March 1, 1932. M. P. BRINGARDNER 1,847,168

SHOE

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Fig. 1

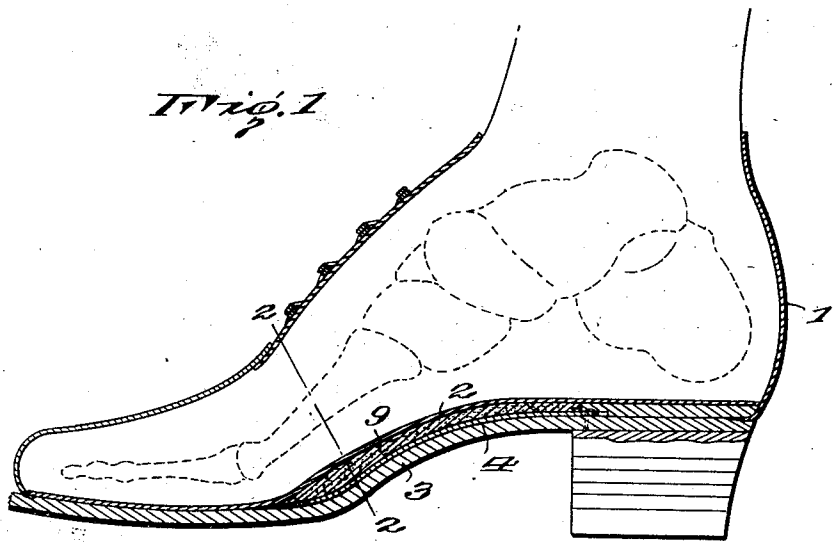


Fig. 3.

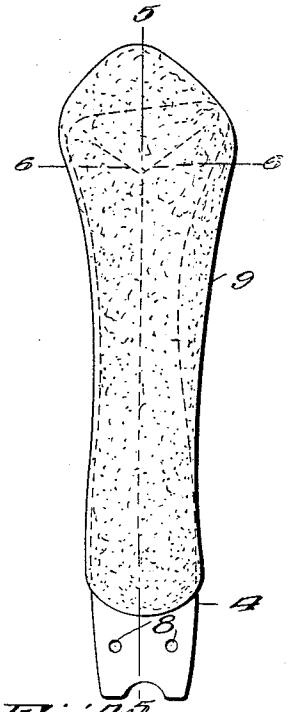
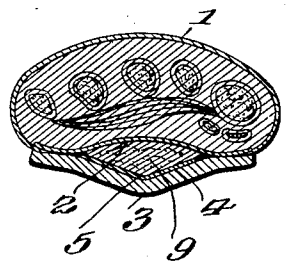


Fig. 2.



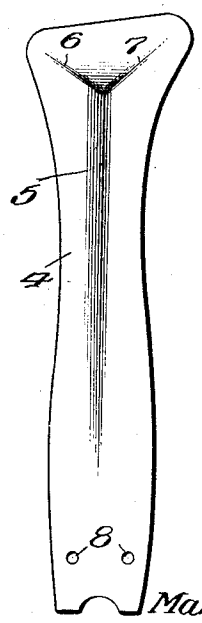


Fig. 4.

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SHOE

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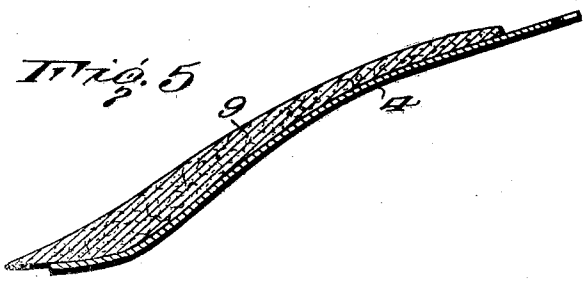


Fig. 5

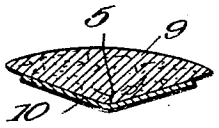


Fig. 6.

