

No. 652,442.

Patented June 26, 1900.

W. B. OUTTEN.  
AUSCULTATOR.

(Application filed Mar. 6, 1899.)

(No Model.)

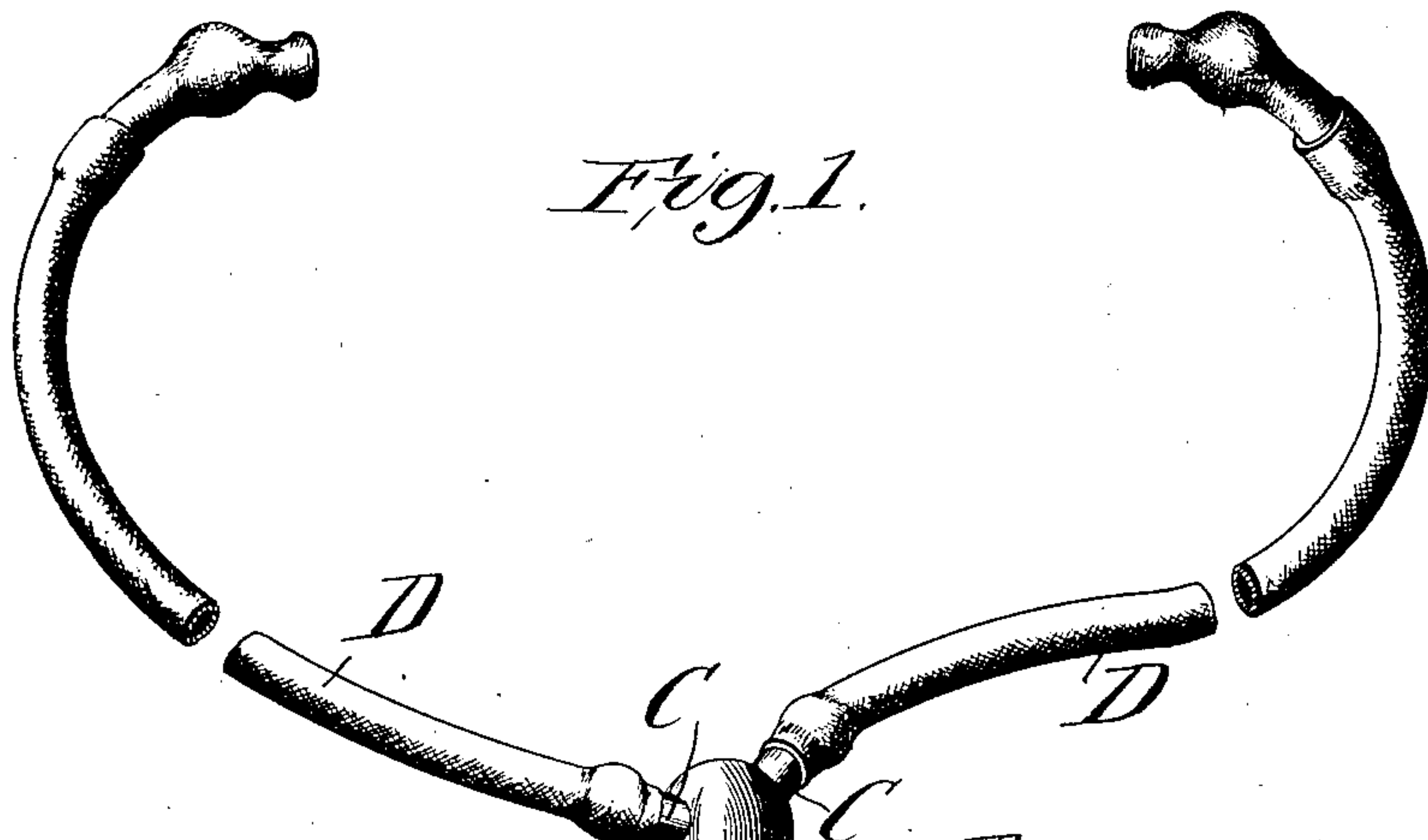


Fig. 1.

Fig. 3.

