Feb. 25, 1936. E. G. McKINNEY 2,031,615

CLIMBING ASSEMBLY

Filed June 10, 1932

Fig. 1

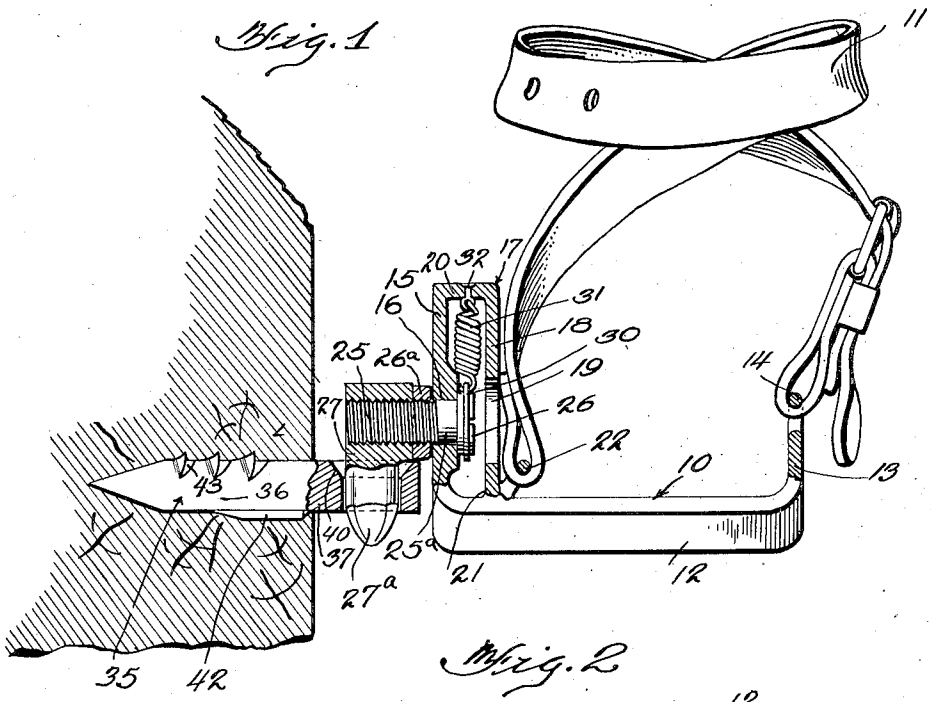


Fig. 2

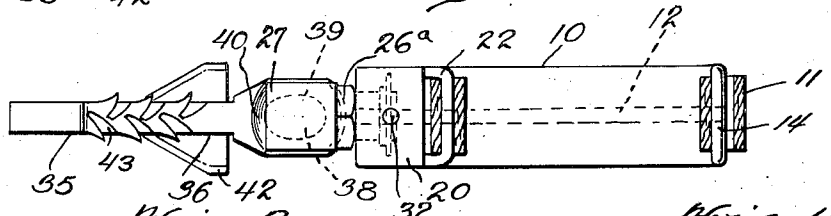


Fig. 3

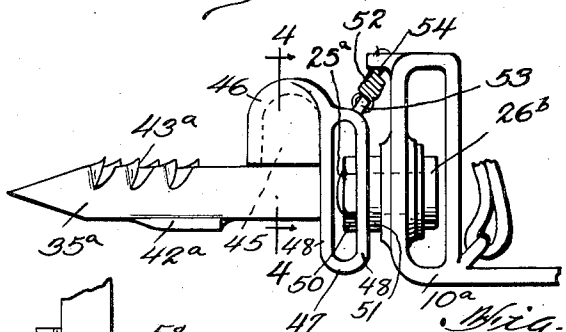


Fig. 4

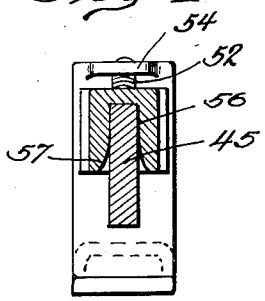


Fig. 5

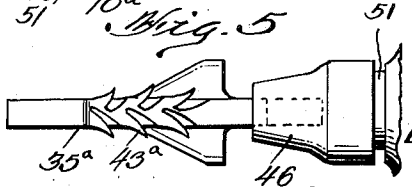
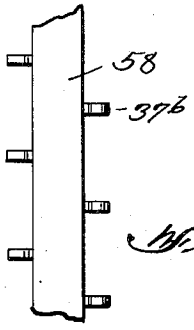


