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C. M. STEVENS.

ANKLE BRACE.

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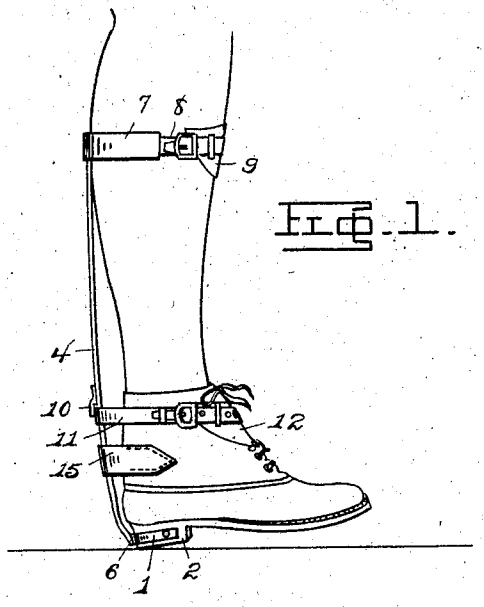


FIG. 1.

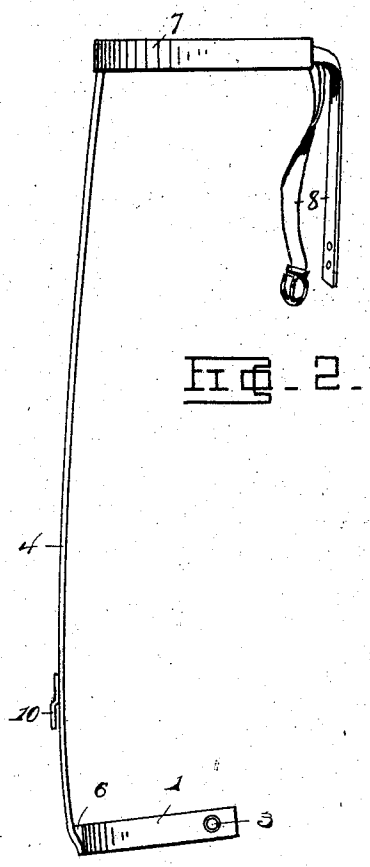


FIG. 2.

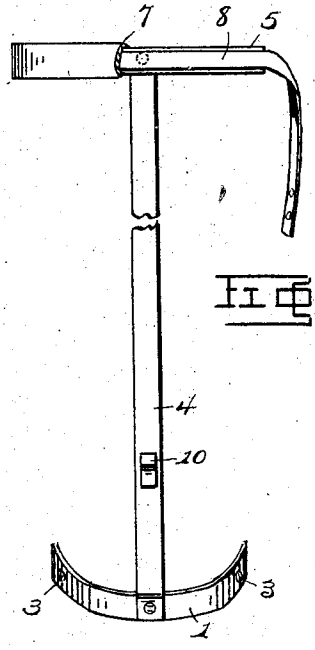


FIG. 3.

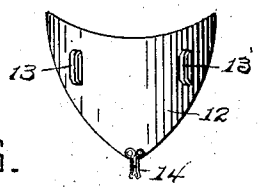
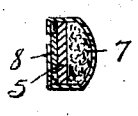


FIG. 4.

FIG. 5.



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CALVIN M. STEVENS, OF WHEELING, WEST VIRGINIA, ASSIGNOR OF SIXTY ONE-HUNDREDTHS TO GEORGE A. WICKHAM, C. H. VARNELL, AND ESTATE OF WILLIAM McLAUGHLIN, DECEASED, AND ONE-TENTH TO LEWIS CLOHAN, OF WHEELING, WEST VIRGINIA.

ANKLE-BRACE.

No. 839,223. Specification of Letters Patent. Patented Dec. 25, 1906.

Application filed July 11, 1906. Serial No. 325,678.

To all whom it may concern:

Be it known that I, CALVIN M. STEVENS, a citizen of the United States of America, and a resident of Wheeling, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Ankle-Braces, of which the following is a specification.

