(No Model.) 2 Sheets—Sheet 1.

G. E. SWAN.

SPRING HEEL FOR BOOTS OR SHOES.

No. 370,907. Patented Oct. 4, 1887.

Fig. 1.

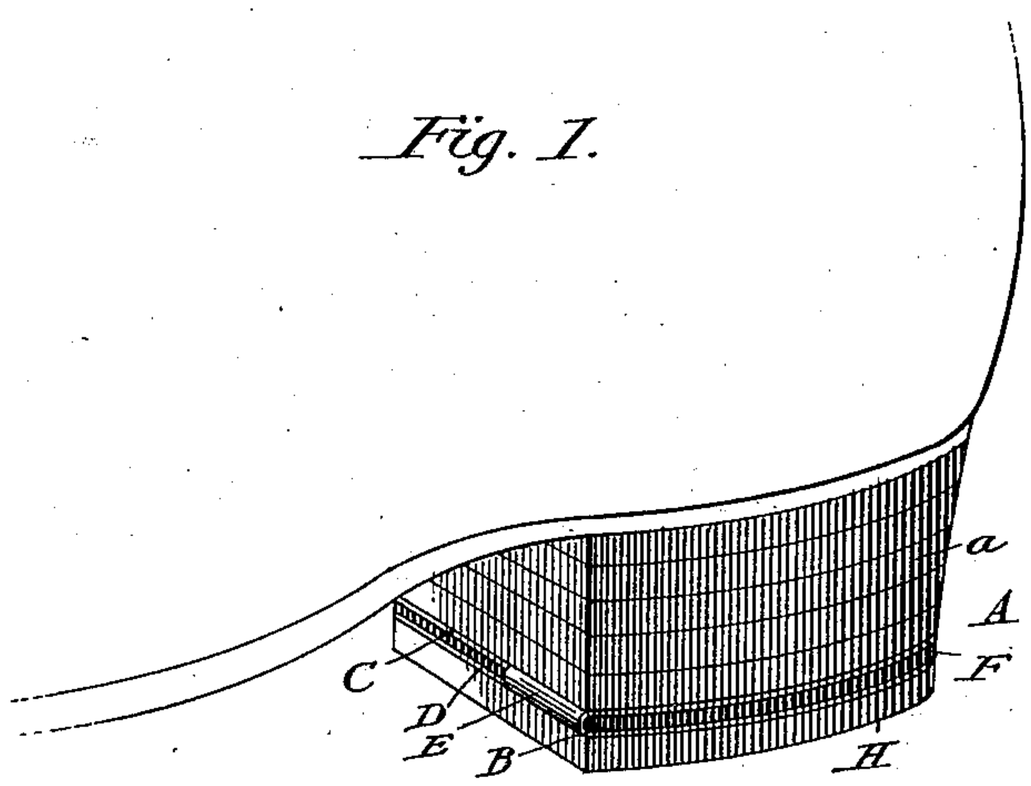


Fig. 2.

Fig. 3.

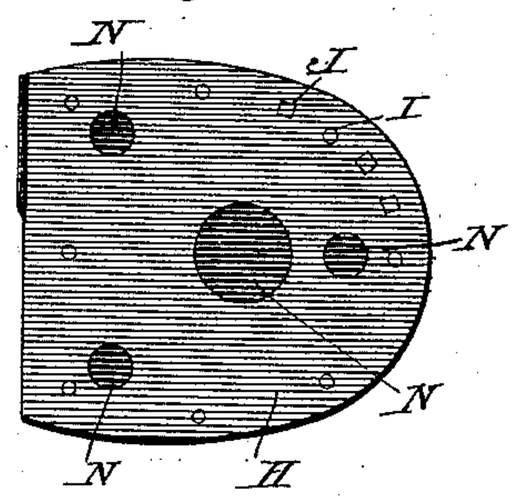
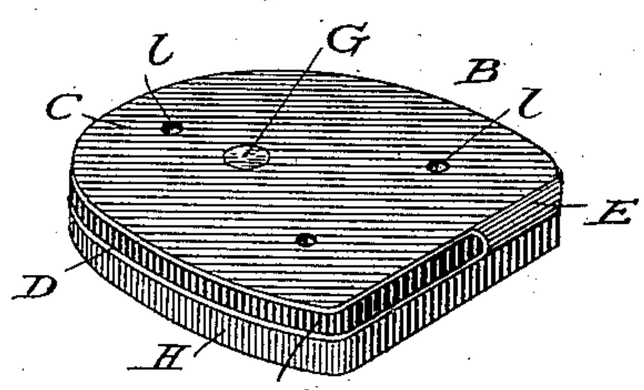


Fig. 4.



