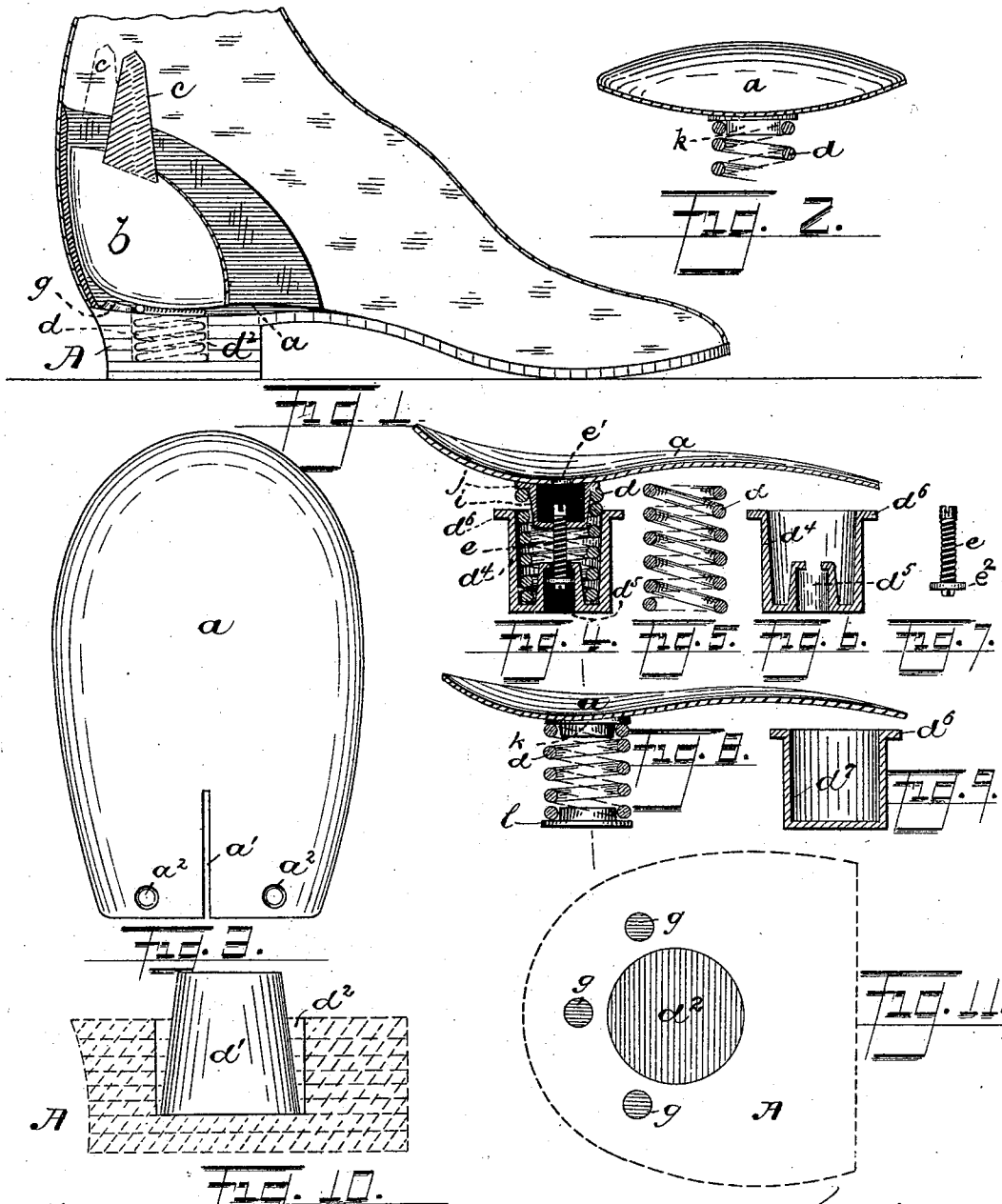


(No Model.)

A. P. GOTHAM.
HEEL.

No. 517,157.

Patented Mar. 27, 1894.



Witnesses

Inventor

Oscar A. Michel.
Chas. F. Michel.

A. P. GOTHAM,

By Drake & Co. atty's.

UNITED STATES PATENT OFFICE.

AMISA P. GOTHAM, OF NEWARK, NEW JERSEY.

HEEL.

SPECIFICATION forming part of Letters Patent No. 517,157, dated March 27, 1894.

Application filed September 10, 1891. Renewed September 2, 1893. Serial No. 484,671. (No model.)

To all whom it may concern:

Be it known that I, AMISA P. GOTHAM, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Boots and Shoes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to afford perfect ease and comfort to the wearer, in walking, running, jumping, alighting from elevations, carriages, cars, descending stairs and the like; the avoiding of all jarring to the spinal column as in the several acts above mentioned; and, while standing upon any vibrating or jarring surfaces as is experienced in factories, railroad and street cars and the like; thereby avoiding the complex condition known as fatigue which is experienced by all who walk or stand upon hard or jarring surfaces.

