

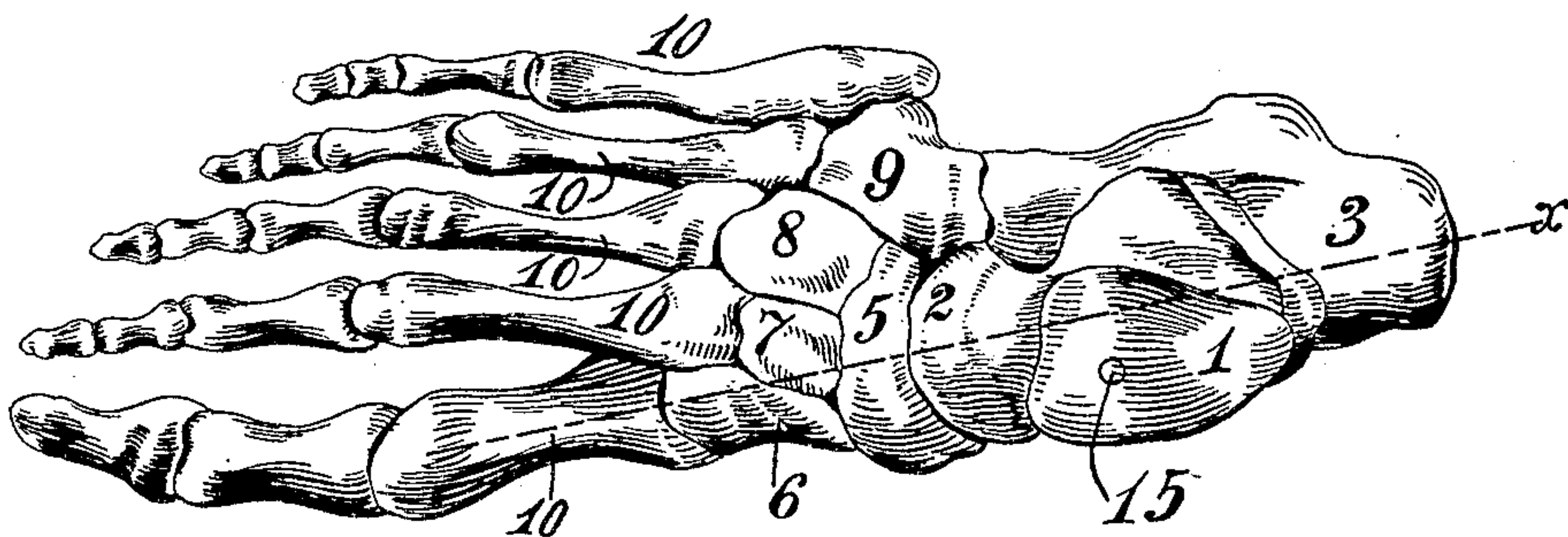
No. 812,920.

PATENTED FEB. 20, 1906.

