

July 30, 1968

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3,394,790

LOCKING APPARATUS FOR SKIS AND POLES

Filed Sept. 7, 1966

3 Sheets-Sheet 1

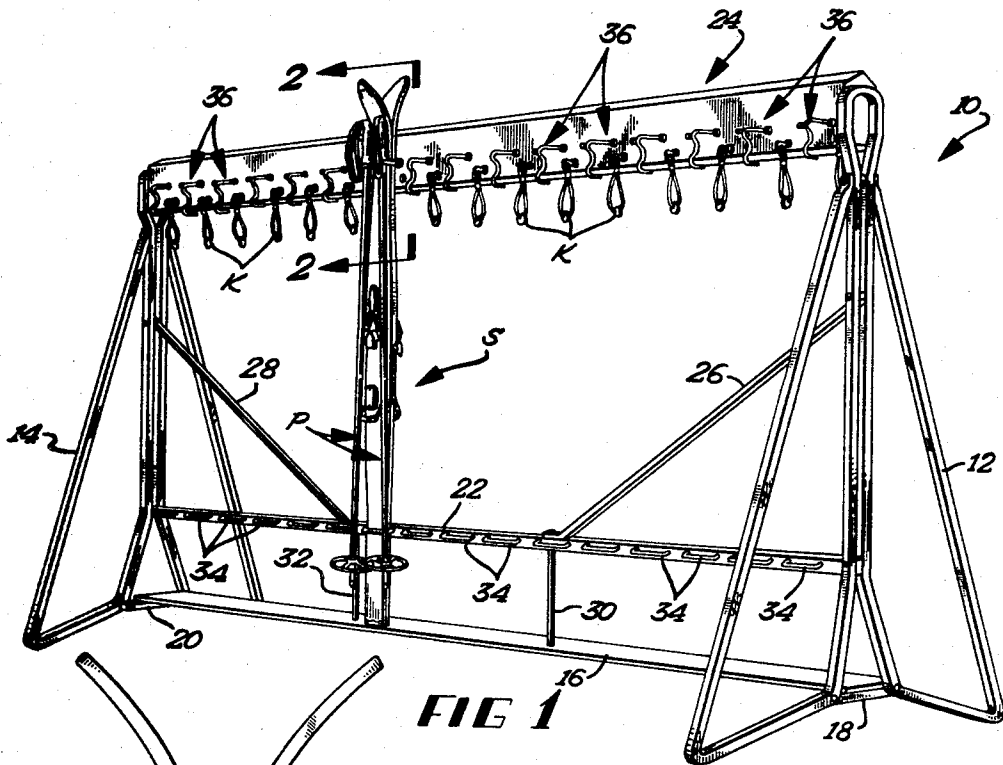


FIG 1

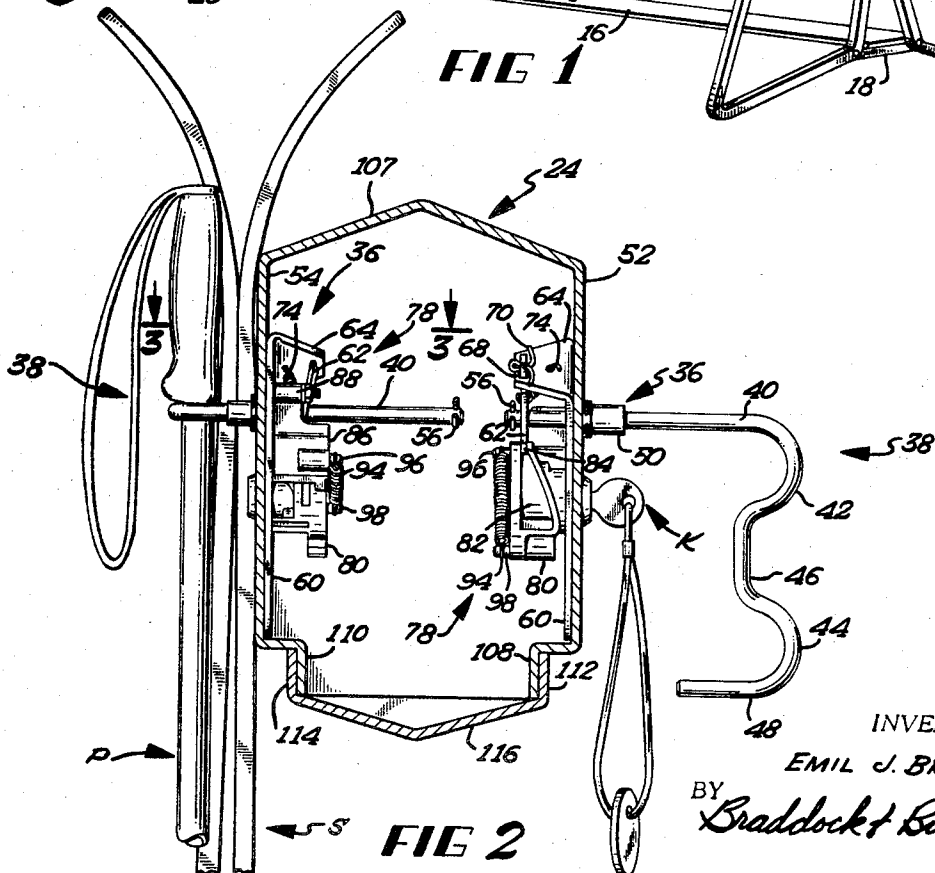


FIG 2

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3 Sheets-Sheet 2

