March 21, 1939. H. G. JOSEPHSON 2,151,554

ARMORED SHOE

Filed Feb. 13, 1937

Fig. 5.

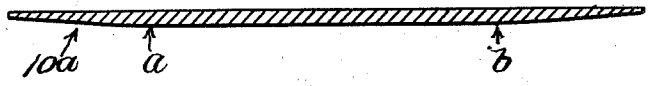
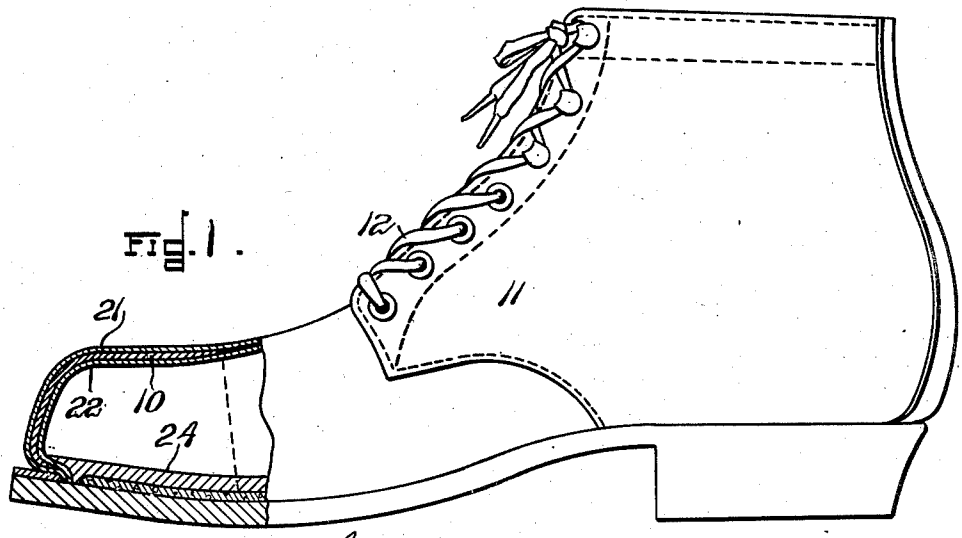


Fig. 1.



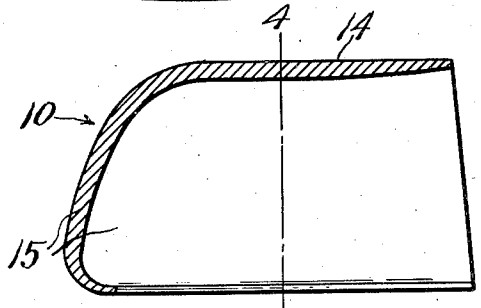


Fig. 3.

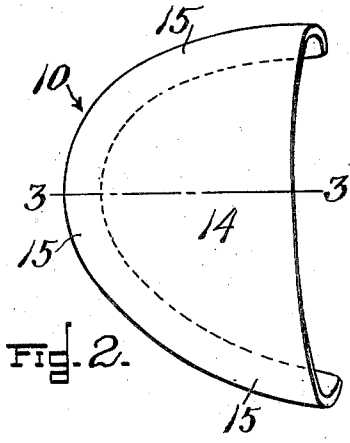


Fig. 2.

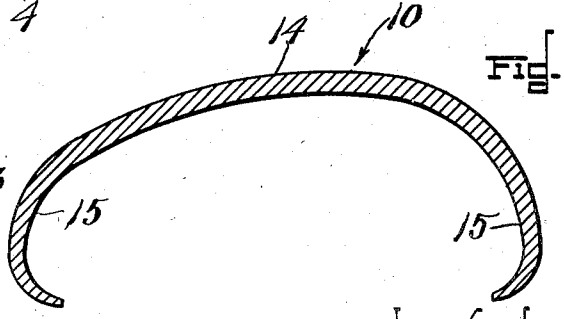


Fig. 4.

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ARMORED SHOE

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Application February 13, 1937, Serial No. 125,556

2 Claims. (Cl. 36—77)

My invention relates to boots and shoes and more especially to workmen's boots and shoes of that class which have the toe portion of the upper reinforced and strengthened to protect the foot against injury when a heavy object is accidentally dropped thereon.

Workers in foundries, machine shops and many other places are often called upon to handle heavy castings, or other objects, and it often happens that a workman will drop such an object upon his foot resulting in serious injury to the latter, particularly the toes.

My invention has for its object to provide an improved armored boot or shoe for workmen which will shield and protect the foot of the wearer so as to prevent injury thereof in the manner just referred to.

It is also an object of my invention to provide, as a new article of manufacture, a toe-shielding box of novel and advantageous construction for incorporation within the toe portion of a workman's leather shoe.

It has heretofore been proposed to construct the toe portion of a workman's leather shoe of the character described with a toe-shielding sheet metal box molded so as to provide the same with a top wall portion and an integral skirt portion at the opposite sides and front of said top wall portion, said box being wholly embedded within the toe portion of the upper of the shoe and affording protection to the toes of the wearer against injury from a heavy object falling thereon. So far as I am aware, however, such boxes have always heretofore been made of uniform thickness throughout and in order to avoid uncomfortable shoulders upon the interior of the shoe the metal employed was comparatively thin so that it was necessary to harden the same to a high degree in order to give to it the required strength and rigidity with the result that sometimes the box would be fractured by a blow and parts thereof driven into the foot of the wearer.

