

- [54] **DEVICE FOR NEGOTIATING INCLINED SURFACES**
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- [58] Field of Search .....**36/2.5 R, 2.5 D, 36/25, 32 R**

[56] **References Cited**

**UNITED STATES PATENTS**

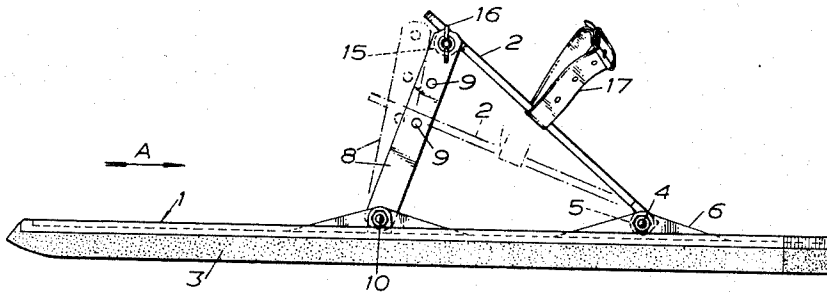
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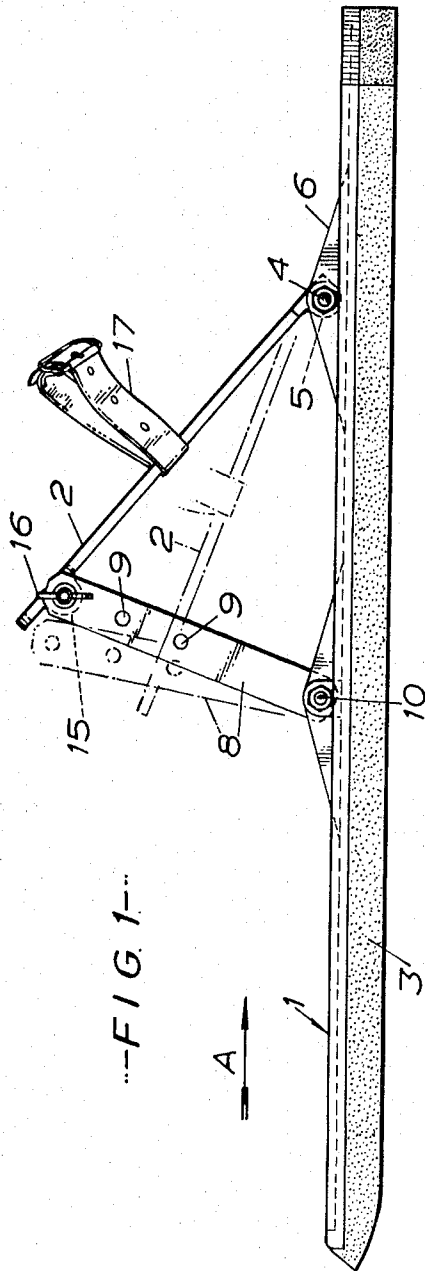
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[57] **ABSTRACT**

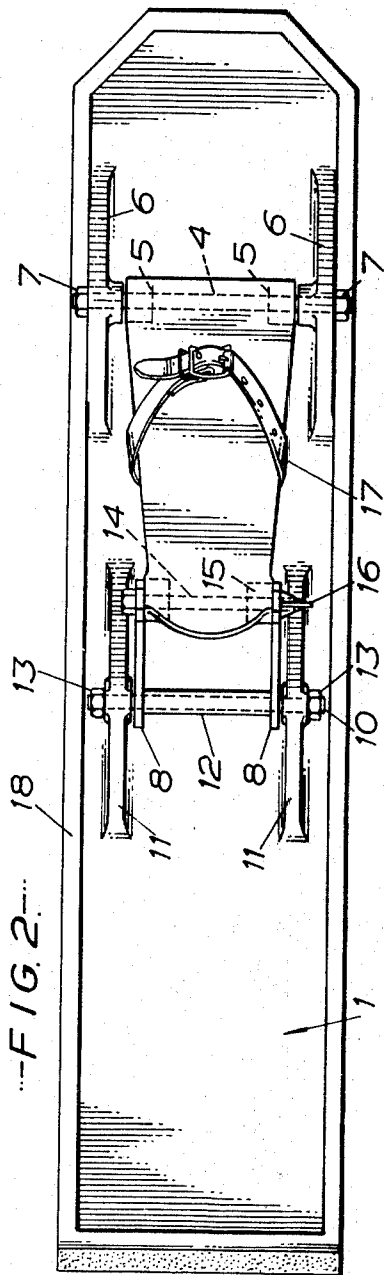
A device in the form of an elongate base member having a non-slip surface on the lower face thereof and carrying a foot support platform, the inclination of which can be varied with respect to the base member. A pair of such devices or "shoes" enable a user to negotiate an inclined surface, such as a roof, without recourse to ladders and other aids.

