United States Patent

[11] 3,572,737

[72] Inventors **Thomas G. Smolka**
Vienna-Mauer;
Walter Schwarz, Strasshof, Austria

[21] Appl. No. **775,693**
[22] Filed **Nov. 14, 1968**
[45] Patented **Mar. 30, 1971**

[73] Assignee **Wiener Metallwarenfabrik Smolka & Company**
Vienna-Schwechat, Austria

[32] Priority **Nov. 21, 1967**
[33] **Austria**
[31] **A10514/67**

[54] **SPRING LOCK DEVICE**
9 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **280/11.35**
[51] **Int. Cl.** **A63c 9/08**
[50] **Field of Search** 80/11.35

[56] **References Cited**

UNITED STATES PATENTS

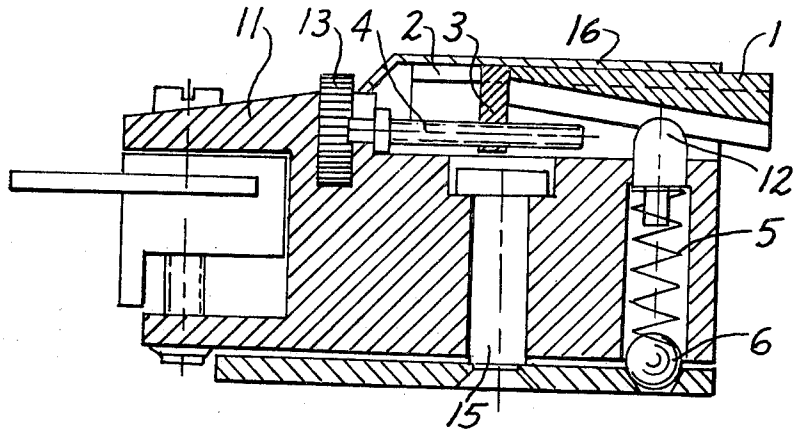
3,172,677	3/1965	Marker	280/11.35(HA)
3,201,140	8/1965	Marker	280/11.35(HA)
3,314,686	4/1967	Smolka et al.	280/11.35(HA)

FOREIGN PATENTS

1,440,444	4/1966	France	280/11.35HA
1,494,703	8/1967	France	280/11.35HA
1,498,661	9/1967	France	280/11.35HA

Primary Examiner—Benjamin Hersh
Assistant Examiner—Milton L. Smith
Attorney—Woodhams, Blanchard and Flynn

ABSTRACT: A spring-locking device for safety release ski bindings having a wedge-shaped member supported for adjustable movement in a guide and locking member resiliently engaging the wedge-shaped member to releasably lock the safety release ski binding so that an adjustment of the wedge-shaped member will vary the amount of force required to release the ski binding.