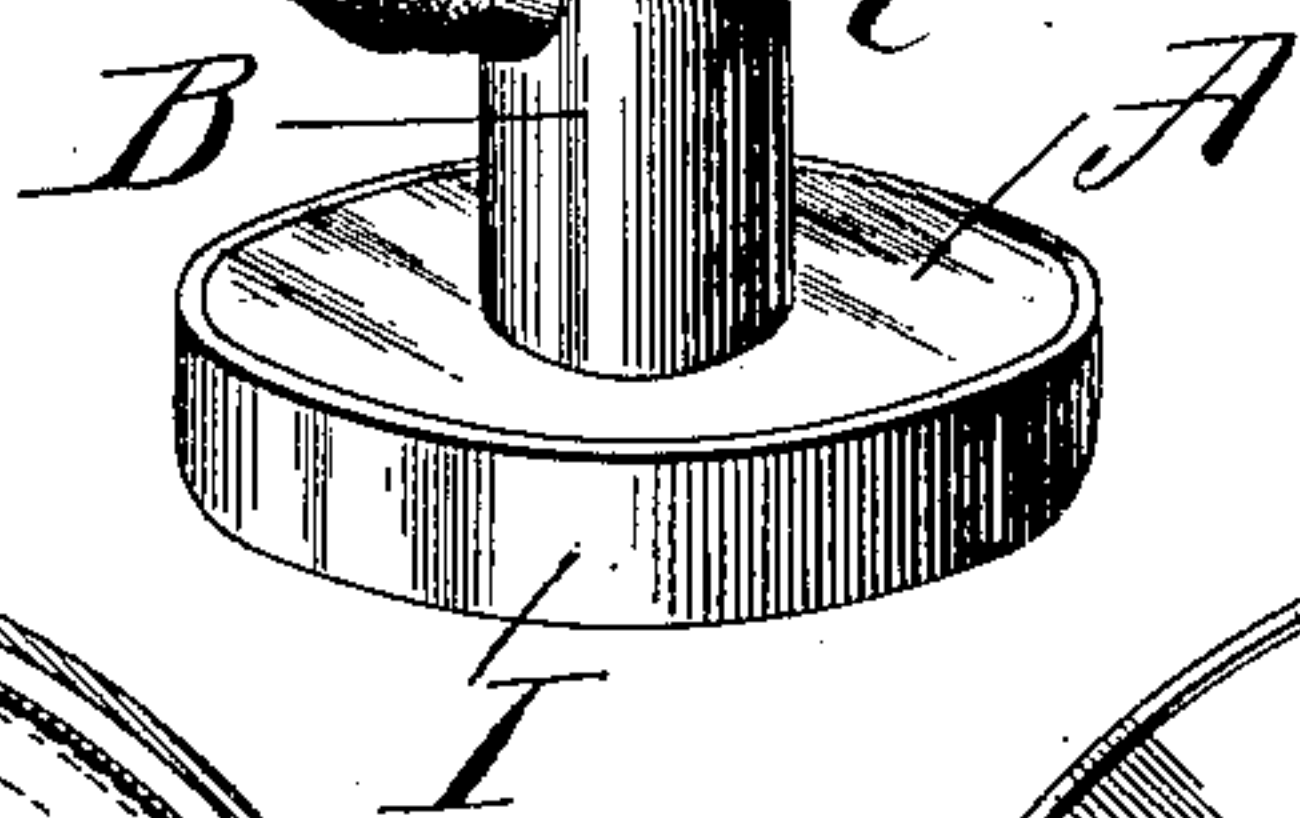


Fig. 2.

