Jan. 17, 1939. R. L. TIEFEL 2,144,207

SKI BINDING

Filed Jan. 28, 1938 2 Sheets-Sheet 1

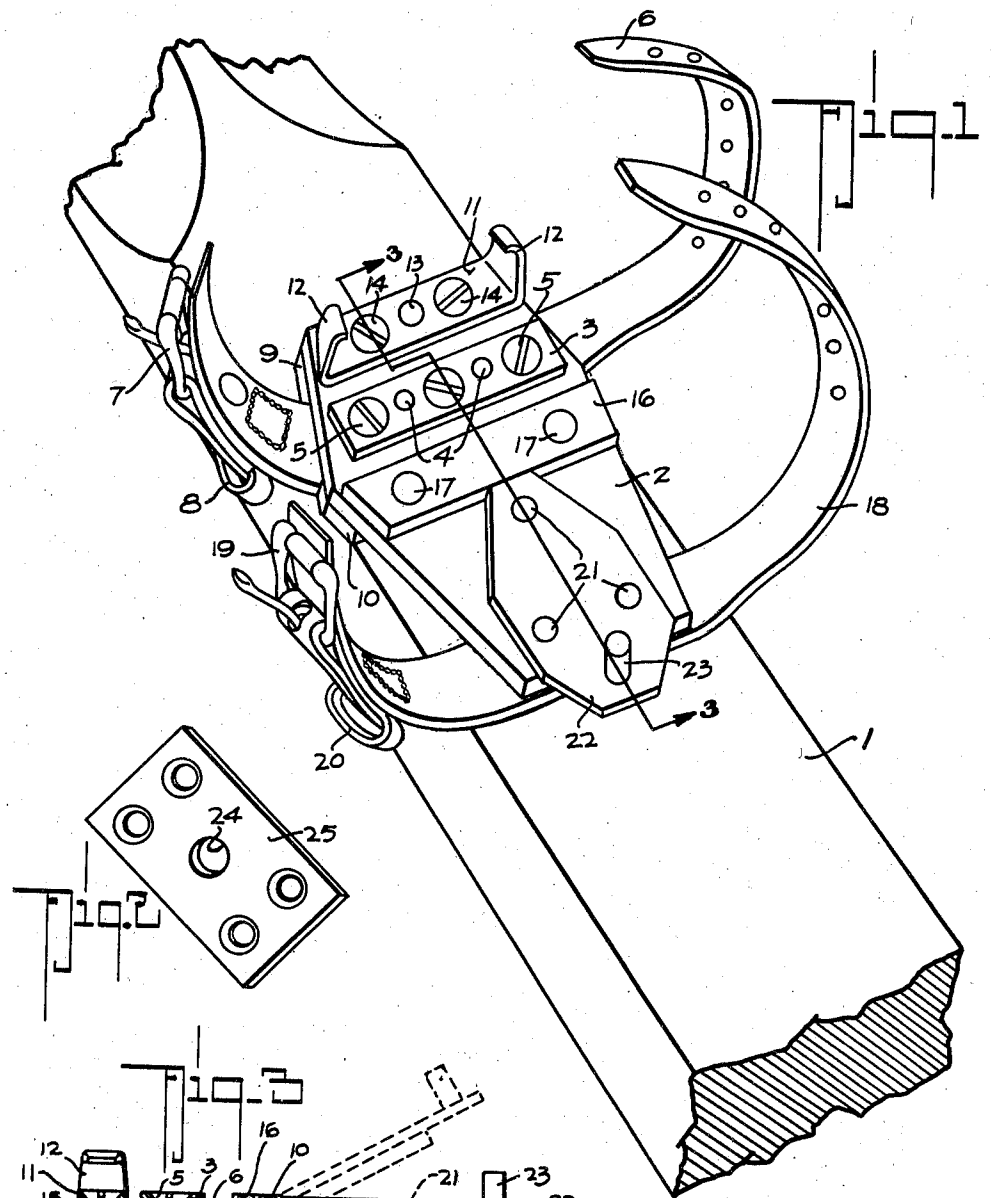


Fig. 1

Fig. 2

Fig. 3

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SKI BINDING

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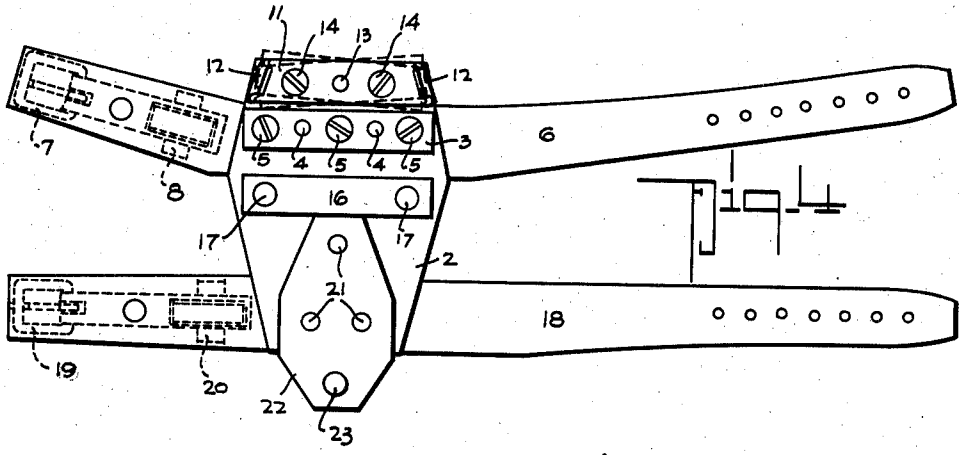


Fig. 4

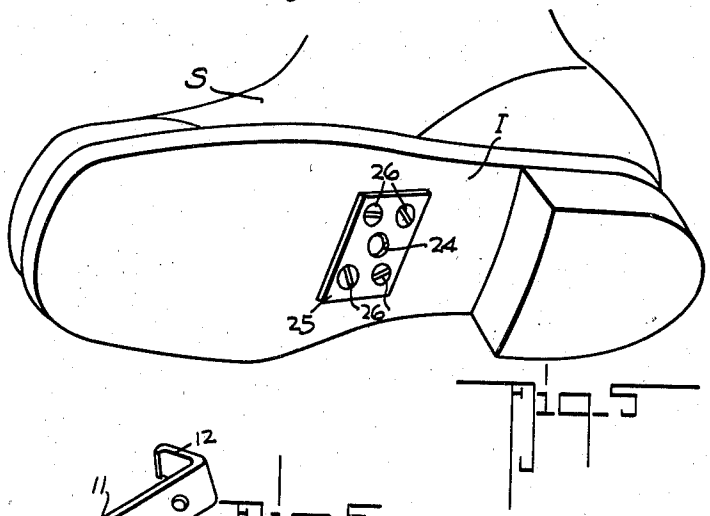


Fig. 5

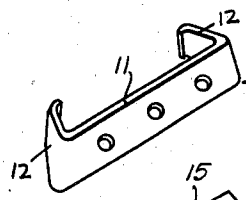


Fig. 6

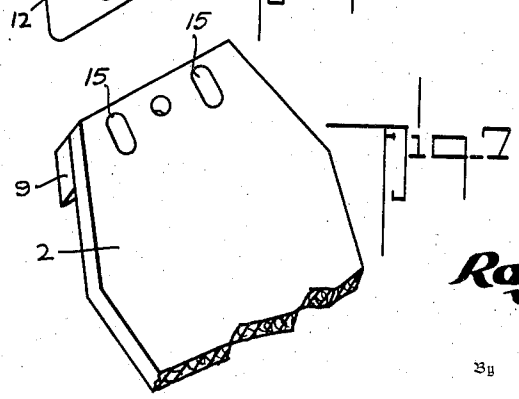


Fig. 7

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Patented Jan. 17, 1939 2,144,207

UNITED STATES PATENT OFFICE

2,144,207

SKI BINDING

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Application January 28, 1938, Serial No. 187,413

4 Claims. (Cl. 280—11.35)

The present invention relates to an improved ski binding of the flexible hinge type, that is securely anchored at its front or toe portion to the ski, and also firmly coupled or connected at its rear portion to the instep of the boot or shoe or the skier.

