Oct. 11, 1949. H. E. SCHATZ 2,484,389

SPORT SHOE AND MEANS OF ATTACHMENT

Filed Feb. 20, 1947 2 Sheets-Sheet 1

Fig. 1.

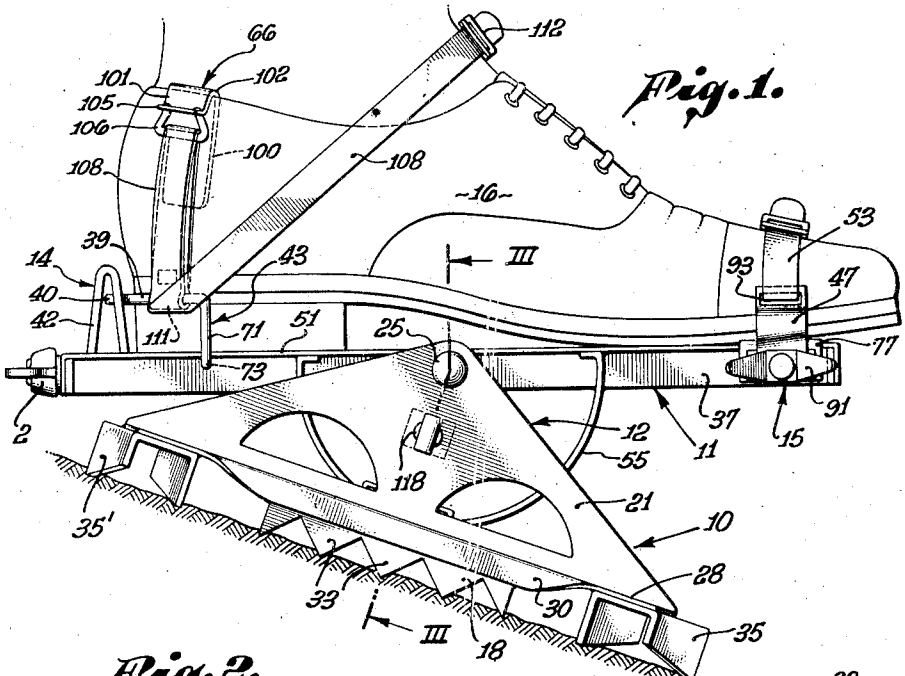


Fig. 2.

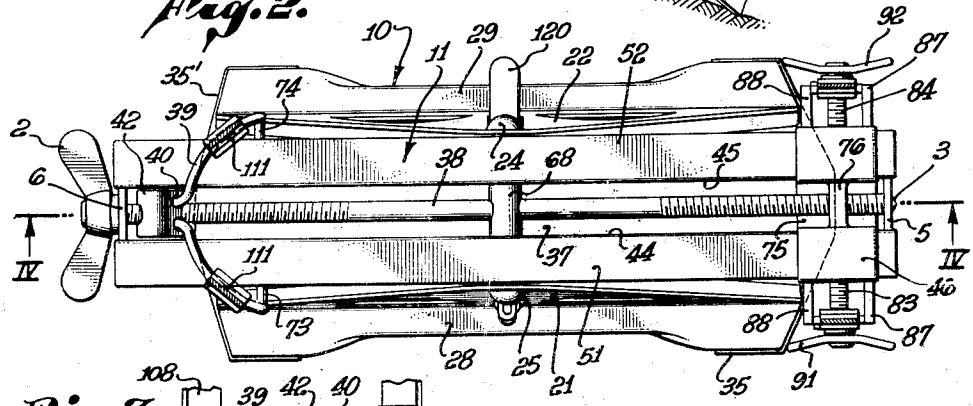


Fig. 3.

