Nov. 4, 1924. 1,514,569

C. W. PETTES

STEPLADDER

Filed March 1, 1924

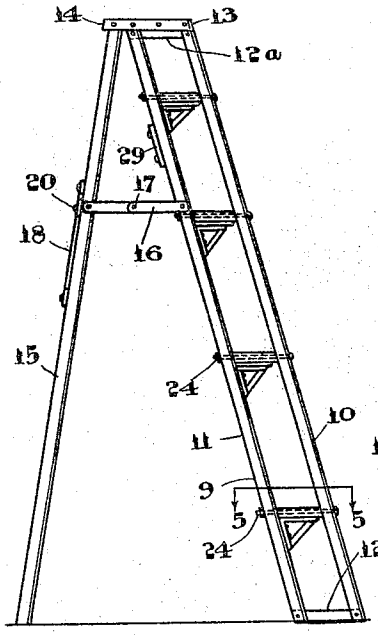


FIG. 1

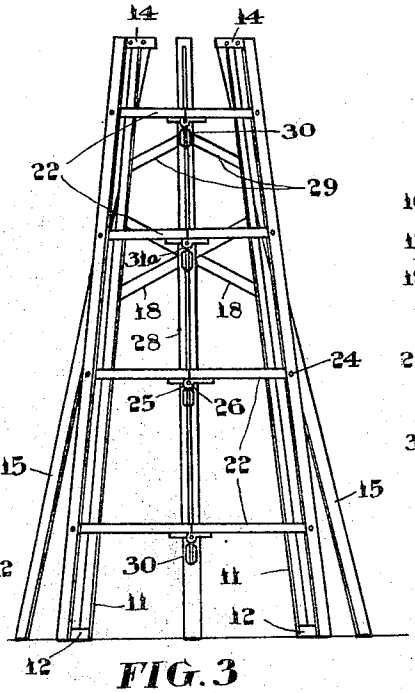


FIG. 3

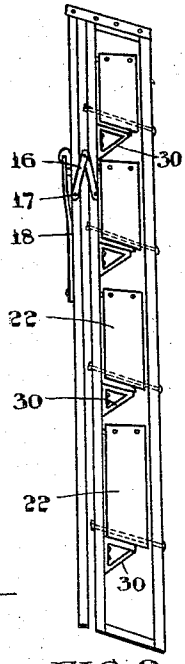


FIG. 2

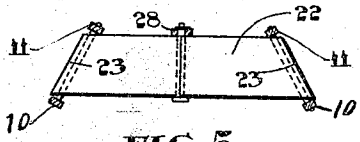


FIG. 5

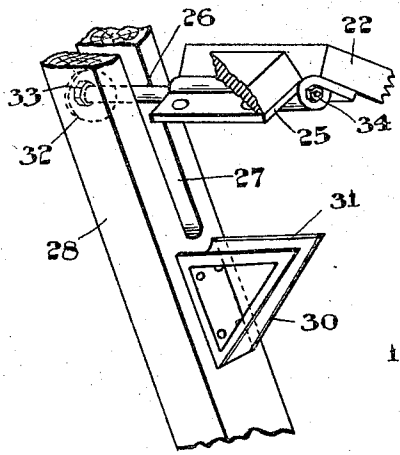


FIG. 4

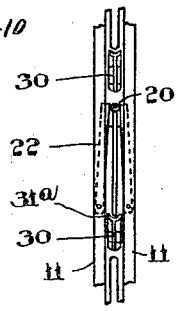


FIG. 6

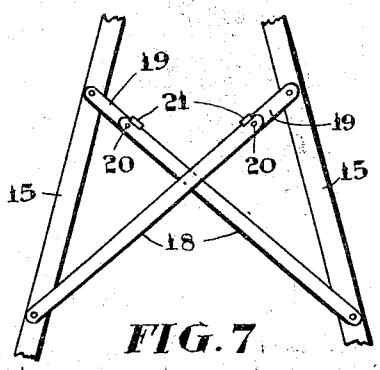


FIG. 7

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UNITED STATES PATENT OFFICE.

