

J. S. E. FREEL.
TRUSS.

APPLICATION FILED APR. 2, 1908.

909,077.

Patented Jan. 5, 1909.

Fig. I.

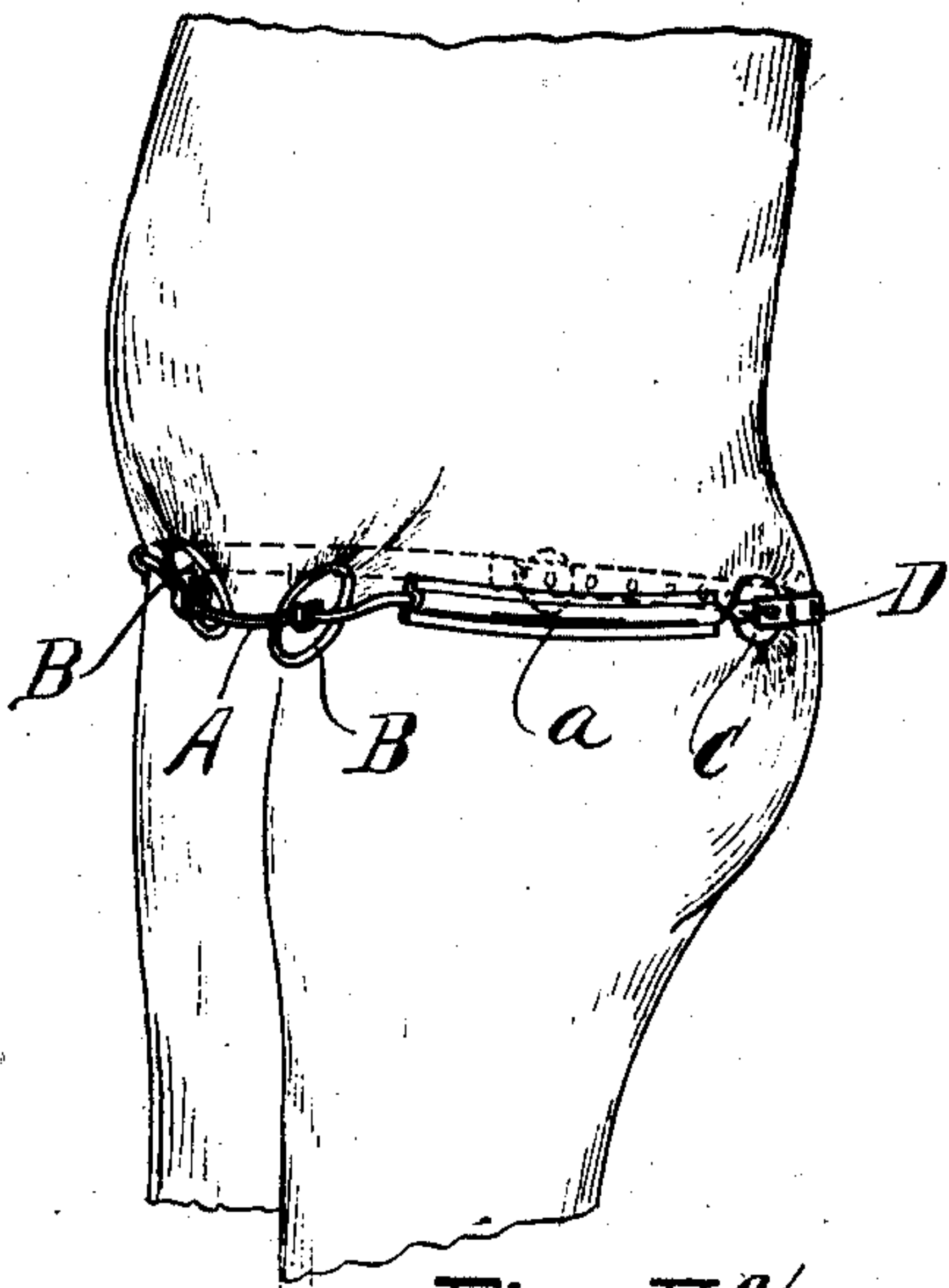


Fig. IX.

