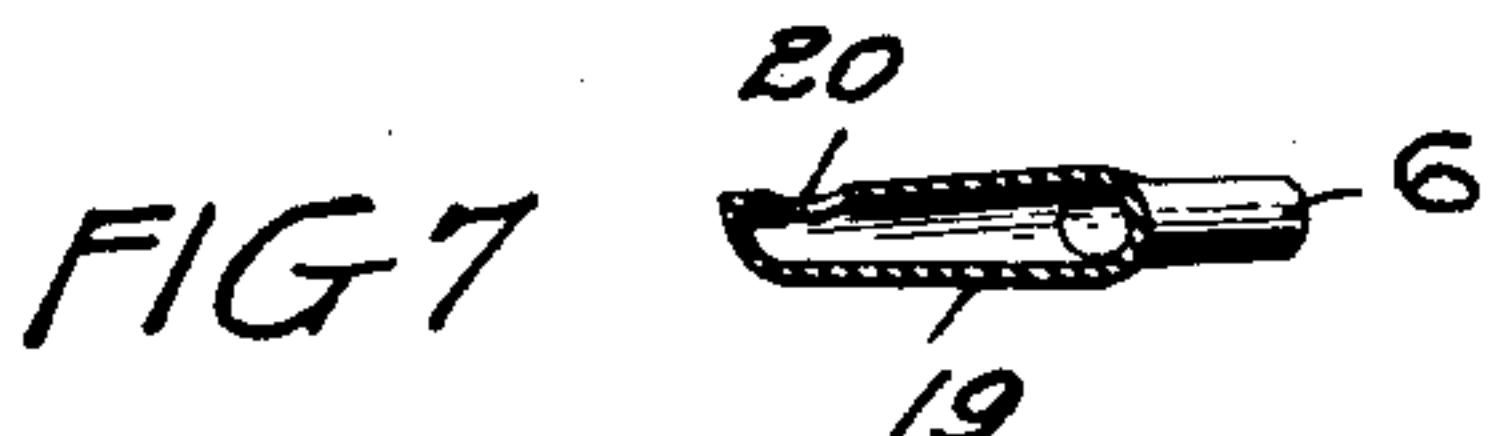
