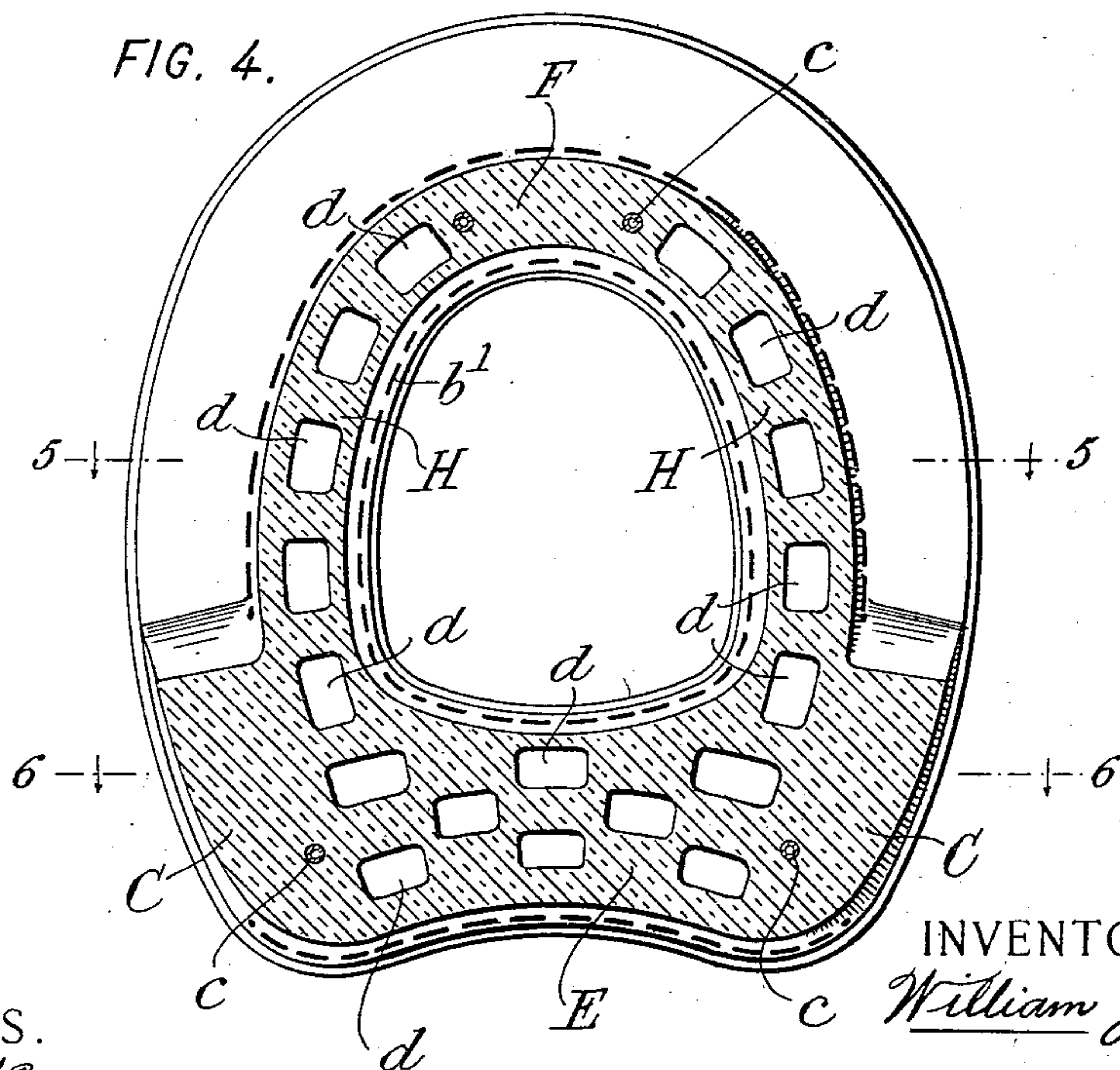
