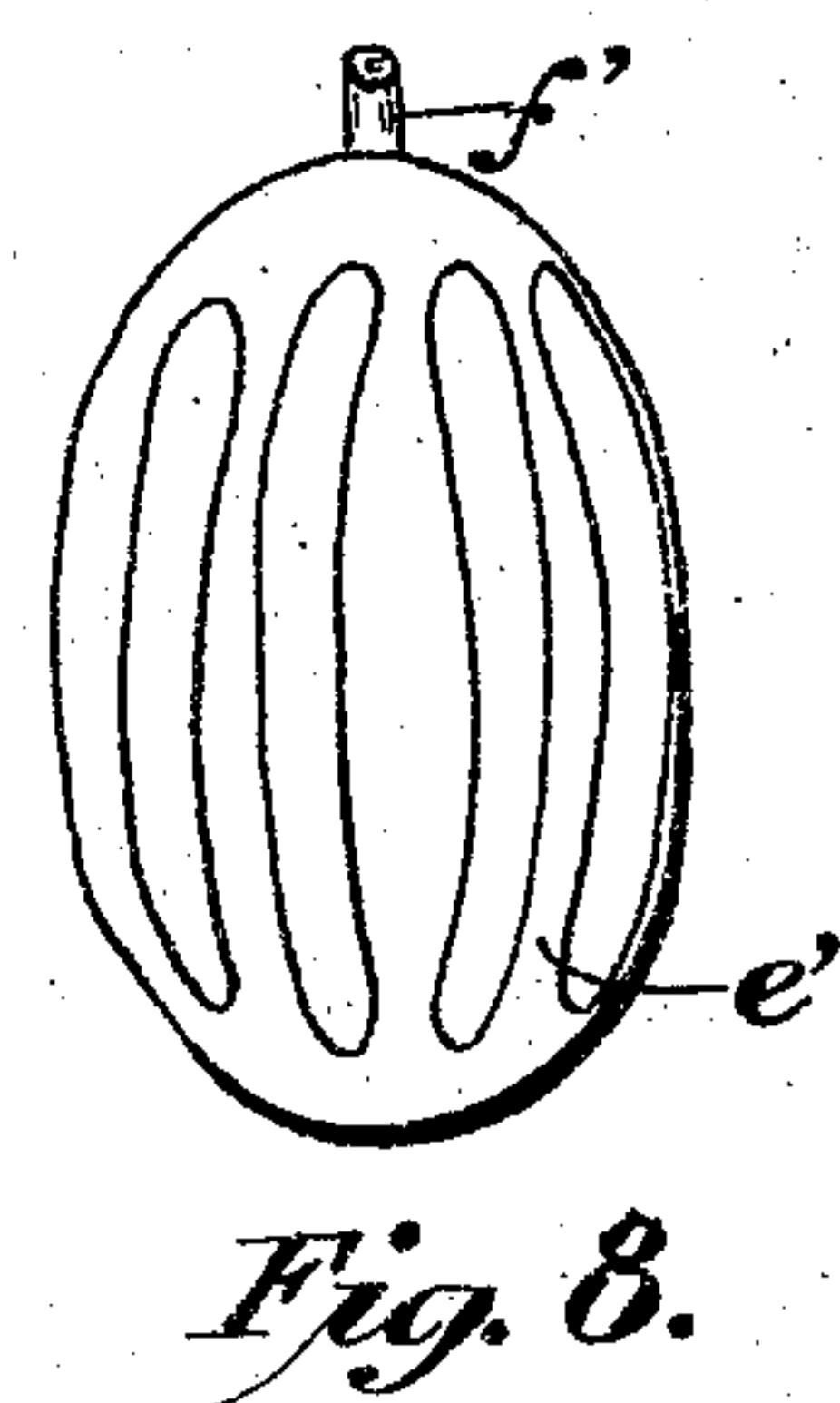
