

Jan. 19, 1926.

1,570,576

C. S. RIVITZ

LADDER SHOE

Filed June 15, 1925

2 Sheets-Sheet 1

FIG-1

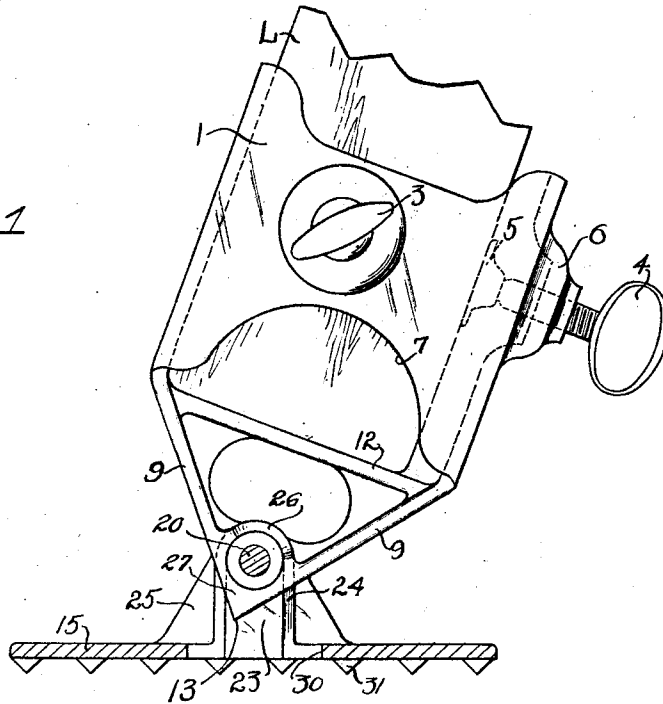
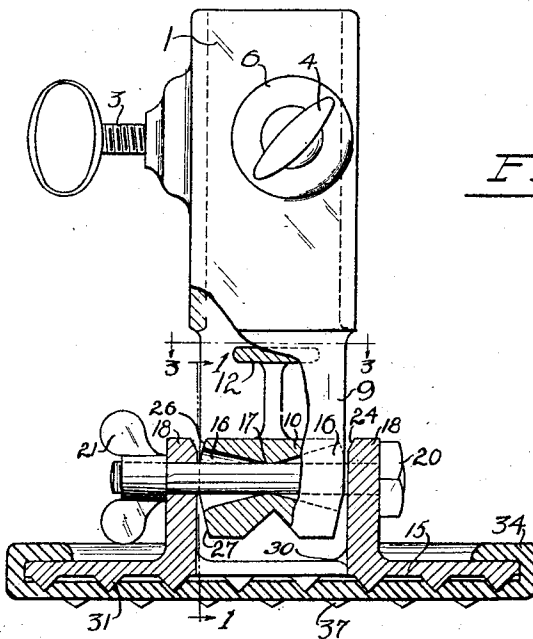


