

Oct. 21, 1947.

E. KOLLER

2,429,413

SKI BINDING

Filed April 29, 1942

2 Sheets-Sheet 1

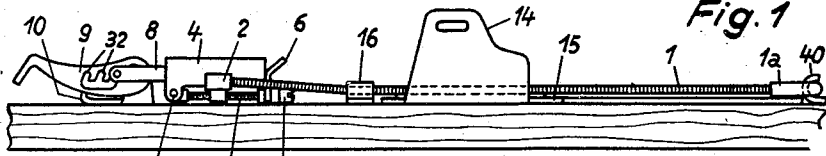


Fig. 1

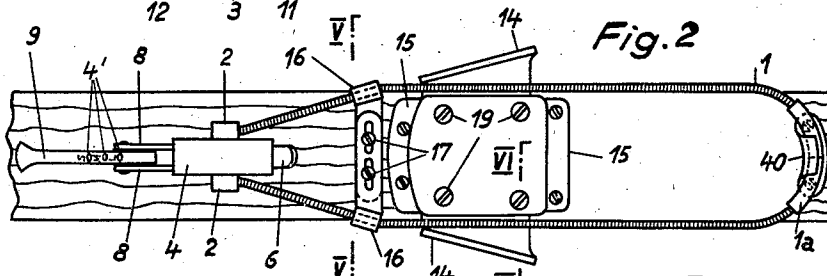


Fig. 2

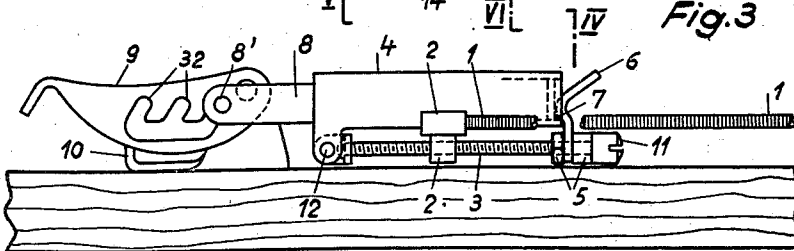


Fig. 3

Fig. 12

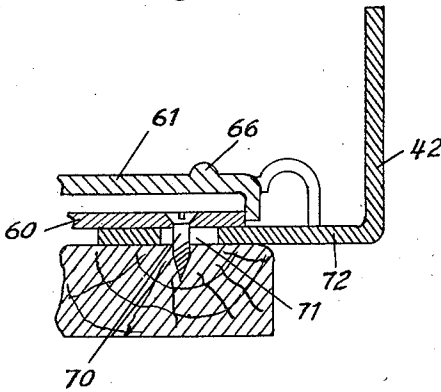


Fig. 4

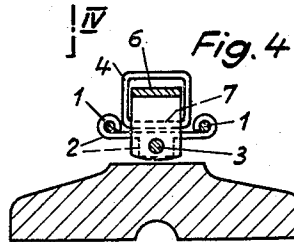


Fig. 5

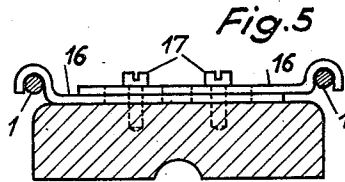


Fig. 6

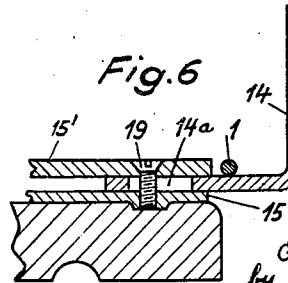
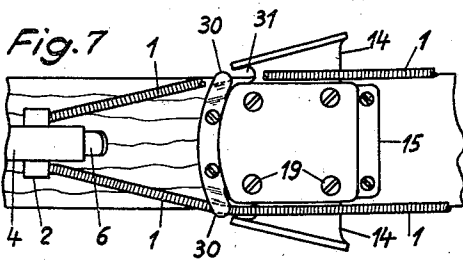


