Dec. 20, 1932. R. I. SVORSTOL 1,891,509

SKI BINDER

Filed Jan. 26, 1932 2 Sheets-Sheet 1

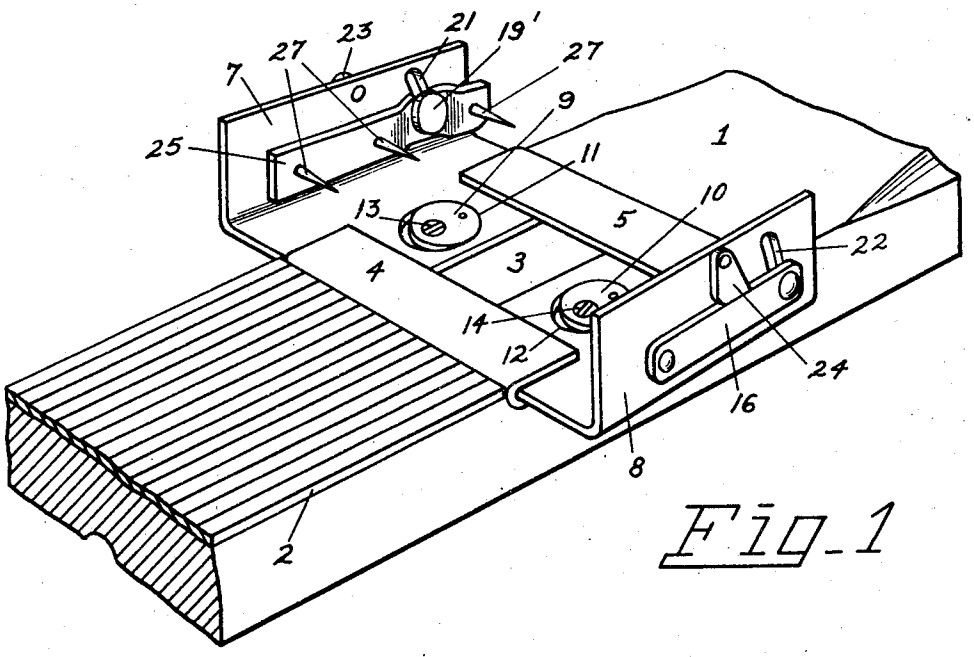


Fig. 1

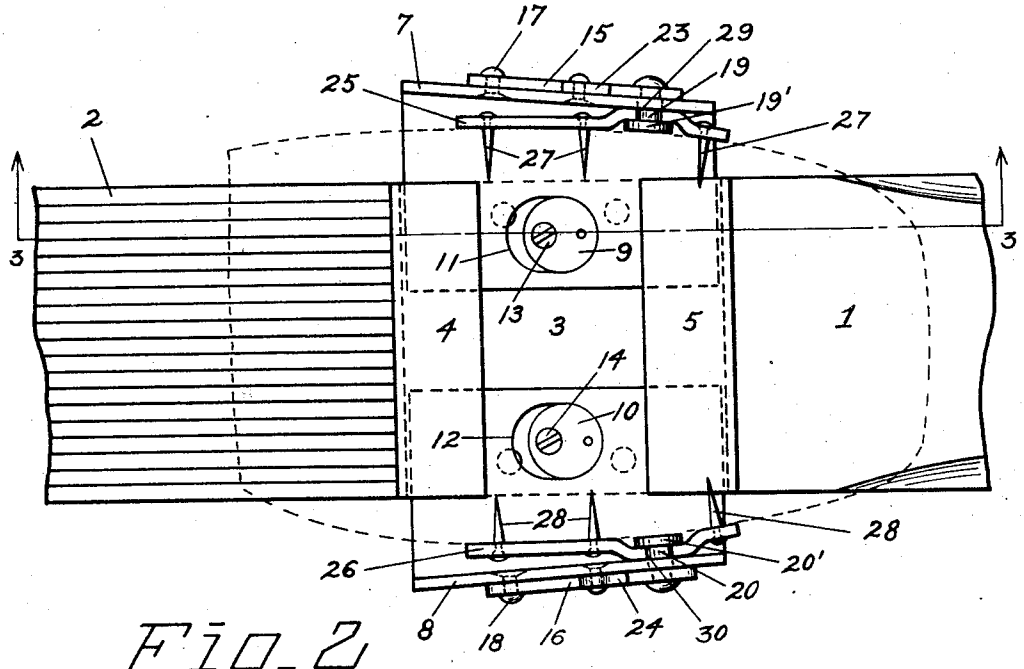


Fig. 2

Ragnar I. Svorstol
INVENTOR
BY H. Clarke Walker
ATTORNEY

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SKI BINDER

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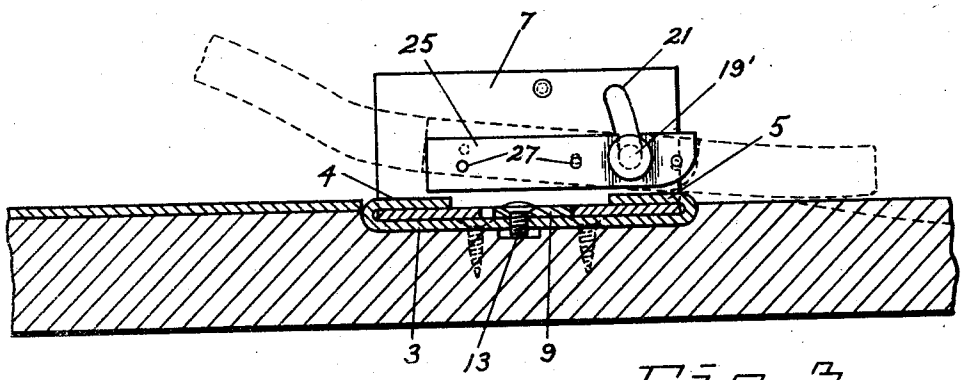


Fig. 3

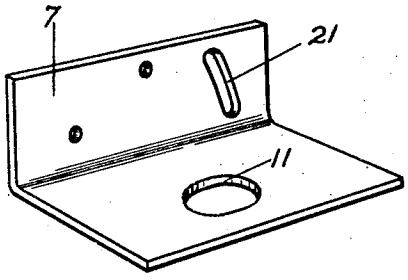


Fig. 4

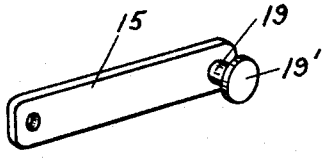


Fig. 6

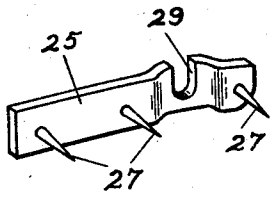


Fig. 7

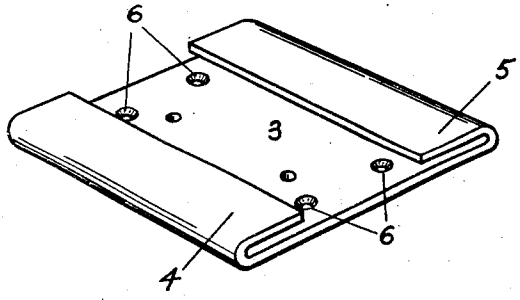


Fig. 5

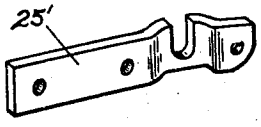


Fig. 8

Ragnar I. Svorstol
INVENTOR
BY
ATTORNEY

Patented Dec. 20, 1932

1,891,509

UNITED STATES PATENT OFFICE

RAGNAR I. SVORSTOL, OF KENT, WASHINGTON

SKI BINDER

Application filed January 26, 1932. Serial No. 588,968.

My present invention relates to improvements in ski binders employed in securing a pair of skis to a skier's shoes and particularly to a type especially suitable for use in cross country skiing.

An object of the invention is to provide a pair of ski binders which will allow greater freedom and comfort for the skier's feet by the elimination of straps commonly used to secure the skis to the feet.

A further object is the provision of a pair of ski binders which may easily be adjusted to accommodate shoes of various widths.

A further object is the provision of a pair of ski binders to which the skier's shoes are pivotally secured to allow the shoe soles to flex and the heels of the shoes to be raised up from the skis as the skier makes alternate strides with the skis.

A final object is the provision of a ski binder which, when mounted on a pair of skis, will permit the skis to be quickly attached to or detached from the skier's shoes.

It will be understood that the ski binders are made in pairs and are adapted to be mounted on and secured to a pair of skis in the usual position conventional with the art of ski construction.