The invention consists in the improvement herein shown and described, and in the arrangements and combinations of the several parts thereof, as finally pointed out in the claims.

Referring to the accompanying drawings in which similar letters of reference indicate corresponding parts, in each of the several views where they occur:—Figure 1, represents, partly in elevation and partly in section, a shoe embodying my improvement in its simplest form. Fig. 2 represents a transverse section of the vertically movable heel plate and spring taken through line *x* of Fig. 8, showing also, in elevation, the upper seat, not shown in Fig. 1, on which said spring rests. Fig. 3, represents, a top plan view of said heel plate, showing a slit at the front end thereof. Fig. 4 represents a central longitudinal vertical section of the heel plate and the several parts which may be employed in connection therewith, some of which are not shown in Fig. 1. Figs. 5, 6 and 7 are details of the spring, socket and screw, shown in Fig. 4, said spring and socket being shown in section and the screw in elevation. Fig. 8 rep-

resents a central longitudinal vertical section of the heel plate and spring, without the socket, and a modified form of the upper and lower seats of the spring; and Fig. 9 represents in a central vertical transverse section, a modified form of the socket shown in Figs. 4 and 6. Fig. 10, represents a central longitudinal vertical section of the heel of the shoe, enlarged, and a modified form of spring, the latter being in elevation, and Fig. 11 represents a top plan view of the heel showing the socket or cavity therein and certain cushions or bumpers.

In said drawings, A, Fig. 1, indicates the heel of a boot or shoe having a socket or chamber *d*² formed inside thereof, in which is seated a coiled spring *d*, or a soft rubber spring *d'* as in Fig. 10. The upper end of said spring projects normally above the inner surface of the heel and connects with the vertically movable heel-plate *a*, the front extremity of which is firmly secured to the insole of the boot or shoe by means of screws or otherwise; the position of the plate and spring being shown as compressed by the weight of the wearer. A slip counter, *b* is secured at its base to the rear end of the heel-plate, *a* while a portion of the free or upper surface is secured to elastic straps, *c* which in turn are secured to the leg of the boot or shoe, thus keeping the slip counter always taut.

Three elastic cushions *g*, Figs. 1 and 11 are sometimes employed to prevent sudden contact between the heel-plate and shoe. As a further means of preventing sudden impact in either side of the heel, or at the rear of same, as is the case where persons wear down their shoe or boot heels more on one side than on the other, or at the rear, than on either side, due to the indirect pressure of their weight upon their heels, or to irregularities or deformities of the legs or feet, contracted tendons, weak ankles and the like, I provide extra elastic cushions of various sizes which are placed at proper points on the heel in order to counteract any indirect pressure, thereby directing the weight of the wearer into a direct line with the axis of gravity, as will be understood.

The strength, length, thickness and width of the heel plates vary, in order to fit and

comply with all sizes of feet from the child to the largest adult, and to conform to the muscular contraction of all heels of persons ranging in weight from twenty-five to three hundred and fifty pounds. Said heel-plate *a*, at the front end, is provided with holes *a*² for screws or other means of securing it to the insole of the boot or shoe, as also a slit to favor the dishing of the plate, to more readily fit the point of security and to admit of a lateral springing quality which renders the plate more pliable in its several movements.

In Fig. 4, is shown a device by which the spring can be braced and steadied, lengthened or shortened to meet the requirements or wishes of the wearer. The same consists in an appendage or seat *i*, or *k*, Fig. 8, to which is secured the spiral spring *d*, both of which are adapted to fit in a bushing or socket *d*⁴ of the heel and having a sub-socket *d*⁵ the upper end or top of which is perforated to admit the passage of the screw or bolt *e*. Between the wall of said appendage or seat *i* and that of the bushing *d*⁴ is formed an annular chamber to admit the spring *d*, and in which said spring when fully compressed is completely chambered. Said screw-bolt *e*, engages by means of a threaded nut in the base of the appendage or seat *i*, at the top of which is a flange *j* through which may pass rivets, pins or other means in order to firmly secure it to the bottom of the heel-plate. Said appendage or seat *i* projects inside of the coiled spring *d*, the top coil of which abuts against the under surface of said flange and firmly grasps the outer tapering surface of said appendage or seat as indicated in Fig. 4. By inserting a screw driver through an aperture *e*¹ in the heel-plate or in the opening at the bottom of the sub-socket, the screw or bolt may be turned in either direction, a crease or groove being made in both ends thereof for the purpose, and the spring *d* be thereby compressed or relaxed, as the case may be, thus increasing or diminishing the vertical movement of the heel-plate *a*, as will be obvious.

