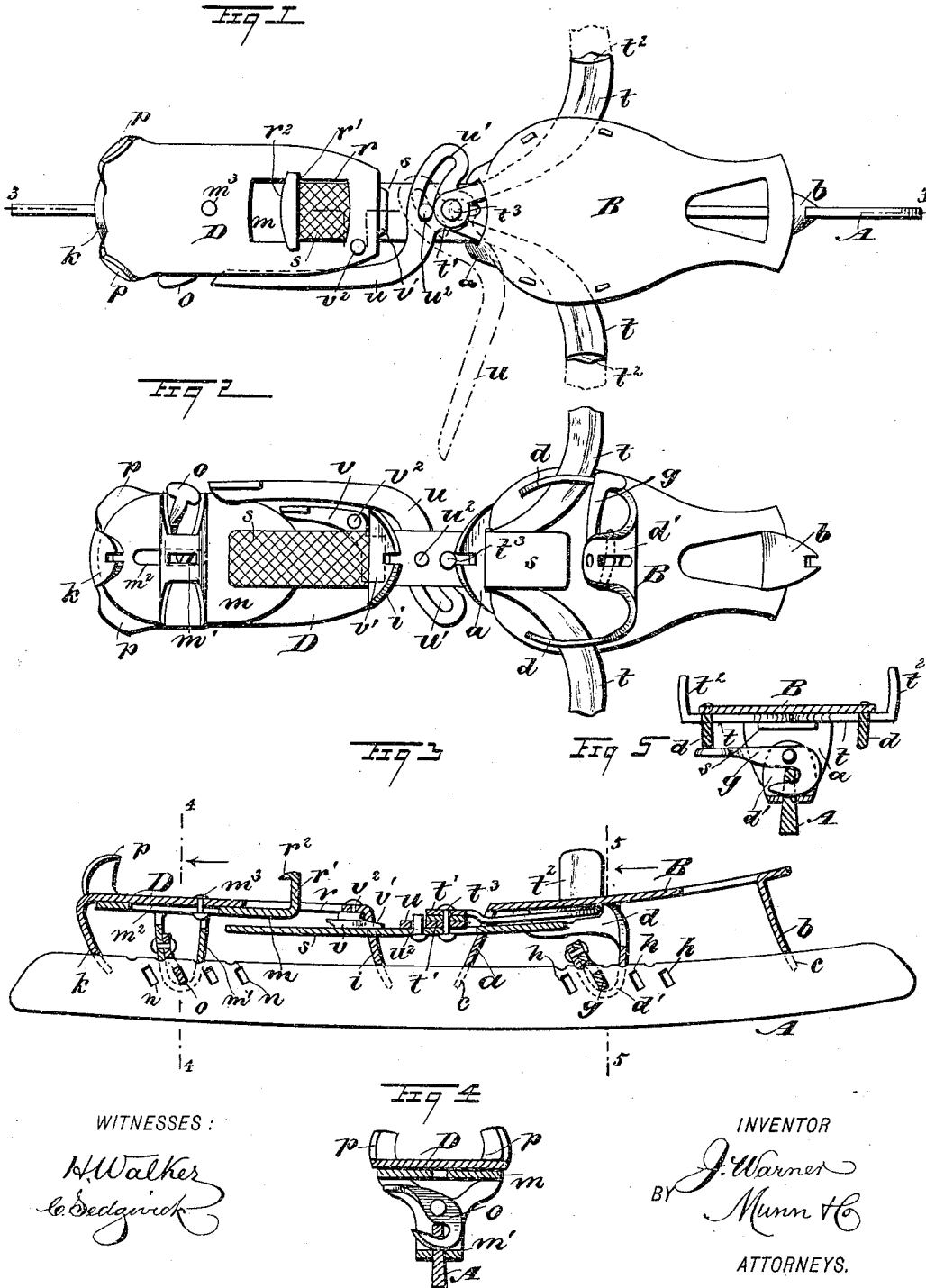


(No Model.)

J. WARNER.
SKATE.

No. 480,051.

Patented Aug. 2, 1892.



UNITED STATES PATENT OFFICE.