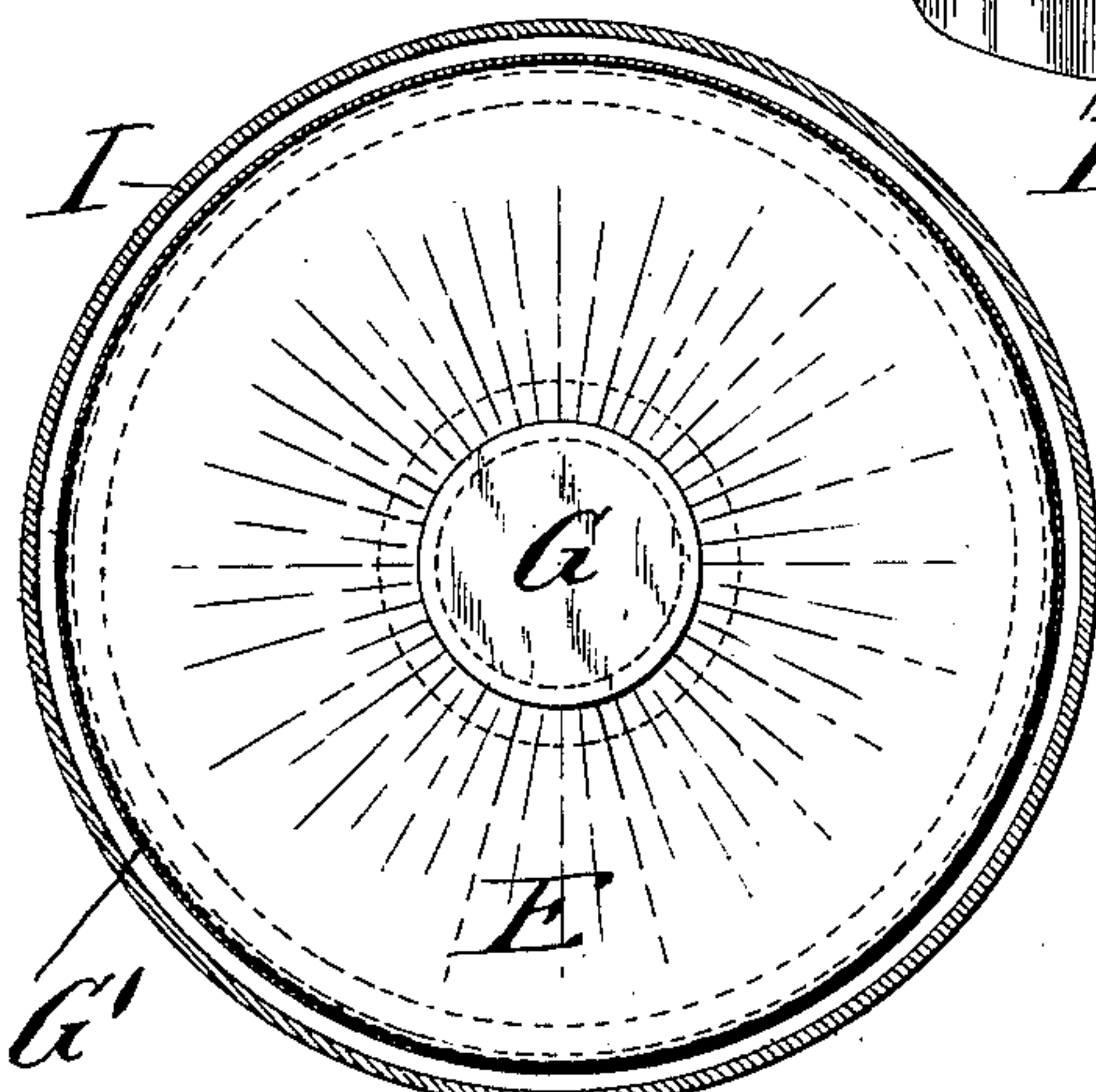