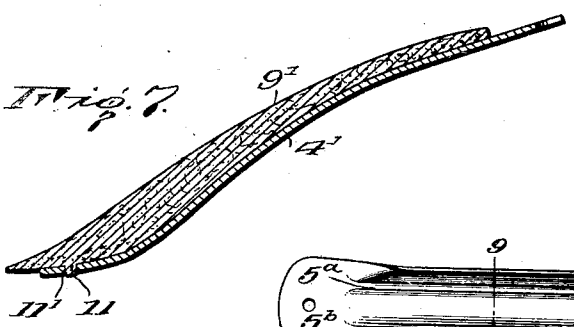


Fig. 7.

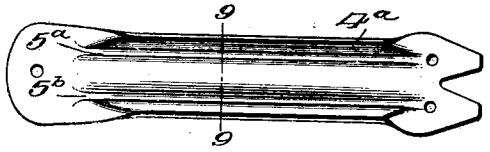


Fig. 8.

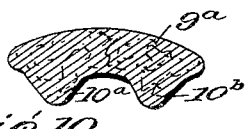


Fig. 10.



Fig. 9

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Patented Mar. 1, 1932 1,847,168

UNITED STATES PATENT OFFICE

MARTIN P. BRINGARDNER, OF ST. LOUIS, MISSOURI

SHOE

Application filed June 15, 1929. Serial No. 371,262.

This invention relates to shoes and to shoe shanks.

It is common practice in the manufacture of shoes to place between the inner and outer soles at the instep a metal reinforcing and stiffening member. However, the shanks heretofore used in shoes, while strengthening and stiffening the shoe at the instep have not given any substantial support to the various bones of the tarsus which form the longitudinal arch of the foot nor to the bones of the metatarsus which form the transverse or metatarsal arch of the foot.

It is the primary object of my invention to provide a shank for shoes which will resiliently support both the longitudinal and transverse arches of the foot and which will thereby prevent or correct any defect in the anatomy of the foot in the region of either of the arches.

It is also an object of my invention to provide a shoe shank comprising a stiff reinforcing and strengthening member which may be stamped from relatively inexpensive metal, and a superimposed resilient and compressible cushion which, under the pressure of the foot, will conform accurately to the shape of the bottom of the foot and thereby provide the necessary support for both arches.

Further objects of my invention are to provide means for maintaining the resilient cushion in proper place with respect to the stiff reinforcing portion and for permitting relative movement between the forward end of the shank and the inner and outer soles. This latter feature permits the shoe to follow more closely the natural flexion of the foot in walking.

In carrying out my invention I provide a substantially rigid reinforcing and stiffening shank portion of relatively stiff spring steel. This rigid shank portion is formed with a longitudinal groove which extends throughout the major portion thereof. Superimposed upon this portion and extending slightly beyond the forward end thereof is a cushion which forms a resilient support for the longitudinal and transverse arches. The lower side of this cushion is formed with a ridge which conforms to the groove in the rigid shank portion. This ridge and the cooperating groove in the rigid portion tend to maintain the two parts in their proper relation. The upper side of the cushion has a slight curvature to conform more closely to the contour of the bottom of the foot. If desired, the under surface of the forward portion of the cushion may be provided with a stud which engages a corresponding opening in the forward end of the steel shank. This further tends to maintain the cushion in its proper place on the rigid shank portion.

When the present shank is placed in the shoe it is secured thereto at the rear end only, the forward end being left free so that there may be relative movement between it and the inner and outer soles of the shoe in walking. This permits the shoe to follow in part the natural flexion of the foot.

The various features of the invention will be further described in connection with the accompanying drawings, but it is to be understood that this more detailed disclosure and description is intended as an exemplification of the invention and that the same is not limited thereto. In these drawings:

Fig. 1 is a longitudinal sectional view through a shoe embodying the present invention and showing the same in its proper relation to the foot.

Fig. 2 is a transverse sectional view through the shoe in the region of the transverse or metatarsal arch, the same being taken on line 2—2 of Fig. 1.

Fig. 3 is a plan view of the shank with the resilient cushion removed.

Fig. 4 is a plan view of the shank with the resilient cushion in place.

Fig. 5 is a longitudinal sectional view taken on line 5—5 of Fig. 4.

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 4.

Fig. 7 is a longitudinal sectional view similar to Fig. 5, but showing a modification.

Figs. 8, 9 and 10 are detail views showing a further modification.