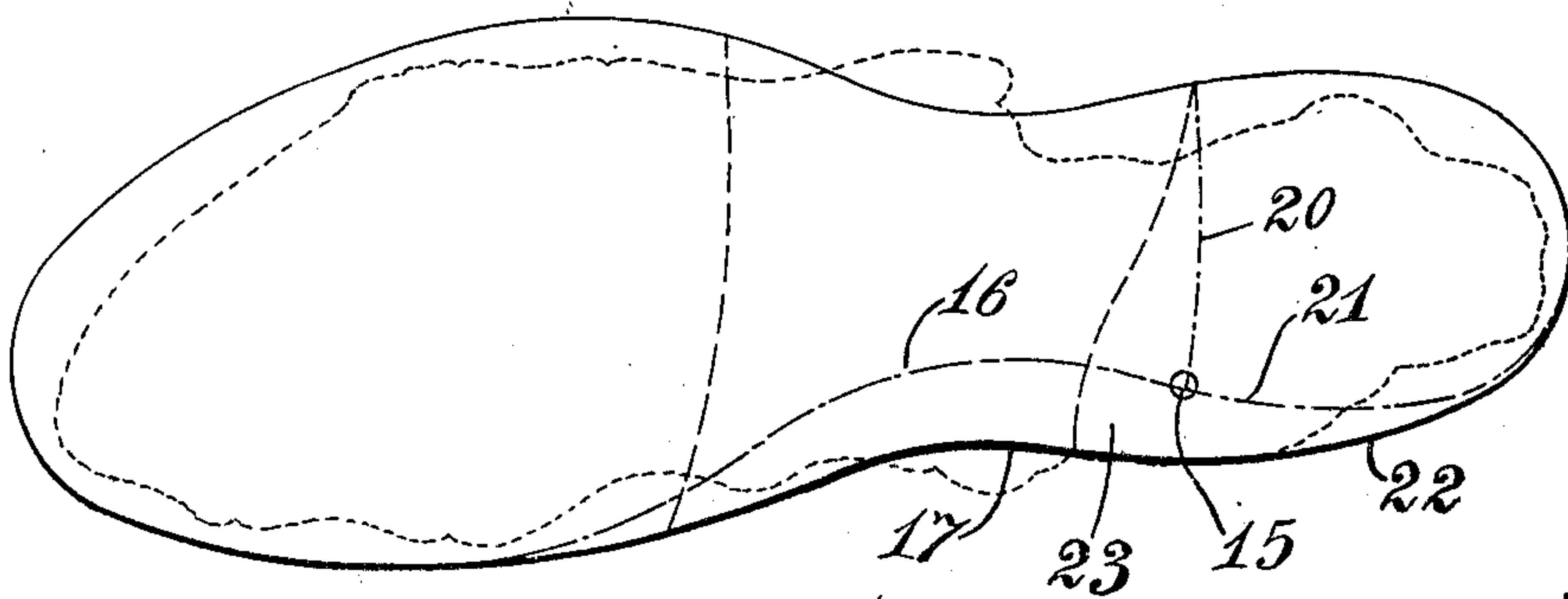
H. P. COLE.  
ANATOMICAL FOOTWEAR.  
APPLICATION FILED FEB. 16, 1904.

2 SHEETS—SHEET 1.

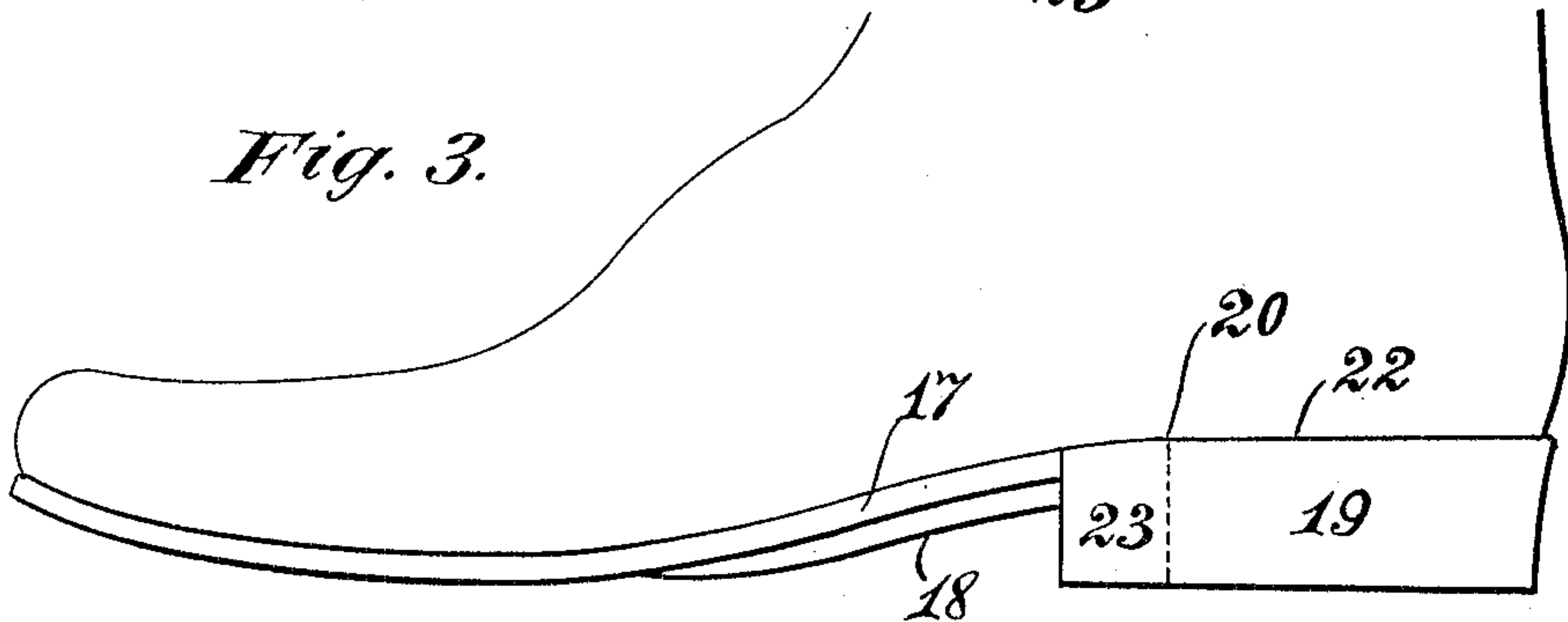
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses:  
Chas. F. Schuch  
J. E. Anderson.

