(No Model.) 2 Sheets—Sheet 1.

E. G. STAYNER.

SKATE.

No. 503,624. Patented Aug. 22, 1893.

Fig. 1.

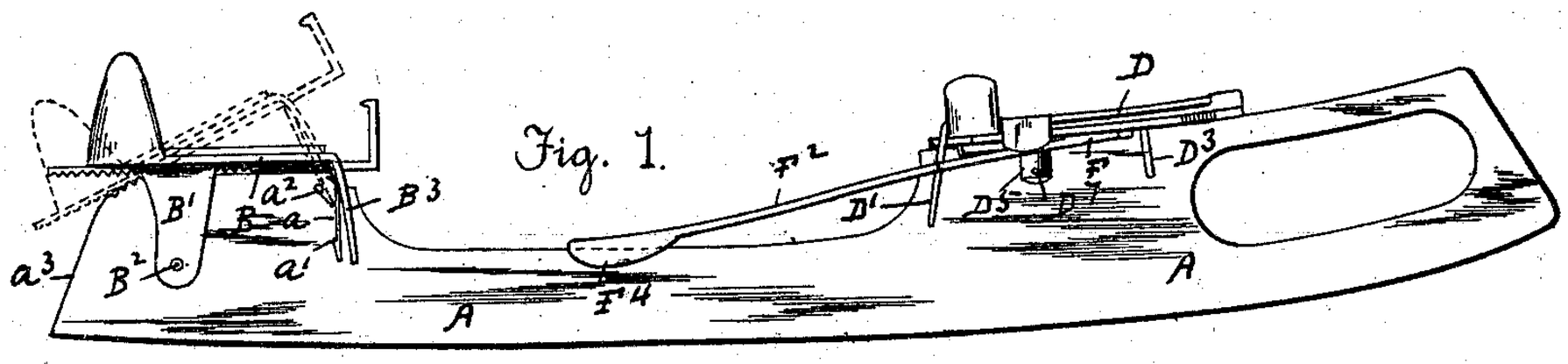


Fig. 2.

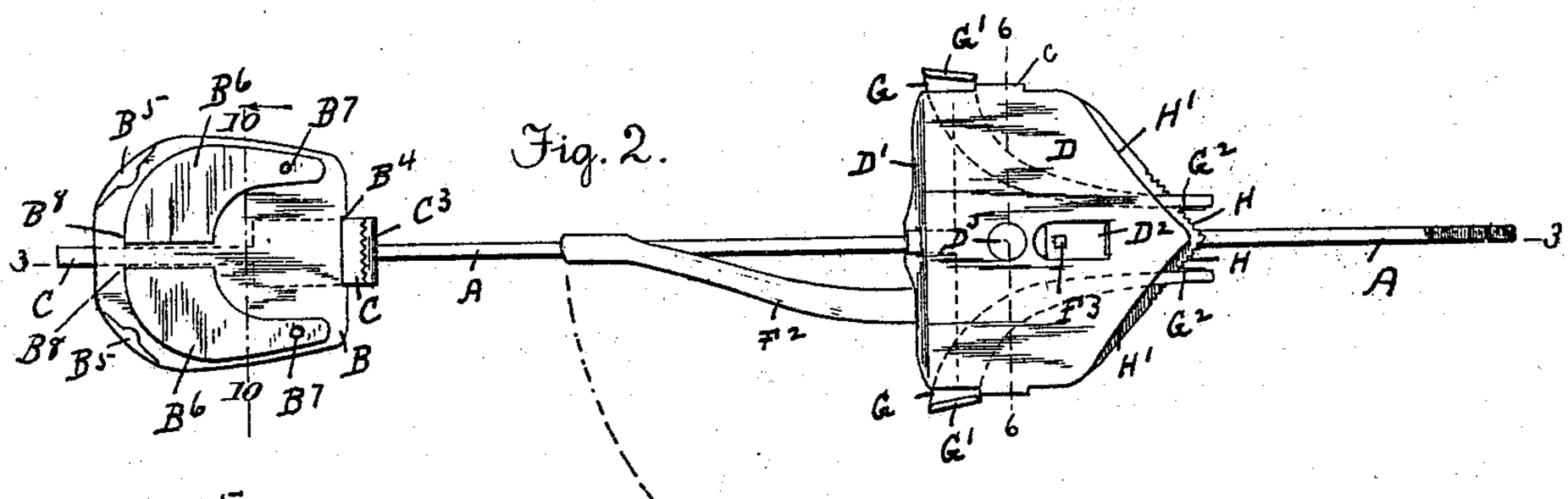


Fig. 3.

