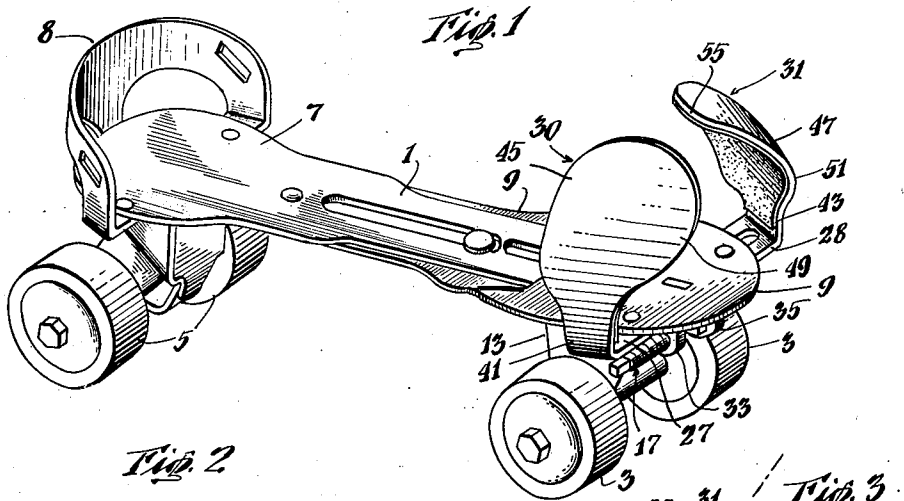
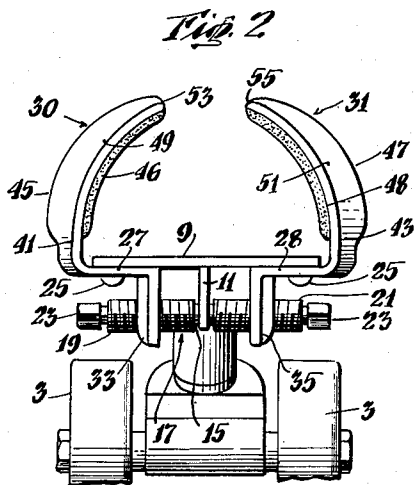
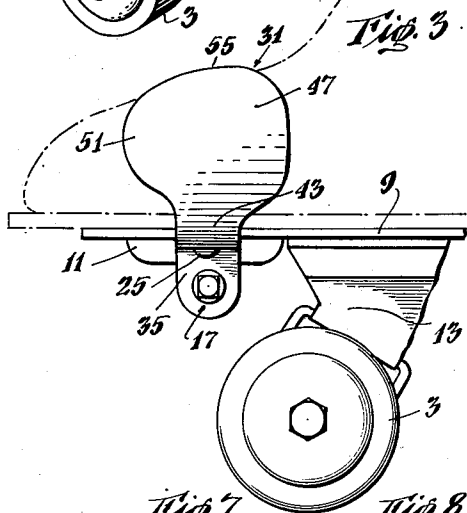
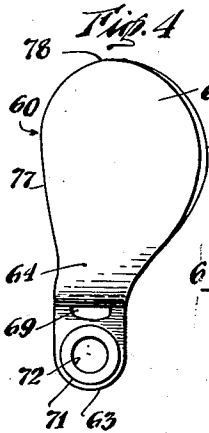
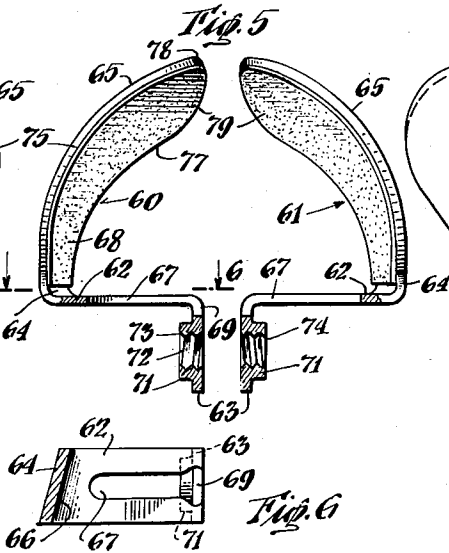
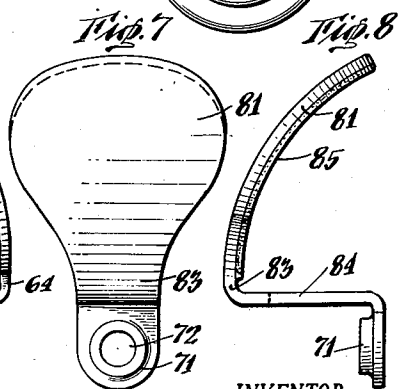


