

(No Model.)

W. B. ARNOLD.
HEEL.

No. 598,838.

Patented Feb. 8, 1898.

Fig. 1.

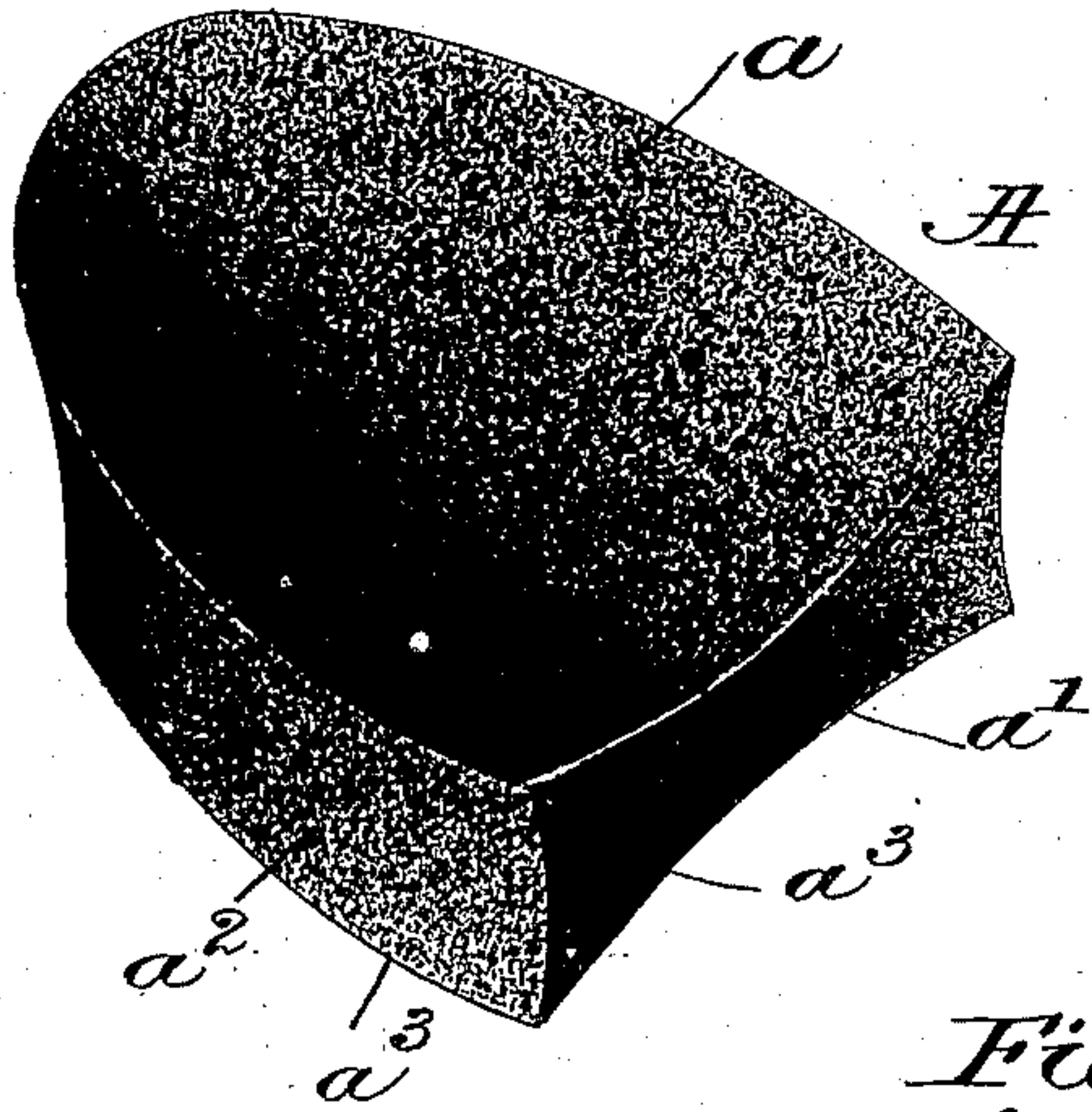


Fig. 2.