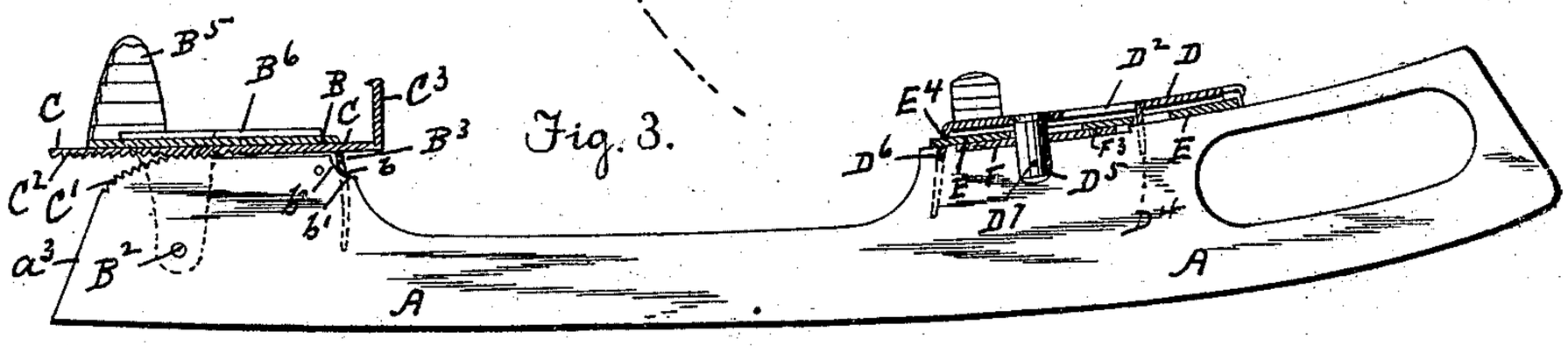


Fig 6.

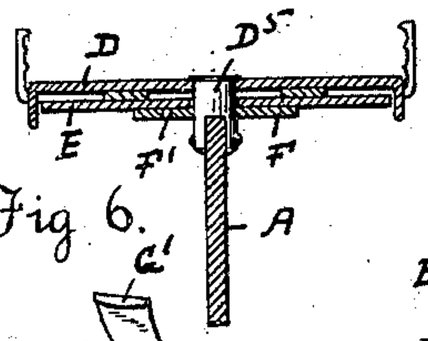


Fig 7.

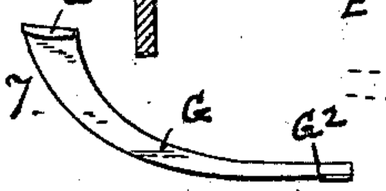


Fig 8.

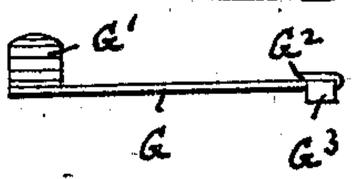


Fig. 4.

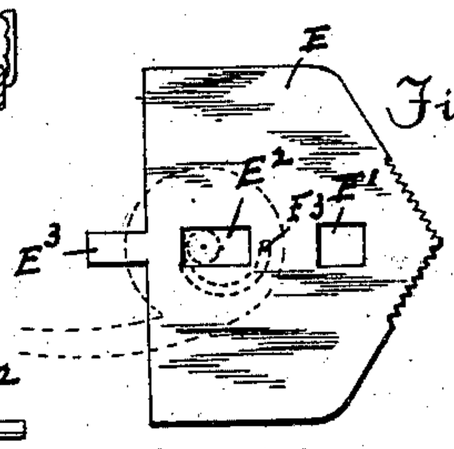


Fig. 9.