Inventor:  
Harlan P. Cole,  
By his Attorney  
W. H. T. Blodgett

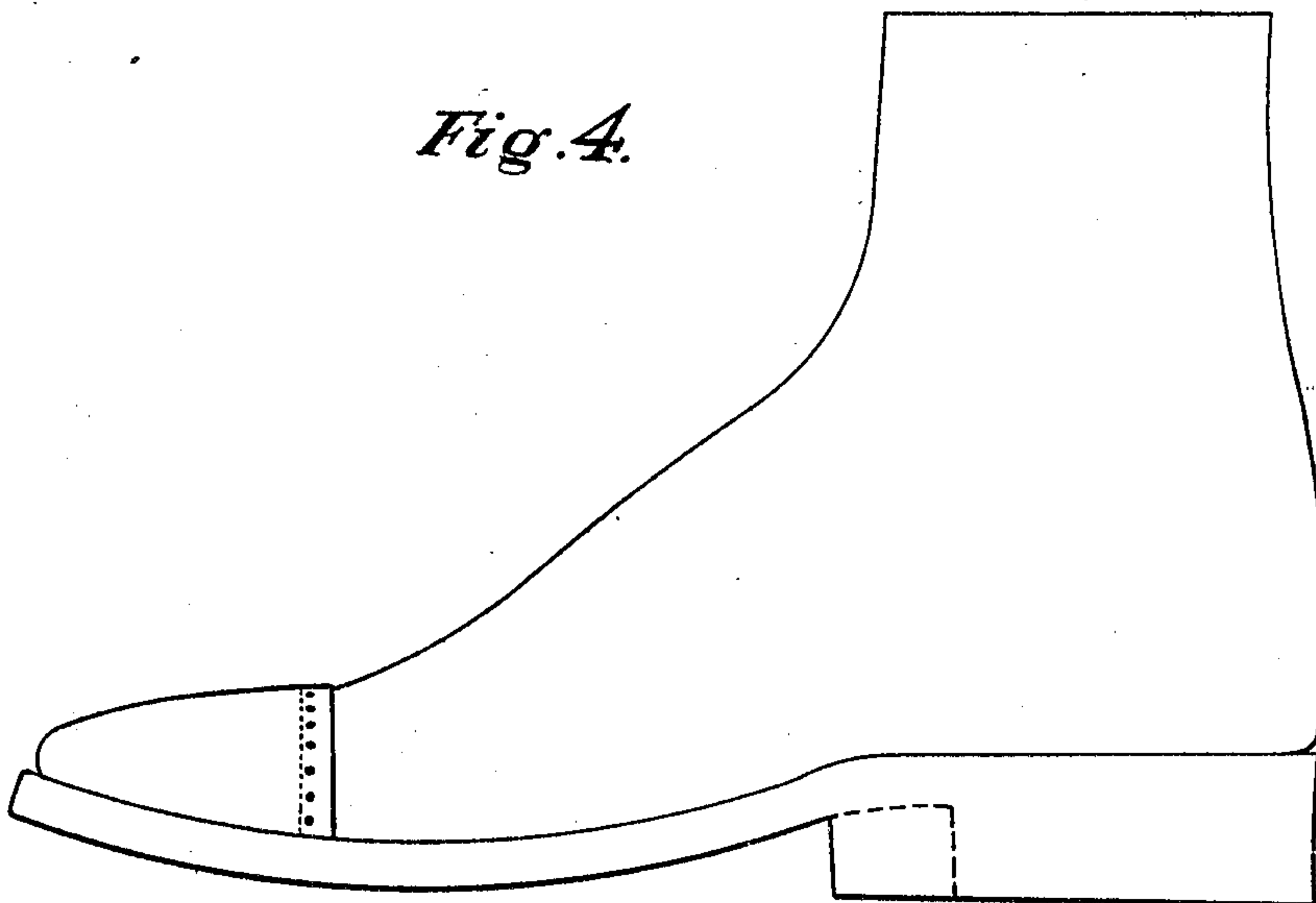