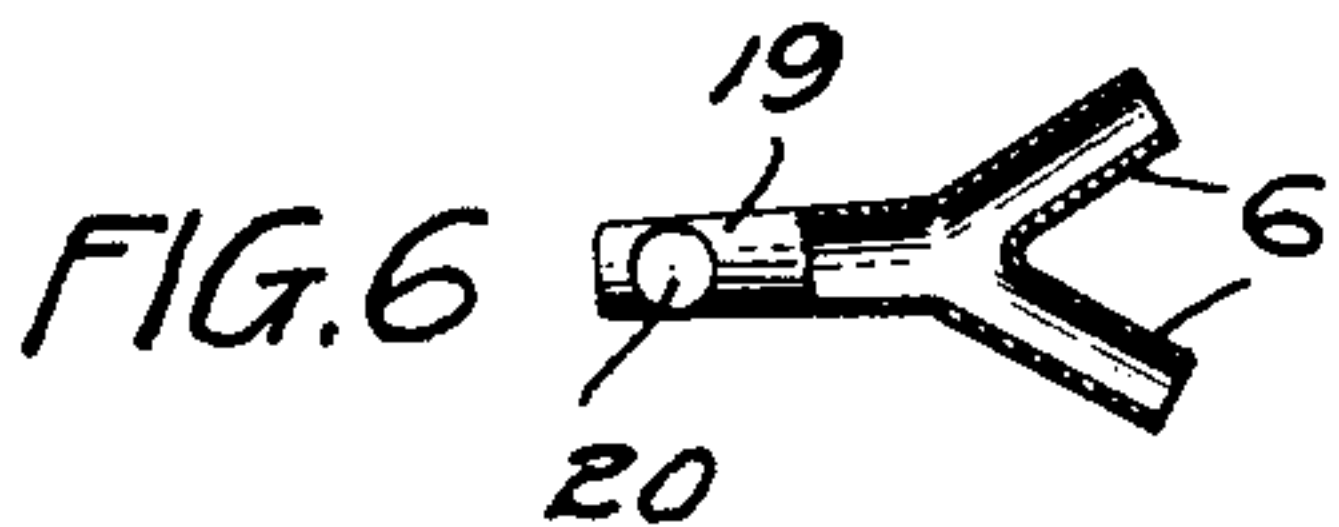
