

Nov. 7, 1944.

H. N. SMITH

2,361,972

ICE CREEPER

Filed April 5, 1944

2 Sheets-Sheet 1

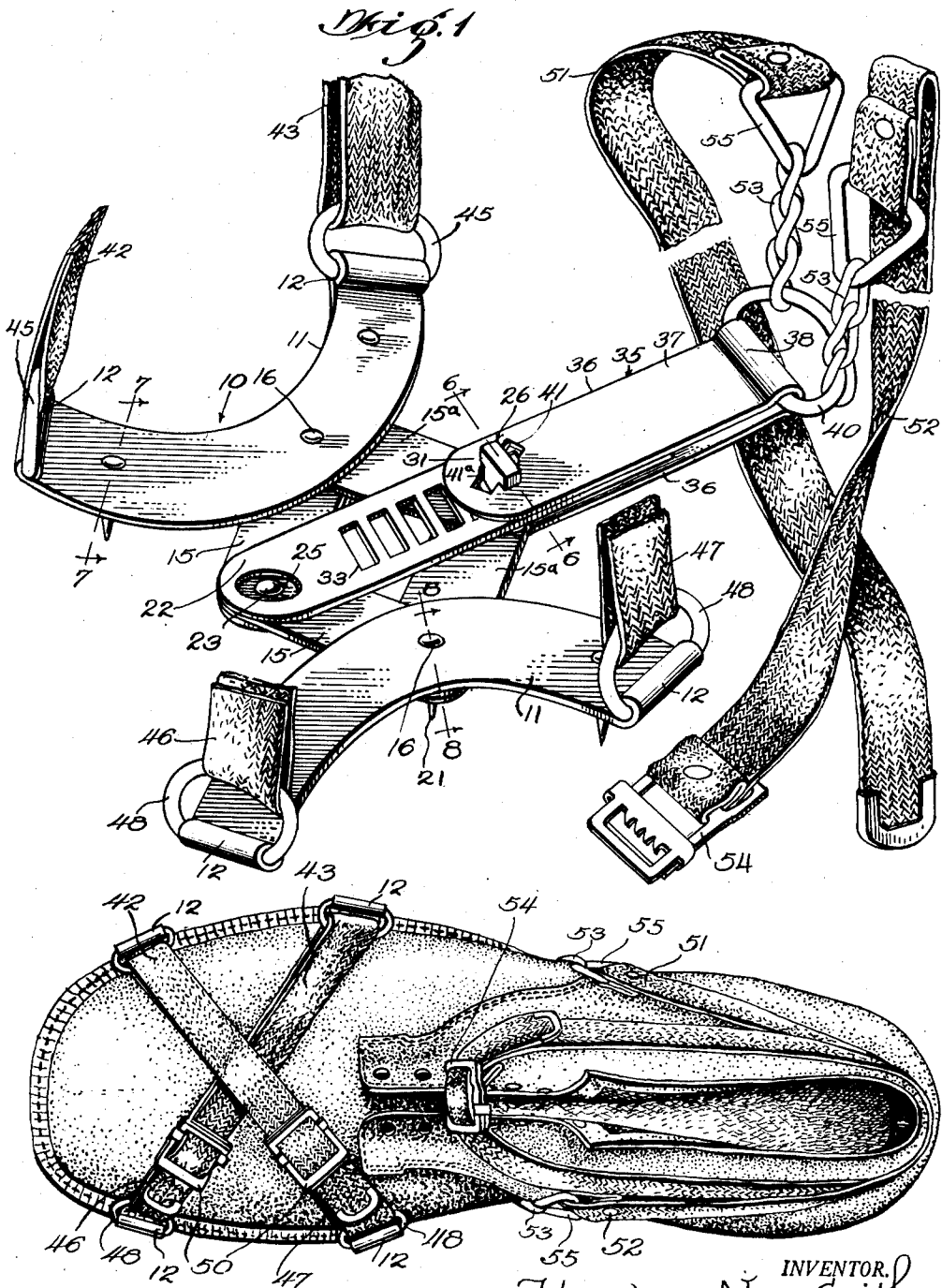


Fig. 2

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2 Sheets-Sheet 2

Fig. 3

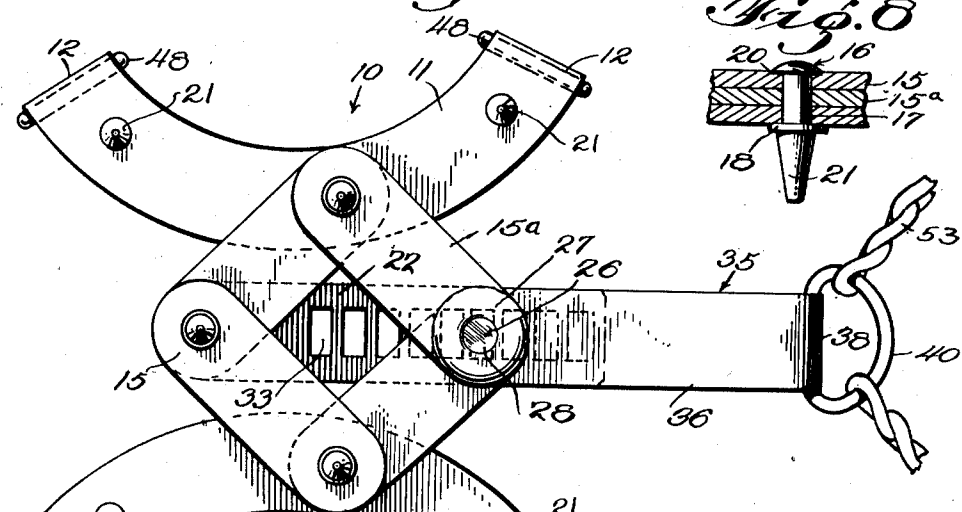


Fig. 8

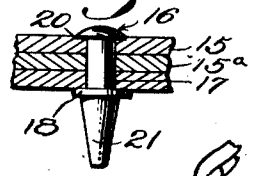


Fig. 4

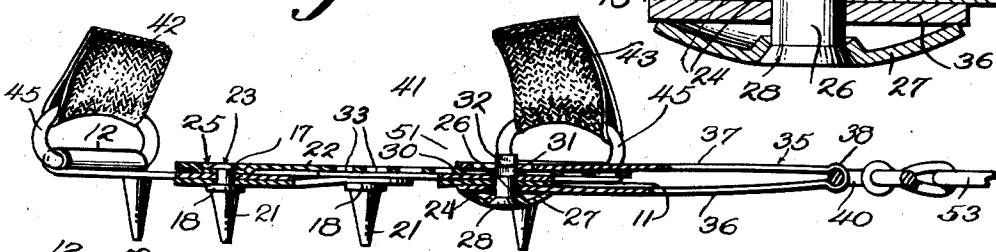


Fig. 6

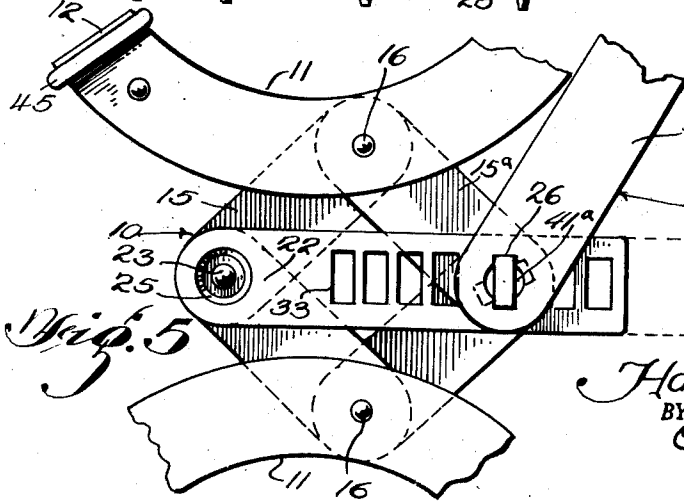
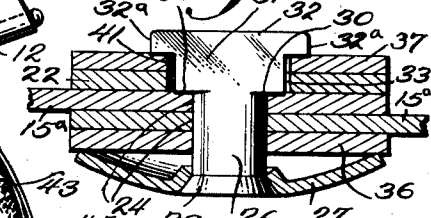
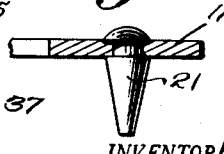


Fig. 7



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2,361,972

ICE CREEPER

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Application April 5, 1944, Serial No. 529,606

11 Claims. (Cl. 36—62)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein, if patented may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to ice creepers, and more particularly to adjustable creepers adapted to be secured to the shoes or boots of the user to insure firm or safe foothold on ice or slippery surfaces.

More specifically, the creeper which is made the subject matter of this application is an improvement on the device disclosed in my United States Patent No. 2,313,099 granted March 9, 1943.