FIG-2



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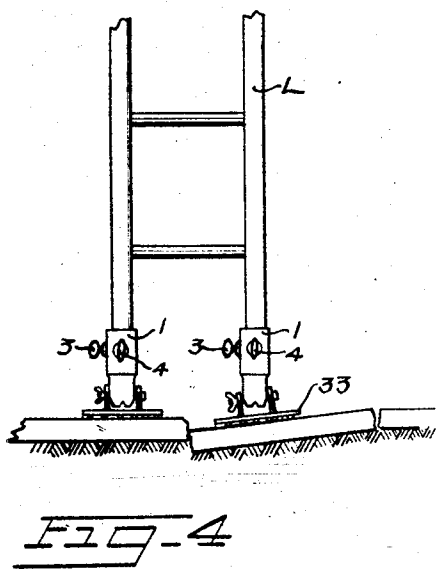
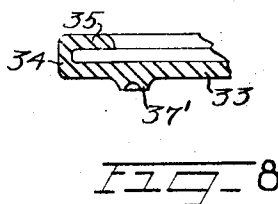
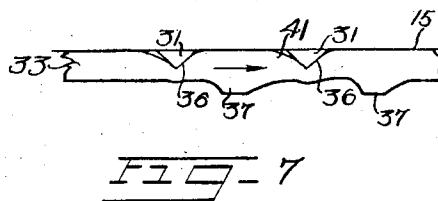
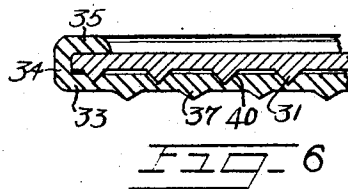
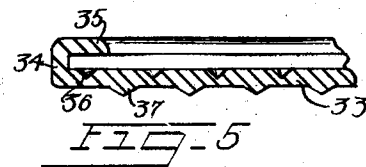
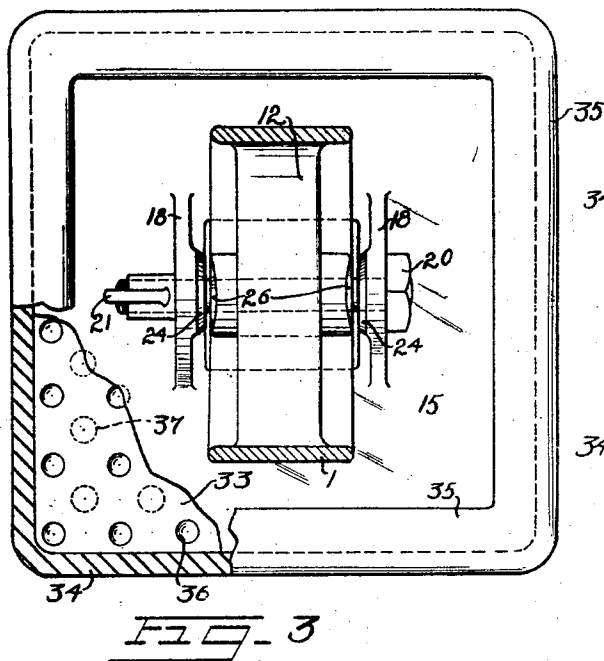
1,570,576

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LADDER SHOE

Filed June 15, 1925

2 Sheets-Sheet 2



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Patented Jan. 19, 1926.

1,570,576

UNITED STATES PATENT OFFICE.

CHARLES S. RIVITZ, OF CLEVELAND, OHIO.

LADDER SHOE.

Application filed June 15, 1925. Serial No. 37,024.

To all whom it may concern:

Be it known that I, CHARLES S. RIVITZ, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in a Ladder Shoe, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 This invention relates to safety shoes for ladders and the general object is to provide a pivoted shoe capable of being easily and quickly attached to the leg of a ladder to prevent slippage of the base of the ladder when it is in upright inclined position.

More specifically an object is to provide an extremely simple universal pivotal mounting for a substantially flat base portion of a shoe to secure firm engagement between the entire bottom of surface of the shoe of each ladder leg, when the ladder is placed on uneven surfaces or surfaces of different levels.

25 Further objects include the provision of the base portion of the shoe with a gripper attachment which may be easily fitted to the base and easily removed and which may be provided with resilient toes for engaging comparatively even or smooth surfaces, such as ice or oily floors.

30 The device and its application will become more clear from the further description which relates to the accompanying drawings wherein I have illustrated the preferred form of my invention. The essential novel characteristics will be summarized in the claims.

35 In the drawings Fig. 1 is a side elevation of my shoe shown as attached to the lower end of the leg of a ladder parts being shown in section; Fig. 2 is a front elevation of my shoe parts being shown in section; Fig. 3 is a fragmentary sectional plan taken along the lines 3—3 of Fig. 2; Fig. 4 is a side elevation of a pair of shoes fitted to the ladder and engaging uneven ground surfaces; Fig. 5 is a fragmentary section taken through my resilient gripper attachment; Fig. 6 is a similar fragmentary section showing the gripper in place on the base member of the ladder; Fig. 7 is a diagrammatic illustration of the action of the gripper in engaging the ground; Fig. 8 is a fragmentary cross sectional view showing a modified form of gripper.

