This invention relates to pneumatic soles for shoes, and specifically to a pneumatic sole which may be detachably secured in position to cover the leather outer sole and heel of a shoe, and which may easily be removed as desired.

Briefly, the invention comprehends the provision of a pneumatic sole which may be manufactured in various widths and lengths, dependent upon the dimensions of the leather outer sole and heel to which it is to be applied. The detachable pneumatic sole is provided with a recess adapted to embrace the heel of the shoe, and with instrumentalities facilitating the operation of applying the pneumatic sole in its operative position around the leather heel and sole, and of removing it therefrom.

The primary object of the invention therefore, is the provision of a commercially practicable pneumatic sole or cushion which may be applied to the ordinary heel and outer sole of a shoe, and including means facilitating the attachment and detachment of said pneumatic sole into and from its operative position.

Other objects of the invention will be made apparent in the accompanying specification, when read in connection with the drawings forming a part thereof.

In said drawings:

Fig. 1 is a side elevation view of a shoe, having applied thereto the pneumatic sole forming the subject matter of my invention, the pneumatic sole being shown in longitudinal cross-section.

Fig. 2 is a perspective view of the pneumatic sole partly broken away.

Fig. 3 is a lateral cross section of the shoe and pneumatic sole on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged detail in section, of one of the resilient connectors in a wire which holds the pneumatic sole in operative position, and,

Fig. 5 is a perspective view of a plate which assists in retaining the pneumatic sole in position.

Now referring specifically to the drawings, in which like reference characters indicate like parts throughout the several views, A is an ordinary shoe, equipped with the usual heel portion 1, and the customary outer leather sole 2. It is to be noted that in all heavy walking shoes of the present day type, the outer sole of the shoe projects beyond the upper portion A, the latter being curved downward and inwardly at its juncture with the heel and sole, to form a groove 3, extending entirely around the shoe. Into this groove 3 is applied the pneumatic sole B, which assists in retaining the pneumatic sole in position, as will hereinafter appear.

The pneumatic sole B is best illustrated in Fig. 2, comprising a hollow body of flexible rubber, having the general contour of a shoe sole, and provided at its top edge with a head 4, in which is positioned a wire 5 of spring metal. The sole B is formed with a heel-shaped cavity 6 at the rear end, said cavity being defined by a step 7, integral with the flat portion 8, shaped to coincide with the bottom surface of the leather sole 2 of the shoe.

The wire 5 extends entirely around the sole B, within the head 4, but, to permit easy attachment of the sole B to the sole 2, the wire 5 is formed in two sections 5a and 5b, and flexible connectors C are provided on each side of said wire, said connectors being best shown in Fig. 4. The connectors C are identical, comprising an elongated metallic shell 9, one end of the shell being interiorly screw-threaded to receive a hollow plug 10, through which section 5a of the wire extends; a head 11 being secured to the end of said section 5a, to retain the latter in position. The end of the section 5b of the wire extends through an aperture in the opposite end of the shell 9, and carries a head 12 which is slidable within the shell 9, and a coiled spring 13 encircles the section 5b and tends at all times to force the head 12 towards the bead 11, and to thereby decrease the length of the area circled by the wire 5, as will be understood. It is clear that, when the toe portion of the sole B is placed over the toe portion of the sole 2, a rearward pull on the heel portion of the sole B will cause the head 12 to move away from...
the head 11 (see Fig. 4) and elongates the wire 5 and the sole B, the flexibility of the rubber of which the sole is composed readily permitting such movement. In this position the heel portion may easily be snapped over the heel 1 of the shoe and the spring 13 will operate to pull the wire 5 into the groove 3, and firmly secure the sole B in position, as illustrated in Fig. 1. It is to be understood that the wire 5 is initially formed to the curvature of a shoe, and that it will automatically fit into the groove 3 at the front, rear and sides of the shoe.