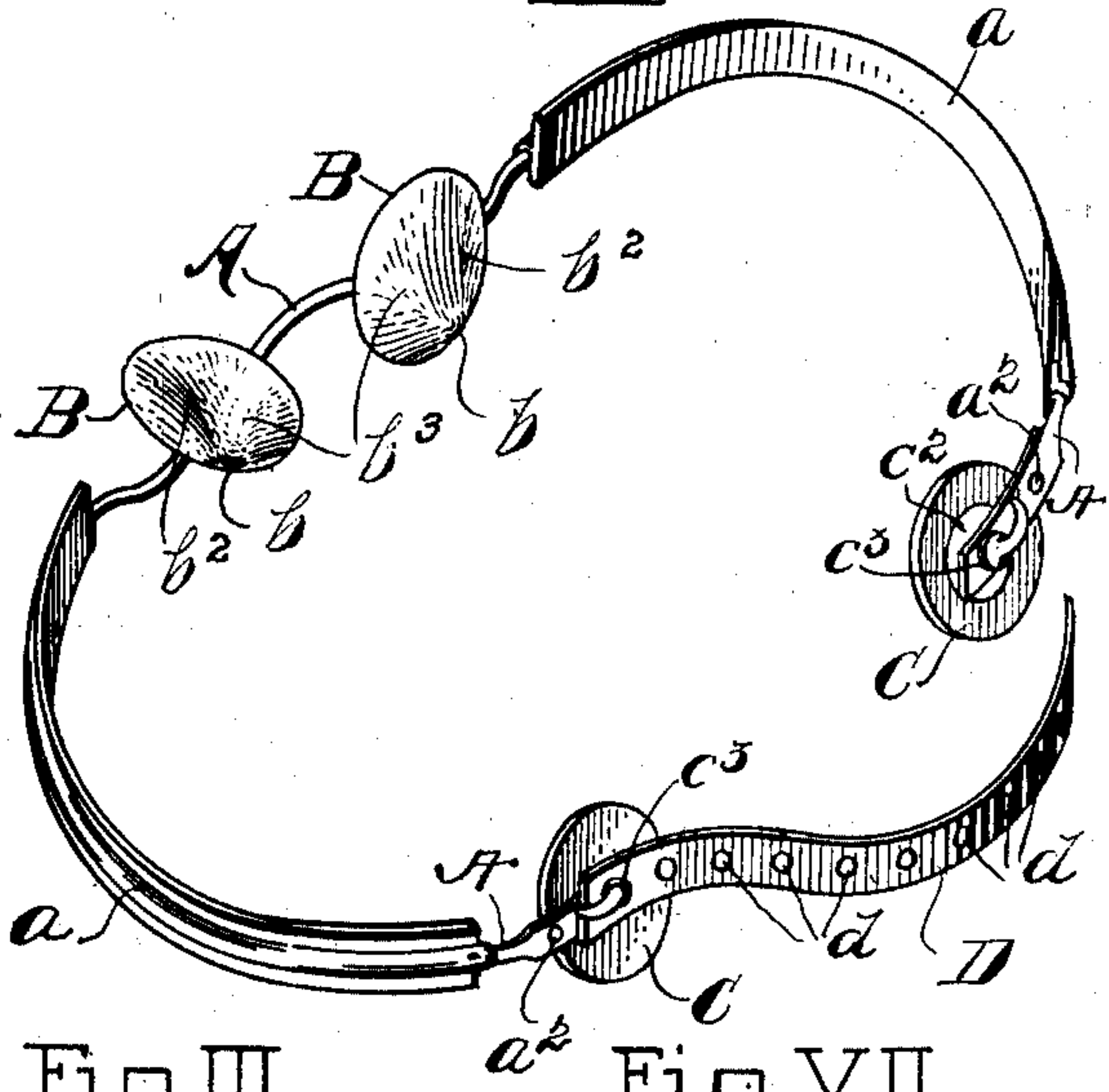


Fig. III.

Fig. VII.