Fig. 6



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CLIMBING ASSEMBLY

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Application June 10, 1932, Serial No. 616,545

22 Claims. (Cl. 227—8)

This invention relates to climbing assemblies and more particularly to improvements in pole climbers.

In the known type of pole climbers utilizing hooks or spurs which are kicked into a pole or the like, certain disadvantages exist among which may be noted the hacking of the pole by the hooks or gaffs which gradually reduces the life of the pole. Further, there is the danger with this type of device of the lineman falling as, for example, when the gaffs slip out of the pole, due to defective wood or to improper use of the device or to electrical shock suffered by the lineman coming into contact with live wires.

Accordingly, an object of my invention is the provision of a pole climbing assembly which is efficient in use and which substantially eliminates the danger of the lineman falling. A further object is the provision of a pole climbing device incorporating a flexible connection between the member which is attached to the foot of the user and the spur or equivalent element held to the pole, whereby the lineman's legs are flexibly held and are movable within reasonable limits. A further object is the provision of a climbing device by the use of which a lineman may be held to the pole in case of shock without danger of twisting his knees or the like, as would occur in the case of fall were the stirrup or foot member held rigidly to the pole. A further object is the provision of a novel form of pole attachment for use in a climbing assembly, which attachment may be driven into or otherwise associated with the pole prior to raising the same or which may, with equal facility, be secured progressively to a raised pole by the lineman as he climbs the same. A further object is the provision of a pole climbing assembly incorporating a fixed attachment to a pole and a climbing stirrup having an element cooperating with the pole attachment, in which the element may be readily associated with the attachment but is substantially incapable of accidental removal therefrom. A further object is the provision of a climbing attachment for concrete poles, steel poles, towers, smoke-stacks, and the like. A further object is the provision of a novel form of ladder with which may be associated a climbing device carried on the feet of the climber.

Other objects will be in part obvious from the annexed drawing and in part hereinafter indicated from the following analysis of the invention, in which reference is made to the accompanying drawing illustrating an embodiment of my idea.

In the drawing—

Fig. 1 is a side view, certain parts being shown in section, of my preferred form of climbing assembly;

Fig. 2 is a top view of the devices shown in Fig. 1;

Fig. 3 is illustrative of a modified form of climbing assembly;

Fig. 4 is a section along lines 4—4 of Fig. 3;

Fig. 5 is a partial top view of the assembly of the Fig. 3 modification;

Fig. 6 is a partial side elevation of a ladder or equivalent structural element provided with climbing attachments in accordance with my invention.

Referring to the drawing and more particularly to Figs. 1 and 2, I provide a stirrup member generally indicated at 10 adapted to be positioned beneath the lineman's instep and fastened about the ankle by a strap 11 or equivalent securing means. The stirrup 10 comprises an L-shaped element of strap iron or steel, the horizontal leg of which is provided on its under face with a longitudinal reinforcing rib 12. The relatively outer end of this leg is extended upwardly as at 13 and provided with a loop or eye 14 forming a point of securement for the attaching strap. The vertical leg 15 of the L-shaped stirrup member 10 is provided with an aperture 16 as will be hereinafter fully described.

Welded or otherwise secured to the parts 10 and 15 of the stirrup member is an auxiliary L-shaped strap 17, the vertical leg 18 of which extends parallel and in spaced relation to the vertical leg 15 as aforesaid and which is provided with an opening 19 in alignment with the opening or aperture 16 of the stirrup portion 15. The horizontal leg 20 of the auxiliary strap member extends to the top edge of the stirrup portion 15 and is suitably secured thereto as by welding. Connection between the lower end of the auxiliary strap member 17 and the horizontal leg portion of the stirrup 10 is made as by welding, as at 21. An eye 22 is secured at the junction of the leg 18 and horizontal leg portion 10 and forms an anchor for the strap 11.