Referring in detail to the drawings and indicating the various parts by numerals, 1 indicates a socket for receiving the end of the leg of a ladder illustrated at L. The socket is shown as provided with clamping screws 3 and 4, each of the screws preferably carrying universally pivoted clamping feet 5 which may be drawn into hollow boss portions 6 on the wall of the socket member so that I may utilize the entire space within the socket with a minimum amount of wall material. This and other details relating to the socket members are shown and claimed in my prior Patent No. 1,543,723 granted June 30, 1925. The socket member is shown as having an opening 7 in the side near the bottom for the sake of lightness of construction and the front and rear side walls are shown as extending downwardly at 9 and converging into a bearing portion 10. Near the point at which these members 9 begin to converge I preferably provide a floor strip 12 upon which the bottom of the ladder leg may rest and which serves to reinforce the entire structure.

One of the primary characteristics of my invention is that the base portion designated 15 is universally pivoted to the socket member whereby the socket member and ladder leg may extend upwardly at different angles in more than one plane while the base will firmly engage the ground over its entire surface. Thus even though the ground may be rough or uneven as shown in Fig. 4 or at a different level with respect to both legs of the ladder, the ladder will be supported safely in the desired position.

40 The means whereby this universal pivoting action is accomplished consists preferably of a double flaring opening 16 having a restricted portion designated 17 through which a member 20 carried rigidly by the base may extend. The base is shown as being provided with a pair of ears 18 extending along either side of the bearing portion 10 and adapted to carry the member 20 which may be a bolt as shown, provided with a wing nut 21 whereby the base may be easily removed when desired.

To provide for greater freedom of movement of the socket relative to the base the ears are shown in Fig. 3 as having a central rib 23 having rounded surfaces 24 adjacent the bearing portion 10 and bracing webs 25 extending to the base on the side of the web

remote from the bearing portion 10. The member 10 is also rounded at 26 above the bolt and similarly rounded or beveled at 27 below whereby the base may be capable of considerable sideward swing relative to the socket yet prevented from excessive shifting along the bolt. It will be noted that substantially complete peripheral contact is maintained at all times between the bearing 10 and the member 20 at the point 17 with the result that the base will not be subject to rattle while the ladder is being carried from place to place, and it will be seen that the base, by reason of the double flared opening and the rounded surfaces may be turned relative to the socket until the axis of the bolt is parallel to any given interior surface of the opening.

The converging members 9 are shown as terminating at a wedge point 13 below the bearing 10 and adapted to serve as a separate ground engaging member for heavy earth or mud. In Fig. 1, I have shown the relation of the point 13 to the opening 30 in the base. It will be seen from this figure that if the pivot bolt or pin were to break or be withdrawn unexpectedly by reasons of the loss of the thumb nut, the point 13 will drop through the opening and engage the ground with sufficient force to insure the ladder against slipping.

The base is shown as comprised of a substantially flat member having an opening 30 in its central region and having a series of projections 31 extending downwardly from the bottom surface. These projections may serve as non-slip members for surfaces of the general character of hard ground, gravel and the like. Such engaging members, however, are not suitable for all generally plane surfaces and to adapt the shoe to very smooth surfaces, I provide a gripper member preferably formed of elastic rubber or rubber composition, shown as comprising a bottom portion 33, side wall 34 for engaging the peripheral edges of the base member 15 and a continuous inwardly extending marginal portion 35 for engaging the top surface of the base member 15. By reason of the elastic character of this gripper member it may be easily slipped over the base and retained in place by the flanges. A very close gripping effect beneath the portion 35 is maintained by reason of the wall portions 34 being slightly stretched when the gripper is in place; the relative dimensions before being applied being substantially those shown in Fig. 5.

Cooperating with the projections 31 to retain the general body of the gripper against excessive stretching I have shown depressions 36 in the upper surface of the gripper member there being preferably one depression for each projection 31. As

shown in Fig. 6 these depressions are shown of less depth than the height of the projections 31 whereby should wear of the rubber occur between the projections and the depressions, the depressions will still have firm side contact with the projections, and when the base is resting upon the ground will prevent any appreciable creeping of any region of the gripper relative to the base.

