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SAFETY SHOES

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Fig. 1.

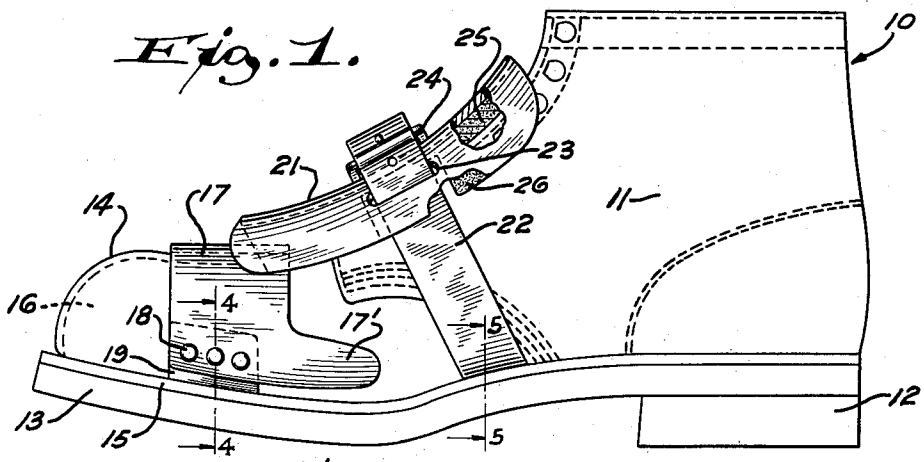


Fig. 2.

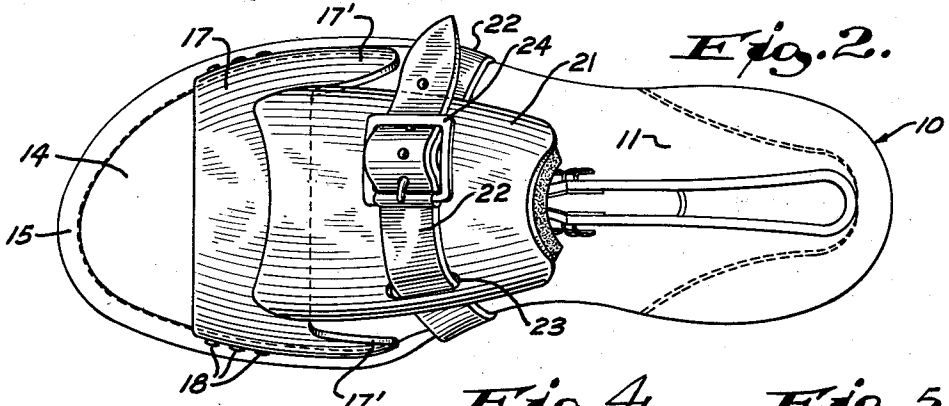


Fig. 3.

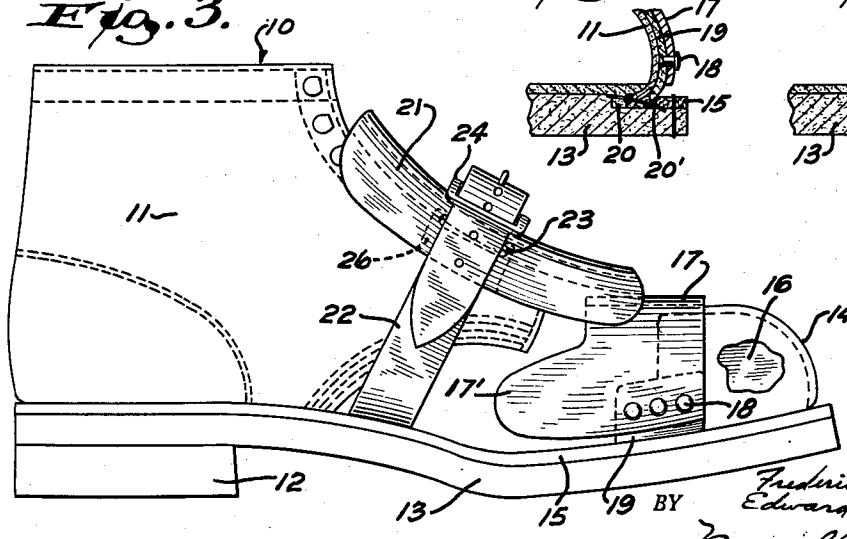
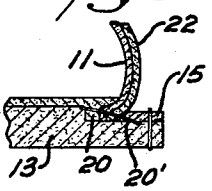


Fig. 4.

Fig. 5.



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SAFETY SHOES

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8 Claims. (Cl. 36—72)

This invention relates to improvements in safety shoes for use by steelworkers, foundrymen, welders, and other workmen engaged in hazardous occupations.

