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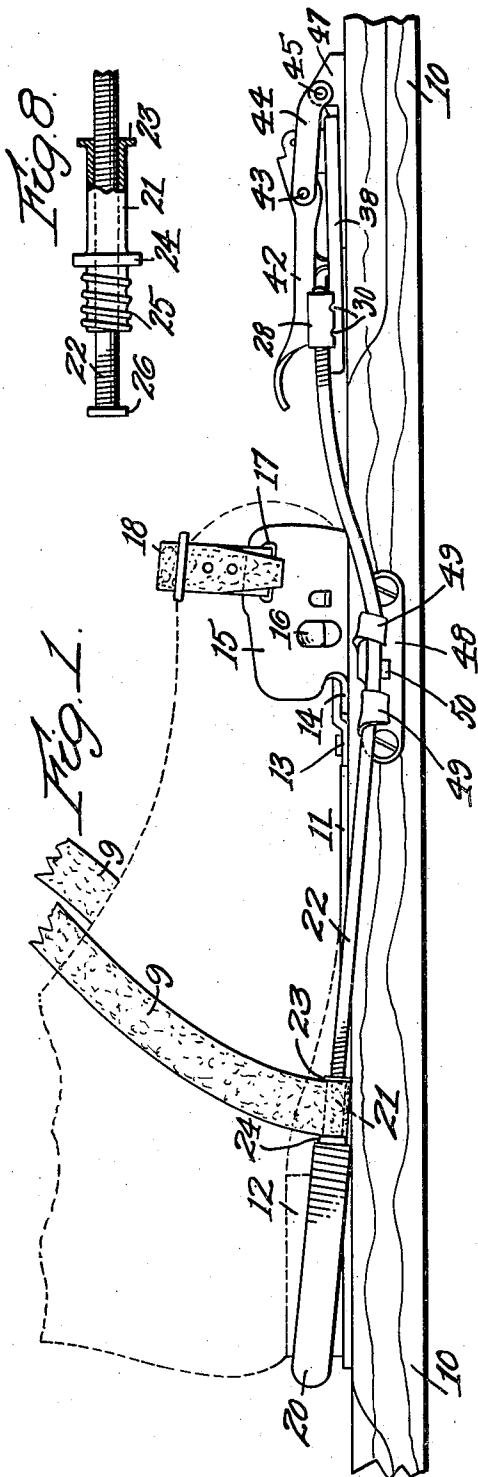
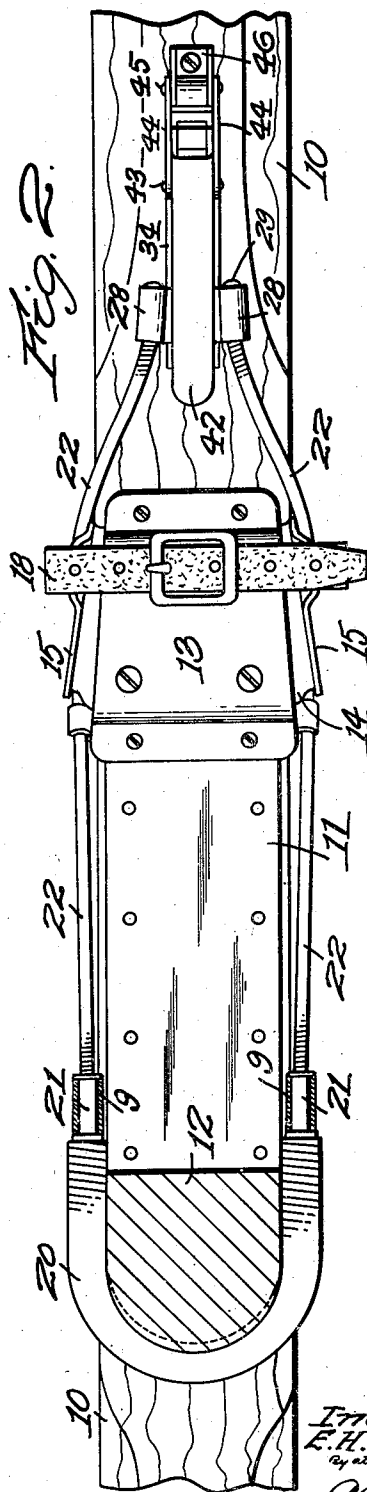
E. H. CARROLL