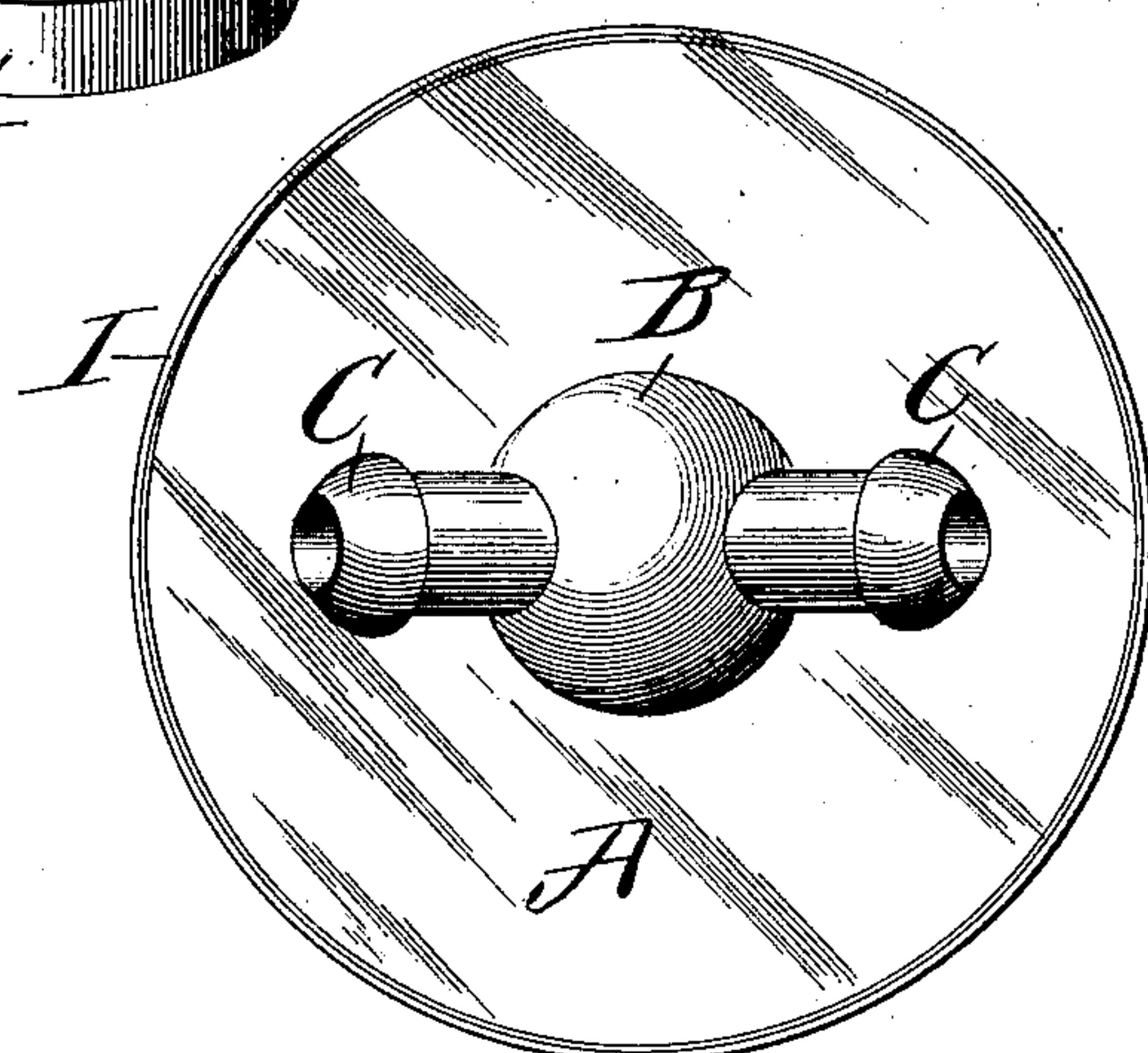
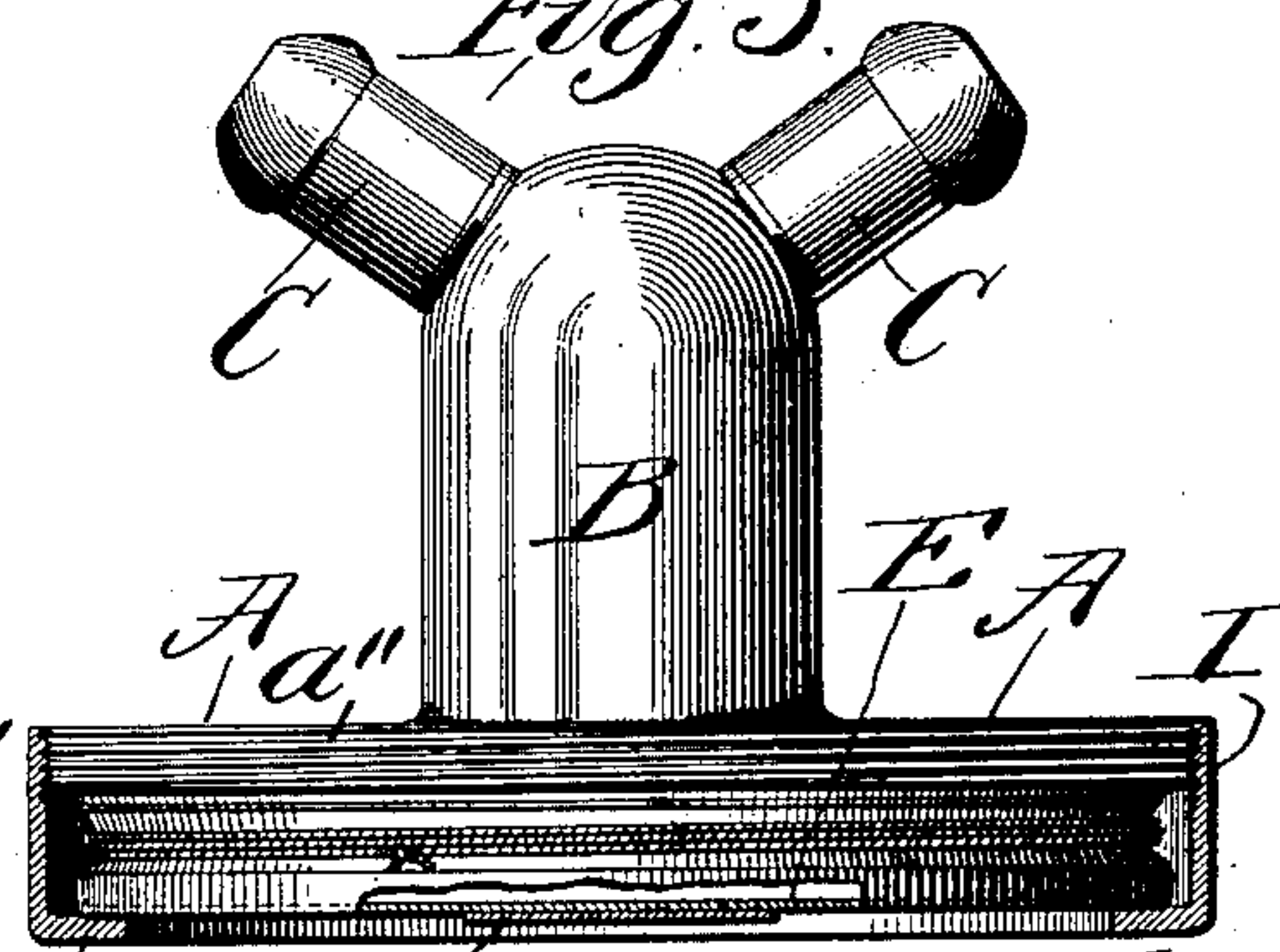