Fig. 7

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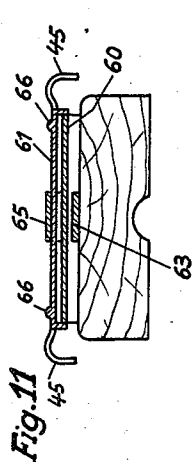
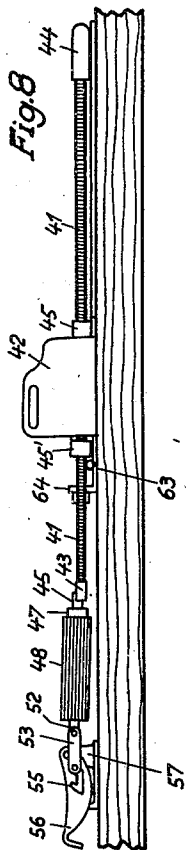
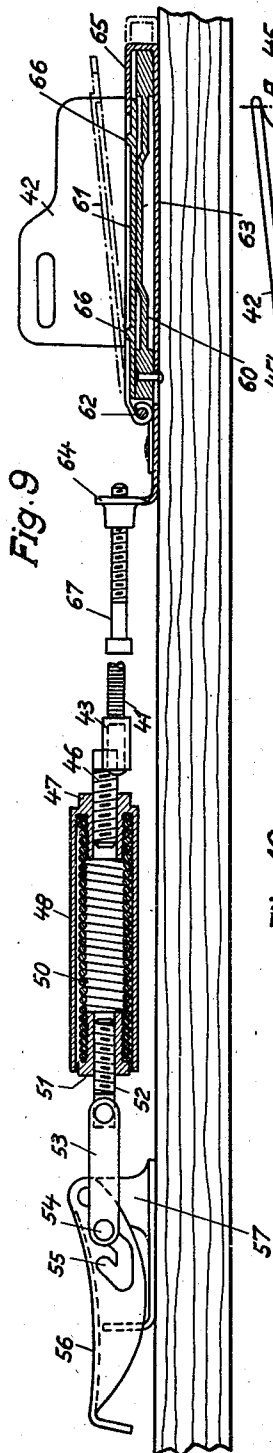
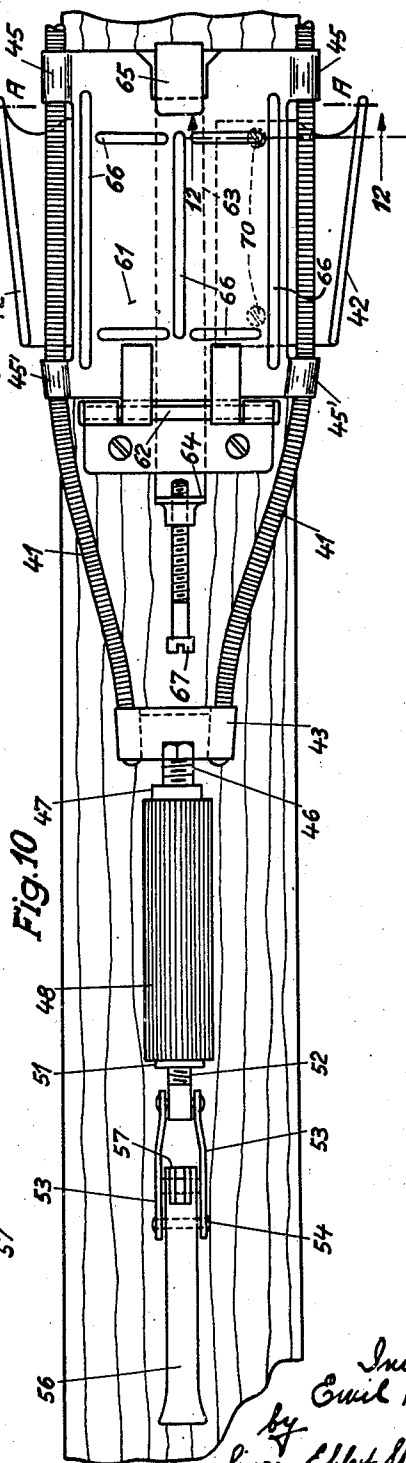
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SKI BINDING

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UNITED STATES PATENT OFFICE

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SKI BINDING

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5 Claims. (Cl. 280—11.35)

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This invention refers to a ski binding with a heel cable which is resiliently and adjustably attached to a support disposed in front of the toe irons.

