

**No. 631,683.**

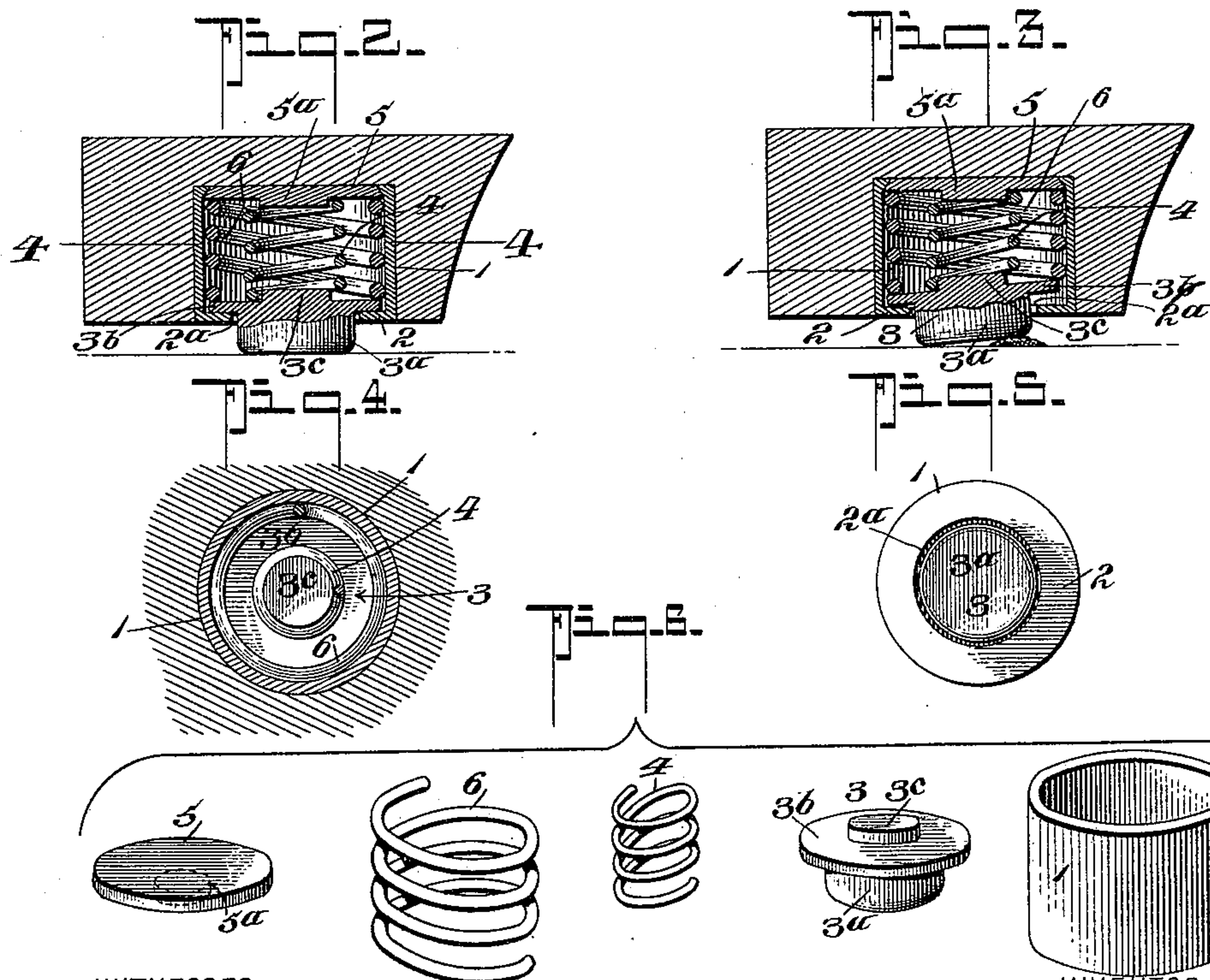