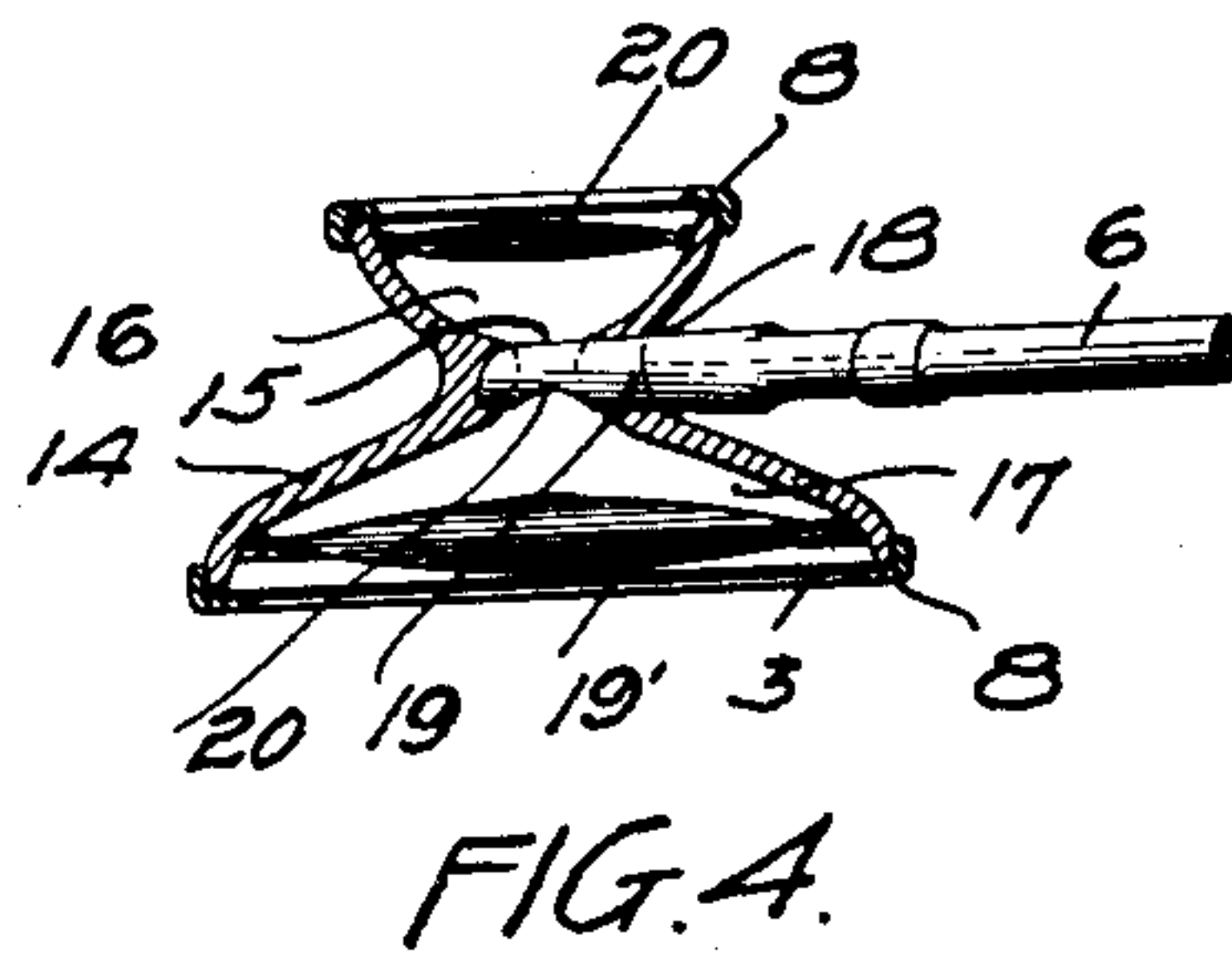
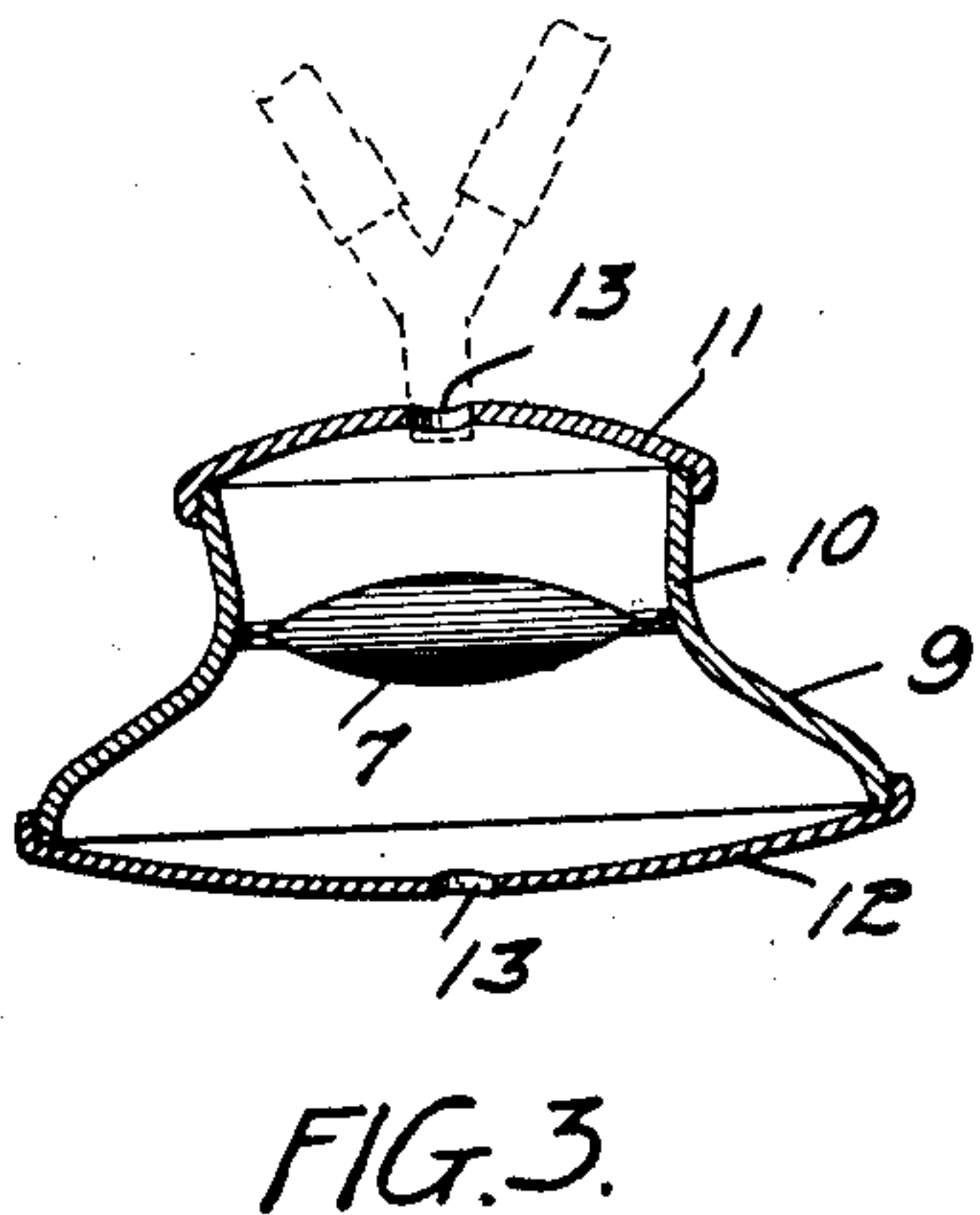