CLARE W. PETTES, OF VERDUN, QUEBEC, CANADA.

STEPLADDER.

Application filed March 1, 1924. Serial No. 696,224.

To all whom it may concern:

Be it known that I, CLARE W. PETTES, a subject of the King of Great Britain, and resident of the city of Verdun, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Stepladders, of which the following is a full, clear, and exact description.

This invention has relation to certain new and useful improvements in folding step ladders and has for its primary object the provision of a step ladder of the character stated which will be of extremely simple and inexpensive construction and may be folded in compact form.

Another object of the invention resides in the provision of a folding step ladder of the character stated in which the steps have angularly cut outer ends and hinged central portions so as to permit compact folding of the steps between the sides of the ladder structure when the ladder is not in use.

The invention has for a further object the provision of a step ladder of the character stated in which the side portions of the ladder structure are positioned at an angle with respect to the steps and the outer ends of the latter cut accordingly; the steps being hinged at their central portions and mounted on hinge pins which are adjustable longitudinally in a central supporting strip for the main portion of the ladder structure, while the rear supporting standards of the ladder are connected with the respective sides of the main part of the ladder and also connected with one another by sectional bracing members, to permit movement of the standards toward one another as the opposite sides of the ladder are folded together with the steps folded between the ladder sides.

The invention has for a still further object the provision of a folding ladder of the character stated which will be constructed so that the complete device may be quickly folded or opened up, as desired and when open for use will be strong and rest firmly on the ground while supporting a considerable weight on the steps of the ladder, without subjecting any of the parts of the ladder to unnecessary or unreasonable strain.

With the foregoing and other objects in view as will appear as the description proceeds the invention consists in the novel construction, combination and arrangement of co-operating elements as hereinafter more specifically set forth, claimed and shown in the accompanying drawings forming a part of the present application, in which:

Figure 1 is a side elevation of the ladder in set up position.

Figure 2 is a side elevation of the ladder in folded position.

Figure 3 is a front elevation of the ladder in set up position.

Figure 4 is an enlarged fragmentary perspective view, showing the hinged portion of one of the steps and the mounting thereof.

Figure 5 is a detail section substantially on the plane of line 5—5 of Figure 1, looking in the direction indicated by the arrows.

Figure 6 is a fragmentary detail front elevation showing the ladder in folded position.

Figure 7 is an enlarged detail fragmentary elevation of the supporting standard and the bracing members for the same.

Referring more in detail to the drawings in which similar reference characters designate corresponding parts throughout the several views, it will be seen that each side 9 of the ladder is in the form of a frame including forward corner members 10 and rear corner members 11 which have their bevelled lower ends connected by the lower frame members 12 and their corresponding bevelled upper ends connected by the upper frame members 12^a. This may be readily understood by referring to Figure 1.

By referring to Figure 7 it will be noted that the supporting standards 15 diverge toward their lower ends and are connected intermediate their ends by the crossed connecting and bracing members 18 and the auxiliary connecting and bracing members 19 pivoted to the upper ends of the connecting and bracing members 18. The lower ends of the connecting and bracing members 18 are pivoted to the supporting standards

15 while the upper ends of the auxiliary connecting and bracing members 19 are pivoted to the supporting standards 15. Pivot pins 20 connect the overlapped ends of the supporting and bracing members 18 and the auxiliary connecting and bracing members 19. Locking lugs 21 are carried by the auxiliary connecting and bracing members 19 for engagement over the edge of the supporting and bracing members 18 at their pivoted upper ends, to retain the auxiliary connecting and bracing members 19 in alignment with the supporting and bracing members 18 and prevent pivotal movement of the latter in one direction on the pivot pins 20, after opening of the supporting and bracing members 18 and the auxiliary connecting and bracing members 19 to operative position, as shown in Figure 7.