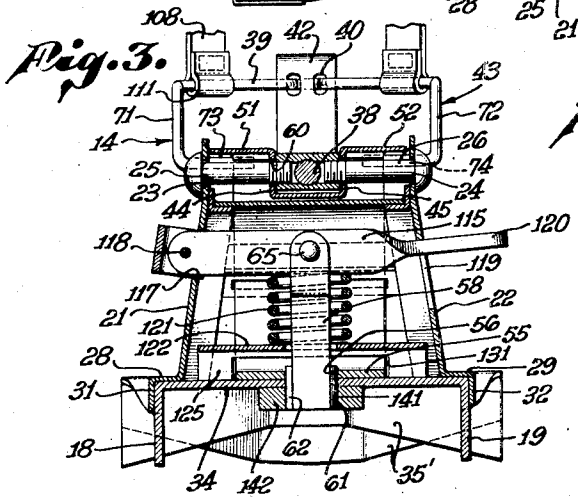
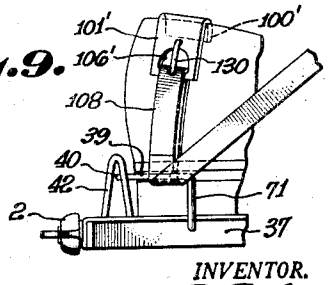


Fig. 9.



INVENTOR.
Herman E. Schatz
BY
ATTORNEY

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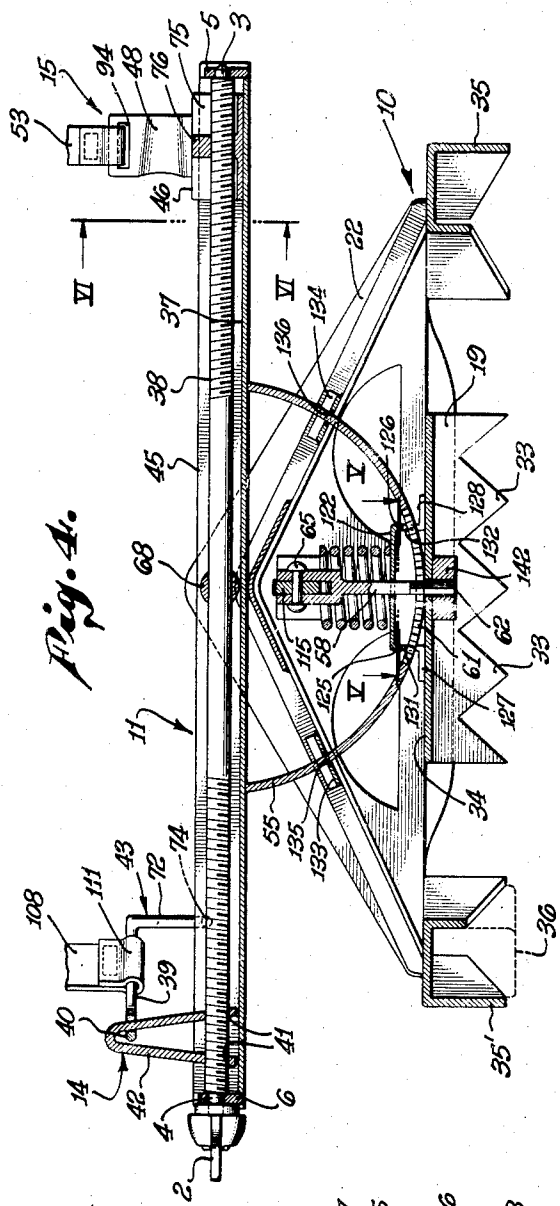


Fig. 4.

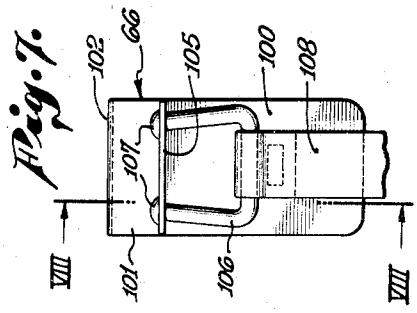


Fig. 7.

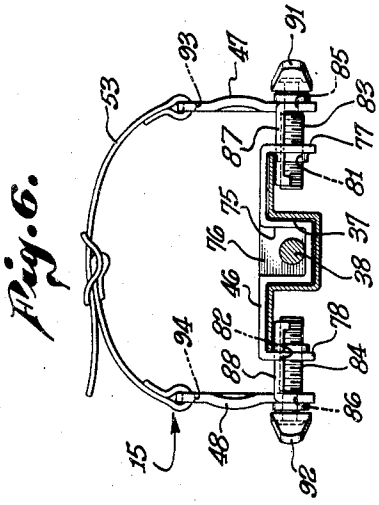


Fig. 6.