My invention contemplates the use of base plates which are attached to the skis in suitable manner and each base plate is provided with a pair of angular side members adjustably mounted on the base plate. The side members are provided with pivotally mounted means for supporting a pair of lug pins which project inwardly of the side member in a horizontal plane and which are fashioned with enlarged heads. The lug pins are designed to engage in notches in a pair of metal strips which are attached to either side of a shoe sole by screws or other suitable means. Suitable locking means carried on the side members prevent the lug pins from becoming disengaged from the notches in the strips which are secured to the shoes and the enlarged heads of the lug pins prevent lateral movement of the shoe with respect to the side members of the binder. The shoes are thereby pivotally mounted at either side of the sole portion of the side members of the binder and this pivoted mounting permits the rear portion of the shoe to be flexed upwardly from the ski, affording natural movement of the feet as successive strides are made with the skis.

The invention thus resides in certain novel combinations and arrangements of parts as will hereinafter be more fully set forth and described.

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 the best mode I have thus far devised for the practical application of the principles of my invention.

Figure I is a view in perspective of a ski binder of my invention shown mounted on a fragment of a ski to illustrate the mode of mounting thereon. Figure II is a top plan view of the ski binder mounted on a fragment of a ski to illustrate the application to a ski and showing in dotted lines the outline of a shoe sole in the position it would occupy when secured to a ski by means of the binder. Figure III is a sectional view as taken at line 3—3 of Figure II showing the method of securing the device to a ski and illustrating in dotted lines the flexed position of a shoe sole when secured to the pivoted shoe attaching means. Figure IV is a view in perspective of one of the side members of the binder. Figure V is a view in perspective of the base plate of the ski binder. Figure VI is a view in perspective of one of the pivoted arms adapted to be mounted on each side member and which carry the lug pins. Figure VII is a view in perspective of one of the strips for attachment to the edges of a shoe sole and showing the use of short spikes adapted to be driven into the edge of the sole to secure the strip to the sole of the shoe. Figure VIII is a view in perspective of a strip similar to the strip shown in Fig. VII but illustrating the use of holes in the strip through which screws may be inserted to secure the strip to the edge of the shoe sole.

In the accompanying drawings 1 indicates a central portion of a ski, here shown to illustrate the method of mounting the device of

this invention thereon and 2 indicates the usual strip of rubber matting commonly employed as a mat on which the shoes of the skier may rest as well as a protective covering for the surface of the ski.

My invention contemplates the use of a base plate 3 which is fashioned with overturned edges 4 and 5 to form a pair of oppositely disposed parallel channels and the plate is provided with countersunk holes 6 thru which suitable screws may be passed to secure the plate 3 to the top surface of the ski. Referring to Figure III it will be seen that a portion of the ski surface has been cut down to allow the overturned edges 4 and 5 of the base plate 3 to be level with the surface of the mat 2, but permitting the overturned edge 5 to project slightly above the surface of the ski 1. It will be understood that each ski is provided with a base plate 3 on which the other parts of the device may be mounted.

Each base plate 3 is provided with a pair of side members 7 and 8 of right angular shape, each side member 7 and 8 having a base portion adapted to be slidably received in the oppositely disposed channels of the base plate 3 and having an upright portion extending perpendicularly to the base portion. The upright portions of the side members 7 and 8 are tapered inwardly toward the front end portion of the ski to conform to the outline of a shoe sole and this feature is illustrated in Figure II, where the outline of a shoe sole is indicated by dotted lines. The side members 7 and 8 are slidable in the channels of the base plate 3 and are provided with adjustable means to space the side members apart in proper adjustment for shoes of different widths. The adjustment is accomplished by the use of cams 9 and 10 which are positioned in elongated openings 11 and 12 in the base portions of the side members 7 and 8 respectively. The cams 9 and 10 pivot about screws 13 and 14 which are placed off-center in the cams and which extend down thru the cams into threaded holes in the base plate 3. The screws 13 and 14 may be loosened and the cams 9 and 10 rotated to adjust the positions of the side members 7 and 8 after which the screws 13 and 14 may be tightened to lock the cams in the set position. Thus it will be seen that the side members 7 and 8 may be moved toward each other or spaced apart by means of the cams and then locked in the desired position.

The side members 7 and 8 are provided with arms 15 and 16 which are pivotally secured at one end to the side members by rivets 17 and 18 and these arms are positioned on the outside of the upright portions of the side members. The arms 15 and 16 are equipped at their forward ends with lug pins 19 and 20, and the pins are fashioned with enlarged heads 19′ and 20′. The pins 19 and 20 are riveted to the arms 15 and 16 and extend inwardly thru slotted openings 21 and 22 of the side members 7 and 8. It will be apparent that the pins 19 and 20 carried by the arms 15 and 16 are adapted to reciprocate in the slotted openings 21 and 22 of the side members and they may be locked in lowered position by means of stop blocks 23 and 24 which are pivotally secured to the side members above the arms 15 and 16. These stop blocks 23 and 24 may be turned to a raised position to allow the arms 15 and 16 to be raised and when the arms are lowered the stop blocks may be turned down to engage against the upper edges of the arms, thereby locking the arms in such lowered position. It is desirable that the rivets which pivotally secure the stop blocks 23 and 24 to the side members be sufficiently tight to create frictional resistance between the sides of the stop blocks and the side members 7 and 8, respectively. This will insure the stop blocks remaining in their set position, which is an important factor in the successful operation of the ski binders.