This invention now provides means to allow for a very fine adjustment of the heel cable with respect to the toe irons which are secured to the ski. As adjusting means a threaded spindle may be employed to which the heel cable is adjustably secured.

According to one preferred embodiment of my invention guiding means for the heel cable are arranged in front of the toe irons, the said guiding means serving to secure the parts of the cable passing inside of the toe irons in the desired distance one of the other. With these guiding means and when disposing the cable inside of the vertical lateral parts of the toe irons a minimum downward pull on the boot of the ski-runner can be obtained. This is especially of advantage for level running and for climbing uphill. For running downhill a considerable downward tension may be obtained by passing the cable under hooks disposed rearwardly of the toe irons. Several embodiments of my invention are illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is a side elevation of one embodiment of the invention.

Fig. 2 is a plan view of the same binding.

Fig. 3 is a side elevation of the parts arranged in front of the toe irons on a larger scale.

Fig. 4 is a section taken on line IV—IV of Fig. 3. Figs. 5 and 6 are sections taken on the lines V—V and VI—VI respectively of Fig. 2.

Fig. 7 shows a modification of the guiding means for the heel cable.

Fig. 8 is a side elevation of another modification of the ski binding according to this invention.

Figs. 9 and 10 show the forward part of this modification on a larger scale partly in longitudinal vertical section and in top plan view.

Fig. 11 is a section taken on line A—A of Fig. 10 and Fig. 12 is a section taken on the line 12—12 of Fig. 10.

Referring now to the ski binding shown in the drawings, the binding is provided with a heel cable 1, which is protected by a helically wound wire in a manner known per se. This cable is adapted to be laid around the boot of the ski runner and the two ends of the cable are secured to a fastening element 2. That part of the cable 1 which is to cooperate with the heel part of the ski boot is provided with a tubular part 1a consisting of rubber or the like. The tubular part 1a allows

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an easy rolling of the heel cable on the heel of the ski boot.

The fastening element 2 is secured to a threaded spindle 3 (Figs. 1, 3 and 4) rotatably mounted in the spring casing 4. Though spindle 3 is rotatably mounted in the casing 4 it cannot move in axial direction. A rotation of the spindle 3 effects therefore an axial displacement of the fastening element 2. Spindle 3 is not only rotatable about its own axis but also about bolts 12 entering corresponding holes of the spring casing 4. The opposite end of the spindle 3 bears a slotted head 11 and two nuts 5. Between these two nuts a strap 6 is disposed, a projecting part 7 of this strap 6 entering the rear and open end of the casing 4. Bolts or rivets 8' are secured to the forward end of this shackle, the said bolts or rivets entering one of the three notches 32 arranged one behind the other on the lever 9. The lateral parts of shackle 8 guide the casing 4 when the latter is moved forward or rearward under or against the action of the compression spring disposed in the casing 4 and not shown in the drawing. Above the notches 32 of the lever 9 slits 4' and letters L, M, and S are marked on the back of lever 9 in the neighbourhood of the corresponding slits to indicate that the pull exerted by the cable 1 on the ski boot is either low (L) medium (M) or strong (S) according to whether the bolts or rivets 8' are placed in the rearmost, the central or the foremost of the notches 32. The slits 4' allow the ski runner to see in which of the notches 32 the bolts or rivets 8' are placed.