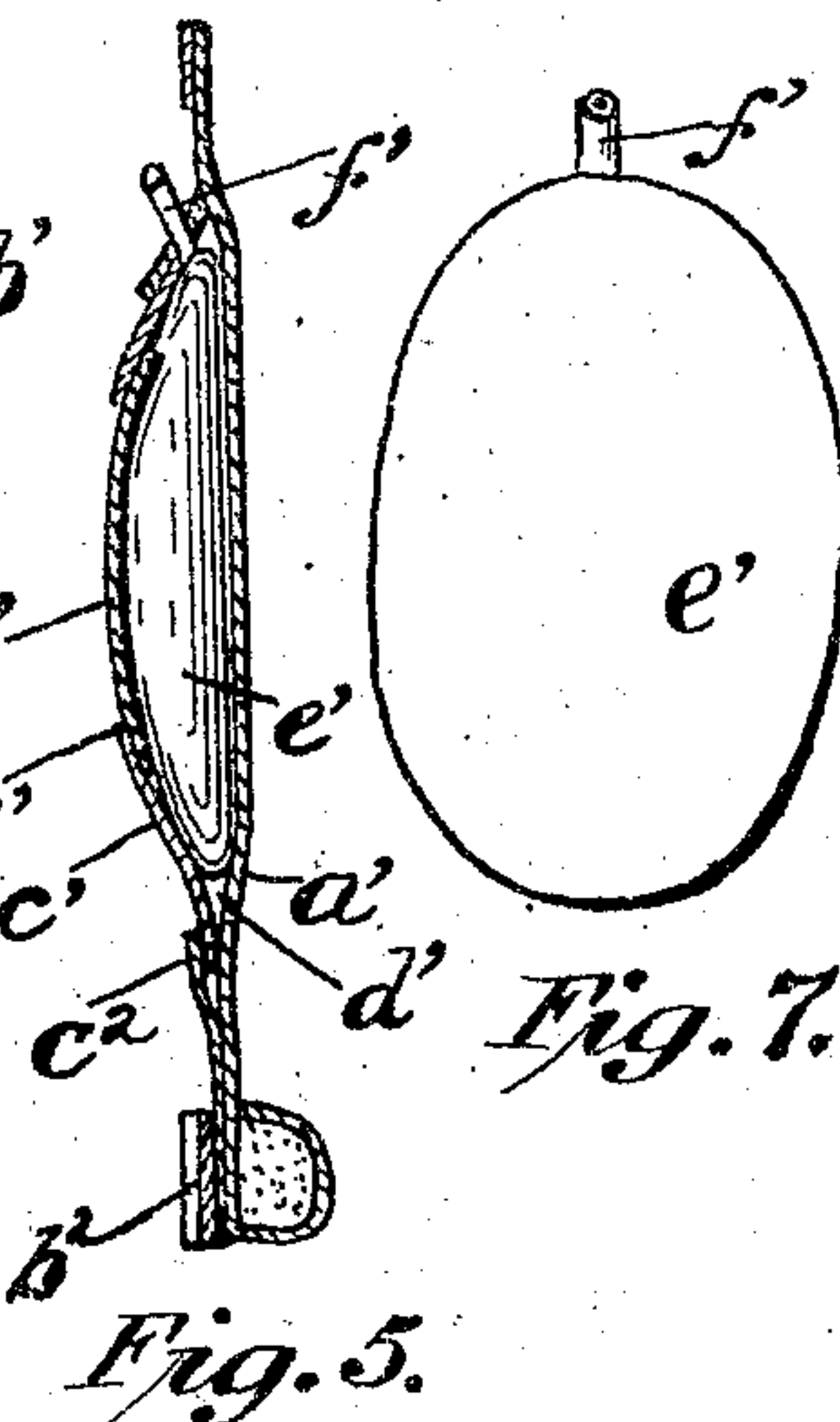
