

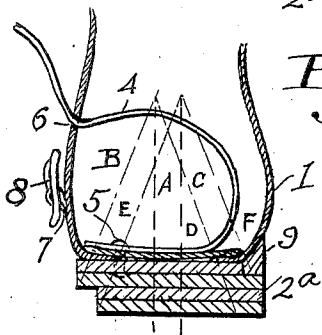
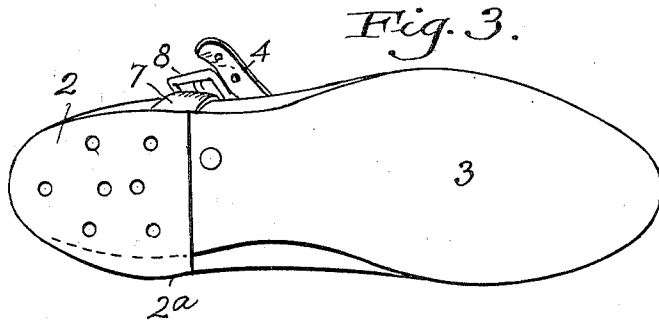
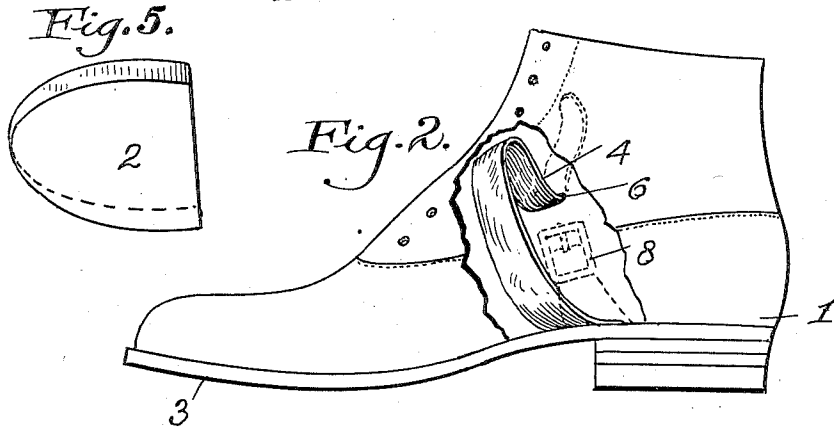
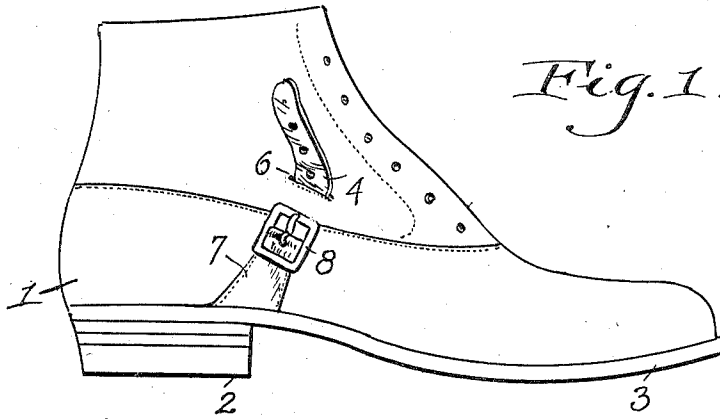
Nov. 15, 1927.

1,649,173

J. McDONOUGH

ORTHOPEDIC SHOE

Filed March 31, 1923



Inventor:  
James M. Donough,  
Thurston Knox & Hudson  
attys.

# UNITED STATES PATENT OFFICE.

JAMES McDONOUGH, OF MONTCLAIR, NEW JERSEY.

## ORTHOPEDIC SHOE.

Application filed March 31, 1923. Serial No. 629,034.

The present invention relates to what may be termed an orthopedic shoe or boot, and the object of the invention is to provide a shoe in which the center of the tread surface of the heel is arranged directly under the center of weight in cases where the imposition of the weight upon the bones of the foot is displaced from normal. Also to provide means in connection with the shoe which will support the bones in their distorted position and return them to a normal position when not too greatly disarranged.

Reference should be had to the accompanying drawings forming a part of this specification in which Fig. 1 is a side elevation of a shoe embodying the invention; Fig. 2 is an elevation with portions broken away, of a shoe embodying the invention; Fig. 3 is a bottom plan view; Fig. 4 is a sectional elevation of a shoe embodying the invention, with the heel lift in position for initial treatment; and Fig. 5 is a bottom plan view of the heel of Fig. 4.

It has been my discovery that heels as they are commonly applied to shoes are not properly positioned with respect to a line which bisects the heel and extends to the ball of the foot, which is the line which should represent the path of movement of the center of weight of the person wearing the shoes in the act of walking. This is evidenced by the almost universal overrunning of the heels of shoes either upon the inside of the heel or upon the outside of the heel. This overrunning of the heels is occasioned by the fact that the center of weight of the body of the person wearing the heels is not properly supported by the heels of the shoe, and upon that side of the heel upon which the greater weight comes will come the greater wear.

In my co-pending application, Serial No. 448,587, filed Feb. 28, 1921, I have explained and provided a heel which will obviate this difficulty. In the present application I employ a heel which in the method of its application to a shoe embodies the same principle as that described in my above mentioned application. But in this particular instance it is made to assume a slightly different form and shape which will correct conditions in the foot of a person caused by support improperly arranged under the limb.

