Jan. 11, 1938. M. G. REECE ET AL 2,105,263

INDUSTRIAL SHOE

Filed June 8, 1936

Fig. 1.

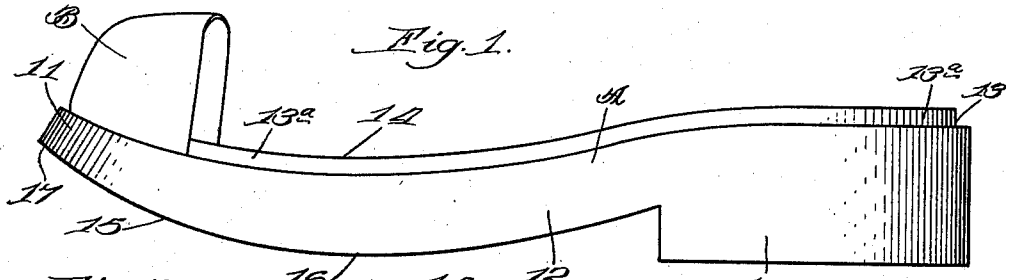


Fig. 2.

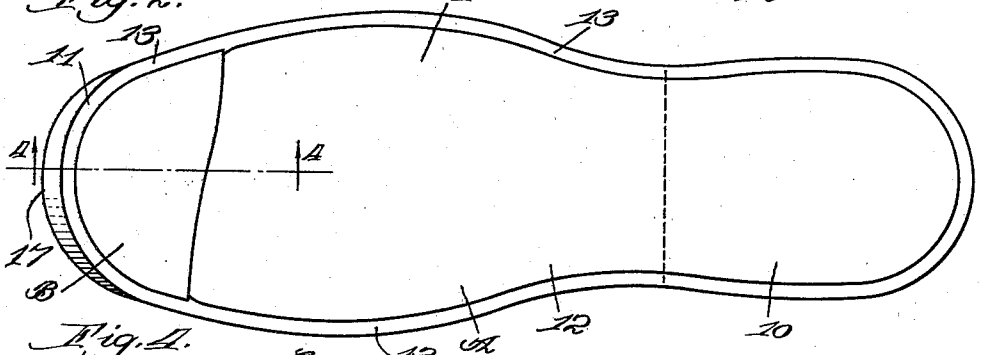


Fig. 4.

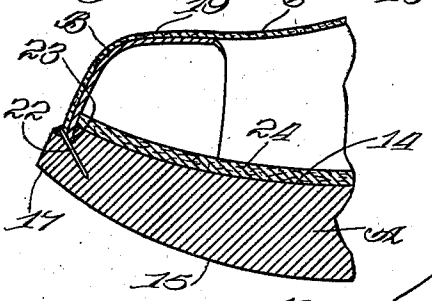
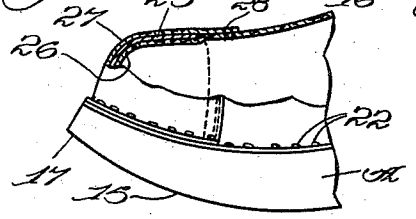


Fig. 3.

Fig. 5.



Inventors:
M. Genevieve Reece,
Alta Dorthea Reece and
Gus E. Bergman.
By Dyrenforth, Lee, Chritton & Wills.
Att'ys.

Patented Jan. 11, 1938 2,105,263

UNITED STATES PATENT OFFICE

2,105,263

INDUSTRIAL SHOE

Mae Genevieve Reece, Alfa Dorthea Reece, and Gus E. Bergman, Columbus, Nebr., assignors to Reece Wooden Sole Shoe Company, Inc., Columbus, Nebr., a corporation of Nebraska

Application June 8, 1936, Serial No. 84,200

2 Claims. (Cl. 36—2.5)

This invention relates to a shoe, and more particularly to an industrial shoe having a wooden sole and metal toe.

An object of the invention is to provide a shoe which will afford maximum protection to the wearer and which is particularly adapted for use in industrial plants where there is danger of injury to the feet of workmen. A more specific object is to provide a shoe which will give adequate protection to the toes of the wearer and which will prevent injury through falling objects and the like. A further object is to provide a shoe which is safely and comfortably worn even under adverse heat conditions or where there is contact with water, oil or acid. Other objects and advantages will appear as the specification proceeds.