Suitably disposed in offset relation to the projections and extending downwardly from the lower surface of the gripper I have shown toe members 37 which may be conical as shown at the left in Fig. 5, or of the character of vacuum cups as shown in Fig. 8 at 37'. I preferably use the conical projections which are simpler to manufacture and which I find produce a peculiar snubbing effect very similar to what may be obtained by the flesh on the ball of the human finger when engaging a smooth surface to shove it along. The reason for this is that the rubber while held against excessive stretching by the projection 31 on the member 15, may stretch somewhat between the projections, as illustrated diagrammatically in Fig. 7. In this figure I show the base as though pressed downwardly by the ladder. The shoving action due to the setting of the ladder at an angle is supposedly tending to urge the base along in the direction of an arrow. The side surfaces 40 on the projections 31 are shown as completely engaged by the rubber of the gripper, while on the opposite sides of the projections the rubber has been drawn away, being stretched as shown at 41. The net result is that the toes are permitted to roll slightly and thus take firmer hold on the smooth surface which I have found to be very effective in preventing the ladder from slipping.

It will be seen from the above description that I have provided a very simple and cheap ladder foot construction which will enable the ladder to be used at a considerable angle to the vertical without endangering the user.

Having thus described my invention, I claim:—

1. A ladder shoe comprising in combination a member adapted to be secured to the end of a ladder leg, a base member, one of said members having a projection with an opening extending therethrough restricted in a region intermediate its ends, and the other of said members having a pair of ears and a member carried thereby and extending through the opening in close engagement with the restricted portion, whereby a universal connection is had between said first named member and the base.

2. A ladder foot comprising a hollow member having a downwardly extending

projection terminating in a bearing portion, the bearing portion being provided with an opening having a restricted central region, a base member having ears adapted to extend along either side of said bearing portion, and a pin carried by the ears and passing through the opening substantially filling the restricted portion of the opening, whereby when the base is in a given plane, the hollow member may be swung side-wardly as well as forwardly and rearwardly while firm engagement between the pin and bearing is maintained.

3. A ladder shoe comprising in combination a member adapted to be secured to the end of a ladder leg, a base member arranged to be secured thereto, a single bearing member extending from one of said members, a pair of bearing members extending from the other in overlapping close relation to the said single bearing member, an opening in the said single bearing member having a restricted zone intermediate of its ends, a pin carried by said pair substantially fitting the opening at said zone to allow universal movement between the base and the ladder leg member, one of the bearing members having rounded surfaces receding from the normal point of contact with the cooperating bearing member, whereby said close relation may be maintained when the universal movement takes place.

4. A safety device for a ladder foot having a member provided with a downwardly extending pointed projection at its end and a substantially flat base member having ears adapted to extend along either side of said projection and means carried by the ears for pivotally securing said ears to the projection, the base member being provided with an opening located below the point whereby the point may engage the ground in case the pivotal means fails to function.

5. In combination, a substantially flat member adapted to be secured to a ladder leg, projections extending downwardly from the lower surface of the flat member, a gripper member adapted to extend along said lower surface and having recesses engaged by the projections, and toe members extending downwardly from the lower surface of the gripper member in offset relation to the projections.

6. A ladder foot construction comprising

a member adapted to be secured to a ladder leg, a base member pivoted thereto having a substantially flat lower surface, projections extending downwardly from the lower surface, a resilient gripper member adapted to extend along said lower surface and toe members extending downwardly from the lower surface of the gripper member in offset relation to the projections.

7. A shoe member for a ladder having a substantially flat lower surface, means for pivotally attaching a ladder leg to said member and an elastic gripper member having a continuous intumed marginal edge adapted to slip over the marginal edges of the flat member and be retained thereon by the elasticity of the gripper and means positioned at intervals along the central zone of the gripper for preventing such central zone from creeping along said flat surface as the material of the gripper is stretched.

8. A shoe member for a ladder including a substantially flat member, for pivotally supporting a ladder leg on said member, a gripper member formed of resilient elastic material for providing said member with a non-slip surface, said gripper having a continuous inwardly extending brim adapted to engage the upper margin of said member and means including projections extending downwardly from the member and pockets in the gripper engaged by the projections for preventing creeping movement of the central body portion of the gripper relative to the member when the said body portion is stretched by engagement with a floor surface.

9. In combination, a member adapted to support a ladder, projections extending downwardly therefrom, a gripper attachment for said member comprising a sheet of elastic material secured at its edges to said member and having projections extending downwardly therefrom in offset relation to the projections on said member whereby when downward and lateral force is applied to said member, the projections are allowed to roll slightly while keeping substantially their original position relative to the said member.

In testimony whereof, I hereunto affix my signature.

CHARLES S. RIVITZ.