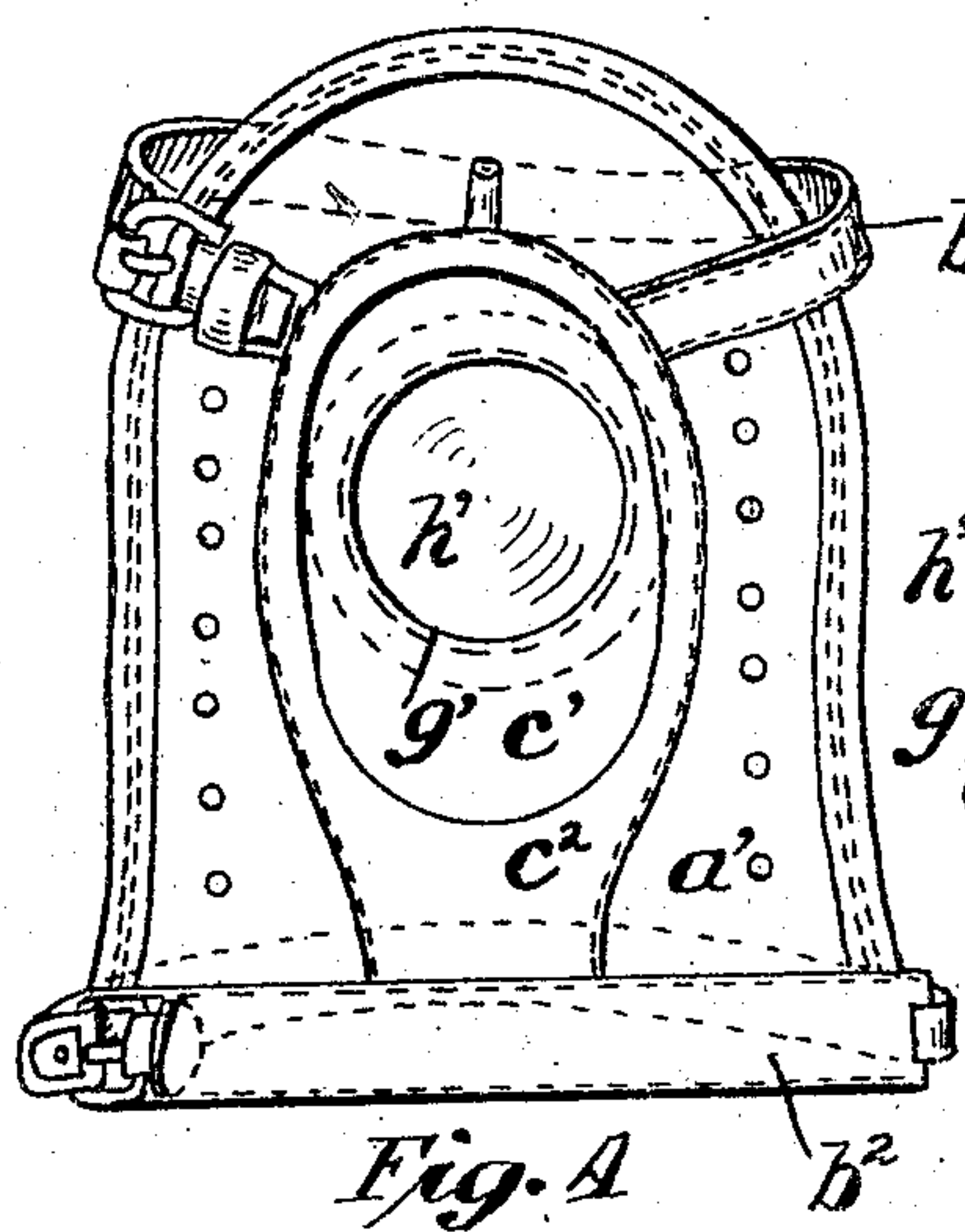
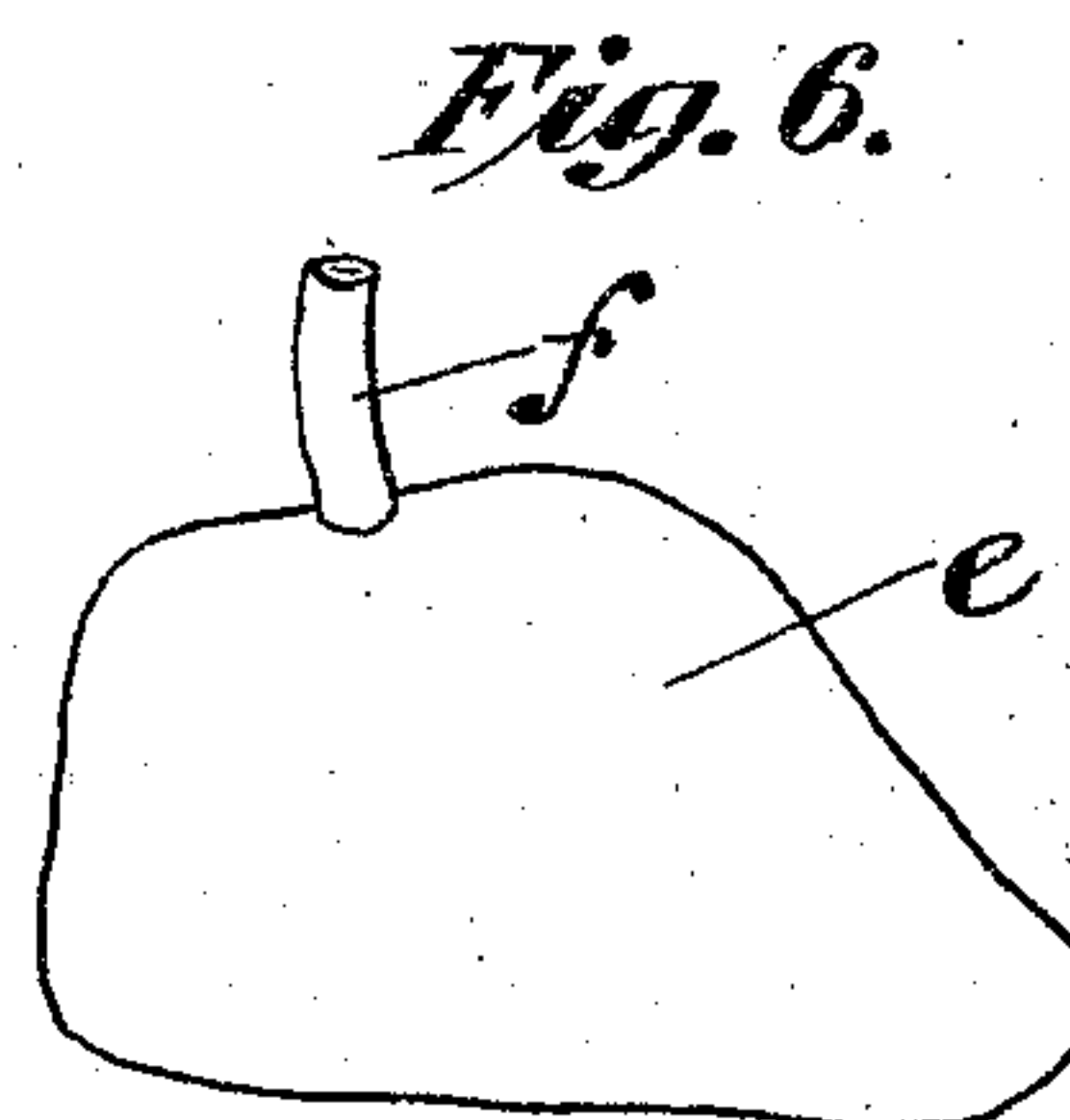
