(No Model.)

LA VERNE W. NOYES.

LADDER AND DUPLEX STEP THEREFOR.

No. 591,418. Patented Oct. 12, 1897.

Fig. 1.

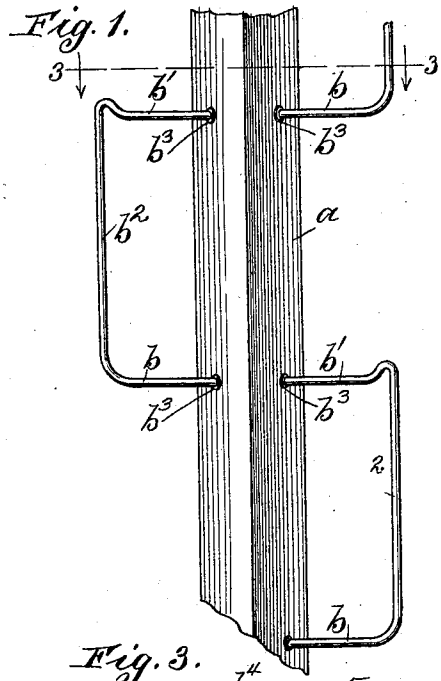


Fig. 2.

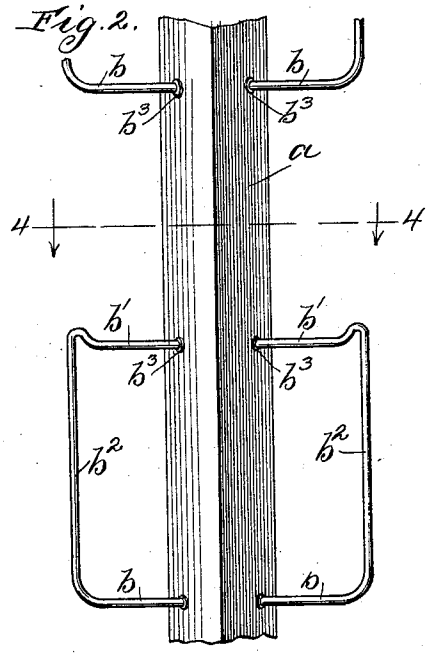


Fig. 3.

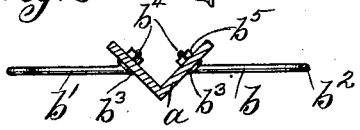


Fig. 4.

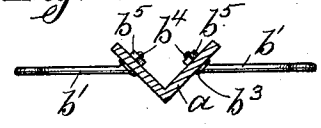
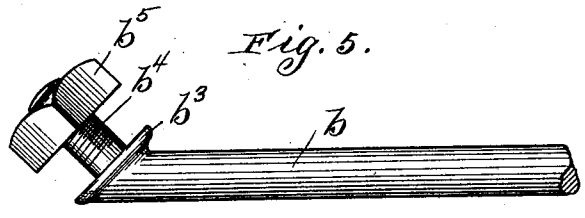


Fig. 5.



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LADDER AND DUPLEX STEP THEREFOR.

SPECIFICATION forming part of Letters Patent No. 591,418, dated October 12, 1897.

Application filed May 26, 1897. Serial No. 638,198. (No model.)

To all whom it may concern:

Be it known that I, LA VERNE W. NOYES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Ladders and Duplex Steps Therefor, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved ladder and duplex step therefor, my object being to provide a form of ladder-step that may be manufactured at small cost and readily placed in position, and, furthermore, to provide a construction which will afford a vertical handhold for the person climbing the ladder.

The duplex step comprises a pair of horizontal foot rods or treads adapted to be secured at their inner ends to the upright or post and joined at their outer ends by a vertical portion, which constitutes a vertical handhold, while at the same time it distributes the load upon a step, so that each of the two foot treads or rods of a pair supports the load which may be imposed upon one of the treads.

In practice I make the double or duplex step from a single bar or rod of metal having the ends bent at right angles to constitute the foot treads or steps, the intermediate portions constituting the handhold and support between the steps. The ends of the rod are preferably upset to form shoulders, and threaded shanks are provided extending therefrom and adapted to pass through the upright or post upon which the steps are mounted and to be secured thereto by means of nuts screwing upon the ends of the shanks.

My invention is particularly applicable to towers for windmills, tanks, and the like, these towers being formed with a number of posts or uprights, usually four, braced together laterally and supporting the windmill or tank upon the upper ends. The steps of my invention may be readily applied to one of the posts of these towers to form a ladder. The posts are usually formed from angle-bars, and I have particularly designed the duplex step described in detail herein for use in connection with posts of this angle-bar construction.