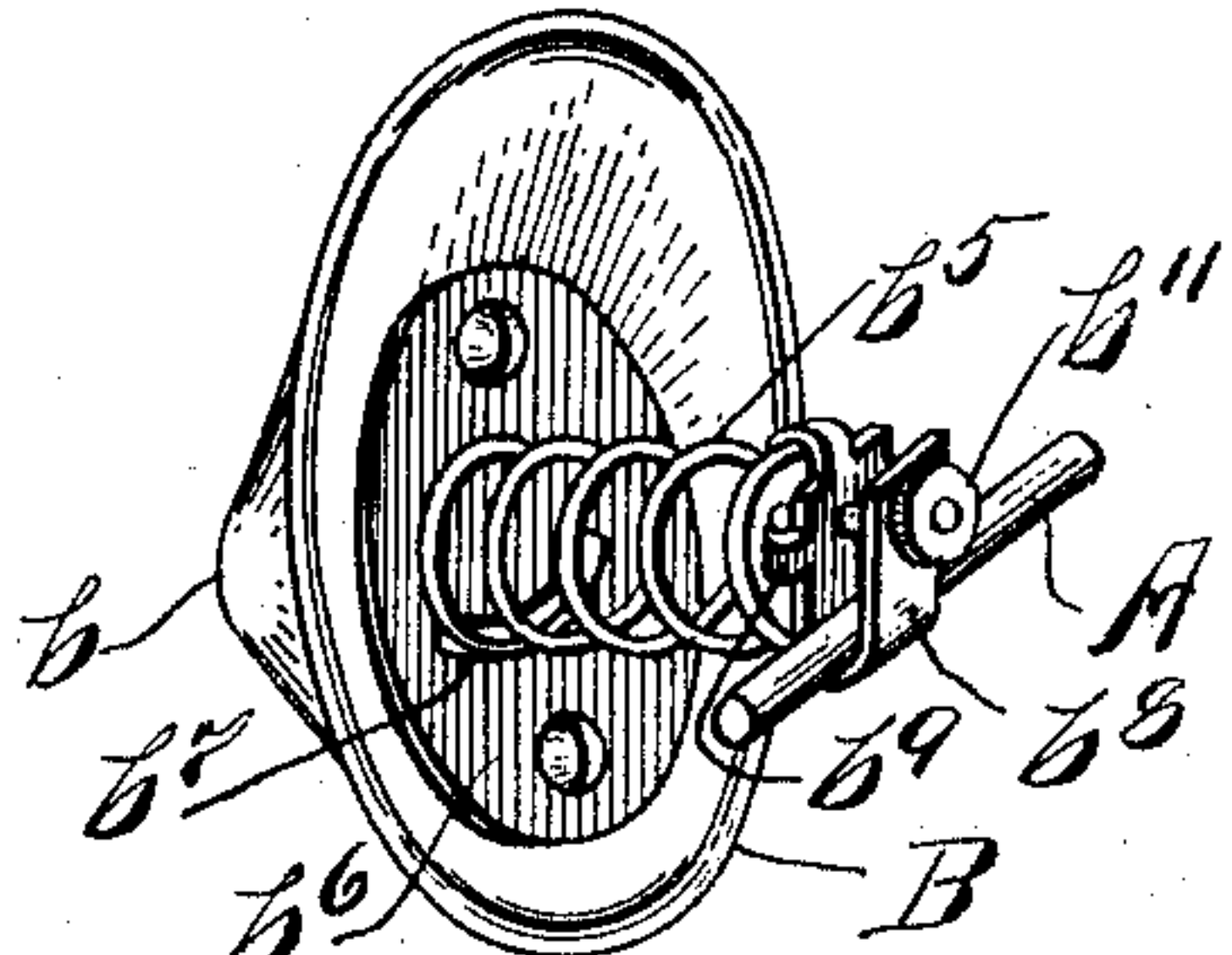
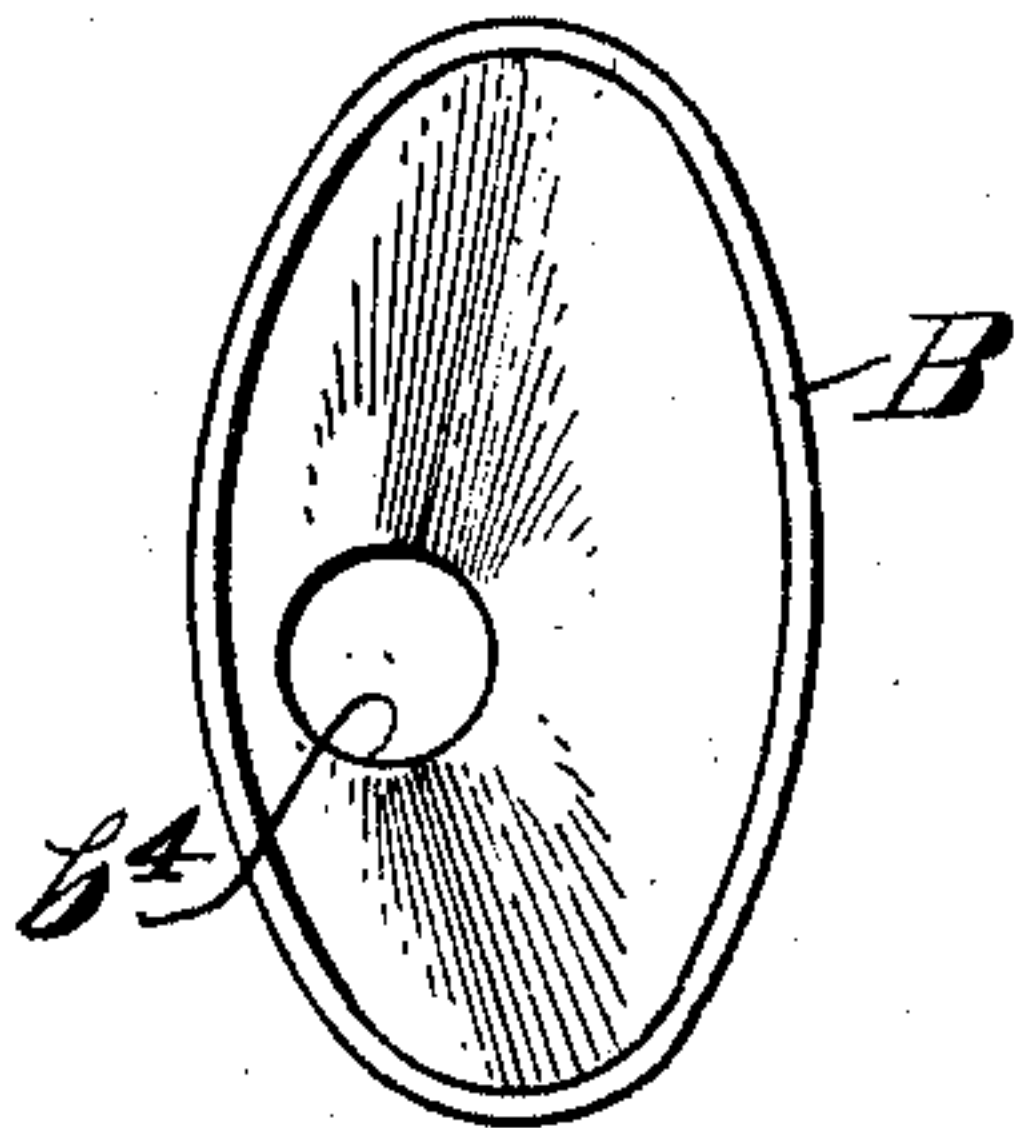


Fig. IIa.

