L. TROLLE.

FOOTWEAR.

APPLICATION FILED DEC. 5, 1916. RENEWED AUG. 16, 1919.

1,337,983.

Patented Apr. 20, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

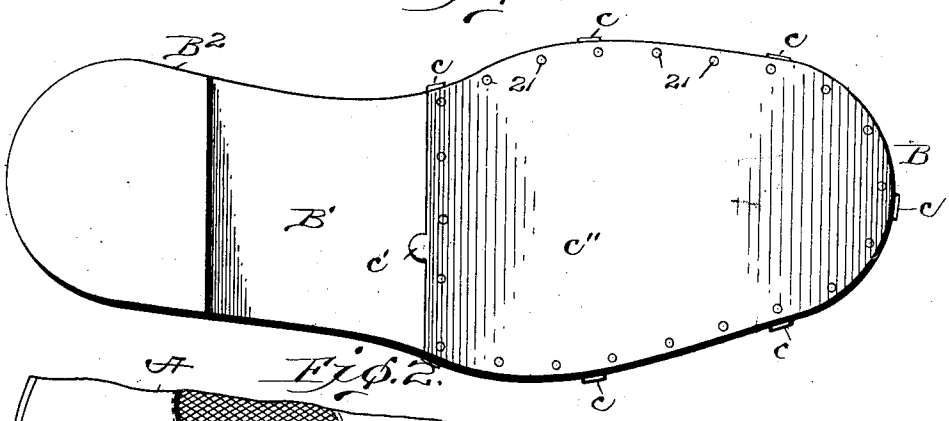


Fig. 2.

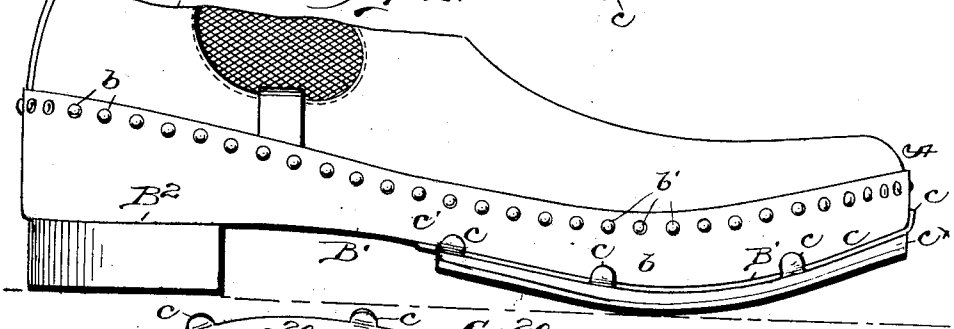


Fig. 3.

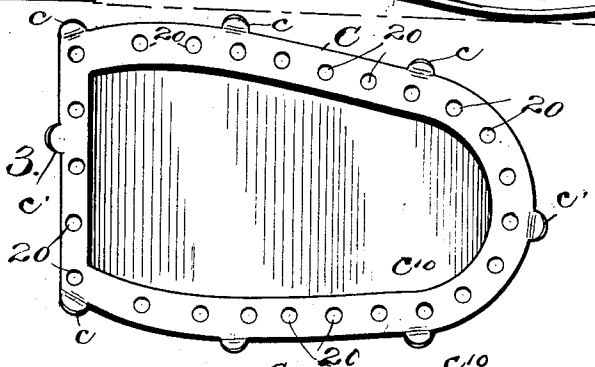
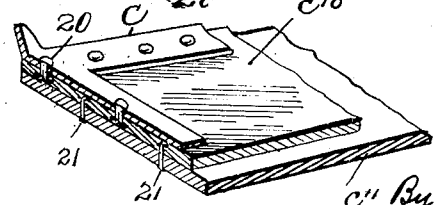


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

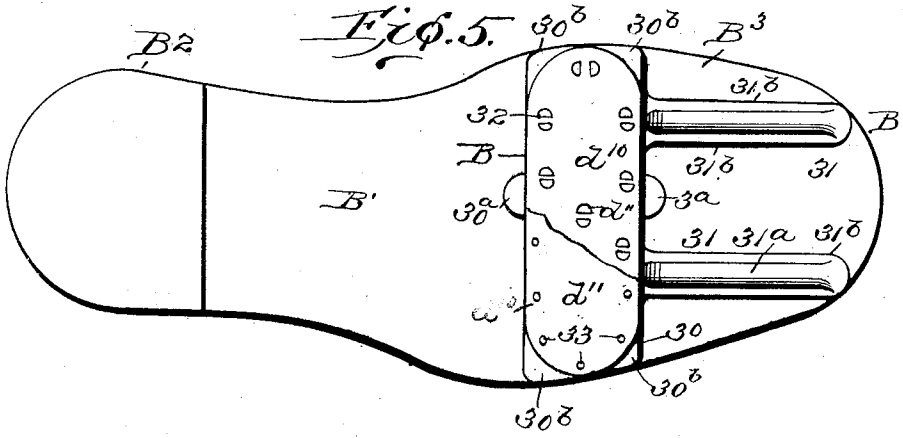


Fig. 6.