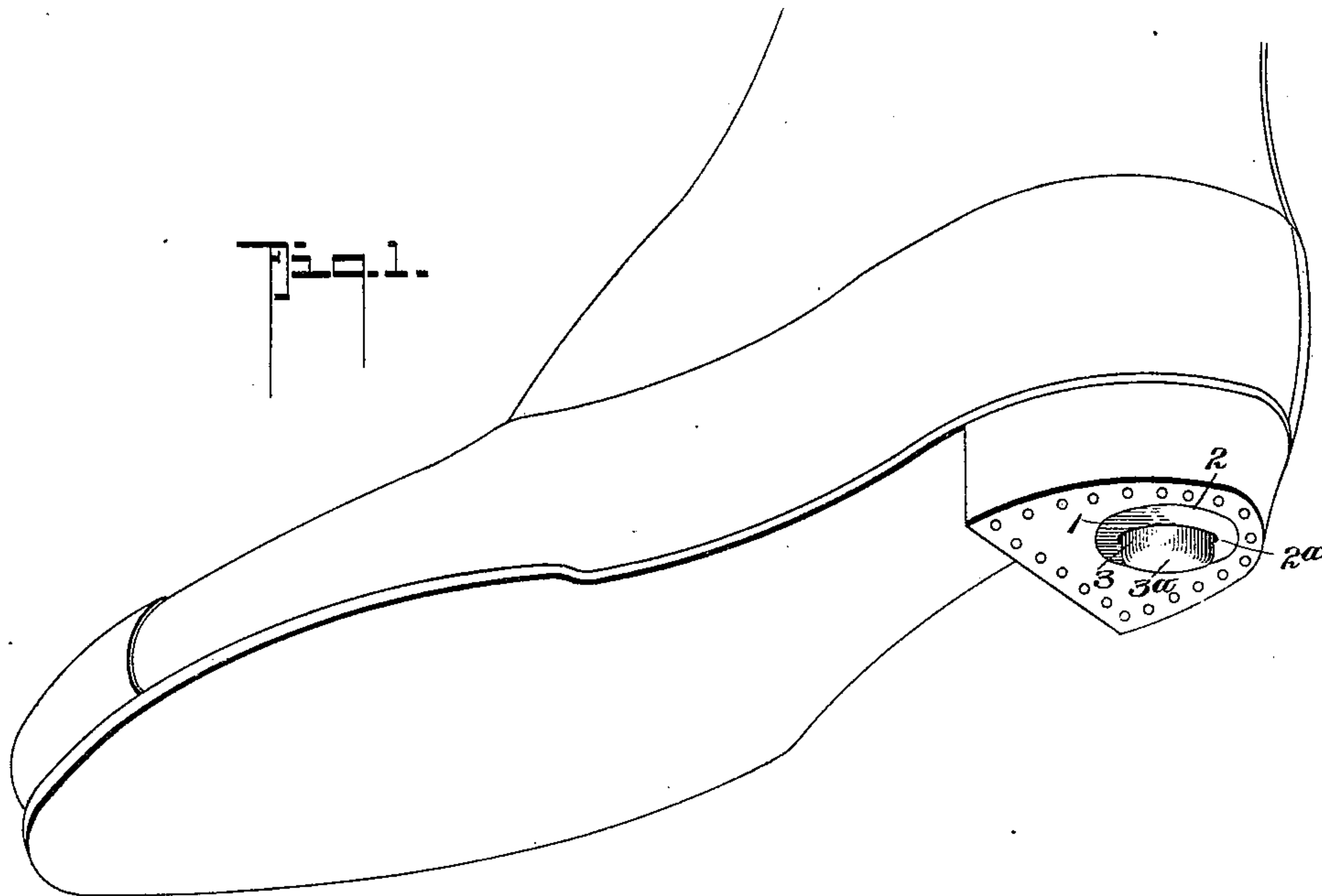
Patented Aug. 22, 1899.