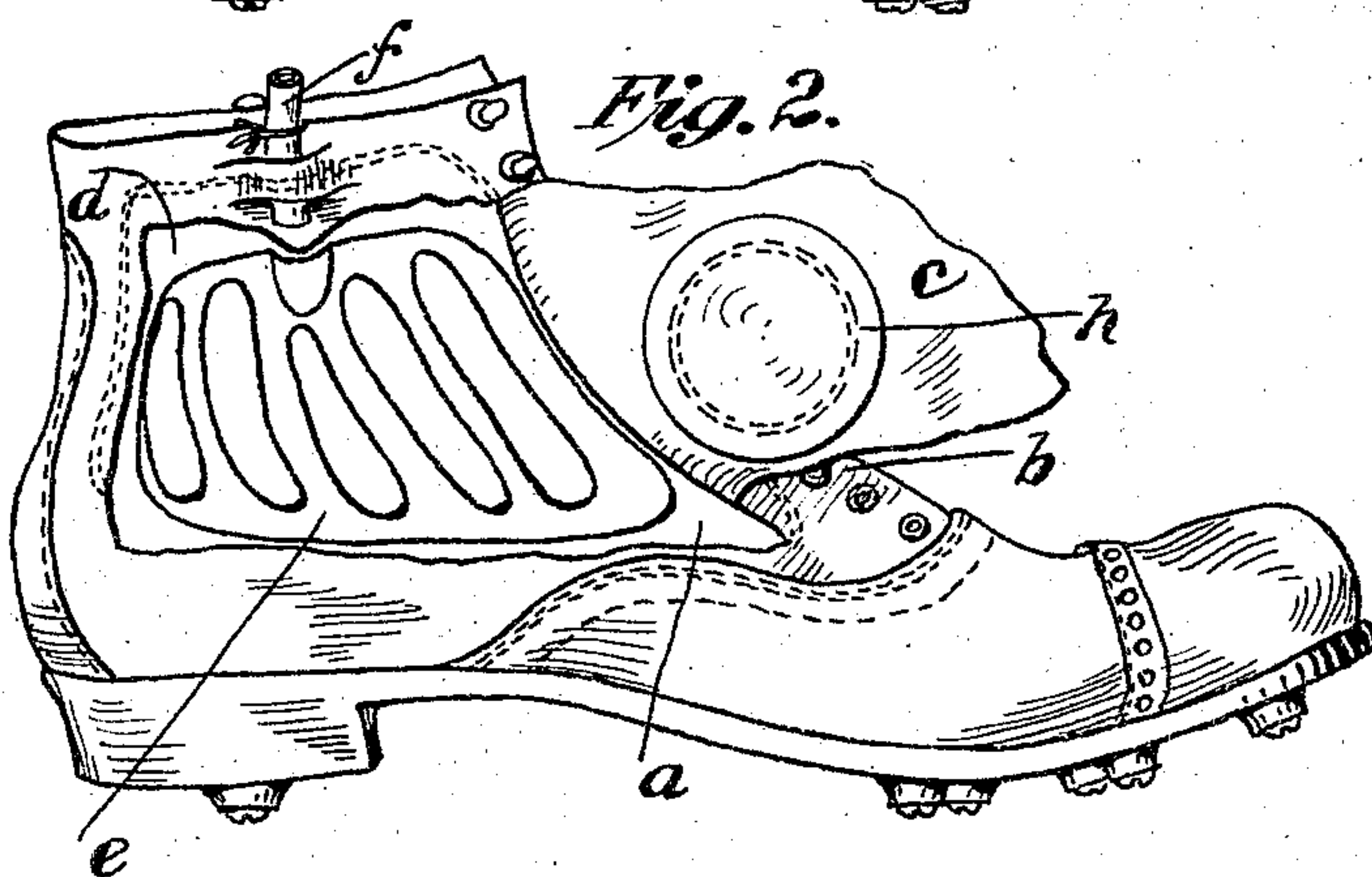