PATENTED MAR 30 1971

3,572,737

FIG. 1

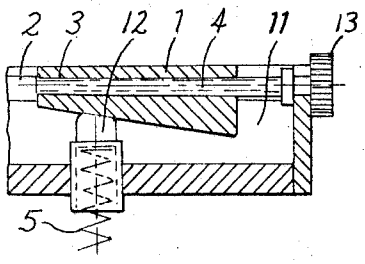


FIG. 2

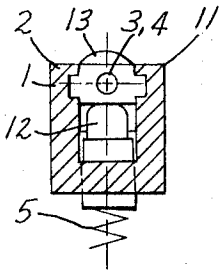


FIG. 3

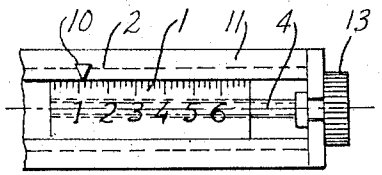


FIG. 4

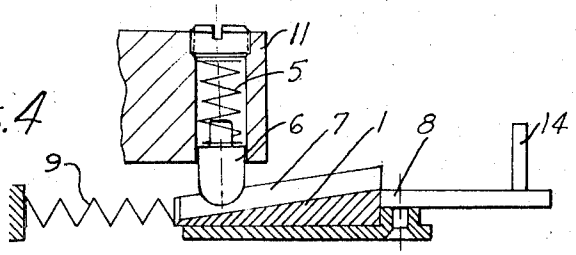


FIG. 5

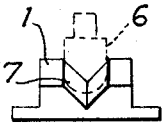


FIG. 6

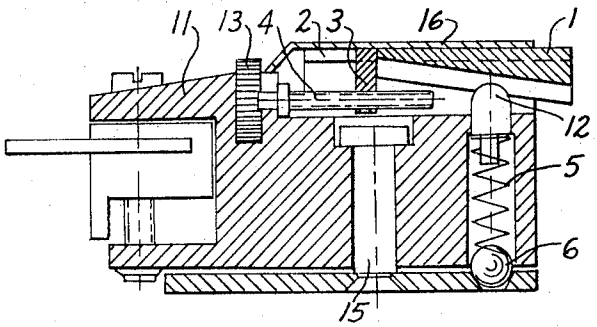


FIG. 7

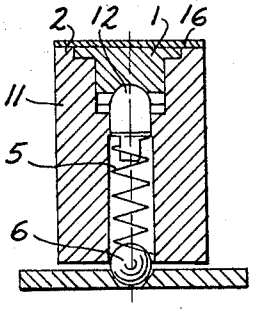


FIG. 8

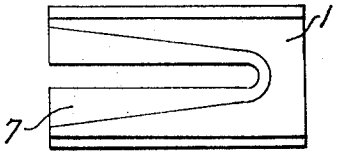


FIG. 9



INVENTORS
THOMAS G. SMOLKA
WALTER SCHWARZ

BY
Woodhams, Blanchard and Flynn
ATTORNEYS

SPRING LOCK DEVICE

This invention relates to a spring-locking device, particularly for safety ski bindings, in which the effective force applied by the spring is adjustable. Known spring locking devices, in general, provide a screw for a stepless adjustment of the locking force. If said screw is rotated, the spring is compressed a predetermined amount. The path of the spring and the path of the screw in axial direction are in these devices of equal length, however, it is not very easy to determine the amount to which the screw has been adjusted. Parts have been provided in connection with the screw for which parts can slide along a scale but here too, it is not possible to obtain an exact reading since the movable part covers exactly the same path as the screw in axial direction.

The basic purpose of the invention is to overcome the above disadvantage and to produce a precision adjustment for a releasable ski binding. To attain this purpose, the invention provides that a wedge-shaped member is adjustably movable in a guide.

A relatively flat wedge can move transversely to the spring in this construction. If the wedge is moved a desired amount, the amount by which the spring is compressed is less than the amount of travel by the wedge. This reduction depends on the inclination of the wedge, namely whether same is flat or steep. A very flat wedge will, of course, be used according to the invention and thus it is possible to provide a precisely divided scale in connection with the wedge-shaped member whereby it can be read by means of markings associated therewith.

In an advantageous construction, a body member has a threaded bore therein which is engaged by a rotatably supported but axially fixed screw. The wedge-shaped member can be arranged on the side of the spring not facing the locking area so that the spring is on one end urged against a locking element and on the other end urged directly or indirectly against the wedge-shaped member.

In a further embodiment of the invention, the wedge-shaped member has an elongated locking groove which extends longitudinally along the wedge-shaped member parallel to the direction of movement thereof. The elongated locking groove is inclined in the longitudinal direction of movement.

In a further construction, the inclination of the sidewalls of the locking groove vary along the longitudinal length thereof.

A still further possibility of construction is that the wedge-shaped member abuts on one end against a cam or eccentric disc and, preferably, on the other end a spring.

The subject matter of the invention is illustrated in examples of several embodiments in the drawing, in which:

FIGS. 1 to 3 are front-elevational and cross-sectional views of a first embodiment;

FIG. 4 illustrates a further embodiment;

FIG. 5 is a side-elevational view of the wedge-shaped member according to FIG. 4;

FIGS. 6 and 7 are related cross-sectional views of a swinging jaw constructed according to the invention;

FIGS. 8 and 9 are front-elevational and cross-sectional views of a further embodiment of the wedge-shaped member.

According to FIGS. 1 to 3, a spring 5 is associated with one ski-binding part 11 which on one end is urged against a locking element, for example a ball, or also against a lever not shown. The other end of this spring 5 urges a cylindrically-shaped part 12 against a wedge-shaped member 1 which is movable in a guide 2 of the ski-binding part 11. The wedge-shaped member has an internally threaded bore 3 therein and a threaded screw 4 is received in said threaded bore. The screw 4 is rotatably supported but is fixed against axial movement in the ski-binding part 11 or in a part rigidly connected to the ski-binding part. The wedge-shaped member 1 has a scale on its upper side (FIG. 3) which scale has a mark 10 associated therewith on the ski-binding part 11.

If the screw 4 is rotated, the wedge-shaped member 1 moves transversely to the axis of the spring 5 and compresses same. As is illustrated in the drawing, a movement of the wedge-shaped member 1 a predetermined amount will cause a movement of the spring. However, the amount of movement of the spring is only a fraction of the amount the wedge-shaped member 1 has moved. Moreover, and in order to achieve a still further precise division of the movement of the wedge-shaped member 1, one could arrange a scale having markings thereon to the screw head 13 so that the scale on the wedge-shaped member 1 can be further subdivided.