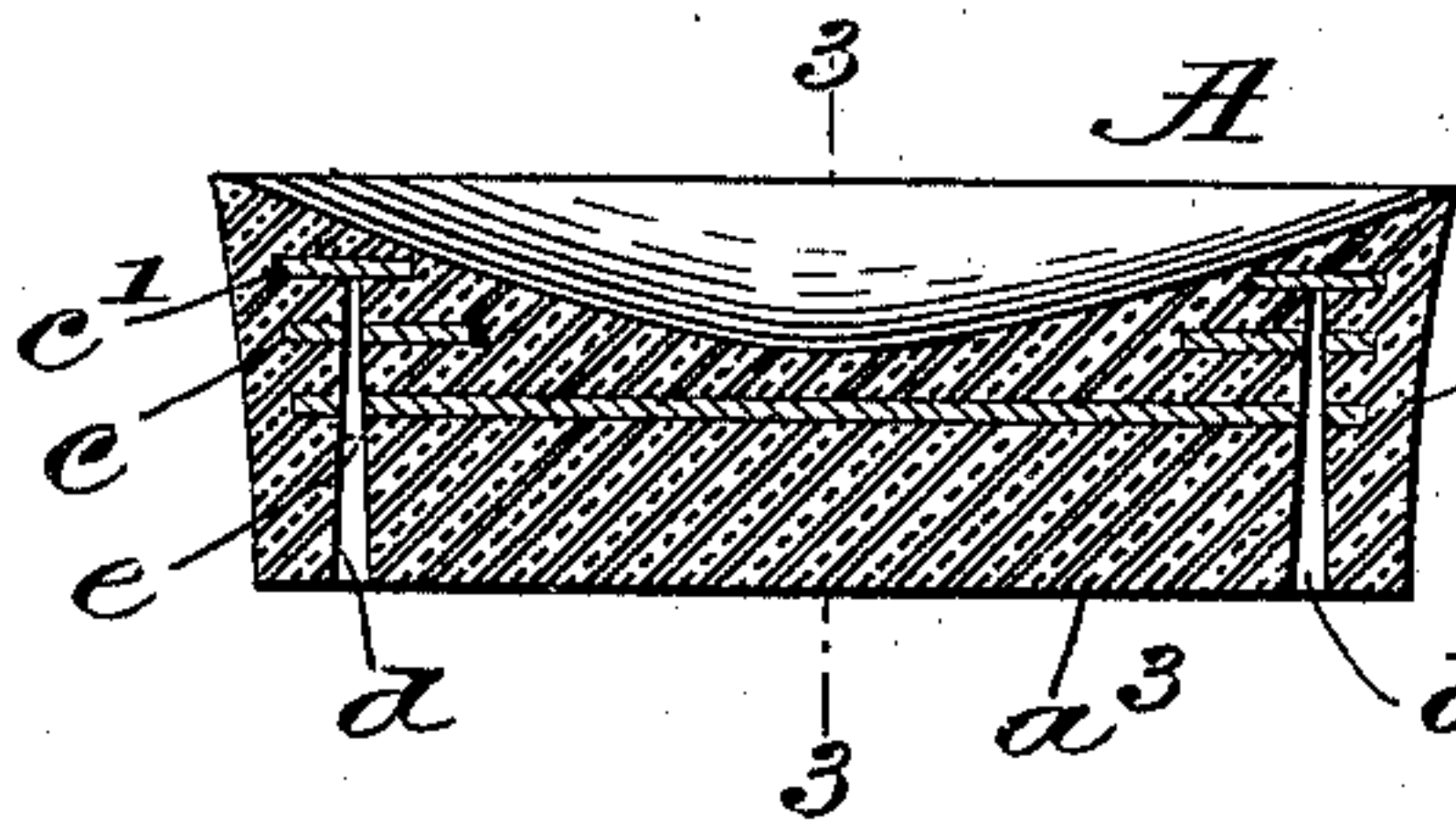


Fig. 3.