In the device disclosed in my Patent No. 2,313,099 and in other adjustable creepers disclosed in the prior art, pivotally-united toggle links and cleat-supporting components are moved relatively to each other, to cause the creeper to conform to the size of the shoe or boot, by tightening flexible securing straps. The tightening of the securing straps not only causes the creeper to conform to the boot or shoe, but also maintains its components in position on the foot. Inasmuch as toggle links and securing straps are employed to adjust and secure the creeper to a shoe or boot, the range of adjustment is limited, and when the creeper components are adjusted to fit relatively small shoes, the toggle components approach the limit of their effective leverage, so that the tightening or securing straps may not secure the creeper to the shoe. Furthermore, if the securing straps should stretch or yield, then the creeper components become loose on the foot so that retightening is required.

Therefore, an object of this invention is to provide an improved creeper having a frame formed of a plurality of pivotally-united components which are movable about their pivots relative to each other to adjustably vary the size of the frame to permit it to fit the shoe of the user, means for rigidly securing the components relative to each other in their adjusted position, and flexible straps for securing the rigidly united components to the shoe or boot of the user.

Another object of this invention is to provide an improved ice creeper having a composite frame formed of pivotally-united components which support ground engaging spikes or cleats, a strap secured to components of the frame and adapted to engage the upper portion of the user's shoe to secure the frame to the sole of the shoe with its cleats extending downwardly to engage the ground or supporting surface, means for adjusting the frame components to permit the frame to conform to the size of the user's shoe, means for locking the adjusting components of

the frame in fixed relationship to each other so that the selected adjustment of the frame is constantly maintained independently of the securing straps.

A specific object of this invention is to provide an improved ice creeper having a composite frame formed of a plurality of pivotally united components which support ground-engaging spikes or cleats and straps secured to the components of the frame and adapted to engage the upper portion of the user's shoe to secure the frame to the sole of the shoe with the cleats extending outwardly, means for adjusting the frame components to permit the frame to conform to the dimensions of the shoe sole, and locking means having a member which forms a component of the frame and which is movable from locking to unlocking position, and straps secured to the member and adapted to engage the upper portion of the shoe to secure the member in locking position.

It is also an object of this invention to provide an ice creeper of generally improved construction, whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable, and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction herein described and claimed, it being understood that various changes in form, proportion and minor details of construction may be made within the scope of the claims without departing from the spirit or sacrificing any advantages of the invention.

For a complete disclosure of the invention, a detailed description thereof will now be given in connection with the drawings forming part of the specification wherein:

Fig. 1 is a perspective view of the improved ice creeper;

Fig. 2 is a top view of a shoe showing the creeper applied thereto;

Fig. 3 is a fragmentary bottom plan view of the creeper;

Fig. 4 is a longitudinal sectional view taken through the creeper, parts appearing in elevation;

Fig. 5 is a fragmentary top plan view of the creeper, showing components in their unlocked position;

Fig. 6 is an enlarged transverse sectional view taken on the line 6—6 of Figure 1;

Fig. 7 is a transverse sectional view taken on the line 7—7 of Fig. 1; and

Fig. 8 is a transverse sectional view taken on the line 8—8 of Fig. 1.

Referring to the drawings, in which corresponding parts are indicated by similar reference characters, there is depicted a composite frame 10 which includes opposed arcuate plates or members 11. The terminals of each arcuate plate 11 are upwardly turned to provide cylindrical eyes 12 for the reception of loops or rings.

Opposed links or link plates 15 and 15a are provided, and their outer terminals are secured in overlapping relation to the arcuate plates 11 by means of pivots 16. Each pivot 16 is provided with a shank 17 that extends through aligned apertures formed in an arcuate plate 11 and the link plates 15 and 15a. A collar 18 is formed at one terminal of the shank 17, and the opposed terminal of the shank 17 is flanged or riveted, as indicated at 20, in order to pivotally secure the overlapping terminals of link plates 15 and 15a and the intermediate portion of the arcuate plate 11 to each other. A ground-engaging cleat or spike 21 extends outwardly from the collar 18 of the pivot stud 16, and this cleat is tapered to provide a pointed outer terminal. The inner overlapping terminals of the links 15 are pivotally secured to each other and to one terminal of an adjusting link 22 by a pivot stud 23, similar to the stud 16, in order to permit the links 15 to turn freely relative to each other and to the adjusting link 22. The portion of the adjusting link 22 which receives the pivot stud 23 is offset or dished, as indicated at 25, so that the inner face of the dished portion 25 forms a bearing surface to engage the upper face of the uppermost link plate 15. The inner terminals of the link plates 15a are pivotally secured to each other by a locking bolt or stud 26 which extends through apertures 24 formed in the link plates 15a. One terminal of the stud 26 is swivelly secured to a spring disk 27 by a riveted shoulder or flange 28, as best seen in Figures 4 and 6. The pivot stud 26 is provided with opposed laterally-extending shoulders 30 which engage the upper face of the uppermost link plate 15a, thereby resiliently binding together the inner overlapping terminals of the link plates 15a and the resilient disk 27. The upper portion of the stud 26 is preferably rectangular in cross section to thereby provide opposed flat faces 31, and its upper terminal is provided with a head 32 having opposed overhanging flanges 32a, for a purpose to be hereinafter explained.