JAMES WARNER, OF EAST SOMERVILLE, MASSACHUSETTS.

SKATE.

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To all whom it may concern:

Be it known that I, JAMES WARNER, of East Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Skates, of which the following is a full, clear, and exact description.

This invention relates to an improvement in skates of a class that are adapted to be secured upon the feet without straps, and has for its object to provide a skate of the type named which is of a novel, simple, strong, and durable construction, which will be convenient to attach or detach, that will lock fast to the foot forwardly and at the heel, and that is adjustable as to the clamping devices so as to be attachable to foot-coverings of different lengths and widths.

To these ends my invention consists in the peculiar construction of parts and their combination, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improved skate. Fig. 2 is a reverse plan view, the runner being removed. Fig. 3 is a longitudinal section on the broken line 3 3 in Fig. 1. Fig. 4 is a cross-section on the line 4 4 in Fig. 3, and Fig. 5 is a cross-section on the line 5 5 in Fig. 3.

The runner A is slightly curved and sloped toward the top edge at each end, as indicated in Fig. 3. The foot-ball and heel supports are separate structures, made, preferably, of plate metal cut and bent into shape by proper dies, so as to be rapidly and perfectly produced. The forward support, termed a "toe-plate," is shaped in contour, by preference, as indicated at B in the drawings, having a limb *a* bent downwardly and at an angle rearward, on the end portion nearest to the heel, and at the front end a similar limb *b*, formed integrally by cutting a portion free to be bent downwardly and forwardly, both limbs being located near the center of width of the toe-plate and notched on their free lower ends centrally of a proper depth and width to closely embrace the upper edge portion of the

runner A, as at *c* in Fig. 3. There is a toe-plate bracket provided, which is also formed by preference of light strong metal plate, consisting, essentially, of two divergent limbs *d*, that are branched from a transversely-formed hook *d'* below, which hooked portion is centrally slotted through its bow, so as to adapt it to embrace the upper edge portion of the runner A. The limbs *d* of the toe-plate bracket are bent upward and rearward equally distant from the hook-portion *d'* and are secured to the lower side of the toe-plate by rivets or other means near to its side edges. Upon the inner side of the hook portion *d'* and near its upwardly-bent free end a locking-dog *g* is pivoted. This piece is shaped like a hook at its lower end and is so fulcrumed that it will have the action of a cam when vibrated to interlock with the skate-runner by a manipulation of the laterally-extending lever portion of the dog.

A series of suitably-spaced transverse oblong perforations *h* are formed in the runner A at a proper distance from its front end, which holes incline rearwardly, and above each hole an indentation is made in the upper edge of the runner. (See Fig. 3.) The locking-dog *g*, from its position, is adapted to enter either of the holes *h* when upwardly vibrated to effect such a connection, this movement drawing the limbs *a b* of the toe-plate B into close contact with the upper edge of the runner A, and at the same time secures the lower portion of the bracket C to the runner intermediately of these limbs.

The heel-supporting plate D, which engages the runner A at a suitable distance from the toe-plate, is elongated sufficiently to admit other parts below it and has two integral limbs *i k* turned down from the front and rear ends of the plate and inclining forwardly, as shown in Fig. 3. The lower ends of the limbs *i k* are grooved vertically at their center of width to fit upon the top edge of the runner A.

There is a bracket provided, which is located below the heel-plate D, said bracket comprising a cap-plate *m* and a U-shaped brace *m'*, the latter being attached at right angles to the lower side of the cap-plate and transversely of the same and slotted across its

bow below to fit upon and embrace the upper edge portion of the runner A. There is a series of oblong, spaced, and inclined holes n formed in the runner at a proper distance from its rear end of like dimensions to the holes h and serving a similar purpose. The vibratable latch-dog o , which is pivoted to the inner side of one limb of the brace m' , interlocks with any of said holes it may be desired to so engage, and, as shown in Fig. 4, the dog named has a cam-hook and a laterally-projected lever above the hook, whereby the latter may be rocked to secure the bracket to the runner or release it therefrom.

The heel-plate D is furnished with two toes p , that are projected upwardly from its rear end near each side edge, and these toes are curved forwardly to adapt their front edges at the top to have contact with the heel of a skater's boot or shoe when the skate is to be secured upon it.