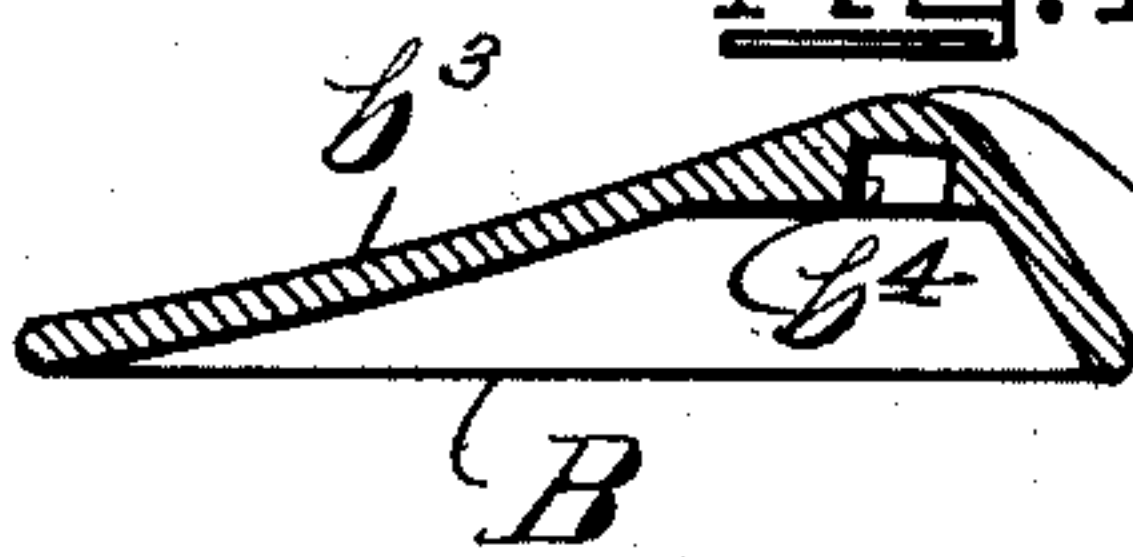


Fig. II.

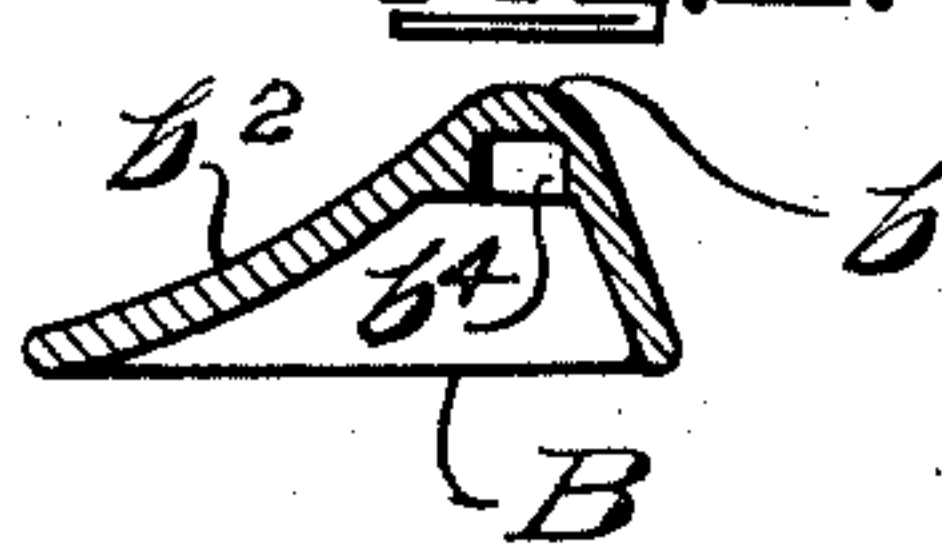


Fig. V.

Fig. VI.