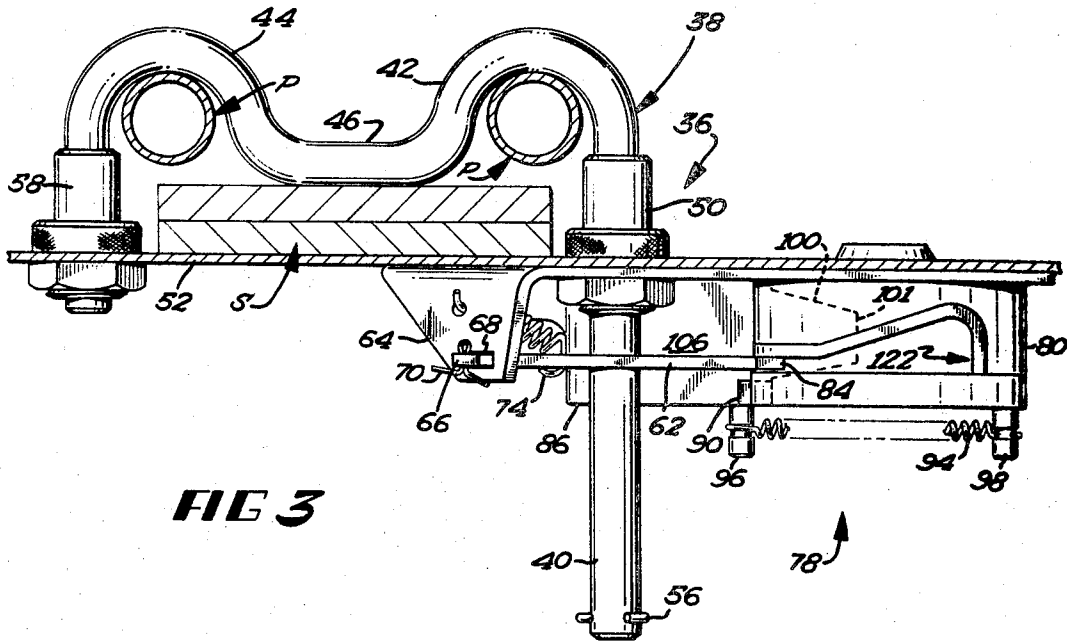


FIG 3

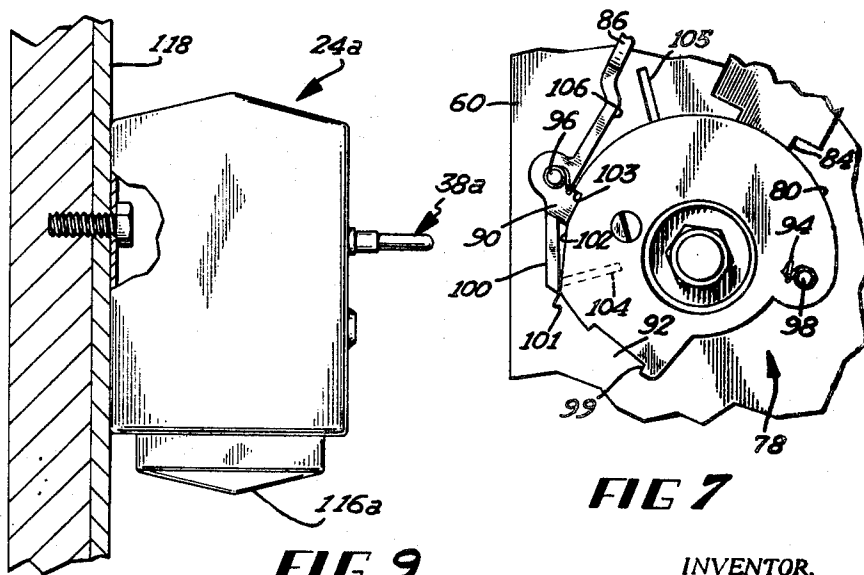


FIG 7

FIG 9

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3 Sheets-Sheet 3

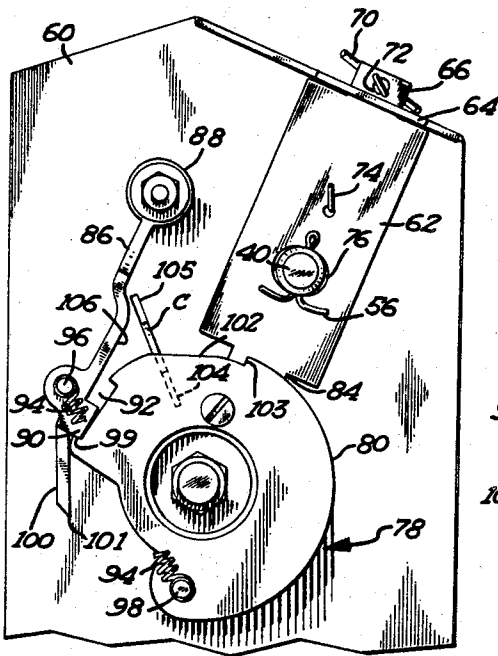


FIG 4

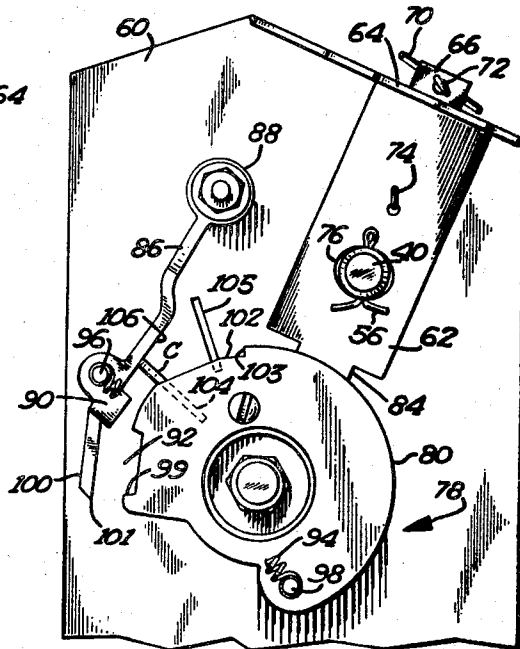


FIG 5