Projecting through the said aperture 16, I arrange a rotary stud 25 having a threaded shank portion and a head 26 which is arranged in the space between the vertical strap portions 15 and 18 of the stirrup member, the stud being adapted for insertion through the aperture 19 of the leg 18, which, for convenience in assembly, is of greater diameter than that of the stud head 26. A lock nut 26a is threaded to the threaded shank

portion of the stud 25 and cooperates to hold thereon a spur element 27 having a pointed shank 27a. In order to permit rotation of the spur element 27 and stud 25 relative to the stirrup, the portion 25a of the stud which bears on the inner surface of the aperture 16 is suitably machined.

By means of a lug 30 fixed to and rotatable with the head 26 of the stud, I may secure to the stud a spring 31 which is anchored at its other end to an eye 32 fixed to the strap portion 20 of the stirrup member. Thus, the spur 27, together with the stud 25, is flexibly and rotatably connected to the stirrup member 10, the spring 31 serving to maintain the spur in a normal operative position prior to its insertion in the socket, to be described in the following.

According to my invention, I provide as an attachment to a pole to be climbed a series of spikes 35 substantially as illustrated, the said spikes having a pointed shank portion 36 of preferably square section and a head portion 37. The head portion, more clearly illustrated in Fig. 2, is provided with an aperture 38, advantageously of oval shape, and forming a socket into which the spur 27 may be inserted. In order that the spur may be substantially rigidly held in the socket 38, I provide the socket opening with straight walls 39 (see Fig. 2). The spur 27 is of corresponding cross-sectional formation as the socket aperture 38. Thus, turning of the spur about its longitudinal axis is prevented. In order to aid in inserting the spur 27 into the socket head 37 of the spike, I may slope or incline the upper walls 40 of the socket aperture 38. Thus the point 27a of the spur is guided into seating relation in the socket aperture.

In order to prevent crushing of the wood of the pole as heavy weights are carried by the spike 35, I provide pressure wings or plates 42 which extend horizontally from the under face of the spike. I have found it further desirable to provide the spike with notches 43 along its relatively upper edges to keep the spike from working out of the pole due to continued use.

In the modified form of construction illustrated in Figs. 3, 4 and 5 I have shown an equivalent form of connection between the spike 35a and the stirrup member 10a. According to this modification, the spike 35a is provided with an upwardly extending spur 45 which in cross section is preferably rectangular (see Fig. 4). Otherwise the spike is substantially similar to the spike illustrated in Fig. 1, being provided with the lower bearing plate 42a and notches 43a. The stirrup member 10a carries, instead of the spur as in the previous form, a socket 46 adapted to fit over and be held by the spur 45. Said socket 46 is formed integrally or otherwise on an elongated O-shaped strap element 47 between the vertical legs 48 of which a threaded stud 25a extends. The stud is provided with a head 26b and is rotatably connected to the stirrup 10a and to the socket supporting element 47 by means of holding nuts 50 and 51. Thus the socket 46 and stud 25a may be securely cooperated with the spur 45 of the spike 35a with the stirrup 10a permitted a rotary movement about the axis of the stud 25a.

A spring 52 having one end fixed to a lug 53 on the socket carrying element 47 and its other end fixed in a lug 54 formed on the stirrup member maintains the socket 46 in normally operative position and further serves to return these parts to their normal position after turning movement of the stirrup member.

By reference to Fig. 4, the socket 46 is provided with an interior concavity having vertical walls 56 through a portion of the depth of the cavity, the said walls curving outwardly as at 57 adjacent the socket mouth, thus to permit ready insertion of the spur 45 into the socket opening.