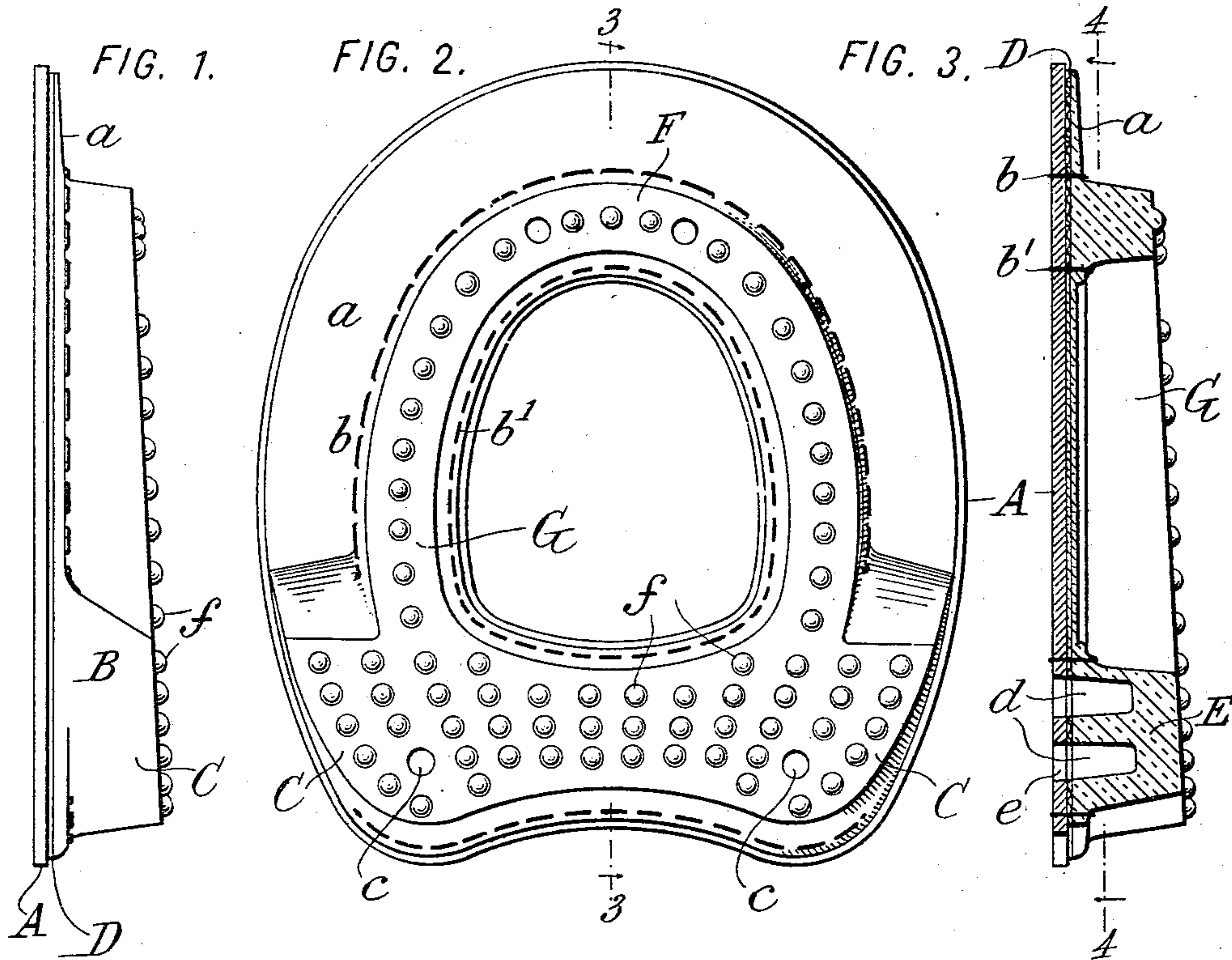


