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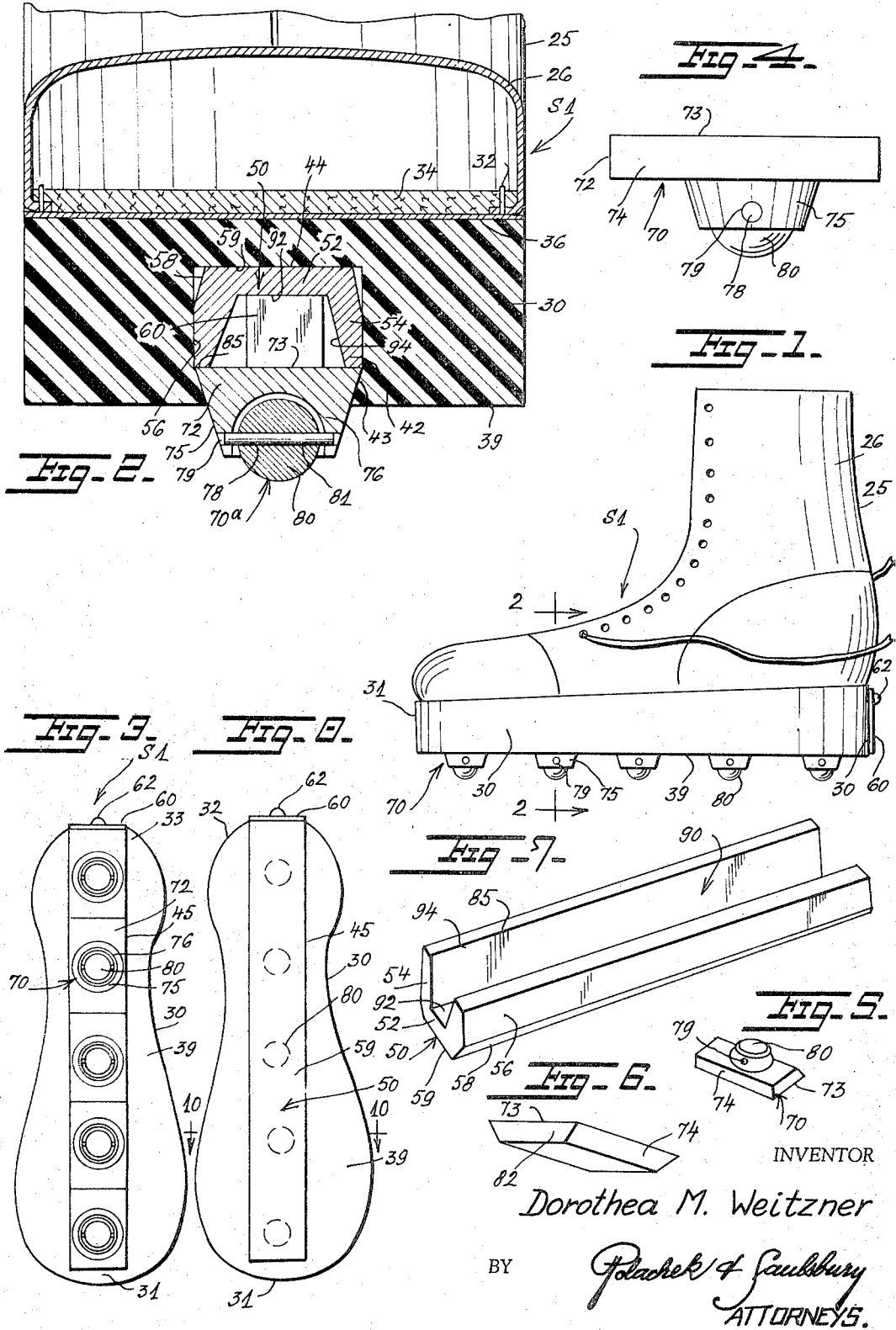
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RETRACTABLE ROLLER AND ICE SKATES FOR SHOES

Filed March 12, 1965

5 Sheets-Sheet 1



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RETRACTABLE ROLLER AND ICE SKATES FOR SHOES

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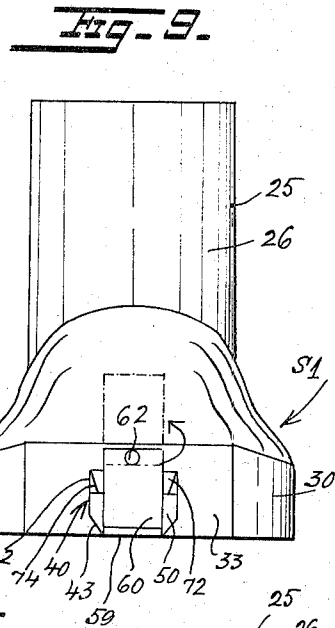
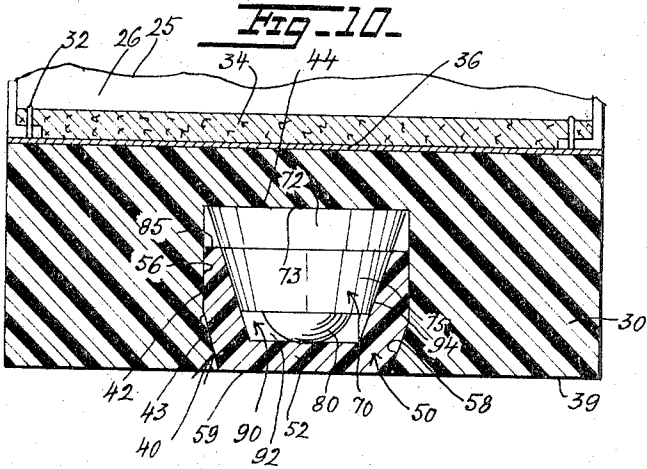