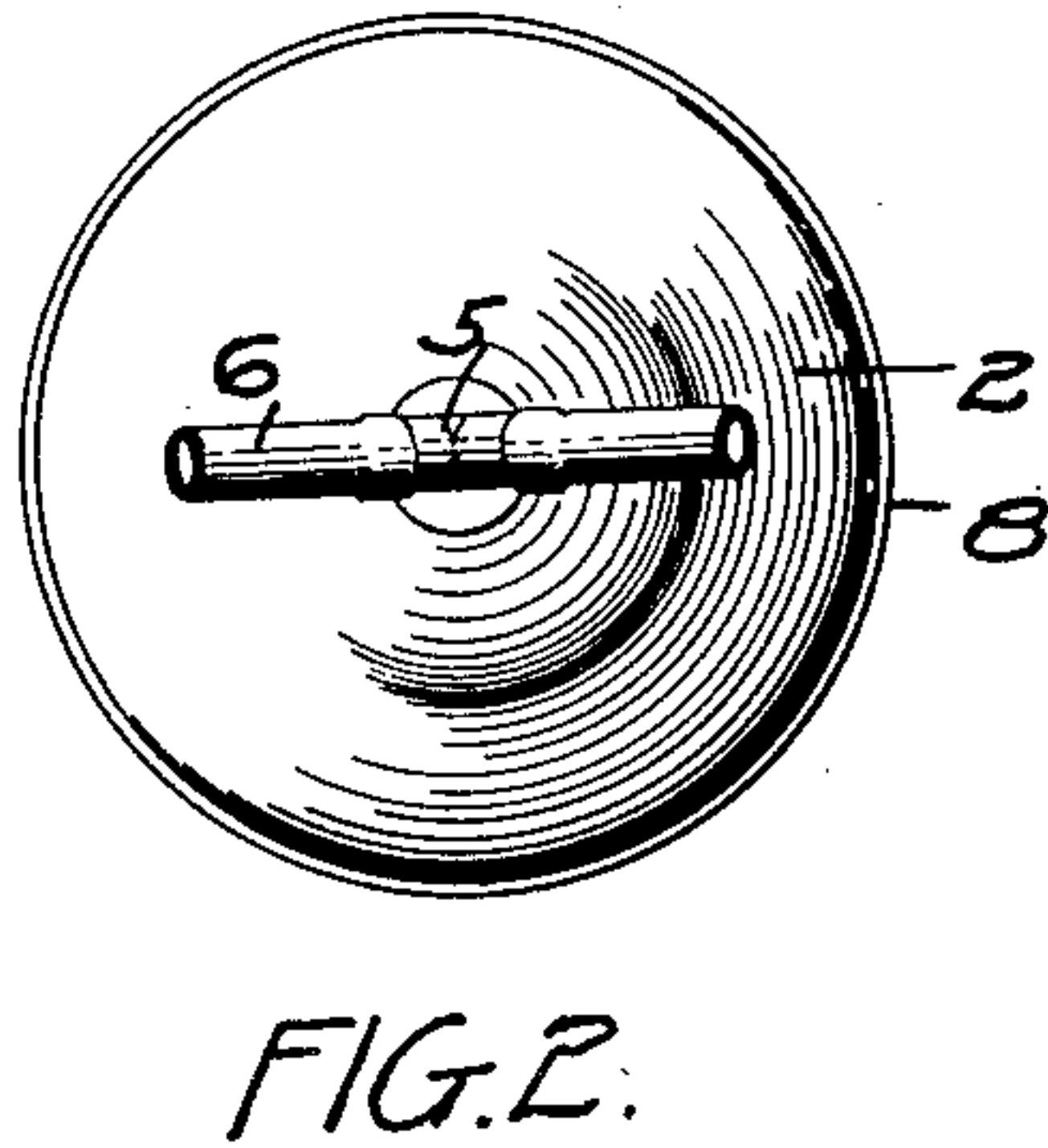