W. J. KENT.
HOOF PAD.

APPLICATION FILED AUG. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES.
Fred White
Thomas M. Hall

INVENTOR:
William J. Kent
By Attorneys,
Arthur C. O'Connell

W. J. KENT.
HOOF PAD.

APPLICATION FILED AUG. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

FIG. 5.

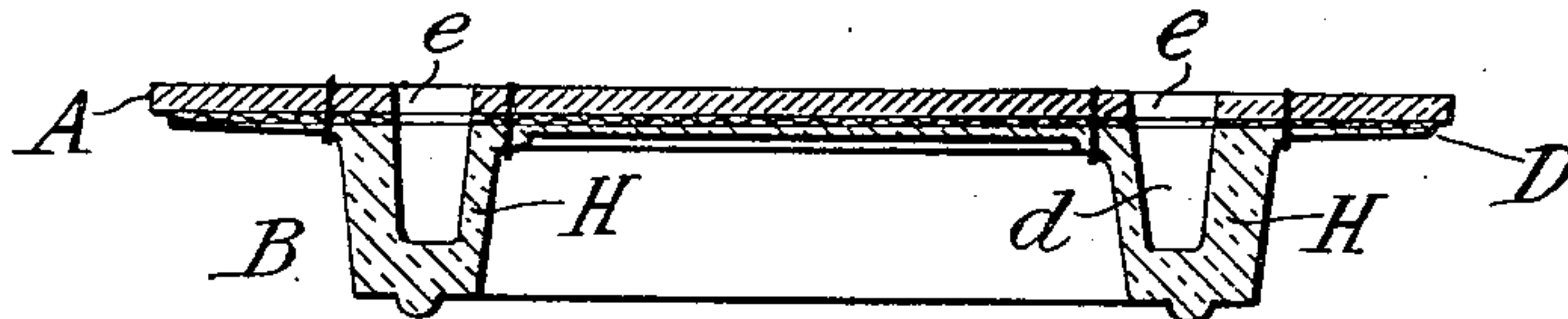


FIG. 6.

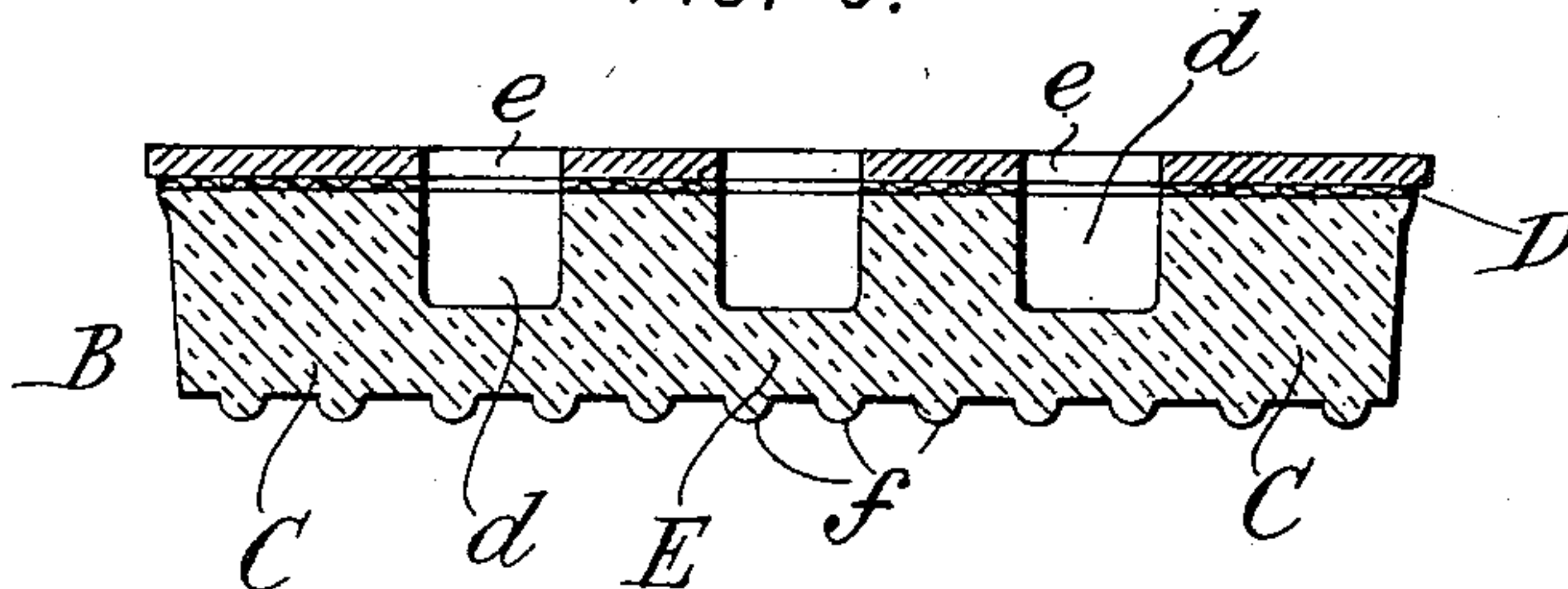


FIG. 7.