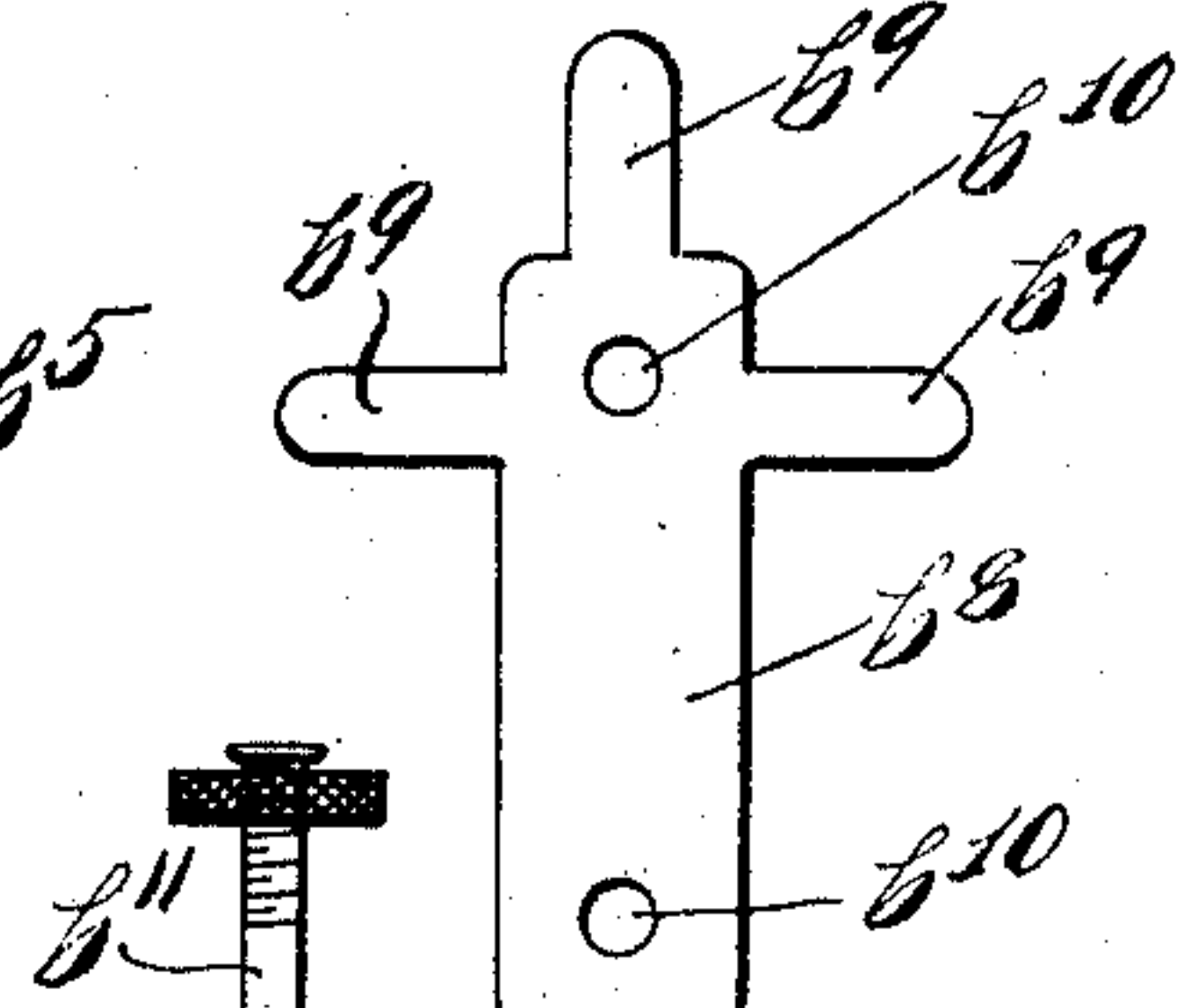
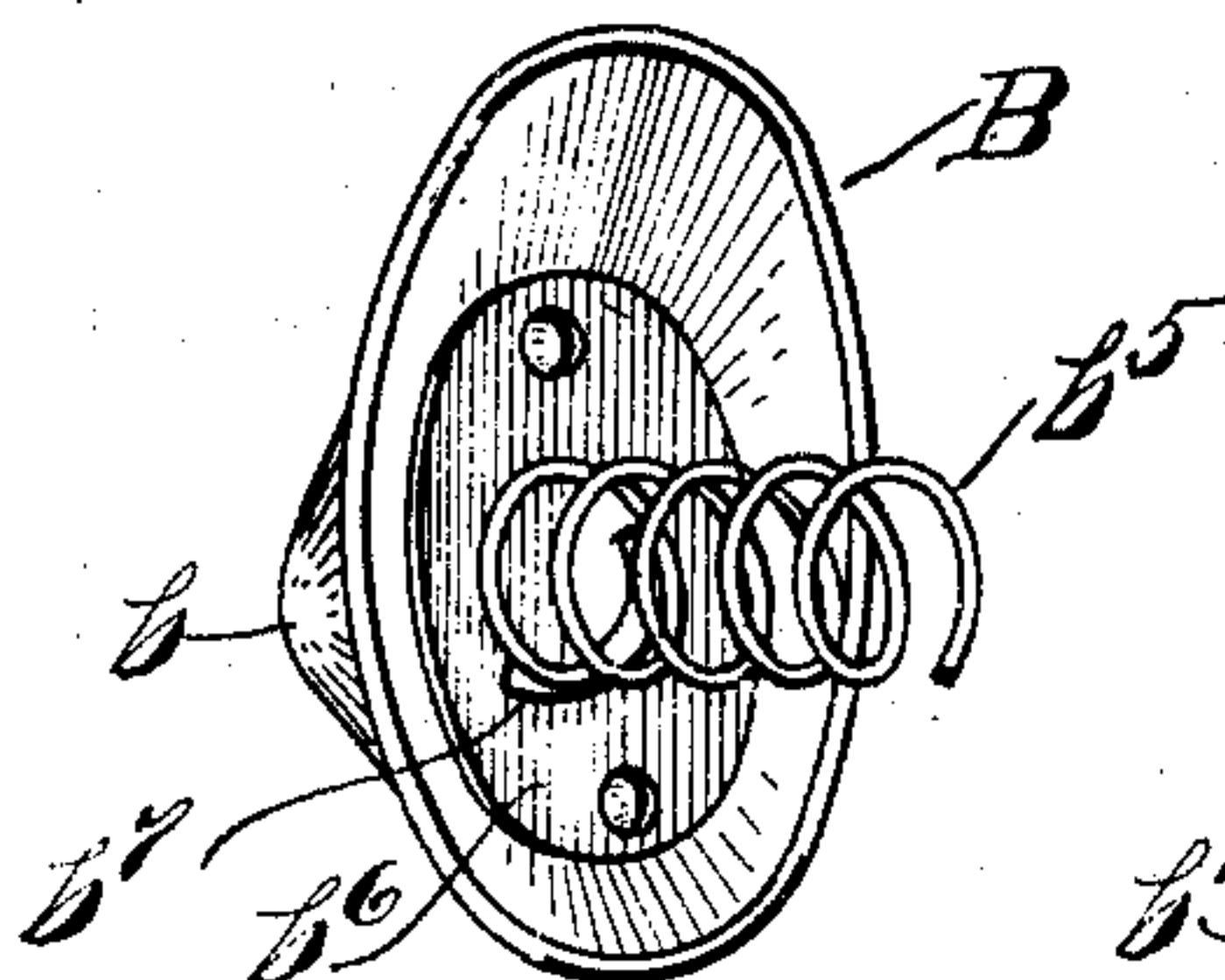


Fig. IV.