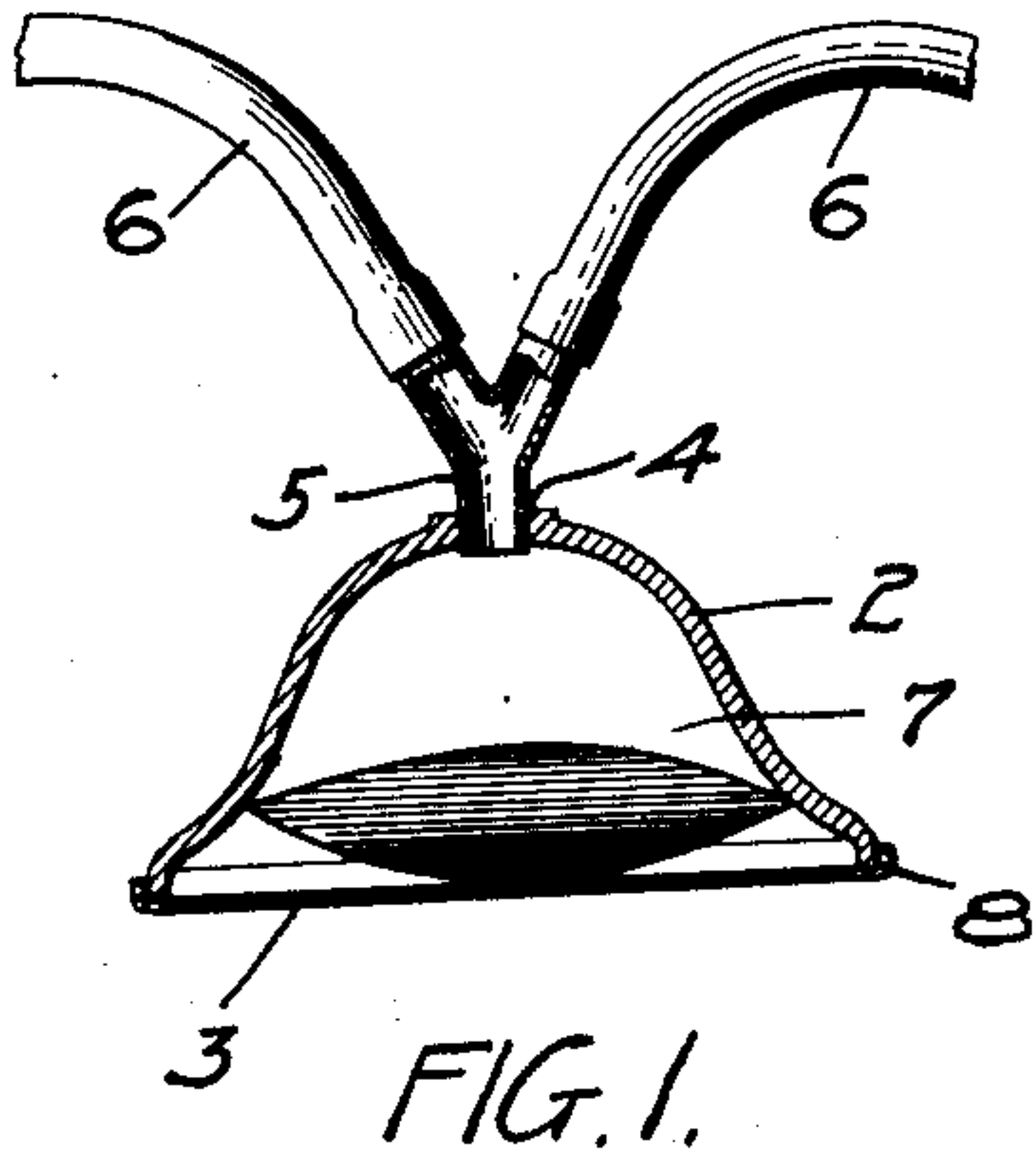