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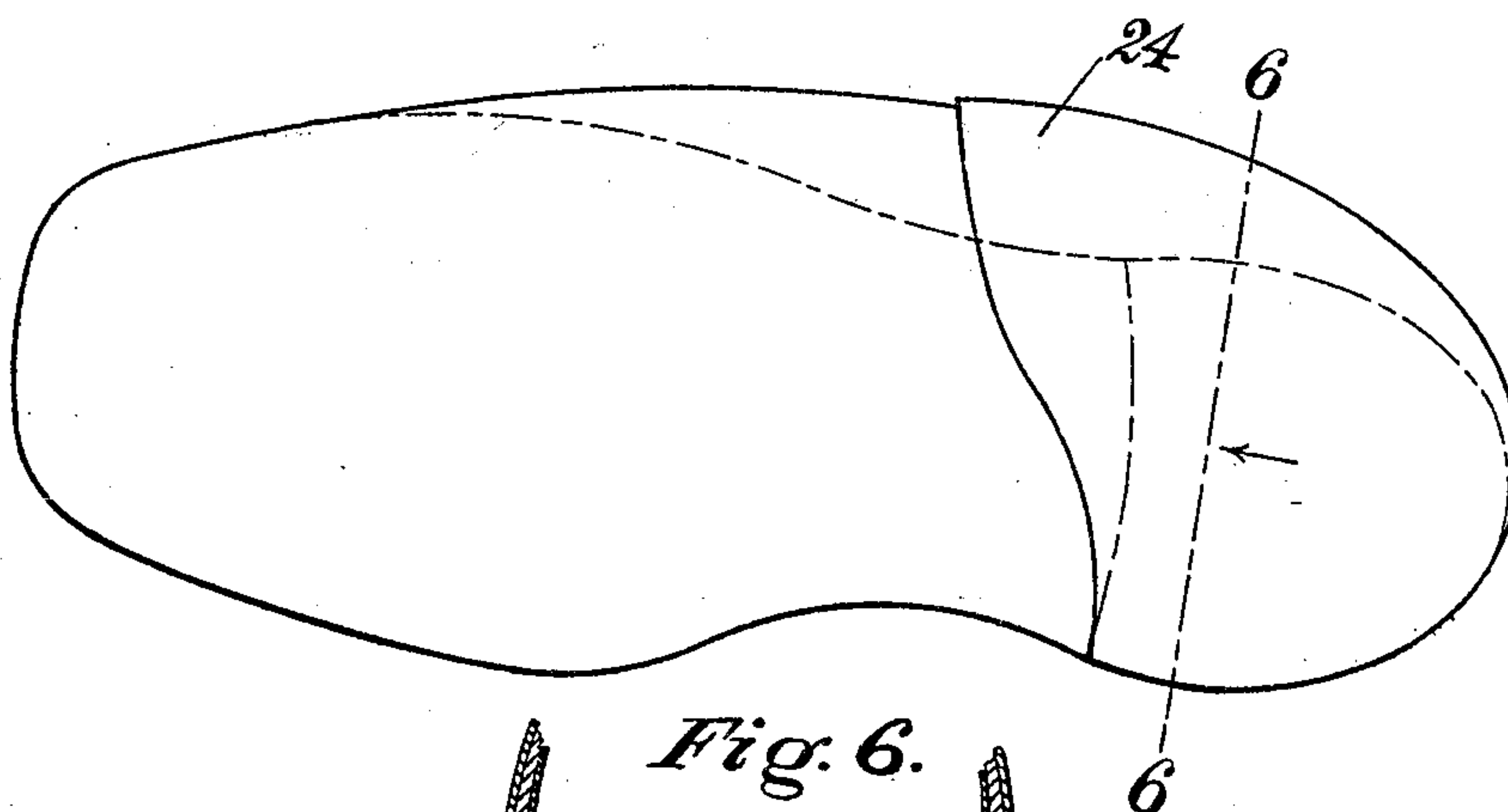
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