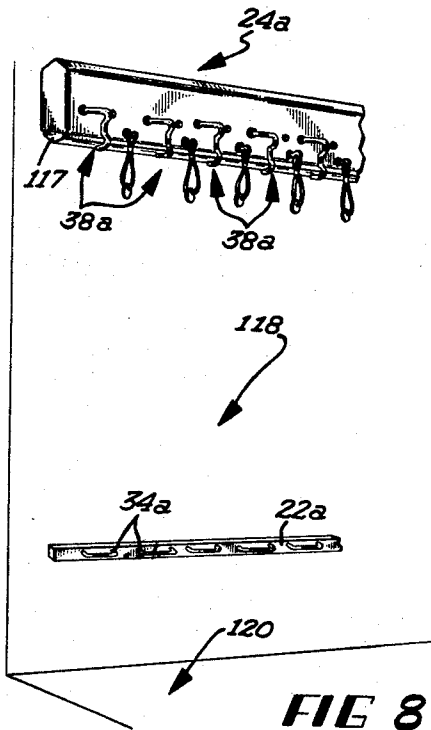


FIG 8

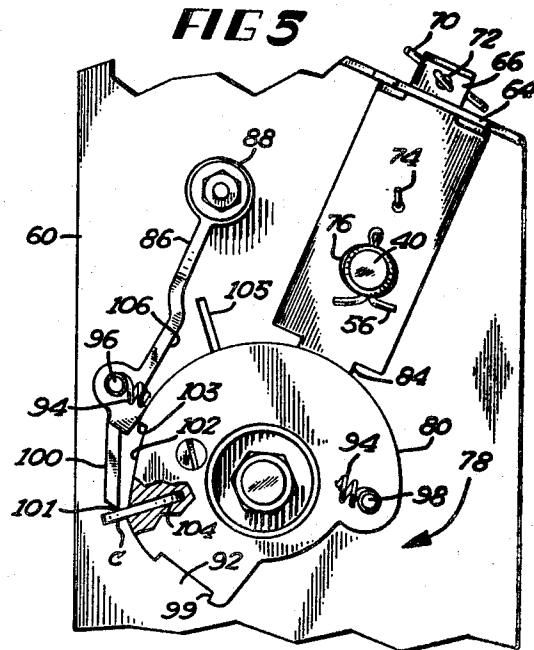


FIG 6

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**LOCKING APPARATUS FOR SKIS AND POLES**  
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Filed Sept. 7, 1966, Ser. No. 577,653  
 12 Claims. (Cl. 194-64)