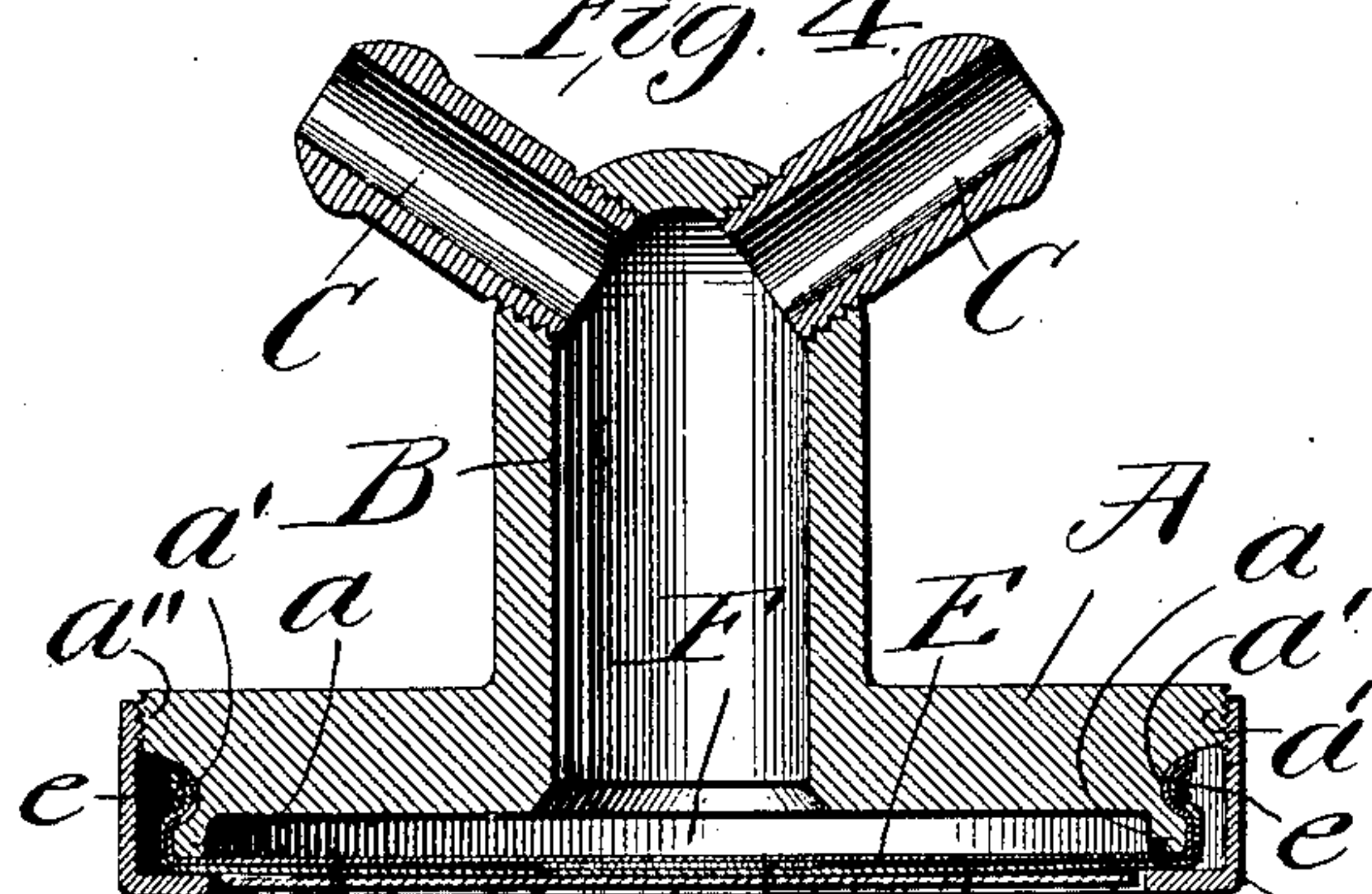


