(No Model.)

F. H. RICHARDS.

HEEL PROTECTOR.

No. 401,069. Patented Apr. 9, 1889.

Fig. 2

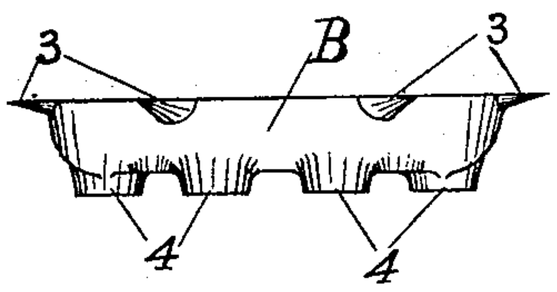


Fig. 5.

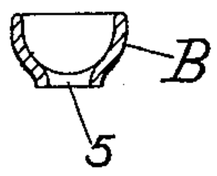


Fig. 4

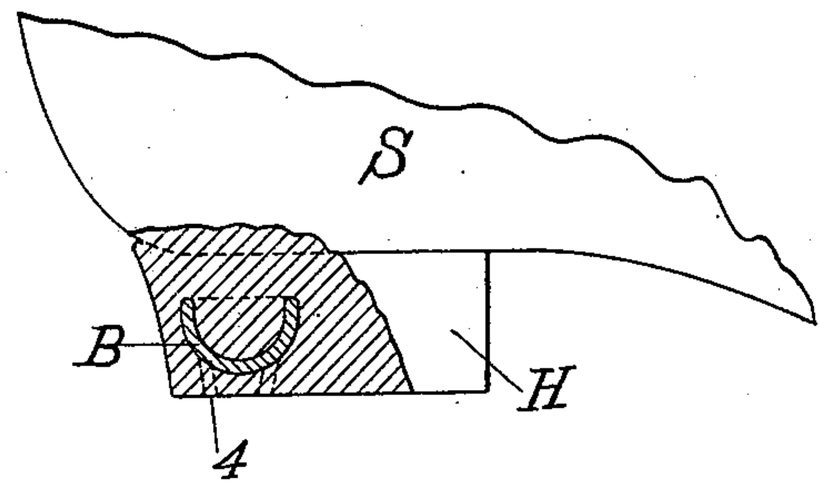


Fig. 1

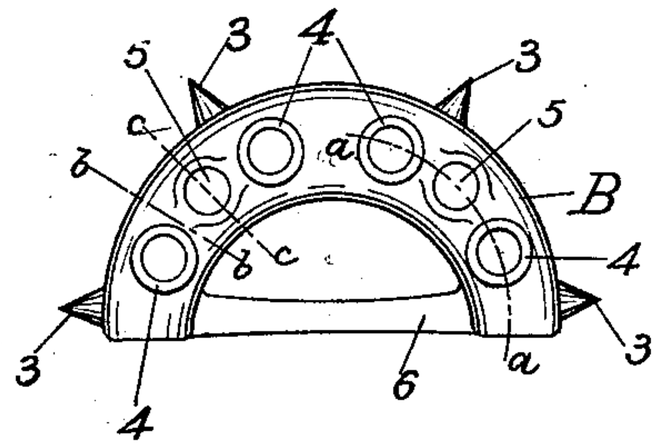


Fig. 3.

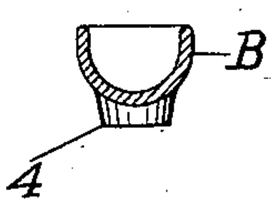


Fig. 6

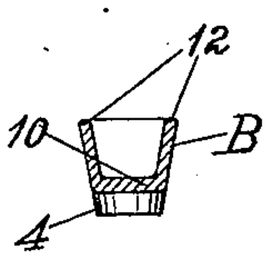


Fig. 7

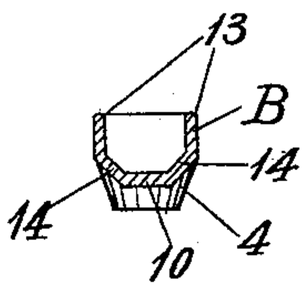
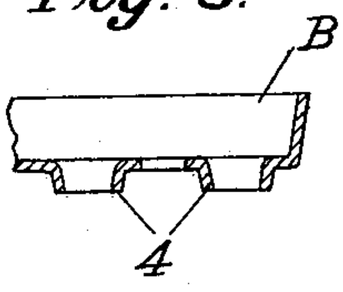


Fig. 8.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE AMERICAN HEEL PROTECTOR COMPANY, OF NEWARK, NEW JERSEY.