I have thus far described the construction and operation of such portions of the ski binders as will remain attached to the skis. It is intended that the lug pins 19 and 20 furnish the means by which the skier's shoes are secure to the side members 7 and 8 of the binders. The lug pins are employed for this purpose since a pivoted connection is desired between the shoe and the ski proper.

For the purpose of pivotally attaching the shoes to the upright side members I employ a pair of strips 25 and 26 of suitable length and these strips are provided with spikes 27 and 28 which are adapted to be forced into the edges of a shoe sole to secure the strips to the shoe. A strip is secured to either side of the shoe sole as shown in Fig. II where dotted lines indicate the outline of a shoe sole as well as the approximate position of the strips when applied to the shoe. It is pointed out that regular skiing shoes are provided with much thicker soles than ordinary shoes, altho any shoe having a thick sole is suitable for the application of the strips 25 and 26 thereto. The strips 25 and 26 have offset portions near their front ends as shown in the drawings and are provided at these offset portions with notched openings 29 and 30, which are cut down from the upper edges of the strips. These notches 29 and 30 are adapted to receive the lug pins 19 and 20 which are pivotally mounted on the side members 7 and 8, and the heads 19′ and 20′ of the pins engage the inner sides of the strips 25 and 26 at their offset portions. It will be seen that the offset portions of the strips 25 and 26 form recesses between the edges of the shoe sole and the offset portions of the strips, and these recesses are adapted to receive the heads 19′ and 20′ of the lug pins 19 and 20.

When the lug pins 19 and 20 are engaged in the notches of the strips 25 and 26 and

locked in such position by the stop blocks 23 and 24 the shoe is thereby secured to the ski, and can not be disengaged until the stop blocks have been turned upward and the lug pins raised up from the notches 29 and 30 of the strips 25 and 26. The shoe is thus pivotally attached to the ski and may pivot slightly about the lug pins 19 and 20 as shown by dotted lines in Figure III. This pivoted attachment allows the rear portion of the shoe to be raised up from the ski as is done when the skier takes alternate strides on the skis and the shoe sole flexes to some extent as a result.

Figure VIII of the drawings illustrates a strip 25′ for attachment to the edges of a shoe sole and this strip is provided with holes through which screws may be inserted to secure the strip to the shoe instead of the spikes 27, 28, as previously described.

In using the ski binders of this invention the strips 25 and 26 are affixed to either side of the shoe sole, care being exercised to see that the notches of the strips are directly opposite one another. The shoe is then placed between the side members 7 and 8 to gauge the correct spacing of these members and the side members may be adjusted and set in such position that the lug pins 19 and 20 will engage in the notches 29 and 30 of the strips 25 and 26. When the adjustment has been made the stop blocks 23 and 24 may be turned to a raised position to allow the arms 15 and 16 carrying the lug pins 19 and 20 to be raised at their forward ends. The shoe may then be positioned between the side members in such manner that the lug pins 19 and 20 will be directly above the notches 29 and 30 of the strips 25 and 26. The arms 15 and 16 may then be lowered to allow the lug pins to engage in the notches 29 and 30, and the stop blocks 23 and 24 are then turned down against the upper edges of the arms 15 and 16. Each of a skier's shoes is secured to a ski in this manner and the skis may be quickly detached after use by reversing the operation outlined above.

It will be understood that the ski binders of my invention are to be constructed in pairs to be mounted one on each ski and the different parts are fashioned accordingly, dependent upon whether the binder is adapted to embrace either a right or left shoe. The drawings have illustrated one binder of a pair, specifically the one adapted to embrace the left shoe, but it will be apparent that both binders of a pair are constructed similarly in every respect excepting the taper of the angular side members, which in a binder for the right shoe must be opposite to the taper of these members in a binder for the left shoe.

It is believed that the foregoing description is sufficiently clear to enable anyone skilled in the art to which the invention appertains to make and use the same, with reference also to the accompanying drawings.