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SKATE CLAMP

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SKATE CLAMP

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This invention relates generally to skates and more especially to skates of the type adapted to be removably secured to the shoe of the wearer. The invention more particularly relates to clamping means adapted to cooperate with the structure of the skate for removably clamping the skate to the shoe of the wearer.

In both roller and ice skates as heretofore constructed to be removably attached to the shoe of the wearer various types of toe sockets and of clamping means are utilized to provide for secure attachment of the skate to the shoe. In some of those devices which utilize a more or less rigid socket into which the toe of the shoe is placed the socket is constructed with flexible lateral portions capable of limited movement with a view to gripping to the toe portion of the shoe. In others of these devices straps are utilized extending over the toe of the shoe or the part of the upper thereof between the toe and the instep of the foot within the shoe. Although in some cases the sockets are so formed that the toe of the shoe can protrude somewhat forwardly of the socket, in general insufficient provision is made to accommodate the skate to shoes of different widths and different lengths. The shoe, therefore, if forced into the socket to permit the heel of the shoe to come into proper position in engagement with the heel plate or other heel retaining device of the skate, becomes distorted and undue stress is placed upon the toes and upon the foot within the shoe with resulting discomfort and prevention of natural movement of the foot within the shoe and of the toes thereof to resist the stress placed thereon in the normal action of skating.

It also has been proposed to secure accommodation to size by providing clamping members at opposite sides of the skate movable toward and away from each other to bring clamping lugs into clamping engagement only with the side edges of the sole of the shoe. In such devices not only is the sole of the shoe unduly strained when tightly gripped as is necessary but all of the stress which results from the movements made in skating must be transferred to the foot through the sole of the shoe and then through the upper of the shoe, thus producing an undue strain on the shoe. While such clamping means as heretofore used provide for adjusting the clamping members at opposite sides of the skate to the width of the sole of the shoe no means has been provided which is effective to bring suitable clamping pressure upon the upper of the shoe or the toe portion thereof

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while preventing lateral movement of the sole of the shoe with respect to the skate and at the same time providing for variations in the length of the shoe as well as the width of the part thereof which extends about the toe portion of the foot adjacent the ball of the foot.

It is accordingly an object of the invention to provide in a skate constructed for removable attachment to the shoe of the wearer a clamping means which will obviate the necessity of tightly gripping the sole of the shoe and at the same time will firmly hold the skate upon the shoe of the wearer.

It is another object of the invention to provide a clamping means which will enable the foot within the shoe to respond to and to resist directly the stress brought thereon in the action of skating.

It is a further object of the invention to provide means for removably clamping the skate to the shoe of the wearer which will produce firm but gentle pressure upon the upper of the shoe and preferably upon the toe portion thereof in the region adjacent and forwardly of the ball of the foot.

It is an additional object of the invention to provide means for attaching a skate to the shoe of the wearer in which the foot directly resists the stress while at the same time cooperating with the sole of the shoe to prevent lateral movement of the skate on the shoe.

It is an important object of the invention to provide means for removably fastening a skate to a shoe in such a manner that the foot retains its natural position within the shoe and is capable of normal action with the toes free to move within the shoe without cramping.