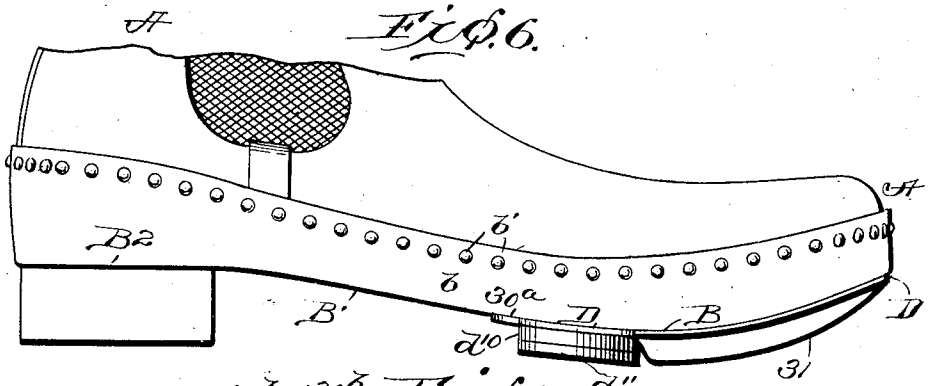


Fig. 7.

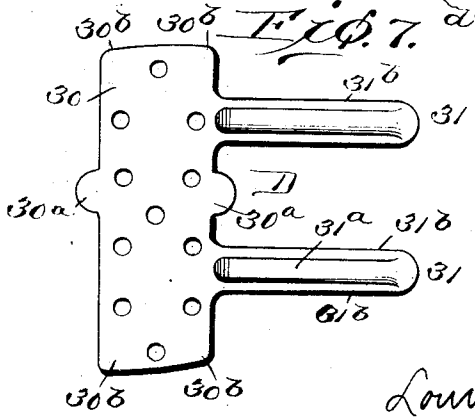
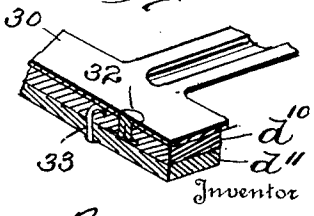


Fig. 8.



Inventor

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UNITED STATES PATENT OFFICE.

LOUIS TROLLE, OF RACINE, WISCONSIN, ASSIGNOR TO AMERICAN METAL SHOE COMPANY, OF RACINE, WISCONSIN, A CORPORATION OF WISCONSIN.

FOOTWEAR.

1,337,983. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed December 5, 1916, Serial No. 135,126. Renewed August 16, 1919. Serial No. 318,041.

To all whom it may concern:

Be it known that I, LOUIS TROLLE, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Footwear, of which the following is a specification.

This invention has reference to that type of footwear—boots, shoes or the like—comprising an upper formed of flexible material, as leather, for example, and a bottom formed of metal: this particular type of footwear being designed for the use of lumbermen, stablemen, quarrymen, metal founders, farmers, workers in breweries, garages, creameries and others who require footwear which will withstand rough usage and protect the feet against moisture, cold, briers, rocks, stones and their effects.

The particular purpose of the invention is to provide footwear of the type stated which may be comfortably worn, and at the same time to introduce important economies in the manufacture and repair of the same.

This important purpose of the invention is secured from the constructions and correlations of parts exemplified in the accompanying drawings, wherein:—

Figure 1 is a plan view of an article of footwear, and shows one particular embodiment of my invention;

Fig. 2 is a side view of the same;

Fig. 3 is a detail view of the separately formed sole-portion of the article, seen from above and before it has been attached to the metallic bottom of the article;

Fig. 4 is a detail sectional perspective view intended particularly to show the way by which the several parts of the separately-formed sole-portion of the article are connected;

Fig. 5 is a plan view of the under side of an article of footwear having a different embodiment of the invention with one layer of the sole-portion cut away to disclose a layer above the same;

Fig. 6 is a side view of the latter form of said article;

Fig. 7 is a detail plan view of the separately formed metallic sole-member; and

Fig. 8 is a detail sectional perspective view showing the separately formed metallic sole-member and the relatively soft ground-engaging portions, particularly intended to show the means for securing these parts together.