Witnesses.
Morris A. Clark
Wm. J. Little,

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(No Model.) 2 Sheets—Sheet 2.

G. E. SWAN.

SPRING HEEL FOR BOOTS OR SHOES.

No. 370,907. Patented Oct. 4, 1887.

Fig. 5.

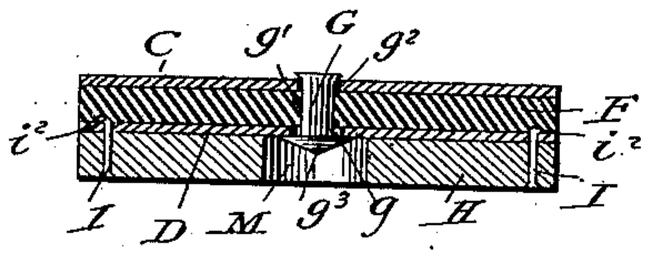


Fig. 6.

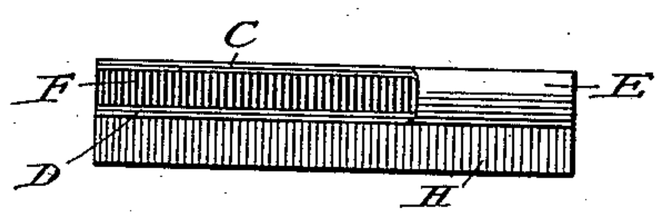


Fig. 7.

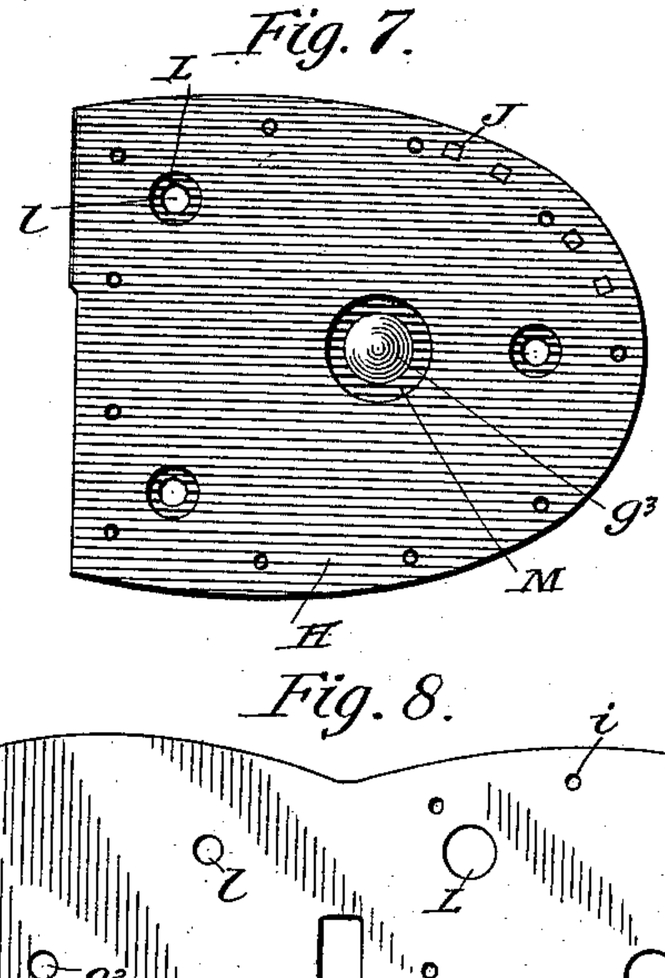


Fig. 8.