Referring now to the drawings in detail, the numeral indicates a shoe of ordinary con-

struction having inner and outer soles 2 and 3 respectively between which the cushioned shank is inserted during the manufacture of the shoe.

The cushioned shank comprises a substantially rigid member 4 of relatively stiff spring steel or similar metal. The member 4 is curved longitudinally to conform to the curvature of the shoe sole at the instep and is formed with a central depression or groove 5 which extends throughout the greater portion of the length thereof. The groove 5 terminates just back of the forward end of the member 5 where it connects with diverging grooves 6 and 7 which extend forwardly and outwardly almost to the forward corners of the member 4.

The rear end of the member 4 extends backwardly a sufficient distance to partially overlie the heel of the shoe, and this end is securely fastened by nails or other securing means passing through the openings 8. The forward end of the member 4 is not rigidly secured to the sole of the shoe but is left unattached so that relative movement between the forward end of the member and the inner and outer soles is permitted, thereby causing the shoe to more closely follow the natural flexion of the foot during walking.

Superimposed upon the member 1 is a resilient and compressible cushion 9. The rear end of this cushion terminates short of the rear end of the member 4, but the forward end extends slightly beyond the forward end of the member 4 as shown in Figs. 1 and 5. That portion of the cushion which overlies the depression in the member 4 formed at the junction of the grooves 5, 6 and 7, is thickened and enlarged transversely to more effectively support the metatarsal or transverse arch of the foot.

The cushion 9 may be glued or otherwise secured to the member 4 although it may be left unattached if desired. To insure the cushion 9 being normally maintained in its proper superimposed position upon the member 4 when unattached thereto, and to further aid in this maintenance when glued or otherwise attached, the lower side thereof is formed with an extending portion or ridge 10 and otherwise shaped to accurately fit within the depression in the upper face of the member 4 formed by the grooves 5, 6 and 7.

In the modification shown in Fig. 7 the lower face of the cushion 9′, near the forward end, has protruding therefrom a stud 11 which engages an opening 11′ in the forward end of the member 4′ to further assist in maintaining the cushion in proper position upon said member.

In Figs. 8 to 10 the member 4^a is provided with a pair of longitudinal grooves 5^a and 5^b instead of a single groove as shown in the form illustrated in Figs. 1 to 6 inclusive. The cushion 9^a, in this form of the invention, is likewise formed with a pair of extending portions or ridges 10^a and 10^b on the lower side thereof which fit within the grooves 5^a and 5^b to maintain the two parts in proper position.

When a shoe shank embodying the present invention is built into a shoe the rear end underlies the longitudinal arch of the foot and gives it support while the forward end underlies the metatarsal arch and maintains it in proper position with respect to the other bones of the foot.

When a person is walking with a shoe on which has my improved shank therein, the weight of the body as it is transferred from the heel to the ball of the foot, will cause the rear and middle portions of the cushion to be flexed or moved slightly forward and compressed under the metatarsal arch. As soon as the foot is lifted from the ground the rear portion of the cushion returns to its normal position. This constant shifting of the cushion under the arches causes a massaging action which strengthens the muscles at those portions of the foot. It will thus be seen that my improved shank not only provides a resilient support for the longitudinal and metatarsal arches but that by constantly massaging the muscles in those regions strengthens and restores them to their normal condition.

While the invention has been particularly described in connection with certain forms of the invention the same is not limited thereto as it is apparent that various changes may be made without departing from the spirit of the invention as the same is set forth in the appended claims.

What I claim is:

1. A shank for shoes comprising a stiffening and reinforcing member having its forward end adapted for movement relative to the insole of said shoe, a cushion loosely superimposed thereon, said stiffening and reinforcing member having an aperture near the forward end thereof and a stud projecting from the lower face of the cushion and received in said aperture to position the cushion on said stiffening and reinforcing member.

2. A shank for shoes comprising a stiffening and reinforcing member having its forward end adapted for movement relative to the insole of said shoe having a longitudinal groove, a cushion loosely superimposed on said member, said cushion having an extending portion received in and fitting said groove, said stiffening and reinforcing member also having an aperture near the forward end thereof and a stud projecting from the lower face of the cushion and received in said aperture to position the cushion on said stiffening and reinforcing member.

In testimony whereof I affix my signature.

MARTIN P. BRINGARDNER.