Sept. 12, 1967 B. PROVAZNÍK 3,340,961

POLE CLIMBER

Filed April 25, 1966

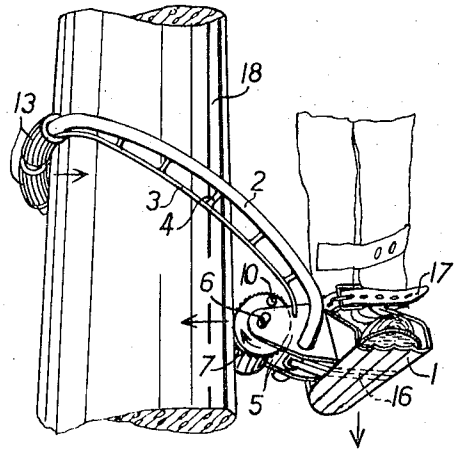


Fig-1

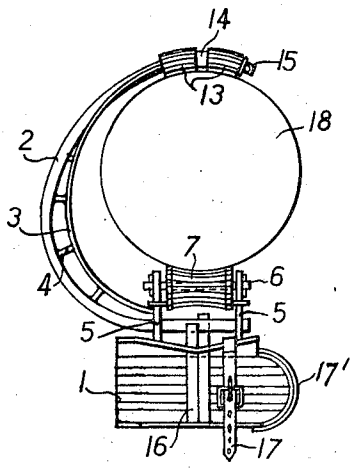


Fig-2

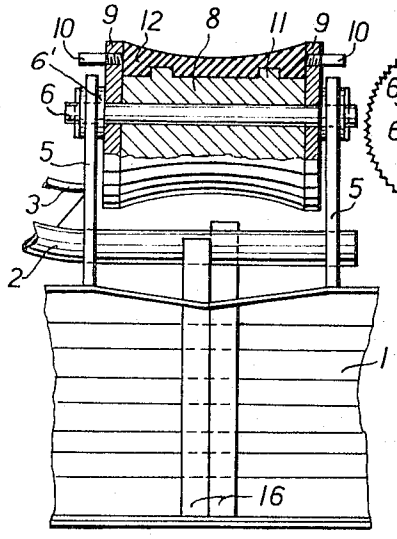


Fig-3

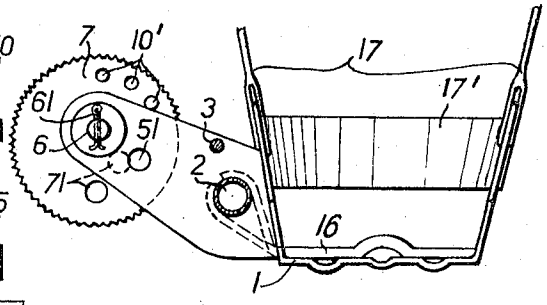


Fig-4

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# POLE CLIMBER

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8 Claims. (Cl. 182—134)

## ABSTRACT OF THE DISCLOSURE

A pole climber having an approximately U-shaped carrier dimensioned to receive the pole in its bight, a foot support on one leg of the carrier, and two clamping members at the opposite ends of the two legs, the clamping member near the foot support being a roller freely rotatable about an eccentirc axis and having a face of circular cross section and concavely arcuate in axial section.

This invention relates to a pole climber or climbing iron of the type used by electricians for climbing telephone or power transmission poles, one climber being attached to each foot of the worker.

A pole climber normally consists of a sickle-shaped supporting member which defines a laterally open recess and which may be laid about the pole to be climbed. A plate or other support for the foot of the wearer is attached to one end of the supporting member, and means are provided for tightening the grip of the climber on the pole in response to the bearer's weight when the same is applied to the foot support.

The primary object of the invention is the provision of a climber of the type described which effectively and safely grips the pole, yet is simple and rugged in its construction so as to have a long useful life without requiring repair and maintenance work.

Another object of the invention is to provide a climber which does not seriously interfere with normal walking on the ground so that the wearer may walk from one pole to the next without removing his climbers.

A further object is the provision of climbers the use of which does not require an extensive training period, and which are readily controlled by the wearer after a brief instruction in their use.