**8 Claims, 4 Drawing Figures**





---FIG. 1---



---FIG. 2---

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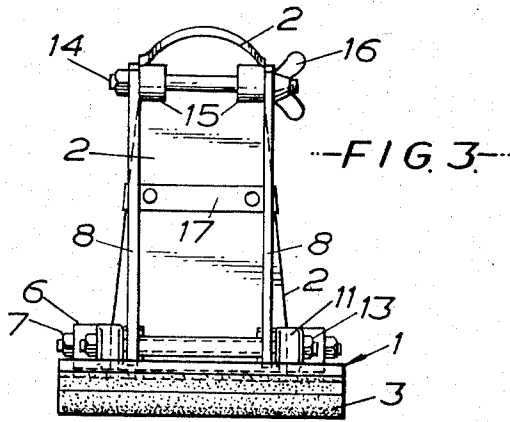


FIG. 3

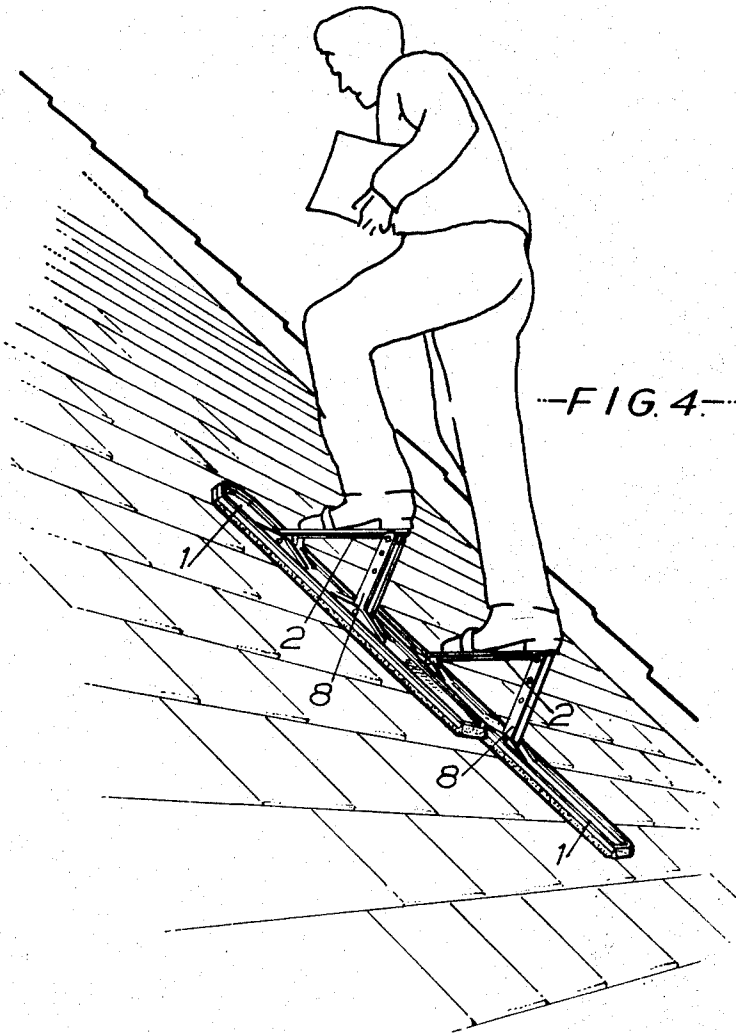


FIG. 4

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## DEVICE FOR NEGOTIATING INCLINED SURFACES

The present invention relates to roof shoes. In the following description and claims the term "roof shoe" denotes a device which when secured to a foot of a user will enable the user to negotiate inclined surfaces. Whilst mainly intended for use on pitched roofs the "shoe" is not limited to such use and can be employed for negotiating any inclined surface capable of bearing the weight of a user.