With the object of obviating these objectionable features, I have provided, as a new article of manufacture, an improved sheet metal toe box having the peculiar characteristics set forth in the following description, the several novel features of the invention being particularly pointed out and defined in the claims at the close thereof.

In the accompanying drawing:

Figure 1 is a side elevation of a workman's shoe, partly in section, having the toe portion thereof constructed in accordance with this invention.

Figure 2 is a plan view of the sheet metal toe box forming part of the shoe illustrated in Fig. 1.

Figure 3 is a section, somewhat enlarged, on line 3—3 of Fig. 2.

Figure 4 is a section on line 4—4 of Fig. 3.

Figure 5 is a cross-sectional view of the sheet metal blank from which my new toe box is formed.

In Fig. 1 of the accompanying drawing I have shown my new protective box 10 as incorporated in a workman's shoe of the blucher type whose upper 11 is held closed around the ankle by means of a lace 12. The box 10 is preferably placed in position between the upper leather 21 and lining 22 when these parts are assembled on the last with the innersole 24.

My new protective toe box 10 is made from a sheet steel blank 10*a*, Fig. 5, of a size and outline suitable to be molded by means of dies into the toe-shape shown in the other figures of the drawing, after which it is hardened and tempered as usual. When completed the toe box comprises a top wall 14 whose rear marginal portion tapers in thickness toward its edge and a skirt 15 extending continuously along the opposite sides and front thereof and tapering in thickness toward its bottom and rear edges, the lower marginal portion of the skirt being curved or bent inwardly a comparatively short distance to fit into the inseam of the shoe as shown in Fig. 1 so as to occupy a position outside of the usual stitches, not shown, which fasten the innersole either directly or indirectly to the outersole. If desired, the usual leather or fiber toe box, not shown, may be provided within the metal toe box 10 when the latter is incorporated within the shoe.

A particular point of novelty of my invention is that the blank 10*a*, Fig. 5, from which the box 10 is produced, is formed with a relatively large middle section extending from *a* to *b* that is of uniform thickness throughout and which is surrounded by a marginal section or area extending from *a* and *b* to the perimeter of the blank and this marginal part is made tapering in thickness the outer edge of the blank. In other words, the blank is formed with a middle area of uniform thickness and with a beveled marginal area surrounding the same.

In practice I may make the middle area of the blank three thirty-seconds of an inch thick and the outer edge of the blank about three sixty-fourths of an inch thick, but these dimensions may be varied so long as the middle area is of relatively greater thickness and all of the marginal portion is beveled or tapered in thick-

ness to a relatively thinner edge. Thus the greater middle portion of the finished toe box can be made much thicker and stronger than was possible with the constructions heretofore proposed while the tapered marginal portions with their thin edges avoid the production of uncomfortable shoulders within the shoe.

The blank 10*a* may be shaped as described by any suitable means but preferably by means of a drop hammer, press or the like, or by rolling because of the expense of other methods and because the result of the preferred methods is that the material of the beveled marginal portion is compressed or condensed thereby materially stiffening and reinforcing the same.

The ordinary metal toe box heretofore provided consisting of a single piece of sheet metal of uniform thickness throughout, usually about three thixty-fourths of an inch, hardened and tempered, will withstand crushing pressures, gradually applied, of about three thousand pounds, and about one hundred and twenty-five to one hundred and fifty foot pounds imposed thereon by a falling weight. On the other hand, my new toe box produced as above described will withstand very much greater crushing pressures gradually applied, and about four hundred foot pounds imposed thereon by a falling weight.

What I claim is:

1. A shoe of the character described comprising an innersole, an outersole and an upper, and including as a part of the toe thereof a unitary sheet metal toe box structure for shielding the foot of the wearer from injury by a heavy object falling thereon, said toe box unit having only a top wall part whose rear marginal portion tapers in thickness toward the rear edge thereof and a skirt at the opposite sides and front of said top wall part whose lower and rear opposite side marginal portions taper in thickness toward the edges thereof, the lower marginal portion of said skirt being bent inwardly a comparatively short distance to fit into the inseam of the shoe so as to occupy a position wholly outside of the fastening devices which connect the innersole with the outside parts of the sole of the shoe.

2. As a new article of manufacture, a unitary molded sheet metal toe box structure for a shoe of the character described, said unit having only a top wall part whose rear marginal portion tapers in thickness toward the rear edge thereof and a skirt at the opposite sides and front of said top wall part whose lower and rear opposite side marginal portions taper in thickness toward the edges thereof, the lower marginal portion of said skirt being bent inwardly a short distance to fit into the inseam of the shoe in which the toe box structure is incorporated and so as to occupy a position wholly outside of the fastening devices which connect the innersole of the shoe with an outside part of the sole thereof.

HELMER G. JOSEPHSON.