Oct. 6, 1964 G. SCHWEIZER 3,151,874

SAFETY BINDING LEVER FOR SKI BINDINGS

Filed July 3, 1962 2 Sheets-Sheet 1

FIG. 1

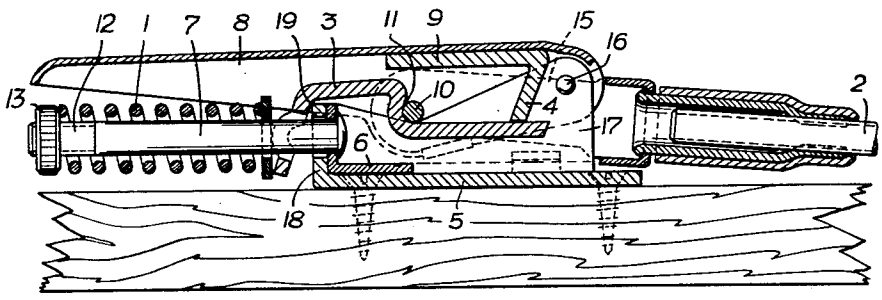


FIG. 2

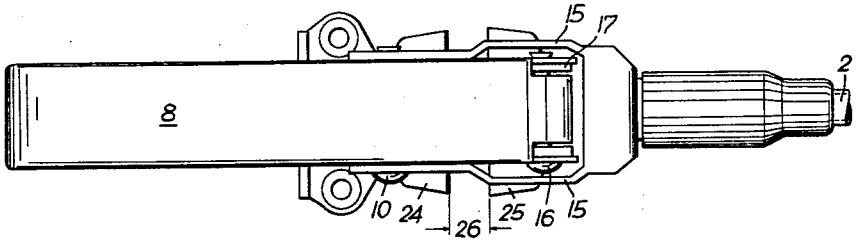
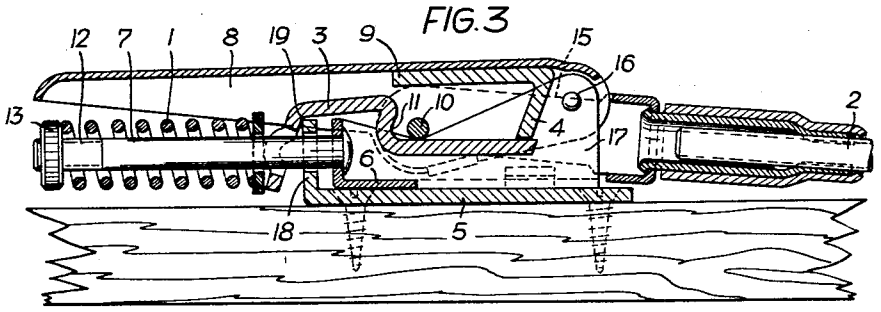


FIG. 3



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Oct. 6, 1964 G. SCHWEIZER 3,151,874

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Filed July 3, 1962 2 Sheets-Sheet 2