HEEL-PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 401,069, dated April 9, 1889.

Application filed July 11, 1887. Renewed September 25, 1888. Serial No. 286,387. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Heel-Protectors, of which the following is a specification.

This invention relates to that class of heel-protectors especially designed for use in the heels of rubber boots, the object being to provide such a protector having greater strength and which can be made of unannealed iron, thereby producing a better article at a less cost than heretofore.

The invention consists in the improvements hereinafter more fully set forth.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan or top view of a protector embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-sectional view in line *b b*, Fig. 1. Fig. 4 is a side elevation of a boot-heel, partially in section, showing the protector therein. Fig. 5 is a cross-sectional view in line *c c*, Fig. 1. Figs. 6 and 7 show certain modifications within the scope of my invention in the form of the protector. Fig. 8 is a vertical section in the curved line *a a*, Fig. 1.

Similar characters designate like parts in all the figures.

My improved heel-protector consists, substantially, of a curved or segmental channel-bar of the nature of an inverted arch, and provided on its crown or lower side with suitable wear-plugs depending therefrom. This bar (designated by B) I prefer made of the form of a true arch, as in Figs. 1 to 5, inclusive; but this cross-sectional shape may be modified. The outer edge of the bar has suitable placing-braces, as 3, to hold the protector in a well-known manner while it lies in the heel-mold during the operation of making the boot-heel. After insertion the protector stands in the heel H of a shoe, as S, as indicated in Fig. 4, with the arch inverted. Suitable wear-plugs, as 4, depend from the crown of the arch and stand even with the lower surface of the heel. These plugs are usually formed hollow; but they may be solid.

Between the wear-plugs I form openings, as 5, in or near the crown of the arch, through which the heel-forming material below the bar B is united at such places with that material within said bar. This assists in holding in shape the yielding material of which the heel is made. The particular shape, number, and location of these openings are not essential. Connecting the ends of bar B, I generally employ a bar, 6, which serves still more firmly to anchor the protector in place.

In Figs. 6 and 7 are shown obvious modifications in the form of the channel-bar B. In Fig. 6 said form consists of a flat lower plate, 10, and straight sides 12, inclined slightly outward. In the latter figure the flat lower plate, 10, and vertical side walls, 13, are joined by the inclined sections 14. On these two forms, however, I consider that shown in the preceding figures to be a material improvement, it being, in my opinion, simpler, stronger, and more readily manufactured. The side walls may be of different heights, if so preferred.

The old way of connecting the several wear-plugs of a protector by small bars has in practice some serious objections. If those protectors are made of hard gray iron, (the cheapest and best material for the plugs themselves,) the connecting-bars very frequently break when the heel is subjected to the heavy blows directed upon it in the operations of making the boot; and if, on the other hand, the casting be annealed or made malleable, those blows serve to bend said connecting-bars, and thereby displace the plugs and hold them in an irregular position. By my present improvements, however, the protector when made of the unannealed metal is found in practice able to withstand not only the wear and blows of actual use, but also those severer strains to which it is subjected in the factory.

Having thus described my invention, I claim—

1. The improved heel-protector herein described, it consisting of a bar having the cross-sectional form of an inverted arch or channel-bar and provided on its under side with wear-plugs and on one edge with placing-braces, substantially as described.

2. The improved heel-protector herein described, it consisting of a curved bar having the cross-sectional form of an inverted arch

or channel-bar, said bar being provided with wear-plugs and having openings therein between said plugs, substantially as described.

3. The improved heel-protector herein described, it consisting of the curved bar B, of a cross-sectional form, substantially as described, said bar being connected at its ends by a bar, 6, and provided with wear-plugs and placing-braces, substantially as described.

4. The improved heel-protector herein described, it consisting of the bar B, having the cross-sectional form of an inverted arch or channel-bar and the hollow wear-plugs 4, depending from the under side of said bar, the openings through said plugs connecting with the interior of said bar, all substantially as described.

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