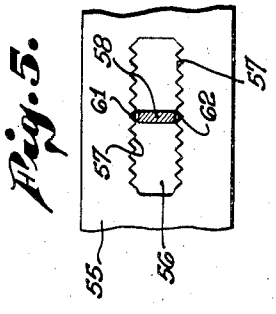


Fig. 5.

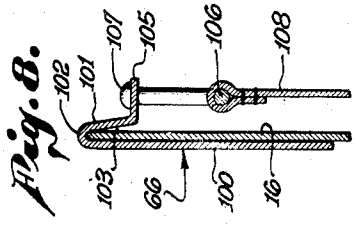


Fig. 8.

INVENTOR.
Herman E. Schatz
BY
ATTORNEY

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UNITED STATES PATENT OFFICE

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SPORT SHOE AND MEANS OF ATTACHMENT

Herman E. Schatz, Ocean Park, Calif.

Application February 20, 1947, Serial No. 729,711

12 Claims. (Cl. 36—7.6)

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This invention relates to a shoe attachment for use in hiking, mountain climbing, and the like.

When walking on irregular terrain, such as up and down hills, the different angles to which one's feet are subjected in supporting the body impose on the leg muscles abnormal strain and cause the hiker to become tired much sooner than would be the case if it were possible to carry the weight of the body upon feet maintained in a substantially level or normal position, and it is therefore a primary object of this invention to provide an attachment which may be fixed to an ordinary shoe that can readily be adjusted for compensating for the inclination of the ground on which one is walking.

Another object is to provide novel means for mounting the present attachment on a shoe that will transmit the connecting forces to the shoe in such a manner as to relieve the foot of the wearer from the strain of maintaining the attachment in place on the shoe.

Another object is to provide a shoe attachment that will grip the surface of the ground and at the same time afford sufficient contact area with the ground to prevent miring or sinking in wet and soft places.

Another object is to provide a shoe attachment having the above characteristics that will be equally adaptable for walking on smooth surfaces such as pavement.

A further object is to provide a shoe attachment having the above characteristics that will be light in weight, durable, easy to adjust, simple in structure and comparatively cheap to manufacture.

A still further object is to provide means whereby any attachment, such as a skate, may be attached to the shoes of a wearer in a simple and effective manner.

The above and further objects will be made apparent throughout the further description of the invention when taken in connection with the accompanying drawings, wherein like reference characters refer to like parts. It is to be distinctly understood that the drawings are not a definition of the invention, but merely illustrate one form by means of which the invention may be effectuated.

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In the drawings:

Fig. 1 is a side elevational view of an attachment assembled on a shoe embodying the invention.

Fig. 2 is a top plan view of Fig. 1, partly in section having the shoe removed.

Fig. 3 is a sectional view taken along the line III—III of Fig. 1.

Fig. 4 is a sectional view taken along the line IV—IV of Fig. 2.

Fig. 5 is a detail sectional view taken along the line V—V of Fig. 4.

Fig. 6 is a sectional view taken along the line VI—VI of Fig. 4.

Fig. 7 is an elevational view of a detail embodying the invention.

Fig. 8 is a sectional view taken along the line VIII—VIII of Fig. 7.

Fig. 9 is a fragmental view illustrating a modification of a detail embodied in the invention.

Referring to the drawings which illustrate one form of the invention, there is provided a ground engaging or contacting member, (represented in its entirety by 10) having pivotally mounted thereon a bridge or shoe supporting member (represented in its entirety by 11), means (represented in its entirety by 12) for adjusting the position of the bridge 11 relative to the ground contacting member 10 and means (represented in their entireties by 14 and 15) for attaching the device to the rear part and front part, respectively, of a shoe 16.

The ground engaging member 10 consists of a pair of spaced, vertically disposed plates or side members 21 and 22. These plates 21 and 22 are substantially in the shape of an inverted V, the apexes of which are provided with openings 23 and 24 for receiving bolts, pins or stub shafts 25 and 26 respectively on which the bridge or shoe supporting member 11 is pivotally mounted. The plates 21 and 22 are flanged outwardly as shown at 28 and 29. A portion intermediate of the ends of these flanges 28 and 29 terminate in downwardly extending flanges 31 and 32.