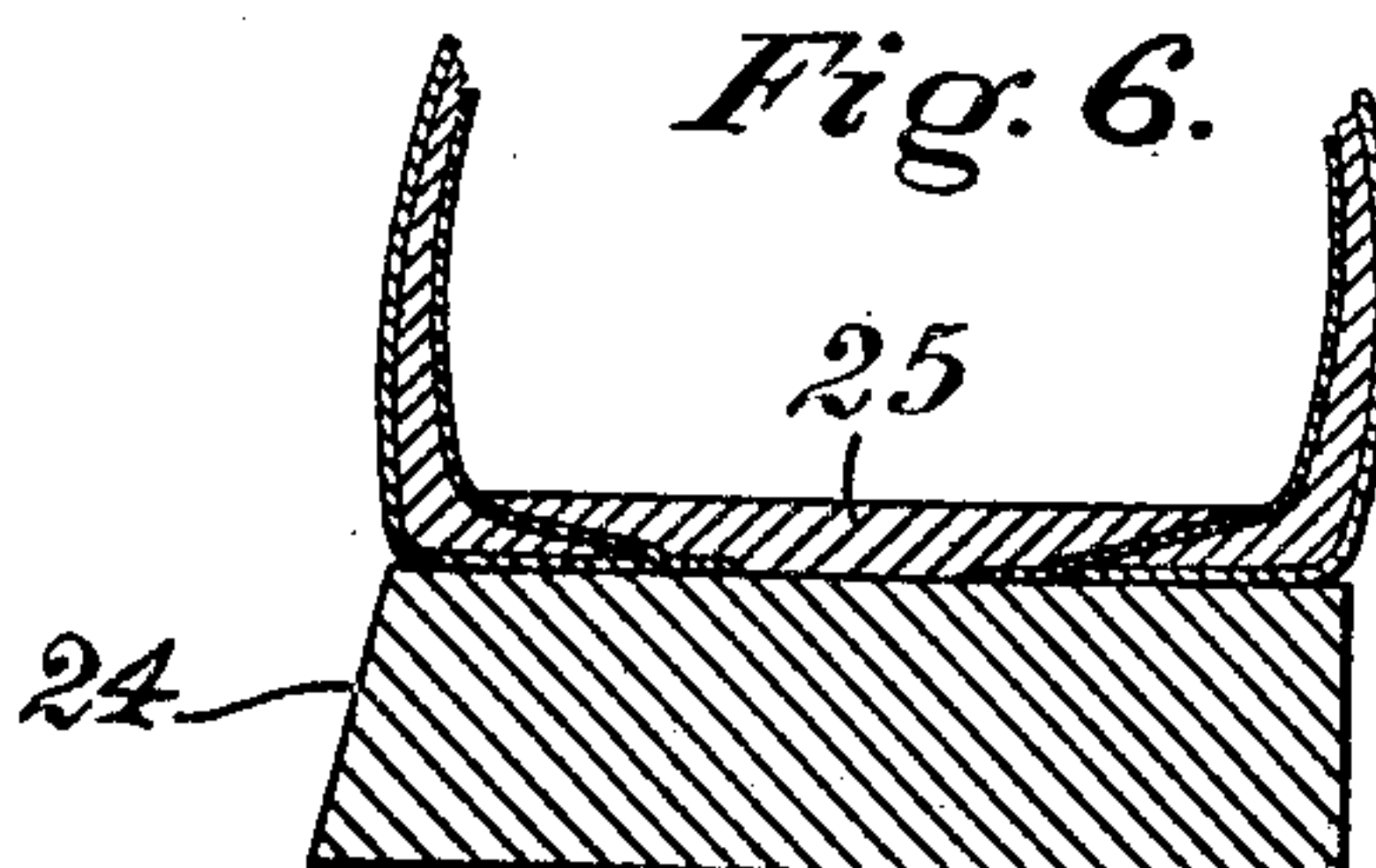
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Witnesses:*