It is a feature of the invention that the skate is provided with a pair of clamping members disposed at opposite sides of the skate which are supported by the skate for movement of these members generally parallel to the sole of the shoe and transversely of the length of the skate. As with some conventional devices these clamping members each may be formed with a portion extending horizontally so as to be suitable for use in skates of conventional form having a generally horizontal sole plate upon which the sole of the shoe rests and on which the clamp is carried in sliding relation thereto for the transverse movement of the clamping member. According to the invention these clamping members also each have a part which may take the form of a leg or shank which is carried by the horizontal sliding portion adjacent the outer end

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thereof and extends upwardly from the horizontal sliding portion in position so that this part or shank comes into engagement with the edge surface of the sole of the shoe when the clamping member is moved inwardly toward the center line of the skate. The vertical extent of this upwardly extending part or shank of the clamping member preferably is somewhat greater than the thickness of the sole of the shoe so that allowing for variations in the thickness of the sole of the shoe a full contact with the edge surface of the sole of the shoe by this shank will be secured. It will be understood, however, that any clamping effect which may be secured by such contact of this part of the clamping member with the edge surface of the sole of the shoe is not solely relied upon to secure clamping of the skate to the shoe but is effective to prevent lateral movement of the skate relative to the sole of the shoe.

In order securely to hold the skate upon the shoe and in proper relation to the foot of the wearer, in accordance with the invention each clamping member at either side of the skate is provided with a spoon portion extending upwardly from the aforementioned upwardly extending shank of the clamping member. The contour of this spoon portion generally conforms to that part of the upper of the shoe which extends about the toe portion of the foot adjacent and forwardly of the ball of the foot. This spoon portion is formed with a substantial extent of conforming surface so that the pressure which is brought upon the shoe and the foot therewithin as the clamp is moved transversely inwardly toward the center line of the skate is distributed over a substantial extent of the surface of the shoe, thereby providing ample surface against which the foot may press resisting the stress brought thereon in the action of skating. The spoon is of arcuate shape in the extent thereof proceeding upwardly from the shank of the clamping member, thus to secure the requisite conformation to the upper of the shoe. In the preferred embodiment the clamping member is formed of sheet material such as sheet metal so that each clamping member may be cut from the sheet as a blank and formed to the requisite shape.

Other objects and features of the invention will be understood from the description of the drawing to follow in which

Fig. 1 is a perspective view of one form of roller skate equipped with the clamping means of the invention,

Fig. 2 is a front elevation to enlarged scale of the skate and the clamping means of Fig. 1,

Fig. 3 is a fragmentary side elevation of the skate and clamping means of Fig. 2,

Figs. 4 and 5 show two elevations of a modification of a pair of the clamping members of the invention,

Fig. 6 shows a horizontal section on line 6—6 of Fig. 5,

Figs. 7 and 8 show two views in elevation of a further modification of the clamp of the invention.

In the embodiment of the invention illustrated in Figs. 1, 2 and 3 corresponding parts are represented by the same reference characters. Fig. 1 shows a roller skate of conventional construction having a main frame or base 1 supported by the two front rollers 3 and two rear rollers 5 and carrying a heel plate 7 adjacent the rear end of the frame above the rear rollers 5 and a sole plate 9 at the forward end of the skate and generally above the forward rollers 3 for bearing of the sole

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of the shoe thereon when the heel of the shoe is resting upon the heel plate 7 and abutting the rear heel guard 8. The skate is provided with a depending lug or rib 11, Figs. 2 and 3, located substantially on the lengthwise center line of the skate and forwardly of the bracket 13 in which forward rollers 3 are journaled and which supports the sole plate 9. The lug 11 is notched at its lower side to receive the groove 15 of a right and left hand screw member 17, this groove 15 being centrally positioned in the length of the screw member 17, the right and left hand threaded portions 19, 21 being positioned at either side thereof. The screw member 17 may be provided at its ends with square heads 23 to receive a key for rotating the screw member 17 as in conventional devices for clamping the skate to the sole of the shoe.

