March 26, 1963 F. A. WILMANNS 3,082,553

SAFETY SHOES

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Fig. 1.

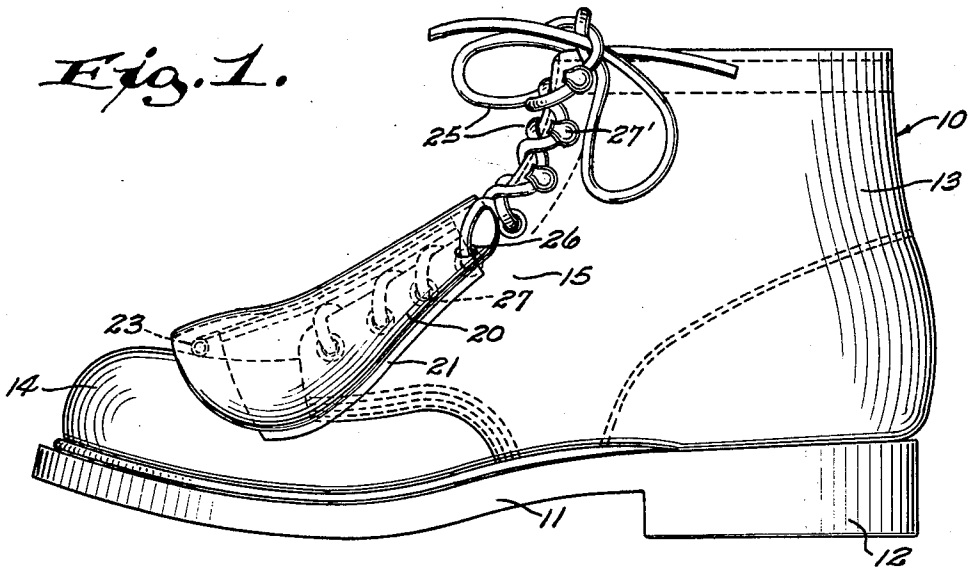
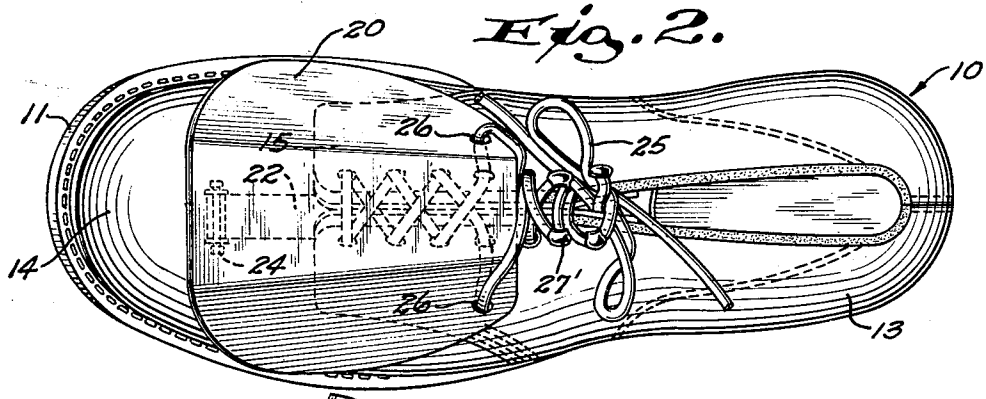


Fig. 2.



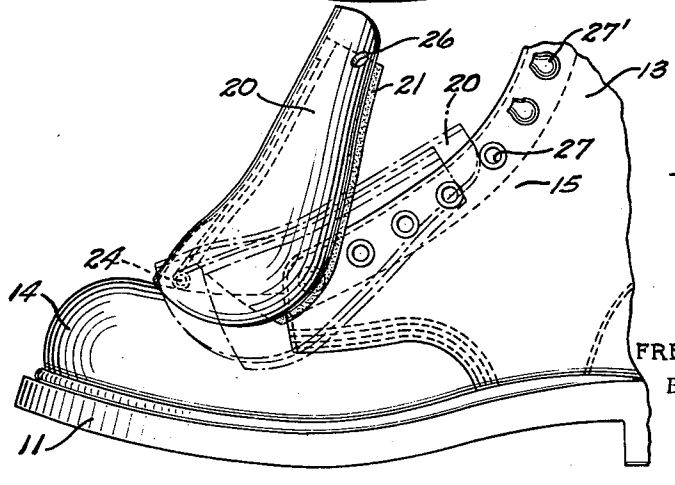


Fig. 3.

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Fig. 4.