Fig. 4.

Fig. 5.



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attys.



# UNITED STATES PATENT OFFICE.

WARREN B. OUTTEN, OF ST. LOUIS, MISSOURI.

## AUSCULTATOR.

SPECIFICATION forming part of Letters Patent No. 652,442, dated June 26, 1900.

Application filed March 6, 1899. Serial No. 707,993. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN B. OUTTEN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Auscultators, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same; reference  
10 being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of my improved auscultator. Fig. 2 is a top plan view of the same. Fig. 3 is a bottom plan view of the same, certain parts being removed to more clearly show the diaphragm. Fig. 4 is a vertical sectional view through the same. Fig. 5 is a side elevational view showing the clamping-ring in section.

20 This invention relates to a new and useful improvement in an auscultator, the object being to provide an instrument of the kind described for use by physicians and others for the purpose of rendering slight sounds  
25 audible.

The special features of the present invention reside in the use of a diaphragm, preferably made of animal membrane or tissue, and in the provision of means coöperating  
30 with said diaphragm for tensioning the same.

Other features reside in the construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward pointed out in the claims.

35 In the drawings, A indicates the body portion proper of the auscultator, from one side of which arises a hollow dome B, said dome having, preferably, two nipples C projecting therefrom, to which are secured two flexible  
40 tubes D, having earpieces in their ends, which are adapted to be inserted in the ears of the operator. The side of the body portion A opposite the dome B is provided with a circumferential flange *a*, above which is a  
45 reduced annulus *a'*, said body portion then broadening out, forming a larger diameter, which is screw-threaded, as at *a''*.