Fig. 11

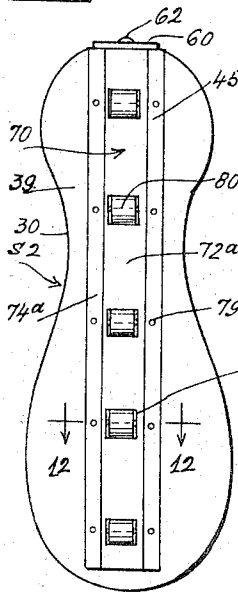


Fig. 15

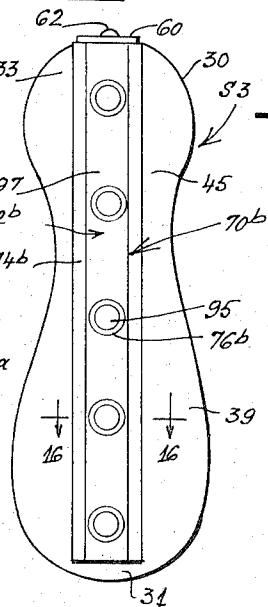


Fig. 18

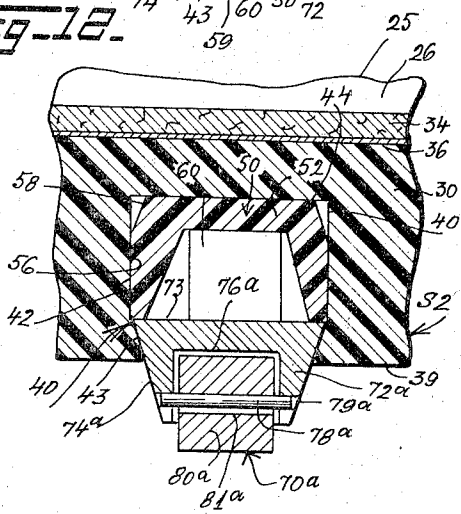


Fig. 13

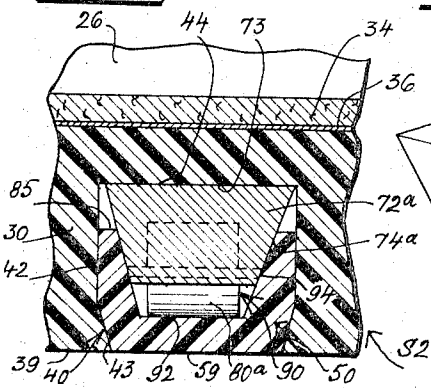
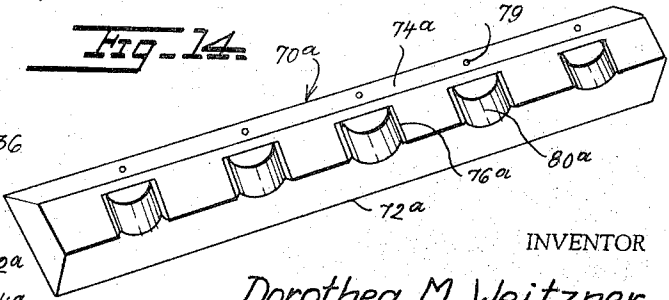


Fig. 14



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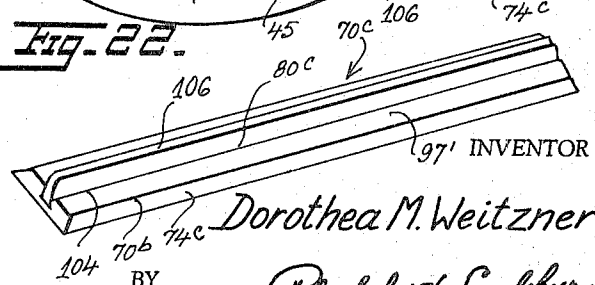
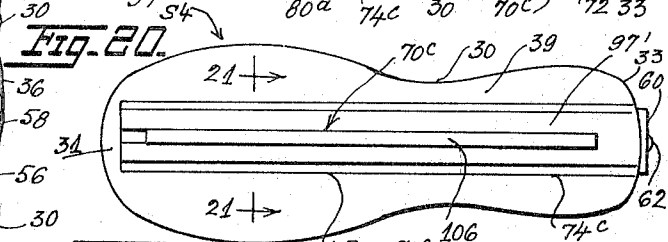
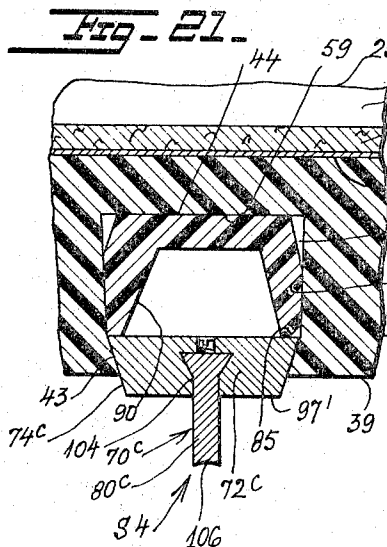
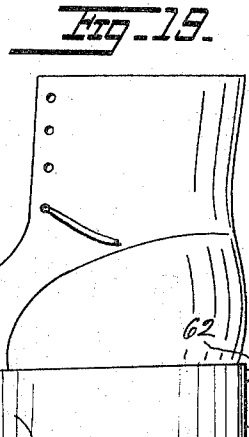
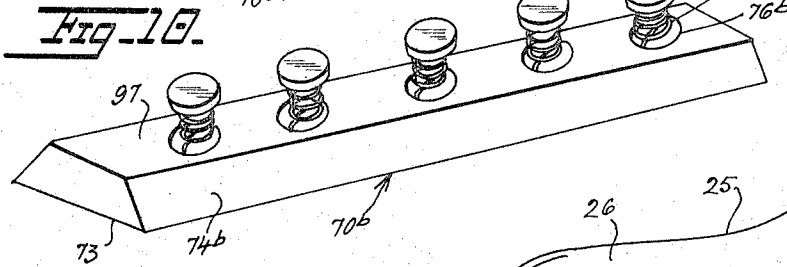
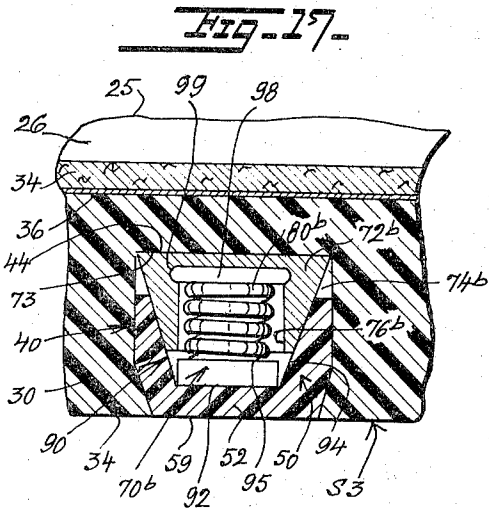
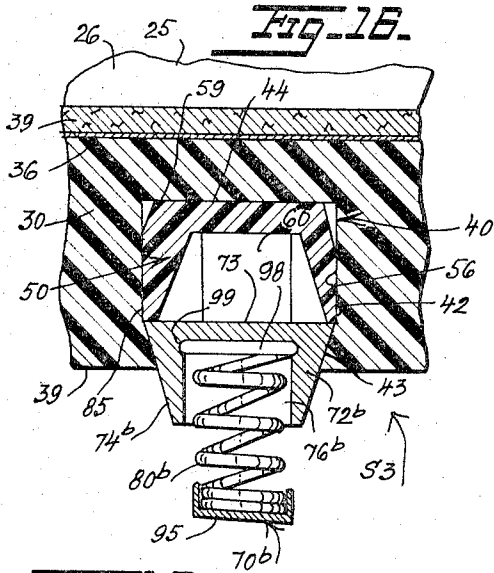
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RETRACTABLE ROLLER AND ICE SKATES FOR SHOES

