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No. 857,430. PATENTED JUNE 18, 1907.

C. F. & C. G. YOUNGQUIST.

POLE CLIMBING SHOE.

APPLICATION FILED JUNE 19, 1906.

2 SHEETS—SHEET 1.

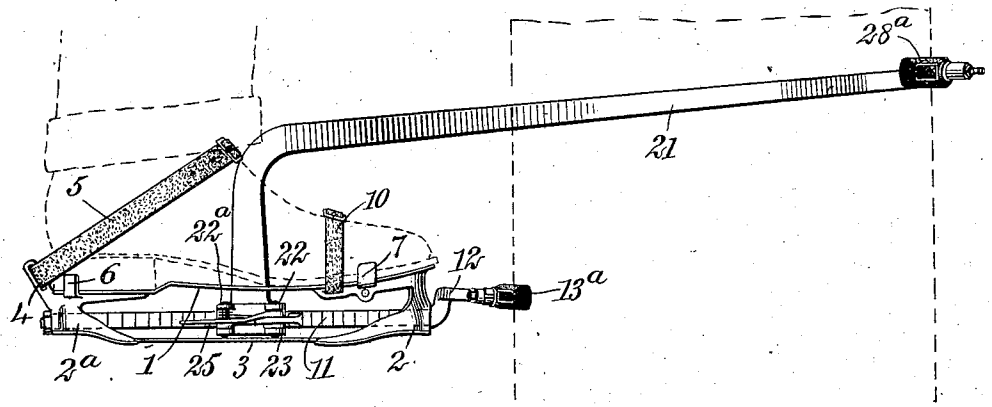

Fig. 1.

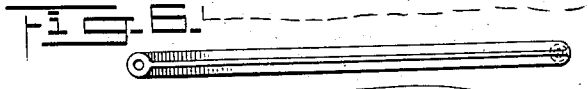

Fig. 6.

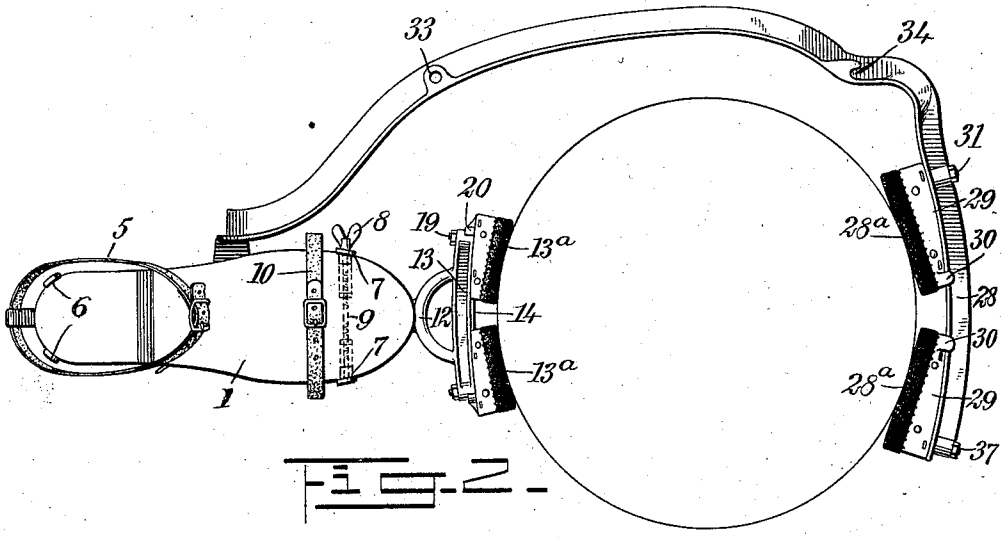

Fig. 2.

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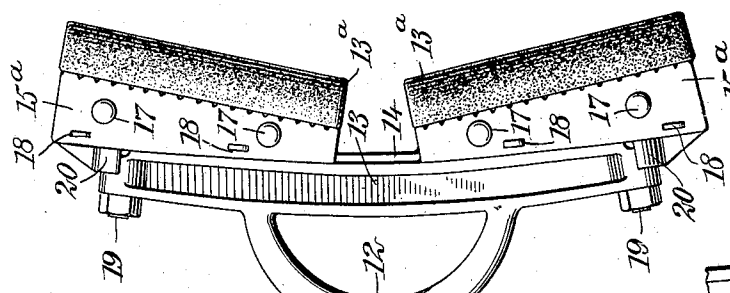


FIG. 5.

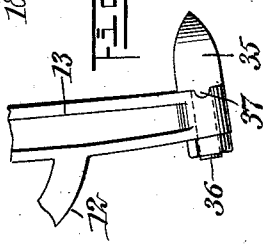


FIG. 3.