The duplex steps are arranged so that there will be two foot-treads at each elevation upon opposite sides of the support, whereby a person climbing the ladder can find at all elevations where he may wish to stand a foot-tread for each foot.

In the preferred form of my invention I arrange the duplex steps alternately upon opposite sides of the central support, whereby the treads and vertical or upright handholds of the steps present a sinuous form. With this arrangement the hand hold extends throughout the length of the ladder, being alternately upon opposite sides of the central support.

Referring to the accompanying drawings, Figure 1 illustrates a section of a ladder formed from the steps of my invention. Fig. 2 illustrates a modification in the arrangement of the steps. Fig. 3 is a sectional view on line 3 3, Fig. 1. Fig. 4 is a sectional view on line 4 4, Fig. 2. Fig. 5 is a detail view of the end of the step, which is attached to the upright or post.

Like letters refer to like parts in the several figures.

The upright or post a is illustrated in the present instance as an angle-bar, and the duplex steps are mounted upon the opposite sides thereof. Each of the steps is formed from a rod of iron, preferably round, having the ends bent at right angles to the body thereof to constitute horizontal steps or foot-treads b b', joined at the outer ends by the vertical supporting portion b^2, which also constitutes the vertical handhold. The upper step b' is bent upward at the outer end, where it joins the vertical portion b^2 to form a guard to prevent the foot from slipping off the step. The handhold b^2 forms a guard for the lower step. Each of the steps is provided at the inner end with a shoulder b^3, made by upsetting the metal, and a threaded shank b^4 extends therefrom at an angle and passes through a hole provided in the angle-bar. Upon the end of the threaded shank screws a nut b^5, which clamps the shoulder of the step against the angle-bar.

In Fig. 1 the ladder is formed by placing the duplex steps in alternation upon the opposite sides of the upright or support—that is, first on one side and then on the other—so that a step on one side rests between two steps on the opposite side.

In Fig. 2 the duplex steps are placed opposite each other. By the former arrangement a vertical handhold extending from the bottom to the top of the ladder results.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A duplex step formed from a single rod having the ends bent into parallel positions to form foot-treads joined by an upright support and handhold, substantially as described.

2. A duplex step formed from a single rod having the ends bent into parallel positions to form foot-treads joined by an upright support and handhold, the ends of said steps having upset shoulders thereon and shanks extending therefrom, substantially as described.

3. A duplex ladder-step formed from a rod having the ends bent at right angles to form a pair of foot-treads joined at the ends by a vertical support and handhold, the upper foot-tread being bent upward where it joins the vertical handhold to form a foot-guard, substantially as described.

4. A duplex ladder-step formed from a rod having the ends bent at right angles to form foot-treads joined by a vertical support and handhold the ends of said steps having upset shoulders thereon and threaded shanks extending therefrom, substantially as described.

5. A duplex ladder-step formed from a rod having the ends bent at right angles to form foot-treads joined by a vertical support and handhold, the ends of said steps having shoulders the faces of which are at an angle to the steps, and threaded shanks extending beyond said shoulders at an angle to the steps, substantially as described.

6. A ladder having a central support and duplex steps mounted in sinuous form alternately upon opposite sides of said support each of said duplex steps comprising a pair of parallel foot-treads joined by an upright handhold, substantially as described.

7. A ladder having a central support and duplex steps mounted upon opposite sides thereof, each of said duplex steps comprising a pair of parallel foot-treads joined by an upright handhold, the steps being placed so that there will be two foot-treads at each elevation upon opposite sides of the support, substantially as described.

8. A ladder comprising an upright support the faces of which are at an angle to the plane of the ladder, and a series of duplex steps each comprising a pair of horizontal foot-treads joined at the outer ends by an upright support and handhold, said duplex steps being arranged upon said support in a common plane and so that there will be two foot-treads at each elevation upon opposite sides of the support, substantially as described.

9. A ladder comprising an upright or support in the form of an angle-bar and a series of duplex steps mounted upon the opposite sides thereof and each comprising a pair of horizontal foot-treads joined at the outer ends by a vertical support and handhold, the inner ends of said foot-treads each carrying an upset angularly-situated shoulder adapted to rest against the face of the angle-bar and a threaded shank passing perpendicularly through said angle-bar, and a nut screwing upon said shank, substantially as described.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

LA VERNE W. NOYES.

Witnesses:
H. D. MAIZE,
W. CLYDE JONES.