floor, will cause the trunnions 23 and 24 to respectively engage within the bayonet slots or bayonet slot terminals to lock the sections against accidental movement when the ladder is in use.

The ladder further includes a rear leg structure including upper laterally spaced leg sections 30 and lower laterally spaced leg sections 31. The upper leg sections 30 are connected by front and rear transverse cleats 32 and 33, the latter having hinged connection at 34 with the rear under side of the platform 10 to permit the same to swing from a normally vertical depending position to a rearwardly inclined position. The lower rear leg structure including the laterally spaced sections 31, is slidably associated with the upper sections 30 by movement between transverse forward and rear cleats 35 and 36, the sections 31 being connected by front and rear cleats 37 and 38 and by an intermediate cross piece 39.

Mounted in suitable bearings 40 on the under side of the platform adjacent one side edge, is a latch rod 41 having an eccentric or crank portion 42 and provided at its opposite ends with hooked portions 43 and 44, the former adapted to engage with a keeper 45 on the inner face of one of the lower front leg structure sections 17. The latter hooked portion 44 is adapted to engage with a segmental keeper element 46 provided on the inner surface of one of the sections 31 at its upper end, the arcuate face of which element 46 when the lower section is fully elevated, is disposed on a radius coincident with the hinge 34. The weighted lever 47 is fulcrumed in bearings 48 on the under side of the platform 10 and is operatively connected with the crank portion 42. The weighted lever normally operates to move the hooked elements 43 and 44 into engagement with the keepers 45 and 46 when the lower front and rear leg sections 17 and 31 are disposed in their elevated position. It thus follows that when the ladder is in a folded or lowered condition, as illustrated in Figs. 1, 3, 4 and 5, the same may be extended to its raised position by lifting the same by means of the platform 10 and raising upwardly on the weighted lever 47 to release the hooked elements 43 and 44 from the keepers 45 and 46. The front leg structure will open to its extended condition as previously described while the rear leg structure will slide downwardly to its extended condition. In order to lock and maintain the lower rear leg sections in their extended condition, a bayonet slot 50 is provided in the rear edge of said sections while a weighted transverse bar 51 having terminal arms 52 pivoted at 53, is designed to gravitationally move into the bayonet slots 50. In order to allow the movement of said locking bar 51 into the bayonet slots, the upper rear leg sections 30 are provided with slots 54 extending inwardly from the rear edges. The rear leg structure when folded is maintained in a vertical depending position by means of a hook 55 pivoted to the outer side of one of the upper sections 30, at 56, and engageable in an eye 57 on one of the upper sections 12 of the front leg structure. When swung rearwardly to an angular position for extension of the ladder, the hook 55 is adapted to be engaged in a lower eye 58 on the front leg section 12.

In use and operation, the device when folded and collapsed, as illustrated in Fig. 4, may be employed as a chair, in which instance the platform 10 constitutes a seat. In this condition the device may also be employed as a low step-ladder. When it is desired to extend the ladder, the operator grasps the platform at the side edges at the same time raising the outer end of the weighted lever 47 so as to release the hooked elements 43 and 44 from the keeper elements 45 and 46. By lifting the ladder, the lower sections of the front leg structure will initially slide downwardly and thence swing downwardly and forwardly until the trunnions 23 and 24 properly engage in the bayonet slots. At the same time, the lower rear leg sections 31 will slide downwardly until the locking rod 51 engages in the bayonet slots 50. As the lower end of the extended leg structure rests on the floor or supporting surface, it is obvious that the trunnions and locking rod will be maintained in the bayonet slots against accidental displacement while the ladder is being used in its extended condition.

What is claimed is:

1. An extensible step-ladder, including a platform, a depending angularly disposed front leg structure having a rigid upper section and a pivotally connected lower section, a normally vertically depending rear leg structure swingable rearwardly to an angular position, means for securing the same in either of said positions, a downwardly slidable lower rear leg section, and a common manually releasable means for retaining the lower sections of the front and rear leg structures in a raised position.

2. An extensible step-ladder including a platform and depending front and rear leg structures, the former comprising a rigid forwardly inclined upper section composed of a laterally spaced pair of members and transverse connecting steps, said members each having a rearwardly projecting outer

side flange and a bifurcated lower end, the furcations having alined bayonet slots extending inwardly from the forward edge and the inner furcation of each having a bayonet slot extending inwardly from the rear edge, the flanges having a longitudinal slot adjacent the lower end provided with a forwardly extending lower portion and a bayonet slot terminal in the outer furcation of each member communicating with said longitudinal slot, the said front leg structure including a lower section composed of a laterally spaced pair of members, cross steps connecting the same and cross rods having the terminals projecting therethrough, the terminals of one of the cross rods engaging in the longitudinal slot for slidably and swingably associating the lower section with the upper section and the terminals of the other cross rod adapted upon extension of the ladder to engage in the front bayonet slots of the furcations for locking the leg structure in extended condition.

3. An extensible step-ladder, including a platform and depending front and rear leg structures, the former comprising a rigid forwardly inclined upper section composed of a laterally spaced pair of members and transverse connecting steps, said members each having a rearwardly projecting outer side flange and a bifurcated lower end, the furcations having alined bayonet slots extending inwardly from the forward edge and the inner furcation of each having a bayonet slot extending inwardly from the rear edge, the flanges having a longitudinal slot adjacent the lower end provided with a forwardly extending lower portion and a bayonet slot terminal in the outer furcation of each member communicating with said longitudinal slot, the said front leg structure including a lower section composed of a laterally spaced pair of members, cross steps connecting the same and cross rods having the terminals projecting therethrough, the terminals of one of the cross rods engaging in the longitudinal slot for slidably and swingably associating the lower section with the upper section and the terminals of the other cross rod adapted upon extension of the ladder to engage in the front bayonet slots of the furcations for locking the leg structure in extended condition, and manually releasable means for retaining the lower section in raised position, including a latch rod having a hooked terminal and a keeper on the lower leg section.

4. An extensible step-ladder, including a platform and depending front and rear leg structures, the latter including a normally vertically depending upper section comprising a pair of laterally spaced members having hinged connection for swinging movement rearwardly to an angular position, and a lower section including a pair of laterally spaced members slidably associated with the upper section and having bayonet slotted portions, and a gravity locking means engageable with the bayonet slotted portions for locking the lower leg section in extended condition.

5. An extensible step-ladder, including a platform and depending front and rear leg structures, the latter including a normally vertically depending upper section comprising a pair of laterally spaced members having hinged connection for swinging movement rearwardly to an angular position; a lower section including a pair of laterally spaced member slidably associated with the upper section and having bayonet slotted portions and a gravity locking means engageable with the bayonet slotted portions for locking the lower leg section in extended condition, and manually releasable means for retaining the lower section in elevated position.

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