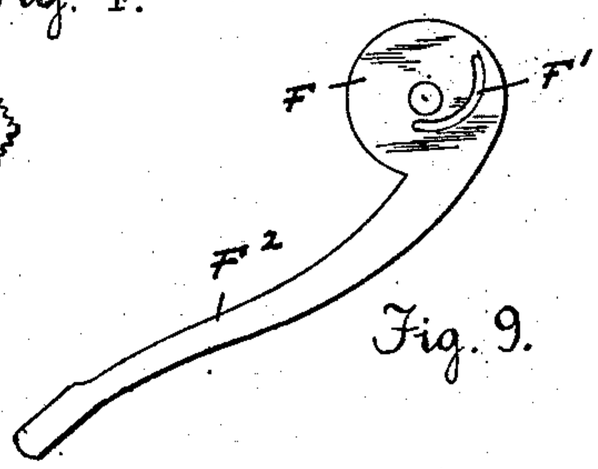
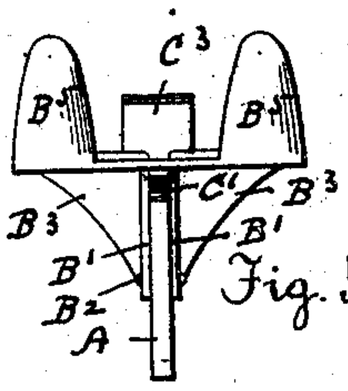


Fig. 5.



Witnesses.
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H. W. Fowler.

Inventor.
Edward Guy Stayner.
By his Attorney.
Rufus B. Fowler

(No Model.)

2 Sheets—Sheet 2.

E. G. STAYNER.

SKATE.

No. 503,624. Patented Aug. 22, 1893.

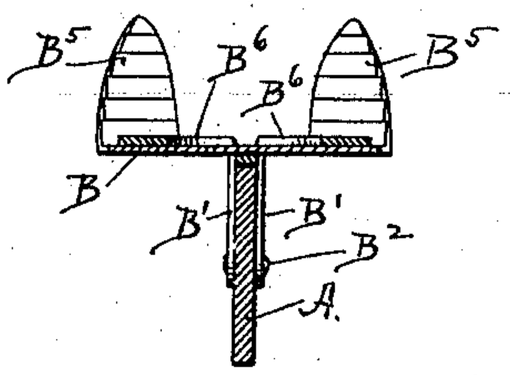

Fig. 10.

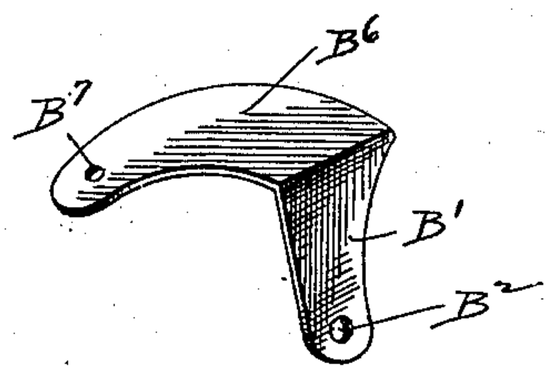

Fig. 11.

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UNITED STATES PATENT OFFICE.

EDWARD GUY STAYNER, OF HALIFAX, CANADA.

SKATE.

SPECIFICATION forming part of Letters Patent No. 503,624, dated August 22, 1893.

Application filed February 5, 1892. Serial No. 420,475. (No model.)

To all whom it may concern:

Be it known that I, EDWARD GUY STAYNER, a citizen of the Dominion of Canada, residing at Halifax, in the county of Halifax and Province of Nova Scotia, Canada, have invented a new and useful Improvement in Skates, of which the following is a specification, accompanied by drawings, forming a part of the same and representing a skate embodying my invention.