The general object of the present invention is to provide a safety shoe which will afford protection against hot metal or other materials likely to cause burns, and from heavy falling objects which might crush or otherwise injure the foot.

A particular object of the invention is to provide an improved safety shoe which will not be unduly heavy and cumbersome, but which will afford a maximum of comfort, lightness and flexibility, while retaining its protective qualities.

A further object of the present invention is to provide a safety shoe of the type described which is relatively simple in construction, economical to manufacture, and unusually neat and attractive in appearance.

A more specific object of the present invention is to provide an improved safety shoe in which external plastic toe and instep protectors are positioned on the top surface of the shoe and attached thereto by retaining straps permanently anchored between the upper leather and welt, the unusual shape and contour of the plastic protectors and the novel manner in which the strap ends are anchored and positioned coacting to produce a flexibility and protectiveness heretofore unknown in the safety shoe art.

A further object of the invention is to provide a construction as above described which may be readily built into a standard safety toe work shoe to render the same suitable for use in special occupations.

With the above and other objects in view, the invention consists of the improved safety shoe, and all of its parts and combinations, as set forth in the claims, and all equivalents thereof.

In the accompanying drawing, in which the same reference characters designate the same parts in all of the views:

Fig. 1 is a side elevational view showing one side of the improved safety shoe;

Fig. 2 is a top view of the shoe;

Fig. 3 is a side elevational view of the improved safety shoe showing the side opposite that shown in Fig. 1;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1; and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 1.

Referring more particularly to the drawing, the improved safety shoe comprising the present invention includes a high work shoe 10, principally of leather, having an upper 11, heel 12, sole 13, toe 14, and welt 15. Formed on the inside of the toe is a rigid metal toe protector 16, such as is employed in the conventional safety shoe. An external toe shield 17 of hard, rigid, lightweight plastic material is molded in transversely curved form to fit over a forward portion of the shoe as illustrated and partially overlap the rear edge of the metal

toe 16, and is attached by means of rivets 18 to short flexible straps 19, as best appears in Fig. 4. The straps 19, preferably of leather, are stitched between the welt 15 and lower edge of the upper 11, by the same stitching 20' which connects the upper and welt to the stitching rib 20 when using the conventional welt process. The external toe shield 17 has lower rearwardly projecting wings 17' designed to provide additional protective covering.

The novel manner in which the external toe shield 17 is attached to the shoe permits a slight movement of the shield with relation to the shoe and this contributes considerably to the flexibility of the shoe. In addition, the movable nature of said toe shield allows a small degree of yield or give in the event of a violent blow, which yielding action minimizes the damaging effect of such a shock and substantially increases the utility and efficiency of the shoe.

An instep protector 21, also molded of lightweight, durable, rigid, hard plastic material, is positioned on and fits over the instep portion of the shoe, overlapping the rear end of the toe shield 17, and is adjustably retained by leather straps 22. The instep protector is transversely curved in a downward direction with the radius of curvature progressively less toward the upper end. The protector is also longitudinally curved to fit the curve of the instep of the shoe as is clear from Fig. 1. As will best be seen in Fig. 5, the strap ends 22 are stitched between the welt 15 and upper 11, by the inseam stitching 20' which secures the parts to the stitching rib 20. The straps 22 are extended through slots 23 in the instep protector 21 and are adapted to be joined together by a buckle 24, or other suitable means, on the top side of the protector 21.

The material of which the protectors 17 and 21 are made is preferably a molded polyester resin reinforced with fiberglass cloth. This material has strength and hardness combined with lightness in weight.

The underside of the instep protector 21 is lined with sponge rubber 25, or other lightweight cushioning material, which is designed to increase the wearer's comfort and to act as a shock absorber in the event of a hard blow. The portion of said sponge rubber lining 25 around and outwardly of the slots 23, is cut away, as shown in Figs. 1 and 3 to provide channeled depressions 26 for the reception of the straps 22. The latter feature permits the straps to lie flat against the instep and reduces the possibility of the strap folding or bending at a right angle beneath the instep protector. In addition to extending the life of the straps, this arrangement eliminates the formation of strap ridges or protrusions which can cause considerable discomfort to the wearer.

As can be readily seen, the manner in which the instep protector 21 is adjustably retained by the straps 22 permits easy adjustment of the protector to accommodate the needs or convenience of the wearer. To put the shoe on, it is merely necessary to have the straps unbuckled so as to permit the instep protector to be swung to one side and to lace the shoe in the customary manner. The degree of tightness desired may be regulated by the buckle fastening means. It will be noted that the presence of the buckle 24 prevents the complete removal of the instep protector and guards against its inadvertent loss or misplacement.