The adjusting link 22 is provided with a plurality of aligned rectangular apertures 33 of substantially the same dimensions and configuration as the cross section of the upper terminal of the stud 26, in order that this stud may be received within a selected aperture 33. A flexible locking member or link 35 is provided, and this link is bifurcated to provide parallel flexible plates 36 and 37 which are united at one terminal by a cylindrical eye 38, which is provided for the reception of a loop or link 40. The outer terminal of the flexible plate 36 is pivotally secured to the stud 26 (Figures 4 and 6) and the outer terminal of the flexible plate 37 is provided with a rectangular recess 41 which has its longitudinal walls disposed in angular relation to a median line passing longitudinally through the locking link 35, for a purpose to be hereinafter disclosed. The intermediate portion of the recess 41 is laterally enlarged, as indicated at 41a, to define a bayonet slot.

Straps 42 and 43 are secured to the opposite terminals of an arcuate plate 11 through interposed loops or rings 45, which are received within the cylindrical eyes 12. Straps 46 and 47 are secured to the terminals of the opposed arcuate plate 11 through the instrumentality of loops or rings 48 that are received within cylindrical eyes 12 provided at the terminals of the plate. The straps 46 and 47 are provided with buckles 50 which receive and secure the straps 42 and 43 to the straps 46 and 47, as will be more fully explained hereinafter.

Straps 51 and 52 are secured to the loop 40 carried by the locking link 35 through the instrumentality of chains 53 and triangular loops 55. The strap 52 is provided for a buckle 54 which is arranged to receive the strap 51 for a purpose which will be hereinafter explained.

Inasmuch as the components of the frame 10 are pivotally secured to each other, and since the link plates 15 and 15a are arranged to provide opposed toggles, the frame 10 may be adjusted to accommodate shoes or boots of different sizes, and the adjusting range is preferably of such amplitude as to permit the composite frame 10 to conform to the sole of any size boot or shoe.

In adjusting the frame 10 for application to any selected size shoe, the locking link 35 is turned about the axis of the pivot stud 26 until its rectangular recess 41 aligns with the enlarged rectangular head 32 of the pivot stud 26. In this position, the resilient plate 37 of the locking link 35 spring outwardly, thus liberating the adjusting link 22 for outward movement, so that its rectangular recess 33 which engages the stud 26 may be moved outwardly sufficiently to disengage the stud, thus permitting the links 15 and 15a to be moved relative to each other. The links 15 and 15a are then moved relative to each other to adjust the frame 10 to fit the shoe, and after this adjustment has been made, the selected aperture 33 of the adjusting link 22 is placed about the stud 26, thereby locking the stud against rotation. The locking link 35 is now turned about the stud 26 until its apertures 41 again align with the enlarged head 32 of the stud 26. The flexible plate 37 is then pressed inwardly to force the apertures 41 over the head 32 of the stud 26 until the outer face of the plate 37 clears the laterally extending flanges 32a of the stud 26. The locking links 35 are then turned about the axis of the pivot stud 26 until it aligns with the adjusting link 22.

After these adjustment, the creeper is in condition for application to the user's shoe, and it may be readily applied to the shoe by placing the upper face of the frame 10 against the sole of the shoe, and then crossing the straps 42 and 43 over the forward portion of the shoe and securing them to straps 46 and 47 by the buckles 50. The straps 51 and 52 are then trained and crossed around the heel portion of the shoe and then carried to the ankle or instep portion thereof where they are united by the buckle 54. This immovably secures the creeper to the sole of the shoe with the spikes or cleats 21 extending downwardly to engage the ground or other supporting surface, thereby insuring positive and safe foothold. While the frame is strapped to the user's shoe, it is impossible for the link plates 15 or 15a to move relative to each other, because they are held in rigid relation by the interposed adjusting link 22. Furthermore, it is impossible for the locking link 35 to move to unlocking position, because this link

is immovably secured in alignment with the adjusting link 22 by means of the straps 51 and 52.