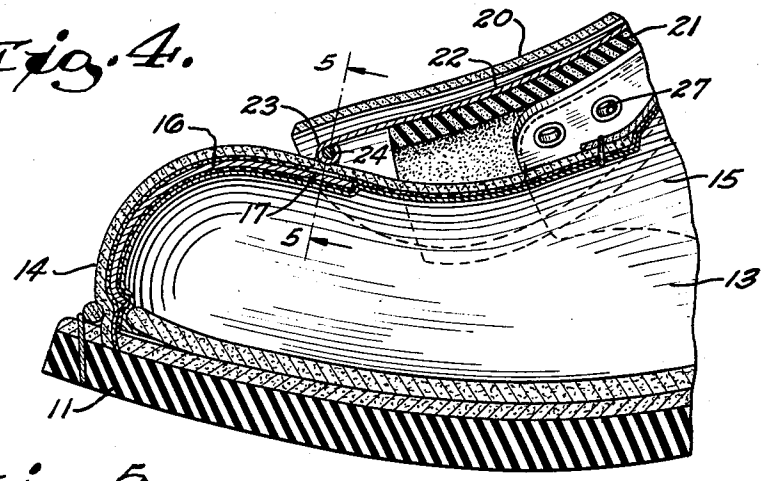


Fig. 5.

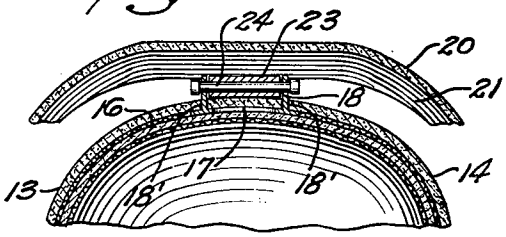


Fig. 7.

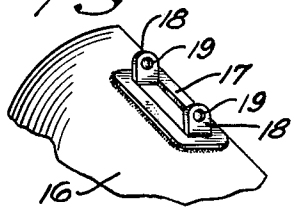
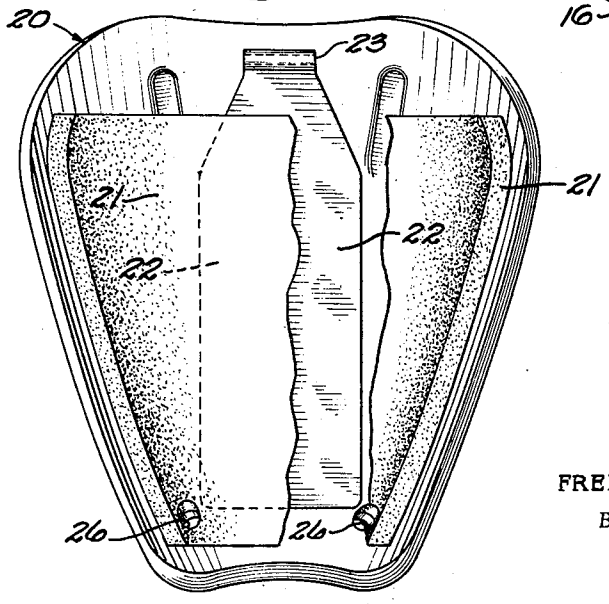


Fig. 6.



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SAFETY SHOES

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2 Claims. (Cl. 36—72)

This invention relates to improvements in safety shoes, and more particularly to a safety shoe having a novel instep guard permanently attached thereto.

For many jobs within foundries, steel mills, or the like, and for other occupations, it is important that the workmen wear so-called safety shoes to minimize the possibility of injury from falling objects, or from molten metal or the like. Such safety shoes usually have steel toe pieces therein, and in addition it is desirable that they include a rigid guard or shield adapted to fit over the instep portion of the shoe. The construction of a shoe incorporating such an instep guard presents a problem, however, because the guard must be so designed that it can be removed from its normal protective position overlying the instep to permit the lacing and unlacing of said shoe. For this reason, some commercially-available safety shoes utilize an instep guard which is strapped onto the shoe and which can be detached and completely separated from the shoe when the workman desires to unlace and remove the same. Unfortunately, it has been found that with this type of attachment, the workmen usually tend to disregard the instep protectors after a while and neglect to attach the same to their shoes, thus losing the advantage of such a shoe and increasing the possibility of serious foot injuries.

With the above in mind, the principal object of the present invention is to provide a safety shoe having an instep guard permanently secured thereto, thereby ensuring the use and accurate positioning of said guard by the wearer, but wherein said instep guard is hingedly connected to said shoe in a simple manner so that it can be temporarily swung to a position where it will not interfere with the normal lacing or unlacing thereof. In addition, the hinge renders the shoe flexible to adapt itself to walking motion.

A further object of the invention is to provide a safety shoe having an instep guard permanently hingedly attached thereto as described, wherein said guard is adapted to be releasably secured in its protective position overlying the instep portion of the shoe by means of the regular shoe laces, thereby eliminating the necessity for the special strap and buckle assemblies used on some safety shoes and which strap connections are not only difficult for the wearer to manipulate and fasten, but which are relatively expensive and add substantially to the manufacturing cost of the shoe.