### ABSTRACT OF THE DISCLOSURE

A ski rack has a vertical wall in which a U-shaped rod is slidable. A first leg of the rod is longer and stays in the wall. The other leg is shorter and swings free of the wall to allow the rod to surround the skis and poles. A rod brake is coin and key controlled and acts on the first leg inside the wall to selectively hold or release the leg. The rod brake includes a plate with a rod receiving hole which passes the first rod when the plate is normal to the rod and holds the rod when the plate is canted.

This invention relates to lockable storage apparatus for sporting equipment such as skis and poles and the like. More particularly, the invention relates to coin-operated locking apparatus for securely retaining equipment such as skis and ski poles against intentional theft, mistaken taking or other mishandling.

With the increasing popularity of skiing in recent years, an increasing number of people own skis. Skis of good quality remain expensive, however, and this has resulted in a widespread black market operation dealing in stolen skis and poles. Where, for example, the owner leaves his skis unguarded outside a lodge at a ski resort, it is a simple matter for a thief, dressed in typical skiing clothes, to take the skis away as if they were his own. Sale of the stolen skis is facilitated by the fact that they are not normally provided with identifying indicia of any kind.

Accordingly, it is one object of this invention to provide a ski storage apparatus which, although relatively simple in construction and mode of use, will retain skis and poles in such a way that the undetected theft thereof is virtually impossible. In this respect, the present apparatus secures the skis and poles by means of a locking apparatus that prevents endwise withdrawal of the equipment and which is highly resistant to forced opening. Because a key type lock is employed the apparatus is not entirely secure and, of course, the skis could be released by destroying or dismantling the apparatus, but in any event the chances for unobserved theft are greatly reduced.

Another object of this invention is to provide a locking mechanism for ski storage apparatus having the aforementioned characteristics and which is coin operated whereby commercial use may be made of the apparatus. A related aim of the invention is to provide such a coin-operated apparatus for a plurality of sets of skis and poles and which is easy to service. For this purpose, the apparatus employs a plurality of individual locking means, each delivering its coins to a single coin tray.

Still another object of the present invention is the provision of ski retaining apparatus which is so constructed as to be resistant to adverse weather conditions as well as to normal conditions of use. Even during fair weather, for example, skis will be wet or will have snow adhering there-to when placed in the apparatus. This objective of the invention is, therefore, to provide an apparatus which will give long service without deterioration under these wet conditions.

Still another object of this invention is to provide an apparatus having the aforementioned characteristics which is constructed so as to be readily portable, this feature per-

mitting the apparatus to be moved to accommodate changing demands for its use. Location and weather conditions may make some ski runs at a particular resort more desirable than others so that more of the present apparatus may be required at one location than another. However, the invention is not limited to a portable structure, but can be embodied in static structures as well.

Briefly described, the present apparatus is adapted to hold and retain skis which are secured together in sole-to-sole relation in the usual fashion. For each pair of skis, the apparatus includes a fixed bracket which is arranged to encircle the paired skis at a location between the bindings and the heels thereof and an adjustable bracket means supported in spaced relation to the fixed bracket, the adjustable bracket means being adapted to encircle the skis closely at a location between the binding and the toes thereof. Locking means are provided for securing the adjustable bracket means in place, and, while the invention may employ various locks for this purpose, a preferred locking mechanism includes a canted plate type of rod brake for holding the ski-encircling part of the adjustable bracket means in place. The arrangement is such that the skis are closely encircled at a location where their combined outer cross-sectional dimension is least so that attempted endwise withdrawal is defeated by the larger cross-sectional dimensions of the skis in both directions from the clamping point.