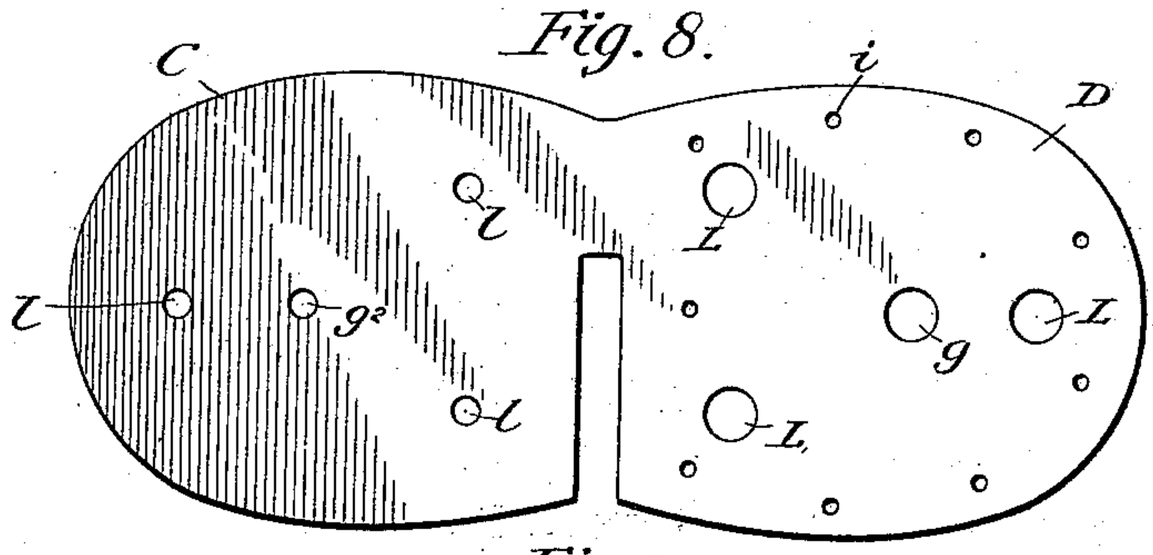
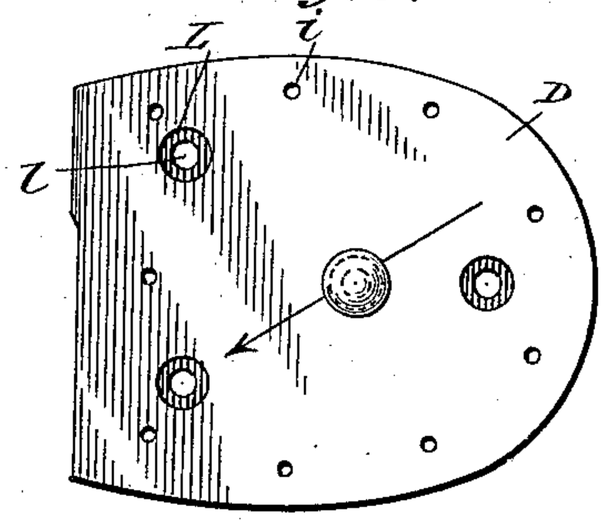


Fig. 9.



Witnesses.
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Attorney

UNITED STATES PATENT OFFICE.

GEORGE E. SWAN, OF BEAVER DAM, WISCONSIN.

SPRING-HEEL FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 370,907, dated October 4, 1887.

Application filed April 2, 1887. Serial No. 233,436. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. SWAN, a citizen of the United States, residing at Beaver Dam, in the county of Dodge and State of Wisconsin, have invented certain new and useful Improvements in Flexible or Spring Heels; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to flexible or spring heels of that class in which a device comprising a cushion and retaining-plates is adapted to be applied to the heel of the boot or shoe.

The object of my present invention is to provide an improved flexible heel which will effectually obviate the jar usually experienced in walking upon stone pavements, and which will efficiently operate to give a forward spring in walking, thereby imparting ease and elasticity to the step of the wearer. Ordinarily, in walking a propelling action is effected by the ball of the foot, and my improved flexible heel is designed by its forward spring movement, as hereinafter described, to impart a supplementary propelling movement to the heel in stepping or walking.