2,253,889

SKI HARNESS

Filed March 11, 1939

2 Sheets-Sheet 1



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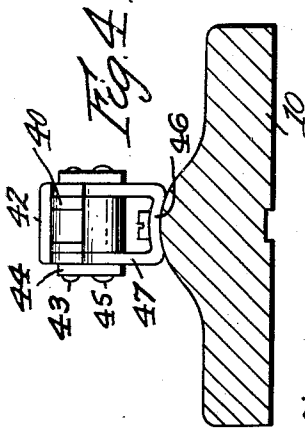
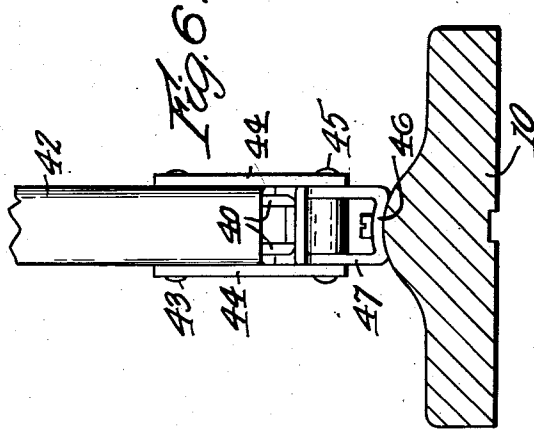
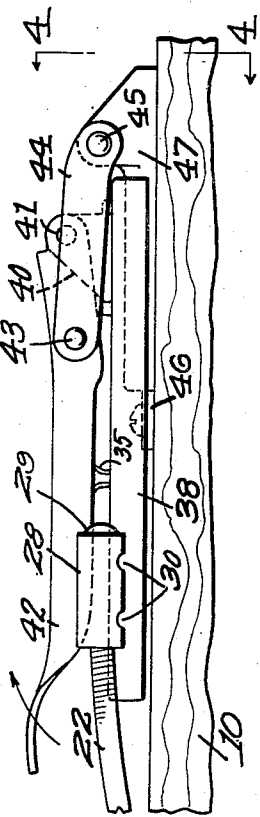
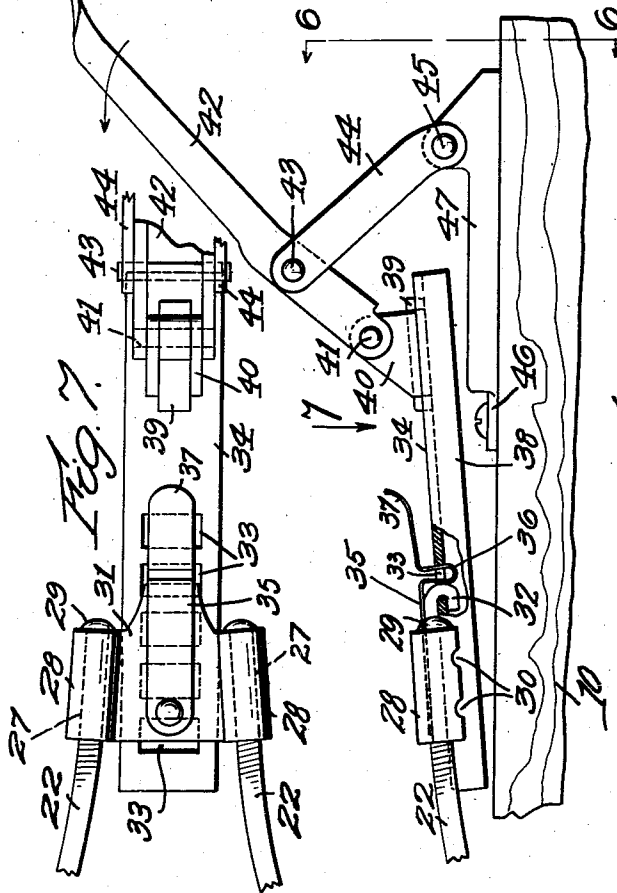
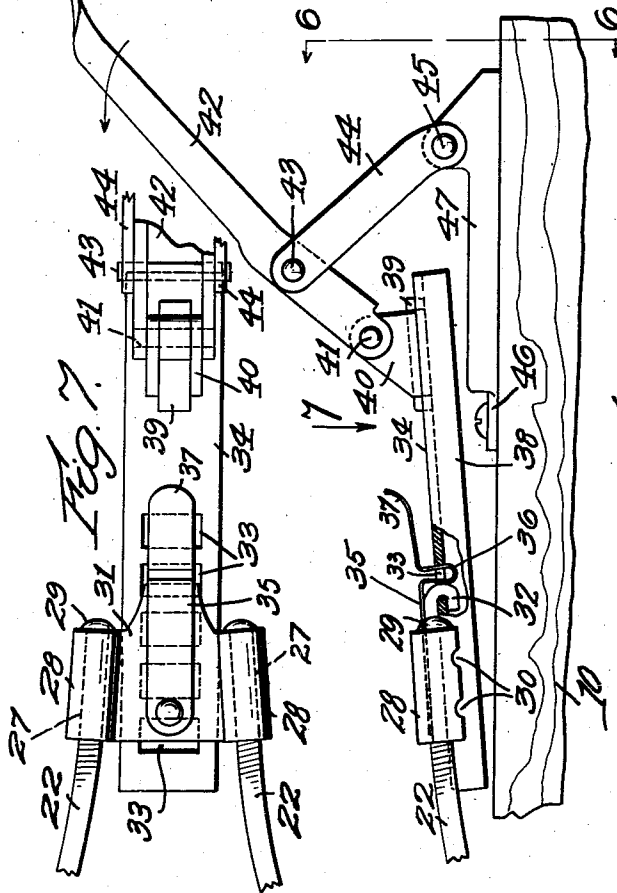
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,253,889