By rotating the slotted head 11 of the spindle 3 the fastening element 2 is displaced in axial direction. This displacement allows to adapt the heel cable to various sizes of ski boots within a very wide range in a simple and effective way. By loosening one of the nuts 5 straps 6 can be withdrawn from the casing 4 and spindle 3 may then be rotated about the bolts 12.

When climbing uphill or when running on the level it will be advantageous to arrange the cable 1 above the horizontal parts of the angle-shaped toe irons 14, as shown in Figs. 1, 2 and 6. In order to secure the lateral parts of the cable 1 in the desired position above the horizontal parts of the toe irons 14 and inside the upright cheeks of the same there are provided adjustable holders 16 consisting of strips of metal provided with hooks for guiding the cable 1. These holders 16 with the openings of their hooks facing downwardly are arranged in front of the toe irons. The holders 16 shown in the drawing are secured to the ski. Obviously they might also be secured to the base

plate 15 of the ski binding. The two holders 16 are adjustable one with respect to the other, by means of slots and screws 17 passing through the said slots. Of course, also the horizontal parts of the toe irons might be provided with guiding means for the heel cable.

In order to secure the toe irons 14 fixedly to the ski and to allow for a repeated adjustment of the said toe irons, the same are secured to the base plate 15 by means of metal screws 19, passing through slots 14a in the horizontal parts of the toe irons (see Figure 6).

The cover plate 15' is preferably thick enough to protect the cable 1 which lies upon the horizontal part of the toe iron from being damaged by the nails of the ski boot (Fig. 6). The same object may be attained by securing a second plate on a cover plate which in this latter case might be of thinner sheet iron.

Instead of providing special holders 16 as shown in Figure 2 the base plate 15 might be provided with hook shaped lugs 30 which are bent downwardly. Such an embodiment of the invention is illustrated in Fig. 7. Cable 1 passes below the lugs 30, but lies on top of the horizontal parts of the toe irons. In order to prevent the damaging of the cable suitably shaped recesses 31 are provided in the forwardly facing portions of the horizontal parts of the toe irons.

A holder 40 for the cable 1 is provided on the ski in such a way that it does not interfere with the heel of the boot when the same rests on the ski. The purpose of the said holder 40 is to hold the cable 1 in the position shown in Fig. 2 for instance when the ski is carried by the ski-runner on his shoulders. This holder 40 is important because without the provision of the same, the cable loop which passes above the horizontal parts of the toe irons would hang down and come into engagement with other things or persons.

The modification of the binding shown in the Figures 8 to 11 is also provided with a steel cable 41 which is protected by a helically wound wire. The ends of the cable 41 are connected to the fastening element 43 arranged in front of the toe irons 42. In its heel part cable 41 is provided with a tubular part 44 consisting of rubber or the like. Cable 41 is arranged inwardly and upwardly of the toe irons 42 and hooks 45 and 45' are arranged to guide the cable. A threaded bolt 46 is fixedly connected to the fastening element 43. The said bolt 46 bears a nut 47 which is provided with a cylindrical bush 48 the surface of which is either grooved or of polygonal cross section so as to facilitate a rotation on the spindle 46. A tension spring 50 is secured to the nut 47, the said tension spring being arranged within the bush 48 and being protected by the same. The other end of the spring is connected to a second nut 51 which is arranged on the threaded bolt 52. The forward end of bolt 52 is rotatably mounted in the shackle 53 which bears at its forward end a bolt 54 which enters one of the notches 55 of the lever 56. Lever 56 is rotatably mounted on a support 57 which is screwed to the ski.

One of the bolts 46 and 52 is provided with left-handed thread, the other with right-handed thread. By turning the bush 48 the nuts are moved towards or from each other, according to the sense of rotation of bush 48. This allows an easy and effective adjustment of the heel cable to any size of ski boot.

