

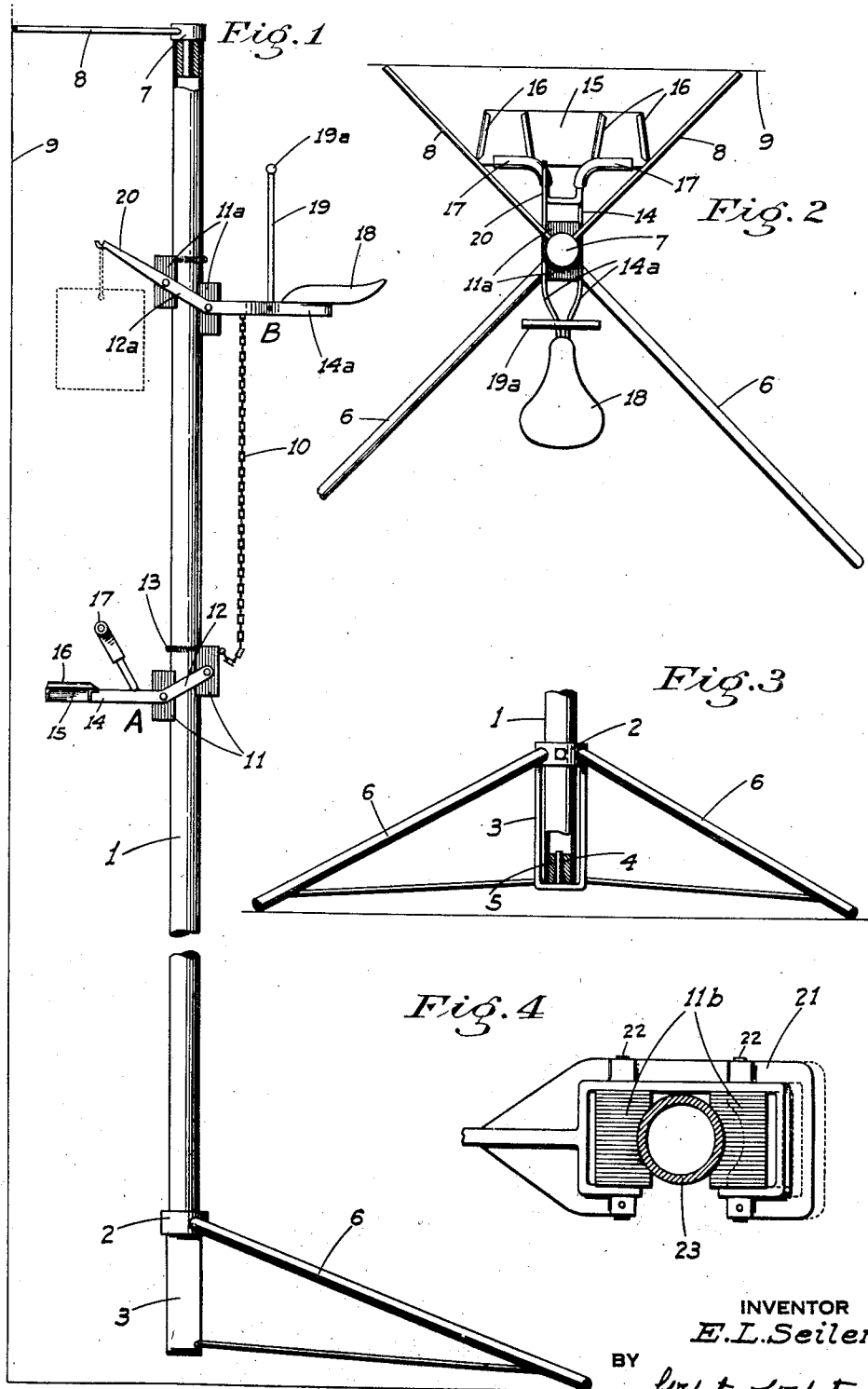
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RUNGLESS LADDER

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RUNGLESS LADDER

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7 Claims. (Cl. 227—25)

This invention relates to ladders, and particularly represents improvements over the rungless ladder shown in my Patent No. 1,918,293, dated July 18, 1933.