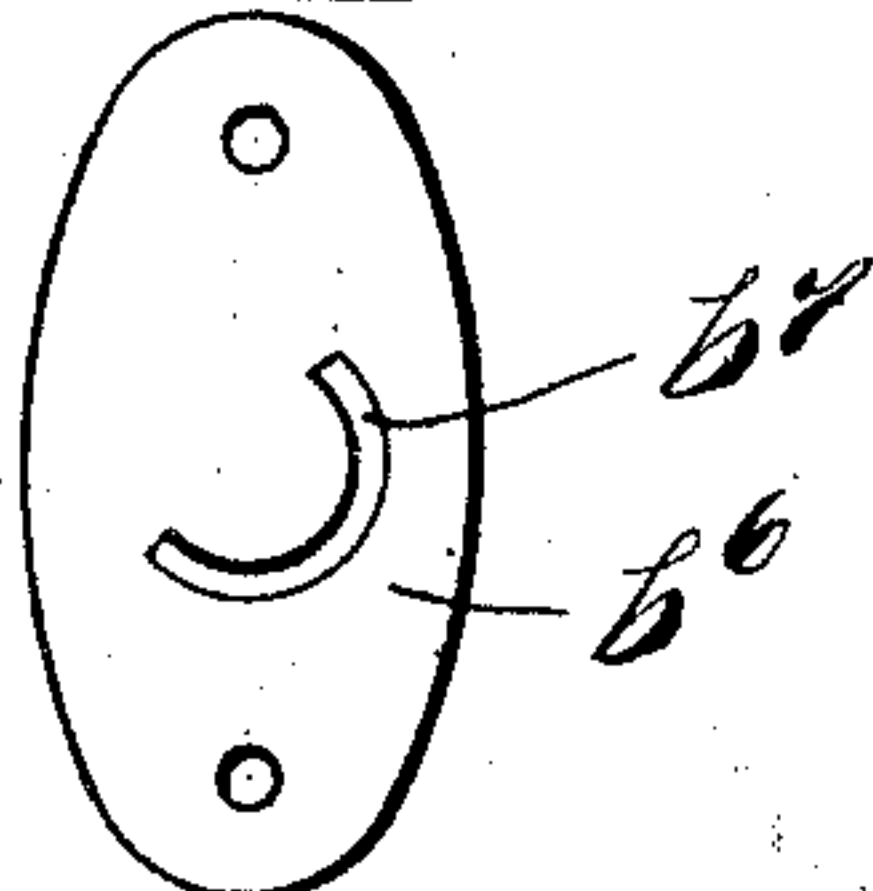
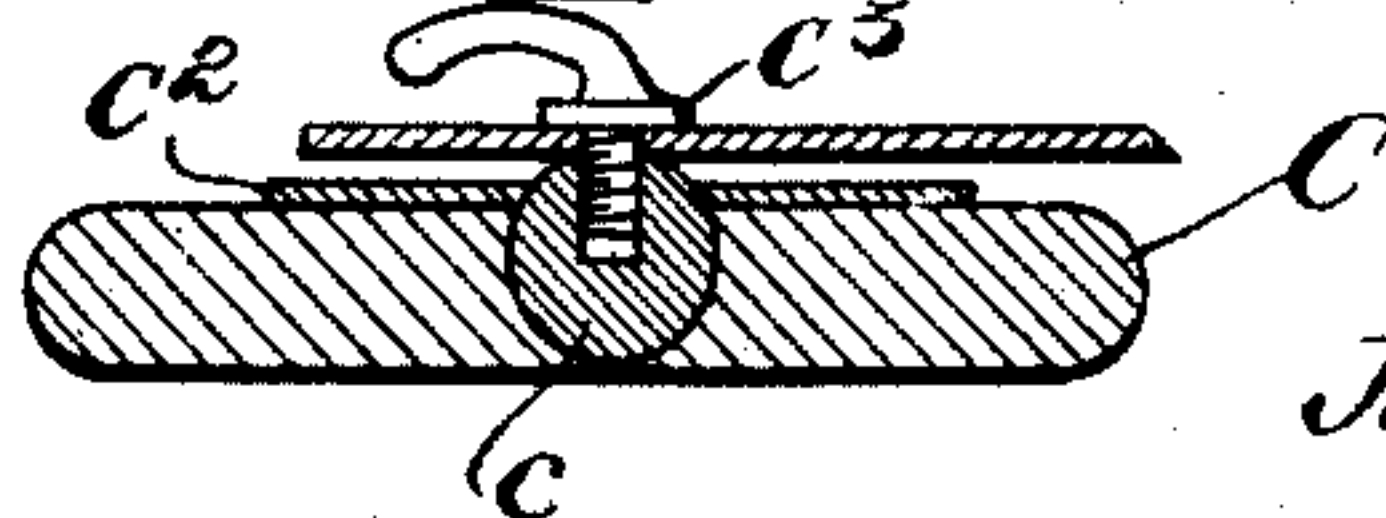


Fig. VIII.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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TRUSS.

No. 909,077.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES S. E. FREEL, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Trusses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to produce an efficient truss, in which, also, the discomfort attendant upon wearing the usual truss, and any danger from undue pressure beyond the situs of lesion, will be obviated.