Referring to the drawings: Figure 1 is a side view of the skate. Fig. 2 is a top view of the same. Fig. 3 is a side view of the skate with the heel and toe plates shown in sectional view on line 3, 3, Fig. 2. Fig. 4 is a detached view of the cam actuated sliding plate G; the position of the actuating cam being indicated by broken lines. Fig. 5 is a rear view of the heel plate. Fig. 6 is a sectional view on line 6, 6, Fig. 2. Fig. 7 is a top view of one of the toe clamps. Fig. 8 is a side view of the same. Fig. 9 is a detached view of the cam and lever by which the sliding plate G is actuated. Fig. 10 represents a transverse, sectional view of the blade and heel plate, on line 10, 10, Fig. 2 and Fig. 11 represents in perspective view, one of the angle plates by which the heel plate is pivoted to the blade.

Similar letters refer to similar parts in the different views.

My invention relates to certain details of construction designed to increase the strength and durability of the skate, and also to simplify and reduce its cost of manufacture; and my invention further relates to the construction and arrangement of the operating parts, having for its object to secure simplicity in construction and increase the range of adjustability of the clamping mechanism, as hereinafter described.

Referring to the accompanying drawings, A denotes the blade; B the heel plate provided with downwardly extending lugs B′, pivoted at B^2 to the blade A, by which a rocking motion is permitted the heel plate, allowing it to be raised into the position indicated by broken lines in Fig. 1. The forward edge of the heel plate B is provided with a downwardly extending flange B^3 slotted vertically to inclose the blade A and hold the forward edge of the heel plate B from lateral motion. The flange B^3 is also provided with a horizontal mortise B^4 to receive the toothed clamping bar C. At the rear edge of the heel plate B are the upwardly projecting lugs B^5, B^5, having their inner surfaces preferably serrated or provided with projecting spur points to engage the edge of the heel. The rear upper corner of the blade A is provided with teeth C′ concentric with the pivot B^2 and engaging the teeth C^2 on the clamping bar C. The clamping bar C slides between the lugs B′ and is provided with teeth C^2 forming a narrow rack engaging the teeth C′ upon the blade A. The forward and wider end of the clamping bar C, which passes through the mortise B^4, is turned upwardly at C^3 with teeth C^4 upon its inner surface to engage the front edge of the heel. Attached to the flange B^3 is an elastic blade *a* provided with a shoulder *a*′, which strikes the pin a^2 held in the blade A as the heel plate is raised into the position indicated by broken lines in Fig. 1, in order to limit the movement of the heel plate and prevent the teeth C^2 from being carried out of engagement with the teeth C′. By pressing the elastic blade *a* out of engagement with the pin a^2 the heel plate can be rocked on the pivot B^2 until the clamping bar C is brought parallel with the oblique end a^3 of the blade A, thereby disengaging the clamping bar from the teeth C′ and permitting it to be withdrawn entirely or adjusted with reference to the lugs B^5 so as to receive a larger or smaller heel.

In applying the skate to the foot; the heel plate is raised into the position shown by broken lines in Fig. 1, the heel placed in position with its rear edge resting against the lugs B^5. The heel plate is then pressed downward into the horizontal position shown in Fig. 1 until the edge *b* of the flange B^3 strikes the edge of the blade A at *b*′. During this downward movement of the heel plate the toothed clamping bar C is rocked upon the concentric teeth C′, by which the bar is engaged, while the angular movement of the lugs B′ serves to carry the heel plate forward relatively to the clamping bar C causing it to slide upon the bar C and decreasing the distance between the lugs B^5 and the upturned portion C^3 of the clamping bar and bringing the teeth C^4 firmly against the front edge of the heel.

The lugs B′ are formed of plates bent at

right angles and having their horizontal portion B^6 resting upon the upper surface of the heel plate B, to which they are attached by rivets B^7; the vertical portion forming the lugs B′ extending through narrow mortises B^8 in the heel plate B, upon each side of the blade A.

The heel rests directly upon the horizontal portions B^6, relieving the attaching rivets B^7 of all strain in carrying the heel plate B down by the pressure of the heel in the operation of clamping the skate upon the foot.