FIG.4

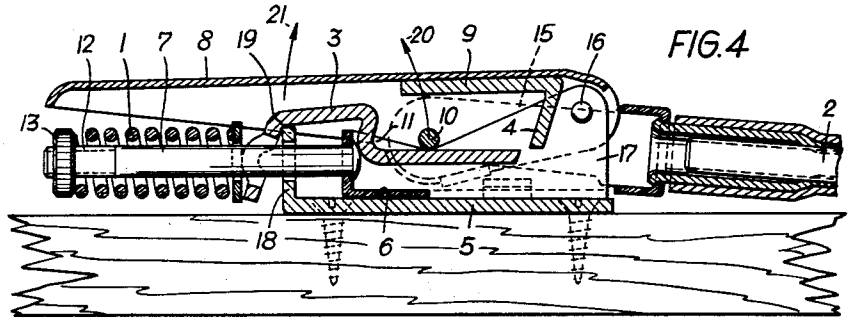


FIG.7

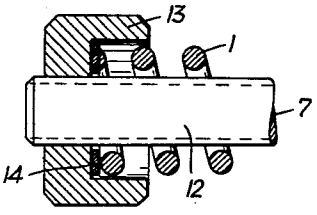


FIG.5

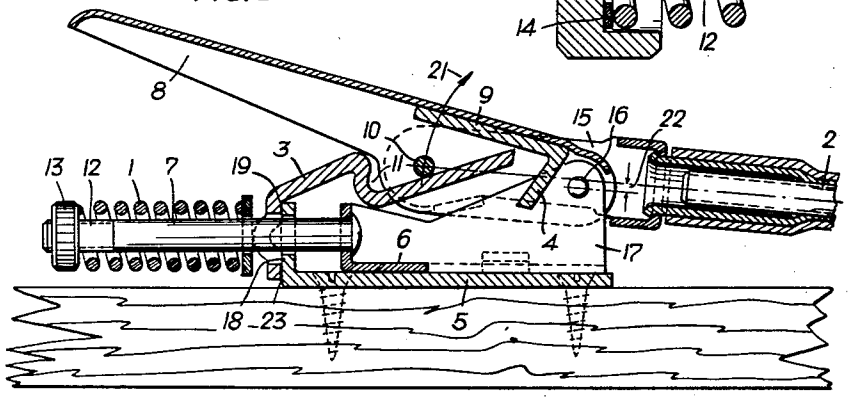
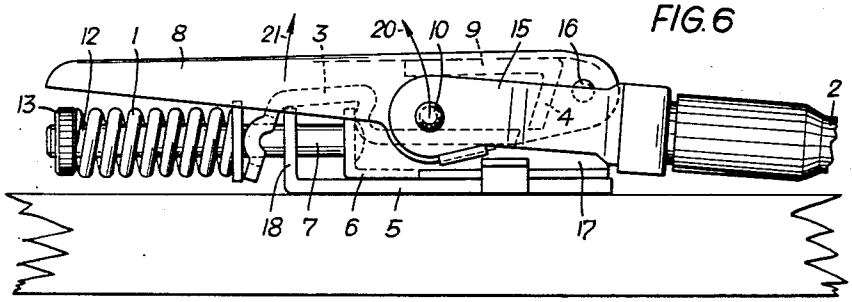


FIG.6



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United States Patent Office

3,151,874
Patented Oct. 6, 1964

3,151,874

SAFETY BINDING LEVER FOR SKI BINDINGS

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Filed July 3, 1962, Ser. No. 207,198
Claims priority, application Austria, July 20, 1961, A 5,611/61
5 Claims. (Cl. 280—11.35)

The invention relates to a safety binding lever for ski bindings and is characterized in that a spring is provided for receiving the tension of the cable and for effecting in an unlocked position of the corresponding binding parts the opening of the safety binding lever. The invention is further characterized by a crank lever between the one end of the spirng and a stop on the binding lever.

In the drawings the object of the invention is shown by way of example in one embodiment.

FIGS. 1 and 2 show longitudinal sectional and top plan views, respectively, in the non-operative position of the single parts of the binding lever;

FIG. 3 is a view similar to FIG. 1 indicating the normal operative position;

FIG. 4 is a view similar to FIG. 1 indicating the position of the single parts of the binding lever which results in case of overload;

FIG. 5 indicates the binding lever in an upwardly snapped position;

FIG. 6 is a side elevation indicating the position of the parts of the binding lever at overload (like FIG. 4); and,

FIG. 7 is a detail of the bolt and adjustment nut.

The present inventon is an improvement over prior art devices, particularly in the provision of a locking mechanism for a clamp lever of a ski binding including a locking bolt which may be displaced by a tension force on the binding into a "release" position to permit a spring of the mechanism to act on the lever and cause the rapid movement thereof and the opening of the binding.