Shoes having wooden soles have long been used in industrial plants. Advantages of the wooden soles are that they are non-conductors of heat or electricity, that they are non-porous and especially serviceable in preventing liquids or chemicals from access to the feet of the wearer, and that they are rigid and non-yielding and tend to prevent injury to the foot by sharp objects walked upon, or through a blow from beneath the foot. These advantages have caused the wooden soled shoe, long known in the art, to be widely used in industrial plants.

However, the protection afforded by the wooden sole has not been adequate to properly protect the feet of the workmen. It has been common for a heavy object to fall upon the foot of the workman, embed itself in the upper of the shoe, and pin the foot fast before he has a chance to extricate it. A rigid wooden sole in itself is ineffective to prevent this type of injury, but rather tends to aggravate it, for the rigid inner surface will allow the toes no escape.

We have discovered a type of industrial shoe which meets the demand for adequate toe protection. In our construction we employ a metal toe piece. Though in the past metal has been used in the toes of some conventional type shoes, to our knowledge a metal piece has never before been used in an industrial shoe having a wooden or rigid sole. The peculiar advantages of such construction appear more clearly after my detailed description.

In the drawing—

Figure 1 is a side view in elevation of the wooden shoe sole and the steel toe; Figure 2, a plan view of the wooden shoe sole with the steel toe; Figure 3, a side view in elevation of a completed shoe; Figure 4, a fragmentary sectional view of the front portion of the completed shoe, the section being taken along line 4—4 of Figure 2; and Figure 5, a fragmentary view partly in section, of a modification of our invention.

In the illustrations given, A designates a rigid shoe sole; B, a rigid metal toe; and C, the leather upper.

The sole A is herein described as being made of wood, this being the preferred material, but it may also be made of other rigid non-flexible materials. A light weight wood of strong tough fibre makes a good material. The thickness of the sole may be as desired, but we have found a thickness of approximately 2 inches at the heel and approximately 1¼ inches under the ball of the foot to be satisfactory. The top of the sole is shaped to conform with the foot in natural position. The top of heel 10 and toe portion 11 are slightly higher, and the inside portion of shank 12 appears slightly raised to form a partial support for the arch of the foot.

Around the top edges of the sole is a rabbet or groove 13. As a result of this groove, all the top edges of the sole are lowered and the inner portion 14 which supports the foot appears raised. As illustrated, groove 13 is about ¼ inch wide and ¼ inch deep, though these dimensions may be varied if desired. At the toe portion groove 13 is increased in width to allow room for the lower edge of the steel toe. The wall 13a of groove 13, as shown in the illustration, is vertical and perpendicular with the top of the sole, but if preferred the wall 13a may be inclined inwardly at the bottom causing rabbet or groove 13 to extend slightly under the inner sole portion 14.

The bottom of the sole consists of the heel 10, the shank 12, and the rocker portion 15. The under portion of heel 10 is of shape similar to the heel of a conventional type shoe and needs no further description. The under surface of the shank and rocker portions are of substantially arcuate contour, the lower point 16 being approximately midway between the heel 10 and the tip 17 of the toe. The upward curvature of the rocker portion 15 is such that when the shoe is tipped forwardly the sole will rock on the walking surface to allow the foot to raise and turn as in the natural movement of walking.

The upper C is preferably made of leather and comprises the vamp 19, heel counter 20, and leg portion 21. The vamp 19 is preferably in one piece and is adapted, when attached to the sole, to completely cover the metal toe B. The counter and leg portions are sewed and riveted together as in ordinary shoe construction. But in attaching the upper to the sole we prefer to turn the lower edges outwardly and drive nails 22 from the exterior of the shoe through the outwardly turned edges, through the bottom of groove 13, into the wood of the sole. The points of nails 22 should be inclined inwardly so as to draw the upper well into the corner of groove 13. At the toe portion the upper is attached just as at the sides except that here the upper is not

in contact with wall 13a of the groove, the steel toe being interposed therebetween.

The metal toe B is in general the shape of the toe of an ordinary shoe, except that it is deeper to allow ample room for toe comfort, as, being non-resilient, it can not yield in any way. Preferably the toe B is made of steel, but other metals or non-resilient materials may be used, if desired. As shown more clearly in Figure 4, its under edge 23 is turned inwardly so as to form a slight hook for engaging wall 13a of the groove on the wooden sole.