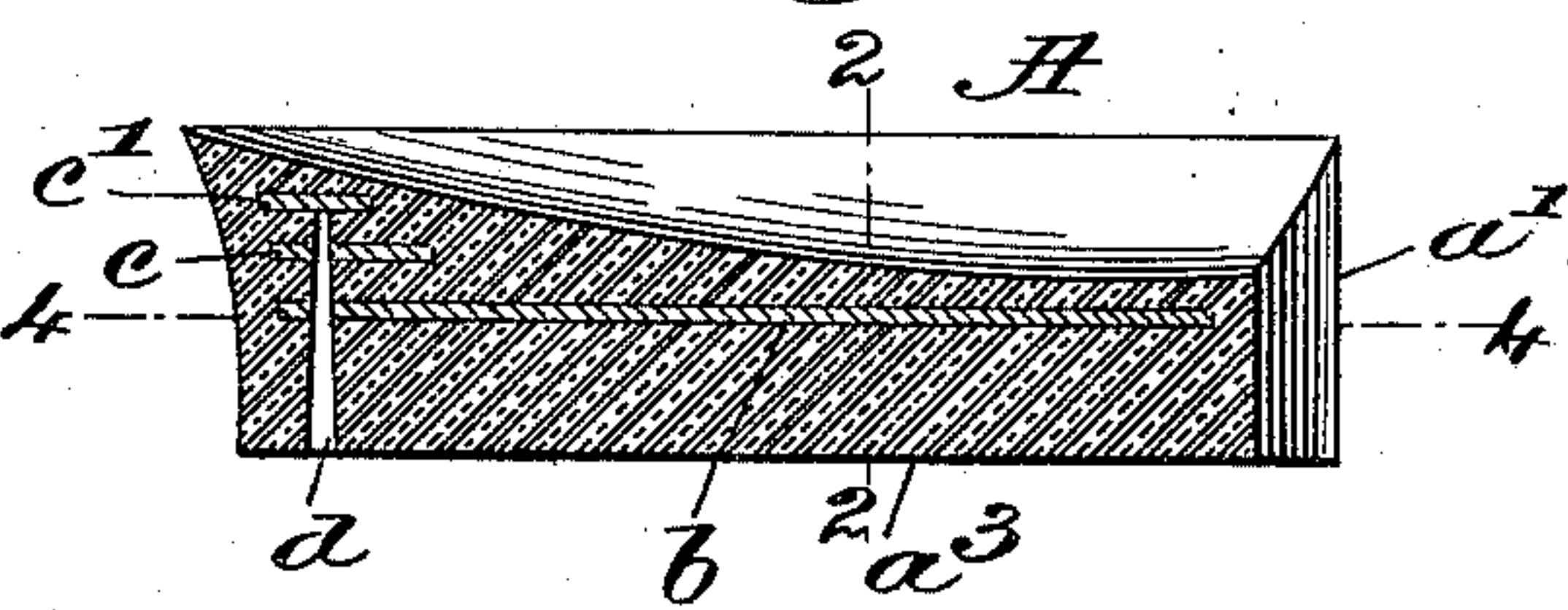
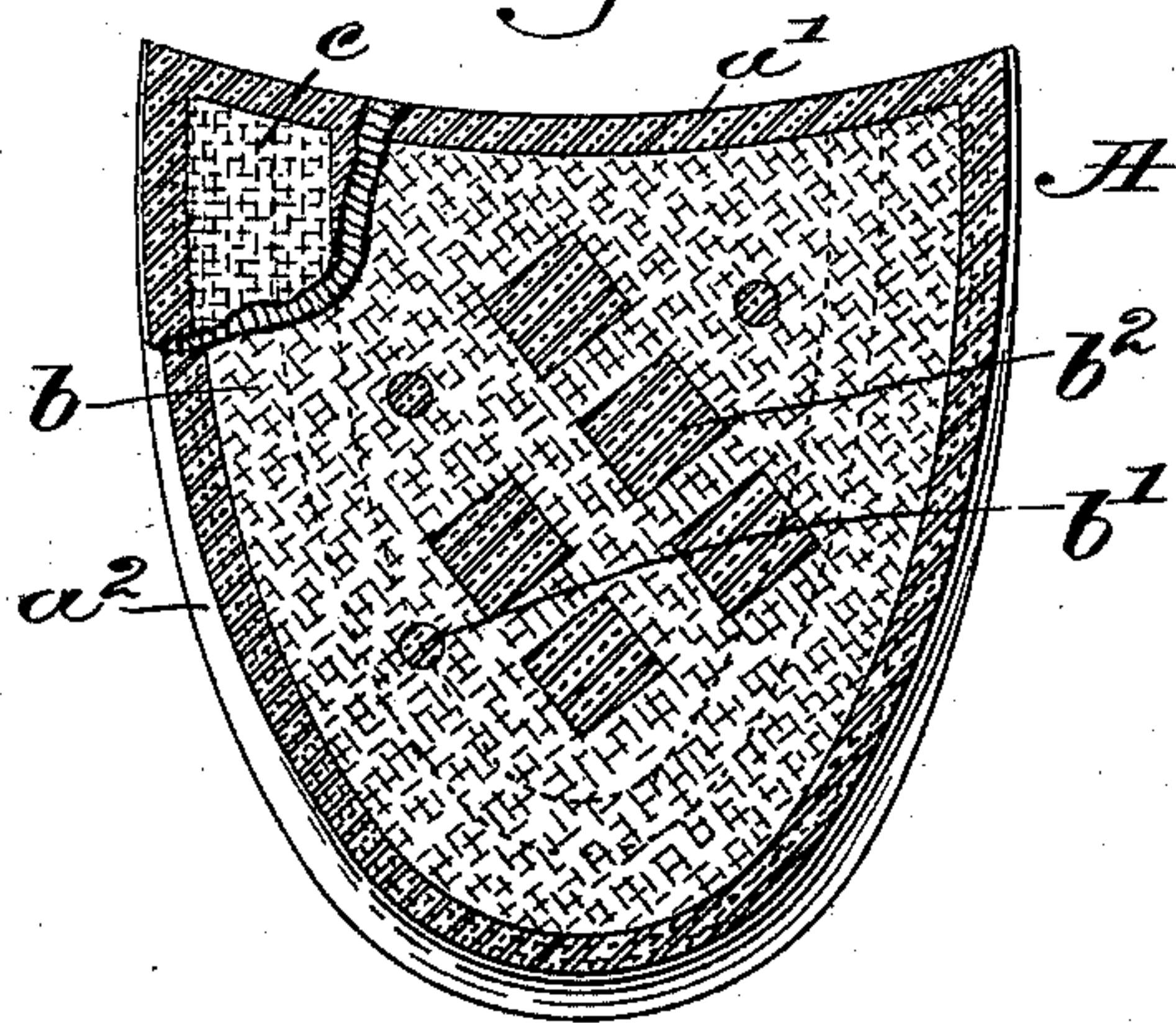