Other objects, advantages and new features of the present invention will become apparent upon a consideration of the following detailed description, when read in conjunction with the accompanying drawings wherein:

FIGURE 1 is a perspective view of first form of the present invention, this embodiment constituting a portable locking rack;

FIGURE 2 is an enlarged cross-sectional view through a portion of the locking rack of FIGURE 1, taken on the line 2-2 thereof;

FIGURE 3 is a cross-sectional view taken on the line 3-3 in FIGURE 2;

FIGURES 4 to 7 are rear elevational views of portions of the locking mechanism of the present invention, showing various stages in the operation thereof;

FIGURE 8 is a partial perspective view showing a second, static form of the invention; and

FIGURE 9 is an end elevational view of the upper portion of the structure of FIGURE 8 showing its mounting to a permanent wall, which wall is shown in cross section.

In the first form of the invention as shown in FIGURES 1 through 7, a portable rack 10 includes a pair of end supports 12 and 14 made up of square tubing, for example, in the generally triangular shape shown. The ski-retaining elements of the rack 10 extend between end supports 12 and 14 and consist of a bottom plate 16 supported on crossbars 18 and 20 on the end supports 12 and 14 respectively, a fixed bracket support bar 22 and an adjustable bracket supporting means indicated generally at 24. Diagonal braces 26 and 28 lend rigidly to rack 10, and vertically disposed tension rods 30 and 32 provide additional support for bottom plate 16 which is usually made of wood, such as redwood for example.

Fixed bracket support bar 22 carries a plurality of U-shaped brackets 34 and is spaced above bottom plate 16 by a distance such that each bracket 34 will encircle a pair of skis S at a location between the heels and the bindings thereof when they are placed in the apparatus as shown. While they do not appear in the drawings, another plurality of fixed brackets are provided on the opposite side of bar 22.

Bracket supporting means 24 carries a plurality of adjustable and lockable bracket means 36. Adjustable bracket means 36 are each positioned with respect to one of the

fixed brackets 34 such that its clamping rods 38 will encircle skis S at a location between the bindings and the toes thereof, and particularly at that point along the length of the paired skis S where their combined outer cross-sectional dimension is least. In this way, as mentioned above, endwise withdrawal of the skis is made substantially impossible.

Rods 38 are adapted to be brought into close encircling relation to skis S and to a pair of poles P. As best illustrated in FIGURES 2 and 3, rod 38 each include an elongated first straight leg portion 40, a pair of semi-circular portions 42 and 44 joined by a transverse straight portion 46 and a shorter second straight leg portion 48, in spaced parallel relation to the first leg portion 40. The spacing of leg portions 40 and 48 is such as to accommodate standard ski widths, and the inner radii of semi-circular portions 42 and 44 are chosen to be substantially equal to standard ski pole diameters. The leg portions 40 are each slidably received in a bushing 50 mounted in walls 52 or 54 of bracket support means 24, and are prevented from being withdrawn therefrom by means of cotter pins 56 passing through suitable bores near the inner ends of the leg portions 40. Guide bushings 58 are mounted in horizontal alignment with leg portions 48 of rods 38 when the rods are horizontally placed.

Rods 38 are retained in their close encircling relation to skis in the present apparatus as shown by means of a coin-operated locking means which includes a canted plate type of rod brake which permits inward but not outward movement of rod 38 when the brake is engaged. The various parts of each locking mechanism are mounted on a plate 60 each of which is in turn attached to wall 52 or wall 54 in order to mount the locking mechanism in such a way that access to its working parts may not be had from outside support means 24.

Rod brake plates 62 are each hingedly mounted on a plate 60. For convenience and economy in manufacture, each hinged mounting of plate 62 is achieved by forming an inwardly turned portion 64 on plate 60. A narrowed end portion 66 on brake plate 62 passes through a slot 68 in portion 64, slot 68 being made wider than the thickness of brake plate 62 so that brake plate 62 is free to pivot about an axis parallel to portion 64. A cotter pin 70, secured in a suitable aperture 72 in narrowed portion 66, retains brake plate 62 in assembled relation to plates 60. Brake plate 62 is spring biased toward the main portion of plate 60 by means of a tension spring 74 acting between brake plate 62 and upturned portion 64 on plate 60.

Leg portion 40 of rod 38 passes through an aperture 76 in brake plate 62 which is made slightly larger than the outside diameter of the rod so that when the plate is normal to the rod, the rod is free to move; but when the plate is canted, the edges of the aperture 76 will engage the leg 40 and prevent its movement in one direction. Spring 74 will act to hold brake plate 62 in its canted locking position if allowed to do so and any attempt to withdraw rod 38 when the brake is engaged will only serve to increase the holding action of the brake. Thus, when the brake is engaged, it is possible to move rod 38 inwardly to bring the portions 42, 44 and 46 thereof into close engagement with skis S, but outward motion is impossible.

