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SHOE

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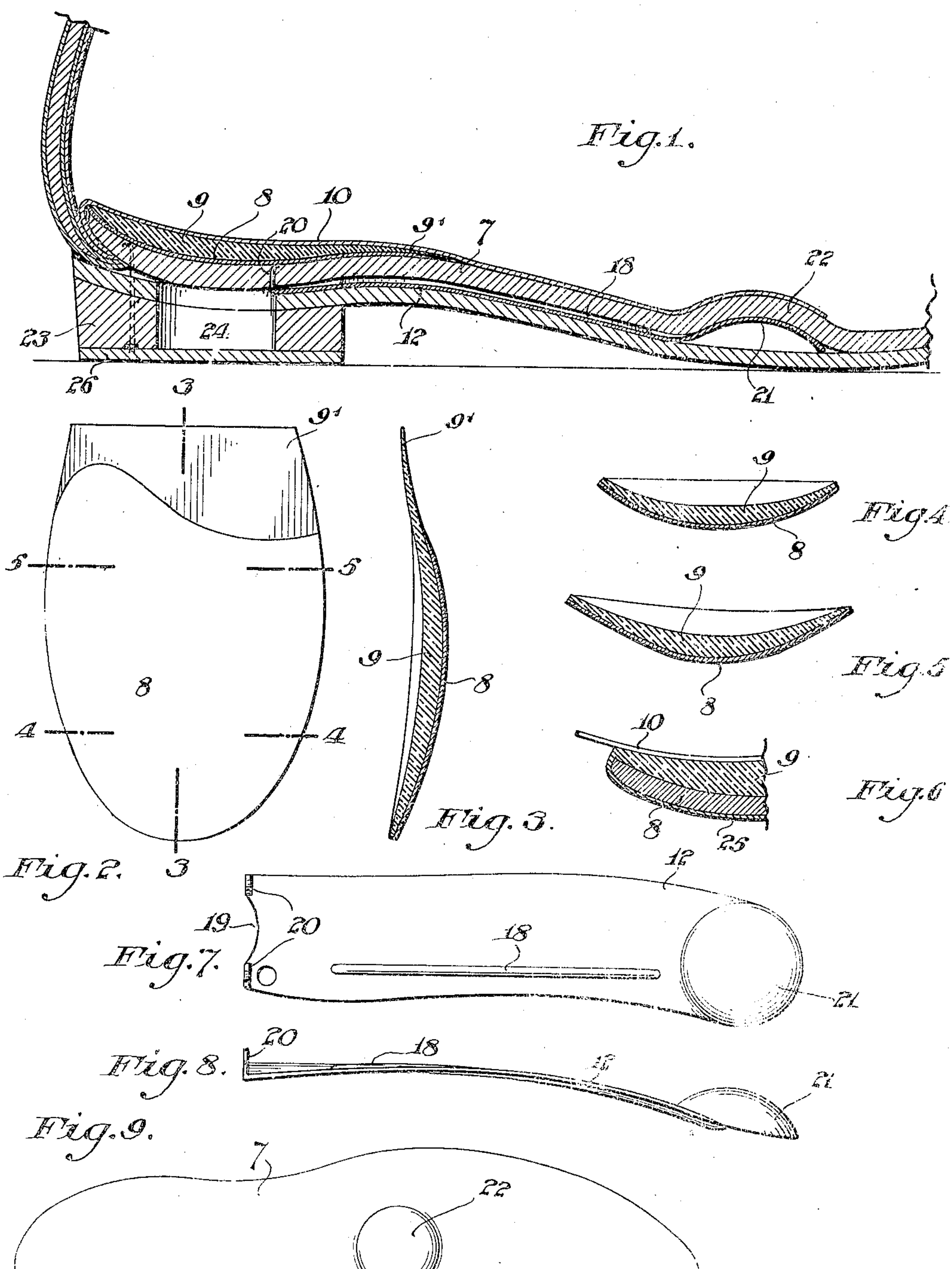

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SHOE

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The invention relates to improvements in shoes. The object is to provide improvements in respect to the shock absorbing and supporting means associated with the heel, means for supporting the astragalus and adjacent bones, and also improvements in the formation of the arch support and of the inner sole in connection with means for supporting the metatarsals.