Near the front and at the center of the heel-plate D a slot r of proper width and length is cut, wherein a toe r' is adapted to slide, this toe being a projecting portion bent at a right angle from the front edge of the cap-plate m .

The heel-plate D and cap-plate m of the bracket below it are further loosely joined by the formation of a longitudinal slot m^2 in the cap-plate and the sliding engagement therewith of a capped rivet m^3 , which is secured in and depends from the heel-plate, the U-shaped brace m' having apertures formed in its limbs near to the heel-plate, so as to permit the rivet to slide through and afford a proper range of adjustment.

There is a rearwardly-bent sharpened lip formed on the upper end of the toe r' , as at r^2 in Fig. 3, which lip may be caused to engage the front wall of a boot or shoe heel and an embedment of the lip be produced by a forward sliding movement of the heel-plate, which when locked will retain the skate firmly affixed upon the heel of the wearer.

The preferred means for adjustably locking the heel-plate D to retain it and the toe r' in clamped adjustment, as stated, coact with a novel clamping device for the toe-plate B, as will appear. The limb i on the front of the heel-plate is horizontally slotted at its center of width to receive the body of a flat bar s , that passes through a similar slot in the rear limb a of the toe-plate, a sufficient length being given to said bar to allow the heel and toe plates to be changed in position as may be required to suit the length of feet of different skaters. There are opposite horizontal slots cut in the upper edges of the limbs d , where they engage the lower side of the toe-plate B, of proper width to receive the curved arms t , which branch oppositely from the point where they have lapped engagement with each other, as at t' . The portions of the arms t which project at each side of the toe-plate B are bent upwardly at their outer ends and are made slightly concave on

the inner faces, so as to insure a tight grip of these toes t^2 upon the engaged side edges of a shoe or boot sole. The lapped ends t' of the curved arms t are pivoted together and upon an ear on a lever u , that is provided with a curved cam-slotted lateral projection u' , and a stud u^2 , that is affixed in the bar s below, passes loosely through the cam-slot in the projection u' . There is a short longitudinal slot formed in the connecting-bar s below the pivot t^3 , which connects the ends t' of the curved arms t , which pivot passes through the slot mentioned and is cap-riveted at each end, whereby the parts are loosely jointed together, so that a vibration of the main portion of the lever u , which will cause it to project outwardly, as shown by dotted lines in Fig. 1, will spread the toes t^2 apart, and a folding movement of the lever, as shown by full lines, will draw said toes toward each other and lock them fast upon the side edges of a boot or shoe to which the skate is to be attached, and to avoid improper lateral projection when the skate is so adjusted the lever u is bent, as indicated in Figs. 1 and 2, which will dispose of its main portion close below the heel-plate D.

The slot in the front limb i of the heel-plate D is of sufficient width, vertically considered, to allow the introduction of a wedge between the heel-plate and the connecting-bar s , which will lock the heel-plate upon the bar, and for convenience such a wedge-block is formed on the inner end of the bent lever v , as at v' in Fig. 3, said lever being pivoted to the heel-plate at v^2 , so that the outward vibration of the lever will release the wedge-shaped end that is in locked adjustment when located as represented in Fig. 2.

The surface of the connecting-bar s that is likely to be impinged upon by the wedge-block v' is roughened by any suitable means, so that the inward vibration of the limb of the lever v will retain the heel-plate upon the heel of a boot or shoe, if it has been previously driven forward, so as to embed the lip r^2 in the front side of the heel and the toes p at the rear, as before mentioned.

It will be seen that from the peculiar construction of parts the entire skate can be produced in quantity by machinery rapidly and perfectly, cheapening the cost and affording a superior device of its class, and the formation of all parts except the runner from plate metal insures strength with lightness, which are important requisites in metallic skates, the peculiar method of locking parts together greatly facilitating their necessary adjustment if the appliance is to be worn by different persons whose feet vary in dimensions.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the transversely-apertured runner, of the foot and heel plates having depending slotted arms or brackets and a pivoted locking-hook mounted on one

arm or bracket of each plate and engaging the apertures in the runner, substantially as set forth.