The article of footwear shown in both exemplifications of the invention includes an upper A which may be of any appropriate style and type and is formed of any suitable flexible material—leather, for example—and a bottom which comprises a portion B to which the sole is secured, a shank B′ and a portion B^2 to which the heel is secured. This bottom is made of metal (sheet steel being preferred) and the three stated portions thereof are preferably integral with each other. It has a marginal flange *b*, which is permanently secured by suitable means, as the rivets *b′*, for example, to the lower edge of the upper A.

Moreover, in both of the herein exemplified forms of the invention there is a metallic sole member formed separate from the herein referred to bottom, but permanently united thereto in such a manner as to be substantially integral therewith.

One of the exemplified forms of the separate metallic sole member, as will be best seen on reference to Fig. 4, consists of an open frame C whose dimensions and contour are such that it will extend from the toe to the shank with its front and longitudinal marginal edges in juxtaposition to the corresponding edges of the sole portion B, and said marginal edges are formed with projections *c* which are turned up to lie against the flange *b*. The member C also has a flange *c′* which lies against the shank B′. The flanges *b* and projection *c* and the shank B′ and projection *c* are united so as to be substantially integral, as by welding, electric welds being preferred. In the particular construction shown in Figs. 1–4, inclusive, the projections of the member C are in the form of spaced lugs or ears, but this, while preferred, is not essential.

In the form of the invention shown in Figs. 5–8, inclusive, the member which corresponds to the member C of the other form, is marked D. This member comprises a

plate 30 and a plurality of spaced forwardly extending arms or bars 31. The plate 30 extends across the sole-portion B of the bottom at a place immediately underneath the ball of the foot and the arms or bars 31 extend to the toe portion of the bottom and have convex under surfaces. The arms or bars form rocker bars which are essential to the comfort of the wearer when this part of the shoe is not made of flexible material. They preferably are formed with longitudinal channels, 31^a, providing marginal edges 31^b which may be welded or otherwise suitably united to the sole portion B of the bottom, and the plate 30 also has projections 30^a which extend from opposite edges of the plate and are welded or otherwise suitably united to said portion of the bottom. The corners 30^b of the plate form projections which also are united to the sole portion B of the bottom.

These members C and D provide carriers by which relatively soft ground-engaging members, which are appropriately attached thereto, are connected to the metallic bottom.

It is to be understood that neither of these metallic members C, D is to be detached from the metallic sole-portion B of the shoe bottom, although they carry the flexible or relatively soft ground engaging portions which are subject to wear. Hence provision should be made for renewing the ground-engaging member when the same becomes worn and this is taken care of in each of the herein exemplified forms of the invention by constructing the ground-engaging member of two or more layers of flexible material and by permanently securing to the metallic member C or D the layer which lies next to the same and utilizing said layer as the element to which the other layer or layers are secured. Thus, upon reference to Fig. 3 it will be seen that the upper layer, marked c^{10}, is permanently secured to the member C by rivets 20 whose heads are substantially flush with the upper surface of said members and whose prongs are clenched against the under surface of the layer c^{10}: and that the lower layer, marked c^{11}, is secured to the upper layer by nails 21 whose points are clenched between the upper surface of the upper layer and under surface of the member C. In Figs. 5 and 8, the upper layer, marked d^{10}, is shown as permanently secured to the plate 30 by rivets 32, whose prongs are upset against the lower surface of the layer, and the lower layer, marked d^{11}, is shown as fastened to the upper layer by the nails 33, whose ends are upset against the upper surface of the upper layer.

It will be apparent that the upper layer, being protected against wear by the lower layer or layers need not be renewed and substantially forms a permanent but flexible part of the bottom and affords a means by which one or more lower layers of flexible material may readily be secured, whenever desired. These layers are preferably formed of leather or a suitable composition having the desirable qualities of leather in a use of this nature.

It will be noted that the layers c^{10} and c^{11} in the form of the invention exemplified in Figs. 1–4 inclusive, are substantially co-extensive with the sole-portion B of the bottom, while the layers d^{10} and d^{11} in the form exemplified by Figs. 5–8 inclusive, are disposed under the ball of the foot only. In the latter form, the rocker bars 31 give ease to the forward part of the foot in walking. As shown in Fig. 5, the corners of the layers d^{10} and d^{11} are rounded, thus exposing the corners 30^b of the plate 30, in order that the latter may be welded or otherwise suitably united to the metallic bottom of the shoe. Obviously, the members C, D act as anvils to bend the points of the nails 21, 33 while the latter are being driven to attach the layers c^{11}, d^{11} to the layers c^{10}, d^{10} respectively.