Coin and key operated cam means generally indicated at 78 serve to hold brake plate 62 in a position normal to leg portion 40 when the apparatus is not in use, and allow the brake plate to move to its canted position when it is desired to lock skis S in the apparatus. For this purpose, a cam disc 80 is mounted to rotate on a suitable key barrel, of usual or preferred construction (not shown), so as to rotate about an axis normal to plate 60 when key K is inserted from outside the bracket supporting means 24 and is turned. Disc 80 has a peripheral cam slot 82 in which rides a follower portion 84 of brake plate 62.

Cam slot 82 is shaped as shown to hold brake plate 62 in its unlocked position or to allow it to move to its canted position.

With the parts in the unlocked position as seen in FIGURES 3 and 4, to prevent rotation of cam disc 80 unless a coin is placed in the mechanism, a lever 86 is pivotally mounted at one end on plate 60 as at 88. Near its opposite end, lever 86 has a detent lug 90 adapted to enter a peripheral recess 92 formed in cam disc 80. A spring 94 connected to a post 96 on lever 86 at one end and to a post 98 on cam disc 80 at the other end tends to maintain detent lug 90 in the recess 92.

With reference to FIGURES 4 to 7, it will be observed that spring 94 also acts to bias cam disc 80 for rotation, initially in a clockwise sense; and, in toggle fashion in a counterclockwise sense after the cam disc is rotated a predetermined amount.

In the initial position of cam disc 80 (see FIG. 4), spring 94 acts to bias an end 99 of recess 92 into engagement with detent lug 90. This engagement serves as a precise index for aligning a coin receiving recess 104 in cam disc 80 with a coil slot 105 formed in plate 60 and in the respective walls 52 and 54.

With the parts positioned as shown in FIGURES 3 and 4 and in the right hand side of FIGURE 2, a coin C of suitable size will be inserted through the coin slot 105 and into recess 104 to take a position as seen in FIGURE 4. The key K will then be rotated to bring the coin C in contact with a lower surface 106 of the lever 86 thus to lift the lever and its detent lug 90 out of recess 92 to permit rotation of the cam disc 80, all as seen in FIGURE 5. As perhaps best seen in FIGURE 3, the coin C is not in alignment with the detent lug 90 of the lever 86, so as it passes along the surface 106 of the lever 86, it passes by the detent lug 90 and slides out along a tongue 100 which constitutes an extension of the lever 86, said tongue having a pointed end 101. The parts will arrive at the position as shown in FIGURE 6, and then the coin will fall from the cam disc 80. Spring 94 has passed over the center of rotation of cam disc 80 and now acts to hold the cam disc in its rotative position. In this condition of the parts, the cam follower portion 84 of the brake plate 62 has been allowed by the peripheral cam slot 82 to move to its locked position.

With the parts in this locked position, and with the skis and poles positioned as seen in FIGURES 1, 2, and 3, the clamping rod 38 moved in as tightly as possible against the paired skis and poles; the key K can be removed, thus locking the skis and poles in the apparatus as previously explained.

When it is desired to release the skis, key K will be re-inserted, and the key K and cam disc 80 will be rotated in clockwise direction as seen in FIGURE 6, past the position as seen in FIGURE 7, and back to the position of the parts as seen in FIGURE 4. As this happens, the cam slot 82 will move the cam follower portion 84 of the rod brake plate 62 back away from the plate 60 to its unlocked position, thus allowing the clamping rod 38 to be moved outwardly to bring second leg portion 48 in clearing relation to bushing 58 to the end that the skis and poles can be removed.

At this point the detent lug 90 will again be inside of the peripheral recess 92 and any attempt to rotate the key and cam disc 80 without the insertion of a coin C will be prevented by that surface of the cam disc 80 which defines the upper end of the recess 92.

Because of the rather gentle angle to the peripheral cam slot 82 on the cam disc 80, it will be evident that some point can be reached as the cam disc is rotated in a clockwise direction as seen in FIGURE 6 where the cam follower portion 84 will have moved sufficiently away from the plate 60 so that the first leg portion 40 will be released by the brake plate, and this condition can be achieved before the detent lug 90 drops into the recess 92. Were this to happen, the parts could be left in this

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position, and reused without the necessity of inserting a coin in the slot 105. To prevent this, a ramp 102 has been provided on the cam disc and this ramp is terminated with a stop shoulder 103. Thus, as the key is used in the process of releasing the skis, and the parts move from the position as seen in FIGURE 6 to the position as seen in FIGURE 7, the detent lug 90 first drops down on the ramp 102 and comes into blocking relationship to the stop shoulder 103, thus preventing rotation of the cam disc 80 in the counterclockwise direction as seen in FIGURE 7. The brake plate will have been moved sufficiently to allow the clamping rod 38 to be in the unlocked position when the parts are positioned as shown in FIGURE 7, but the parts cannot be rotated to the locked position until the cam disc moves to the position as seen in FIGURE 4, and until another coin is inserted in the slot 105 and into the recess 104.