*J. E. Anderson.*

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*Harlan P. Cole,*  
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# UNITED STATES PATENT OFFICE.

HARLAN P. COLE, OF HARTFORD, CONNECTICUT, ASSIGNOR TO NETTIE D. COLE, OF HARTFORD, CONNECTICUT.

## ANATOMICAL FOOTWEAR.

No. 812,920.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed February 16, 1904. Serial No. 193,862.

*To all whom it may concern:*

Be it known that I, HARLAN P. COLE, a citizen of the United States of America, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Anatomical Footwear, of which the following is a specification.

My invention relates to anatomical footwear of all kinds, and has for its object the prevention and cure of the disabilities and deformities known to surgeons as "talipes valgus," "talipes varus," "weak foot," "flat-foot," &c.

It is of universal knowledge that many people are afflicted with weak ankles, thereby causing the feet to turn while standing or walking, which weakness if not remedied frequently results in one or other of the above disabilities or deformities; also, that such occupations as policemen, shop assistants, nurses in hospitals, &c., which require persons to walk or stand upon their feet a large portion of the time, tend to strain the muscles that support the arch of the foot and to produce weakness and subsequent deformity, thereby causing "run-down" heels and other distortions of the footwear in use. The collection of bones forming the skeleton of the human foot is arranged in such a manner that when the weight of the body rests upon it the foot would topple over to the inside were it not for the support of certain muscles of the leg that pass down to the foot from opposite sides, spread their tendons out across its under surface, and keep the transverse axis of the foot in a horizontal position. The "arch" of the foot, so called, maintains its normal position, with its inner border raised from the surface on which the foot rests so long as these muscles are normally healthy.

Primarily, the object of my invention is the provision of footwear of any kind so constructed as to support the parts liable to displacement through straining or weakening of muscles, thus preventing the turning of the ankle or the rotation of the foot inward or outward upon its long axis.

In ordinary footwear the sole is curved inwardly to form the shank in such a way that no support is afforded to the foot where such support is most needed—just beneath and immediately anterior to the ankle—and the heel

is located back of these points, so that it affords no support to that part of the foot receiving the weight of the body. Consequently the ordinary shoe, boot, or other footwear does not furnish this support, and therefore in no way acts to prevent the turning of the foot on its longitudinal axis when the weight of the body overcomes the weakened muscles.

In view of the premises a further object of my invention is the provision of a sole constructed on lines adapted to sustain the normal position of the foot and stiffened or reinforced under one lateral half, if desired.

A further object of the invention is the provision of a heel of such shape that the center of gravity or the weight of the body conducted through the leg to the foot will fall within the base thereof, so that it will be impossible for the ankle to turn or the foot to revolve about its longitudinal axis.

A further object of the invention is the provision of footwear of symmetrical shape, which will not apparently differ in appearance to the casual observer from the common kinds in universal use, but which will not only prevent the troubles above set forth, but will effect a cure of chronic cases.

By the term "footwear" is meant any article of the kind—for instance, boots, shoes, sandals, slippers, &c.—commonly employed for the protection of the human foot.

In the accompanying drawings, Figure 1 is a plan view of the skeleton of the human foot. Fig. 2 is a plan view of the sole of an article of footwear constructed in accordance with the present invention, said view showing by dotted lines an outline of the skeleton of the foot and also diagrammatically illustrating the manner in which the invention operates to sustain the normal position of the foot. Fig. 3 is a side elevation of footwear constructed in accordance with my invention. Figs. 4 and 5 are side and bottom views of a different form of the invention. Fig. 6 is a section on line 6 6 of Fig. 5.

Like numerals designate similar parts throughout the several views.

In Fig. 1 the numeral 1 designates the superior articular surface of the astragalus, the major axis of which lies parallel to the length of the foot; 2, the anterior portion of that bone; 3, the os calcis; 5, the scaphoid bone; 6, the internal cuneiform bone; 7, the middle



cuneiform bone; 8, the external cuneiform bone; 9, the cuboid bone, and 10 10 the metatarsal bones.