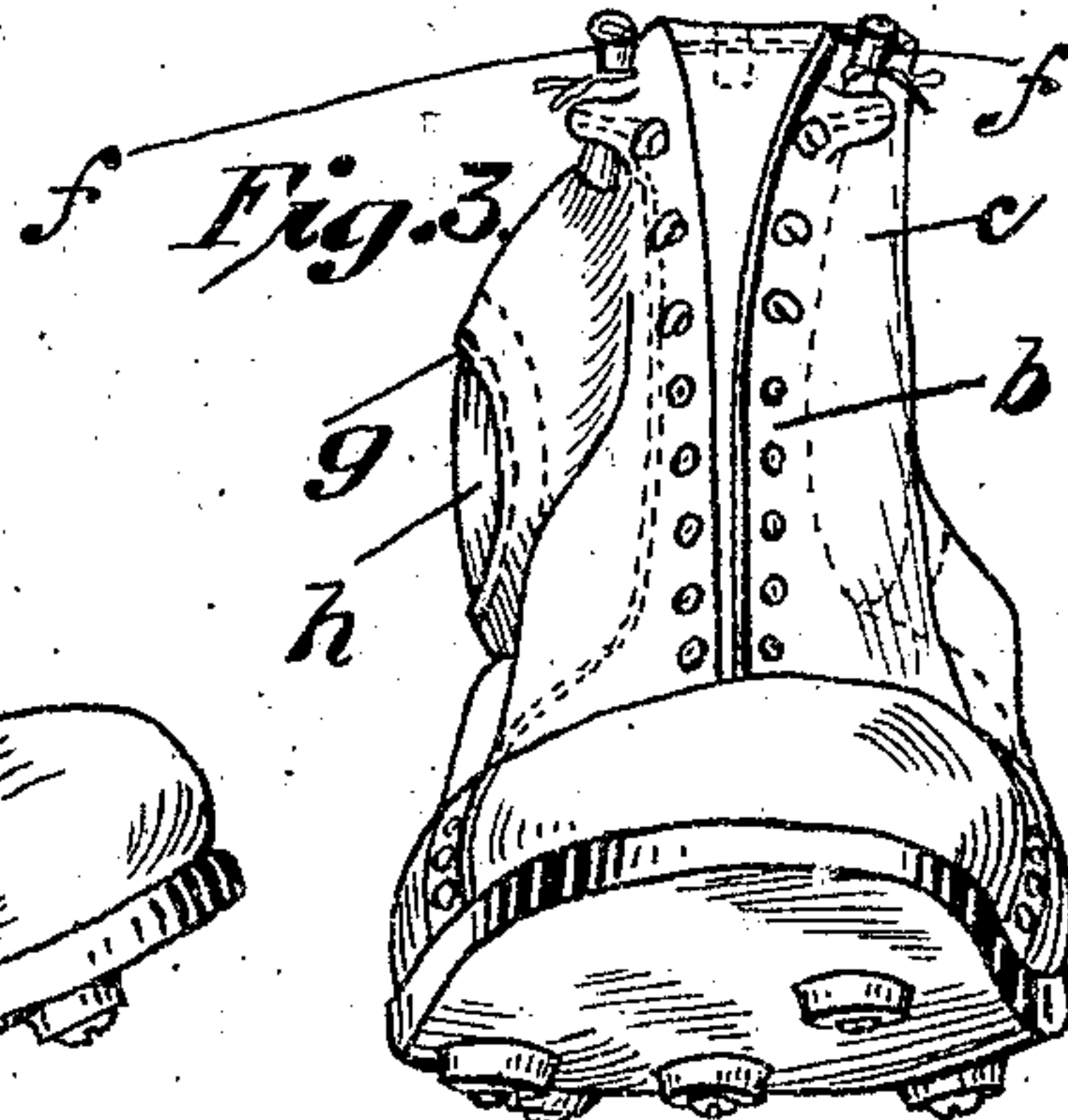