With reference to FIGURE 2, the bracket supporting means 24, as shown, includes walls 52 and 54 which are formed from a single sheet of metal, the walls joined by a roof portion 107 shaped to reject the accumulation of moisture thereon. The integral nature of the walls 52 and 54 and the roof 107 also contribute to keeping moisture out of the working parts of the apparatus.

At their lower edges, walls 52 and 54 are formed with inwardly offset portions 108 and 110 respectively, these offset portions accommodating flanges 112 and 114 on a removable bottom wall or coin tray 116. Coin tray 116 is also formed with a downwardly converging configuration as shown, this shape also aiding in the shedding of moisture. A similar inward end offset 117 of means 24 and tray 116 shields the joints between the walls 52 and 54 and also makes it more difficult to get a prying tool into the joint. Bottom wall 116 is secured in place in any suitable manner and emptying of the coins is accomplished by removing the wall 116. Suitable means for holding wall 116 in place will preferably include lock means to prevent entry by anyone other than the servicing personnel.

As stated above, the invention is not limited to a portable rack structure but may be embodied in fixed structures as well. FIGURES 8 and 9 illustrate such an embodiment as a second form of the invention, the suffix "a" being employed with reference numerals in these figures which relate to elements similar to the elements of rack 10.

With reference to FIGURE 8, it will be observed that the ski retaining apparatus is there shown as mounted on a wall 118 which may be, for example, an interior wall in a ski lodge. In this embodiment, there is a fixed bracket support bar 22a which is attached to wall 118 at a distance above the floor 120 which is comparable to the distance of bar 22 above plate 16 in the first form of the invention. A plurality of fixed, ski-encircling brackets 34a are carried by bar 22a.

A bracket supporting means 24a is mounted on a wall 118 at a distance above bar 22a corresponding to the distance or spacing between bar 22 and means 24 in the first embodiment. It will be understood that a plurality of adjustable bracket means, including rods 38a, are provided in means 24a. Means 24a is mounted by lag screws, one of which is shown in FIGURE 9, the heads of the lag screws being disposed within the coin box. The lower side of bracket supporting means 24a is closed by a removable wall 116a, and it is a simple matter to insert a tool for manipulating the lag screws through the open bottom of the coin box when the wall 116 is not in place.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Apparatus for securely retaining a pair of skis comprising bracket means adapted to encircle said pair of skis at a location between the bindings and the heels thereof, adjustable bracket means mounted in spaced relationship to said first-mentioned bracket means and adapted to encircle said pair of skis closely at a location

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between the binding and the toes thereof, lock means for securing said adjustable bracket means in its close encircling relation to said pair of skis, a bracket support means having a wall adapted to support said adjustable bracket means and said lock means, said adjustable bracket means including a rod member shaped to define a first straight leg portion and a second straight leg portion in spaced parallel relation thereto, said leg portions being joined by a ski-engaging portion and being mounted through said wall for sliding movement normally with respect thereto whereby a closed ski-retaining loop of variable area is defined by said rod member and said wall said first straight leg portion being substantially longer than said second straight leg portion, said first straight leg portion being slidable in said wall between a first position wherein the end of the said second leg portion is in an abutting relationship with the exterior face of said wall and a second position wherein the said end of said second leg portion is in a spaced relationship with said exterior face of said wall.

2. Ski-retaining apparatus as defined in claim 1 wherein said lock means comprises rod brake means engaging said first leg portion for selectively retaining said rod member against sliding movement with respect to said wall and coin-operated means for engaging and releasing said rod brake means.

3. The combination as specified in claim 1 wherein said ski engaging portion is shaped to also encircle a pair of ski poles.

4. Apparatus for securely retaining a pair of skis comprising bracket means adapted to encircle said pair of skis at a location between the bindings and the heels thereof; adjustable bracket means mounted in spaced relation to said first-mentioned bracket means and adapted to encircle said pair of skis closely at a location between the bindings and the toes thereof; lock means for securing said adjustable bracket means in its close encircling relation to said pair of skis; rack means for supporting said bracket means and said adjustable bracket means in vertically spaced relation, there being a plurality of each of said bracket means, adjustable bracket means and lock means; said rack means for supporting said adjustable bracket means including a first vertical wall, a second vertical wall in spaced parallel relation to said first vertical wall, a top wall and end walls bridging said vertical walls, and a removable bottom coin tray connected between said vertical walls at the respective lower edges thereof, all to define a closed coin box; at least some of said adjustable bracket means and associated lock means being mounted in each of said vertical walls.

