March 11, 1952 L. M. BRUNET 2,588,801

FOOTWEAR

Filed Aug. 15, 1950

2 SHEETS—SHEET 1

FIG 1

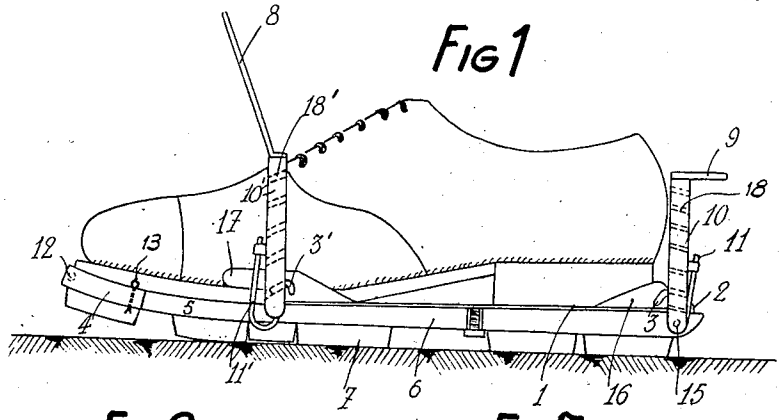



FIG 2

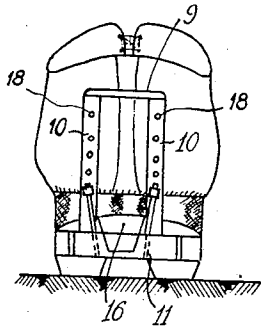



FIG 3

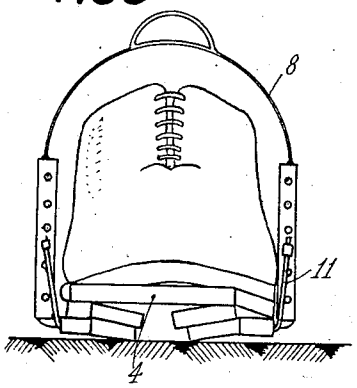
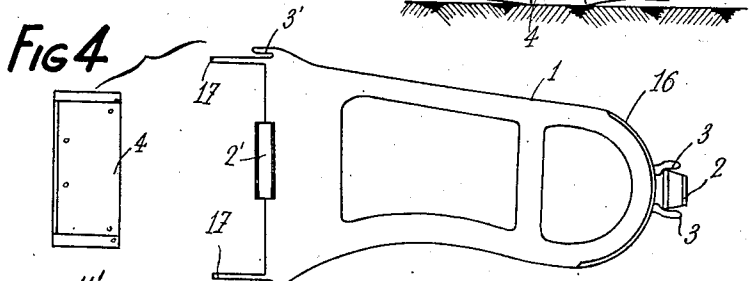