According to FIGS. 4 and 5, the spring 5 urges the locking element 6 against a locking groove 7. The locking groove is arranged longitudinally of the wedge-shaped member 1 and is correspondingly inclined therewith a rotatable eccentric disc 8 is provided for adjustment, which disc moves the wedge-shaped member 1 during a rotation thereof. In order for the wedge-shaped member to always abut the eccentric disc 8, a relatively weak spring 9 is provided which has a force which is just strong enough to assure an abutment of the wedge-shaped member 1 against the eccentric disc 8; in this embodiment the spring has no other function. The eccentric disc 8 is supported in frictional contact with the wedge-shaped member in such a way that it stops in each position which is being adjusted and is not disturbed by the spring 9 or by impacts or the like. A handle 14 can be provided for easier handling. If desired, the spring 9 can be utilized in combination with a suitable projection on the rightward (FIG. 4) end of the wedge and notches in the disc 8 as a detent system for further resisting undesired rotation of the disc 8.

FIGS. 6 and 7 illustrate swinging jaw 11 which can pivot about the axis 15 during a safety release. The force at which the jaw sets free the shoe is determined by the amount of locking or by the force of the locking spring 5. The locking device can be adjusted by means of a wedge-shaped member 1 which is movably supported in a guide 2 and which is covered by the plate 16. The movement of the wedge-shaped member is caused by a screw 4 which in turn causes the upper support part 12 of the spring 5 to be urged against the spring 5 to compress same.

A change of the release force is, according to FIGS. 8 and 9, not only assured by the wedge-shaped construction of the elongated groove 7 but also by the progressive difference in the inclination of the sidewalls of the groove in a direction transverse to the longitudinal direction of movement of the wedge-shaped member 1.

Thus, for example, the spring in the left end of FIG. 8 is not only under less tension but also the safety release release force is decreased since the inclination of the locking groove is small. Of course, the locking groove 7 can be arrange to cooperate with the locking element 6 and not on the side of the spring 5 which does not face the locking area.

The invention is not limited to the illustrated embodiments. A number of possibilities of construction are given which lie within the scope of the invention. The invention can be used for ski bindings with rear tensioning means, front jaws and like.

We claim:

1. A spring-locking device, in particular for a safety release ski binding, comprising:

a support having a guide thereon;

a wedge-shaped member supported for linear movement in said guide, said wedge-shaped member having an elongated stepless ramplike surface thereon;

locking means resiliently engaging said wedge-shaped member for releasably locking said safety release ski binding, said locking means including a pressure member slideably engaging said ramplike surface and spring means resiliently urging said pressure member against said ramplike surface, the axis of said spring means extending substantially transverse to the direction of movement of said wedge-shaped member and at an angle of less than 90° relative to the elongated direction of said ramplike surface; and

adjusting means for selectively adjustably moving said wedge-shaped member along said guide to vary the amount of force required to release said ski binding, said

adjusting means including a manual adjustment member mounted on said support and drivably engaged with said wedge-shaped member and movable relative to said support and said wedge-shaped member whereby an adjustment of said wedge-shaped member will vary the amount of force required to release said ski binding.

2. A spring-locking device according to claim 1, wherein said adjusting means comprises an internally threaded bore in said wedge-shaped member which is engaged by a rotatably supported screw secured to said support, said screw comprising said adjustment member.

3. A spring-locking device according to claim 1, wherein the wedge-shaped member is arranged at one end of the resilient locking means and a locking element is located at the opposite end of the resilient locking means, so that the resilient locking means is on one end supported on the locking element and on the other end on the wedge-shaped member.

4. A spring-locking device according to claim 1, wherein the wedge-shaped member has an elongated locking groove therein which extends along the wedge-shaped member in the direction of movement of said wedge-shaped member.

5. A spring-locking device according to claim 4, wherein the elongated locking groove is inclined in the longitudinal direction of movement of said wedge-shaped member.

6. A spring-locking device according to claim 5, wherein the inclination of the sidewalls of the locking groove vary along the longitudinal length of said wedge-shaped member.

7. A spring-locking device according to claim 1, wherein said adjusting member comprises a cam member engaging said wedge-shaped member on an end thereof remote from a spring urging said wedge-shaped member toward said cam member, said cam member being adapted to move said wedge-shaped member in said guide against the urging of said spring.

8. A spring-locking device according to claim 7, wherein said cam member is an eccentric disc pivotally mounted to said support whereby a pivotal movement of said disc effects a movement of said wedge-shaped member along said guide.

9. A spring-locking device according to claim 1, including scales and marks arranged on said wedge-shaped member and on said stationary support for the wedge-shaped member.