While certain modifications in the construction of the device may be resorted to it is believed that such changes may be made as will fall fairly within the spirit and scope of the appended claims.

Having thus fully described my invention, I claim:

1. In a device of the character described, a base plate adapted to be mounted on a ski, a pair of angular shoe embracing members adjustably mounted on the base plate, pins mounted on each of said shoe embracing members and extending inwardly thereof, a pair of strips provided with means for attachment to the edges of a shoe sole and having means adapted to pivotally engage the pins carried by said shoe embracing members.

2. In a device of the character described, a base plate adapted to be mounted on a ski, a pair of shoe embracing members slidably mounted on the base plate, adjustable means for positioning said shoe embracing members, pins mounted on each of said shoe embracing members, a pair of strips provided with means for attachment to the edges of a shoe sole and having means adapted to pivotally engage the pins carried by said shoe embracing members.

3. In a device of the character described, a base plate adapted to be mounted on a ski, said base plate being fashioned with a pair of overturned edges to form a pair of oppositely disposed parallel channels, a pair of shoe embracing members having base portions slidably disposed in the channels of the base plate and having upright portions adapted to embrace a shoe therebetween, adjustable means for positioning said shoe embracing members in spaced relation, arms pivotally mounted on the upright portions of each of said shoe embracing members, pins carried by each of said arms, a pair of strips provided with means for attachment to the edges of a shoe sole and being provided with means for pivotally engaging the pins carried by said arms.

4. In a device of the character described, a base plate adapted to be mounted on a ski, said base plate being fashioned with a pair of oppositely disposed parallel channels, a pair of angular shoe-embracing members having base portions slidably disposed in the channels of the base plate and having upright portions adapted to embrace a shoe therebetween, adjustable means for positioning said shoe embracing members and means for locking said adjustable means in set position, arms pivotally mounted on the upright portions of the shoe embracing members, pins secured to said arms and extending inwardly through arcuate slotted openings in the upright portions of the shoe embracing

members, a pair of strips having means for attachment to the edges of a shoe sole and being provided with notches adapted to receive the pins carried by said arms and means for securing the pins in engagement with the notches in said strips.

5. In a device of the character described, a base plate adapted to be mounted on a ski, a pair of shoe embracing members slidably mounted on said base plate, means for adjusting and securing said shoe embracing members in spaced relation on the base plate, arms pivotally mounted on each of said shoe embracing members, pins secured to said arms and extending inwardly through arcuate slotted openings in said shoe embracing members, a pair of strips having means for attachment to the edges of a shoe sole and being provided with notches adapted to receive the pins carried by said arms and a pivotally mounted lug on each of said shoe embracing members adapted to bear against the upper edges of said arms for the purpose of maintaining the pins carried by said arms in engagement with the notches in said strips.

6. In a device of the character described, a base plate adapted to be mounted on a ski and being fashioned with a pair of oppositely disposed parallel channels, a pair of shoe embracing members having base portions slidably disposed in the channels of the base plate and having upright portions adapted to embrace a shoe therebetween, a pair of cams eccentrically pivoted on the base plate and adapted to co-act with elongated openings in the base portions of the shoe embracing members and means for securing the cams in set position, arms pivotally mounted on the upright portions of the shoe embracing members, pins carried by said arms and a pair of strips adapted to be attached to opposite edges of a shoe sole and having notches therein to receive the pins carried by said arms.

7. In a device of the character described, a base plate adapted to be mounted on a ski, a pair of shoe embracing members having base portions slidably mounted on said base plate and having upright portions adapted to embrace the forward portion of a shoe therebetween, arms pivotally mounted on said uprights, pins carried by each of said arms and extending inwardly through arcuate slotted openings in said uprights and being adapted to reciprocate in said slots, a lug pivotally mounted on each of said uprights and adapted to bear against the upper edges of each of said arms for the purpose of locking the pins carried by said arms in lowered position in said slotted openings, a pair of curved strips having pointed spikes integral therewith and adapted to be secured to opposite edges of a shoe sole by driving said spikes into the edges of the shoe sole and said strips being provided with notches adapted to receive the pins carried by said arms.

8. In a device of the character described, a base plate adapted to be mounted on a ski, a pair of angular shoe embracing members slidably mounted on said base plate, an arm pivotally mounted on each of said shoe embracing members, pins carried by each of said arms and being fashioned with enlarged heads, a pair of strips having means for attachment to the edges of a shoe sole and each of said strips having a notched offset portion adapted to receive the pins carried by each of said arms.

In testimony whereof I affix my signature.

RAGNAR I. SVORSTOL.