In addition to their obvious advantages of convenience, the novel straps 22 employed in attaching the instep protector to the shoe function to permit a sliding movement during walking, of the instep protector 21 relative to the overlapped toe shield 17. This latter feature allows the shoe to be readily flexed when the foot bends as in walking or stooping, thereby contributing to the flexibility and comfort of the shoe. Furthermore, the

slidable nature of the instep protector permits a degree of yield or give in the event of a blow and helps to lessen the harmful effects of such blow.

The unique combination of the coacting metal toe cap **16**, external plastic toe shield **17**, and plastic instep protector **21**, which elements are relatively overlapping and slidable upon one another, form a complete protective covering for the top surface of a foot, extending from the toes to lower ankle, and produce a light, durable safety shoe which is unequaled in comfort and neatness.

Various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the claims.

What we claim is:

1. In a safety shoe, an external shield shaped to fit over a forward portion of the shoe, means securing said shield in position, an instep protector which is longitudinally and transversely curved to fit over the instep portion of a shoe and having a slot near each side, straps secured to the side portion of the shoe and having ends extending slidably through said slots in the instep protector, and means for detachably securing said strap ends together over the protector to maintain the instep protector in assembled position with its forward end overlapping said shield.

2. In a safety shoe, an external shield formed of a rigid, lightweight fiberglass-reinforced plastic shaped to fit over a forward portion of the shoe, means securing said shield in position, an instep protector of like material which is longitudinally and transversely curved to fit over the instep portion of a shoe and having a slot near each side, straps secured to the side portion of the shoe and having ends extending slidably through said slots in the instep protector, and means for detachably securing said strap ends together over the protector to maintain the instep protector in assembled position with its forward end overlapping said shield.

3. In a safety shoe, a metal toe piece formed on the inside of the toe portion of said shoe, an external toe shield formed of an arched strip of hard plastic material overlapping the rear portion of said metal toe and extending rearwardly therefrom, a curved plastic instep protector overlapping the rear portion of said toe shield and shaped to fit over the instep portion of the shoe, and detachable means for movably retaining the instep protector in operative position.

4. In a safety shoe, a metal toe piece formed on the inside of the toe portion of said shoe, an external toe shield formed of an arched strip of hard plastic material overlapping the rear portion of said metal toe and extending rearwardly therefrom, a curved plastic instep protector overlapping the rear portion of said toe shield and shaped to fit over the instep portion of the shoe, and strap and buckle means for movably retaining the instep protector in operative position.

5. In a safety shoe having an upper, having a welt, and having a toe portion, an external toe shield formed of an arched strip of hard material fitting over a toe portion of said shoe, a pair of short retaining straps having lower ends stitched between the upper and welt of said shoe and having upper ends connected to said toe shield, a curved instep protector fitting over the instep portion of the shoe and overlapping the rear portion of said toe shield, a pair of retaining straps having lower ends stitched between the upper and welt rearwardly of said short straps, and means for releasably fastening said straps over said instep protector to hold the latter in assembled position.

6. In a safety shoe having an upper, having a welt, and having a toe portion, an external toe shield formed of an arched strip of hard material fitting over a toe portion of said shoe, a pair of short retaining straps having lower ends stitched between the upper and welt of said shoe and having upper ends connected to said toe shield, a curved instep protector fitting over the instep portion of the shoe and overlapping the rear portion of said toe shield, a pair of retaining straps having lower ends stitched between the upper and welt rearwardly of said short straps, said instep protector having side slots, a sponge rubber lining on the inner surface of said instep protector, said straps being extended through said side slots in said instep protector and said lining being cut away from an area around and outwardly of said slots to provide a channel for said straps, and means for adjustably connected said straps together on the top side of said instep protector.

7. In a safety shoe having an upper and having a welt, a curved instep protector fitting over the instep portion of the shoe, a pair of retaining straps having lower ends stitched between the upper and welt, said instep protector having side slots through which said straps extend, and means for adjustably connecting said straps together on the top side of said instep protector.

8. In a safety shoe having an upper and having a welt, a curved instep protector fitting over the instep portion of the shoe, a pair of retaining straps having lower ends stitched between the upper and felt, said instep protector having side slots, a cushioning lining on the inner surface of said instep protector, said straps beig extended through said side slots in said instep protector and said lining being cut away from an area around and outwardly of said slots to provide a channel for said straps, and means for adjustably connecting said straps together on the top side of said instep protector.

References Cited in the file of this patent

UNITED STATES PATENTS

1,184,013	Pierce	May 23, 1916
1,247,467	Strauss	Nov. 20, 1917
2,392,867	Stoner	Jan. 15, 1946