Referring to the drawings, 1 indicates the counter of the shoe, 2 the heel thereof, and 3 the sole. The tread surface of the

heel 2 is so disposed with respect to the counter of the shoe that a line joining the center of the rear part of the heel and extending to a point on the sole representing the ball of the foot of the wearer will substantially divide the area of the heel so that with the improved heel of my orthopedic shoe like units of area will support equal parts of the weight of the body of the wearer of the shoe. Thus the weight will be equally distributed, and there will be no greater weight over a given area than there is over any other area of similar size, which is quite contrary to the conditions which exist in a usual form of shoe.

This will involve an extension of the heel often beyond the limiting line of the counter. As, for instance, as shown in the drawing, there is a portion of the lower surface of the heel which is indicated at 2<sup>a</sup> that extends beyond that portion of the counter in which the heel of the wearer is encased. The amount of extension depends upon the extent the center of weight has moved from a normal position.

The heel 2 may be made of any suitable material or combination of suitable materials.

By referring to Fig. 4 a better understanding of the conditions which it is desired to correct may be obtained. We may assume that the dotted line A represents weight resting in a normal position with the triangle of the weight bearing on the heel upon the dotted lines B and C, thus equally distributing the weight upon the bottom of the shoe. But when the bones of the foot become disarranged the line of weight moves toward the inside of the foot as represented by the dotted line D. In order, therefore, to properly support the weight in this second position, it is necessary to position the heel in such fashion as is shown in Fig. 4, so that the supporting surface of the heel of the shoe will be arranged directly under weight, as shown by the triangle represented by lines E and F.

As will be seen, this condition requires an extension of the heel at one side of the shoe and removing a certain portion of the heel lift from the opposite side of the shoe.

When a heel is arranged in this way, weight will be distributed equally per unit over its supporting surface. But if the bones of the foot are greatly disarranged, force must be applied against the inner border of

the foot until the bones are returned to their normal position.

This in the present instance is accomplished by providing a bracing strap which is in part positioned upon the inside of the shoe and extends upon the outside.

Referring to Fig. 4 more particularly, there is a strap 4 which at one end is fastened as indicated at 5, this being usually toward the outer portion of the counter and on the side opposite to which the arch of the foot fits when in the shoe. The strap is so positioned that it extends beneath the foot, under the inner border of the foot, and around and across the top of the foot. The strap extends through a slot or opening 6 formed in the shoe, and upon the outer part of the shoe there is secured a strap 7 which has a buckle 8 in which the end of strap 4 may be secured.

When the strap is pulled up, it tends to raise the inner border, or so-called arch, of the foot toward its normal position. This influence is maintained by securing the strap 4 in the buckle 8 Fig. 4. As the bones of the foot are moved toward their normal position and weight moves toward the outside of the foot, the inner portion of the supporting surface of the heel is gradually reduced and the outer portion of the tread surface proportionately increased until the bones of the foot are returned to their normal position; weight rests upon the lines A, B and C and the heel of the shoe is restored to its proper shape. When the strap is used upon a low shoe or slipper, its free end passes out of the shoe above the edge of the upper and is attached as previously described.

In cases in which it is necessary to provide a considerable offset in the heel 2, an insert 9 is arranged between the offset position 2<sup>a</sup> of the heel and the counter of the shoe, so that a line of support will be established between where the margin of weight rests upon the counter and where the margin of support is provided by the tread surface of the heel.

Having described my invention, I claim—

1. An orthopedic shoe comprising a counter, upper, sole and heel, one side of said heel extending sidewardly from a normal position, the tread surface of the opposite

side of the heel being removed to the same extent.

2. An orthopedic shoe comprising a counter, upper, sole and heel, a strap member having one end thereof attached against the upper surface of the shank portion of the sole of the shoe, and extending across the bottom of the foot to its inner border, across the inner border and upper surface of the foot, the free end of said strap extending outside of the upper of said shoe, and means for securing the free end of the strap.

3. An orthopedic shoe comprising a counter, upper, sole and heel, a strap within the shoe, one end of said strap being fastened to the shoe, said strap extending across the bottom of the foot to its inner border, where it forms a loop and passes up and around the inner border and upper surface of the foot to its outer border, the upper of said shoe being provided with an opening through which the end of the strap extends, and means on the outside of the shoe for securing the end of the strap.

4. An orthopedic shoe comprising a counter, upper, a sole and a heel, the portion of said heel on the inner side of the center of the counter being extended past its normal position toward the inner side of the limb, the outer portion of the tread surface of the portion of the heel on the outer side of the center of the counter being removed the extent the inner portion is carried in, thereby causing an equal distribution of weight per unit of area of the supporting portion of the heel, when the bones of the foot are disarranged and the weight rests in an abnormal portion, a strap arranged within the shoe with one end attached to the upper surface of the outer portion of the shank, said strap passing beneath and against the lower surface of the foot to its inner border where it forms a loop and passes around the inner border and across the upper surface of the foot, said upper having an opening therein through which the end of the strap extends, and means upon the outside of the shoe for holding the strap in an adjusted position.

In testimony whereof, I hereunto affix my signature.

JAMES McDONOUGH.