Rigidly fastened to the sole plate 9 as shown in Fig. 2 and extending downwardly therefrom are headed studs 25 adapted to engage the under surfaces of the clamping members about to be described in a manner similar to that of conventional clamping means for gripping the sole of the shoe. These studs 25 are so positioned between the lug 11 and the lateral edges of the sole plate 9 that the shanks thereof may become positioned within slots formed in horizontally extending portions 27, 28 of the clamping members 30, 31 to hold these members in contact with the under surface of the sole plate 9 and in sliding relation thereto. As in conventional sole clamping means also the clamping members 30, 31 of the invention may be provided with downwardly extending lugs 33, 35, Fig. 2, which are threaded respectively to receive the threaded portions 19 and 21 of the screw member 17. When the horizontal portions 27, 28 of the clamping members are held by the studs 25 in sliding relation to the sole plate 11, upon rotating the screw member 17 the clamping members may be moved concomitantly inwardly and outwardly transversely of the length of the skate, the studs 25 serving to maintain the groove 15 of the screw in engagement with the notch of the rib 11. The length of the threaded portions of the screw 17 is such and the length of the slots in which the shanks of the studs 25 are received is such that the clamping members 30, 31 may be moved from the position where the downwardly extending lugs 33, 35 are adjacent the rib 11 to a position where these lugs 33, 35 are adjacent the respective studs 25, the shanks of the studs then being adjacent the inner ends of the slots formed in the horizontally extending portions 27, 28 of the clamping members 30, 31.

As shown more particularly in Figs. 1 and 2 the clamping members of the invention are provided with upwardly extending legs or shanks 41, 43 which are of sufficient vertical extent to extend to a point adjacent the upper edge of the side edge surface of the sole of the ordinary shoe resting upon the sole plate 9. As may be seen in the perspective of Fig. 1 and the elevation of Fig. 2, these upwardly extending legs or shanks of the clamping members may be formed with flat inner surfaces which are positioned in vertical planes at an angle to the lengthwise center line of the skate and oppositely inclined in relation to this center line in order to conform generally to the forward taper of the sole of the shoe in the portion thereof adjacent to and immediately forward of the ball of the foot. It will be noted, also, that these shanks of the clamping members, while being adapted to bear against the side edge surface of the sole of the shoe, are not

formed as in conventional devices with a lip or hook intended to hook over upon and clinch the sole of the shoe and to prevent its movement upwardly away from the sole plate. These shanks, however, when the clamps 30, 31 are moved toward each other, are brought in contact with the respective side edge surfaces of the sole and prevent lateral movement of the skate relative to the sole of the shoe without squeezing or distorting the sole of the shoe.

As shown more particularly in Figs. 1 and 2 also the clamping members of the invention are provided with spoon portions 45, 47 which extend upwardly from the respective shank portions 41, 43 and are of arcuate form to conform substantially to the lateral surfaces of that portion of the shoe which overlies the toes of the foot adjacent to and forwardly of the ball of the foot. These spoon portions of arcuate form also extend to a substantial degree over upon and in contact with the upper surface of the toe portion of the shoe so as to bring the clamping pressure upon this upper surface as well as upon the lateral surfaces in order to prevent downward movement of the skate relative to the shoe. It will be apparent, therefore, that downward displacement of the skate with respect to the shoe is prevented by the spoon portions 45, 47 of the clamping members and the lateral displacement of the skate is prevented by the engagement of the shanks 41, 43 of the clamping members with the sole of the shoe.

It will be further noted in Figs. 1 and 2 that the surfaces of the spoon portions are so formed that they converge in the direction forwardly along the skate. The outline of these spoon portions is such in consideration of the arcuate form of the spoon surfaces and the convergence thereof that these spoon portions conform substantially to the toe portion of the shoe which extends about the portion of the foot which is adjacent and forwardly of the ball of the foot. When the foot is within the shoe this portion of the shoe is of generally tapering form and the outline of the spoon portions and the extent thereof lengthwise of the skate are such as to provide a substantial area of contact between the spoons and the toe portion of the shoe. The clamping pressure thereby becomes distributed over the surface of the toe portion of the shoe and upon the foot within the shoe.