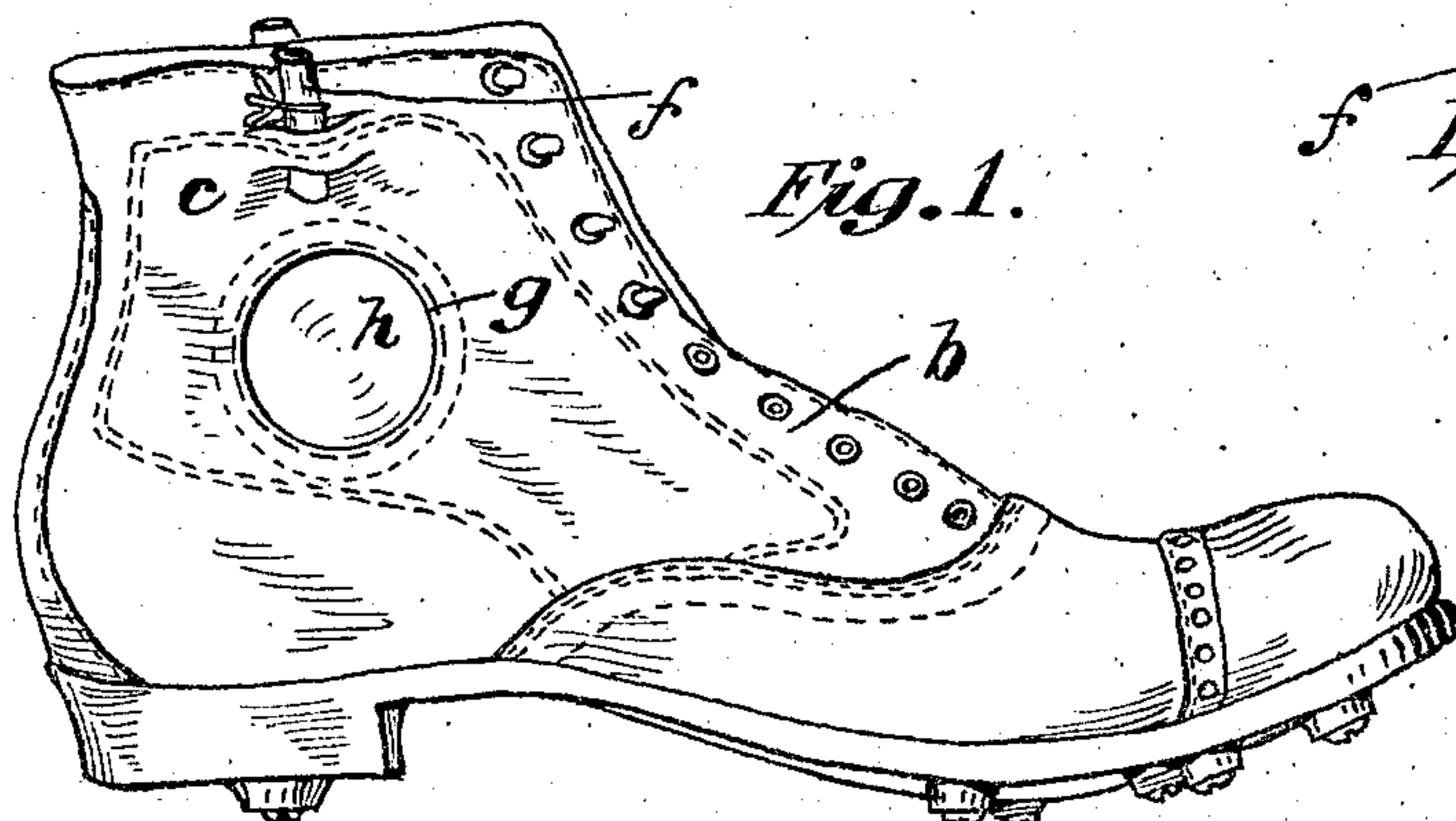