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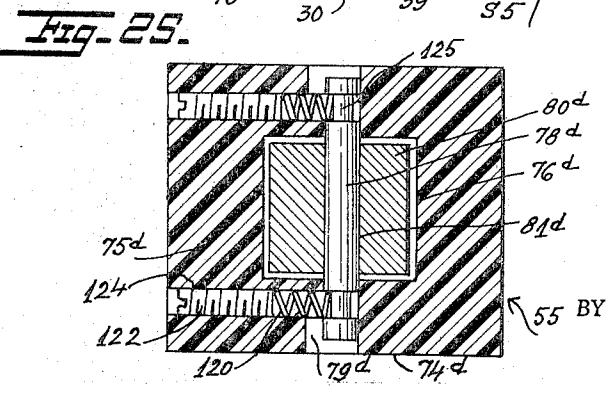
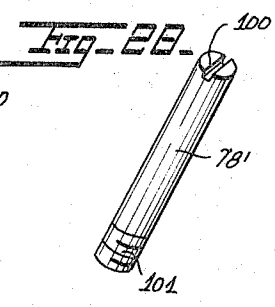
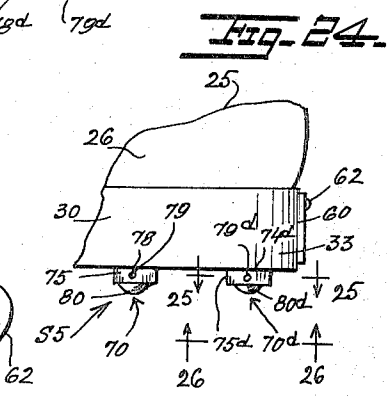
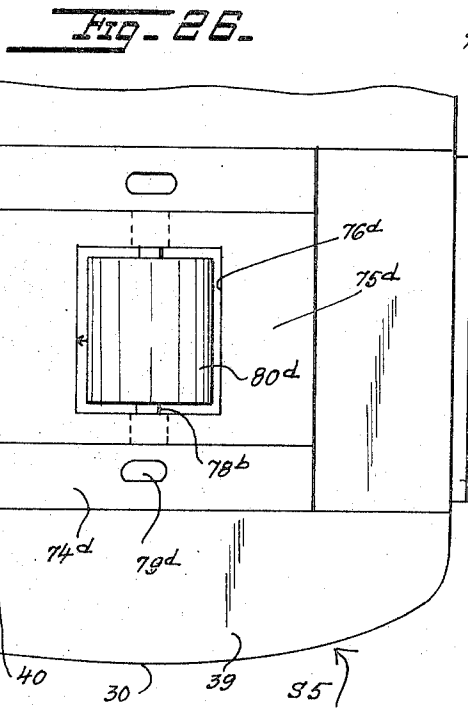
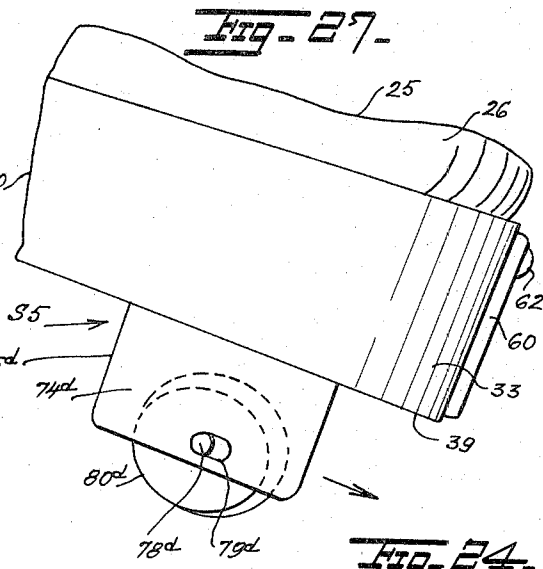
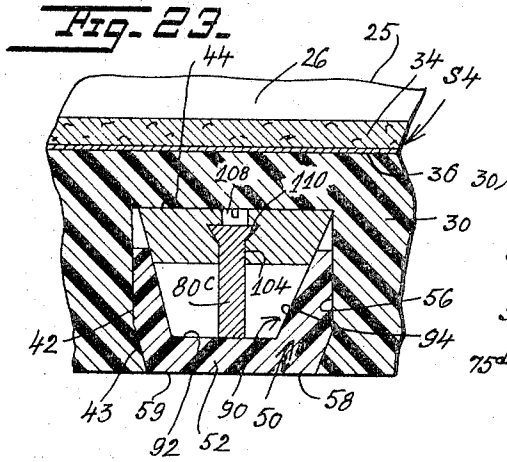
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RETRACTABLE ROLLER AND ICE SKATES FOR SHOES