A further means of detachably connecting the sole B to the sole 2, comprises the plate 14 of thin spring metal having at each end a pair of upwardly extending fingers 15 adapted to grasp the wire 5, as shown in Figs. 2 and 3. It will be understood that the plate 15 extends on top of and transversely of the flat portion 8 of the sole B, directly adjacent the step 7 so that, when the sole B is in operative position, the rear edge of the plate will be near the front face of the heel 1 of the shoe, and under the instep of the wearer. As the heel portion of the sole B is snapped over the heel 1, by the method heretofore described, the rounded upper ends 15a of the spring metal fingers 15, will snap over the projecting portions of the shoe sole 2, and into the groove 3, as will be clear. It will therefore be obvious that the utilization of the resilient connector C and the plate 14, equipped with the spring fingers 15, not only permit of temporary enlargement of the area circumscribed by the wire 5, facilitating application of the sole B to operative position, but also operate to automatically and detachably lock the sole in said position. Manifestly the sole B may be detached by a downward and rearward pull on the heel portion. The downward pull releases the grasp of the fingers 15 on the edge of the sole 1, and the rearward pull elongates the wire 5 so that the heel portion thereof may easily be slipped out of the groove 3. The connectors C and the fingers 15 are of ample strength to retain the sole B in position under ordinary circumstances.

If desired the lower surface of the sole B may be of thick rubber to increase its wear, and may be provided with anti-slippering corrugations 16, and the sole B utilized as a waterproof sandal.

The sole B is provided at some convenient point, here shown at 17, with a valve-controlled port to permit infiltration or deflation.

From the foregoing it is obvious that I have provided a pneumatic sole which may be quickly and easily attached to the ordinary sole of a shoe, and which is equipped with instrumentalties adapted to retain it in operative position under ordinary circumstances, but which are readily yieldable to a pull intended to remove the sole. The devices may be made up in regular standard sizes and styles, and applied to shoes, boots, gaiters or slippers without any changes or alterations whatsoever. They are especially useful to persons whose work necessitates continuous walking or standing, as will be understood.

Modifications of the structure herein described and illustrated may be suggested to those skilled in the art, but my invention covers all embodiments falling fairly within the scope of the appended claims.

What I claim is:

1. A removable pneumatic sole for shoes or the like, comprising a flexible shell of impervious material initially shaped to conform substantially to the outlines of a shoe sole, a hollow head formed on the upper periphery of said shell, and a flexible wire carried in said head.

2. A removable pneumatic sole for shoes or the like, comprising a flexible shell of impervious material initially shaped to conform substantially to the outline of a shoe to which it is to be applied, and a flexible wire carried by the upper periphery of said shell and adapted to fit into the groove formed between the sole and upper portion of said shoe.

3. A removable pneumatic sole for shoes or the like, comprising a flexible shell initially shaped to conform substantially to the outline of a shoe to which it is to be applied, a two-section wire carried by the upper periphery of said shell and adapted to fit into the groove formed between the sole and upper portion of said shoe, and means yieldably connecting the two sections of said wire together, substantially as described.

4. A removable pneumatic sole for shoes or the like, comprising a flexible shell initially shaped to conform substantially to the outline of a shoe to which it is to be applied, a wire carried by the upper periphery of said shell, and a plate extending transversely across said shell and provided at each end with flexible fingers adapted to embrace said wire.

5. A removable pneumatic sole for shoes or the like, comprising a flexible shell initially shaped to conform substantially to the outline of a shoe to which it is to be applied, a two-section wire carried by the upper periphery of said shell and adapted to fit into the groove formed between the sole and upper portion of said shoe, means yieldably connecting the two sections of said wire, and a plate extending transversely across said shell and provided on each end with flexible fingers adapted to embrace said wire.

6. A pneumatic sole for shoes, comprising an inflatable body shaped to the contour of the sole of a shoe, a two-section wire carried by the upper periphery of the body,
and means yieldably connecting the two sections of said wire.

7. A pneumatic sole for shoes, comprising an inflatable body shaped to the contour of the sole of a shoe, a two-section wire carried by the upper periphery of the body, and means yieldably connecting the two sections of said wire, in combination with means extending transversely of said body and provided with flexible members connected to surrounding said wire on each side of the body.

In testimony whereof I affix my signature.

GEORGE MANELAS.