In its normal position the foot rests upon  
 5 three chief points—the under surface of the posterior part of the os calcis 3, the head of the first metatarsal bone, and the head of the fifth metatarsal bone—and it will be seen that the upper articular surface of the as-  
 10 tragalus 1, which supports the weight of the body through its articulation with the bones of the leg, lies to the inner side of the line  $x$ , joining the under surface of the posterior part of the os calcis (the heel) to the head of  
 15 the first metatarsal bone, and that the center of gravity of the joint between the astragalus and the tibia (shin-bone) is at about the point indicated by the circle 15 in Figs. 1 and 2, and consequently the weight of the body will  
 20 have a tendency to cause the astragalus and the os calcis, upon an inward projection of which the former rests for the most part, to rock laterally against their sustaining mus-  
 25 cles and produce a turning of the foot. To prevent this action and afford a firm support for the instep, I extend the sole of the shoe from the position in which it is usually formed, as indicated by the dotted line 16 in Fig. 2,  
 30 to the position indicated by the full line 17 in said figure. In other words, the sole of foot- wear embodying my invention is extended, as at 17, to lie under the entire under surface of the foot, and said sole may be stiffened or  
 35 reinforced, as at 18, to afford greater rigidity and sustaining power, if desired.

In my invention the heel 19, which in the usual construction terminates at the dotted line 20 21 in diagram Fig. 2, is extended lat-  
 40 erally at 22 beyond the bearing-point 15 of the weight of the body and is projected forward at 23, also beyond said point, all as illus- trated in said Fig. 2, whereby the line of weight of the body as extended through the leg and designated by the circle 15 in Figs. 1  
 45 and 2 will come within the line 17 of the ex- tended sole and also within the forward ex- tension 23 and the lateral extension 22 of the heel, so that the natural tendency of the foot to rock on its longitudinal axis is absolutely  
 50 prevented.

The extensions of the sole and heel illus- trated in Fig. 2 are particularly adapted for cases in which there is a weakness or tendency to weakness of the muscles that pass to the  
 55 inner side of the ankle and support the arch of the foot. In cases where there is a tend- ency to an outward revolution of the foot

about its long axis the extensions of the sole and heel are made on the side of the footwear, as shown at 24 in Figs. 4 to 6, inclusive. 60

In lasts on which ordinary footwear is formed the heel of the last is convex on its under side, and consequently produces a con- cave seat or depression for the reception of the heel of the foot. This causes a ball-and-  
 65 socket joint action when the foot is in place and tends to aggravate the evils above men- tioned. In both forms of my invention I form the sole flat where the heel of the foot rests upon it, as at 25, Fig. 6, thus affording a  
 70 firm and straight bearing-surface, which will aid in preventing the rotation of the foot on its longitudinal axis. It will thus be seen that the weight of the body, supported as it is by the legs, is so sustained that there is no  
 75 liability of the inward or outward rotation of the foot and that weak ankles are effectually sustained without the possibility of turning and thereby distorting the footwear employed and "running down" the heels thereof. 80

Changes may be made in the shape of the sole and also that of the heel of my improved footwear without departure from the inven- tion, which is not limited to the exemplifica-  
 85 tions given. Furthermore, the construction may be such that the foot may be supported in ways different from that shown and still be within the purview of the invention.

Having thus described my invention, what I claim is— 90

1. Footwear having a sole laterally extend- ed on one side, and a heel also laterally ex- tended on one side to conform to the exten- sion of the sole, said heel being forwardly ex- tended on one side beneath the shank, whereby the weight of the body is thrown within the space occupied by the lateral extension of the sole and the forward and lateral extension of the heel, and turning of the ankle is pre-  
 95 vented.

2. Footwear having a heel extended later- ally beyond the normal sole to sustain the foot and extended forwardly on the inner side over the shank, whereby the line of weight of the body is thrown within the space occupied by said heel, and rocking of the foot on its longitudinal axis is prevented. 100

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

HARLAN P. COLE.

Witnesses:

F. E. ANDERSON,  
 C. F. SCHMELZ.