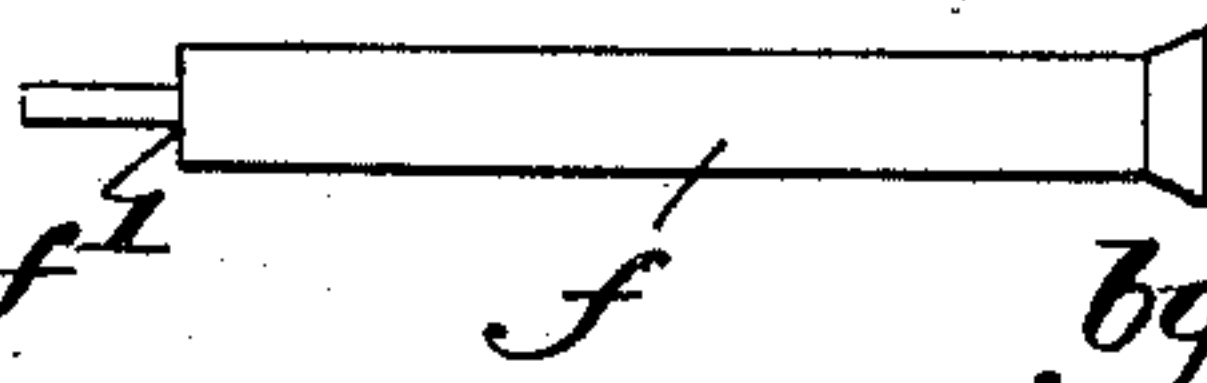
Fig. 4.