The generally accepted method of negotiating pitched roofs is by the use of cat ladders and the like which are laid on the roof and secured in position. The ladders are likely to damage roof tiles or slates and are cumbersome to handle. In order to move from one position to another the ladders must be moved and re-secured which adds to the time and hence the cost of repair work. The present invention seeks to provide means which avoid the above drawbacks with ladders and allow a user to move at will across a roof or other inclined surface without causing any damage.

Thus according to the present invention a roof shoe as hereinbefore defined comprises an elongate base member having a non-slip surface on the lower face thereof and a foot support platform having means to engage a foot of a user on the upper face thereof and means for selectively adjusting the inclination of the support platform relative to the base member such that when the base member is resting on an inclined surface the support platform is substantially horizontal.

Preferably, the toe end of the support platform is pivotally connected to the base member and the heel end of the support platform is detachably connected to a support pivotally mounted on the base member, the support having a plurality of positions selectively co-operable with the heel end of the support platform in order to vary the inclination of the support platform with respect to the base member. Alternatively, the toe end of the support platform can be arranged to co-operate with a number of securing positions on the base member in order to vary the inclination of the support platform.

Conveniently the non-slip surface comprises a layer of a plastics material adhered to the lower face of the base member. A suitable non-slip surface is formed from a foamed resilient plastics material.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a side elevation of a roof shoe according to the present invention;

FIG. 2 is a plan view of the roof shoe in FIG. 1;

FIG. 3 is an end view of the roof shoe in the direction of Arrow A; and

FIG. 4 shows the application or use of a pair of shoes.

A roof shoe comprises an elongate, rigid base 1 carrying a foot support platform 2 which can be inclined at various predetermined angles to the plane of the base 1. The undersurface of the base 1, that is the surface which in use is adjacent an inclined surface, is covered with a non-slip material such as a layer of a foamed resilient plastics material 3.

The support platform 2 is arranged on the base 1 such that it is positioned forward of the center of the length of the base. The toe end of the support platform

2, that is the end adjacent the front of a foot of a user, is pivotally connected to the base 1 by a bolt or spindle 4 which passes through bosses 5 on the under surface of the support platform 2 and is supported in a pair of bearing blocks 6 formed integral with the base, one at each side thereof. The bolt 4 is secured by a lock-nut 7.

The heel end of the support platform 2 is detachably connected to a pair of support bars 8. Each bar 8 is provided with a number of axially spaced apart apertures 9, the apertures in one bar being in substantial alignment with the apertures in the second bar. The bars 8 are pivotally connected at one end to the base 1 by a bolt or spindle 10 which is supported in a second pair of bearing blocks 11 formed integral with the base 1. The bolt 10 passes through the blocks 11 and an aperture adjacent an end of each bar 8 and the length of the spindle between the bars 8 carries a tubular sleeve 12 which serves as a spacer to maintain the ends of the bars apart. A lock-nut 13 secures the end of the bolt 10 protruding beyond block 11.

The heel end of the support platform is detachably connected to the bars 8 by a bolt or spindle 14 which passes through a pair of aligned apertures 9 in the bars 8 and bosses 15 on the under surface of the support platform. The bolt 14 is provided with a wing nut 16 for ease of release.

A leather or similar strap or band 17 is secured to the support platform 2 for anchoring a foot of a user to the platform. More than one strap can be provided if necessary. The base 1 is provided with a continuous peripheral rib 18 which serves to strengthen the base.

In use, a pair of such shoes are laid on a roof and the inclination of the support platforms 2 is adjusted relative to the roof until each platform is substantially horizontal. A user then steps on to the support platforms, one foot on each, and secures a strap 17 around each foot. The user is then free to negotiate the roof at will in any direction and with confidence that the shoes will provide him with a sure footing. It will be observed that the support platform 2 is disposed towards the forward end of the base 1. This ensures that the weight of a user standing on the shoes is distributed as far as possible over the whole surface area of the shoes.

The base is elongate in order to span a plurality of roof tiles or slates. This gives added protection should one of the tiles be loose or broken as the base will still be resting on good tiles or slates. Thus the base can have a length of approximately 85 cms. and a width of approximately 20 cms. The bolt or spindle 4 can be positioned approximately 20 cms. from the toe end of the base and the distance between bolt 4 and bolt 10 can be approximately 28 cms. The above dimensions are given purely for the sake of example.