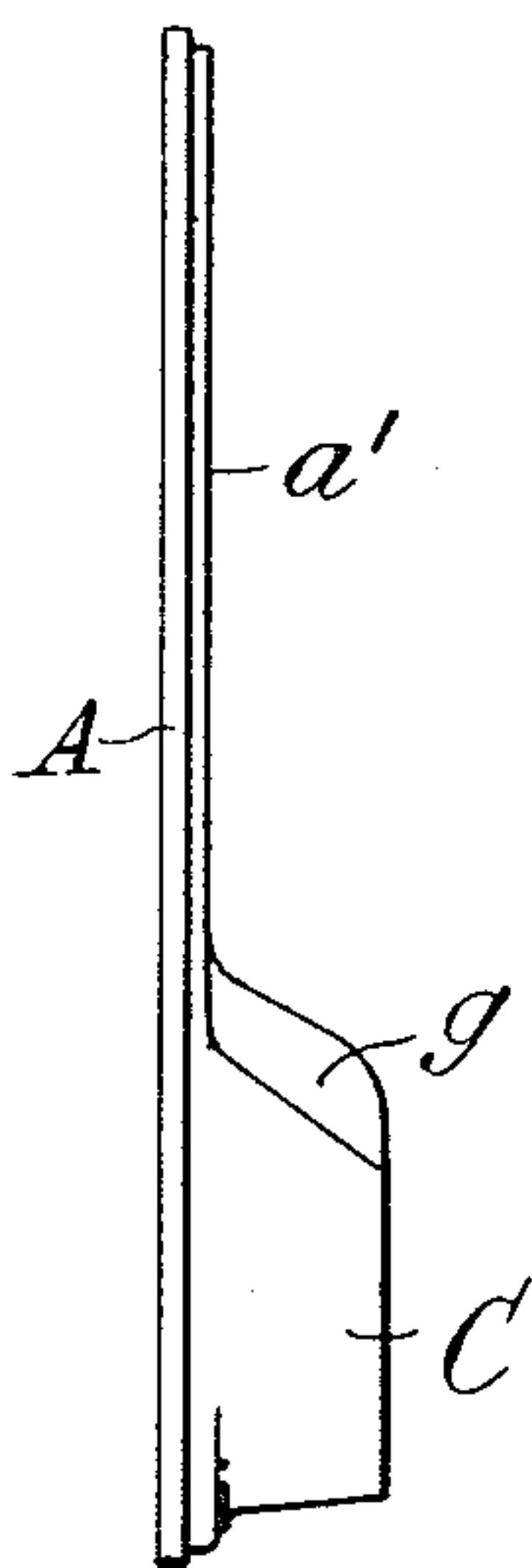


FIG. 8.