D denotes the toe plate, having its rear edge turned downward, forming a flange D′, which is slotted to receive the blade A. A portion of the body of the toe plate is turned downward forming the hole D^2 and the downwardly turned portion is bifurcated to inclose the blade, forming lugs D^3 and D^4. The flange D′ and lugs D^3, D^4 support the toe plate D a short distance above the blade A, so as to allow a space between the upper edge of the blade A and the under side of the toe plate D, to receive the toe clamping mechanism, as hereinafter described. At the central section of the toe plate D is a post D^5, having a slightly enlarged head at its upper end, which is countersunk in the upper surface of the toe plate and having its lower end bifurcated to inclose the blade A, to which it is riveted, thereby attaching the toe plate D to the blade A. The blade A is notched at D^6 to receive the flange D′ causing the toe plate D to be held from movement along the blade A; it being held from lateral movement at the front and rear by the flange D′ and lugs D^3, D^4. The toe plate D is therefore rigidly held in position by means of a single pin or rivet D^7 in the post D^5, and, as the strain upon the post D^5 is only downward and in the direction of the pressure of the foot, and as the toe plate is securely locked against any lateral movement by the notch D^6 and by the flange D′ and lugs D^3 and D^4, it will be obvious that the rivet D^7, by which the post is held in position is entirely relieved from strain when the skate is in use.

In the space intervening between the upper edge of the blade and the lower surface of the toe plate D is placed a sliding plate E, shown in detached view in Fig. 4. The sliding plate E is provided with a rectangular opening E′, inclosing the lugs D^3, D^4 and an opening E^2 inclosing the post D^5, said openings being long enough to permit a limited sliding motion of the plate E; and at the rear of the sliding plate is a tail piece E^3, extending through a mortise E^4 in the flange D′. The sliding plate E is thus held from lateral movement but is permitted a limited movement forward and back along the blade A. Recessed in the upper edge of the blade A is a circular plate F, rotating around the post D^5; having an elastic lever handle F^2 and provided with the eccentric cam slot F′ engaging a pin F^3 held in, and projecting from, the under side of the sliding plate E.

Interposed between the toe plate D and the sliding plate E are curved clamping bars G indicated by broken lines in Fig. 2 one being shown in detached views in Figs. 7 and 8. Upon the sides of the toe plate D, are formed lugs *c*, *c*, which are turned downwardly over the edge of the sliding plate E, leaving open spaces between the rear edges of the lugs *c* and the edge of the flange D′, through which the rear ends of the clamping bars G extend and are turned upwardly at G′, and preferably provided with serrated inner surfaces adapted to bear against the edge of the boot sole.

The forward edges of the toe plate D and sliding plate E are oblique, preferably forming an angle of about forty-five degrees with the blade A, the edge of the toe plate being smooth and the edge of the sliding plate E being provided with a series of teeth H, H.

The forward ends of the clamping bars G are provided with shoulders G^2 upon their upper surfaces, arranged to bear against the oblique edges H′, H′ of the toe plate D, and projecting downwardly from the under side of the clamping bars G are lugs G^3, arranged to be engaged by the teeth H, H.

When the cam plate F is rotated upon the post D^5, by the angular movement of the handle F^2 in the direction of the arrow 1, Fig. 2, the sliding plate E will be carried backward bringing the teeth H, H, immediately beneath the oblique edges H′, H′, so that the teeth will clear the lugs G^3, as the shoulders G^2 rest against the oblique edges H′, H′ of the toe plate D, thereby allowing the forward ends of the clamping bars G to be moved along the edges H′, H′, so as to bring the upturned ends G′ against the edges of the boot sole, and rendering each of the clamping bars G independently adjustable.

By bringing the handle F^2 into the position shown in Figs. 1 and 2 the sliding plate E is moved forward, causing the teeth H to engage the lugs G^3, drawing the clamping bars G forward, and bringing the ends G′ firmly against the edges of the boot sole. The free end of the lever handle F^2 is provided with two downwardly projecting lugs F^4 extending below the plane of the upper edge of the blade A and the lever handle is made elastic in order to allow its free end to be raised and carried over the edge of the blade so that it will be locked in position by the lugs F^4, which inclose the blade A between them.

By the above described construction, all those portions of the skate, which are mounted upon the blade A, constituting the toe and heel supports can be cut from sheet steel and bent into the shapes as shown, and no attachment to the blade A is required, except by the rivet D^7 and the pivotal pin B^2, and both these attachments are entirely relieved from strain when the skate is in use, the toe supporting plate D being locked in position by means of its engagement with the blade A as described. I thereby avoid all riveted or other joints subject to strain and liability of becoming loose.