E indicates a diaphragm, preferably made of animal membrane or tissue, which is  
50 stretched across and over the flange *a*, the same being held in position by suitable cords, wire, or other securing medium *e*, which en-

gage the edges of the diaphragm and bury said edges in the groove *a'*, where they are held firmly in place. The diaphragm, being 55 supported only by the flange *a*, is free to vibrate over a chamber F in the body portion A, formed by the flange *a*, and in so doing transmit the sound-waves into the dome B and through the tubes connected therewith. 60

In order to secure the diaphragm in position so that it will be taut or tense the same is usually dampened, so that in drying it will become tense. In order to increase this tenseness I introduce a disk G about the center of the diaphragm, securing the same in position by a mucilaginous substance. The disk is composed of material similar to that of the diaphragm, preferably of animal membrane or tissues, and being secured in position on the diaphragm when said diaphragm is still in a moist condition the contraction of the diaphragm and its tensification occur between the flange *a* and the periphery of the reinforce G. 75

As shown in Fig. 4, a second diaphragm G' may be employed, which is substantially the same as the diaphragm E, the reinforce G being inserted between the two diaphragms and secured to each. Any material may be employed for rendering these diaphragms impervious to moisture, such as varnish or a preparation of shellac; but I prefer to use a protecting-plate H, made of aluminium or some like sheet metal which will not tarnish or corrode under the action of the acids in perspiration, this protecting-plate being preferably secured in position either to the reinforce G, if but a single diaphragm is employed, or on the outer diaphragm within the lines of said reinforce, as shown in Fig. 4. 80

I indicates a protecting-ring, which also acts in the capacity of a clamp to hold the diaphragm or diaphragms tightly against the flange *a*. This ring is screw-threaded on the body A at *a''* and is provided with an intumed flange at its lower edge extending over the flange *a*, the opening in said ring being substantially of the same diameter as the chamber F. The protecting-shield H is of less diameter than the opening in ring I, such space being left between the edge of said shield and the intumed flange of said ring, so as to permit the diaphragm to which said 100



shield is connected to vibrate freely without being bound by the attached shield contacting with the ring.

I am aware that minor changes in the arrangement, construction, and combination of several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In an auscultator, the combination with a body portion provided with a projecting flange, of a diaphragm stretched over said 15 flange and secured in position, and a protecting plate or shield impervious to moisture secured to said diaphragm only at its central portion and covering substantially the entire 20 exposed part thereof, substantially as and for the purpose set forth.

2. The combination with a body provided with a screw-thread, and with a projecting flange, a diaphragm stretched over said 25 flange, means securing the same to the outer side of the flange, and a clamping-ring having a screw-threaded flange of a size to be placed over said diaphragm and securing means, and having a screw-thread engaging 30 said thread on the body and a flange which engages with the outer edges of the diaphragm opposite said projecting flange and presses the diaphragm against the flange, substantially as described.

3. The combination with a body portion, 35 provided with a projecting flange, of a plurality of diaphragms stretched over said flange, and a disk interposed between two of said diaphragms and secured to each substantially as described, whereby said dia- 40 phragms are tensioned.

4. The combination with a body portion provided with a projecting flange, of two diaphragms stretched over said flange, a

tensioning-disk interposed between said dia- 45 phragms, and a shield or protecting-disk secured to the outer diaphragm; substantially as described.

5. In an auscultator, the combination of a body portion provided with a dome and a 50 sound-chamber in communication with said dome, a flange projecting from said body portion, a diaphragm of membrane stretched over said flange, a protecting-ring extending over the outer circumferential edge of the 55 diaphragm and a protecting-plate of impervious material secured to the diaphragm and extending substantially to said protecting-ring, substantially as described.

6. In an auscultator, the combination of a 60 body portion provided with a sound-chamber, an ear tube or tubes in communication with said sound-chamber, a diaphragm secured to the body portion and constituting one wall of said sound-chamber, means in addition to 65 the diaphragm-securing means for tensioning said diaphragm, a protecting-ring for the circumferential portion of said diaphragm, and a protecting-plate impervious to moisture secured to said diaphragm and extending sub- 70 stantially to said protecting-ring, substantially as described.

7. In an auscultator, the combination of a body portion having a sound-chamber, an animal-membrane diaphragm secured to the 75 body, an animal-tissue disk cemented to said diaphragm in substantially the manner described, and means impervious to moisture for protecting said diaphragm from moisture; 80 substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 1st day of March, 1899.

WARREN B. OUTTEN.

Witnesses:

F. R. CORNWALL,  
A. S. GRAY.