In the particular embodiment illustrated in Figs. 1, 2 and 3 the outline of the edge surface of the spoon portions 45, 47 is convex forwardly so that wings or lobes 49, 51 are formed at the forward edges of the respective clamping members, the rearward edge of these spoon portions extending generally vertically and being connected to the forward edge by smooth curves along the top edges 53, 55. These forward and rearward edges of the spoon are connected by smooth curves also to the forward and rearward edges of the shanks 41, 43. In skates of some designs clamping members having such forward projecting lobes may be used in order to provide the desired lengthwise extent of the spoon surface and the requisite area thereof and to bring the clamping pressure upon the shoe in the desired part of the toe portion thereof. It will be understood that within the scope of the invention and depending upon the location of the center line of the screw member 17 along the length of the skate the configuration of the outline of the spoon relative to this center line may

be changed and adapted to suit the particular conditions of skates of different construction.

In Figs. 4 and 5 are shown elevational views of a pair of clamping members 60, 61 of preferred form for adaptation to conventional skates, particularly roller skates, Fig. 6 showing a sectional view taken on line 6-6 of Fig. 5. These clamping members are designed particularly for skates which are provided with a screw member such as the screw member 17 shown in Figs. 1, 2 and 3. The clamping members of Figs. 4, 5 and 6 are formed for attachment to and support on a skate by means of fixed headed studs similar to studs 25 in Fig. 2. As shown in Figs. 5 and 6 each clamping member of the embodiment being described is formed with a horizontally extending portion 62 of substantial length which at one end thereof is provided with a downwardly extending lug 63 and at the other end carries upstanding therefrom a shank portion 64 and a spoon portion 65 of arcuate form extending upwardly from the shank portion 64. The horizontally extending portion 62 has formed therein lengthwise thereof a slot 67 which is enlarged at the end thereof adjacent the lug 63 to provide the opening 69 through which the head of a stud, such as the stud 25 of Fig. 2, may pass as the shank of the stud passes into the slot 67. It will be noted that the opening 69 is formed partly in the lug 63 in order that the head of the stud 25 may pass therethrough to the position beneath and in engagement with the under surface of the horizontally extending portion 62 of the clamping member. This relation of the stud and its head to the portion 62 is the same as shown in Fig. 2 so that the stud may function to hold the clamping member with the upper surface of the portion 62 thereof against the under surface of the sole plate 9 of the skate.

The lug 63 in each clamping member is provided with a boss 71 having a hole 72 threaded to receive the corresponding thread of a screw member 17 such as that described in connection with Fig. 2. The clamping members 60, 61 shown in Fig. 5 are viewed in their relation when in positions at the respective sides of the skate and looking forward toward the front end of the skate. The threads 73, 74 formed respectively in the lugs 63 of members 60, 61 will be of opposite hand and so as to fit to the respective threads of the screw member 17.

As shown in Fig. 6 the upstanding shank portion 64 of each clamping member in this embodiment is positioned in a vertical plane which extends at an angle other than a right angle to the length of the slot 67 in order that the inner surface 66 of this shank may bear against the adjacent side edge surface of the sole of the shoe as above described. The vertical extent of the shank 64 up to a point 68 may be substantially straight and the spoon portion 65 at its lower end may be substantially tangent to this shank.

As shown in Fig. 4 which is an elevation of the left hand clamping member shown in Fig. 5 the rearward edge 75 of the spoon portion of the clamping member is formed with a convex curvature of substantial degree and defines a wing portion or lobe extending rearwardly with respect to the center line of the hole 72 in the lug 63 so that this lobe will extend rearwardly with respect to the screw member and the notch in the rib 11 when the clamping members are in position on the skate. Since in many conventional roller skates the axis of the screw member and the

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notch are positioned forwardly of the forward rollers of the skate, having regard to the desired position of the ball of the foot substantially above these forward rollers, the rearwardly extending wing or lobe of the clamping member serves not only to secure adequate surface for contact with the toe portion of the shoe but also serves to effect this contact more nearly adjacent but forwardly of the joint between the toes and the instep of the foot, that is, adjacent and forwardly of the ball of the foot.

