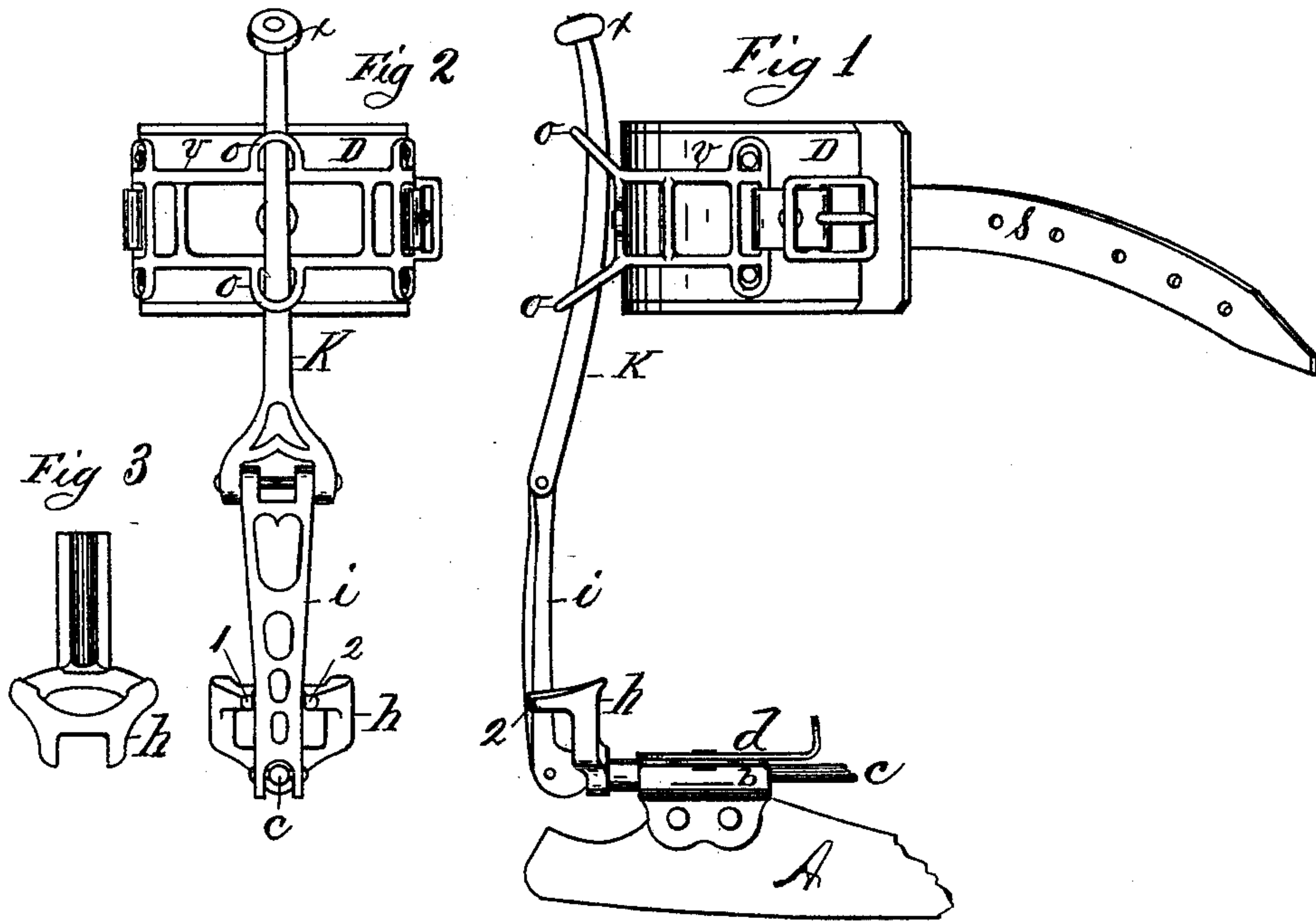


E. H. BARNEY.
Ankle-Supports for Skates.

No. 214,231.

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IMPROVEMENT IN ANKLE-SUPPORTS FOR SKATES.

Specification forming part of Letters Patent No. **214,231**, dated April 15, 1879; application filed February 3, 1879.

To all whom it may concern:

Be it known that I, EVERETT H. BARNEY, of Springfield, county of Hampden, and State of Massachusetts, have invented new and useful Improvements in Ankle-Supports for Skates, which improvements are fully set forth in the annexed specification and in the accompanying drawings.

My invention has for its object the construction of such an ankle-support for a skate as will, while serving perfectly to keep the foot from turning sidewise, allow an entire freedom of movement of the leg below the knee; and it consists of a lever, which is hinged to the top end of the cam-lever shown and described in my Patent No. 187,584 of February 20, 1877, which cam-lever rises vertically behind the heel, and of a looped ankle-strap, through which the first-mentioned lever has a free movement vertically, and also of a peculiarly-constructed heel-clamp adapted to operate with said cam-lever to serve the object of this invention, as above set forth.