FIG 4



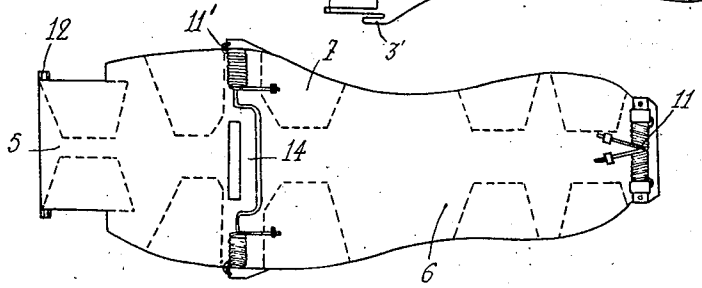




FIG 5

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2 SHEETS—SHEET 2

FIG 6

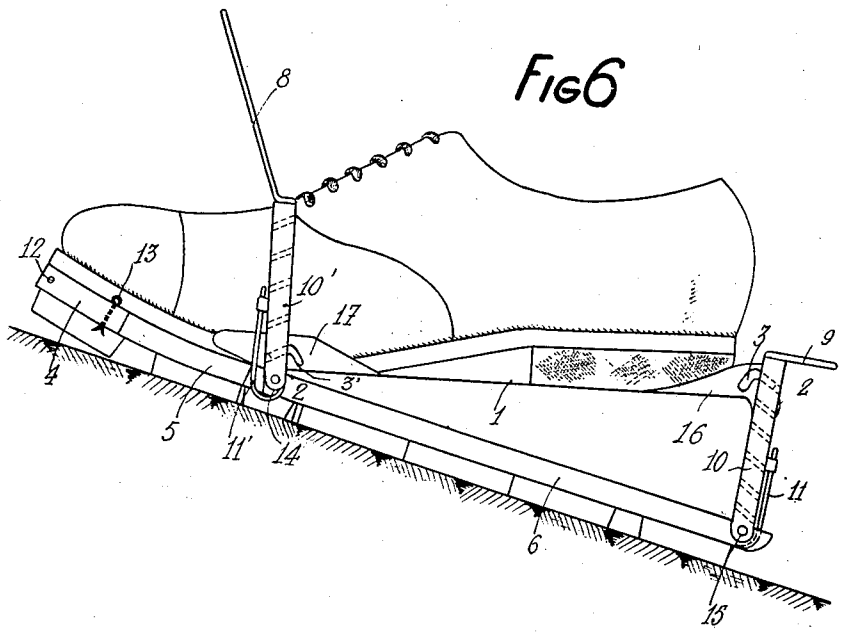
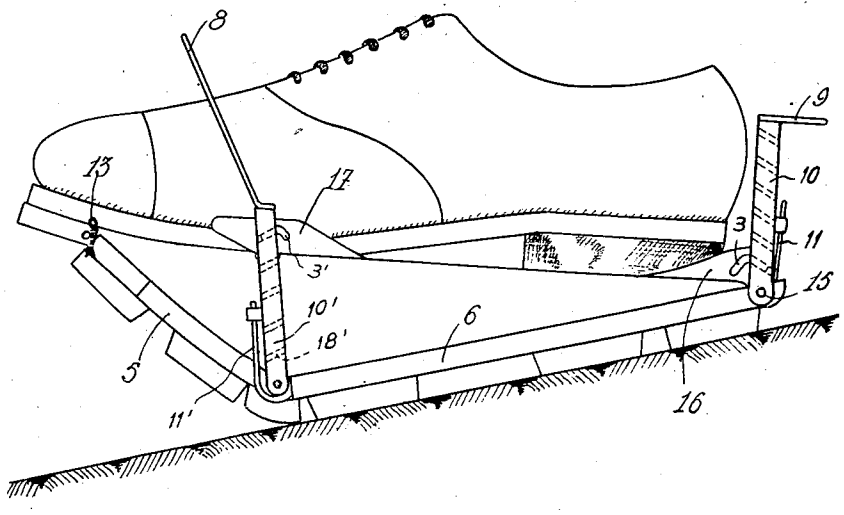



FIG 7




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2,588,801

# UNITED STATES PATENT OFFICE

2,588,801

## FOOTWEAR

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In France August 17, 1949

7 Claims. (Cl. 36—7.5)

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The present invention relates to a device for attachment to shoes to permit the latter to retain a horizontal position regardless of the slope of the ground on which the wearer is walking.

More specifically, the device consists of a movable sole system and flanges, the sole resting upon the ground and comprising two elements adapted to be secured at various heights on a metal frame secured to the shoe, one at the rear of the frame, the other at the middle of the sole portion, so that the frame will remain horizontal irrespective of the inclination of the movable sole.

The invention will be better understood by reference to the ensuing description and to the accompanying drawings in which:

Fig. 1 illustrates the device of the invention mounted on an ordinary shoe as seen from the side;

Fig. 2 illustrates the same device as seen from the rear;

Fig. 3 illustrates the same device as seen from the front;

Fig. 4 illustrates the fixed frame alone, as seen from beneath;

Fig. 5 illustrates the movable part as seen from above;

Fig. 6 illustrates the device and shoe assembly in use on an upward grade; and

Fig. 7 illustrates the same assembly in use on a downward grade.

In the figures, the device according to the invention consists of a part secured to the shoe of the wearer comprising a metal frame 1 attached from heel to mid-sole by any suitable means such as screws or rivets, and a slideway 4 also secured, as by screws. The frame 1 is provided with two spacer elements 2 and 2', respectively at the rear of the heel and under the sole, and four oblique fingers, 3 and 3' positioned on each side of the elements 2 and 2', respectively. Lastly, the frame 1 has a lug or flange 16 around the heel and a lug or flange 17 on each side of and at the middle of the sole.

The device further includes a movable frame consisting of two portions, viz. a front portion 5 and a rear portion 6, interconnected by a hinge 14 and lined with rubber segments 7 in the form, for example, of truncated trapezoids, to minimize skidding.

The movable frame comprises in addition a front control member 8 and a rear control member 9 described in greater detail hereinafter.

Pivoted on the hinge 14 are are two links 10' formed with perforations 18' into which fingers

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3' project under the influence of springs 11' acting upon the links.

Pivoted on the rear of the heel at 15 is a pair of links 10, formed with perforations 18 into which project the fingers 3, which are urged into engagement by the springs 11.