The plates 21 and 22 are spaced apart by a flat, relatively wide member 34. The member 34 is positioned centrally between the longitudinal lengths of the plates and is provided with downwardly extending flanges 18 and 19 on opposite sides thereof which are conveniently con-

nected to the flanges 31 and 32. The flanges 18 and 19 are grooved or serrated to form teeth or ground-engaging elements 33. The front and rear ends of plates 21 and 22 are connected by downwardly extending, curved, channel-shaped members 35 and 35', respectively. These channel members 35 and 35' aside from augmenting the teeth 33 and gripping the ground, may have their channels filled with a rubber composition element as indicated by dotted lines 36. These removably held rubber elements 36 preferably extend slightly below the lowermost plane of channel members 35 and 35' and teeth 33 in order to prevent the lower edges of the channel members 35 and 35' and the teeth 33 from contacting surfaces such as pavement.

The bridge 11 may be of stamped metal to form a central, longitudinal channel 37. The upper edges of the sides 44 and 45 of the channel 37 terminate in outwardly extending flanges 51 and 52 respectively, the flanges 51 and 52 forming a support for the sole of the shoe 16. Opposed openings 60 are provided in the center of sides 44 and 45 of channel 37 and in alignment with openings 23 and 24 provided at the apexes of plates 21 and 22. A longitudinally disposed, internally threaded tubular member 68 is positioned in the channel 37 and in alignment with openings 60 for receiving the threaded ends of stub shafts, pins or bolts 25 and 26 upon which the bridge is pivotally supported. It will be noted that the lower face of the ground contacting member 10 extends forwardly and rearwardly of the horizontal, pivotal connection with the shoe supporting bridge, and therefore extends beneath both the heel and toe portions of a shoe held on the bridge.

The front and rear ends of channel 37 are closed by members 5 and 6 respectively. The members 5 and 6 are provided with openings for receiving turnable, supporting, non-threaded end portions of a shaft 38, as shown at 3 and 4 respectively. The rear end of the shaft has a winged member 2 fixed thereto for turning the shaft. The shaft 38 is provided with a threaded portion adjacent each of its ends, the threads on one end being opposite to those on the other end. The rear threaded end of shaft 38 is connected to means 14 by way of a threaded opening 41 provided adjacent the bottom of the legs of a substantially inverted U-shaped member 42. The lower free end of the legs of member 42 extend into and are adapted to move along the channel 37 in response to rotation of the threaded shaft 38. A heel-engaging member 43 is carried by the member 42 so that upon rotating the shaft 38 the position of engaging member 43 may be adjusted to fit shoes of different lengths.

The heel-engaging member 43 may consist of a curved, laterally extending portion 39 adapted to engage and conform to the contour of a shoe heel. The center of the curved portion 39 of the member 43 may be connected with member 42 by providing a looped portion connected in spaced openings adjacent the top of member 42 as shown at 40. The ends of the curved portion 39 terminate in downwardly extending side members 71 and 72 positioned to engage opposite sides of a shoe in the region of the heel. The lower ends of side members 71 and 72 terminate in inwardly turned prong members 73 and 74 respectively for engaging the under sides of flanges 51 and 52 respectively. The prong members 73 and 74 are adapted to slide along the under-surfaces of the flanges 51 and 52 in response to movement of member 42 by the threaded shaft 38.

Novel means are provided for attaching the means 14 to a shoe in the region of the heel which includes a clip represented in its entirety by 66. One of these clips is positioned on each side of the heel of the shoe and engages the upper edge of the shoe. The clip 66 has a relatively wide, elongated inner member 100. The member 100 is folded back on itself to form a relatively short, downwardly extending outer member 101 connected by a curved portion 102. The portion 101 forms a channel 103 with the upper portion of member 100, the channel 103 being adapted to receive the upper edge of the side of the counter as clearly shown in Fig. 1. The lower end of member 101 terminates in an outwardly extending flange 105 (see Fig. 8) to which is connected a loop or link member 106 of U shape, having the upper end of its legs inserted through spaced openings in the flange 105 and held herein by means of upset ends as shown at 107. Straps 108 are provided on each side of the heel of the shoe and their lower ends may be attached to member 39 on each side of the shoe heel as shown at 111. The free end of the straps may then pass up and through the links 106 from the exterior of the links, then downwardly and around the member 39, and then upwardly across the arch of the foot of the wearer, the straps having their free ends connected by any suitable means such as a buckle, as shown at 112. By lacing each side of the counter to the member 39, the greater part of the stress of fixing the means 14 to the heel is carried by the counter or rear part of the side walls of the shoe, and very little stress is transmitted to the arch of the foot of the wearer, since the straps 108 are folded through the links 106 and downwardly folded around the cooperating portions of member 39. The inner member 100 of the clip 66 is flat and smooth and lends rigidity to that portion of the counter with which it is in contact and which portion is subjected to the stress of maintaining the means 14 in rigid contact with the shoe heel. It is here pointed out that the clip 66 and the manner in which it is fixed to the present device may be also employed in connection with attaching skates or other articles to shoes. Also, one end of the straps may be fixed to the loops 106 on the clips 66 as shown in Fig. 7 and the free end of the straps passed under and around the member 39 and over the arch of a foot where the free ends of the straps may be connected together.