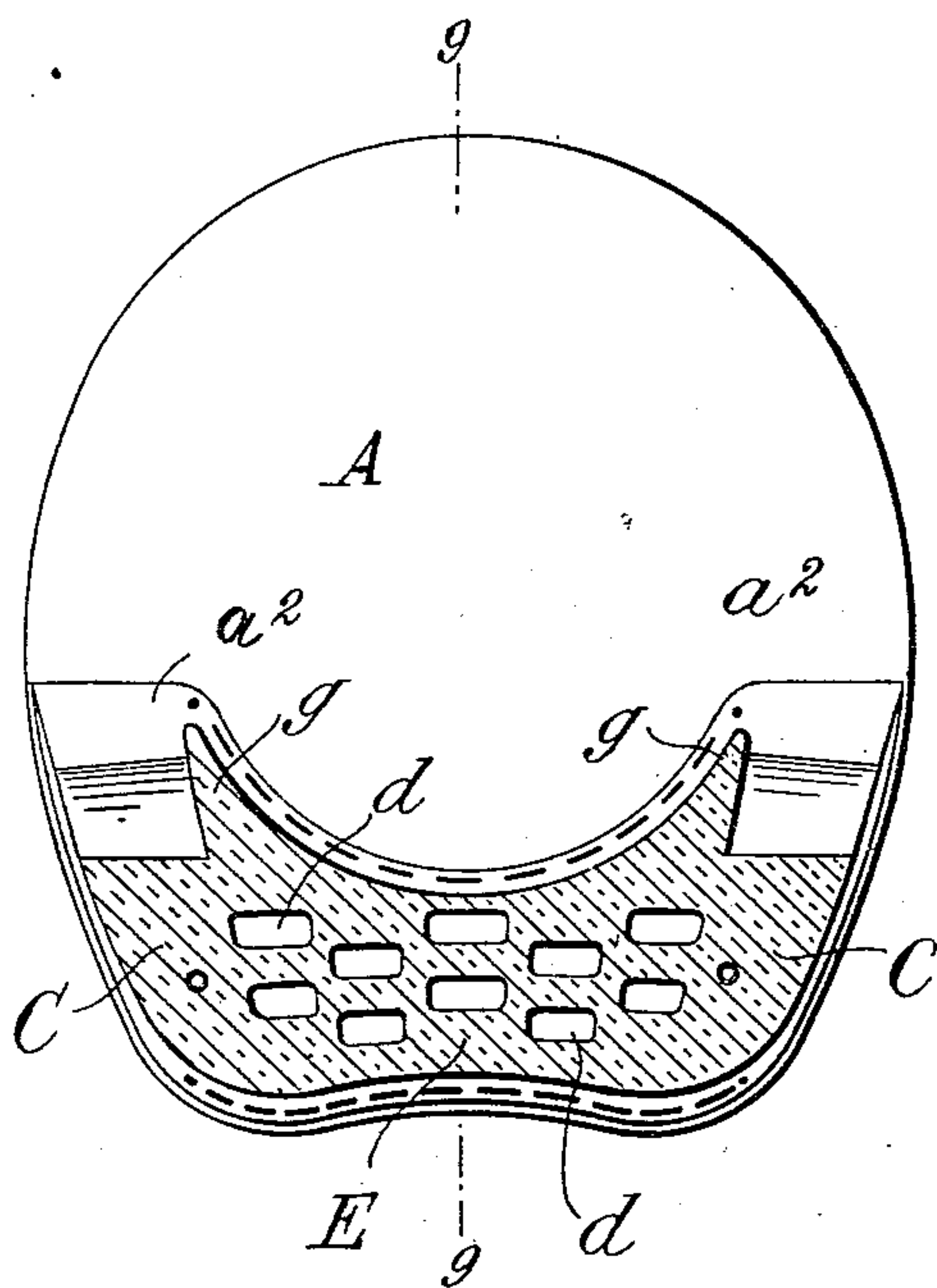
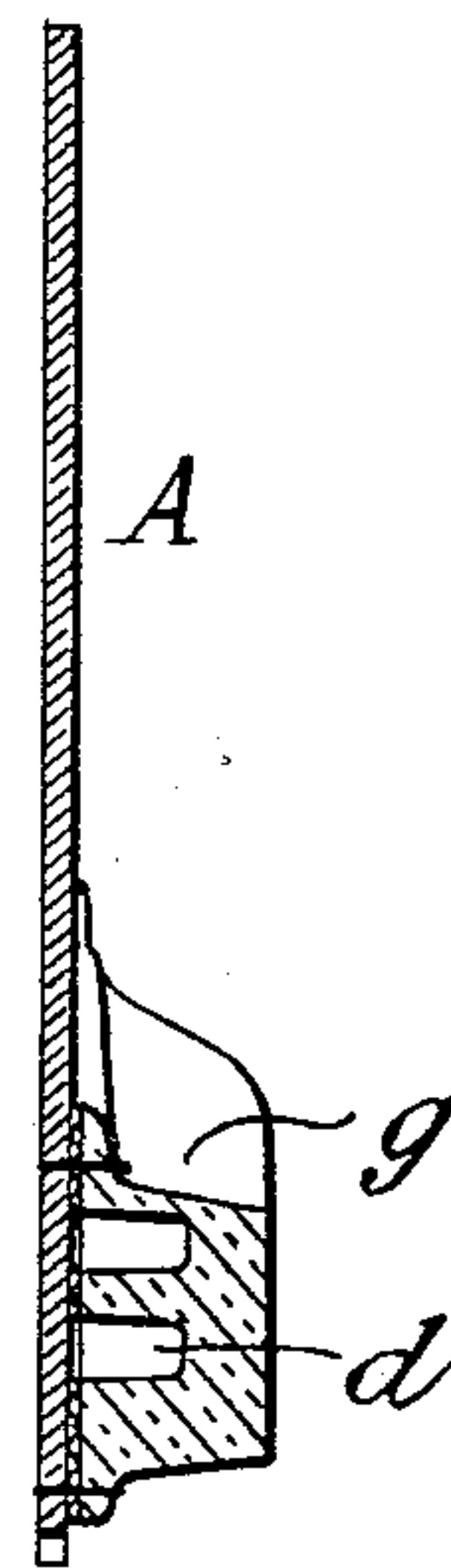