SKI HARNESS

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13 Claims. (Cl. 280—11.35)

The principal objects of this invention are to provide an improved clamp for a ski harness which involves a toggle joint working in such direction that the operating handle thereof, when the clamp is closed; will cover the adjusting bar and protect it; to provide a clamp which will involve fewer parts than have been considered necessary heretofore and will involve economy in construction; to provide a more effective leverage and means by which the toggle joint is closed and held closed by movement of the operating lever in a direction toward the foot supporting of the ski and in which the bracket with which the lever is connected will serve as a guide and support for the perforated adjusting bar; to provide a construction for adjustably connecting the adjusting bar with the cable in which the cable is affixed to the member that is adjusted and loosely connected with the spring that goes around the rear of the heel, and to provide an improvement in connection with this spring and cable which will allow relative motion between the spring and cable and yet furnish a positive connection between them.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a side view of a portion of a ski with a preferred embodiment of this invention applied thereto, shown in closed condition;

Fig. 2 is a plan of the same;

Fig. 3 is a side view as shown in Fig. 1 on enlarged scale;

Fig. 4 is a transverse sectional view of the ski on the line 4—4 of Fig. 3, including an end view of the clamp in closed condition;

Fig. 5 is a side view partially in section showing the clamp open;

Fig. 6 is a sectional view of the same on the line 6—6 of Fig. 5, showing an end view of the clamp in its open condition.

Fig. 7 is a plan of a portion of the clamp and cable, as indicated by the arrow 7 in Fig. 5;

Fig. 8 is a plan of the connecting member between the cable and spring shown partly in section.

For the purpose of carrying out this invention, the ski 10 is shown as provided with the usual foot support 11, the heel of the shoe being indicated at 12 and the toe plate at 13 on which the toe of the shoe rests. This toe plate is provided with a portion 14 extending under the short part of it and having two side wings 15 having the usual ear 16 and perforation 17 for the toe strap

18. This toe plate is secured to the ski by screws in the usual way.

Back of the heel and along the sides is the usual flexible spring 20, the two ends of which extend forward of the heel and are connected with a pair of connecting pieces 21. Each one of these connecting pieces is hollow to allow the cable 22 to pass through it. It is provided with a flange 23 at the end and a second flange 24 at a distance from it and with an external screw-thread 25 at its end adapted to screw into the spring which constitutes a safe means for securing this member 21 in position. These threads are the same pitch as the coils of the spring 20. The cable 22 is provided with a head 26 which is adapted to abut against the end of the screw and limit the relative motion between the two parts in one direction only so as to hold the cable firmly in place. The connection between the cable and spring therefor is a solderless one. The spool 21 between the flanges 23 and 24 is for the purpose of receiving the heel strap 9. The spool is extended to get the strap directly on it instead of the cable.

