

April 2, 1935.

F. WHITE

1,996,133

LADDER

Filed Dec. 26, 1933

2 Sheets-Sheet 1

Fig. 7.

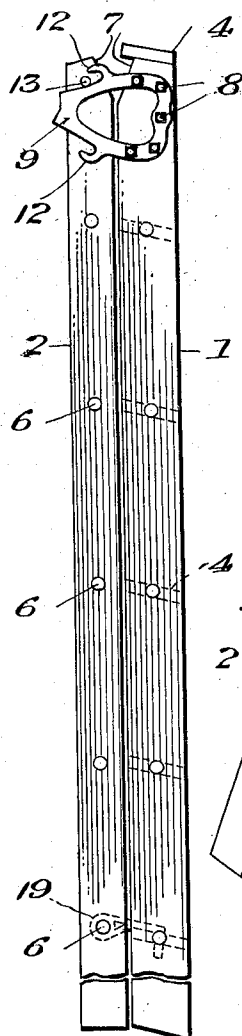


Fig. 1.

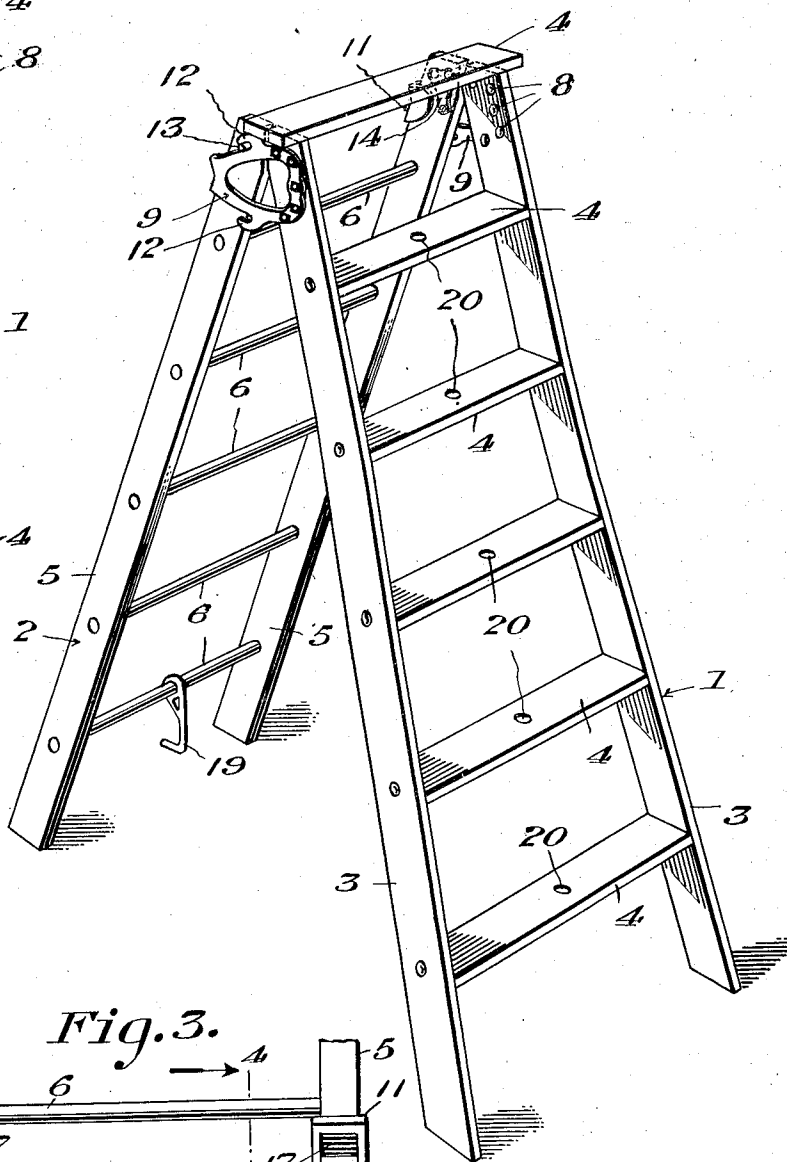
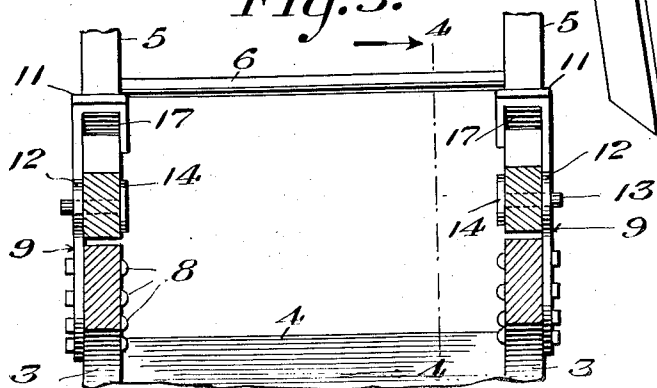