In the assembly of the various parts, the steel toe is first placed on the toe portion of the wooden sole with the edge 23 engaging wall 13a of the groove. The upper, its several parts being previously sewed and riveted together, is then placed in position, the front portion of the vamp extending all about the steel toe. By nailing the upper to the sole as previously described, the parts are made secure. The edges of the leather are then preferably trimmed off flush with the edges of the sole. An insole 24 may be inserted inside the shoe to provide greater comfort to the wearer.

When the shoe is being worn and the wearer is in standing position, the shoe is in contact with the walking surface at the heel and at point 16. When the wearer takes a step and in so doing lifts his heel to tilt his foot, the point of contact moves from point 16 along the rocker surface 15, and at the completion of this movement the tip 17 of the sole is in contact with the walking surface. During this rocking movement the toe of the shoe has moved a distance downwardly towards the walking surface.

If, while wearing our improved shoe, a workman receives a blow on the toe as from the fall of a heavy object, the steel toe, being rigid, will not allow the object to puncture or crush his foot. Instead, the force of the blow will be transmitted by the edges of the steel toe to the wooden sole. The wooden sole, being rigid, will not be flexed by the impact and will transmit the force over all of the surfaces with which it is in contact. An ordinary flexible sole used in combination with such a toe would be likely to flex under the blow and allow injury to the foot by bruise or puncture from the underside.

Also, if the ordinary sole were used with the steel toe the whole force of the blow must be borne by the toe portion of the sole, causing the toes of the wearer to be pinned down to an under surface, while in our construction the force is transmitted backwardly by the rigid sole and borne at points rearward of the toe portion.

Another very important result is achieved here by such a combination. A blow falling on the steel toe is not here met by immediate resistance as would be the case where the ordinary sole is used. But here the force starts the toe portion downwardly causing the shoe to rock, and during this movement much of the force of the impact is wasted so that when the tip 17 does contact the solid surface no damage will be done. Furthermore, when the toe is being thus depressed, the heel of the shoe is being lifted and the shoe turned toward an inclined position where it will slip from under the heavy object, or at least can be easily withdrawn. The upward thrust of the heel operates as a signal to the workman to continue this movement and withdraw the foot.

As an additional safety measure we have employed a means of attaching the steel toe which enables the steel toe to be removed easily in case of accident where the foot has been caught, or for any other reason it is desired to remove the steel toe separately. The leather vamp extending over the steel toe need only be slit near its lower front edge to allow the steel toe to move forwardly and be removed from the shoe. Though held very securely when the vamp is in place, this method of attachment allows the steel toe to be quickly and easily removed in an emergency.

In providing the groove 13 about the edge of the sole we not only provide a means for anchoring the steel toe, but also make possible a better attachment of the upper to the sole. When properly nailed, the upper will be depressed into the corner of groove 13 and will always bear tightly against the edge of the inner surface 14; this tends to make the joint waterproof and keep foreign matter from the feet of the wearer.

Figure 5 shows a modification of my invention in which the steel toe 25 is held between the vamp 26 and the toe cap 27, and is secured to the sole by nailing the edges of the vamp and toe cap to the sole. The rear edge of the toe cap is sewed to the vamp at seams 28 which are rearward of the metal toe 25. In this embodiment, the steel toe is prevented from contact with the foot of the wearer. Also the rear edge of the steel toe is enclosed and can not cause irritation or discomfort.

Throughout the foregoing description and in the appended claims we have used the term "shoe" in its broad sense as an article of footwear and as including boots or sandals, and wherever the term "shoe" is used, it should be understood as embracing a boot as well. While we have shown specific forms of construction by way of illustration, it will be understood that many changes may be made in the construction without departing from the spirit of our invention.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

We claim:

1. A shoe comprising a wooden sole, an upper, a non-flexible metal toe beneath said upper, said sole having a rabbet extending around its upper edge, said upper being attached to the lower face of said rabbet, the front wall of said metal toe being substantially perpendicular to the top toe surface of said sole, said front wall having its lower edge inclined inwardly and formed to a relatively sharp lower edge, said lower edge engaging the vertical wall of said rabbet.

2. A shoe comprising a wooden sole, an upper, a non-flexible metal toe beneath said upper, said sole having a rabbet extending around its upper edge, said upper being attached to the lower face of said rabbet, the front wall of said metal toe being substantially perpendicular to the top toe surface of said sole and abutting the vertical wall of said rabbet, said front wall of the metal toe being formed to a relatively sharp lower edge engaging the vertical wall of said rabbet.

M. GENEVIEVE REECE.
ALFA DORTHEA REECE.
GUS E. BERGMAN.