My principal object now is to construct the ladder so that it is no longer necessary for the painter etc. to stand while on the ladder, but instead he may be comfortably seated while working at any point in the height of the ladder. Also the ladder is lighter and simpler as a whole than was previously the case, and cannot be tipped outwardly or away from the surface being worked on.

The ladder includes a single main upstanding post, on which a foot-supporting unit, as well as a separate seat unit, are adjustably mounted.

Another object of the invention is to make these units so that they can be removably applied to heavy vertical cables or the like—such as those of suspension bridges—so that any such cable may then serve as the ladder post and the cables may be individually painted without the need of a scaffolding or sling for supporting the worker.

A further object is to improve the construction of the post-engaging clamping means of the adjustable occupant-supporting units so that a better grip on the post is obtained without the possibility of indenting the same and enabling a relatively thin tubular member to be practically used for the purpose.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of my improved ladder.

Figure 2 is a top plan view of the same.

Figure 3 is a front view of the base and adjacent portion of the ladder post, the latter being partly in section.

Figure 4 is a top plan view of a modified form of adjustable clamping unit.

Referring now more particularly to the characters of reference on the drawing, and particularly at present to Figs. 1 to 3 the ladder comprises a rigid tubular post 1 of suitable height. The supporting base for the post comprises a collar 2 through which the post slidably projects, and a cradle 3 depending from the collar to support the base of the post, the cradle having an

upstanding locating pin 4 projecting into a bushing 5 in the post. A pair of legs 6 projects from the front side of the collar in diverging and downwardly sloping relation to a termination below the bottom of the cradle when the post is vertical, giving the same supporting advantages as is had with the structure of my co-pending application, Serial No. 423,069, filed December 15, 1941. The post at the top is capped by a turnable head 7 from which a pair of horizontal rods 8 extends in diverging relation in a direction opposite to the legs to abut against a wall 9 or the like and maintaining the post vertical and again tipping toward the wall.

Adjustably mounted on the post are separate foot engaging and seat mounting units indicated generally at A and B respectively, said units being connected by a length of chain 10 or the like which limits the extent of separation of the units to a predetermined convenient distance.

The unit A comprises a pair of friction blocks 11 normally engaging the post 1 on opposite sides and vertically offset from each other. These blocks are connected on the opposite sides of the post by pivoted links 12 disposed on a downward slope from the upper to the lower block when the blocks are thus vertically offset. The upper block is yieldably held in contact with the post by a spring band 13 connected to the block at the top and extending about the post.

Arms 14 rigid with the links at their lower end project toward the wall 9 and supporting foot-plate 15 on which are transversely spaced foot locating and holding elements. These elements may be in the form of flanges or clips 16 to engage snugly over the soles of the shoes along their side edges, or they may be in the form shown in the aforementioned patent. Also mounted rigid with the arms 14 and projecting above the foot plate are laterally extending members 17 to engage over the front of the shoes or fit adjacent the ankle, to give additional support for lifting the unit by the feet.

By reason of the above construction it will be seen that as long as there is any downward pressure on the arms 14, the clamping blocks will tightly engage the post and the unit will be held against slipping. If, however, the arms are tilted upwardly, a movement imparted thereto by a slight upward bending of the feet, the links will be shifted toward horizontal position, and the blocks will accordingly spread apart. The grip on the post is then released and the unit may be moved up or down as desired, becoming immediately re-clamped against movement on the post as soon as the lifting pressure on the arms is relieved.

The unit B supports the weight of the operator while unit A is being thus manipulated, and is substantially the same construction as said unit A, having vertically offset friction or clamping blocks 11a and connecting links 12a. In this case, however, the position of the blocks and links on the post is reversed from that occupied by the corresponding parts of the unit A, and the arms 14a project from the front of the post and support a seat 18 which may be of bicycle type. An upstanding rod 19 having a cross handle 19a on its upper end projects upwardly from the arms 14a in front of the seat, so that a lifting or releasing pressure may be exerted on the unit B when the weight of the occupant is removed from the seat. One link 12a may be extended upwardly and back of the post as at 20 to provide a support for the bail of a paint bucket or the like.