A further object of the invention is to provide a device of this class which will possess advantages in point of simplicity and inexpensiveness in construction, durability, and general efficiency in operation, which can be readily applied to the heels of boots and shoes now in use, and which will wear longer than heels of ordinary construction by reason of its yielding or elastic quality.

In the drawings, Figure 1 is a perspective view of the heel and rear portion of a shoe provided with my improvement; Fig. 2, a vertical longitudinal sectional view of the same; Fig. 3, a bottom view of the heel; Fig. 4, a detail perspective view of the spring device detached; Fig. 5, a detail transverse sectional view thereof; Fig. 6, a detail view of the front edge; Fig. 7, a detail bottom view; Fig. 8, a plan view of the blank from which the spring-plate is bent up; Fig. 9, a plan view taken from the under side of the bent-up spring-plate.

Corresponding parts in the figures are denoted by the same letters of reference.

Referring to the drawings, A designates the heel of a boot or shoe, comprising the usual layers of leather, *a*, the lowermost layers having been removed to provide for the attachment of the spring device B. This spring device comprises a spring-plate bent up from a single piece of plate-steel, and comprising upper and lower sections, C D, corresponding to the shape of the heel in horizontal section and flexibly connected by a bend, E, at their front edges. The connecting-bend E is formed at one side of the front edges of the sections, and preferably extends about one-third the length of said edges, as shown in Fig. 6, thus leaving a free open portion for about two-thirds the length of the front edges to permit the forward spring movement, hereinafter described.

Between the sections C D is seated a corresponding flat cushion, F, of rubber or other suitable material. This cushion is retained in position between the sections of the plate by means of a central bolt or rivet, G, passing through an eye or opening, *g*, in the lower section, D, through a corresponding eye, *g'*, in the cushion, and through an opening, g^2, in the upper section, C, the end being riveted to the upper section, while the head g^3 rests against the lower section. This single rivet serves to connect the sections of the plate and retain the cushion between the same, and the cushion is prevented by the connecting-bend E from turning on the rivet. To the face of the lower section is secured a corresponding layer of leather, H, by means of a series of small nails or screws, I, extending around the edge of the same and passing through perforations *i* in the lower section, their ends or points being bent over or clinched, as shown at i^2. This leather layer H forms the wearing-surface of the heel, and may be secured in position in any other suitable manner, and it is preferably provided at its outer edge with a series of steel slugs, J, Figs. 3 and 7, passing only through the leather and preventing the same from "wearing down."

The device is secured in position against the bottom of the ordinary heel by means of screws K, passing entirely through openings L,

formed preferably at each corner and at the rear edge of the heel. These openings L extend through the layer of leather, H, the lower section, and through the cushion, so that the heads of the screws K set up against the upper section, and thus permit an unimpeded action of the spring-plate and cushion. Perforations *l* are provided in the upper section, C, for the passage of the screw-shanks.

The opening *g* in the lower section, D, is of greater diameter than the rivet G. This enlarged opening thus allows an unimpeded forward spring movement of the lower portion of the spring device, comprising the cushion, lower section, and leather, with relation to the upper section, which is rigidly secured to the heel. An enlarged opening, M, is also provided in the leather to permit lateral movement of the head g^3 of the rivet during this forward spring movement.

In practice the openings L and M are preferably closed by a packing, of rubber or other suitable material, as shown at N, Figs. 2 and 3.

The operation and advantages of my invention are manifest. The spring device is applied in relation to the heel, so that the bend E is at the front outer side, and in walking, when the heel strikes the ground, the device effects a double spring movement—that is to say, the sections of the plate spring together, while the lower portion of the spring device, comprising the cushion, lower sections, and wearing-surface, (which portion is not rigidly secured to the heel,) has a forward spring movement at the free open portion of the front edge of the plate in the direction indicated by the arrow, Fig. 9. During this forward spring movement the lower sections slightly twist with relation to the upper section (the latter being rigidly connected to the heel) as much as the bend will allow. Many advantages are obtained by this forward spring movement, principal among which is the fact that it imparts a supplementary propelling power to the heel in stepping or walking, and thus renders the step easy and elastic.