The binding of my invention is adapted for use not only with specially made ski-boots, but it is especially designed for use with the ordinary shoes or boots in order to eliminate the necessity of employing the special ski-boots. For this purpose a pair of shoes or boots for ordinary wear is equipped with a pair of socket plates permanently attached thereto, and these socket-plates cooperate, through the use of a coupling-pin, with the hinge member of the binding that is mounted on the skis. The socket-plate is attached to the instep of the shoe sole, and when so equipped the boots or shoes are employed for ordinary wear without in any manner impairing the utility of the regular boots or shoes, and without interference with the usual functions of the boots or shoes.

In carrying out my invention I provide means whereby the ski may with facility be fitted or adjusted to the foot, and the binding coupled with the boot, and with equal facility the ski may be removed. When in position for use, the binding although of a flexible nature, at the same time possesses the required longitudinal rigidity to insure the positive control of the comparatively long ski that is necessary for turning or stopping, and the flexible binding is adequately braced against lateral pressures or strains for this purpose.

The invention consists in certain novel combinations and arrangements of parts that insure comfort, convenience and safety to the skier employing the binding, as will hereinafter be more fully pointed out and claimed. In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to one mode I have devised for the practical application of the principles of my invention, but it will be understood that changes and alterations may be made in the exemplifying drawings, within the scope of my appended claims, without departing from the principles of the invention.

Figure 1 is a perspective view showing a portion of a ski with the binding of my invention mounted thereon.

Figure 2 is a perspective view of the socket-plate to be permanently attached to the exterior instep of a boot or shoe.

Figure 3 is a detail sectional view longitudinally of the ski, as at line 3—3 of Figure 1.

Figure 4 is a plan view of the binding detached from the ski.

Figure 5 is a perspective view of a conventional boot or shoe equipped with the socket-plate forming part of the coupling between the binding and the boot.

Figure 6 is a perspective view of the toe-clip or clamp, detached from the binding; and Figure 7 is a perspective view of a portion of the flexible sole-plate of the binding, showing the manner of attaching the pivoted toe-clip thereto.

A portion of the ski to which the binding is fastened is indicated as 1, and upon the top of the ski is mounted the flexible sole-plate 2 that may be fashioned of desired shape, preferably hexagonal, from leather, rubber, composition material, or from other suitable material that is strong, durable and flexible to provide for the flexible coupling between the ski and the boot or shoe of the skier. The toe portion of the flexible sole-plate is firmly and rigidly attached to the ski through the use of a top, transversely extending attaching bar 3 of appropriate metal that is riveted at 4, 4, to the top face of the sole-plate, and three attaching screws 5 are passed through the bar, the sole-plate and also through strap 6, and threaded into the ski. The strap 6 forms the toe-strap for the binding, and it is provided with the usual buckle 7 and retaining loop or keeper 8, and the screws, together with the cross bar 3 firmly attach the strap to the ski for buckling over the shoe or boot S in usual manner.

As indicated in Figure 3, the sole-plate is slightly elevated above the top face of the ski to accommodate the straps and also to provide for flexing of the plate, and for this purpose two shims 9 and 10 are interposed between the sole-plate and the ski, one in advance of the strap and the other at the rear of the strap 6. These shims may be fashioned of pliable material similar to the material of the sole-plate, and they aid in providing a rigid and firm anchorage for the front or toe portion of the flexible sole-plate on the ski in order that the rear portion of the flexible sole plate may have its required flexing movement.

A transversely extending metal toe-clip or clamp 11 with lateral flanges 12 to prevent displacement of the boot, is pivotally mounted on a vertical axis at 13, which numeral indicates a

rivet that passes through the clip, the sole-plate and the shim 9, and the pivotal movement of the clip is limited by the use of two retaining screws 14 that pass through holes in the slip, and also through slots 15, 15 in the sole-plate 2 and shim 9, and these screws are firmly threaded into the ski 1. Thus a limited range of movement on the pivot 13 is provided for the toe clip in adjusting the foot in the binding, or in adjusting the binding to the sole of the boot or shoe of the skier, and the screws firmly hold the clamp or clip in adjusted position.