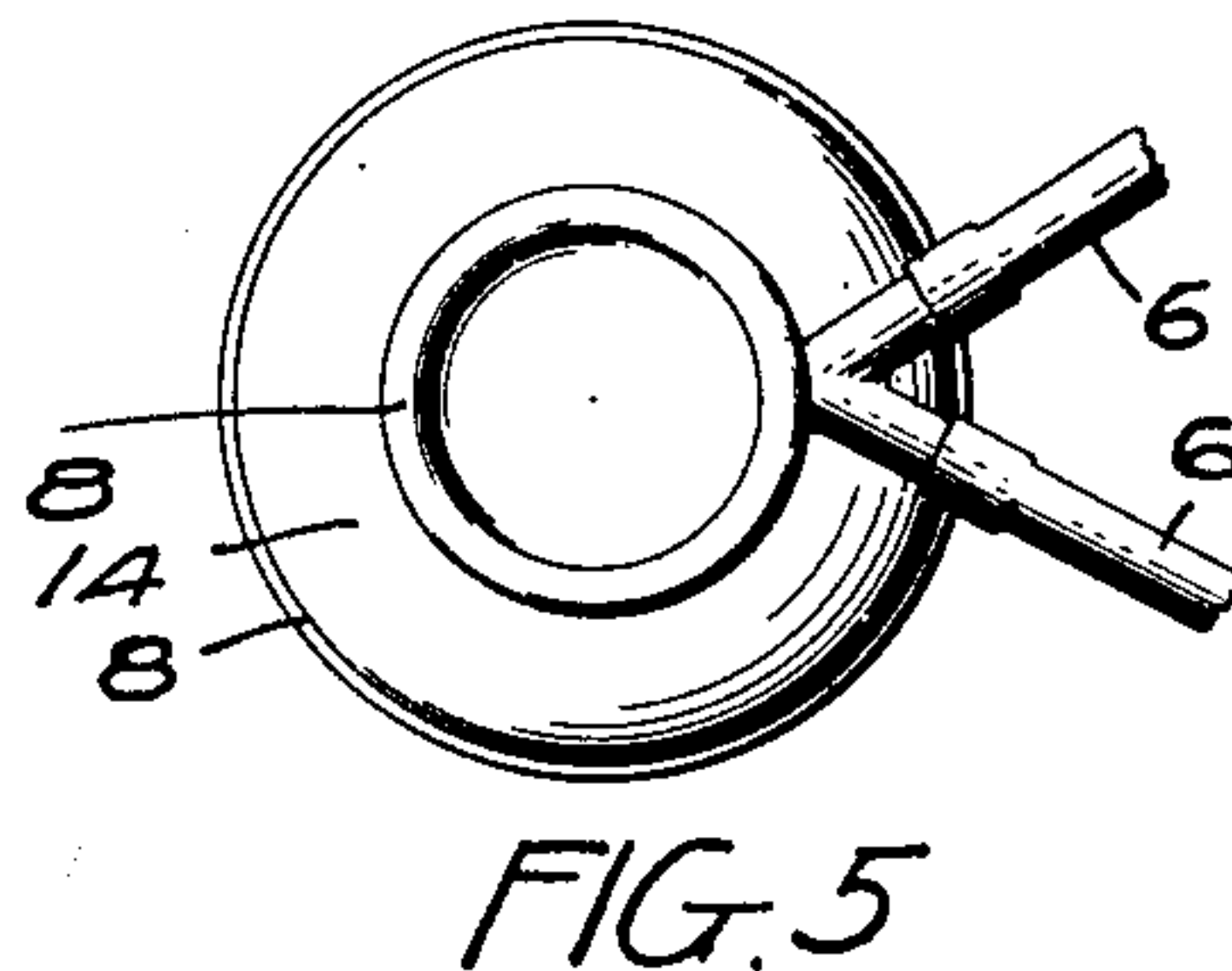
No. 843,319.