2. The combination, with the runner and its adjustable foot-plate adjustable toward and from the heel-plate, of the longitudinal bar extending from heel to foot plate and carrying the sole-clamps, a lever pivoted to said plate and operating the clamps, and a pivoted wedge on the heel-plate and locking the longitudinal bar thereto, substantially as set forth.

3. The combination, with a runner having front and rear series of parallel inclined slots, of the foot and heel plates having depending slotted arms or brackets and pivoted depending locking-hooks passing through the slots and forcing the upper edge of the runner firmly against the upper walls of the slots in the arms or brackets, substantially as set forth.

4. In a skate, a bracket for the toe-plate, comprising two divergent limbs curved above to lie in the same plane and adapted for attachment upon the lower side of the toe-plate, said limbs being integrally connected below by a hook portion that is cross-grooved to fit upon a runner, the limbs being transversely slotted to receive two clamping-arms, substantially as described.

5. In a skate, a toe-plate having a bracket provided with two divergent limbs having transverse clamp-receiving slots and a depending hook portion cross-grooved to fit a runner and provided with a locking-hook crossing said slot, substantially as set forth.

6. In a skate, the combination, with a runner in which spaced holes are formed in series near its top edge, of a toe-plate provided with, front and rear limbs grooved to fit upon the top of the runner near the front, a bracket the limbs of which are affixed upon the lower side of the toe-plate and diverged from an integral hook portion below that is grooved to seat it upon a runner near its toe, and a locking-dog pivoted on said hook portion and having a cam-hook adapted to interlock with either of the holes in the runner, substantially as described.

7. In a skate, the combination, with a runner having spaced perforations near the top edge, of a toe-plate having two depending limbs notched to straddle the runner and a cam-hook locking-dog pivoted to a depending piece on the toe-plate and adapted to interlock with either of the perforations, substantially as described.

8. In a skate, the combination, with a runner perforated in series near the heel, of a heel-plate whose depending notched limbs are adapted to seat upon the top edge of the run-

ner and provided with two spaced upwardly-projected toes at the rear edge, a cap-plate below the heel-plate, having a locking-toe projected through a longitudinal slot in the heel-plate and bearing a sharp lip turned rearward at the free top end, a tongue or rivet fixed to the heel-plate and loosely secured in a longitudinal slot in the cap-plate, a U-shaped brace fast on the cap-plate and grooved where bent below to embrace the top edge of the runner, and a lever-dog having a cam-hook and pivoted on one limb of the brace, which is adapted when upwardly vibrated to interlock with either of the perforations in the runner, substantially as described.

9. In a skate, the combination, with a runner perforated in series near the toe and heel, a toe-plate whereon are two depending limbs front and rear that are grooved to embrace the top edge of a runner, a bracket thereon between said limbs, and a cam-hook locking-dog on the bracket, which will engage either of the perforations in the runner at the front, of a heel-plate on which two upwardly-projected toes are formed at the rear edge, two depending limbs on the heel-plate front and rear, grooved in alignment to embrace the runner above, a cap-plate below the heel-plate, a toe thereon projected through a longitudinal slot in the heel-plate and provided with a sharp lip above, and a locking-dog that has a cam-hook, which will interlock with either of the perforations at the rear end of the runner, substantially as described.

10. In a skate, the combination, with a runner and a bracket at its rear provided with a locking-dog that engages either of a series of transverse holes in said runner, of a heel-plate having two toes at the rear and two depending limbs that are notched below and embrace the runner above, said heel-plate being slotted longitudinally to allow a toe on the cap-plate of the bracket to project through it, and a device to lock the heel-plate in connection with a toe-plate of the skate, substantially as described.

11. In a skate, the combination, with a runner, a toe-plate, and a heel-plate independently and adjustably attachable upon the runner, of a connecting-bar, two curved clamping-arms adapted to slide below on the toe-plate and pivoted to a cam-lever and on the connecting-bar, a stud on the bar engaging with a cam-slot on the lever, and a vibratable wedge-lever pivoted on the heel-plate and adapted to lock said plate to the connecting-bar, substantially as described.

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Witnesses:

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