It is believed that the operation of the climbing assembly as aforesaid will be readily understood by those familiar with the art. The stirrup 10 or 10a is attached to the foot of the lineman by suitably manipulating the holding strap 11 over the ankle and instep of the foot. The spikes 35, 35a are driven into the poles preferably before placing the same into the ground and form a permanent and lasting attachment to the pole. In the construction of Figs. 1 and 2, the spurs 27 carried by the stirrups are cooperated with the socket openings 38 in the spikes and the foot is thus removably held to the pole. The flexible connection between the spur 27 and the stirrup, according to which the spur and stirrup are relatively rotatable about an axis which extends transversely of the foot, permits a degree of movement of the foot and leg of the lineman, while at the same time preventing any accidental removal of the spur from the spike socket. In the modified construction illustrated in Figs. 3 and 4, the socket 46 carried by the stirrup is disposed over and about the spur 45 carried by the spike 35a, the operation of the assembly being otherwise that of the construction shown in Figs. 1 and 2.

As previously indicated, the invention may also be utilized for climbing towers, steel posts, cement posts, smokestacks, and the like, by the provision in such elements to be climbed of attachments in the nature of spikes 35 or 35a. In Fig. 6 I have shown a structural element 58 provided with such attachments 37b, illustrated as a socket, and which may be in the nature of a spike or may be cast or formed integrally therewith or suitably secured thereto. It will be readily appreciated that the stirrup member as illustrated in Fig. 1 may be progressively cooperated with the attachments 37b, permitting the lineman or workman to readily climb the element 58. It will be further seen that the element 58 may take the form of a ladder such as would have utility when associated with a tower, for example, such ladder being constructed with or forming an integral part of the tower construction.

Without further analysis the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

I claim:

1. In a climbing assembly, the combination of a series of fixed elements on the object to be climbed, stirrup members and means for securing said members to the feet of the climber, each of said members carrying an element adapted to be detachably secured to one of the first-named elements, and the first and last-named elements being so formed as to prevent relative turning therebetween upon such securement.

2. In a climbing assembly, the combination of a series of fixed elements on the object to be climbed, stirrup members and means for securing said members to the feet of the climber, each of

said members carrying an element adapted to be detachably secured to one of the first-named elements, certain of said elements being provided with sockets and other of said elements provided with spurs for insertion in said sockets, and means to prevent relative movement between a spur and a socket into which it is inserted.

3. In a climbing assembly, the combination of a series of fixed elements on the object to be climbed, stirrup members and means for securing said members to the feet of the climber, each of said members carrying an element adapted to be detachably secured to the first-named elements, and a flexible connection between the stirrup members and the elements carried thereby.

4. In a climbing assembly, the combination of a series of fixed elements on the object to be climbed, stirrup members and means for securing said members to the feet of the climber, each of said members carrying an element adapted to be detachably secured to the first-named elements, a flexible connection between the stirrup members and the elements carried thereby, and means to maintain the stirrup members in a predetermined position in relation to the elements carried thereby.

5. In a climbing assembly, the combination of an element secured in fixed relation on the object to be climbed, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member adapted to be detachably secured to said first-named element, means tending to maintain the last-named element and the stirrup member in predetermined angular relationship, and the first and last-named elements being so formed as to prevent relative turning between said elements upon such securement.

6. In a climbing assembly, the combination of an element secured in fixed relation on the object to be climbed, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member adapted to be detachably secured to said first-named element, and a rotatable connection between the stirrup member and the element carried thereby, said connection including provisions for preventing free rotation between the stirrup member and the element carried thereby.

7. In a climbing assembly, the combination of an element secured in fixed relation on the object to be climbed, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member adapted to be detachably secured to said first-named element, a rotatable connection between the stirrup member and the element carried thereby, and means to restore said stirrup member and said element carried thereby to a normal position after relative rotation therebetween.

8. In a climbing assembly, the combination of an element secured in fixed relation on the object to be climbed, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member adapted to be detachably secured to said first-named element, one of said elements being provided with a socket and the other element with a spur engaging in said socket, and means to prevent relative movement between a spur and a socket into which it is engaged.