The toe irons 42 are secured to the ski by means of a plate 60 which is screwed to the ski by screws 70 passing through slots 71 in the horizontal

flanges 72 of the toe irons, as shown in Fig. 12. Above plate 60 there is a cover plate 61 pivotally mounted at its forward end on a pin 62. Below the base plate 60 there is a narrow slide 63 which is movable in the direction of the longitudinal axis of the ski. The forward end 64 of the slide 63 is bent upwardly whereas its rear end 65 is bent first upwardly and then backwardly to form a hook adapted to engage the rear end of the cover plate 61. Cover plate 61 has hooks 45 and 45' and ribs 66. An adjustable screw 67 is secured to the forward end 64 of the slide 63.

By displacing slide 63 hooks 45 and 45' are also displaced which results in an alteration of the downward pull which is exerted on the ski boot by the cable. In the position of the parts as shown in Figure 11 the hook-shaped rear end 65 of the slide secures the cover plate 61 in its horizontal position and cable 41 is kept down by the hooks 45. This is the position of the binding when running downhill. When slide 63 is displaced rearwardly its hook-shaped end 65 does no longer keep cover plate 61 in the horizontal position but allows the same to swing in the position shown in dot-and-dash lines in Figure 9 as soon as the heel of the ski boot is lifted. This position of the binding is especially advantageous when mounting uphill.

When the ski-runner falls, the pull occurring in the cable 41 is higher than that occurring in normal skiing. The tension spring 50 is drawn out until the fastening element 43 pushes the threaded bolt 67 rearwardly whereby also the slide 63 is moved in the same direction and releases the rear end of the cover plate 61 so that the latter is allowed to swing upwardly as shown in Figure 9, thereby loosening the tension exerted on the ski boot and eliminating the danger of an accident.

The cable 41 which is disposed inside the upright cheeks and above the horizontal parts of the toe irons is protected by the ribs 66 which prevent the nails of the ski boot from damage to the cable. The binding shown in the Figures 9 to 11 is simple and economical to manufacture.

I claim:

1. In a ski binding, the combination with a toe iron having a horizontal part and lateral upright cheeks, of a heel cable, guiding means for the heel cable secured in front of the toe iron on top of the ski for limiting upward movement of the cable in front of the toe iron beyond a predetermined plane above the top face of the ski and for retaining the cable between the cheeks of the toe iron and on top of the horizontal part of the same, and means in front of said guiding means for securing the ends of the heel cable to the top of the ski.

2. In a ski binding, the combination of a toe iron having lateral upright cheeks, a heel cable, a guide plate for the heel cable secured to the top of the ski and provided with guide hooks opening downwardly and positioned to retain the strands of the heel cable at all times above the top of the ski and between the cheeks, and means in front of the guide plate for resiliently and adjustably securing the combined ends of the heel cable to the top of the ski.

3. A ski binding comprising a toe iron having vertical lateral cheeks, a heel cable, a pair of hooks opening downwardly mounted on top of the ski in front of the toe iron, the hooks being positioned to maintain strands of the heel cable above the plane of the ski and between the cheeks of the toe iron, and means for movably supporting the hooks with respect to the top surface of the ski.

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4. In a ski binding, the combination of a toe iron having fixed lateral cheeks rising above the top surface of the ski, a cover plate overlying the toe iron, a heel cable guided by the cover plate, whereby the heel cable is maintained above the toe iron between the cheeks thereof, releasable retaining means for holding the cover plate in overlying position with respect to the toe iron, a terminal element with which the ends of the heel cable are fixedly united, said terminal element being adapted to act on the retaining means for the cover plate to release the cover plate from the toe iron, whereby the cover plate and the heel cable guided by the cover plate may assume an angular position with respect to the toe iron.

5. In a ski binding, the combination of a toe iron, a heel cable, a cover plate pivotally secured to the ski and provided with guide hooks for the heel cable, a locking means for holding the cover plate in position on the toe iron, a fastening element for the combined ends of the heel cable, and a projection on said locking means in the path of said fastening element, whereby upon movement of the fastening element for the heel cable in predetermined direction, the locking means for the cover plate is moved to release position with respect to the toe iron.

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