The clips 66 for engaging the shoe in the region of the heel may be varied considerably in shape and form, as is shown by Fig. 9. The inner member 100' may be shorter than, or even the same length as, the outer member 101'. In this form the outer member is elongated and provided adjacent its lower end with an opening 106', through which the strap 108 is looped, also tongue member 130 having its upper end pivotally carried by member 101' adjacent the top of the opening 106' and its lower free end extending below the bottom edge of opening 106' and on the outside thereof. The lower end of tongue member is pointed and adapted to engage the strap 108 and prevent it from slipping relative to the member 101'.

Means 15 at the forward end of the bridge 11 consists of a laterally disposed, relatively narrow member 46, similar in cross section to the bridge 11 and having a center channel portion

75 fitting into channel 37 of bridge 11. A member 76 having a longitudinally threaded opening therethrough is fixedly mounted within the channel portion 75 for receiving the front threaded end of the shaft 38, whereby upon rotating the shaft, the member 46 will be moved longitudinally of the bridge 11. The ends of member 46 terminate in downwardly extending flanges 77 and 78 to which clamps 47 and 48 respectively are adjustably mounted. The clamp members 47 and 48 are adapted to contact the opposite sides of the forward portion of the sole of the shoe.

For the purpose of mounting the clamping members 47 and 48 on the flanges 77 and 78, the flanges 77 and 78 are punched to form flanged openings 81 and 82 respectively. These openings 81 and 82 are threaded to receive threaded bolts 83 and 84 respectively. The bolts 83 and 84 extend through openings 85 and 86 adjacent the bottom of the clamping members 47 and 48. The bolts 83 and 84 may be turnably mounted in the openings 85 and 86 by suitable bearings (not shown). For the purpose of turning the bolts 83 and 84, they are provided at their outer ends with fixed wing members 91 and 92. In order to maintain the clamping members 47 and 48 in upright position, there is provided a pair of integral, horizontally extending arms 87 and 88 on each side of members 47 and 48. These arms 87 and 88 extend into complementary openings provided in vertical flanges 77 and 78 of the members 46. It can now be understood that upon turning the bolts by their respective wing members 91 and 92, the clamping members 47 and 48 may be moved toward or away from the adjacent sole of the shoe as required. The members 47 and 48 are provided adjacent their upper ends with slots 93 and 94 to which the ends of lacing straps 53 are connected for fixedly securing and lacing the means 15 to the shoe in the region of the toe.

The means 12 for adjusting the relative position of the bridge 11 with the ground-contacting means 10 consists of a substantially semicircular shaped member 55 centrally positioned beneath the bridge 11 and having its ends connected to the bottom of the bridge 11 by any suitable means, not shown, such as by welding or riveting. The central portion of the member 55 is provided with a longitudinally extending recess or opening 56 (see Fig. 5). The opposite sides of the opening 56 are notched as shown at 57 for engaging cooperating knife edges 61 and 62, provided on the opposite sides of the lower portion of a member 58. The member 58 is vertically disposed between the plates 21 and 22 and centrally thereof. The member 58 is mounted for vertical movement whereby to move the knife edges 61 and 62 of the lower portion of member 58 downwardly and out of contact with the notches 57 in the opening 56, whereby to permit movement of the semicircular member 55 attached to the bridge 11. The upper end of member 58 is pivotally mounted at 65 to a lever 115. The lever 115 is disposed laterally and centrally between the plates 21 and 22 and has one of its ends pivotally mounted to a member 116, fixed adjacent an opening 117, provided in the side of the outer plate 21 as shown at 118. The other end of the lever 115 extends through a slot 119 provided in the side of the inner plate 22, the upper end of the slot 119 acting as a stop to limit the upward movement of the free end 120 of the lever 115. The lever 115 is biased upwardly by a spring 121 encircling member 58 and disposed between a plate 122 and the lower edge of member 115.