5. Ski-retaining apparatus as defined in claim 4 wherein each of said vertical walls has an inwardly offset lower edge portion, said removable bottom tray having a flange at each edge thereof, said flanges being parallel and spaced so as to closely embrace said offset portions when said bottom wall is in place.

6. Apparatus for securely retaining a pair of skis comprising bracket means to encircle said pair of skis at a location between the bindings and the heels thereof, adjustable bracket means mounted in spaced relation to said first-mentioned bracket means and adapted to encircle said pair of skis closely at a location between the bindings and the toes thereof, lock means for securing said adjustable bracket means in its close encircling relation to said pair of skis, bracket support means having a wall adapted to support said adjustable bracket means and said lock means, said adjustable bracket means including a rod member shaped to define a first straight leg portion and a second straight leg portion in spaced parallel relation thereto, said leg portions being joined by a ski-engaging portion and being mounted through said wall for sliding movement normally with respect thereto whereby a closed ski-retaining loop of variable area is defined by said rod member and said wall, said first straight leg portion being substantially longer than said second straight leg portion

whereby said second straight leg portion may be withdrawn from said wall while said first straight leg portion remains therein, said lock means comprising rod brake means engaging said first leg portion for selectively retaining said rod member against sliding movement with respect to said wall, and coin-operated means for engaging and releasing said rod brake means, said rod brake means comprising a plate member having an aperture therein through which said first leg portion extends, the diameter of said aperture being just greater than that of said first leg portion, means pivotally supporting said plate member on said wall, and cam means for holding said plate member selectively in a normal position with respect to said first leg portion in which position said first leg portion is free to move and in a canted position in which said first leg portion is locked against movement.

7. Ski-retaining apparatus as defined in claim 6 wherein said cam means comprises a cam disc mounted for rotation in said wall, said cam disc having a lock barrel disposed therein whereby said cam disc can be rotated by means of a key inserted in said lock barrel.

8. Ski-retaining apparatus as defined in claim 7 wherein said lock means further comprises a lever mounted on said wall for pivotal movement about an axis parallel to the axis of rotation of said cam disc, said lever having a detent lug thereon, and said cam disc having a recess therein for receiving said detent lug, a spring connected between said cam disc and said lever for biasing said lever into engagement with said cam disc and said detent lug into said recess, means defining a coin-receiving slot in said cam disc, means defining a coin-receiving opening in said wall, and a cam surface on said lever engageable by a coin placed in said slot to force said detent lug out of said recess to permit rotation of said cam disc.

9. Ski-retaining apparatus as defined in claim 8 wherein said spring is mounted for toggle action between said cam disc and said lever, said spring biasing said cam disc for rotation in one direction when said plate member is held in its unlocked position and in the other direction when said plate member is held in its locked position.

10. A coin-operated lock means for securing a bracket means having a rod member slidably mounted in a wall for axial movement normally with respect to said wall, said lock means comprising rod brake means engaging

said rod member for selectively retaining said rod member against movement with respect to said wall and coin-operated means for engaging and releasing said rod brake means, said rod brake means comprising a plate member having an aperture therein through which said rod member extends, the diameter of said aperture being just greater than that of said rod member, means pivotally supporting said plate member on said wall, and cam means for holding said plate member selectively in a normal position with respect to the axis of said rod member in which position said rod member is free to move and in a canted position in which said rod member is locked against movement.

11. Lock means as defined in claim 10 wherein said cam means comprises a cam disc mounted for rotation in said wall, said cam disc having a lock barrel disposed therein whereby said cam disc can be rotated by means of a key inserted in said lock barrel.

12. Lock means as defined in claim 11 wherein said lock means further comprises a lever mounted on said wall for pivotal movement about an axis parallel to the axis of rotation of said cam disc, said lever having a detent lug thereon, and said cam disc having a recess therein for receiving said detent lug, a spring connected between said cam disc and said lever for biasing said lever into engagement with said cam disc and said detent lug into said recess, means defining a coin-receiving slot in said cam disc, means defining a coin-receiving opening in said wall, and a cam surface on said lever engageable by a coin placed in said slots to force said detent lug out of said recess to permit rotation of said cam disc.

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