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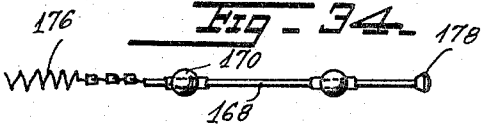
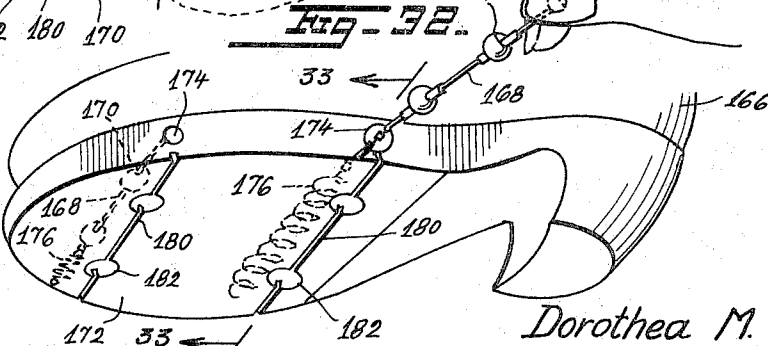
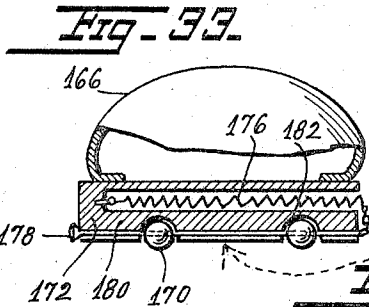
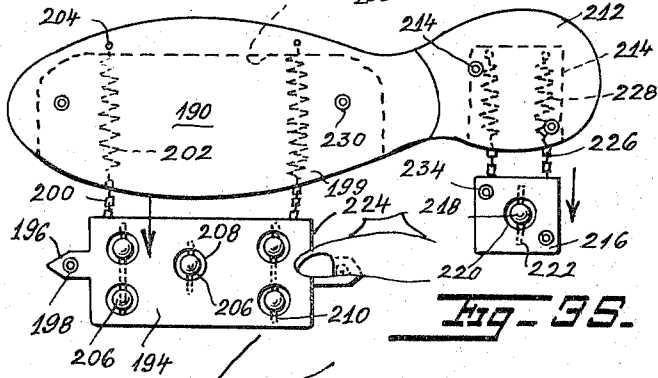
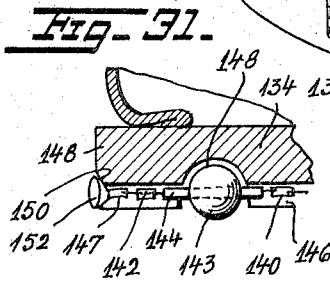
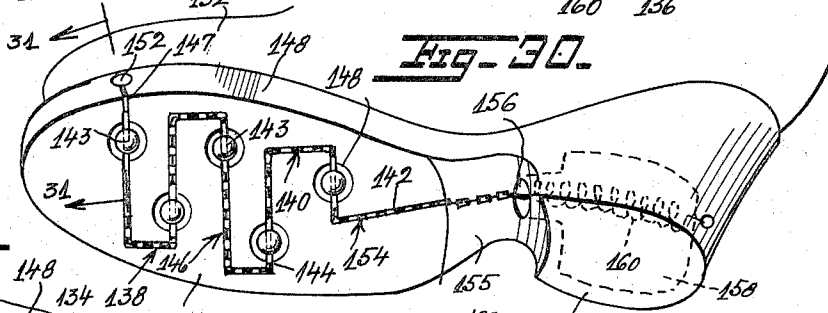
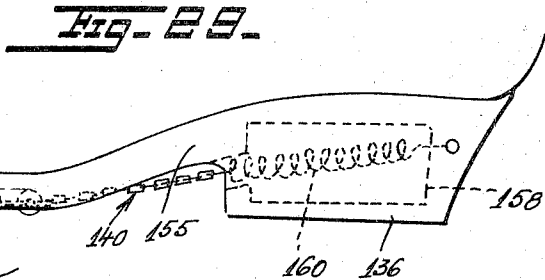
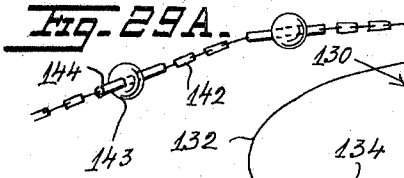
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RETRACTABLE ROLLER AND ICE SKATES FOR SHOES

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5 Sheets-Sheet 5



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3,351,353
**RETRACTABLE ROLLER AND ICE SKATES
FOR SHOES**

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9 Claims. (Cl. 280—7.13)

ABSTRACT OF THE DISCLOSURE

A skating shoe having a thick molded plastic sole formed with a channel or grooves to receive retractable plate members supporting rollers, blades or springs or to receive spring supporting rollers. The retractable rollers, blades or springs may be interchangeable.

According to the invention, there is provided a skating shoe having a thick plastic sole formed with a recess or channel or grooves into which can be fitted one or more plate members or strings supporting cylindrical or spherical rollers, ice skating blades or jump springs. The plate members can be retracted into the channel in the sole along with the rollers, blades or springs and the channel can then be closed by a closure plate so that the shoe can be worn as a walking shoe with a flat sole and heel. The shoe sole is arranged so that the closure plate can be inserted into the channel when the rollers, blades or springs are extended. The closure plate will then be stored out of the way, and in this position will serve to hold the plate members in place in the channel.

It is therefore one object of the invention to provide a skating shoe having a thick molded plastic sole formed with a channel or grooves to receive retractable plate members supporting rollers, blades or springs or to receive strings supporting rollers.