The ladder steps 22 are divided transversely into equal sections, as shown clearly in Figures 3 and 5, the steps having the outer ends 23 of the sections thereof cut on an angle to correspond with the side frames 9. The outer end of each section of the steps 22 is mounted on a pivot pin 24 extended transversely through one of the side frames 9 in such a manner as to be in horizontal position when the ladder is open and arranged in set up condition, as shown in Figures 1 and 2. The step sections have hinge members 25 secured to the under faces thereof with the central hinge pins 26 extended therethrough. This is shown clearly in Figures 3 to 6 inclusive.

It will be seen from these views that the central hinge pins 26 work through elongated longitudinal slots 27 provided in the central guide strip 28 employed for this purpose and connected with the rear corner members 11 of the side frames 9, by suitable bracing members 29, which latter are pivotally connected both to the central guiding member 28 and to the side frames 9. Supporting brackets 30 are mounted on the front face of the guiding member 28 and may consist of a bent plate, the upper edges 31 of which are adapted to engage with portions of the hinge members 25 enclosing the hinge pins 26 when the ladder is in the opened or set up position with the steps opened out to their normal or horizontal position as shown clearly in Figures 1 and 3. Modifications may be made in the bracket 30 which may be formed with forked extensions 31^a adapted to receive the hinge members 25. From Figures 3 and 4 it will be seen that the central hinge pins 26 may move freely in the slots 27 during opening out and folding up of the sections of the steps 22. It is also apparent from Figure 4 that the central hinge pins 26 will be held in the slots 27 by means of the disks or washers 32 held on their rear ends by the heads 33 of the hinge pins 26 or other suitable means. The hinge pins 26 are prevented from working out of the hinge members 25 by the nuts 34 on the forward ends of the hinge pins 26 or by any suitable substitute therefor.

It is believed the complete construction and operation of the ladder may now be apparent from the foregoing paragraphs taken in connection with the accompanying drawings without further detail description. It may be briefly stated, however, that when the ladder is not in use, the steps 22 are folded so that they rest within the side frames 9 as the latter are brought together. This is made possible by the cutting of the outer ends of the step sections at an angle, as previously described. The side frames 9 are moved toward one another until the rear corner members 11 thereof engage the step supporting and guiding strip 28. At the same time, the supporting standards 15 are folded in against the side frames 11. During this folding operation, the connecting and bracing members 16 are folded and also the supporting and bracing members 18 with the auxiliary connecting and bracing members 19. This will be clearly understood by referring to Figures 2 and 7. The supporting and guiding strip 28 may be of sufficient length to rest upon the surface on which the ladder is positioned when the same is opened up for use. This will therefore assure a firm support for the hinged central portions of the step sections.

While the preferred embodiment of the invention has been disclosed it is to be understood that minor changes in the details of construction, combination and arrangement of co-operating elements may be resorted to within the scope of what is claimed without departing from the spirit of the invention.

Having thus described my invention, what I claim is:—

1. A step ladder including open side frames arranged to converge toward their rear sides; sectional steps having obliquely cut outer ends mounted in said open side frames; said sectional steps being adapted to be folded into the open side frames as the latter are moved toward one another and brought close together, hinges connecting the central portions of the sectional steps, supporting and guiding means for said hinges, connections between the last mentioned means and the side frames, rear supporting standards, means for pivotally connecting the upper ends of said rear supporting standards with the upper ends of said side frames, means for connecting and bracing said rear supporting standards, and means for hingedly connecting the rear supporting standards with the respective side frames intermediate the ends of said rear supporting standards, the rear supporting standards being adapted to be folded to-

ward one another and toward the open side frames as the ladder is folded into compact form.

2. A foldable ladder comprising side frames, steps consisting of sections having their inner ends hinged together and their outer ends hinged to the side frames, a vertically extending bar adapted to rest upon the ground in the extended position of the parts, links connecting said bar to the side frames, saddles carried by the bar for supporting the central portions of the steps in the extended position of the parts and pin and slot means connecting the bar to each of said steps.

In witness whereof, I have hereunto set my hand.

CLARE W. PETTES.