Referring to the drawings, which consist of three figures, Figure 1 is a side elevation of the heel of a skate and my improved ankle-support thereto attached. Fig. 2 is a rear elevation of the heel-clamp, cam-lever, hinged lever, and looped ankle-strap. Fig. 3 is a view of the heel-clamp.

In the drawings, A is the heel end of the skate-runner. *b* is a hollow heel-clamp recess; *c*, a section of a fastening-rod. *d* is the heel-plate. *h* is the heel-clamp. *i* is the cam-lever. *k* is the hinged lever. D is the ankle-strap. *o o* are metallic loops secured to strap D. *s* is a buckle-strap.

The construction and operation of the cam-lever *i*, heel-clamp *h*, heel-clamp recess *b*, and fastening-rod *c* are fully set forth in my aforesaid patent of 1877, wherein it is shown that the shape of the shank of heel-clamp *h* and the recess *b*, in which it works, are such that they only permit the heel clamp to move longitudinally, and that it is maintained in the position vertically shown in Figs. 1 and 2.

To make heel-clamp *h* serve the purpose of supporting cam-lever *i* in a vertical position, as shown, I add to it the rearwardly-projecting arms 1 2, between which cam-lever *i* rises up when the skate is fastened to the boot.

Cam-lever *i* is made so that the lower end of lever *k* may be hinged to it, as shown.

The ankle-strap D is made of leather or any other suitable flexible material, and to it is secured the metallic yoke *v*, bearing on its rear side the projecting loops *o o*. The front ends of yoke *v* are so constructed that the buckle and buckle-strap may be secured thereto, making the ankle-strap D serve as a cushion between the ankle and the yoke; and, if desired, the interior surface of said ankle-strap may be padded to make it more easy for the wearer.

After having constructed the above-named parts as described, the ankle-strap is secured to lever *k* by slipping loops *o o* onto it, and by riveting a collar, *x*, onto its upper end.

It will be found that the ankle-strap thus connected to lever *k* has a free up-and-down movement on said lever, and that the curved form of lever *k* and the elongated form of loops *o o*, combined with the freedom of movement just named, contribute to give to strap D a free longitudinal movement toward and from the toe of the skate, while the loops slide on lever *k*.

My ankle-support is fastened to the ankle and operates as follows, viz: First, the skate is secured to the boot through the operation of rod *c*, heel-clamp *h*, and cam-lever *i*, as described in my aforesaid patent of 1877, and when, by the final movement of the cam-lever upward against the heel to complete the fastening operation, said lever enters between arms 1 2 on the rear side of the heel-clamp, it is firmly retained by said arms in a vertical position. The skate being now firmly secured to the boot, lever *k*, and with it ankle-strap D, is brought up into about the position shown in Fig. 1, and strap D is buckled tightly around the ankle, care being taken to secure it far enough below the end of lever *k* to permit of the free swing of the leg forward without bringing the upper loops, *o*, against collar *x*.

Thus secured to the boot, it will be seen that the skate, with its cam-lever *i*, before strap D is buckled to the ankle, may have a lateral rolling motion from the bottom edge of the runner upward, caused by the flexure of the ankle-joint; but when the ankle-support is fastened to the leg as above described, all such

rolling motion is prevented, the skate being held by lever *k* and loops *o o*, through their connection with cam-lever *i*, so that nearly all of any sidewise motion that the skate may have must come from a slight lateral flexure of the knee-joint, and not of the ankle-joint; but while lateral motion is prevented a perfectly free back and forward motion of the knee-joint is permitted by allowing lever *k* to be movable vertically through loops *o o* on strap *D*; and it will be observed that with nearly every step of the skater the upward and downward movement of the toe of the skate causes said action of lever *k*.

In applying my improved ankle-support to skates, in which rod *c* is operated by a key instead of by cam-lever *i*, I cast the heel-clamp *h* with an upwardly projecting arm thereon, substantially like cam-lever *i*, and hinge to the top of said arm lever *k*, as in the construction shown herein, fitting thereto strap *D*, with yoke *v* and loops *o o*.

A modified construction of the hinged levers *i* and *k* may be employed in place of those two levers without departing from the principles of their operation, consisting of a single lever of the length of those two combined, made of

some metal that would permit of forming a thin spring-spot in it about where the hinge is, between the two levers. This construction would make a lever not flexible laterally, but tolerably flexible in a direction toward and from the toe of the skate.

What I claim as my invention is—

1. An ankle-support for a skate, consisting of levers *i* and *k*, hinged together end to end, and ankle-strap *D*, provided with loops *o o*, arranged to inclose lever *k* loosely, said lever *i* being attached to the skate at the rear of the heel-plate, and arranged to be maintained in a position substantially perpendicular to the skate-runner, substantially as and for the purpose set forth.

2. The combination of ankle-strap *D*, provided with loops *o o*, hinged levers *i* and *k*, and heel-clamp *h*, substantially as set forth.

3. The ankle-strap *D*, having secured thereto loops *o o*, substantially as and for the purpose set forth.

EVERETT H. BARNEY.

In presence of—

H. A. CHAPIN,
WM. H. CHAPIN.