A further object is to provide a skating shoe as described with a closure plate at the bottom of the sole for closing the channel in the sole when the plate members are retracted into the sole.

Another object is to provide a skating shoe as described, wherein the closure plate can be stored in the channel to hold the plate members and the rollers, blades or springs in extended positions.

Another object is to provide a skating shoe with retractable, interchangeable rollers, blades or springs.

A further object is to provide a skating shoe with a retractable roller provided with means for braking rotation of the roller when the shoe is tilted upwardly.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIGURE 1 is a side elevational view on a reduced scale of a skating shoe with a roller skate embodying the invention attached.

FIG. 2 is an enlarged fragmentary cross sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a bottom plan view of the skate of FIG. 1.

FIG. 4 is an enlarged side view of an assembly of

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spherical roller, socket and supporting plate, such as used in the skate of FIGS. 1-3.

FIG. 5 is a reduced perspective view of the assembly of FIG. 4, shown in an inverted position.

5 FIG. 6 is a perspective view of a plate member which can be used in the skate of FIGS. 1-3, to take the plate of an assembly of roller, socket and plate support.

FIG. 7 is a reduced perspective view of a closure plate used in the skate of FIGS. 1-3.

10 FIG. 8 is a bottom plan view of the skate of FIG. 1, with rollers retracted and closure plate in place in the sole of the skating shoe.

FIG. 9 is an enlarged rear end elevational view of the skate of FIG. 8.

15 FIG. 10 is an enlarged fragmentary sectional view similar to FIG. 2, but taken on line 10—10 of FIG. 8.

FIG. 11 is a reduced bottom plan view of another skate having cylindrical rollers.

20 FIG. 12 is an enlarged fragmentary sectional view similar to a portion of FIG. 2, but taken on line 12—12 of FIG. 11.

FIG. 13 is an enlarged fragmentary sectional view similar to FIG. 10, with cylindrical roller shown in retracted position, and held in place by the closure plate.

25 FIG. 14 is a reduced perspective view of an assembly of plate support and a plurality of cylindrical rollers.

FIG. 15 is a reduced plan view of a skate provided with jump springs.

30 FIG. 16 is an enlarged sectional view similar to FIGS. 2 and 12, taken on line 16—16 of FIG. 15, and showing an extended jump spring.

FIG. 17 is an enlarged fragmentary sectional view similar to FIGS. 10 and 13, taken through the skate of FIG. 15 and showing a jump spring retracted.

35 FIG. 18 is a reduced perspective view of an assembly of jump springs such as provided in the skate of FIGS. 15-17, shown in inverted position.

FIG. 19 is a reduced side view of another skate having ice skating blades.

40 FIG. 20 is a bottom plan view of the skate of FIG. 19.

FIG. 21 is an enlarged fragmentary sectional view taken on line 21—21 of FIG. 20, showing an ice skating blade in extended position.

45 FIG. 22 is a perspective view of the ice skating blade such as provided in the skate of FIGS. 19-21, shown in an inverted position.

FIG. 23 is a sectional view similar to FIG. 21, showing the ice skating blade in retracted position.

50 FIG. 24 is a side elevational view similar to a part of FIG. 1, of another modified form of skate.

FIG. 25 is an enlarged sectional view taken on line 25—25 of FIG. 24.

55 FIG. 26 is an enlarged fragmentary bottom plan view as seen from the line 26—26 of FIG. 24.

FIG. 27 is an enlarged side elevational view of part of the skate of FIG. 24, showing the skate in a tilted, braking position.

60 FIG. 28 is an enlarged perspective view of a roller shaft.

FIG. 29 is a side elevational view of part of a skating shoe with a roller skate embodying yet another modified form of the invention attached thereto.

FIG. 29a is a perspective view of a fragment of the support for rollers of FIG. 29.

FIG. 30 is a bottom perspective view thereof.

FIG. 31 is an enlarged vertical sectional view taken on the plane of the line 31—31 of FIG. 30.

FIG. 32 is a bottom perspective view of a skating shoe with a roller skate embodying still another modified form of the invention attached thereto.

FIG. 33 is a sectional view taken on the plane of the line 33—33 of FIG. 32.

FIG. 34 is a side elevational view of a fragment of the support for the rollers of FIG. 32.

FIG. 35 is a bottom plan view of a skating shoe with the roller skate embodying yet a further modified form of the invention, the rollers and supports shown retracted from the shoe.

Referring first to FIGS. 1-3, 9 and 10, there is shown a skate S1 including a shoe 25 having an upper 26 and an outer sole 30. The sole 30 is a thick wedge-shaped plate thinnest at the toe end 31 and thickest at the heel end 33 of the shoe. The upper 26 is secured by stitching 32 to an inner sole 34 which is attached by a layer of cement 36 to the upper side of the sole 30; see FIGS. 2, 10. The sole has a flat bottom 39. Extending inwardly from bottom 39 is a central longitudinally extending channel 40 terminating just short of the closed toe end 31 of the sole. The channel is open at the heel end.

Channel 40 has straight, flat parallel sides 42, and a flat upper wall 44 which is horizontal and perpendicular to flat sides 42. Bottom marginal edges 43 of sides 42 are beveled or slanted inwardly toward each other so that the straight spaced edges 45 at the open bottom of the sole are spaced closer together than the vertical sides 42.

A closure plate 50 shown best in FIGS. 2, 7-10 is provided for closing the open bottom of the channel 40. The plate 50 is generally U-shaped in cross section with a flat base panel 52 and two opposed integral side walls 54. The side walls have flat, vertical, parallel, outer surfaces 56 which fit snugly between vertical sides 42 of channel 40. Narrow beveled outer surfaces 58 fit on the beveled margins 43 of sides 42; see FIG. 10. In this position of the closure plate, outer surface 59 of panel 52 is flush with the bottom surface 39 of sole 30.

A small plate or tab 60 is pivotally mounted on the rear end of the sole by a rivet 62. This tab may assume a depending position for substantially closing the open rear end of the channel 40 and holding plate 50 therein by preventing it from moving longitudinally out of the channel. The tab can be pivoted to an upward position clearing the channel as shown by dotted lines in FIG. 9.