The elements 10', 11', 10, 11 are, respectively, controlled by control members 8 and 9 and are clamped against the shoe so as to hold it firmly. By reason of the system including the fingers 3, 3' and perforations 18, 18', the spacing from the fixed part 1, 4 to the movable part 5, 6 is adjustable at two points of the shoe, one point positioned in front and the other at the rear. The front end part of the element 5 slides in the slideway 4 by means of rollers 12 limited in their run by a cotter-pin 13.

The device is used in the following way:

After having screwed or riveted the elements 1 and 4 to the sole of the shoe, the end or tip of the movable element 5 is inserted into the slideway of the element 4 and is secured by the cotter-pins 13, care being taken to insert the shoe through the control element 8. The links 10 and 10' are then moved away from the fingers 3, 3' and the shoe is placed in the desired position relative to the ground upon which the flange 7 rests, then the links 10 and 10' are allowed to be restored by their springs 11 and 11' against the fingers 3 and 3' which thereafter maintain them in place. If the shoe is laid on a portion of flat ground, the fingers 3 and 3' are engaged in the lowermost holes 18 and 18' of the links 10 and 10' and there is obtained the arrangement shown in Fig. 1 for walking on flat ground. For walking up-hill, the links 10 are used over their full height or part of their height and the fingers 3' remain at the base of the links 10, so that the heel of the shoe is raised relatively to the toe, thereby allowing the shoe to remain horizontal as shown in Fig. 6. The only change in walking up-hill with the device lies in the fact that the shoe remains horizontal; it still is possible to bend the foot at the middle of the sole through the action of the hinge 14, while the rear of the foot remains raised by the flange 7 and the link 10. In the opposite case, that is for walking down-hill, the heel portion of the frame 1 is lowered and the fingers 3 engaged with the lowermost portion of link 10 while the fingers 3' are engaged at a suitable height with the links 10', so that the flange 5 is pushed back below the sole of the shoe and the rollers 12 ride in the slideway of the element 4, as far as a point located at a

varying distance behind the front of this element.

There may be attached to the flanges 5 and 6, which carry the rubber segments 7, studs or suitable articulated elements such as snow-rackets climbing irons, etc. to facilitate walking on snow, ice, or sand.

Lastly, the device of the invention may be used on a pair of skis by securing the rear flange to the ski, for instance by means of bolts, and only using the rear, up-hill, control member.

It will be understood that the device of the invention enables the front and rear muscles to be worked normally, eliminates the fatigue caused by up-hill and down-hill walking and, owing to the anti-skid segments, further contributes to safe and pleasant walking. Lastly, the invention may be used in orthopedic treatment to compensate for various types of malformation of the feet.

I claim:

1. A device for attachment to a shoe to permit the foot of the wearer to retain a substantially horizontal position while walking on inclined surfaces comprising, in combination, a substantially flat member securable to the shoe, a second substantially flat member adapted to rest upon the ground when the device is used, at least two spaced-apart connecting means for adjustably connecting said first member with said second member, and means for adjusting both ends of said first member at varying heights with respect to said second member, whereby said first member may be positioned in parallel relationship in forwardly inclined relationship and in rearwardly inclined relationship relative to said second member.

2. A device as defined in claim 1 wherein one of said connecting means is secured to the heel portion of said first member and the other of said connecting means is secured to said first member intermediate the heel and the forward end thereof adjacent the point at which the wearer's foot bends in walking.

3. A device as defined in claim 1, wherein said second member has a forward portion articulately connected to the remaining portion of the member, said forward portion having longitudinally extending slideways and said device further comprises a tongue member attachable to the forward end of the shoe of the wearer and engageable in said slideways.



4. A device as defined in claim 3, wherein the forward connecting means between the first member and the second member is connected to the second member at the point of articulation of the forward portion of the second member with the remaining portion of said member.

5. A device as defined in claim 1, wherein said second member has a forward portion articulately connected to the remaining portion of the member, said forward portion having longitudinally-extending slideways and said device further comprising a tongue member attachable to the forward end of the shoe of the wearer and engageable in said slideways, said slideways being provided with at least one roller, whereby said tongue is freely movable longitudinally in said slideways.

6. A device as defined in claim 1, wherein said connecting means comprise upwardly-extending strips provided with a plurality of perforations and wherein said first member is provided with pivotally-connected fingers engageable in the perforations in said strips for holding the first member at pre-selected heights with respect to said second member.

7. A device as defined in claim 1, wherein the forward connecting means are secured to the sides of the forward portion of said first member and are connected by a hoop adapted to extend over the shoe and the other connecting means are secured at the rear of the heel portion of the first member.

LOUIS MARCEL BRUNET.


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