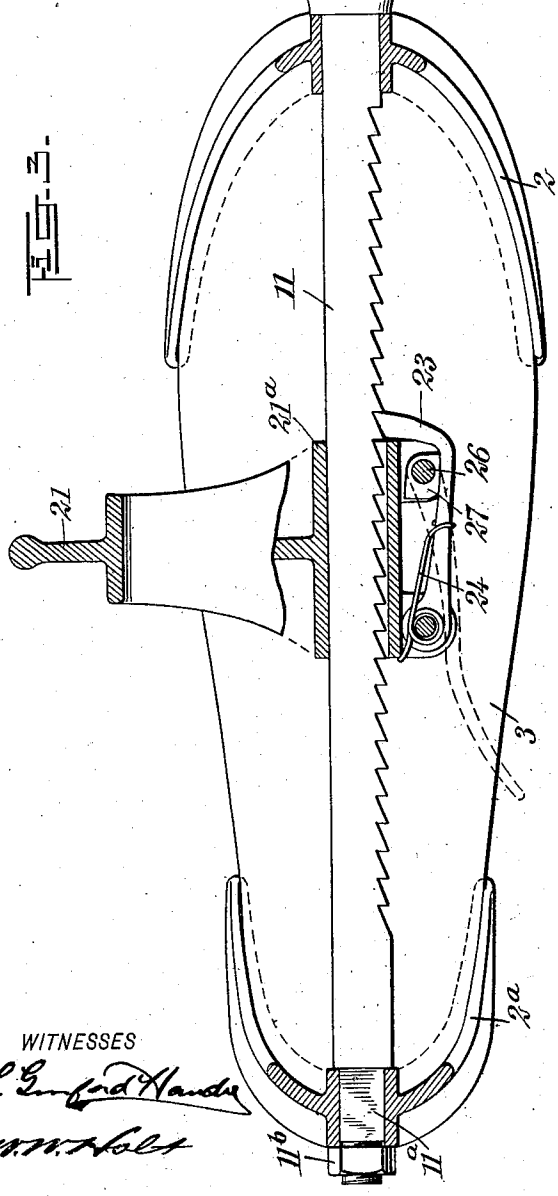
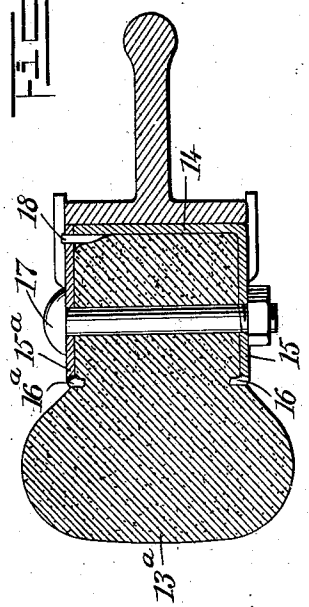


FIG. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

CARL FREDRIK YOUNGQUIST AND CARL GUSTAF YOUNGQUIST, OF SAN FRANCISCO, CALIFORNIA.

POLE-CLIMBING SHOE.

No. 857,430. Specification of Letters Patent. Patented June 18, 1907.

Application filed June 19, 1906. Serial No. 322,396.

To all whom it may concern:

Be it known that we, CARL FREDRIK YOUNGQUIST and CARL GUSTAF YOUNGQUIST, citizens of the United States, and residents of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Pole-Climbing Shoe, of which the following is a full, clear, and exact description.

This invention is an improved pole climbing shoe to be used by linemen and others in ascending and descending wood or metal telegraph, telephone, flag poles and the like.

The object of the invention is the production of a safe device of this character which will require no particular skill to manipulate in the use for which it is intended, and will positively grip the pole and become engaged at each step, enabling the climber to ascend and descend the pole with greater facility and less exertion than with devices of this kind now in use.

To this end the invention consists of a foot plate to be secured to the shoe of the climber, much after the fashion of a skate. Under the foot plate passes a rack bar in fixed relation thereto and carrying means at the toe end of the plate for engaging the pole. An arm adjustable on the rack bar passing above the foot plate curves about to embrace the pole diametrically opposed to the engaging means at the toe but much above it for purposes hereinafter made apparent.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the invention complete with the pole and foot of the user shown in dotted position to illustrate its application; Fig. 2 is a plan view of Fig. 1; Fig. 3 is an enlarged horizontal section taken just above the rack bar in Fig. 1; Fig. 4 is a transverse section through one of the gripping jaws used in climbing iron poles; Fig. 5 is a fragmentary view of Fig. 3, disclosing a spur preferably substituted for each of the gripping jaws when the shoe is to be used in climbing wooden poles; and Fig. 6 is a plan view of an auxiliary bar primarily for the purpose of preventing uneven hold in climbing square poles.