Witnesses:

Thomas J. Drummond,
A. C. Harmon,

Fig. 5.



Inventor:

William B. Arnold
by Crosby Gregory,
attys.

UNITED STATES PATENT OFFICE.

WILLIAM B. ARNOLD, OF NORTH ABINGTON, MASSACHUSETTS, ASSIGNOR
OF ONE-HALF TO THOMAS ARNOLD, OF SAME PLACE.

HEEL.

SPECIFICATION forming part of Letters Patent No. 598,838, dated February 8, 1898.

Application filed June 18, 1897. Serial No. 641,288. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. ARNOLD, of North Abington, in the county of Plymouth and State of Massachusetts, have invented an Improvement in Heels, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a new article of manufacture particularly intended for sale to the trade; and it consists in a rubber heel of great density and peculiar formation, as hereinafter more definitely explained.

My object in providing a rubber heel is to enable the wearer of the usual leather or cloth boot or shoe to avoid the jar and slip of walking and have the ease of movement due to the yield of the rubber heel; and to that end I have invented the herein-described heel, capable of being secured easily and quickly to any boot or shoe by usual nails or fastenings without liability to loosen therefrom.

In the accompanying drawings, illustrative of one embodiment and style of my invention, Figure 1 is a perspective view of a heel complete as an article of manufacture. Fig. 2 is a vertical cross-section thereof on line 2 2, Fig. 3. Fig. 3 is a vertical longitudinal section taken on line 3 3, Fig. 2. Fig. 4 is a horizontal section taken on line 4 4, Fig. 3, looking in the direction of the arrow. Fig. 5 is a side elevation of a special nail-set employed.

Viewing Fig. 1 it will be seen that in general outline my improved heel A comprises an upper dished surface a , tapering or sloping downward toward its breast a' , the latter being preferably curved, as shown more clearly in Fig. 4, and smooth edges a^2 and bottom a^3 . The heel may be varied to suit any style.

In order to make it practicable and feasible to secure the heel directly to a boot or shoe in the ordinary manner by nails and not have it pull or kick off readily, I embed a midrib or diaphragm b solidly in the heel, this midrib being preferably very closely-woven canvas, so that when it is held at every point by the compressed rubber above and below it is laterally unyielding and will hold nails firmly. The midrib b is somewhat smaller than the

section area of the heel in order that the walls or edges of the latter may be unbroken, and in order to prevent the heel from being split by an accidental cut along its edge at the midrib I have perforated the latter, as shown at $b' b^2$, in such a way as to permit the rubber above and below the midrib to unite through it without unduly weakening the midrib, thereby not only strengthening the heel, but also holding the midrib more intimately and solidly. The perforations are peculiarly arranged for the greatest strength of the heel and least weakening of the midrib. Above the midrib b I embed retaining members, shown as two in number, $c c'$, preferably of the same material used for the midrib, these members serving to retain the nails and stiffen the weaker upwardly-extending parts of the upper portions of the heel, preventing it from flattening out in use. The retaining midrib and members $c c'$ are cut out so as to bring the fibers oblique to each other, as shown in Fig. 4, thereby offering a greatly-reinforced support for the nails.

When the heel is cast, nail-holes $d d'$ are permanently formed therein, slightly smaller than the fastening-nails to be used, these holes preferably terminating at the upper inlay c' , although, if preferred, they may go all the way through. Also in some cases it may be desirable to omit the nail-holes, and therefore I wish it understood that my invention is not otherwise limited than is stated in the claims, and that other material than canvas may be used for the midrib and retaining members, and that certain of these may be omitted or more employed, and that the various details of invention may be otherwise varied.