With these and other objects in view, the invention, in one of its aspects, resides mainly in a climber comprising a supporting member which defines a laterally open recess adapted to receive the pole to be climbed and having two terminal portions which face each other in a direction across the recess. One of the terminal portions may be fastened to the foot of the wearer so that the foot is outside the recess. The clamping arrangement for tightening the grip of the climber on the pole under the wearer's weight includes a friction roller having an axis and mounted on the afore-mentioned one terminal portion of the supporting member for rotation about the axis. The roller has an axially extending face of arcuate cross section, but the geometrical axis of this face is spaced from the axis of rotation of the roller. The friction roller projects inward of the recess from the portion of the supporting member to which it is secured. Its axis is transverse of the afore-mentioned direction across the recess, and the arcuate face of the roller is directed toward the other terminal portion of the supporting member.

Other features, additional objects, and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description of a preferred



embodiment when considered with the accompanying drawing in which:

FIG. 1 shows a climber of the invention attached to the foot of a wearer and applied to a pole, in a perspective view;

FIG. 2 shows the climber and the pole of FIG. 1 in plan view;

FIG. 3 shows a detail of FIG. 2 on a larger scale, and partly in section; and

FIG. 4 is a side-elevational, partly sectional view of the detail of FIG. 3.

Referring now to the drawing in detail there is shown a trough-shaped foot support **1** whose base plate is normally approximately horizontal and supports the sole of the wearer. It is supported on a thin-walled steel carrier tube **2** which is bent into a semi-circular shape and reenforced by a slender arcuate steel rod **3** one end of which is attached to one end of the tube **2**, the remainder of the rod being spaced from the tube **2** in a radially inward direction toward the center of the laterally open recess defined by the tube **2**, and attached to the tube by short radial rods **4** welded to the tube **2** and the rod **3**.

The foot support **1** is attached to a terminal portion of the tube **2** by two plates **5** spaced in the direction of elongation of the tube **2** and perpendicular to the same. The plates extend from the tube **2** inward of the afore-mentioned laterally open recess and outward therefrom, the foot support **1** being attached to the outwardly projecting plate portions.

The inwardly projecting portions of the plates **5** have two sets of bores **51** aligned longitudinally of the tube **2** at different distances from the same. A pin **6** is rotatably received in one set of bores **51** and is axially secured therein by cotter pins **61**. A friction roller **7** is mounted on the pin **6** for rotation about the axis thereof in a substantially fixed axial position secured by washers **6'**. This axis extends longitudinally of the associated terminal portion of the tube **2** in a direction which is approximately parallel to the support plane of the foot support **1**.

The roller **7** whose detail structure is best seen in FIG. 3, has a metal core **8** which is a cylinder with circumferential ribs **11** and provided with radially projecting end flanges **9** releasably attached to the core **8** by non-illustrated screws. A sleeve **12** of tough elastomeric material such as synthetic rubber covers the exposed face of the core **8** and is held in position by conforming engagement with the ribs **11** and by the flanges **9**. The outer face of the roller is approximately circular in cross section about a geometrical axis radially offset from the axis of rotation centered in the pin **6** and axially ribbed. The diameter of the outer face decreases axially from the ends toward the middle of the roller.

Abutment pins **10** may be inserted into three sets of axial openings **10'** in the flanges **9** for limiting rotation of the roller **7** about the axis of the pin **6** by abutting engagement with respective narrow face portions of the plates **5**. The spacing between the geometrical axis of the roller **7** and its axis of rotation may be varied by inserting the pin **6** into any one of three bores **71** which extend in the direction of the geometrical axis.

The end of the tube **2** remote from the roller **7** carries two axially ribbed rubber sleeves **13** axially separated by a spacer **14**, and held on the tube **2** by a plug **15** in the open end of the tube.

Flat steel bars **16** attached to the sole portion of the foot support **1** and hooked over the tube **2** transmit much of the weight of a wearer from the foot support directly to the tube **2**, thereby reducing stress in the plates **5**. A leather strap **17** provided with a buckle closure connects lateral flanges of the foot support over the wearer's insetp for securing the foot to its support. Another leather strap

17' is secured at the heel end of the foot support to hold the wearer's heel.

The afore-described climber is used in conjunction with another climber, not shown, in which the spatial relationship of parts is reversed in the manner of a mirror image. The two climbers are attached to the feet of the wearer which are placed in the foot supports **1** and fastened by the straps **17** in the manner shown in FIG. 1. The pin **6** may be shifted to another set of bores **51** if necessary to adjust the spacing of the roller **7** from the friction sleeves **13** to the cross sectional dimension of a pole **18** to be climbed, and the eccentricity of the roller **7** may be simultaneously adjusted by shifting the pin **6** from one of the bores **71** in the roller **7** to another, if necessary to adapt the climber to the surface condition of the pole.