The plate 122 is supported above the member 34 by means of downwardly extending end flanges 125 and 126. The flanges 125 and 126 terminate in outwardly extending flanges 127 and 128 respectively (see Fig. 4), the flanges 127 and 128 resting on and being fixed to the member 34. The flanges 125 and 126 are recessed at 131 and 132 respectively through which the semicircular member 55 passes. Suitable guides 133 and 134, extending laterally between the plates 21 and 22 may also be provided for the semicircular member 55 and to strengthen the ground-engaging assembly 10. These guides 133 and 134 may have their ends fixed to the cooperating sides of plates 21 and 22 and recessed laterally through which the cooperating portions of the member 55 may pass as shown at 135 and 136. For maintaining the member 58 in perpendicular position and to carry the stress exerted thereon by the member 55 when the knife edges at 61 and 62 are in contact with the notches 57 in the sides of port 56, an opening 141 is provided in the bottom and centrally of member 34. The member 34 may be reinforced on the bottom and top adjacent the opening 141 as shown at 142. It can be understood that when the lever 115 is moved downwardly by its free end 120 against the spring 121, the upper end of the knife edges 61 and 62 will pass below the recess 56 in the semicircular member 55 and thereby permit the bridge 11 to be adjusted about its pivot support in order to provide the desired inclination between the ground-contacting member 10 and the bridge 11. Upon releasing the lever 115, the spring 121 will return the lever 115 to its uppermost position and thereby bring the member 58 upwardly and engage the knife edges 61 and 62 with the notches 57 in the recess 56 and anchor the bridge in the position that may be selected.

The present attachment is substantially of the same construction for both the left and right foot, except that the free ends 120 of the levers 115 extend inwardly and in opposite directions to one another. The lever 115 of the attachment on one shoe may be pressed downwardly by the attachment on the other shoe and the bridge adjusted for the desired inclination relative to the ground-engaging member by merely imposing body weight upon a selected end of the bridge 11 of the attachment being adjusted. Upon release of the lever the spring 121 will move the lever 115 to its uppermost position, bringing the knife edges 61 and 62 into engagement with the notches 57 in the recess 56 of the member 55 and lock the foot support 11 at the selected angle with ground-engaging member 10.

The present device can be easily and quickly attached to and detached from a shoe, easily and quickly adjusted to provide the proper and normal position of the feet during walking on irregular terrains and is light in weight, simple in structure, desirable and comparatively cheap to manufacture.

While I have illustrated and described the present invention in connection with a hiking shoe, it will now be obvious to those skilled in the art that certain features of the invention, such as the means including the clip 66 for attaching the present device to a shoe, may be used for connecting other devices such as skates to a shoe. Other changes, additions, substitutions and modifications may be made in the present device with-

out departing from the spirit and scope of the appended claims.

I claim:

1. An attachment for supporting a shoe in substantially a horizontal position when walking on inclined surfaces including: a surface engaging member, a shoe support carried by said member, means for adjusting the relative vertical spacing of both ends of the support, said means including means for pivotally mounting the said shoe support on the said surface engaging member, and means for locking the said member in fixed relation with said support, the last said means including a semi-circular shaped member carried by said shoe support having a locking member thereon and a cooperating locking member carried by the said surface engaging member movable in and out of engagement with the locking member on said shoe support.

2. A shoe attachment for supporting a shoe in substantially a horizontal position when walking on inclined surfaces including a surface engaging member, said member having spaced longitudinal members, means for connecting and maintaining said longitudinal members in fixed relation, the last said means including a downwardly extending inverted channel-shaped member disposed at and connecting the front and rear ends of said longitudinal members, and a shoe support pivotally mounted intermediate its ends on said surface engaging member.

3. A shoe attachment in accordance with claim 2 wherein the said channel-shaped member is provided with inserts, said inserts extending below the lowermost plane of said surface-engaging member.