In the accompanying drawings, forming part of this specification, and in which like letters of reference indicate corresponding parts, I show one of various forms of embodiment of my invention; and, in these drawings, Figure 1 is a view in perspective, showing, in full and in dotted lines, the truss in position on the body for inguinal, or femoral, hernia. Figs. 2 and 2^a are views in cross and in longitudinal section, respectively, showing my preferred form of pad having a projection on the bulge, or operative, face, toward its lower and outer margin to present most concentrated and greatest pressure at the place of the hernia, or at the protrusion, the projection shelving from the bottom of the pad upward toward the apex of the projection, that is, incurving upward and over, somewhat abruptly, to effect sustaining-pressure upward, and shelving somewhat, less abruptly inward, with elongation of pad-surface inward, to present more distributed and less pressure upon the abdomen, and, thus, against the peritoneum. Fig. 3 is a view in elevation showing the hollow, or front face of the pad, with a well under the projection to receive one end of the coil-spring for longitudinal setting of the spring, as to obtain greater or less pressure therefrom. Fig. 4 is a view in elevation, showing a plate having a slot by which the plate is turned upon the inner end of a coil-spring and having perforations through which it is fastened to the pad. Fig. 5 is a view in perspective, showing the pad mounted free on the coil-spring to permit, with accompanying resiliency, motion in any direction conformatory to motion of the body. Fig. 6 is a view in elevation showing a blank having a suitably perforated body and ears;

also, a bolt and nut; so that, by turning up the body of the blank, a clip will be formed and, by turning down the ears onto the outer end of the coil-spring, the clip will be firmly secured to the spring; and, by the bolt through the perforations of the clip, and by the nut, the pad will be adjustably set on the frame of the truss. Fig. 7 is a view in perspective, showing the pad on the plate, the plate on the spring, the spring on the clip, and the clip on the frame. Fig. 8 is a view in section, taken centrally through a back-plate longitudinally of the line of the rear part of the frame of the truss, showing the back-plate with a socket having a ball in it, supplying a ball-and-socket joint for automatic adjustment, a covering-plate or cap, and a catch-pin, or button, having a screw at its inner end passing through a perforation in the frame into the ball to secure the back-plate to the frame in such manner that there can be no danger of shifting, and a goose-neck at its outer end to permit ready application of a back strap by the patient and reliably to hold it, the goose-neck, in use, being turned away from the direction of pull of the strap. Fig. 9 is a view in perspective, taken from the rear, showing the back-plates and exhibiting the relation of general parts of the truss and the strap.

The frame of the truss extends around the hips instead of about the abdomen, bringing the front part into the creases between abdomen and thighs.

The pad, of which one or two may be employed, as the hernia is single or double, is of particular contour, to concentrate pressure, with lift, to effect cut-off externally, and to avoid undue pressure, inward from the situs of the hernia, upon the peritoneum, or peritoneal region.

By the setting of the pad free upon a spring, instead of upon a spring-seated, or joint-seated, post, or the like, it will adapt itself automatically more readily, to distention or recession of the abdominal regions in breathing, as also to any movements of the body.

By setting the pad revolvably upon the spiral spring, (by the plate fixed to its inner face and having the peculiar curved slot, or its equivalent) the stiffness, or degree of thrust, of the spring may be increased by turning the pad outward, that is, away from the body, bringing more of the body of the

spring into play to be overcome, or diminished by turning it inward; thus causing more or less pressure upon the hernia, as may be desirable.

5 By turning up the body of the blank, a suitable clip is readily made; while, by the turning down of the ears of the blank upon the spring, a ready and, at once, immovably-firm attachment of this clip to the spring is
10 secured.

By the set-screw, the clip and spring, carrying the plate, which is mounted on the pad, may be adjusted upon the frame, as usual.

To put the truss together, first put the
15 screw up through the spring from below, and through the clip, and turn on the nut; then turn the plate onto the spring, and then screw it to the pad.

The pad may be of aluminum, or any
20 other suitable non-absorbent substance, for cleanliness and be in form of a shell, or be flat in front.

By changing position of the frame and pads, the truss is equally applicable to cases
25 of abdominal, (*e. g.* umbilical and ventral) or other, hernia, and to any situation where readily regulatable pressure is requisite.

Referring to the drawings for specific illustration of my invention, A indicates the
30 frame of the truss which is provided, preferably, with flange-pieces, *a*, of any suitable substance, has perforations at the back, as at *a*², and, in front, is to carry a pad, or pads, B, and, behind, a plate or plates, C, connect-
35 ed by a strap, D, having perforations, *d*, for adjustability.

The truss, especially in cases of inguinal, or femoral, hernia, will be worn about the hips (the frame being suitably bent to con-
40 form), the plates at the rear resting in the depressions at the upper portions of the glutei maximi, or gluteus maximus muscles, about the region between these and the glutei medii, or gluteus medius muscles,
45 across the tensor fasciæ latæ, below the crest of the ilium, forward into the sulci between the abdomen and the front of the thighs, to the inguinal and femoral regions.

The pad, B, consists preferably, of a shell-
50 like, or recessed, body, the bulge being on its inner, or operative, face, and the hollow at the outer face; though, instead of this face appearing hollow, or recessed, it may be covered, or filled, to be flat, or to present any
55 other appearance; only so that there is play for the spring within, or outside of, the pad.