A plurality of roller assemblies 70 shown in FIGS. 1-5 and 10 can be removably disposed in the channel 40. Each of these assemblies includes a rectangular plate or plate member 72 having a flat top surface 73 and opposing beveled sides 74. The beveled sides fit snugly on the beveled margins 43 of the channel sides 42; see FIG. 2. Extending outwardly and downwardly from each of the plate members 72 is a frustoconical socket 75 having a spherically curved recess 76 in its narrow bottom end. A cross pin or shaft 78 is fitted in spaced openings 79 near the bottom end of the socket 75. This shaft extends horizontally and transversely of the shoe sole 30. Spherical rollers 80 are engaged rotatably on the shafts. Diametral bores 81 in the rollers are slightly larger in diameter than the shafts so that the rollers turn freely on the shafts on horizontal axes transversely of the sole.

Five roller assemblies 70 are shown in FIGS. 1 and 3 installed in the skate S1. A lesser number of roller assemblies can be provided and the spaces left in the channel can be filled by spacer plate members 82 as shown in FIG. 6. These plate members are similar in size and shape to plate members 72 but carry no sockets or rollers. It is also possible to secure two more plate members 72 end-to-end together to form a tandem assembly of rollers.

The roller assemblies are inserted in the channel 40

by pushing them longitudinally through the open rear end of the channel when tab 60 is turned away. The closure plate 50 will be removed from its channel closing position of FIG. 10 and will be inverted and reinserted into the channel 40 above the roller assemblies. Panel 52 will then abut the underside of wall 44 in channel 40 as shown in FIG. 2. The flat free edges 85 of panel 50 will bear on the flat top surface 73 of each of the plate members 72. The closure plate is thus stored out of the way in the channel and at the same time it serves as a spacer and bearing member holding the roller assemblies 70 in stable positions in the shoe sole with the sockets 75 and rollers 80 extending outwardly and downwardly from the bottom of sole 30 as clearly shown in FIGS. 1-3. The skate thus serves as a roller skate.

When it is desired to retract the roller assemblies, the shoe is inverted and closure plate 50 is drawn out of the channel 40. The roller assemblies then fall inwardly until the plate members 72 abut the wall 44 of the channel 40. The closure plate is then turned over and reinserted in the open end of the channel to close the channel and hold the roller members snugly inside the shoe sole. The sockets 75 and the rollers 80 fit snugly in channel 90 extending longitudinally of plate 50. The channel 90 has a flat inner wall 92 on which bear the rollers 80, and oppositely inclined side walls 94 which snugly receive the beveled sides 74 of the plate members 72 and of sockets 75. The shoe 25 can then be used as a walking shoe with the roller assemblies fully retracted and concealed inside the shoe sole.

In FIGS. 11-13 is shown another skate S2 which is generally similar to skate S1 and corresponding parts are identically numbered. The skate S2 has roller assembly 70a including a plate member 72a having cylindrically curved recesses 76a. The recesses are spaced apart longitudinally of the plate member and are disposed axially transverse of the plate member. In the recesses are cylindrical rollers 80a rotatably mounted on shafts 78a frictionally engaged in holes 79a open at beveled sides 74a of the plate member. The shafts extend through axial bores in rollers 80a loosely fitted on the shafts so that the rollers rotate freely. The rollers extend laterally out of the plate member.

Skate S2 may be somewhat easier to use by inexperienced skaters than skate S1 since skate S2 has cylindrical rollers 80a which provide long bearing surfaces extending transversely of the roller assembly. The skate S1 by contrast has spherical rollers 80 which provide point bearing surfaces. This may be preferred by experienced skaters because the spherical rollers provide greater maneuverability in skating.

It is possible to force the shafts 78a axially out of holes 79a for removing rollers 80a, adding more rollers or for interchanging worn rollers with new rollers. Alternatively the cylindrical rollers can be replaced by spherical rollers 80 such as used in skate S1.

In order to facilitate removal and replacement of rollers, the shafts 78a can be replaced by shafts 78a' such as shown in FIG. 28. This type of shaft has a slot 100 at one end and a thread 101 at the other end. One of holes 79a at each of the recesses 76a will be threaded to receive and engage thread 101. By means of a screwdriver or other tool engaged in slot 100, shaft 78a' can quickly be inserted in and removed from plate member 72a.

In skate S2, closure plate 50 holds the roller assembly 70a in the extended position shown in FIGS. 11, 12 and in the retracted position shown in FIG. 13, in ways similar to those described in connection with skate S1. Rollers 80a fit snugly in a groove or channel 90 in plate 50 and beveled sides 74a of plate member 72a fit snugly at the inclined side walls 94 of channel 90 when the roller assembly is retracted into the sole 30 of the shoe 25.

In FIGS. 15-17 is shown skate S3 in which a spring assembly 70a is provided to replace the roller assemblies

70 and 70a in sole 30 of the shoe 25. The spring assembly includes a plate member 72b having cylindrical recesses 76b which are axially perpendicular to the plate member and extend inwardly from its narrow bottom side 97. Coil springs 80b have inner or upper ends 98 secured in grooves 99 at the tops of the recesses 76b. The springs extend axially out of the recesses as clearly shown in FIGS. 16 and 18. Caps 95 are fitted on outer ends of the springs. The recesses 76b are spaced apart longitudinally of the plate member 72b. Other parts of the skate S3 corresponding to those of skates S1 and S2 are identically numbered.

The spring assembly 70b can be inserted into channel 40 through its open rear end. Closure plate 50 will hold the spring assembly as shown in FIG. 16 with the springs extended. The skate can be used as a jump skate. The springs provide buoyancy to the skate. The skater can jump forwardly, rearwardly and to the side while using the skate, or can jump up and down.

To retract the spring assembly, closure plate 50 is removed and inverted. Then it is replaced by sliding it longitudinally of channel 40 while each spring in turn is manually pressed inwardly to the position of FIG. 17. Bevel sides 74b of the plate member 72b will bear on the inner inclined sides 94 in groove 90 of plate 50 while the caps 95 are seated in the groove bearing on wall 92, with the springs 80 in compressed condition.