The toe clamping mechanism is actuated simultaneously by the angular movement of the lever handle F^2.

The clamping bars G are not only independently adjustable, but they permit of a wide range of adjustability, which allows the blade A to be brought in any desired position with reference to the foot without regard to the curvature or peculiar shape of the boot sole.

Although the blade A is used as a lever to clamp the heel plate upon the foot, the strain brought upon the blade is edgewise, or in the plane of its greatest resistance. When the heel plate is brought down into the horizontal position as shown in Figs. 1 and 3 with the edge *b* of the flange B^3 resting upon the step *b'*, the heel is held from any backward movement by the shoulder b^2 and any forward strain against the clamp C^3 will be received by the teeth C', thereby relieving the pivot B^2 from strain. It will thus be seen that both heel and toe plates are securely locked upon the blade independently of the pivotal pin B^2 and the rivet D^7.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a skate, the combination with the blade provided with teeth arranged in an arc of a circle concentric with the pivot of the heel plate, a heel plate hinged to said blade, a sliding clamp bar sliding in ways in said heel plate and provided with teeth engaging the teeth on said blade, a fixed stop on said blade and a latch carried by said heel plate and arranged to engage said stop, whereby the angular movement of the heel plate is limited and the teeth of said clamping bar held in engagement with the teeth on said blade, substantially as described.

2. In a skate, the combination with the blade, of a heel plate hinged to said plate, a clamping mechanism held in said heel plate and arranged to be operated by the angular motion of said heel plate, a fixed stop on said blade and a latch carried by said heel plate and arranged to engage said stop and limit the angular motion of said heel plate, substantially as described.

3. In a skate, the combination of the blade A, heel plate B, pivoted to said blade, elastic blade *a*, attached to said heel plate and provided with a shoulder *a'*, and a stop pin a^2, held in said blade A, by which the angular motion of the heel plate is limited, substantially as described.

4. In a skate, the combination with a blade A, of a heel plate B, provided with slots B^8, angle plates B^6 resting upon the upper surface of said heel plate, and extending through said slots forming lugs B', B', said lugs being pivoted to said blade A, substantially as described.

5. In a skate, the combination with the blade, of the toe plate D attached to, and slightly raised above, said blade, a sliding plate E sliding in ways between said blade and said toe plate, curved clamping bars G, G, sliding in ways between said toe plate D and said sliding plate E, said clamping bars being adapted at their rear ends G' to engage the sole of a boot and having at their forward ends shoulders G^2 arranged to be brought in contact with the forward edge of the toe plate, as the clamping bars are moved back, and with lugs G^3 arranged to be engaged with the forward edge of said sliding plate and drawn against the boot sole, as the sliding plate is moved forward, and connected mechanism by which said sliding plate E is actuated, substantially as described.

6. In a skate, the combination with the blade, of a toe plate D attached to said blade by a central post D^2, a sliding plate E sliding in ways in said toe plate, curved clamping bars G provided with shoulders G^2 engaging the forward edge of said toe plate, and lugs G^3 engaging the forward edge of said sliding plate, a cam plate pivoted on the post D^2 and operatively connected with said sliding plate, substantially as described.

7. In a skate the combination with the blade and a toe plate attached to said blade, of curved clamping bars G provided with lugs G^3 arranged to be engaged by the forward end of a sliding plate, and a sliding plate provided with a V-shaped forward end, having a series of notches engaged by said lugs, whereby each of said clamping bars is drawn forward and whereby each of said clamping bars can be independently adjusted, substantially as described.

8. In a skate, the combination with the blade, of a toe plate D provided with a V-shaped forward end, a sliding plate, sliding in ways in said toe plate, curved clamping bars arranged to be engaged by said sliding plate and drawn against the sole of the boot, shoulders G^2 projecting from said bars and adapted to slide along the V-shaped edge of said toe plate, substantially as described.

Dated this 22d day of January, 1892.

EDWARD GUY STAYNER.

Witnesses:

L. G. POWER,

JOHN MENGER.