**G. E. SWAN.**

## HEEL SPRING FOR BOOTS OR SHOES.

(Application filed Sept. 22, 1898.)

(No Model.)



**WITNESSES :**

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# UNITED STATES PATENT OFFICE.

GEORGE E. SWAN, OF BEAVER DAM, WISCONSIN.

## HEEL-SPRING FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 631,683, dated August 22, 1899.

Application filed September 22, 1898. Serial No. 691,643. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. SWAN, residing at Beaver Dam, in the county of Dodge and State of Wisconsin, have invented a new and Improved Heel-Spring for Boots or Shoes, of which the following is a specification.

This invention, which relates generally to an improved construction of spring impact device for shoe and boot heels, having for its purpose to lessen the jar when the heel is placed upon the ground in walking and giving the heel an upward impulse as the weight is being transmitted to the ball of the foot, in its more specific nature refers to improvements on a similar device patented by me May 31, 1898, No. 604,805.

In the practical application of my patented spring-heel device I have found the results not all that is desired, for the reason that the body or supporting portion of the device, being in the nature of a single flat disk adapted to be held on the heel by screws or spurs, does not provide such a permanent and rigid support for the slug or tread-block as is necessary to effect the best results. Furthermore, as the tread-block has an elongated wedge shape I have found that should the heel be set at a lateral inclined angle (which is frequently the case) a twist or lateral strain is effected on the said tread-block which has the tendency not alone to impart a pull strain on the bottom or disk member, and thereby weaken its securing means, but also wears the tread-block irregular in such shape as to render a uniform springy action thereof at all angles of the tread or impact of the heel impossible. Again, the peculiar form of the tread-block and the coil-spring disclosed in my patent referred to does not admit of the most economical and stable construction. My present invention, which has the same objects in view of the device disclosed in the said Patent No. 604,805, seeks to provide a more economical and stable construction of such device which can be the more quickly fitted and securely held on the heel and which will effectively operate to take up the shock irrespective of the angle (longitudinal or transversely) at which the heel is set.

My invention therefore comprehends, first, a novel construction of spring-heel device in which the tread-block and the spring mem-

bers are capable of being so fitted into the heel without the aid of screws, spurs, or analogous means and capable of being rigidly held in place irrespective of the manner in which the heel is set or of wear on the same, and, secondly, this invention comprehends a combined holding and buffer means for the spring and tread-block, embodying a main spring, which acts as the buffer to take up the shock, and a supplemental spring, which while also acting as a buffer more particularly serves to return the tread-block to its proper position on the holder, said tread-block also having a novel construction and correlation with the holder, whereby it is capable of self-adjustment laterally and about its own axis and whereby it will effect the same uniform pressure on the buffer-spring no matter at which side or angle it may be depressed by the heel and by which its movement can in no way affect the securing means for holding the entire device on the heel.

In its subordinate features the invention comprises the novel details of construction and peculiar combination of parts, as will hereinafter be described, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 illustrates my invention as applied to the heel of a shoe. Fig. 2 is a section of the heel with my devices applied and showing the parts thereof in their normal position. Fig. 3 is a similar view showing the tread-block as impacting on a forwardly-inclined surface. Fig. 4 is a horizontal section thereof on the line 4 4 of Fig. 2. Fig. 5 is an inverted view of the spring devices detached, and Fig. 6 illustrates the several parts constituting my improved device in detail.

My present form of heel-spring devices comprise a cylindrical casing 1, which in practice is made of different sizes and of less height than the size of the heel to which they are to be applied. The casing 1 has the same diameter throughout, its lower end terminating in an integral bottom plate 2 and its upper end being open, as shown in Fig. 6. The bottom plate 2 has a central opening 2<sup>a</sup>, which in practice is of a somewhat larger diameter than the impact or slug end 3<sup>a</sup> of the tread-block 3, which end in the present structure is circular in horizontal section and has its



lower edges rounded to the more readily slip over obstructions in dragging the heel and also to avoid sharp edges. The tread-block 3 has a disk portion 3<sup>b</sup> of a less diameter than the diameter of the casing 1, in which it plays; but it is made wider than the opening 2<sup>a</sup>, said block also having a central boss 3<sup>c</sup> on its upper face, the purpose of which will presently appear.

4 indicates a main or buffer spring which consists of a stout coil wound so its normal expansible tension will be practically at its limit when the parts are at their normal position, as shown in Fig. 2, whereby to avoid the tendency of forcing the casing out from the heel-socket. The spring 4 is coiled to snugly fit within the casing and to rest on the outer edge of the disk portion 3<sup>b</sup>, the upper end of such spring being held to bear against a top plate 5, which is fitted in the open upper end of the casing after the spring 4 and spring 6, presently described, are fitted within such casing, said top plate being held from moving out of the casing-top by upsetting or swaging the upper end of the casing, as indicated in Figs. 2 and 3.

In fitting my device to the heel a socket is cut in such heel by suitable boring-tool of substantially the diameter and height of the casing 1, which casing is then pressed into the socket until its bottom 2 is flush with the lower edge of the heel, it being manifest that when once driven in the heel the elasticity of the surrounding walls of the heel-socket will cause the said socket to firmly grip the casing and hold it from coming out.