In the embodiment of the invention shown in Figs. 4, 5 and 6 the forward edge 77 of the spoon portion of the clamping member is of convex form but of flatter curvature than the rearward edges 75, this forward edge extending somewhat forwardly with respect to the shank 64 and being continuous with the upper edge 78 which further merges with the rearward edge 75 of the rearwardly extending wing or lobe. It will be noted also in this embodiment that the forward and rear edges 77, 75 merge into and are continuous respectively with the forward and rear edges of the shank 64 of the clamping member and that the width of the shank is substantially the width of the horizontally extending portion 62 of the clamping member, as may be seen in Fig. 6. Such a form of the outline of the edges of the clamping member avoids all sharp edges and corners which may damage the shoe and is advantageous for producing the clamping members by stamping them with suitable dies from sheet metal. The blanks may be cut out of the sheet and formed in suitable forming dies which bend the blank to form the shank 64 in the angular relation to the length of the slot 67 as above mentioned and shown in Fig. 6 and, as well, to produce the arcuate form of the spoon 65. This forming operation may be performed so that the general horizontal extent of the surface of each spoon converges forwardly with respect to the center line of the skate and these surfaces in the two spoons of the pair of clamping members engaged by the screw member and supported at opposite sides of the skate converge with respect to each other. It has been found by thus forming the shank 64 and spoon portion 65 of the clamping members as shown in Figs. 4, 5 and 6 that the clamping members may be attached to skates, particularly roller skates, of conventional construction and of a considerable range of sizes of the skates so that these clamping members may be used on skates for children as well as those for adults.

In Figs. 7 and 8 is shown a modification of the clamping member of the invention in which the spoon 81 and shank portion 83 thereof are of symmetrical outline with respect to the center line of the threaded hole 72 formed in a boss 71 similar to that of Figs. 4, 5 and 6. The shank portion 83, however, as in the other embodiments extends generally vertically from the horizontal portion 84 so as to engage the side edge surface of the sole of the shoe and the spoon portion 81 is of arcuate form extending upwardly from the shank and provides a substantial extent of surface for engagement with a portion of the upper of the shoe which overlies the forward part of the foot. With some designs of skates and some types of shoes such a symmetrical form of the clamping member may be used and may have the advantage of lower cost of manufacture since it is not necessary to provide clamping members of right hand and left hand form as shown in Figs. 4, 5 and 6 although it remains requisite to provide

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a pair of clamping members by threading the holes 72 with the proper right hand or left hand threads to conform to the right hand and left hand threads of the screw member as above described.

In the embodiment of Figs. 1, 2 and 3 the spoon portions 45, 47 respectively are provided with linings 46, 48 which may be of felt, suitable leather or sponge rubber or other material of yielding or resilient character more readily to adapt the inner surface of the spoon to the contour of the surface of the toe portion of the shoe with which the spoon is in contact. Similarly as shown in Figs. 5 and 8 the inner surface of the spoons 65 and 81 may be lined with cushioning pads 79 and 85.

Within the scope of the invention the outline of the edge of the spoon, the extent of the surface thereof in contact with the shoe, the relation of this contacting surface to the supporting means and more particularly to the center line of the screw member and the angularity of both the shank and the spoon portions with respect to the lengthwise dimension of the skate may be varied to suit different constructions of skates and shoes. Other means of attachment of the clamping members to the skate which may require a different form of the horizontally extending parts 27, 28, 62, 84 may be utilized while providing the feature of the invention that the upwardly extending part of the shank is adapted to engage the sole of the shoe without gripping the sole to prevent the lateral movement of the skate relative to the shoe and the further feature that the spoon portions extend up and over the lateral and upper surfaces of the shoe, particularly the toe portion thereof, to secure the requisite clamping pressure on this toe portion and resistance to movement of the skate downwardly with respect to the sole of the shoe and to provide for the resistance by the foot to the stress brought thereon in the action of skating. All such variations are intended to be within the scope of the claims appended hereto.