In the non-operative position the single parts of the binding lever lie as shown in FIG. 1. The tension of the cable 2 acts by way of cover plates 15 on the bolt 10, which is supported in the binding lever 8. The binding lever 8 is mounted on a bolt 16 which is pivoted in side plates 17 of a support 6. The binding lever 8 is locked in this non-operative position. The locking is provided by engagement of the bolt 10 in a recess 11 of a crank lever 3. Thus the binding lever 8 cannot snap up in this position and this is particularly advantageous especially for transporting purposes.

In the normal operating condition i.e. after the user steps into the binding with the boot, the parts are oriented as in FIG. 3. On account of the effect of the tension of the cable 2 the locking between the bolt 10 and recess 11 has been released. Thereby the support 6 which carries spring bolt 7 and binding lever 8 is displaced to the right of the base plate 5 as indicated in the FIG. 3 of the drawing. Thereby the spring 1 has been correspondingly tensioned and the boot sits firmly in the binding. The binding lever 8 cannot snap up as the cable tension acting on the bolt 10 is centered below the bolt 16 and the binding lever 8 is maintained in this position by the action line of the tension force of the cable 2 acting with spring 1. The crank lever 3 acts here as a two-armed lever being pivotally supported at 19 on the flange 18 of the base plate 5. The force of the spring 1 urges the crank lever 3 in FIG. 3 in a counterclockwise direction. However, this force of the spring 1 acts, as shown in the drawing, on an extremely small lever arm of the crank lever 3. Thus, the long lever arm cannot push upwardly against the stop 4 and the binding lever 8. This operating position is

maintained as long as no excessive tension forces act on the cable 2.

When a large tension force does act on the cable 2 the position of the binding lever according to FIG. 4 is obtained. The support 6 and all the parts connected therewith are shifted further to the right hand side. The stop 4 is disengaged from the long lever arm of the crank lever 3. The spring 1 is compressed to produce a comparatively large force. This force acts now upon the short arm of the crank lever 3 and pivots same counterclockwise. The longer lever arm of this crank lever 3 acts by way of the bolt 10 to rotate it counterclockwise (arrow 20) and opens the binding lever by moving it in the direction of the arrow 21. The conditions of the lever have now changed in as far as the lever arm being extremely long according to FIG. 3 between the location 19 and the location 4 and it is now reduced as shown in FIG. 4 to a distance between the location 4 and the bolt 10. The conditions for the snapping up of the binding lever 3 are indicated in FIG. 5. In the shown position the crank lever 3 lies close to the flange 18, and the spring 1 is no longer effective for the opening of the binding lever 8. However, this is not at all necessary now as the tension of the cable 2 at the bolt 10 acts along a line extending above the bolt 16 (the dead center position has been exceeded) and the tension of the cable 2 itself flings open the binding lever. The spacing of the tension line of action of the cable 2 above the rotating axis of the bolt 16 is indicated at 22. In the sequel of the opening the stop 4 moves against the long arm of the crank lever 3 to pivot the crank lever counterclockwise around the spot 23 until the binding lever 8 lies substantially perpendicular to the cable 2. However, such a position of rotation around the spot 23 cannot be maintained by the crank lever 3 for a long time as the spring 1 depresses this crank lever 3 into a position as can be seen in FIG. 5. The long lever arm of this crank lever 3 has then once again assumed a position necessary for the closing of the safety binding lever.

From FIG. 6 one can learn that at an overload, i.e. if the length of the cable has been adjusted too short (i.e. cohesion at the ski boot is too large) the safety binding lever 8 cannot be closed lastingly. In this event the same conditions exist as shown in FIG. 4. This means when closing the lever the same snaps up of itself according to the arrows 20 and 21, indicating that the cable 2 is too short or that the whole binding is adjusted too tight. By providing a longer length of the cable and by tightening the nut 13, respectively, one is able to adjust once again a corresponding position of operation.