Each supporting tube **2** is then placed about the pole **18** in a plane obliquely inclined to the vertical axis of the pole, the end of the tube **2** carrying the foot support **1** being lowermost. The climbers are then moved upward on the pole one by one in a conventional manner. When the weight of the wearer's body is transferred to the supported foot forces are applied to the climber elements and to the pole **18** as indicated by straight arrows in FIG. 1. Gravity acts downward on the foot support **1**, and this results in forces being exerted by the roller **7** and the friction sleeves **13** in opposite horizontal directions toward the center of the pole **18**. If the friction created thereby is not sufficient to stop downward displacement of the climber, the roller **7** is turned in the direction of the curved arrow by its frictional engagement with the pole **18** and the downward movement of the pin **6**. As best seen in FIG. 4, the rotation of the roller **7** in the direction of the curved arrow causes increasingly thick portions of the roller **7** to be interposed between the pin **6** and the pole **18**. The relative positions of the pin **6**, the corresponding end of the supporting tube **2** and of the foot plate **1** being fixed in the operative condition of the climber, the rotation of the roller thus causes the grip of the climber on the pole **18** to be strengthened. The suitably placed abutment pits **10** limit rotation of the roller **7** to the range in which the pin **6** moves away from the pole **18** while it moves downward.

The approximate hourglass shape of the roller **7** increases the area of contact between the roller and the pole as compared to a straight cylindrical roller, and the provision of two sleeves **13** separated by a spacer **14** serves the same purpose. The alternating axial grooves and ribs in the sleeves **12, 13** and the resilient material chosen for their construction further contribute to firm frictional engagement between the climber and the pole.

The climber of the invention has been found to be used competently by electricians, linemen, and other workers required to climb poles and similar objects after a very brief acquaintance with the climber. It does not have to be removed from the foot of the wearer while the same walks on the ground over a reasonable distance, such as that usually separating telegraph poles. It has been found effective on poles of circular, oval, or polygonal cross section, and made of a variety of materials, such as wood, metal tubing, or concrete, without damaging the pole surface. The eccentricity of the roller **7** should be adjusted to the surface roughness of the pole to be climbed, and the optimum adjustment of the climber depends somewhat on the wearer's particular habits and his weight. The necessary experience is quickly gained, but the climber is fully operative even when not adjusted to its optimum dimensions.

The climber of the invention has few and simple moving parts. Wear is limited mainly to the sleeves **12, 13**, and is low with the choice of readily available elastomers. The sleeves are easily replaced if needed.



It should be understood, of course, that the foregoing disclosure relates only to a preferred embodiment of the invention, and that it is intended to cover all changes and modifications of the example of the invention chosen for the disclosure which do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

What is claimed is:

**1.** A pole climber comprising, in combination:

(a) a supporting member defining a laterally open recess adapted to receive the pole to be climbed and having two terminal portions facing each other in a direction across said recess;

(b) securing means on one of said terminal portions outside said recess for securing said one terminal portion to the foot of a wearer;

(c) a friction roller having an axis of rotation and an axially extending face of arcuate cross section about a geometrical axis, said geometrical axis of said face being radially spaced from said axis of rotation; and

(d) mounting means securing said friction roller to said one end portion, said mounting means including means for preventing axial movement of said friction roller while permitting rotation thereof about said axis of rotation,

(1) said friction roller projecting from said one end portion inward of said recess in said direction,

(2) said axis of the roller being transverse of said direction, and

(3) said face of the roller being directed toward the other terminal portion of said supporting member.

**2.** A pole climber as set forth in claim **1**, wherein said securing means define a supporting plane for supporting the sole of said foot, said axes extending in a direction parallel to said plane.

**3.** A pole climber as set forth in claim **2**, further comprising cooperating abutment means respectively fastened to said roller and to said one end portion for limiting said rotation of the roller about said axis of rotation.

**4.** A pole climber as set forth in claim **2**, further comprising a friction facing on said other terminal portion facing said roller.

**5.** A pole climber as set forth in claim **2**, further comprising means for varying the spacing of said axis of rotation from said geometrical axis.

**6.** A pole climber as set forth in claim **2**, wherein said face is of circularly arcuate cross section about said geometrical axis.

**7.** A pole climber as set forth in claim **2**, wherein said mounting means include means for varying the distance over which said roller projects inward of said recess.

**8.** A pole climber as set forth in claim **2**, wherein said supporting member is elongated in an arc about said recess.


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