9. In a climbing assembly, the combination of an element secured in fixed relation on the object to be climbed, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member adapted to be detachably secured to said first-named element, one of said elements being provided with a socket and the other element with a stirrup engaging in said socket, and a rotatable connection between the stirrup and the element carried thereby, said connection including provisions for preventing free rotation between the stirrup and the element carried thereby.

10. In a climbing assembly, the combination of an element secured in fixed relation on the object to be climbed, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member adapted to be detachably secured to said first-named element, one of said elements being provided with a socket and the other element with a spur engaging in said socket, a rotatable connection between the stirrup and the element carried thereby, and means to restore said stirrup and said element to a normal position after relative rotation therebetween.

11. In a climbing assembly, the combination of a spike adapted to be driven into a pole to be climbed, the spike provided with a head extending exteriorly of the pole, a stirrup member adapted for attachment to the foot of the climber, means extending from said stirrup adapted for detachable securement with the spike head, and a flexible connection between the stirrup and said means.

12. In a climbing assembly, the combination of a spike adapted to be driven into a pole to be climbed, a head thereon provided with a socket, a stirrup member adapted for attachment to the foot of the climber, a spur carried by the stirrup for insertion into the socket of the spike head, and a flexible connection between the stirrup and the spur carried thereby.

13. In a climbing assembly, the combination of a spike adapted to be driven into a pole, the spike having a head formed as a spur, a stirrup member adapted for attachment to the foot of the climber, a socket carried by the stirrup member for detachable securement to the spur of the spike, and a flexible connection between the stirrup member and the socket carried thereby.

14. A climbing attachment for poles and the like comprising a spike having a shank portion of substantially rectangular cross section and a head portion, the shank portion being provided with a pressure plate extending from its lower face and with notches along its upper face, the head portion being provided with a socket opening.

15. A climbing element for poles and the like comprising a spike having a shank portion of substantially rectangular cross section and a head portion, the shank portion being provided with a pressure plate extending from its lower face and with notches along its upper face, the head portion being formed as a spur.

16. In a climbing device of the character described, an L-shaped stirrup member adapted for attachment to the foot of the climber and including a horizontal leg and a vertical leg, a strap eye arranged adjacent the juncture of said legs, a strap having an end anchored in said eye, a buckle eye arranged adjacent the other end of said horizontal leg, a buckle anchored thereto, the strap being adapted to extend forwardly over the instep of the foot and thence rearwardly around the ankle and thence forwardly and across the instep for securement at its free end with said buckle.

17. In a climbing device, a stirrup member and

means for securing said member to the foot of the climber, an element carried by said stirrup member and adapted for engagement with the object being climbed, means tending to maintain the element and the stirrup member in predetermined angular relationship, and a flexible connection between the stirrup member and said element, whereby said stirrup member may be turned with respect to said element during such engagement.

18. In a climbing device, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member and adapted for engagement with the object being climbed, a flexible connection between the stirrup member and said element, whereby said stirrup member may be turned with respect to said element during such engagement, and means resisting such turning movement.

19. In a climbing device, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member and adapted for engagement with the object being climbed, means providing for relative turning movement between the stirrup member and the element during such engagement, and means operative upon disengagement of the element from the object being climbed to restore the stirrup member and element to predetermined angular relationship.

20. In a climbing device, a stirrup member and means for securing said member to the foot of the climber, an element carried by said stirrup member and adapted for engagement with the object being climbed, a rotatable connection between the stirrup member and the element carried thereby, and means to restore said stirrup member and said element to a normal position after relative rotation therebetween.

21. In a climbing device, a stirrup member, means for securing said member to the foot of the climber, a spur carried by said stirrup member and rotatable with respect thereto about an axis which extends transversely of the foot of the climber, and means operative between the stirrup member and spur for normally restraining said spur against rotation about said axis.

22. In a climbing device, a stirrup member, means for securing said member to the foot of the climber, and a socket element carried by said stirrup and adapted for engagement with a spur element on the object being climbed, the socket member being rotatable with respect to the stirrup member and about an axis which extends transversely of the foot of the climber.

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