This pad is of peculiar contour on its operative face, having, here, a projection, *b*, near its lower and outer margin, raised gradually,
60 at the outer part of its apex and shelving, or incurving over, somewhat abruptly upward, as at *b*², and preferably somewhat less abruptly, inward, as at *b*³, where, also, a more extended surface is formed, or left,
65 than at the outer, that is, the other, side of

the projection. The purpose of this contour is to give greatest pressure at the particular spot of the tumor, or protrusion of the intestine, with additional shut-off, or barrier,
70 against extension beyond, a lifting pressure against the tumor, and a reduced and distributed pressure, upward and laterally-inward against the peritoneum. My pad, of this contour, may be held, in any situation where desirable, rigidly, if desired, as by
75 bandage; but, as is well known, it is best, that a truss-pad should have some elasticity of pressure and be universally movable; and it is, also, desirable, that there should be capability of regulation of the pressure. These
80 results have been accomplished by spring-seating the pad with the intervention of posts, joints, rods, or the like, and by turning a post screw-threaded at its lower end and provided with a lateral pin, with this pin
85 bearing on the spring; but never by fixing the pad on the end of a spring, for example, a coil-spring, by itself, the spring being free, that is, forming in and of itself, the immediate and sole support for the pad, however se-
90 cured to it, and affording, at the same time, with resiliency, movement in any direction, yielding in any direction, to conform to distention or recession of the parts of the body in contact, or to any movement of the body,
95 and by turning the pad, itself, directly on or off the spring, or the spring to or from the pad,—nere turning the pad on the coil-spring,—for diminishing thrust and pressure, freeing a coil or coils from action, or, in di-
100 rection off the spring, for increased thrust and pressure, exposing more of the spring, all this bringing additional coil or coils into action; that is, without any barrel and pin and slotted post, etc., merely by seating the
105 pad directly, revolvably upon the coil-spring.

Where a bent spring, such as a rod, set slanting, is employed, the more of the spring exposed, the less will be the pressure, and vice versa, that is, less spring: greater stiff-
110 ness.

The outer face may have in it, preferably under the projection, *b*, a well, or depression, *b*⁴, to receive the inner end of a coil-spring, *b*⁵,—or, without the well, the spring
115 may be in the hollow of the pad, generally,—held, in any suitable manner, free to turn, as by a plate, *b*⁶, having an entrance through it, round, or of any suitable shape, for example, crescent-shaped, as at *b*⁷, for the end of the
120 spring.

My pad, set directly on one end of a free spring, for resiliency and conformatory motion, and adjustable as to pressure, may be secured to any suitable truss-frame, in any
125 convenient manner; but I prefer to provide one end of the spring, the outer end in use, with a clip to secure the pad to the frame, and adjustably to secure it. To this end, I form a blank with a body, *b*⁸, ears, *b*⁹, and
130

perforations, b^{10} , turn the body up to present a clip and fasten this on the coil-spring by bending down the ears on the appropriate end-coil of this spring, as shown in Fig. 7 of the drawings, after which it may be fixed upon the frame of the truss by a bolt and nut, b^{11} , as seen in the same figure.

It is desirable that back-plates to a truss should be self adjusting, be capable of movement conformatory to that of the body, and, also, be capable of being set at different positions along the frame; and that their connection to fix the truss in position should be easy for an old and stiff or rheumatic person, and be firm and reliable when effected. For these purposes, I provide the plate with a ball-and-socket joint, as at c , capped by a plate, c^2 , and provide, a catch-pin, or button, c^3 , having a screw-thread at its one end, the inner end in use, and a goose-neck, or hook, at its other end, the outer end in use, this catch-pin being set through the desirable perforation, a^2 , of the frame and screwed into the ball, setting the pin in such manner that the point of the hook will be turned outward, whereupon, when the frame is in place, the wearer may readily slip a perforation, d , in a strap, D, upon a hook and, as the hooks are turned outward, or against the strain of the strap, this will be held without danger of shift or slip on movement of a back-plate with the body.

Having, thus, fully set forth my invention and illustrated means of carrying it into effect, what I claim and desire to secure and be protected in by Letters Patent, is—

1. The combination with a truss-frame with back-plates, each provided with a ball-and-socket joint to cause it to conform to movements of the body, and each attached to the frame by a fastening, the outer portion of which serves as a catch-pin, or button, and the inner portion of which is a screw, that, passing through a perforation in the frame into the ball, secures the back-plate to the

frame in a manner obviating any danger of shifting and a strap for engagement with said catch-pins or buttons, substantially as described.

2. A hollow truss-pad, having on its operative face, toward its lower and outer margin, a projection, rising gradually to the outer part of its apex, and shelving and incurved upward and inward, leaving a more extended surface inward, substantially as and for the purpose described.

3. The combination with a truss-pad of any suitable configuration, or kind, of a free spring, the pad being seated directly on the spring, and relation of the pad to pressure, thrust, or force of the spring being adjustable, substantially as and for the purposes described.

4. The combination with a truss-pad of any suitable kind, of a spring coil to which the pad is adjustably secured for universal motion, and a clip for attaching the spring to a truss-frame substantially as described.

5. The combination with a coil-spring of a clip formed of the perforated body, b^8 , the clip being secured to one end of the spring by the bent ears, b^9 , substantially as described and shown.

6. The combination with a truss-frame of a coil-spring having a clip secured to one of its ends by ears, b^9 , the clip being adjustably attached to the frame by a bolt and nut, substantially as described.

7. The combination of a truss-back-plate movable with the body, of the hook-shaped catch, or catches, and a suitable strap, the catch, or catches, being set hook-outward, substantially as and for the purpose described.

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

JAMES S. E. FREEL.

Witnesses:

R. G. DYRENFORTH,
EDMUND H. PARRY.