In making the heel constituting my present invention I first cast or mold the heel in separate horizontal sections in number according to the layers $b c c'$ and then I stack or pile them in proper order, placing the thicker bottom section first, then the midrib on top of it, then another section, and the member c on top of that, and so on, it being understood that if the members $c c'$ are not used then the rubber is first molded in two sections, and then the midrib is superimposed on the bottom section and the top section placed on the midrib. The stack or pile thus

assembled is then put in a die or mold conforming to the shape required to produce my improved heel as a complete article ready for attachment without alteration to a usual boot or shoe. The die, with its composite contents, is then placed in an oven at very high temperature and enormous pressure is brought to bear on the die and contents, particularly at the peripheral walls of the heel, whereby the separate sections are rendered integral and a permanent density and hard finish is given to the heel edges, capable of receiving a polish the same as leather. The heel is subjected to the heat and pressure for a few moments only. Any finish may be given to the heel thus produced, so that it is equally applicable to russet, tan, patent-leather, or any other variety of shoe.

While I have set forth herein the way I am making my improved heel, I do not mean to limit my patent thereto, inasmuch as I intend herein to cover the heel itself as an article.

The midrib as devised by me, particularly when the heavy canvas midrib is employed, is also an effective factor in the rigidity of the heel, as by its unyielding character and solidly-embedded position it maintains the entire heel flat and firm, preventing any twisting, so that practically the only yield or give that the heel has is a vertical compression of the body of rubber below the midrib and securing-nails. The latter should not be forced entirely through the midrib, but should stop at *e*, Fig. 2, and accordingly I provide a nail-set *f*, having shoulders *f'* to limit its movement, so that as the nails are driven to the position *e* the shoulders *f'* engage the bottom of the heel and prevent farther driving in of the nails.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As an article of manufacture, a rubber resilient heel, having the rubber at the edges of the heel hardened and rendered capable of receiving and permanently retaining a high polish, and having a flexible midrib horizontally embedded within the heel terminating short of said edges, substantially as described.

2. As an article of manufacture, a solid heel, made of rubber, and having a midrib embedded therein from adjacent one edge to adjacent the opposite edge in the path of the fastening-nails, said midrib being of material

longitudinally unyielding to resist the lateral strain of the fastening-nails, but readily permitting the passage of the nails transversely thereof for securing the heel, substantially as described.

3. As an article of manufacture, a solid heel, made of rubber, and having a midrib embedded therein from adjacent one edge to adjacent the opposite edge in the path of the fastening-nails, said midrib being of material longitudinally unyielding to resist the lateral strain of the fastening-nails, and having central perforations of considerable area through which the rubber above and below is united by substantial solid portions of itself, substantially as described.

4. As an article of manufacture, a solid rubber heel, having a midrib horizontally embedded therein to receive the fastening-nails, and one or more U-shaped retaining members also embedded in the path of said fastening-nails, substantially as described.

5. As an article of manufacture, a solid rubber heel, having a midrib horizontally embedded therein to receive the fastening-nails, and a plurality of U-shaped retaining members successively spaced apart and embedded in the heel above said midrib in the path of the said fastening-nails, substantially as described.

6. As an article of manufacture, a solid rubber heel, having a midrib horizontally embedded therein, and a plurality of openings for the fastening-nails permanently cast in the heel, said openings extending through the said midrib from the bottom of the heel and terminating short of the top of the heel, substantially as described.

7. As an article of manufacture, a complete heel made of rubber, and having a canvas midrib and one or more canvas retaining members independently embedded therein in the path of the fastening-nails, the threads of said successive layers of canvas extending obliquely to each other, whereby they may offer greater resistance for retaining the nails, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM B. ARNOLD.

Witnesses:

FREDERICK L. EMERY,
GEO. H. MAXWELL.