FIG. 9.



WITNESSES:

Fred White
Thomas Mallard

INVENTOR:

William J. Kent,

By Attorneys,

Arthur C. Orosen & Co.

UNITED STATES PATENT OFFICE.

WILLIAM J. KENT, OF BROOKLYN, NEW YORK, ASSIGNOR TO REVERE RUBBER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

HOOF-PAD.

SPECIFICATION forming part of Letters Patent No. 733,656, dated July 14, 1903.

Application filed August 16, 1902. Serial No. 119,881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. KENT, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Hoof-Pads, of which the following is a specification.

This invention relates to rubber hoof-pads for use in shoeing horses to reduce the shock or impact of the usual steel shoe or "tip" against hard pavements. Such pads have usually been made with a bar of solid rubber at the heel portion, which for a three-quarters shoe or tip extends entirely across the heel. It has also been common to extend a ridge of rubber around within the contour of the shoe. Pads having a bulbous portion within the shoe, forming an air-chamber against the sole of the foot, have been largely used and have proved very successful.

My present invention aims to produce a pad in which the density or firmness of the rubber cushion shall be modified or graduated over different parts of the foot in order to afford the firmest cushion at the quarters and a more yielding cushion over the more sensitive parts of the foot—that is to say, over the frog and along the sides of the sole within the shoe. To this end I form the pad with thick solid cushioning masses of rubber beyond the heel portions of the shoe, so as to come beneath the quarters or outside heels of the hoof. I also in a pad which employs a rubber cushion extending around within the shoe employ a similar solid mass just behind the toe of the shoe. Elsewhere the cushion instead of being of solid rubber is modified by being made cellular, or by removing intermediate portions of the rubber, so as to leave cells, cavities, spaces, or recesses, such as without necessarily varying the thickness or depth of the cushion, will materially increase its yielding quality, rendering it less resistant and more yielding or elastic. These cells or cavities are closed on the bottom to form a solid wearing-face, and they may be open above, so as to form air-chambers communicating with the sole of the hoof, so that when pressed under the weight the air forced out from them may be momentarily com-

pressed against the foot to add to the cushioning effect and may immediately escape through any convenient aperture—as, for example, through the clefts of the frog. In such case if a leather sole is used it is provided with openings coinciding with the air chambers or cells. It is, however, within my invention to close the chambers or air-cells, which may conveniently be done in the case of a pad having a leather sole by forming the leather without openings and cementing it fast to the rubber pad. In either construction the characteristic feature of my invention is preserved—that is to say, the resiliency of the rubber cushion is modified by forming any desired portions of the cushion with its mass reduced or in effect cut away, so as to form successive recesses, cells, or chambers, whereby the yielding quality of the cushion thus modified is increased in contrast with the relatively unyielding solid portions of the cushion located preferably at the quarters.