In FIGS. 19-23 is shown skate S4 having a skating blade assembly 70c. This assembly includes a plate member 72c having beveled sides 74c. A dovetailed groove 104 is formed in the narrow bottom side 97' of the plate member. In this groove is removably fitted an ice skating blade 80c having a hollow ground outer edge 106. Set screws 108 inserted in the upper side of the plate member may engage the dovetailed edge 110 of the blade to hold it in the plate member 70c. The skating blade assembly may be held in extended position as shown in FIG. 21, by the closure plate 50, or may be held in fully retracted and protected position by the closure plate as shown in FIG. 23. Other parts corresponding to those of skates S1-S3 are identically numbered.

In FIGS. 24-27 are shown parts of skate S5 which is generally the same as skate S1 and corresponding parts are identically numbered. In skate S5, the roller assembly 70 located at the rear or heel end of the shoe has been replaced by roller assembly 70d. This roller assembly is constructed for braking rotation of roller 80d when the skate is tilted upwardly at the front as indicated in FIG. 27.

Roller assembly 70d has a plate member 72d from which extends socket 75d. In this socket is a cylindrical recess 76d extending axially transversely of the plate member. Rather elongated slots 79d are provided in opposite walls of the socket 75d which has tapered sides 74d. Shaft 78d has opposite ends slidably engaged in the slots 79d. Coil springs 120 are seated in bores 122 in the socket and their tension is adjusted by screws 124 engaged in the bores 122. The springs are axially horizontal and bear on the ends of the shaft biasing it to a rearward position at the rear ends of slots 79d. In this position of the shaft, roller 80d is centrally located in recess 76d and rotates freely on the shaft since axial bore 81d of the roller is slightly larger in diameter than that of the shaft so that the roller rotates freely on the shaft. The shaft has circumferential groove 125 at its ends in which seat the rear ends of the springs.

When the skater tilts the skate upwardly at the front as shown in FIG. 27, the weight of the skater forces the roller to a forward position in which springs 120 are compressed and the ends of the shaft move forwardly to the forward ends of slots 79d. Then a forward portion of the roller contacts a forward portion of the wall of recess 76d causing a frictional braking of rotation of the roller. When the skater restores the skate to the horizontal position of FIG. 24, the springs expand restoring the roller

to the centered position in recess 76d for free rotation therein. If desired a spherical roller can be substituted for the cylindrical roller with a similar braking effect being obtained when the skate is tilted upwardly at the front or toe end of the shoe.

The roller assembly 70d may be retracted fully into the channel 40 in the sole 30 and may be held therein by the closure plate 50 in the same manner as described in connection with skate S1.

It will be noted that the same shoe 25 with sole 30 is used for all forms of the invention heretofore described. The roller, blade and spring assemblies are all removable and interchangeable at will so that the same shoe can be used for a roller, ice or jump skate. When the roller, blade, or spring assemblies are retracted, the shoe can be used as a walking shoe with closure plate 50 closing the channel in the sole 30.

Referring now to the modified form of the invention shown in FIGS. 29 to 31, inclusive, herein a skating shoe 130 having an upper 132, sole 134 and heel 136 is shown. Skating equipment 138 is shown attached to the sole 134 and heel 136. This equipment constitutes a roller skate and comprises a flexible string 140 composed of spaced links 142 supporting a plurality of spherical rollers 143. The rollers are rotatably mounted on short shafts 144 connected at their ends to the links 142. The string 140 with its links is embedded in a circuitous groove 146 formed in the outer surface of the sole 134. At spaced intervals therealong, the groove is formed with countersunk semispherical recesses 148 dimensioned to receive the spherical rollers 143 with a portion thereof projecting outwardly of the surface of the sole. The shafts 144 span the recesses and seat on opposed portions of the edges thereof. The rollers are adapted to rotate in the recesses. One end of the string 140 is embedded in a short groove 147 extending laterally and intersecting the side peripheral edge 148 of the sole 134 where it is countersunk as indicated at 150 to seat interlockingly a button 152 on the adjacent end of the string. The other end of the string extends through a groove 154 centrally of the sole and leading rearwardly thereof over the instep 155 of the shoe and into and through a hole 156 formed in the heel 136. The heel is hollow forming a compartment 158 communicating with the hole 156 and attached to the said other end of the string inside the heel there is a compression spring 160, the other end of the spring being fixed to the rear end of the compartment 158. This arrangement of end fixtures keeps the string 140 taut with the rollers in rolling position in the recesses 148.

When the roller skate is not in use and it is desired to store the skate away, it is merely necessary to release the button 152 from its seat 150 and lift the string out of the groove 146 whereupon the spring 160 which is under tension will pull the string with the rollers through the hole 156 into the compartment 158 in the heel 136.

In the form of the invention shown in FIGS. 32 to 34, inclusive, the skating shoe 166 is equipped with roller skating equipment comprising a pair of flexible strings 168, 163 supporting spherical rollers 170 in spaced relation therealong, only two rollers being shown. The sole 172 of the shoe is formed with passages 174 extending from side to side thereof and dimensioned to receive the strings 168 with their rollers 170. One end of each string is suitably attached to one end of a compression spring 176 which is housed in the passage 174 and has its other end fixed to the inner wall end of the passage. The other end of the string is formed with a button 178. In using this skating equipment, the strings 168 are pulled outward of the passages 174 and are then seated in transverse grooves 180 formed in the outer surface of the sole 172, the rollers 170 being seated in semi-spherical recesses 182 formed in the grooves 180. The buttons 178 are interlocked with the edge walls of the passage terminals in the side edges of the sole.

When the skating equipment is not in use and it is de-

sired to store the equipment, it is merely necessary to release the buttons 178 from their interlocking seats whereupon the springs 176 will pull the strings with rollers into the passages 174.