By reason of the yielding or elastic action of the spring device the wearing-surface H offers less frictional resistance to the pavement or ground, and will therefore wear longer, than an ordinary heel. The durability of the heel is thus greatly enhanced.

It is manifest that numerous modifications may be made in the construction and arrangement of parts without departing from the spirit and scope of my invention, and I therefore do not limit my invention to the exact construction and arrangement herein shown and specified, but reserve the right to all such changes as properly fall within the terms of my claims.

I claim as my invention—

1. An elastic or spring device adapted for application to the heels of boots and shoes, and comprising a spring-plate having an upper and lower section, substantially as described, flexibly connected and corresponding in outline to the heel, an elastic cushion secured between the said sections and corresponding in outline to one of the layers of the heel, and a wearing-surface secured against the lower section and carried thereby, the said device being adapted to be secured to and against the bottom of the heel proper, substantially in the manner set forth.

2. An elastic or spring device adapted for application to the heels of boots and shoes, and comprising a spring-plate having an upper and lower section flexibly connected at their front edges, the upper section being adapted to be rigidly secured to the bottom of the heel proper, so that the lower portion has a spring movement with relation to the heel, an elastic cushion seated between the sections of the plate, a retaining bolt or rivet rigidly secured to the upper section and projecting through the cushion and lower section, and a wearing-surface corresponding to and secured against the lower section, substantially as set forth.

3. An elastic or spring device adapted for application to the heels of boots and shoes, and comprising a spring-plate bent up from a single piece forming an upper and lower section flexibly connected at one side of their front edges, the upper section being adapted to be rigidly secured to the bottom of the heel proper, so that the lower portion of the device has a spring movement with relation to the heel and upper section, an intermediate cushion secured between the sections of the plate and retained against lateral displacement by the said connection, a central rivet or bolt secured to the upper section and passing down through the cushion and lower section and provided with the retaining-head, a layer of leather forming the wearing-surface, and devices connecting this wearing-layer to the bottom of the lower section, substantially as set forth.

4. In an elastic or spring device adapted for application to the heels of boots and shoes, a spring-plate comprising an upper and lower section corresponding in outline to the heel and flexibly connected at one side of the front edges of the sections, said connection extending about one-third the length of the front edge, the upper section being adapted to be rigidly secured to the bottom of the heel proper, and the lower section having a spring movement with relation to the upper section and a forward spring movement upon the connection and toward the free portion of the front edges of the sections, and an intermediate cushion, substantially as and for the purpose set forth.

5. In an elastic or spring device adapted for application to the heels of boots and shoes, the combination, with a spring-plate comprising an upper and lower section flexibly connected, the lower section having an enlarged opening, *g*, and with a corresponding cushion having an eye, of a central retaining bolt or rivet secured to the upper section and passing down through the eye of the cushion through enlarged opening *g*, and provided with a head

by which the sections are retained together, whereby the lower portion of the device has a spring movement with relation to the rigid upper section, substantially as and for the purpose set forth.

6. As an improved article of manufacture, the herein-described elastic or spring device adapted for application to the bottom of the heels of boots and shoes, comprising a spring-plate bent up from a single piece and forming an upper and lower section connected by a bend, a corresponding intermediate cushion, a bolt or rivet connecting the sections of the plate and securing the cushion in position, and a leather wearing-surface secured against the under face of the lower section, the whole being adapted to be detachably secured to the heel by means of screws or the described equivalent devices, substantially as and for the purpose set forth.

7. The combination, with the heel of a boot or shoe, of an elastic or spring device comprising an upper section having perforations *l*, a lower section having an enlarged opening, *g*, and connected with the upper section by a bend, an intermediate cushion, a bolt or rivet secured to the upper section and passing through the cushion and opening *g*, and provided with a retaining-head, a wearing-surface secured to the bottom of the lower section and having an enlarged opening, M, openings L in the wearing-surface, lower section, and cushion, and screws passing through the upper section, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE E. SWAN.

Witnesses:
J. R. LITTELL,
WM. J. LITTELL.