While the user is painting etc. the major portion of his weight is on the seat, the feet resting on the plate 15 and being engaged with the clips 16, the post 1 of course projecting between his legs. When it is desired to shift position on the ladder, as for instance in an upward direction, the operator first elevates the lower unit A by tilting and subsequent upward movement imparted to the arms 14 as previously described, his weight being then taken entirely by the unit A. When the unit A has reached the desired new level, the operator rests his full weight thereon and raises himself from the seat, elevating the unit B by gripping the handle 13a and pressing the same toward the post, as well as pulling up in order to free the blocks 11a from the post and elevate the same. When it is desired to lower himself on the ladder, the reverse procedure is followed, the unit B being lowered first and the unit A being subsequently lowered.

With the above described structure the units A and B are permanently mounted on the post and can be removed only from the upper or lower end of the post when the ladder is disengaged from the base or head. In order to enable the occupant-supporting units to be mounted on vertical cables, poles, or the like whose ends are permanently connected to other parts, the clamping portions of these units may be made in the form shown in Fig. 4. In this case the clamping blocks 11B are disposed and pivoted in a rigid link unit 21 of C form, which is open on one side as shown. This link unit is arranged so that when the pivot points 22 of the blocks are horizontally aligned, the blocks are then separated a greater distance than the diameter of the cable or pole 23 to be engaged, so that each pole clamping unit can be initially engaged with or removed from the pole by a lateral movement of the unit.

From the foregoing description, it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A ladder including an elongated vertical member, means to support said member in a substantially vertical position, and vertically separated units on the member adjustable along

the same independently of each other, a seat mounted on the upper unit, foot locating and retaining elements on the lower unit whereby an upward movement of the feet will manipulate said unit and a handle element mounted on the upper unit in front of the seat in upstanding relation thereto for manipulating said upper unit.

2. A ladder including an elongated vertical member, means to support said member in a substantially vertical position, a vertically adjustable unit on the member for the support of the weight of an occupant, said unit comprising a pair of clamping blocks normally engaging the member on opposite sides and offset vertically from each other, in upper and lower relation, links pivotally connecting the blocks and disposed with a downward slope between the upper and lower blocks when the latter are engaged with the member, and an arm unit rigid with and projecting in a substantially horizontal direction from the lower end of the links as a continuation thereof and by which the weight of the occupant is normally taken.

3. A structure as in claim 2 with a resilient element connected to the upper block above the connection of the links therewith and yieldably embracing the member.

4. A ladder including an elongated vertical member, means to support said member in a substantially vertical position, and vertically separated units on the member adjustable along the same independently of each other, foot supporting and holding means on the lower unit disposed out from one side of the member and a seat mounted on the upper unit and disposed out from the opposite side of the member.

5. In a ladder including an elongated vertical member, and means to support the same in a substantially vertical position; a vertically adjustable unit mounted on the member and comprising a foot plate disposed laterally out from the member, transversely spaced foot locating and retaining elements on the plate and laterally extending elements fixed with the plate above the same in position to extend over and across the feet adjacent the ankles.

6. An adjustable operator supporting device for use on a vertical member comprising a pair of clamping blocks normally engaging the member on opposite sides and offset vertically from each other, in upper and lower relation, links pivotally connecting the blocks and disposed with a downward slope between the upper and lower blocks when the latter are engaged with the member, and an arm unit rigid with and projecting in a substantially horizontal direction from the lower end of the links as a continuation thereof and by which the weight of the occupant is normally taken, and means fixed with the arm unit for manual manipulation to move said unit in a direction to shift the links toward a horizontal position when the weight of the operator is removed from the arm unit.

7. A structure as in claim 6, in which the links on opposite sides are rigidly connected together across the back of the blocks from one side thereof and are disconnected between the blocks on the opposite side to provide an unobstructed gap through which the member may pass upon relative lateral movement when the links are moved to a substantially horizontal position.

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