The numeral 1 indicates a foot plate having a shape to conform to the sole and heel of a shoe with the heel end of the plate slightly depressed to more exactly fit the foot and minimize the likelihood of the foot sliding on the plate after it is strapped and clamped in position.

Attached to the toe and heel end of the plate at its under face are respectively forked supporting blocks 2 and 2^a with the forks of each opposed to each other. The lower sides of the forks of the blocks 2 and 2^a curve slightly downwardly at their extreme ends and are flanged on both their inner and outer edges, and to the inner flanges of which a thin base plate 3 is attached. This plate prevents the mechanism between it and the foot plate from coming in contact with weeds or mud when the user walks on the ground.

Projecting from the rear end of the block 2^a at an angle of about 45 degrees is a slotted lug 4 for receiving a strap 5 to strap the shoe of the user. This strap, when tightened, pulls the shoe of the user rearward, engaging the heel of the shoe with two jaws 6 extending above the foot plate from the block 2^a. The block 2 is provided with two similar but adjustable jaws 7 at the toe end of the foot plate, operated by a key 8 in turning a right and left hand screw 9. Supplemental to the jaws 7 in engaging the toe end of the shoe, is a strap 10 passing under the foot plate 1 and through slots in the block 2 arranged to the rear of these jaws.

Passing longitudinally through the blocks 2 and 2^a intermediate the foot plate and base plate, is a rack bar 11. This rack bar, which is square in cross section, is symmetrically disposed with respect to the plates and is reduced at its rear end at 11^a to provide a shoulder to abut against the edge of the hole in the block 2^a when a nut 11^b on its threaded extremity is pulled up. The end of the rack bar, after passing through the block 2, is bent upwardly, terminating in a horizontal fork 12, which latter is integral at its end with an arc shaped bar 13 and is adapted to carry the pole engaging means adjacent to the foot plate.

When the shoe is used for climbing iron poles rubber pads 13^a forming the clamping jaws, are used. These pads have slightly convexed faces as shown in Fig. 4 to give a good bearing surface, and rectangular shanks engaged in metal holders comprising a metal strip 14 running the entire length of the bar

13, having horizontally extending plates 15 with teeth 16 embedded in the rubber, and a plate 15ª corresponding and opposed to the plate 15, having teeth 16ª embedded in the rubber shank at the opposite side. These plates 15 and 15ª with the teeth 16 and 16ª respectively carried by them, are forced into contact with the shanks of the rubber jaws by bolts 17 passing transversely through them. The plates 15ª are positioned on the metal strip 14 and held from working thereon by metal pins 18 passing transversely through them in contact with the outer face of the strip.

As shown, the metal holders for the jaws are inclined toward each other to insure proper contact with the pole, and are secured to the bar 13 by bolts 19 passing through the strip 14, and alining apertures at the end of the bar for the purpose. Sockets 20 at each end at the rear face of the strip 14 embrace the end of the bar, assisting the bolts and relieving them from strain.

Adjustably connected to the rack bar 11 through an elongated guide 21ª is an arm 21 flanged at both sides on its inner edge and beaded on its outer edge to insure both strength and lightness. At the opposite side of the guide 21ª from where the arm 21 joins, are two pairs of projecting lugs 22 and 22ª, best shown in Fig. 1. Between the pair of lugs 22ª is pivoted a pawl 23 passing forward of the lugs 22 where it curves over at substantially right angles and engages with the teeth of the rack bar, being normally forced inward into engagement, by a spring 24 coiled about its pivot with the arms thereof respectively pressing on it and the guide 21ª.

The teeth of the rack bar, as shown in Fig. 3, are inclined on their forward faces with perpendicular rear faces, which construction admits of the foot plate being slipped forward on the rack bar through the guide 21ª, but prevents the reverse movement until the pawl 23 is released. For releasing this pawl is provided a lever 25 fixed to a pin 26 rotatably mounted between the lugs 22 and carrying fixed to it a cam 27 in the same horizontal plane with the pawl.

The arm 21 passes horizontally from the guide 21ª for a short distance until it clears the foot plate 21 and then passes vertically upward to about the height of the ankle of the user and then curves outwardly around in front of the bar 13, terminating in an arc shaped portion 28 diametrically opposed to said bar some distance above it. The arc 28 has fixed to its inner face rubber pads 28ª, forming jaws of the same outward formation as the jaws 13ª, these jaws being fixed in metal holders 29 much the same as the jaws 13ª differing only in that the holders 29 instead of being connected together by a metal strip similar to the strip 14, are provided with projecting ears 30 at each side on their adjacent ends to embrace the edges of the arc 28. The opposite ends of the holder 29 are connected to the arc by bolts 31 passing through holes in swelled portions of the arc for the purpose. For reinforcing the arm 21, for preventing uneven hold in climbing square poles, is provided a detachable bar 32, shown in Fig. 6, adapted to be connected to the arm at one end by suitable means passing through the eye 33ª in the bar and the eye 33 extended from the arm. The opposite end of the bar is first connected with the arm by passing a headed pin 34ª projecting from its under-side into the notch 34. This pin is shown in dotted outline in Fig. 6.