The invention comprises a cushion container or shield having a non-symmetrical forward edge, a cushion or resilient pad secured in the upper concave portion thereof, covering all the marginal edges thereof and having an extension beyond the forward edge of the shield. The resilient material of the pad also preferably covers, in the form of a film, the under or convex side of the shield. The invention comprises an inner lining or cover for the pad extending substantially beyond the forward edge of the pad. The said shield, pad and cover are preferably all secured firmly together.

The invention also comprises an improved arch supporting element extending beneath the insole, from a point approximately beneath the central portion of the shield, to a point near the opposite side of the instep, and provided at its forward end with a raised or concavo-convex formation. The insole is provided with a concavo-convex formation, which I call the metatarsal support, adapted to register and cooperate with the said formation on the arch supporting element. The heel proper of the boot or shoe is preferably provided with a centrally disposed recess, or chamber, which constitutes an air chamber; all as herein more specifically described.

The invention includes improvements in the inventions described and claimed in my Patents No. 1,148,604 dated Aug. 3, 1915, and No. 1,372,709 dated March 29, 1921.

Referring to the drawings, which illustrate merely by way of example a preferred embodiment of my invention;

Fig. 1 is a vertical longitudinal section through a portion of a shoe containing my improvements.

Fig. 2 is an underside plan view of the pad and supporting shield.

Fig. 3 is a section on the line 3, 3 of Fig. 2.

Fig. 4 is a section on the line 4, 4 of Fig. 2.

Fig. 5 is a section on line 5, 5 of Fig. 2.

(In Figs. 2 to 5 inclusive the inner lining is omitted.)

Fig. 6 is a fragmentary section on an enlarged scale.

Fig. 7 is a plan view of the arch supporting element.

Fig. 8 is a side elevation of same.

Fig. 9 is a plan view, on a reduced scale, of the insole.

Similar numerals refer to similar parts throughout the several views.

Referring to Fig. 1, the insole 7 is cupped or dished at the heel end to conform to the convex side of the cushion shield 8. The concave formation is shown longitudinally in Fig. 1, and transversely, it corresponds to the sections of the shield 8 as shown in Figs. 4 and 5, so that the shield 8 is adapted to fit snugly in the said depression at the heel end of the insole.

Within this shield 8 is provided the pad or cushion 9, which cushion overlies the entire marginal edge of the shield 8, as clearly shown in Fig. 6. This cushion 9 has an extension beyond the forward edge of the shield 8, forming a skirt 9′ which is tapered to a vanishing line substantially in advance or beyond the forward edge of the shield 8, as shown in Figs. 1, 2 and 3.

A preferred way to form the pad 9 in association with the shield 8, is to place the shield in a mold and then pour the material, such as rubber or other suitable resilient substance, while in the plastic state, into the concave portion of the shield preferably until it flows over the edges thereof and around the under side and then subject the same to pressure so that the resilient material will become closely adherent to the shield both upon the upper concave side and also upon the under or convex side; the covering of resilient material on the under side, being in the form of a thin film 25, as indicated in Fig. 6. At the same time, as above stated, this cushion extends over and is adherent to the entire marginal edge of the shield, and a portion of the material is permitted to extend, in the form

of a skirt 9′, beyond the forward edge of the shield so as to provide a very gradual taper of the pad onto the insole and thus provide a very smooth surface over the edge of the shield. Upon the top of the pad or cushion 9 is placed the inner lining 10, which is secured firmly to the surface of the pad to the extreme margins thereof. This inner cover or lining 10 extends on all sides beyond the margins of the pad so that, when said marginal extensions are drawn around the margins of the insole and tacked or otherwise secured to said insole, as described in my Patent No. 1,372,709, the pad 9 and its containing shield are held securely in place in the cup formation of the insole. The forward part of this inner lining or cover 10 is preferably extended beyond the forward edge of the skirt 9′ over the insole to a point beyond the forward end of the arch supporting element 12.