F. W. KEEN.
ANATOMICAL GUARD, BOOT, OR PAD.
APPLICATION FILED NOV. 6, 1902.

NO MODEL.



Witnesses
Comptroller
G. P. Wentworth

Fredrick W. Keen Inventor
By his Attorney
N. G. Frothingham

UNITED STATES PATENT OFFICE.

FREDERICK W. KEEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO CHARLES H. WILLIAMS, OF BOSTON, MASSACHUSETTS.

ANATOMICAL GUARD, BOOT, OR PAD.

SPECIFICATION forming part of Letters Patent No. 746,338, dated December 8, 1903.

Application filed November 6, 1902. Serial No. 130,328. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. KEEN, a subject of the King of Great Britain and Ireland, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Anatomical Guards, Boots, or Pads, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to anatomical guards, boots, or pads, and more particularly to a class thereof especially adapted to be applied to and protect certain exposed bony portions of the body under various conditions.

The object of my invention is to provide a guard, boot, or pad of this class which will readily conform to the part to be protected, which will present exteriorly a cushion which will not only relieve the part to which it is attached from the effects of blows or contact with other parts or substances, but will also mitigate the effects of such on the interfering part, and which may readily be applied.

A further object is to provide a guard, boot, or pad the cushion of which may be regulated to meet different requirements and the exposed portions of which are sheathed or reinforced to protect the cushion proper, and thus preserve the flexibility or elasticity of the latter and prevent accident thereto resulting in its deflation.

The invention consists in those novel features of construction hereinafter set forth and described, and more particularly pointed out in the claim hereto appended.

Referring to the drawings, Figure 1 is a side elevation of an athlete's shoe embodying my invention. Fig. 2 is a similar view thereof, showing the facing turned back to disclose the pocket and the contained air-bag. Fig. 3 is a front elevation thereof. Fig. 4 is a front elevation of a boot or pad for a horse embodying the invention. Fig. 5 is a cross-section thereof, showing the pocket and the contained air-bag in elevation; and Figs. 6, 7, and 8 are views of different forms of air-bags.

Like letters refer to like parts throughout the several views.

My invention comprises a flexible base

adapted to conform to the contour of the part to which it is applied, provided with means whereby it is secured in the desired relation. This base is provided with a facing having an opening therein adjacent to the most exposed portion of the part to be protected and coincident with that portion of the guard, boot, or pad which is liable to the greatest wear, and a concave metal plate is secured in this opening by any desired means, as ordinary stitching alone or in conjunction with a facing-strip. In the pocket or sac so formed is seated an air-bag, which is interposed between the flexible base and the facing referred to. This bag is provided with a tube exterior to both the base and the facing to facilitate the inflation of said bag.

Referring more particularly to Figs. 1 to 3, inclusive, the invention is shown as applied to an athlete's shoe. In this embodiment of the invention the lining *a* of the upper constitutes the flexible base adapted to conform to the ankle of the wearer. The said base is secured to the ankle and foot of the wearer by means of the ordinary vamp *b* and lacing. (Not shown.) The leather upper *c* is sufficiently large to form a pocket or sac *d* between it and the lining or base *a*, in which is seated an inflatable air-bag *e*, provided with an air-tube *f*. This bag conforms to the pocket *d* sufficiently to prevent its undue expansion and the resulting loss of air-pressure. Directly above the point where the ankle-bone of the wearer will be the upper *c* has an opening *g* therein of sufficient size to include the most exposed area of said upper both with relation to the part to be protected and the blows thereon to be anticipated. This opening is closed by a concave plate *h*, of aluminum or other light tough metal, which is secured in position by means of openings adjacent the edge thereof and ordinary stitches. The precise means of securing this plate in position, however, are immaterial to the invention. The plate *h* serves to protect the air-bag *e* from the effects of spikes, blows, &c., and at the same time in case of the deflation or partial deflation of the bag will protect the ankle-bone from the effects of such accidental blows or spiking. The general shape of air-bag *e* is shown in Figs. 2

and 6. The tube *f* thereof preferably projects beyond the shoe-top in a manner to give convenient access thereto.