I claim:

1. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, means for rigidly securing the links in different positional relations to each other to thereby adjust the frame to fit shoes of different sizes, and straps secured to the frame and adapted to engage the upper portion of the shoe to thereby secure the frame to the shoe.

2. An ice creeper includes a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, means for rigidly securing the links in different positional relations to each other to thereby adjust the frame to fit shoes of different sizes, straps secured to the frame and adapted to engage the upper portion of the shoe to thereby secure the frame to the shoe, a locking member cooperable with the said link securing means and movable to and from locking and releasing positions, and straps secured to the locking member and adapted to engage the upper portion of the shoe to thereby secure the locking member in locking position.

3. An ice creeper including a frame having a plurality of plates pivotally secured to each other, ground-engaging cleats extending from the plates, means for rigidly securing certain of the plates in different positional relations to each other to thereby adjust the frame to fit shoes of different sizes, and straps secured to the frame and adapted to engage the upper portion of the shoe to thereby secure the frame to the sole of the shoe.

4. An ice creeper including a frame having a plurality of plates pivotally secured to each other, ground-engaging cleats extending from the plates, means for rigidly securing certain of the plates in different positional relations to each other to thereby adjust the frame to fit shoes of different sizes, straps secured to the frame and adapted to engage the upper portions of the shoe to thereby secure the frame to the sole of the shoe, a locking member cooperable with the said link securing means and movable to and from locking and releasing positions, and straps secured to the locking member and adapted to engage the upper portion of the shoe to thereby secure the locking member in locking position.

5. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links, means for adjustably securing the adjusting link to certain of the said links to thereby rigidly secure the said links in a predetermined positional relation to each other in which the frame is adjusted to fit a shoe of given size, and straps secured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe.

6. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links, means for adjustably securing the adjusting link to certain of said links to thereby rigidly secure the said links in predetermined positional relation to each other in which the frame is ad-

justed to fit a shoe of given size, straps secured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe, and a locking member cooperable with the said link-securing means and movable to and from locking and releasing positions, and straps secured to the locking member and adapted to engage the upper portion of the shoe to thereby secure the locking member in locking position.

7. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links and having spaced apertures formed therein, a stud pivotally secured to certain of the links and received within a selected one of said apertures to rigidly secure the links in positional relation to each other in which the frame is adjusted to fit a given shoe, and straps secured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe.

8. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links and having spaced apertures formed therein, a stud pivotally secured to certain of the links and received within a selected one of said apertures to rigidly secure the links in positional relation to each other in which the frame is adjusted to fit a given shoe, straps secured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe, a locking member cooperable with said stud and movable to and from locking and releasing positions, and straps secured to the locking member and adapted to engage the upper portion of the shoe to thereby secure the locking member in locking position.

9. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links and having spaced rectangular apertures formed therein, a stud pivotally secured to certain of the links and having a rectangular portion to be received within a selected one of the said apertures to hold the studs against rotation relative to the adjusting link and to rigidly secure the links in positional relation to each other in which the frame is adjusted to fit a given shoe, straps secured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe.

10. An ice creeper including a frame having separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links and having spaced rectangular apertures formed therein, a stud pivotally secured to certain of the links and having a rectangular portion to be received within a selected one of the said apertures to hold the stud against rotation relative to the adjusting link and to rigidly secure the links in positional relation to each other in which the frame is adjusted to fit a given shoe, straps secured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe, and a locking member having a portion which is pivotally secured to the stud and a portion which engages the stud in locking relation.

11. An ice creeper including a frame having

separate plates, ground-engaging cleats extending from the plates, links pivotally secured to the plates and to each other, an adjusting link permanently secured to certain of the said links and having spaced rectangular apertures formed therein, a stud pivotally secured to certain of the links and having a rectangular portion to be received within a selected one of the said apertures to hold the stud against rotation relative to the adjusting link and to rigidly secure the links in positional relation to each other in which the frame is adjusted to fit a given shoe, straps se-

5 cured to the frame and adapted to engage the upper portion of the shoe to secure the frame to the shoe, a locking member having a portion which is pivotally secured to the stud and a portion which engages the stud in locking relation when the locking member is in a predetermined position, the locking member being removable to and from the locking position, and straps secured to the locking member and adapted to engage the upper portion of the shoe to thereby secure the locking member in locking position.

10 HARVEY N. SMITH.