4. An attachment for use in maintaining soles of shoes in a virtually horizontal plane when walking on inclined terrain, comprising: a longitudinally extending, substantially plane shoe-supporting element; clamping means carried by the element to firmly position and hold a shoe thereon; and an adjustably positionable member provided with a surface-engaging bottom face, said member being connected to the shoe-supporting element for adjustment about a transverse axis located beneath the arch of a shoe on the supporting element and in the centrally disposed section of the latter, and means for adjustably positioning said member upon said axis, said means including a biased locking and releasing arm extending transversely beyond the longitudinal edge of the shoe-supporting element.

5. An attachment for supporting a shoe with its sole in a substantially horizontal position when walking upon inclined surfaces, comprising: a shoe-supporting bridge provided with clamps for attaching the same to toe and heel portions of a shoe; and a ground-contacting member beneath said bridge and adjustably connected thereby by a transversely extending, substantially horizontal, pivotal connection intermediate the ends of said bridge, said ground-contacting member having a lower, ground-contacting face extending from beneath the region of the toe to beneath the region of the heel of a shoe on the bridge, said face being wider than said bridge.

6. An attachment for supporting a shoe with its sole in a substantially horizontal position when walking upon inclined surfaces, comprising: a shoe-supporting bridge provided with means for attaching the same to a shoe; an elongated ground-contacting member provided with a pair of upstanding, spaced, triangular sides; a horizontally disposed, pivotal connection between said sides and said bridge intermediate the ends of the latter; and means for adjustably pivotally positioning said ground-contacting member with respect to said bridge, said ground-contacting member having a lower ground-contacting face extending from beneath the region of the toe to beneath the region of the heel of a shoe on the bridge.

7. An attachment of the character stated in claim 6, wherein the ground-contacting face of the ground-contacting member is wider than the bridge and is provided with ground-engaging elements.

8. An attachment of the character stated in claim 6, wherein the means for adjustably positioning the ground-contacting member on said pivotal connection are spring-biased and include a lever having an operating end extending through a port in a side of said ground-contacting member.

9. An attachment of the character stated in claim 6, wherein the means for adjustably positioning the ground-contacting member on said pivotal connection include: an arcuate member carried by the bridge and extending downwardly between said spaced sides, and spring biased means carried by the ground-contacting member for selective and adjustable engagement with the arcuate member for positioning the ground-contacting face of the ground-contacting member in a desired plane with respect to the plane of the bridge.

10. An attachment of the character stated in claim 6, wherein the shoe-supporting bridge includes a longitudinally extending channel, a shaft having oppositely threaded end portions rotatably held in said channel and shoe-engaging clamping means operably connected to the threaded end portions of said shaft.

11. An attachment of the character described, including a ground-contacting member and a shoe-supporting bridge connected thereto by a pivotal connection, said shoe-supporting bridge comprising a longitudinally extending channel member having spaced upstanding side walls and a bottom web, a flange extending from the longitudinal edge of each side wall of the channel, said flanges lying in a plane above said web, means carried by the forward portion of the bridge for clamping opposite sides of a shoe in the region of the toe, means carried by the rear portion of the bridge for engaging opposite sides of a shoe in the region of the heel, and means disposed in said channel for moving said first and second means toward and away from one another selectively.

12. An attachment for supporting a shoe with its sole in a substantially horizontal position when walking upon inclined surfaces, comprising: a shoe-supporting bridge provided with means for attaching the same to a shoe; an elongated ground-contacting member provided with a pair of upstanding, spaced, triangular sides; and means adjustably connecting said bridge and ground-contacting member for selectively positioning the bridge in a desired plane with respect to the plane of the lower surface of the ground-contacting member, said means including a substantially horizontal, transverse pivot pin connecting the apex portion of each side with the bridge intermediate its ends, an arcuate element carried by the bridge around said pin and extending between said sides, a longitudinally extending opening in said arcuate element, opposing edges of said opening being provided with

serrations, a locking bar carried by the ground-contacting member and extending through said port, said locking bar being movable into and out of locking engagement with the serrations of said opening, spring means normally biasing said locking bar into engagement with said serrations, and lever means connected to said locking bar for selectively moving the bar out of locking engagement.

HERMAN E. SCHATZ.

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