Referring now to Figs. 4 and 5, the invention is shown as applied to a boot or pad for a horse. In this application of the invention, *a'* is a flexible base adapted to conform to a horse's leg and be secured in place by means of the straps *b' b'*. A facing *c'* is secured to said base by means of the facing-strip *c'*, ordinary stitching being employed to secure these parts together in a manner to form a pocket *d'* between said base *a'* and said facing *c'*. In the pocket so formed is seated an air-bag *e'*, provided with an air-tube *f'* exterior to said pocket to facilitate the inflation of said bag. An opening *g'* is provided at the point of said facing where the horse is liable to strike or receive other blows, and this opening is closed by a concave plate *h'*, of aluminium or other light tough metal, which is secured in position by means of holes adjacent to the edge thereof and ordinary stitches through said holes and said facing. As in the embodiment of the invention heretofore described, the exact means employed to secure this plate in place is not material, except inasmuch as the plate must be fixed in its relation to its support in a manner to avoid displacement under blows or through deflation of the air-bag. Figs. 7 and 8 disclose two different constructions of air-bag particularly adapted for use in connection with the application of the invention as shown in Figs. 4 and 5.

The operation of both forms of the invention heretofore described is identical, the sole difference residing not in the function, but in the application, of the invention. Said operation is as follows: The several parts being assembled and properly united, as described, the air-bag *e* or *e'* is inflated through the tube *f* or *f'* thereof and said tube thereafter closed as with an ordinary string to prevent the escape of the compressed air in the bag. The guard, boot, or pad is then applied to the part to be protected and secured in this relation by the means *b* or *b'*, provided for that purpose. The base *a* or *a'* and the air-bag *e* or *e'* being flexible, the pressure exerted through the securing means causes them to conform to that portion of the anatomy to which the guard, boot, or pad is applied, thus distributing the effects of further compression of the cushion through falls or blows thereon from interference with other objects. The extent of inflation may be regulated to that required by the conditions of use, the cushion being regulated thereby. When the part to be

protected is prominent, with corresponding depressions adjacent thereto, the air-pressure within the sac or pocket *d* or *d'* may be increased to give greater rigidity to the entire facing *c* or *c'*, and thus give greater powers of resistance to blows thereon. When the part is not so prominent, a lower pressure will suffice.

The plate *h* or *h'* being of metal and disposed, as it is, directly over the most prominent part to be protected gives adequate protection to the air-bag from sharp stones, sole-spikes, horseshoe-calks, or other objects with which it must contact repeatedly, thus preventing the puncture of the air-bag. The said plate being light, it does not interfere with the wearer in any way. Its concavity tends to conform, more or less, to the contour of the pocket when the air-bag is inflated and at the same time presents outwardly a curved surface, which would tend to deflect blows thereon. Not only does this plate act as described when the air-bag is inflated, but in case the said bag should become wholly or partly deflated said plate will still offer some protection to the more prominent part being guarded—for example, the ankle-bone. This plate likewise aids in protecting the air-bag within the pocket from climatic conditions.

The presentation outwardly of a cushion of this type not only insures protection to the wearer, but objects coming into contact therewith are likewise protected from injury resulting from the blow whether this be the interfering leg of a horse or the person of another participant in athletic games.

Having described the invention, what I claim as new, and desire to have protected by Letters Patent, is—

A guard, boot or pad comprising a flexible base adapted to conform to the contour of the part to which it is applied, means whereby said base may be secured in relation to said part, a facing on said base whereby a sac or pocket is formed comprising flexible material secured to said base and having a central opening therein, a concave metal plate closing said opening and means whereby said plate is secured to said facing, an air-bag seated within said sac or pocket so formed, and means for inflating said air-bag.

In witness whereof I have hereunto affixed my signature, this 5th day of November, 1902, in the presence of two witnesses.

FREDERICK W. KEEN.

Witnesses:

N. L. FROTHINGHAM,
A. A. ASHMAN.