A further object of the invention is to provide a safety shoe construction which makes it possible for the manufacturer to attach the instep protector to a standard metal toed shoe with a minimum of expense and without necessitating a special shoe construction for the instep protector feature.

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 following specifications and claims, and all equivalents thereof.

In the accompanying drawings, wherein the same reference numerals designate the same parts in all of the views:

FIG. 1 is a side elevational view of the improved safety shoe;

FIG. 2 is a top view thereof;

FIG. 3 is a fragmentary side elevational view of the shoe illustrating a pivoted position of the instep guard;

FIG. 4 is a fragmentary vertical, longitudinal sectional view through the shoe and instep guard;

FIG. 5 is a fragmentary transverse sectional view through the toe portion of the shoe and instep guard, taken along line 5—5 of FIG. 4;

FIG. 6 is a plan view of the underside of the instep guard with part of the lining broken away; and

FIG. 7 is a fragmentary perspective view looking principally at the top of the metal safety toe piece showing the instep guard hinge bracket thereon.

Referring now more particularly to the drawings, the improved safety shoe comprising the present invention includes a high work shoe **10**, principally of leather, having a sole **11**, heel **12**, and an upper **13** having a toe portion **14** and an instep portion **15**, the latter being provided with conventional laces **25** and lace-receiving eyelets **27** and hooks **27'**.

A rigid shield or guard **16** is secured within the toe portion **14** to provide a safety box toe construction, said guard being formed of steel or other rigid metal or material to provide a protective shield over the wearer's toes. Said toe protector is similar to those heretofore used in safety shoes. However, as a part of the present invention, a hinge bracket **17** (FIG. 7) is welded or otherwise permanently secured on the upper surface of said toe piece, being spaced forwardly a short distance from the rearward edge thereof. As illustrated, said hinge bracket **17** is provided with spaced upstanding ears **18** having aligned apertures **19**, said upstanding hinge ears projecting through slits **18'** provided therefor in the leather material covering the metal toe (FIG. 5).

As is shown, the instep guard **20** in the present invention is saddle-like in form, being concavo-convexly curved both longitudinally and laterally, to fit the contour of the instep portion **15** of the shoe. The lower or forward end of said guard is designed to overlap the rearward portion of the metal toe, as illustrated, so that the force of a blow received by said instep guard will be transmitted to and absorbed by said metal toe **16**, thus minimizing the effect of the blow on the instep portion of the wearer's foot. The underside of said instep guard is lined with sponge rubber **21**, or other light-weight cushioning material, which is designed to function as a shock absorber in the event of a blow.

The instep guard in the present invention is preferably formed of a suitable plastic such as "Bolta" of General Tire, having strength and hardness combined with lightness in weight, but it is to be understood that it may be formed of steel, aluminum, wood or the like. The particular material from which said guard is constructed is not critical to the invention and any suitable material may be employed.

As will be seen, the instep guard **20** characterizing the present invention has a pair of laterally spaced lacing apertures **26** adjacent its rearward end, the function of which will be hereinafter described, and the underside of said guard is provided with a metal strip **22** which extends longitudinally down the center thereof. The forward or lower end of said strip **22** is bent to form a cylindrical hinge element **23** adapted to fit between the aforementioned upstanding hinge ears or elements **18** on the steel toe protector **16**.

In the assembly of the present shoe, the instep guard **20** is positioned over the instep portion **15** of the shoe and the hinge element **23** on said guard is fitted between the hinge ears **18** on the exterior of the toe portion of said shoe. A hinge pin **24** is then inserted into and through said aligned hinge elements **18** and **23**, and headed at both ends or otherwise permanently secured therein, to form a hinge connection permanently but piv-

otally attaching said instep guard to the shoe. As is shown in FIG. 3, due to the hinge connection thus provided, said instep guard 20 may be swung from the position shown in FIG. 3 in broken lines, wherein it overlies the shoe instep, to the nearly upright position shown in full lines, wherein it is spaced from the instep and permits the wearer to put on or remove the shoe without difficulty. It will be noted that when said guard 20 is in its upright position it is still at an angle less than the true vertical, the purpose of which will be seen.

When the shoe and instep guard have been assembled as described, the regular shoe laces 25 are threaded progressively upwardly through the rows of eyelets 27 and through the aforementioned apertures 26 in the upper portion of the guard 20 (FIGS. 1 and 2), said laces then being laced around the lace hooks 27' and tied in the conventional manner. The result is that the instep guard is permanently attached to the shoe at its lower end by means of the hinge assembly above described, and is releasably maintained in protective position over the wearer's instep by means of the shoe laces 25.