So far as described it will be readily apparent that should the pressure on the tread-block be substantially vertical the compression on the spring 4 would be a substantially uniform one; but should the pressure on the said tread-block be at an angle, as indicated in Fig. 3, the compression of the spring 4 would be irregular and a free or proper play of the tread-block, particularly so when returning to its normal position, might under some circumstances be retarded.

To obtain the full buffer action of the spring 4 under all conditions and to positively provide for the tread-block properly returning to its normal position, I provide a supplemental spring 6 of a much smaller diameter and less tension than the spring 4, the lower end of such spring 6 engaging the disk 3<sup>b</sup> and seating about the boss thereon, while the upper end thereof bears against the top plate and seats about a central pendent boss 5<sup>a</sup>, forming a part of such plate. The spring 6, it will be observed, while also serving the function of a buffer-spring more particularly acts as a fulcrum on which the tread-block can gyrate, and thereby properly distributing the strain on the main buffer-spring 4 no matter which side of it may be depressed in its engagement with the ground or floor, said movement of the tread-block being made possible by reason of its disk portion being of a

less diameter than the casing in which it plays and its head or slug member of a less diameter than the opening 2<sup>a</sup> in the bottom 2 of the casing.

Another and important advantage attained by making the head or slug of the member 3 smaller than the opening 2<sup>a</sup> is that by being held free of contact with the bottom 2 under substantially all conditions of movement there will be no lateral or twist strain on the casing, which might by reason of such continuous strain be loosened in its socket and its fastening thereby be made insecure.

By arranging the several parts as described the device can be constructed at a minimum cost and requires no skill whatever in applying it to the heel of a boot or shoe.

By holding the tread-block and buffer-spring as described all lateral or twist strain on the whole casing is avoided and the said block held for a universal movement both as to its rotary and lateral action.

I am aware that, broadly, it is not new to provide a tread-block having a buffer-spring attached and held in a socket in the heel, as such construction is disclosed in Patent No. 255,871, dated April 4, 1882. In this patent the block is fixedly attached to the spiral spring, does not have a universal movement, is not self-adjusting, and does not move independent of bearing against the side walls of the heel-socket in which it plays.

I am also aware of Patent No. 554,988, dated February 18, 1896, and I therefore broadly make no claim which covers the construction disclosed therein or in Patent No. 255,871; but

What I do claim, and desire to secure by Letters Patent, is—

1. A device for the purposes described, comprising a hollow casing adapted to be fitted into a correspondingly-shaped socket formed in the heel to which it is to be attached, said casing having a bottom having a central opening; a tread-block comprising a disk or head portion, vertically and rotatably movable within the casing and having an integral slug or impact member projected through the opening in the casing-bottom, and a buffer-spring held within the casing to rest on the tread-block as specified.

2. A device for the purposes described, comprising a hollow casing adapted to fit a socket in the heel, said casing having its bottom formed with a center opening; a pressure-spring held in the casing and a tread-block having a slug portion projected through the opening in the casing-bottom, said block being held between the spring and the casing-bottom, but disconnected therefrom, whereby it is capable of moving laterally and rotatably, substantially as shown and for the purposes described.

3. A device for the purposes described; comprising a casing adapted to be fitted in the socket of the heel and having a bottom central aperture; a tread-block comprising a disk portion of less diameter than the casing and



having a slug or tread member of less diameter than the casing-bottom aperture; a main coil buffer-spring seated in the casing to bear against the outer edge of the tread-block and a second coil-spring held to bear centrally on the said tread-block, all being arranged substantially as shown and described.

4. As a new article of manufacture; a spring tread attachment for heels; comprising a casing formed of a cup-shaped body having its bottom centrally apertured; a tread-block consisting of a disk portion of a less diameter than the cup-shaped body, having an integral pendent circular tread or slug member adapted to extend through the opening in the casing-bottom and being of less diameter than such opening, and a central boss

on the upper face; a main buffer or coil spring held in the casing to bear on the outer edge of the tread-block disk; a second coil-spring 20 held within the first spring, its lower end seating on the tread-block around its boss and a top plate fixedly held on the upper end of the cup-body formed with a pendent boss to project in the upper end of the inner spring, 25 all being arranged substantially as shown and described, whereby the inner spring will serve as a yielding fulcrum or center bearing for the tread-block as it is moved laterally or rotated.

GEORGE E. SWAN.

Witnesses:

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THEO. G. HUTH.