It is also to be noted that the forward edge of the shield 8 is non-symmetrical. That is, said forward or front edge is in the form of reversed curves, so that the portion on the inner side of the shoe extends forwardly further than the portion on the outer side, in order to provide a proper support for the heel of the foot without exerting pressures where the same are undesirable.

For example, the cushion and shield are so formed at the front edge as to allow the os calcis, to remain in a normal and natural position, thereby holding the astragalus, in normal position in order to secure a proper equal distribution of body weight. By this arrangement the os calcis is enabled to keep a direct pressure on the scaphoid, and this direct pressure tends toward the prevention or cure of fallen arches or flat feet.

It will also be noted that the concavo-convex formation of the shield has varying radii at different cross-sections which formation contributes in the proper distribution of the supporting pressures.

The arch supporting element 12 is preferably made of tempered steel of the form shown in Figs. 7 and 8, and is provided with a stiffening rib 18 running longitudinally of it. It is slightly cut away as at 19 at its rear end and provided with tangs 20 which are adapted to project through the insole 7 and clinch against the shield 8, as shown in Fig. 1. This rear end of element 12 is adapted to lie beneath approximately the center of the shield 8 and to extend forwardly toward the ball portion of the shoe as shown. At the forward end is provided the concavo-convex formation 21 which projects upwardly into a corresponding concavo-convex formation 22 in the insole. This formation 22 in the insole is made by hammering or otherwise depressing a portion of the insole, while soft, into a depression formed in the last for this purpose. It will thus be seen that the engagement of the formations 21 and 22 and the tangs 20 with the insole, secures a positive and constant cooperation of the arch supporter and the insole maintaining a proper slightly resilient support of the instep and also a cooperation with the pad 9 and shield 8 which the arch supporter overlaps.

The formation 22 also forms a support or brace which cooperating with the metatarsals and assures the proper position and support of the foot in this region.

That is to say, the element 12 in cooperation with the insole 7 supports the entire arch of the foot, while the elevation 22 holds the metatarsals in position. When the muscles and ligaments holding the bones relax and fail to contract, the bones go down,—drop—and the dropping causes the foot sufferer in walking, to strike the "heads" of the metatarsals. By the means described the bones are forced upwards and useless suffering is prevented.

In combination with the above arrangement I also prefer to use a heel 23 of the shoe with a recess or chamber 24, centrally located, so that an enclosed air space is provided between the insole 7 and the outer surface or layer 26 forming the tread of the heel, which has a cushioning effect and also greatly lightens the weight of the heel and reduces the cost of production.

By the use of the term shoe I of course include any similar foot wear as for example boots or slippers.

What I claim is:—

1. In a shoe, the combination of an insole having a concave or cup formation at the heel end thereof and a metal shield fitting therein having its forward edge in a reverse curve with one part in substantial advance of the other and provided with a pad conforming thereto adapted to support the heel while allowing the os calcis to remain in normal position with respect to the astragalus in order to secure equal distribution of the weight.

2. In a shoe, the combination of an insole having a concave or cup formation at the heel end thereof and a metal shield fitting therein having its forward edge in a reverse curve with one part in substantial advance of the other and provided with a pad covering the entire concave surface and the entire margin of said shield to support the heel while allowing the os calcis to remain in normal position with respect to the astragalus in order to secure equal distribution of the weight.

3. In a shoe, the combination of an insole having a concave or cup formation at the heel end thereof and a metal shield fitting therein having its forward edge in a reverse curve with one part in substantial advance of the other and provided with a pad covering the entire concave surface and the entire

margin of said shield and extending beyond the front edge of the shield and tapering to a vanishing line to support the heel while allowing the os calcis to remain in normal position with respect to the astragalus in order to secure equal distribution of the weight.

4. In a shoe, the combination of an insole having a concave or cup formation at the heel end thereof, a concavo-convex shield seated therein having a part of its forward edge in advance of another part and provided with a pad conforming thereto adapted to support the heel while allowing the os calcis to remain in normal position with respect to the astragalus, and an arch supporting element beneath the insole having tangs clinched through the insole against the shield and having a concavo-convex formation at its forward end beyond the instep, the insole having a corresponding, cooperating concavo-convex formation, forming a support for the metatarsals.

JOHN McBREARTY.