The safety shoe comprising the present invention can be easily and quickly removed from a wearer's foot merely by untying and loosening the upper portions of the laces 25 and manually swinging the upper end of the instep guard 20 upwardly to the full line position of FIG. 3. The lower portions of the laces may then be loosened sufficiently to permit the easy withdrawal of the shoe. When loosening the lower portions of the laces, it is unnecessary to draw said laces completely through the instep guard apertures 26. The result is that once the laces have been laced through the instep guard in the present invention, they need never be withdrawn therefrom, and the securement of said guard in its protective position over the wearer's instep is automatically accomplished merely by the tightening and tying of said laces in the ordinary manner.

Unlike those safety shoes wherein the instep guard is detachable and can be completely separated from the shoe, the permanent attachment of the instep guard to the present shoe eliminates the possibility of said guard being discarded or neglected by the workman. Moreover, even in the event the user is too lazy to thread the shoe laces through the instep guard apertures 26 as described, the design of the present shoe ensures that said guard will nevertheless provide protection for the instep portion of the wearer's foot.

As will be seen in FIG. 3, and as hereinabove mentioned, when the instep guard is in its upright position, it is at an angle less than the true vertical, the forward end of said guard projecting a short distance beyond the hinge and abutting the surface of the shoe as illustrated in full lines in FIG. 3 to prevent further upward swinging movement of said guard. Thus, when said guard is not manually held in its upright position it will fall by gravity to a lowered position overlying the shoe instep. This is not as desirable as having said guard firmly held in its protective position by the laces 25, but it nevertheless ensures protection for the user's instep.

From the foregoing detailed description, it will be seen that the present invention provides a unique safety shoe incorporating an instep protector which, while it is permanently secured to the shoe and eliminates the possibility of the wearer neglecting to use the same, is so designed that it can be temporarily moved to a position where it will not interfere with the normal lacing or unlacing of the shoe.

A further important advantage of the present construction is that by utilizing the regular shoe laces to releasably secure the instep guard in its protective position over the wearer's instep, it is unnecessary to have a special, relatively expensive strap and buckle assembly such as is used in prior shoes of the same general type. Moreover, once said shoe laces have been threaded through the instep guard apertures, the securement of said guard in its protective position over the instep is automatically accomplished merely by the tightening and tying of said laces in the ordinary manner, thus eliminating the tedious and time consuming task of manually manipulating and fastening a number of straps and buckles.

With the present construction, it is possible for a shoe manufacturer to readily provide safety shoes either with or without the instep protector. Due to the novel features of the present invention, the hinge bracket 17 may be quickly added to a standard toe piece when it is desired to have an instep protector on the finished shoe. The only other change in the construction which is required is the provision of the small slits 18' in the leather of the toe to receive the hinge ears 18. Thus, a standard metal toed shoe may be readily manufactured with the instep protector feature with a minimum of expense and without necessitating a special shoe construction for the instep protector feature.

With the above in mind, it is intended that the present invention include the embodiment illustrated and hereinbefore described, and any and all modifications or changes therein as may come within the spirit of the invention and within the scope of the following claims.

What I claim is:

1. In a safety shoe having an instep portion and having a flexible toe portion with spaced slits and having a rigid toe protector permanently within and covered by said flexible toe portion, the improvement comprising: a hinge bracket permanently secured to the upper surface of said rigid toe protector beneath said flexible toe portion and having spaced hinge ears projecting through the spaced slits of the flexible covering of said toe portion; a rigid, instep guard normally positioned to overlie the instep portion of said shoe, said instep guard having a lower end overlapping said toe protector; a cylindrical hinge element secured to on the underside of said instep guard adjacent its lower end, said hinge element interfitting between said spaced hinge ears on the toe portion; and means external to said toe portion securing said hinge elements together to form a hinge connection whereby said instep guard can be swung about said hinge from its normal position overlying the instep portion of said shoe to a position spaced therefrom.

2. In a safety shoe having an instep portion including an elongated lacing section with shoe laces therein and having a toe portion of flexible material with a rigid toe protector permanently within and completely covered by said flexible material, the improvement comprising upstanding hinge means permanently secured to the upper surface of the toe protector beneath the flexible material and having portions projecting through said flexible material, a rigid instep guard, and a hinge element on the underside of said instep guard adjacent its lower end interfitting with the projecting portions of the hinge means of the rigid toe protector, means permanently securing said hinge elements together to form a hinge connection whereby said instep guard can be swung about said hinge from an operative position overlying the instep portion of the shoe to a relatively upright position, said instep guard having eyelets in an upper portion positioned over an intermediate portion of the length of said lacing section when the instep guard is in operative position through which intermediate portions in the length of said shoe laces can be laced to releasably hold said instep guard in its operative position.

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