In the process of making the shoe, the metallic bottom, comprising the portions B, B^1, B^2 and the flange b, is formed by molding or stamping it to shape and is riveted to the selected upper A. The separate metallic member C or D is formed, preferably by stamping the same and the layer c^{10} or d^{10}, as the case may be, is riveted thereto. After the metallic bottom has been secured to the upper A and after the layer c^{10} or d^{10} has been secured to the metallic member C or D, respectively, and either before or after the renewable layer c^{11} or d^{11} has been secured to the layer c^{10} or d^{10}, the members C or D are welded or otherwise permanently, and preferably integrally, united to the sole portion B of the bottom.

It will thus be seen that I have provided a shoe or other article of footwear of the metallic bottom type, which may be comfortably worn, may be very economically produced and whose relatively soft wearing part may be readily renewed, and it will be particularly noted that the inner surface of the bottom B is entirely free from any fastening elements and has no openings through which water, snow or the like may enter.

It, of course, will be understood that while I have described the invention with reference to the sole portion of the shoe, it is equally applicable to the heel, by obvious changes in the shape and dimensions of the members C, D and of the layers which are secured thereto. It will also be understood that while I have described the illustrated forms with some degree of particularity, these forms nevertheless are merely exemplary and that the invention may be other-

wise and variously embodied without departing from its spirit or the scope of the subjoined claims.

What I claim is:—

1. An article of footwear, comprising a flexible upper, a metallic bottom secured to the upper, a second metallic member, formed separately from the bottom and permanently united thereto, and a relatively soft ground-engaging member secured to the second metallic member.

2. An article of footwear, comprising a flexible upper, a metallic bottom secured to the upper, a second metallic member, formed separately from the bottom and permanently united thereto, and a relatively soft ground-engaging member comprising two layers, one of which is permanently secured to the second metallic member and provides a backing to which the other layer is fastened.

3. An article of footwear, comprising a flexible upper, a metallic bottom secured to the upper, a second metallic member, formed separately from the bottom and welded thereto, a relatively soft layer, rivets extending through the flexible layer and second metallic member and having their heads substantially flush with the upper surface of the latter and their prongs upset against the lower surface of the layer, and a second relatively soft layer secured to the first-mentioned layer.

4. An article of footwear comprising a metallic bottom, a transversely disposed metallic carrier secured to the underside of the sole portion of said bottom and provided with longitudinally extending rocker bars and a relatively soft wear member carried by said carrier.

5. An article of footwear, comprising a flexible upper, a metallic bottom, a second metallic member permanently secured to the metallic bottom and extending across the same and provided with forwardly projecting arms or bars having convex lower surfaces, and a relatively soft member arranged rearward of the arms or bars and secured to the second-metallic member.

6. An article of footwear, comprising a flexible upper, a metallic bottom, a second metallic member, comprising a portion which extends transversely of the bottom and arms or bars which extend longitudinally of the bottom from said portion and have convex under surfaces, the transversely extending portion and the arms or bars of the second metallic member having flanges which are welded to the metallic bottom, and a relatively soft member mounted upon and attached to the transversely extending portion of the second member.

7. An article of footwear, comprising a flexible upper, a metallic bottom, a second metallic member, comprising a portion which extends transversely of the bottom and arms or bars which extend longitudinally of the bottom from said portion and have convex under surfaces, the transversely extending portion and the arms or bars of the second metallic member having flanges which are welded to the metallic bottom, a relatively soft layer permanently attached to the transversely extending portion of the second member, and a second relatively soft layer attached to the first layer.

8. Means forming a relatively soft ground-engaging portion for attachment to a metallic bottom of an article of footwear, the said means comprising a metallic member having flanges arranged to be welded to said bottom, and a relatively soft layer attached to said member.

9. Means forming a relatively soft ground-engaging portion for attachment to a metallic bottom of an article of footwear, the said means comprising a metallic member having flanges arranged to be welded to said bottom, a relatively soft layer permanently attached to said member, and a second relatively soft layer attached to the first layer.

10. Means forming a relatively soft ground-engaging portion for attachment to a metallic bottom of an article of footwear, said means comprising a metallic member having a part to extend transversely of the metallic bottom and parts spaced from each other and arranged to extend longitudinally of said bottom, the latter parts having convex under surfaces and flanges arranged to be welded to the bottom, the transversely extending part of said member also having portions arranged to be welded to the bottom, and a relatively soft ground-engaging element attached to said transversely extending part of the metallic member.

In testimony whereof I affix my signature.

LOUIS TROLLE.