The seat or appendage *i* and the screw or bolt *e* are not indispensable in ordinary walking but are intended for running, very rapid or very slow walking, the adjustableness of the arrangement being necessary to the grading of the spring tension and propelling power. The appendage *i*, however may be employed with or without the annular bushing or socket *d*⁴ or the screw or bolt *e*, and in lieu of the coiled metal spring in the arrangement shown in Fig. 1 a soft rubber spring *d*¹ Fig. 10 may be employed for the purpose already pointed out. Said springs vary in size, being made from No. 25 to No. 50 drill-gaged wire so that they will vary in strength or lifting power corresponding to the individual requirements and the various weights of persons, ranging from twenty-five to three hundred and fifty pounds; thereby gathering up all the weight of the wearer and transmitting

the same into lifting force which aids so greatly in walking.

In respect to the annular bushing or socket *d*⁴ and the sub-socket *d*⁵ as shown in Fig. 4, it will be seen that the outer wall of the latter and the inner wall of the former are tapering from above downward so that the lowest coil of metal spring *d*, shall be securely engaged at the base of the annular chamber, while the next lowest and subsequent coils of said spring shall move freely and without friction upon either wall, as will be understood. The perforation in the top of sub-socket *d*⁵ is larger than the shank of the screw or bolt *e* which passes through it thus admitting of a lateral or oscillating movement of the heel-plate during walking and the like.

In cases of very low heels where boring or reaming of the cavity or chamber *d*² Fig. 10, might so weaken the remaining layers of leather that form the floor of said cavity or chamber in the heel of the boot or shoe I provide a flange *d*⁶ upon the bushing or socket *d*⁴ Fig. 6, or upon the single cup-like socket *d*⁷ Fig. 9, which rests upon the margin of said cavity or chamber *b*², which should be recessed to receive it, thereby removing all pressure upon the floor of same. To the lower end of the screw *e*, Figs. 4 and 7 is secured a washer like disk *e*² which moves up and down in the sub-socket *d*⁵ Fig. 4, similar to the piston head in the cylinder of an engine except that the outer rim of said disk *e*² is rounded to admit of a lateral or oscillating movement in order to comply with the flexibility of the heel-plate. A rubber washer, not shown, may be inserted between the disk, *e*², and the top of said sub-socket *d*⁵ to prevent any noise being made by the contact of the metal surfaces.

The arrangement illustrated in Fig. 8 shows the coiled metal spring *d* attached at both ends to flanged seats *k* and *l* which are securely grasped by the first and last coils of said spring *d*. The upper flanged seat is securely fastened to the heel-plate *a* while the lower flange seat is held only by the spring and rests at the bottom of the cavity or chamber *d*² in the boot or shoe heel, as will be understood. It will be seen that the flange of lower seat *l* extends beyond the outer surface of the coiled spring to prevent rubbing of the spring against the walls of said cavity.

Fig. 9 represents a plain cup-like socket *d*⁷ which may be used in lieu of socket *d*⁴ or in cases of low heels, wherein the flange *d*⁶ performs a valuable service as already described.

Having thus described my invention, what I claim, and wish to secure by Letters Patent of the United States, is—

1. The combination with a heel having a socket therein, a bushing seated in said socket having a cup shaped chamber or socket formed therein, the upper end of which bushing is substantially even with the top of the heel and is provided with a flange a coiled spring resting in said chamber or socket, and a heel plate resting upon and having an ap-

pendage projecting into said coiled spring as described and for the purposes set forth.

2. The combination with a heel having a socket therein, a bushing seated in said socket
5 and having an annular chamber or socket formed therein; a coiled spring resting in said chamber or socket; a perforated heel-plate resting upon and having an appendage projecting into said coiled spring; and a
10 screw engaging with said bushing and with said appendage whereby the spring may be compressed or relaxed, as described and for the purposes set forth.

3. The combination in a boot or shoe, of an
15 independent vertically movable heel-plate, a heel band carried by said plate, elastic straps connecting with said heel band at one end and with the boot or shoe at the other, and a spring adapted to support said heel plate, as
20 described and for the purposes set forth.

4. The combination, in a boot or shoe, of a

vertically movable heel-plate, a spring adapted to support said heel plate, and elastic cushions *g* arranged and adapted to operate as described, and for the purposes set forth. 25

5. The combination with a heel having a socket therein, a bushing seated in said socket having a cup-shaped chamber, the upper end of which bushing is substantially even with the top of the heel and is provided with a
30 flange, a coiled spring resting in said chamber or socket, and a movable heel plate resting upon and having an appendage depending therefrom and guarding said spring, substantially as set forth. 35

In testimony that I claim the foregoing I have hereunto set my hand this 31st day of August, 1891.

AMISA P. GOTHAM.

Witnesses:

OLIVER DRAKE,

OSCAR A. MICHEL.