I claim:

1. In a skate of the type adapted to be removably secured on the shoe of the wearer, the combination therewith of two separate clamping members disposed respectively at opposite sides of the skate and supported by said skate for movement of said members generally parallel to said sole of the shoe transversely of the length of the skate, said clamping members each having a part extending upwardly with respect to and adapted to engage the adjacent side edge of the sole of the shoe and having a spoon portion extending upwardly from said part over and about the toe portion of the shoe and leaving the forward part of said toe portion unobstructed to project forwardly of said clamping members, said spoon portion of said clamping members being shaped to conform when said part engages said side edge of the sole of the shoe substantially to the contour of the toe portion of the shoe which extends over and about the foot of the wearer adjacent and forwardly of the ball of the foot, said spoon portion having a substantial surface extent for contact with said toe portion for distributing the clamping pressure thereof upon said toe portion of the shoe, and means for concomitantly effecting movement of said oppositely disposed clamping members toward and away from each other transversely of the length of the skate to move said clamping members into

and out of clamping position with respect to the shoe.

2. In a skate adapted to be removably secured on the shoe of the wearer, the combination as defined in claim 1 which comprises cushioning means on the faces of said spoon portions which are adjacent the surface of said toe portion of the shoe for effecting conforming contact with said surface.

3. In a skate of the type adapted to be removably secured on the shoe of the wearer, the combination therewith of separate clamping members disposed respectively at opposite sides of the skate and separately supported by said skate for movement of said members generally parallel to the sole of the shoe transversely of the length of the skate, said clamping members each having a part extending upwardly with respect to the side edge of the sole of the shoe when adjacent thereto and having a spoon portion extending upwardly from said part over and about the toe portion of the shoe and leaving the forward part of said toe portion unobstructed to project forwardly between said clamping members, said spoon portion of said clamping member being disposed in relation to the skate and being shaped so as to conform generally to the contour of the toe portion of the shoe which extends over and about the foot of the wearer adjacent and forwardly of the ball of the foot and having a surface of substantial extent for contact with said toe portion for applying pressure upon said toe portion of the shoe to hold the forward part of the foot upon the skate, and means for concomitantly effecting movement of said oppositely disposed clamping members toward and away from each other transversely of the length of the skate to move said clamping members into and out of clamping position with respect to the shoe.

4. A clamping member for a skate of the type which is provided with a screw threaded with threads of opposite hand in the two portions of the length thereof for effecting simultaneous opposite movement of clamping members disposed at opposite sides of the skate, said clamping member being formed with a horizontally extending portion provided with a slot adapted to receive a stud carried by said skate to provide for rectilinear sliding movement of said clamping member transversely of the length of said skate, said clamping member having a lug depending from said horizontally extending portion adjacent the end of the slot which is disposed toward the center line of the skate and threaded for engagement with one of said threaded portions of said screw of said skate, said clamping member having a shank extending upwardly from said horizontally extending portion at the end thereof opposite to said lug and adapted to be disposed adjacent the side edge

of the sole of the shoe when the skate is in position upon the shoe, said clamping member having a spoon portion extending upwardly from said shank and shaped to provide a substantial surface of substantial width lengthwise of the skate and extending over and about and generally conforming to the contour of the toe portion of the shoe which extends from the sole over and about the foot of the wearer adjacent and forwardly of the ball of the foot when said shank of said clamping member is adjacent the side edge of the sole of the shoe, said spoon portion being disposed with respect to said horizontally extending portion and to said lug so as to leave the forward part of said toe portion of the shoe unobstructed to project forwardly of the clamping member when attached to the skate.

5. A pair of clamping members as defined in claim 4 in which said lugs of said pair are threaded with threads of opposite hand.

6. In a skate of the type adapted to be removably secured on the shoe of the wearer the combination as defined in claim 1 in which said skate carries headed studs rigidly supported thereby and projecting from the underside thereof, said clamping members each being formed with a portion extending horizontally beneath the skate and provided with a slot extending therein transversely of the length of the skate, the shanks of said studs respectively passing through said slots and the heads of said studs respectively engaging the under surfaces of said horizontally extending portions of said clamping members to hold said clamping members in horizontally sliding relation to said skate, said clamping members being provided with lugs respectively depending from said horizontally extending portions thereof adjacent the ends thereof disposed toward the center line of the skate, said slots at said ends thereof being continued in said lugs and being enlarged at least in said lugs to provide for passage therethrough of said heads of said studs as said shanks of said studs enter said slots to bring said heads into engagement with said under surfaces of said horizontally extending portions of said clamping members upon said horizontal sliding movement of said clamping members.

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