PATENTED FEB. 5, 1907.

P. A. AURNESS.
STETHOSCOPE.
APPLICATION FILED JAN. 22, 1906.



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PETER A. AURNESS, OF MINNEAPOLIS, MINNESOTA.

STETHOSCOPE.

No. 843,319.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed January 22, 1906. Serial No. 297,121.

To all whom it may concern:

Be it known that I, PETER A. AURNESS, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Stethoscopes, of which the following is a specification.

My invention relates to improvements in the efficiency and general utility of stethoscopic instruments.

It relates particularly to the employment in a stethoscopic air-chamber of a sound-wave-refracting lens or lenticular body having refractory qualities, such lens being adjusted and attached in a focalizing manner to a sound-exit in said air-chamber.

The object of this invention is to provide in an instrument of this kind a sound-wave-refracting lens focalizing sound-waves at or near a sound-exit for the further passage of such focalized and thereby intensified sound-waves through appropriate tubes or pipes to the ear. This object is obtained by particular constructions and combinations of parts, all as hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional view of a stethoscopic instrument embodying my invention. Fig. 2 is a top view of the same. Fig. 3 is a sectional view of a modification of the device shown in Fig. 1. Fig. 4 is a sectional view of another modification. Fig. 5 is a top view of the same. Figs. 6 and 7 are details of the ear-tubes.

In the drawings, 2 represents a bell-shaped body, composed of metal or any other suitable material, having its open end closed by a diaphragm or membrane 3 and provided at its closed ends with an orifice 4, into which a nipple 5 is inserted, and provided with branch tubes 6 for insertion into the ear. One, two, or more of these tubes may be formed in connection with the nipple 5 to enable one or more persons to make use of the instrument simultaneously. A refractory lens 7 is provided within the body, double convex in form and consisting of a membranous envelop containing a suitable fluid or gas capable of collecting and intensifying the sound-waves. This lens may be held in place by the diaphragm, which is secured by any suitable means, preferably by the ring 8, threaded to the base of the part 2.

In Fig. 3 I have shown a modification of

the instrument which consists in providing a shell or casing 9, open at the top and bottom and having an intermediate neck 10, wherein the refractory lens is suspended. The top and bottom of the shell are closed by disks 11 and 12, which are preferably threaded to engage the correspondingly-threaded walls of the shell and are adjustable thereon. These disks are of different areas and either one may be utilized, according to the area of the chest-surface upon which the examination is made. Each disk is provided with a central orifice 13 to receive the nipple 5, which may be inserted into either disk, according to whichever end of the instrument is placed on the chest.

In Fig. 4 I have shown still another modification, which consists in providing a shell 14, having a constricted passage 15 leading from a chamber 16 in the top of the shell to a similar chamber of greater area 17 in the bottom of the shell. Each end of the shell is provided with a membrane corresponding to the one shown in Fig. 1, though of less diameter, and held in place on the shell in a similar manner. The neck of the shell has an orifice 18 to receive a plug 19, having a hole 20 on one side and communicating with tubes similar to those described with reference to Fig. 1. When the plug is inserted into the neck, with the opening therein on the under side, the tubes will communicate with the chamber 17, and when the plug is turned so that the opening is on the upper side the tubes will communicate with the chamber 16. In these chambers refractory lens 19 and 20 are provided, corresponding in function and construction to those heretofore described and serving to collect the sound-waves and transmit them in an intensified form to the ear-tubes. A half-turn of the plug 19 will connect the tubes with either chamber 16 or 17 and adapt the device for use with the small diaphragm or with the larger one, as preferred. This apparatus can be folded compactly and carried in the pocket, and when used as a stethoscope will focalize the sound-waves and transmit them in an intensified form to the ear-tubes.

I claim as my invention—

1. A stethoscope comprising a double cone-shaped shell having open ends and diaphragms of different area inclosing the same, said shell having chambers in each end, and a constricted passage connecting them, a plug fitting into an orifice in said passage and

having ear-tubes and a hole in its side wall communicating with one of said chambers whereby upon rotating said plug either of said diaphragms may be used, substantially
5 as described.

2. A stethoscope comprising a shell having disks of different areas and a refractory lens interposed between said disks, substantially
as described.

10 3. A stethoscope comprising a double cone-shaped shell having open ends and diaphragms of different area closing the same, said shell having chambers in each end and a constricted passage connecting them, said

passage having a horizontal orifice, a plug 15 having ear-tubes attached thereto and a hole in its side wall to allow said plug to communicate with either one of said chambers when inserted into said orifice and a refractory lens provided in each of said chambers and near 20 said diaphragms whereby the sound-waves will be focalized for the purpose specified.

In witness whereof I have hereunto set my hand this 16th day of January, 1906.

PETER A. AURNES.

Witnesses:

RICHARD PAUL,
C. MACNAMARA.