In the accompanying drawings I have shown several forms or embodiments of my invention.

Figure 1 is a side elevation, and Fig. 2 an under side plan, of a pad constituting the preferred embodiment of my invention. Fig. 3 is a longitudinal section thereof on the line 3 3 in Fig. 2. Fig. 4 is a horizontal section thereof in the plane of the line 4 4 in Fig. 3. Figs. 5 and 6 are vertical transverse sections in the planes, respectively, of the lines 5 5 and 6 6 in Fig. 4. Fig. 7 is a side elevation corresponding to Fig. 1, showing a modified construction of pad. Fig. 8 is a horizontal section corresponding to Fig. 4 of a similar pad. Fig. 9 is a longitudinal mid-section corresponding to Fig. 3 cut on the line 9 9 in Fig. 8.

Referring to the drawings, let A designate the usual leather sole or reinforce, and B the rubber base or body of the pad. The latter is made, as heretofore, with a flanged portion *a*, which overlies the shoe or tip, forming a seat therefor, and with a thick cushion C of solid rubber at the outer heels or quarters behind the shoe. The leather and rubber portions are commonly united by being cemented together and also by rows of stitching *b*

and *b'*. It is preferable also to unite these parts by rivets *c c* at suitable intervals, preferably in the positions shown in Figs. 2 and 4. The rubber body of the pad is preferably formed, as usual, with a strengthening-layer of canvas *D*, embedded in and vulcanized to the rubber.

It is desirable in a horseshoe-pad to provide cushions of solid rubber beneath those parts of the foot which are subject to the greatest shock, and which require most firm support, and which being naturally of the least sensitiveness are best able to endure a firm pressure, and to provide for a diminished pressure against the more sensitive parts of the foot. The least sensitive parts of the foot are the outer portions, where the sole is supported by the horny wall, and the more sensitive portions are those parts of the sole and frog which are well within the horny wall. According to my invention I provide cushions of solid rubber at the heel portions or quarters, where they are adapted to receive the weight and shock and communicate it directly to the insensitive outer heels or quarters of the foot, and also, if desired, I provide a similar but preferably smaller and lighter cushion at the toe just within the bend of the shoe, and beneath the more sensitive portions of the foot I reduce the resistance of the cushion by making it cellular, so as to render it somewhat spongy and graduate or diminish the pressure or shock communicated to the more sensitive parts of the foot.

In the construction shown in Figs. 1 to 6 the outer heel-cushions *C C* are of solid rubber, while the intervening cushion, which as a whole is lettered *E*, is of cellular rubber. The toe-cushion *F* is of solid rubber, being, however, narrower and, as shown in Figs. 1 and 3, shallower or of less depth than the heel-cushions. In this form of pad there is a continuous cushion or ridge of rubber *G* extending from and merging into the heel-cushions *C C* and sweeping around just within the contour of the shoe, as shown best in Fig. 2. The front or middle portion of this ridge is formed by the solid toe-cushion *E*, while the side portions thereof are formed of cellular rubber to constitute cushions *H H*, as shown best in Fig. 4. The cellular rubber cushions are formed, preferably, by molding in the rubber a series or succession of air cells or chambers *d d*. These are best arranged in the manner shown in Fig. 4. They are best formed as cavities, which open above or on the upper side or side next the foot, as shown in Figs. 5 and 6. The leather sole *A* may be formed with holes or perforations *e e*, which overlie or coincide with the air-cells, as shown in Figs. 5 and 6. The effect of this is that when the foot strikes the ground the resulting compression of the rubber pad compresses the air in the cells or chambers *d d* and causes an outflow of air from them through the openings *e e* into the space between the leather

sole and the sole of the foot, from which space the excess of air may escape through the clefts of the frog, so that at each step such outflow of air occurs as the foot is put down, followed by a corresponding inflow of air as the foot is raised. Thus a sufficient circulation of air is maintained to properly ventilate the foot.