Fig. 3.



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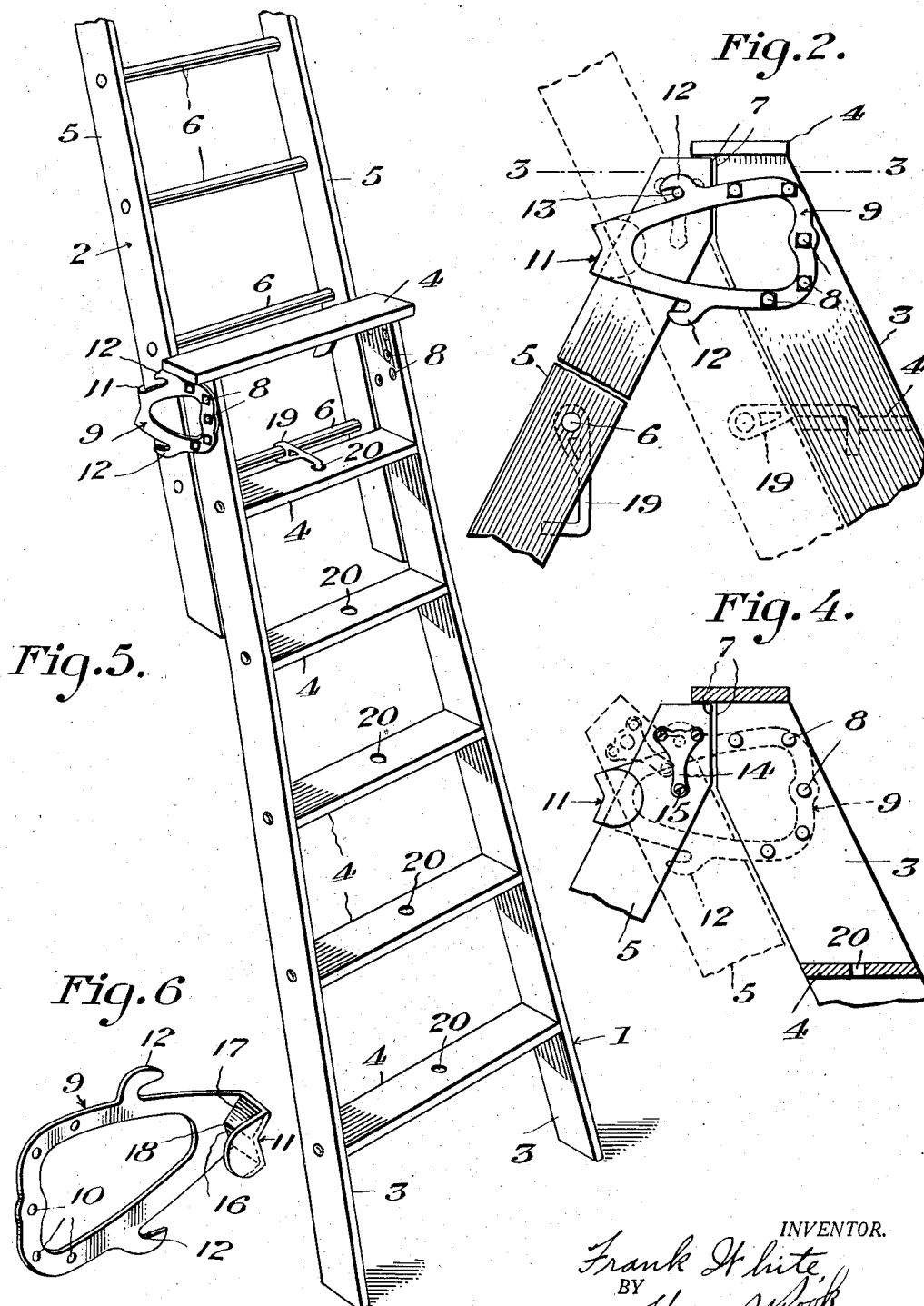
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LADDER