My invention relates to new and useful improvements in ankle-braces, and more particularly to an ankle-brace and foot-support; and it consists in the particular construction, arrangement, and combination of parts which will hereinafter be fully described.

The object of the invention is to provide a brace for attachment to the shoe and to the limb of a person suffering from paralysis or other disease wherein the use or control of the muscles of the foot, leg, or ankle is destroyed or impaired, which brace rigidly holds the foot in a substantially horizontal position and at the same time lends support to and braces the ankle.

A further object of the invention is to provide a brace which firmly carries the foot of a person having a paralyzed leg or foot or having a weak or deformed ankle in a position which not only enables him to stand and walk firmly upon the foot, but also relieves all strain from the muscles of the diseased or deformed member.

The feet of persons afflicted with deformities of the feet or ankles or with diseases in which the use or control of the muscles of the feet is lost hang limp and lifeless, and when such persons are able to walk at all the toe of the disabled foot must be dragged. By the present invention the foot is supported in a natural walking position, and when the leg is swung forward, as in walking, the toe of the foot is thereby lifted or held clear of the ground.

In describing the invention in detail reference is herein had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of the invention, illustrating the application thereof. Fig. 2 is a similar view enlarged, showing the invention or a portion thereof detached. Fig. 3 is a rear elevation of the same. Fig. 4 is a front elevation of the foot or ankle shield, and Fig. 5 is a cross-section of the calf-pad.

Referring to said drawings, in which like reference-numerals designate like parts throughout the several views, 1 indicates a clamp which is adapted to be rigidly secured to the heel 2 of a shoe, screw-holes 3 being provided therein through which securing-screws are inserted to hold said clamp in a heel-embracing position. Rigidly attached in a suitable manner to said heel-clamp 1, midway between its ends, is a longitudinal spring-metal upright arm 4, which is preferably bowed outward slightly, as shown, and secured to the upper or free end of said upright arm at right angles thereto is a curved cross-piece or leg-engaging strip 5, preferably of flexible metal, which may be readily bent to conform to the shape of the calf of the leg which it is to embrace.

Secured between the lower end of the upright arm 4 and the heel-clamp 1, preferably by brazing, is a small triangular or wedge-shaped piece of metal 6, which directs the upright arm 4 outward sufficiently to prevent it from rubbing the upper heel-leather of the shoe.

A suitable leg-protecting pad 7 is provided over the metal strip 5, and held in place against said strip by said pad is the rear portion of a securing-strap 8, which is adapted to be buckled about the leg, as shown in Fig. 1. A shield 9 is preferably held by said strap for preventing undue rubbing of the front part of the leg where engaged by said strap.

A downwardly-directed hook 10 is carried by the rear face of the upright arm 4 at a suitable point for preventing the upward slipping of a strap 11, which encircles the upright arm and the leg near the ankle. By adjusting the pressure of this strap 11 the elevation of the toe or the angle of inclination of the foot may be slightly adjusted, as the tighter said strap is drawn the greater is the elevation of the toe in relation to the leg, and vice versa.

A foot or ankle shield 12, having loops 13, through which the strap 11 is inserted, is preferably provided for protecting the foot against the rubbing of said strap. A hook

14, carried by the lower end of said shield 12 is adapted for engagement with a shoestring for preventing the shield from slipping upward out of place.

A loop 15, formed by sewing the ends of a strap to the shoe-upper at each side of the heel and inclosing the upright 4, is preferably provided, said loop serving to rigidly hold said upright arm and shoe relatively in position, preventing the said arm from being bent rearwardly when the shoe is removed from the foot, and consequently preventing the accidental breaking of the arm from the heel-clamp 1.

It will be noted that the angle formed at the juncture of the upright arm and the heel-clamp is more or less acute, and these parts being held in fixed relation to each other when the upper end of the upright arm is held close against the calf of the leg and the leg is upright the foot is firmly held with the toe slightly elevated above the heel or in a substantially horizontal position. Consequently the dragging of the foot is avoided or prevented.