If the shoe is to be used for climbing wooden poles, the rubber jaws and the metal holders which incase them are removed by unscrewing the nuts at the ends of the bolts 19 and 31, and in the place thereof are substituted spurs 35 shown in detail in Fig. 5. These spurs have cylindrical shanks 36 with threaded ends of the same diameter as the bolts used in connecting the rubber jaws, and the shank of each spur takes the place of each of said bolts, the spurs being held against rotation by means of keys 37 on their under faces fitting into corresponding recesses in the bar 13 and arc 28.

In the use of the pole climbing shoes, they are strapped and clamped to the foot of the user, as shown in dotted lines in Fig. 1, and the arm 21 adjusted on the rack bar 11 to suit the diameter of the pole to be ascended. This adjustment is correctly established when the jaws or spurs are in engagement with the pole and the foot plate of the shoe is disposed in horizontal position. The user, by now throwing his weight on one foot, will bind the jaws of this shoe against the pole and hold him while he releases the jaws of the other shoe by raising his heel to increase the diametrical distance between the jaws by bringing them nearer into horizontal alinement. This foot is then carried upward and the jaws automatically engaged with the pole by throwing his weight upon it. By alternately working each foot in this manner, a rapid ascent or descent of the pole by the reverse operation is accomplished.

Having thus described our invention we claim as new and desire to secure by Letters Patent:

1. In a pole climbing shoe, a foot plate, clamping jaws and straps carried by the foot plate, blocks secured to the under ends of the foot plate having flanges on their lower edges, a base plate secured to the inner flanges of said blocks, a rack bar passing through the blocks between the foot plate and base plate, said rack bar terminating at the toe end of the foot plate in an arc shaped bar, rubber jaws incased in metal holders adjustably connected to said bar, an arm adjustably secured to the rack bar, said arm passing upwardly

and curving about to a point diametrically opposed to the arc shaped bar, rubber jaws incased in metal holders secured to said arm diametrically of but above said first-named jaws, and a detachable bar carried by said arm for the purpose described.

2. In a pole climbing shoe, in combination, a foot plate, a rack-bar in fixed relation to the foot plate, clamping jaws rigidly carried at the forward end of the rack-bar, an arm embracing the rack-bar and curving around from the side of the foot plate to the front thereof, jaws fixed to the arm, and a pawl carried by the arm for holding it in adjusted position on the rack-bar.

3. In a pole climbing shoe, in combination, a foot plate, means for attaching the foot thereto, blocks secured to the under face of the foot plate at each end thereof, a bar rigidly fixed to said blocks and having jaws spaced apart and arranged at the front end thereof, an arm slidable on said bar and curving around from the side of the foot plate to the front thereof, jaws fixed to said arm, and means for holding said arm in adjusted position on said bar.

4. In a pole climbing shoe, a foot plate, means for attaching the foot thereto, blocks secured to the under face of the foot plate at each end thereof, a base plate secured to the lower edges of the blocks, a longitudinal bar fixed intermediate the foot plate and base plate pole engaging means fixed at the toe end of the foot plate, an arm adjustable on said bar, said arm curving around to the front of the foot plate, and pole engaging means carried by said arm.

5. In a pole climbing shoe, a foot plate, means for attaching the foot thereto, a rack bar fixed to the foot plate, pole engaging means carried on the forward end of the rack bar, a base plate secured underneath the rack bar, an arm curved about the forward end of the foot plate having a guide adjustable on the rack bar, pole engaging means fixed to said arm, a pawl pivoted at one side of the guide normally forced into the teeth of the rack bar, and a lever carrying a cam for withdrawing said pawl.

6. In a pole climbing shoe, in combination, a foot plate, means for attaching the foot thereto, a clamping jaw rigidly carried at one end of the foot plate, a second clamping jaw opposed to the first and connected to said foot plate, and means providing for the free movement of said jaws toward each other acting to prevent such movement in the opposite direction.

7. In a pole climbing shoe, in combination, a foot plate, a pair of jaws rigidly carried at the toe end of the foot plate, a second pair of jaws connected to the foot plate and opposed to said first-named jaws, and means providing for the free movement of said pairs of jaws toward each other acting to prevent such movement in the opposite direction.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CARL FREDRIK YOUNGQUIST.
CARL GUSTAF YOUNGQUIST.

Witnesses:
B. F. HESS,
KARL J. ELLINGTON.