The other end of each of the cables extends through a passage 27 through a cylindrical member 28 and has a head 29 therefor to form a positive stop. Each of the cylindrical members 28 is secured to the cable by a punching operation to force the metal of the member 28 firmly against the cable therein and hold it accurately in position. This provides one or two notches 30. These cylinders 28 are integrally mounted on the sides of a plate 31 which is provided with a hook 32 adapted to enter, by obvious manipulations, in one of the transverse openings 33 in an adjusting bar 34. This hook will hold the cable with respect to this adjusting bar as far as one direction is concerned. In order to fill this opening after the hook is entered into the opening 33, as shown in Fig. 5, a spring 35 is riveted to the plate 31 and is provided with a loop 36 and a projection 37 which acts as a handle for manipulating it. This spring can be moved upwardly on account of its resiliency to allow the hook 32 to be entered in its proper place and then be allowed to spring back when it will fill up the rest of the perforation and leave the hook in its adjusted position, safe against removal accidentally.

The bar 34 is formed in a channel shape with wings 38 projecting downwardly. On it is firmly secured a plate 39, which has two opposite ears 40 projecting upwardly and provided with a pivot pin 41 supported thereby. Pivoted to this pivot

pin is the operating lever 42 which also is provided with a pivot pin 43 beyond the pivot pin 41. This handle is of channel shape and it is through the wings thereof that these pins are held. Pivotally connected with the pivot pin 43 are two links 44, one on each side, thus making a toggle joint. These links 44 are connected and pivoted by a pin 45 to a bracket or base plate 46 screwed to the ski directly. This bracket is of channel shape and has upwardly extending flanges 47 through which the pin 45 is held in place. The flanges 47 are near enough together so that they can just be received between the flanges 38 of the adjusting bar and guide the same in its motion.

On each side of the ski is screwed a plate 48 which is provided with ears 49 and 50 for guiding the cable 22. The operation is extremely simple. Starting with the toggle open as shown in Fig. 5, the cables are secured to the adjusting bar 34 in a manner above described and at such a position along the bar as may be found to be correct. The operating lever 42, instead of being moved down from the position shown in Fig. 5 as usual and flattened out in that way, is turned forward toward the foot support. This provides a powerful and complete toggle action and brings the bar 34 down on the flange 47. The bar moves backward along this support to the position shown in Figs. 1, 2 and 3, which is the closed position.

It will be observed that in this position the operating handle covers the entire adjusting bar and also the plate 31 and its spring 35 and leaves the toggle in such position that it is not likely to become loosened accidentally but is readily accessible to be pulled to the open position by moving the end of the lever upwardly. This will move the bar 34 forwardly, loosen the cables and the spring 20 and leave the parts in convenient position for the user to remove his foot.

It will be seen that the flanges 47 furnish a guide and support for the adjusting bar 34 throughout practically all of its forward movement which it has to go through in order to clamp the parts in position. The channel shaped operating lever covers the adjusting bar, the plate 31, and spring 35 and protects them against snow and ice. The toggle is a powerful one, easily operated.

It will be seen also that the cables are secured positively to the plate 31 and movably to the ends of the spring 20 but that, when the device is tightened up, this movable connection is made solid also. The clamp is formed with fewer parts than has been the case heretofore. The handle of the operating lever is up away from the ski when in clamping position where it is readily accessible and from which position it can be operated in spite of any ordinary accumulation of snow and ice. The spring plate, which is ordinarily employed to cover the adjusting bar, is entirely eliminated.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A clamp for a ski harness comprising an elongated bracket adapted to be fixed on a ski, a toggle comprising a link pivotally mounted on the bracket and an operating lever pivotally connected with the link, a flanged adjusting bar, a cable, means for adjustably securing the end of the cable to said bar, and means for pivotally connecting the lever with said bar for directly operating on the bar by said lever, whereby the

bar is movable relative to the bracket, the bar being guided by its flange along the bracket.

2. A clamp for a ski harness comprising a foot rest, an elongated bracket fixed on the ski, a toggle comprising a link pivotally mounted on the bracket and an operating lever pivotally connected with the link, a flanged adjusting bar having a series of perforations, and means for pivotally connecting the lever with said bar at a point toward the foot rest, said lever being in a position to cover the perforated bar when the clamp is closed, and the bar being rectilinearly guided on the bracket by said flange.

3. In a ski harness, the combination with a heel spring and a cable on each side, of a connection between each cable and the heel spring comprising a tubular member through which the cable can pass, said member having spaced flanges and adapted to receive a heel strap directly on its surface, the flanges locating the strap on the member.