Preferably each shoe is made to a weight of, for example, 4.5 Kilograms. This enables the shoe to rest on an inclined surface when not attached to a foot of a user. The above recited weight of a shoe is given purely as an example.

The shoes can be formed from a metal. A suitable metal is an aluminum alloy comprising a major proportion of aluminum and containing approximately 10 to 13 percent Silicon and minor proportions of other metals such as iron, manganese, lead, zinc, titanium, tin and nickel. Such an alloy has good structural properties and is resistant to corrosion. Such properties are desira-

ble as the shoes are liable to rough handling, such as use on building sites, and will be exposed to the weather. The peripheral rib 18 is not essential.

Whilst the shoes can be formed from a metal or metal alloy it is also possible to manufacture the shoes from other rigid materials. Thus the shoes can be formed from wood or from a rigid plastics material. When, and if formed from such materials as a rigid plastics material it is preferable to incorporate weights, such as removable steel weights, in the plastics material so as to ensure that each shoe is sufficiently heavy to rest of its own accord on an inclined surface and will not be dislodged as for example by wind.

The layer of foamed, resilient, plastics material 3 is adhered to the undersurface of the base 1 by an adhesive. Clearly, the adhesive employed will be determined by the type of foamed plastics material and the material of the base 1. Upon wear of the foamed plastics material it can be stripped off the base and replaced with a fresh layer of plastics material 3. Whilst a foamed plastics material is preferred as a non-slip material it will be apparent that other materials can be employed, such as foam rubber.

In the drawings, the adjustment of the inclination of the support platform 2 is achieved by the selective positioning of the bolt 14 at the heel end of the platform in the apertures 9 in the bars 8. Alternatively the inclination of the platform can be achieved by arranging the bolt 4 at the toe end of the support platform 2 to engage in one of a pair of aligned apertures formed in the bearing blocks 6. In such an arrangement it will be necessary to lengthen the bearing blocks 6 so that each block can be formed with a row of apertures to receive the bolt 4.

As the inclination of the support platform relative to the base can be adjusted over a range of values the shoes can be used for negotiating roofs and other surfaces which are pitched at various angles.

I claim:

1. A roof shoe comprising an elongated base member, a foot support platform mounted on the upper face of the base member, the support platform being inclined relative to the plane of the base member, and means defining a non-slip surface on the lower face of the base member, said means comprising a layer of a soft resilient plastics material secured to the lower face of the base member, whereby the material conforms to the surface of the roof.

2. A roof shoe according to claim 1; wherein the layer secured to the lower face of said base member comprises a soft resilient foamed plastics material

which is adhesively secured to said lower face.

3. A roof shoe according to claim 1; in which the foot support platform has a toe end positioned closely adjacent the base member and a heel end positioned a substantial distance from the base member, and connecting means coacting between the base member and the support platform for selectively adjusting the inclination of the support platform relative to the base member, said connecting means including first means pivotally interconnecting the toe end of said support platform to said base member and second means pivotally interconnecting the heel end of said support platform to said base member, one of said first and second means including adjustment means associated therewith for permitting the inclination of the support platform to be adjusted relative to the base member.

4. A roof shoe according to claim 3, in which the adjustment means includes a plurality of openings and releasable pivot pin means adapted to be disposed within one of said openings.

5. A roof shoe according to claim 3, in which the foot support platform is pivotally connected adjacent the heel end thereof to the base member and is detachably connected at the toe end thereof to the base member, the base member having a plurality of positions selectively cooperable with the toe end of the support platform in order to vary the inclination of the support platform with respect to the base member.

6. A roof shoe according to claim 1 including connecting means coacting between the base member and the support platform for selectively adjusting the inclination of the support platform relative to the base member.

7. A roof shoe according to claim 6 in which the foot support platform is pivotally connected at the toe end thereof to the base member and is detachably connected at or adjacent its heel end to a support pivotally mounted on the base member, the support having a plurality of positions selectively co-operable with the heel end of the support platform in order to vary the inclination of the support platform with respect to the base member.

8. A roof shoe according to claim 7 in which the support comprises a pair of spaced-apart bars each pivotally connected to the base member and each having a plurality of axially spaced-apart apertures therein, the apertures in one bar being in alignment with the apertures in the second bar to receive a detachable bolt or spindle which passes through bosses on the heel end of the support platform.

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