In the embodiment according to FIG. 7 the spring bolt 7 has a fine thread 12 with a pitch in the range between 0.4 and 0.9 mm. Friction reducing slide means are provided between the spring 1 and this adjustment nut 13, such as a shim plate 14 of friction poor plastic and graphite containing material, respectively. By the one and/or by both the methods one can turn the adjustment nut 13 easily at any time even under unfavorable conditions and can set the desired spring tension of the spring 1.

At last it is pointed to the fact that marks 24, 25 (FIGURE 2) are provided at the parts of the binding lever (base plate 5, support 6) which are moveable relatively to each other. The distance 26 of the marks 24, 25 from each other is a measurement for the safety adjustment. The marks 24 and 25 are closely visible at any time. If the distance 26 becomes zero the binding lever snaps up.

The invention is not restricted to the shown embodiments. The described locking between the parts 10 and 11 depends upon the force of the spring 1. However, by the scope of invention lockings are, of course, covered being independently from the force of the spring 1, for instance the binding lever may cooperate with a catch spring

fixed on the ski, or the binding lever 2 itself may have a catch spring which cooperates with the crank lever 3 at the spot 11. For the locking in the non-operative position it only is necessary that the binding lever is held by friction and under spring force, respectively, relatively to the ski and the binding parts connected therewith.

What is claimed is:

1. A safety clamp for ski bindings including a tensioning cable, comprising a base plate including a flat portion adapted to be anchored to a ski and an upstanding lug portion with an opening therein, a carriage movable on said base plate, a spring bolt secured to said carriage extending through said upstanding lug portion opening and having a spring retainer adjacent its opposite end, an angle lever pivoted on said upstanding lug portion and including a long arm portion extending in a direction away from said spring retainer and a short arm portion with an opening through which said bolt extends, a coil spring around said bolt abutting said spring retainer at one end and said angle lever short arm portion at its opposite end, said spring urging said lever to rotate about said upstanding lug portion to move said long arm portion outwardly from said base plate, and a clamp lever pivotally mounted on said carriage adapted to be pivotally connected to the tensioning cable and adapted to overlie said angle lever in a clamped position, said clamp lever and said angle lever defining locking means preventing rotation of said angle lever and release of said binding when the tensioning cable is normally stressed as when a boot is positioned in the binding, said locking means including a member displaceable with said clamp lever and the tensioning cable when the tensioning cable is overstressed to release said angle lever.

2. A safety clamp for ski bindings according to claim 1, wherein said locking means includes a stop member carried on said clamp lever.

3. A safety clamp for ski bindings according to claim 1, wherein said locking means includes a stop member carried on said clamp lever adapted to contact the long armed portion of said angle lever when said clamp lever is pivoted downwardly over said angle lever in a clamping position.

4. A safety clamp for ski bindings including a tensioning cable for securing a boot in the ski binding comprising a base plate including an upstanding flat lug portion at one end and a clamp lever mounting bracket portion at an opposite end, said lug portion having an opening therein, a carriage movable on said base plate, a spring bolt secured to said carriage extending through the opening of said upstanding lug portion and having a spring retainer adjacent its opposite end, an angle lever pivoted on said upstanding lug portion and including a first arm with an opening through which said bolt extends and a second arm extending between said upstanding lug portion and said bracket portion, a coil spring around said bolt abutting said spring retainer at one end and said angle lever first arm at its opposite end to bias the second arm portion of said angle lever in a direction outwardly from said base plate, a clamp lever pivotally mounted on said carriage and adapted to be pivotally connected to said tensioning cable at a location spaced in the direction toward said upstanding lug portion from said bracket pivotal connection to said clamp lever, said clamp lever adapted to overlie said angle lever in a clamped position and having a stop portion thereon engageable with the second arm portion of said angle lever and acting to hold said angle lever downwardly against said base plate, said stop member adapted to overlie said angle lever when the cable is normally tensioned but being displaced off said angle lever for releasing the same when the boot is in a position engaged in the ski binding, whereby upon the presence of overstressing on the cable, the angle lever second portion may move away from the base portion to unclamp the boot.

5. A safety clamp according to claim 4, including means for adjusting the compression of said spring.

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