4. In a ski harness, the combination with a heel spring and a cable on each side, of a connection between each cable and the heel spring comprising a tubular member through which the cable can pass, said tubular member having spaced flanges and adapted to receive a heel strap directly on its surface, said tubular member having a screwthreaded end adapted to screw into the end of the heel spring, said cables each having a head on the end located inside the heel spring.

5. In a ski harness, the combination of an adjusting bar having a row of perforations, a plate supported thereby, cables connected to said plate, said plate having a hook for entering any perforation in the plate, and movable means carried by the plate for entering the same perforation behind the hook and filling the perforation to avoid accidental removal of the hook from the perforation.

6. The combination with a cable of a ski harness, of a perforated adjusting bar, a plate adapted to be supported thereby, positive means for connecting the cables to the plate, said plate having a hook on the end thereof for entering a perforation in the adjusting bar, and a spring secured on the plate having a loop adapted to project through one of said perforations in the adjusting bar back of the hook and to be removed therefrom to allow the hook to be removed.

7. A tightener for a ski binding comprising a bracket fixed to the ski, said bracket having a rearwardly inclined projection rising from the forward end thereof, and pivotally supporting a link near its highest point, an operating lever pivotally connecting intermediate its ends to said link, a cable-connected bar secured to one end of said operating lever, said link having a bent portion adjacent the projection so that the former merges smoothly into the contours of the latter when it is in horizontal clamping position.

8. In a ski harness, the combination of an adjusting bar having a row of perforations, a plate, a cable connected to said plate, a projection on said plate adapted to seat in any one of said perforations; with a supporting bar adapted to be fixed to a ski, said adjusting bar being slidable with respect to said supporting bar, and means to guide said bars in such movement, said means comprising flanges on one bar adapted to slidably engage the side edges of the other bar, said projection when seated extending downwardly toward the ski from said plate, and said flanges extending beyond the projection in a direction

toward said other bar, and serving to space said projection from the ski.

9. A bushing for use in connection with a ski binding whereby a cable may be attached to a heel spring and a strap used therewith, comprising a tubular bushing having a bore extending throughout its length, one end of said bushing being threaded for engagement with a heel spring, the other end of the bushing being generally cylindrical in form and having means thereon for limiting movement of said strap positioned thereabout, said means comprising a pair of spaced flanges associated with the cylindrical portion of said bushing, said strap being adapted to be positioned between said flanges.

10. A tightener for use in a ski binding comprising a base plate adapted to be secured to a ski, a clamping lever, a link having an end thereof pivoted to said base plate, and its other end pivoted intermediate the ends of the lever, an adjusting bar pivoted at one of its ends to one end of the lever, the other end of the latter forming a hand grip, said adjusting bar having a plurality of transverse slots therealong, said adjusting bar extending normally rearwardly of the ski from its connection to the lever, a cable, a hook secured to said cable for selective entry in any one of said slots, pivotal movement of said lever rearwardly of the ski being effective to draw said adjusting bar forwardly to a position wherein the cable may be tightened about a ski boot on the ski, said lever having a substantially horizontal final position wherein the cable is so tightened, said lever overlying said adjusting bar and attached hook in said final position to protect the same and aid in maintaining it in position.

11. In a ski harness, the combination of an

adjusting bar having a row of perforations, and means to selectively tighten or release said adjusting bar with relation to a ski; with a heel cable for a ski boot, a hook on said cable in position to be selectively entered in any one of said perforations, and movable means associated with said cable for entering the selected perforation behind the hook and filling the perforation to avoid accidental removal of the hook.

12. In a ski harness, the combination of an adjusting bar having a row of perforations, and means to selectively tighten or release said adjusting bar with relation to a ski; with a heel cable for a ski boot, a hook on said cable in position to be selectively entered in any one of said perforations, and a spring associated with said cable adjacent the hook, said spring having a depending portion adapted to enter the selected perforation behind the hook to avoid accidental removal of the hook.

13. In a device of the class described, a base bar adapted to be secured in fixed relation to a ski, a clamping lever, means providing a link connection pivotally attached on horizontal and parallel axes to said base bar adjacent its forward end and to the clamping lever intermediate its ends and more adjacent its forward end, an adjusting bar adapted to be engaged by a heel cable and pivotally connected to the forward end of said clamping lever at a point on said adjusting bar rearwardly of its forwardmost extent to thereby provide a forwardly extending projection to prevent tilting or tipping of the adjusting bar about an axis transverse to the ski during movement of said clamping lever in either direction.

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