My pad thus constructed has the advantage of graduating the pressure communicated to the foot according to the natural adaptability of the foot to endure pressure or shocks. The rubber body of the pad presents an extended surface for contact with the ground or pavement, for receiving the wear, and for prevention of slipping. This surface may be roughened or modified in any suitable way to give it a better hold upon the pavement—as, for example, by the provision of small projections or pipes *f f*. The cellular structure of the cushioning portions of the rubber base has the effect of reducing the weight for a given size and proportion of pad, which is advantageous both in diminishing the load carried by the horse's foot and in cheapening the pad by reducing the amount of stock required.

While according to my complete invention it is preferable to extend the cushioning parts of the rubber pad around within the inner contour of the shoe, as shown in Figs. 2 and 4, yet my invention may be availed of in a pad wherein the cushioning portion is omitted. In Figs. 7, 8, and 9 is shown a bar-pad or one having a projecting cushion only across the heel portion of the foot. This cushion is composed of the solid heel-cushion *C C* and intermediate cellular cushion *E*, already described. The leather sole *A* is shaped to cover the entire sole of the horse's foot, while the rubber body may have a flange or web *a'* practically coincident in outline with the leather, as shown in Fig. 7, or this flanged portion may be cut away to the outline of the part *a''* in Fig. 8. To stiffen the heel-cushions, fillets or bracket portions *g g* are provided.

In some cases it is preferable to make the cellular cushion more resilient by confining the air in the air cells or chambers *d d*, for which purpose these cells are closed on all sides, which may conveniently be done by forming the leather sole *A* without perforations and cementing it hermetically to the rubber body, as shown in Fig. 9.

My invention may be otherwise modified without departing from its essential features herein fully set forth and which I will endeavor to define in the claims.

I am aware that it has been proposed to make a horseshoe-pad with a continuous air-passage or annular air-chamber extending entirely around the pad. My invention is clearly distinguishable from such proposed construction in that the air cells, chambers, or recesses of my pad are intermittent, so that the

rubber cushion is rendered cellular, somewhat after the manner of a sponge, and so as to afford a somewhat spongy cushion, and in that the spongy cushions are disposed under the most sensitive parts of the foot, with cushions of solid rubber affording firm support to the insensitive portions. My invention is also to be distinguished from those pads in which suction cavities or cups are formed in the solid rubber for increasing the hold or grip on the road-bed. Such suction-cups are too widely separated in a solid rubber cushion to convert the latter, in any proper sense, into a cellular cushion. It is characteristic of the cellular cushion provided by my invention that so large a proportion of the rubber is removed to form the air-cavities as to materially diminish the resistant properties of the rubber cushion, thereby giving it a spongy texture by reason of the flexibility of the walls bounding or separating the air-cavities, so that these walls under pressure may squeeze or be compressed into the cavities.

It is to be understood that in referring to "rubber" or "resilient" rubber in this specification I mean any ordinary vulcanized rubber composition having sufficient resiliency to render it suitable for a horseshoe-pad.

What I claim is—

1. A hoof-pad having a body of resilient rubber formed with a series of adjacent cells closed at their lower sides whereby a pneumatic cushioning effect is imparted to the pad.
2. A hoof-pad having a body of resilient rubber formed in its upper portion with a se-

ries of cells, closed at their lower sides, and constituting pneumatic cushions.

3. A hoof-pad having a body of resilient rubber formed in its upper portion with a series of cells, said cells closed to confine the air within them.

4. A hoof-pad having a body of resilient rubber formed in its upper portion with a series of cells, open at top, and a reinforce-layer attached to said body, and closing the open tops of said cells.

5. A hoof-pad having a body of resilient rubber formed in its upper portion with a series of cells closed at their lower sides, and a reinforce-layer of leather attached to the upper face of said body.

6. A hoof-pad having a body of resilient rubber formed with solid rubber cushions at the outer heel portions, and with a series of cells, closed at their lower sides, in the intermediate portion beneath the frog, whereby to diminish the pressure imparted to the frog.

7. A hoof-pad having a body of resilient rubber formed with solid rubber cushions at the outer heel portions, with a seat for the shoe, and with cushions extending within the contour of the sides of the shoe formed with a series of cells, to diminish the pressure against the inner sole of the hoof.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM J. KENT.

Witnesses:

FRED WHITE,
ARTHUR N. EDROP.