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2 Claims. (Cl. 228—25)

My invention relates to ladders and more particularly to improvements in ladders of the so-called "convertible type".

Generally speaking the principal object of my invention is to provide a sectional ladder of novel and improved construction which may be readily converted into either a step ladder or an extension ladder as desired.

Specifically my invention is directed toward providing a ladder including complementary step and rung sections, respectively, and equipped with novel and improved efficient inexpensive means for coupling the sections together so that they may be either swung into angular relation and locked against both separative and relative longitudinal movement to form a stepladder, or, slid longitudinally of each other to different positions and locked together in such positions to form an extension ladder variable in height.

Other objects will appear from the following description of a preferred embodiment of my invention which has been illustrated in the accompanying drawings, and defined in the claims appended hereto.

Referring to the drawings in which corresponding and like parts are designated throughout the several views by the same reference characters,

Figure 1 is a perspective view illustrating the sections swung into angular locked relation to convert them into a step ladder,

Figure 2 is an enlarged fragmentary view, in side elevation of the upper ends of the sections related as in Figure 1 and showing in dotted lines the rung sections arranged to form an extension ladder,

Figure 3 is a view in transverse section taken on the line 3—3 of Figure 2,

Figure 4 is a view in vertical section taken on the line 4—4 of Figure 3 looking in the direction indicated by the arrows,

Figure 5 is a perspective view illustrating the sections converted into an extension ladder,

Figure 6 is a perspective view of one of a pair of brackets forming part of the before-mentioned coupling means, and

Figure 7 is a view in side elevation illustrating the sections collapsed and locked as when not in use.

Specifically describing the invention, and first considering the invention in its stepladder aspect, the numeral 1 designates the stepladder section and 2 the rung section, the former comprising side stiles 3 and equidistantly spaced steps 4 and the latter having similar stiles 5 and similarly spaced rungs or rounds 6. The sections are

arranged in juxtaposed relation, and the inner or adjacent edges of the stiles 3 and 5 are beveled longitudinally at their upper ends, as at 7, to permit the ends of the sections to be closely disposed in angular relation to each other.

Secured, as by bolts 8 to the outer sides of the stiles 3 adjacent their upper ends are a pair of opposed guide brackets 9 constituting coupling members for said sections and having the form of substantially ovoid frames provided with apertures 10 for receiving the bolts 8. The brackets 9 extend rearwardly of the stiles 3 and terminate in inwardly projecting hooked ends 11 adapted to span the rear edges of the stiles 5 of section 2 and upon which either or both sections 1 and 2 may fulcrum when relatively swung, said hooked ends also serving to guide the sections 1 and 2 in their relative longitudinal sliding movement. Upstanding rearwardly opening hooks 12 are provided on the upper edges of the brackets 9 to receive studs 13 projecting laterally through the upper ends of the stiles 5 from plates 14 secured as by screws 15 to said stiles.