The rear spacer or shim 10 is firmly attached to the plate 2 through the use of a cross brace or bar 16 mounted on top of the sole-plate slightly to the rear of the attaching plate 3 and the space between the attaching plate or bar 3 and the cross brace 16 provides a flexible, or hinge joint for the sole-plate so that it may flex with the movement of the foot with relation to the ski, or vice versa. Rivets 17 passing through the cross brace, the sole-plate and the shim 10, firmly and securely fasten these three members together, to reinforce the hinge-joint that occurs between the brace and the attaching bar 3.

At the rear end of the sole-plate, the usual ankle strap 18, with its buckle 19 and keeper 20, are secured, the strap being mounted beneath the sole plate and secured by rivets 21. These rivets pass through a metal brace plate 22, and through the sole-plate 2 and the strap 18. The brace plate 22, which is mounted on top of the rear, hinged, part of the sole plate, extends longitudinally of the binding or of the ski, and a third rivet 21 secures the front end of the plate 22 to the sole-plate.

The longitudinal brace 22 at its front end abuts against the cross brace 16, and the two members, together, form a T-shaped reinforcement for the portion of the flexible sole-plate at the rear of the hinge joint, and at the rear end of this longitudinal brace plate 22 an upright coupling pin 23 is rigidly mounted, and of sufficient length for co-action with a socket 24 centrally located in the metal socket-plate 25.

The socket-plate 25 is rigidly mounted by screws 26 on the underface of the sole or instep I of the shoe S, as best seen in Figure 5, and the screw-heads, as is also the case with screws 5, and 14, and the rivets 4, 13, 17, and 21, are countersunk, as indicated.

This pin and socket arrangement is of such a nature as to couple the rear portion of the flexible sole-plate with the boot of the skier to insure facile relative movement of the ski and boot, and yet maintain a safe anchorage or coupling of the binding to the boot, which coupling absorbs lateral strains as well as longitudinal stresses, and prevents displacement of the cooperating parts.

In attaching the binding to the ski, the binding is secured by means of the screws 5 at such a point on the top surface of the ski at approximately the balance point of the ski. For attaching the socket plate to the boot, the latter is first properly set in the toe-clip and the binding, and the clip or clamp having been adjusted to the boot and fixed in adjusted position, the coupling pin is used as a guide for locating the position of the socket 24 and the socket-plate on the instep of the boot. After this position has been located, the socket plate 25 is firmly fastened to the instep so that the socket will neatly fit over the pin.

The boot or shoe equipped with the socket-plate, it will be apparent, may be used for ordinary wear, and is ready at all times for use with the binding of the ski, and the ski may readily be "put on" and strapped to the booted foot, to insure comfort, convenience and safety to the wearer or skier.

Various changes may be made in the exemplified structures for the purpose of adapting the binding and the socket-plate to different types of shoes or boots, but it will be understood that these changes or alterations may be made without departing from the principles of my invention as set forth in the following claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A ski binding comprising a transversely flexible sole-plate and means for attaching said plate to a ski in spaced relation therewith, a toe clip pivotally mounted on the sole plate, a coupling plate having a socket and means for attaching said plate to a boot, a reinforcing T-shaped member mounted on the rear, free portion of the sole-plate, and a pin mounted on said member for co-action with the socket.

2. A ski binding comprising a transversely flexible sole plate and means for attaching said plate to a ski in spaced relation therewith, a pivotally adjustable toe-clip mounted on said sole-plate, a reinforcing T-shaped member mounted on the rear, free portion of the sole-plate and a coupling pin rigid with said member, a coupling plate having a socket to receive the pin, and means for attaching the coupling plate to a boot.

3. A ski binding comprising a transversely flexible sole-plate, a transversely arranged attaching-plate and screws fastening said plates to the ski, a transversely arranged brace plate slightly spaced to the rear of the attaching plate to form a hinge joint and means for securing the brace plate to the sole-plate, a coupling pin mounted at the rear-free end of the sole-plate, a socket-plate for co-action with said pin, and means for fastening the socket-plate to a boot.

4. A ski binding comprising a transversely flexible sole-plate, a transversely arranged attaching plate and screws fastening said plates to the ski, a T-shaped reinforcing plate mounted on the sole-plate to form a hinge joint between the latter plate and the attaching plate, a coupling pin mounted at the rear end of the reinforcing plate, a socket-plate for co-action with the pin, and means for attaching the socket-plate to a boot.

RAY L. TIEFEL.