In the modified form of the invention shown in FIG. 35, the sole 190 of the shoe is formed with a recess 192 between its inner and outer surface for the major area thereof in order to receive a rectangular flat metal plate 194 formed with end tube 196 having snap fastener elements 198 thereon through a side opening 199 therein. One end of a linked chain 200 is attached at each end of one long edge of the plate, the other end of the chain being fastened to one end of a compression spring 202, the other end of the spring being secured to a pin 204 at the inner edge wall of the recess 192. The plate 194 supports a plurality of spherical rollers 206 in holes 208 formed therein, the rollers being mounted on shafts 210 journaled in the edge wall of the holes.

The heel 212 of the shoe is also formed with a square shaped recess 214 between its inner and outer surfaces in order to receive a square shaped metal plate 216, carrying a spherical roller 128 centrally thereof in a hole 220 on a short shaft 222. The plate carries snap fastener elements 224 at its opposed corners. One end of a pair of linked chains 226 is fastened to the inner side of the plate, the other end of the chains being attached to one end of a pair of compression springs 228, the other end of the springs being fastened to the inner wall edge of the recess 214.

In use, the plates 194 and 216 are normally housed in their recesses 192 and 214. When it is desired to use the skating equipment, the plate 194 is manually withdrawn from the recesses 192 and pulled outwardly against the action of springs 202, swung over the surface of the sole 190 and secured in position on the sole by means of the snap fastener elements 198 and 230 on the tabs of the plate and sole 190, respectively.

The plate 216 is similarly withdrawn from the recess 214 in the heel and snapped in position on the outer surface of the heel by means of the snap fastener elements 232 and 224 on the heel and plate, respectively.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

What is claimed is:

1. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member being adapted to hold skating members extending laterally of the plate member, said closure plate having a groove formed therein for receiving said skating members, said plate members having opposing beveled edges, whereby positions of said closure plate and plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in the channel and with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with the skating members extending outwardly of the bottom of the sole of the shoe.

2. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said

sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member having recess means formed in one side thereof, said plate member having opposing beveled edges, and rollers rotatably engaged in said recess means and extending laterally outward of said one side of the plate member, said closure plate having a groove formed therein for receiving said rollers, whereby positions of said closure plate and said plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in said channel and with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with said rollers extending outwardly of the bottom of the sole of the shoe.

3. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member having recess means formed in one side thereof, said plate member having opposing beveled edges, and rollers rotatably engaged in said recess means and extending laterally outward of said one side of the plate member, said closure plate having a groove formed therein for receiving said rollers, whereby positions of said closure plate and said plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in said channel and with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with said rollers extending outwardly of the bottom of the sole of the shoe, said rollers being spherical in form.

4. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member having recess means formed in one side thereof, said plate member having opposing beveled edges, and rollers rotatably engaged in said recess means and extending laterally outward of said one side of the plate member, said closure plate having a groove formed therein for receiving said rollers, whereby positions of said closure plate and said plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in said channel and with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of

the channel, and with said rollers extending outwardly of the bottom of the sole of the shoe, said rollers being cylindrical in form.

5. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plurality of plate members in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, certain of said plate members having sockets extending laterally of one side thereof with recesses in said sockets, and rollers rotatably disposed in the sockets and extending outwardly thereof, said channel having an inner wall disposed parallel to the bottom of the sole, said closure plate having a groove formed therein for receiving said sockets and rollers, said plate members having opposing beveled edges, whereby positions of said closure plate and said plate members can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in the channel, and with the plate members held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with the rollers extending outwardly of the bottom of the sole of the shoe.

6. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plurality of plate members in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, certain of said plate members having sockets extending laterally of one side thereof with recesses in said sockets, and rollers rotatably disposed in the sockets and extending outwardly thereof, said channel having an inner wall disposed parallel to the bottom of the sole, said closure plate having a groove formed therein for receiving said sockets and rollers, said plate members having opposing beveled edges, whereby positions of said closure plate and said plate members can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in the channel, and with the plate members held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with the rollers extending outwardly of the bottom of the sole of the shoe, one of the plate members at the rear end of said channel having a laterally extending socket, another recess in the last named socket, another roller in said other recess rotatably supported by a shaft, said socket having opposing walls with elongated slots slidably engaging ends of said shaft, spring means in the other socket holding the shaft at rear ends of the slots so that the said other roller turns freely in said other recess, whereby when said shoe is turned upwardly at its toe end, said roller and shaft are forced forwardly so that a forward portion of said other roller contacts a forward portion of said other recess to brake rotation of said other roller.

7. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from

one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member having a recess means formed in one side thereof, said plate member having opposing beveled edges, coiled jump springs engaged in said recess means and extending axially laterally outward of the one side of said plate member, said closure plate having a groove formed therein for receiving said springs, whereby positions of said closure plate and said plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in said channel and with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with said springs extending outwardly of the bottom of the sole of the shoe.

8. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member having opposing beveled edges, an ice skating blade extending laterally of one side of said plate member, said closure plate having a groove formed therein for receiving said blade, whereby positions of said closure plate and said plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in said channel and with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with said blade extending outwardly of the bottom of the sole of the shoe.

9. A skate comprising a shoe having an upper, a thick sole, means attaching the sole and upper together, said sole having a longitudinally extending channel formed in its exposed bottom and extending substantially from one end to the other end thereof, said channel having opposing walls formed with beveled portions, a closure plate having beveled opposing wall portions seating on the beveled wall portions of the channel so that the plate closes said channel at the bottom of the sole, said channel having an inner wall parallel to the bottom of the sole, and a plate member in said channel between said closure plate and inner wall of the channel and holding the closure plate in place in the channel, said plate member having opposing beveled edges, an ice skating blade extending laterally of one side of said plate member, said closure plate having a groove formed therein for receiving said blade, whereby positions of said closure plate and said plate member can be interchanged in said channel with said closure plate inverted in the channel and abutting the inner wall in said channel with the plate member held in the channel by abutment of said beveled edges with the beveled opposing wall portions of the channel, and with said blade extending outwardly of the bottom of the sole of the shoe, said plate member having a dovetailed groove in said one side extending longitudinally thereof, said blade having a dovetailed edge removably engaged in the dove-

tailed groove, and screw means engaging the dovetailed edge and holding said blade in said dovetailed groove.

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