The arrangement of the hooked ends 11, the hooks 12, and the studs 13 is such that the sections 1 and 2 may be swung away from each other into angular relation with their upper ends juxtaposed to form a step ladder, such swinging movement positioning the studs 13 in the hooks 12 and the rear edges of the stiles 5 against the hooked ends 11. In this position of the parts said hooked ends 11, hooks 12 and studs 13 form in effect locking means preventing further separative and also relative longitudinal movements of the sections 1 and 2. By swinging the sections 1 and 2 toward each other into substantial parallelism the studs 13 are withdrawn from the hooks 12, as illustrated in Figure 4 and said sections are unlocked for relative longitudinal movement to form an extension ladder. If desired the hooks 12 may be duplicated on the lower edge of the brackets 9 so that the latter are interchangeable. The bights of the hooked portions 11 are each formed with two oppositely inclined faces 16 and 17, respectively, providing convex bearing ridges 18 for facilitating swinging movement of the sections 1 and 2. The faces 16 are inclined in the plane of the rear edges of the stiles 5 when the sections 1 and 2 are angularly related to form a stepladder whereas the faces 17 are inclined in the plane of said edges when the sections 1 and 2 are parallel. The advantage of the inclined faces 16 and 17 is that they afford bearing surfaces sufficiently extensive to prevent the hooked ends 11 from biting into the stiles 5 in the different positions of the latter

and thereby facilitate sliding movement of the sections 1 and 2.

The upper edges of the brackets 9 provide substantially straight, uninterrupted tracks between the hooks 11 and 12 upon which the section 2 may be suspended for sliding movement as will be clear. Hence by merely tilting the section 1 so that the section 2 is in suspended position the latter may be caused to gravitate rearwardly to withdraw the studs 13 from the hooks 12, the beveled ends 7 of said sections pivoting on each other at the lower corners of said bevels, whereby the studs 13 are caused to swing in an arc about said corners thereby positively withdrawing said studs from the hooks 12.

Referring now to my novel ladder in its extension aspect as best shown in Figure 5, the sections 1 and 2 are adjustable longitudinally to vary the height of the ladder by degrees corresponding to the spacing of the steps 4 of the section 1. To this end cooperating locking devices are provided on the sections 1 and 2 in the form of a hook member 19 mounted to swing on the lower rung 6 of the section 2 and apertures 20 formed in the steps 4 of the section 1 and into which the hook member 19 may be inserted when the sections have been adjusted as desired.

When the ladder is not in use the sections 1 and 2 may be collapsed by sliding and swinging them together, and may be locked in such condition as shown in Figure 7.

The foregoing constitutes a detailed description of a preferred embodiment of my invention but it is to be understood that right is herein reserved to changes and modifications falling fairly within the scope of the appended claims when they are construed in the light of the prior art.

Having thus described my invention, what I claim is:

1. As an article of manufacture, a bracket having the form of a substantially ovoid frame including, a pair of hooks outstanding from opposite side edges thereof, respectively, and having a hooked end, the bight of the hooked end being formed with oppositely inclined flat faces converging into a convex ridge.

2. A ladder including step and leg sections, respectively, and means for coupling said sections in angular step ladder relation and comprising, a pair of brackets projecting rearwardly from opposite sides of the step section and receiving the leg section therebetween, a pair of studs projecting laterally from opposite sides of the leg section to overlie said brackets and suspend the leg section therefrom, inwardly projecting forwardly opening hooks at the rear ends of said brackets for surrounding the rear edges of said leg section, and hooks upstanding from the upper edges of said brackets for receiving said studs in the angular relation of said sections, the stud receiving hooks opening rearwardly and the upper edges of said brackets being substantially straight between said bearing portions and said hooks to automatically guide said studs into and out of the hooks respectively upon relative angular movement of said ladder sections in opposite directions, whereby the leg section when suspended from said upper edges of said brackets in parallel relation to said step section will be caused to gravitate rearwardly on said brackets and withdraw the studs from said hooks upon tilting of the step section to vertical position while movement of said sections toward angular relation will cause said studs to slide on said upper edges of the bracket into said hooks.

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