From the foregoing it will be seen that I provide an extremely simple device whereby the foot of the wearer is rigidly held in a position which relieves all strain upon the weak or useless muscles and whereby the foot is braced, admitting of the wearer supporting his weight thereon.

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

1. In a device of the character described, an arcuate heel-embracing clamp adapted for securing about the heel of a shoe, an upright arm rigidly secured at its lower end to said heel-clamp midway between the ends of the latter, said arm being adapted to stand directly in the rear of the limb of the wearer, and means for attaching the free end of said arm to the limb of the wearer, substantially as described.

2. In a device of the character described, an arcuate clamp adapted for securing about the heel of a shoe, an upright spring-metal arm rigidly secured at its lower end to the rearmost part of the heel-clamp, means for attaching the free end of said arm to the limb of the wearer, and means whereby the angle of inclination of the foot may be slightly adjusted.

3. In a brace, the combination with a shoe, of a heel-clamp secured to the heel of the shoe, an upright arm rigidly secured to said heel-clamp at the rearmost part of the heel, a flexible cross-piece secured to the free end of said arm, a pad covering said cross-piece, a strap partially inclosed by said pad and adapted for securing about the limb of the wearer, a suitably-located downwardly-directed hook carried by said arm, an adjusting-strap in engagement with said hook and embracing the upright arm and the limb of the wearer whereby the angle of inclination of the foot may be slightly adjusted, and means for preventing the upward slipping of the last-mentioned strap.

4. In a device of the character described, an arcuate heel-embracing clamp adapted for securing about the heel of a shoe, an upright arm rigidly secured at its lower end to said heel-clamp, a triangular wedge between said clamp and arm for giving the latter a slight rearward inclination, and means for securing the free end of the arm to the limb of the wearer.

5. The combination with a shoe, of an arcuate heel-embracing clamp, an upright spring-metal arm secured to said clamp on the median line of the heel, a triangular wedge fitted between the clamp and said arm, means for attaching the free end of the arm to the limb of the wearer, and means whereby the angle of inclination of the foot may be slightly adjusted.

6. The combination with a shoe, of an arcuate heel-embracing clamp, an upright spring-metal arm secured to said clamp on the median line of the heel, a triangular wedge brazed between the clamp and said arm, means for attaching the free end of the arm to the limb of the wearer, a downwardly-directed hook carried by said arm, and a strap in engagement with said hook and adapted for securing about the ankle of the wearer whereby the angle of inclination of the foot may be slightly adjusted.

7. The combination with a shoe, of an arcuate heel-embracing clamp adapted for securing about the heel of the shoe, an upright spring-metal arm secured to said clamp on the median line of the heel, a triangular wedge brazed between the clamp and said arm, means for attaching the free end of the clamp to the limb of the wearer, a strap for encircling the upright arm and the ankle of the wearer whereby the relative elevation of the toe may be slightly adjusted, and means for preventing said strap from slipping upwardly.

8. In a brace, the combination with a shoe, of a heel-embracing clamp secured about the heel of the shoe, an upright arm rigidly attached to said clamp on the median line of the heel, a flexible-metal cross-piece attached to the upper end of said arm, said cross-piece being adapted for bending to conform to the calf of the wearer, a pad covering said cross-piece, a strap held between said cross-piece and said pad for attachment to the limb of the wearer, a strap for encircling the upright arm and the ankle of the wearer whereby the relative elevation of the toe may be slightly adjusted, and shields carried by said straps.

9. The combination with a shoe, of an arcuate heel-embracing clamp, an upright spring-metal arm secured to said clamp on

the median line of the heel, a triangular wedge between the clamp and said arm, means for attaching the free end of the arm to the limb of the wearer, means whereby the angle of inclination of the foot may be slightly adjusted, and a loop whereby said arm and shoe are rigidly held in relative positions, said loop consisting of a strap encircling said arm and having its ends attached to the shoe-upper.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

CALVIN M. STEVENS.

Witnesses:
H. E. DUNLAP,
GEO. A. WICKHAM.