

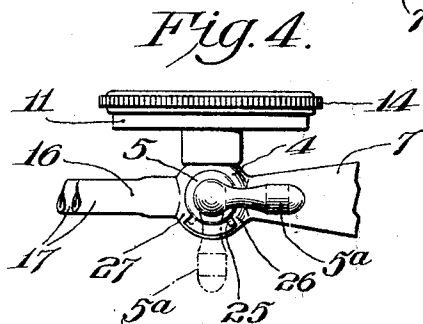
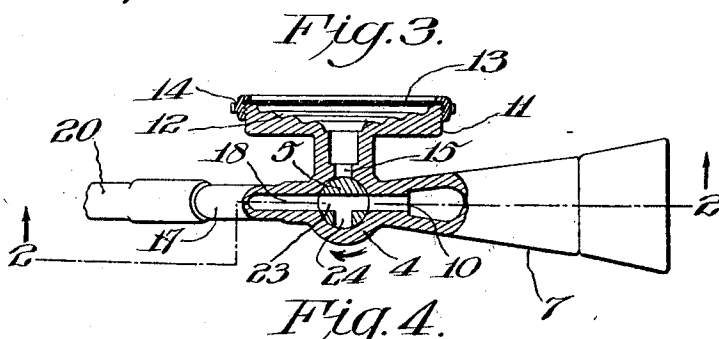
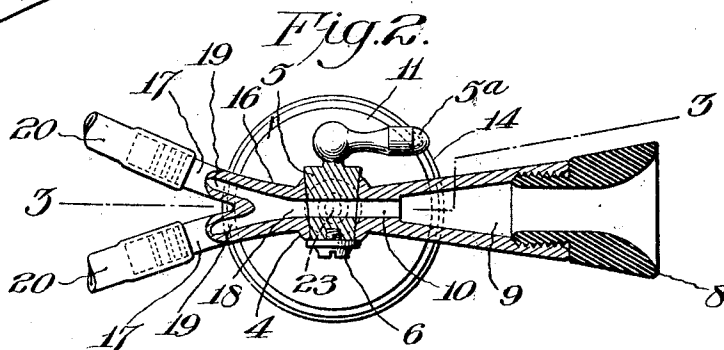
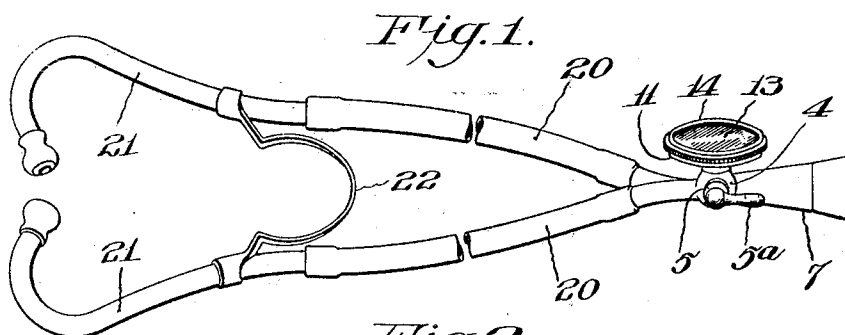
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STETHOSCOPE

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UNITED STATES PATENT OFFICE.

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STETHOSCOPE.

Application filed May 5, 1927. Serial No. 188,946.

This invention relates to improvements in stethoscopes.

In making cardiac examinations it is highly desirable at each examination to take advantage of two forms of stethoscopes one having what is commonly known as a bell body piece having an open sound collecting space or chamber in communication with tubes leading to aurals, and the other having what is commonly known as a diaphragm body piece having a diaphragm covered sound collecting space or chamber in communication with tubes leading to aurals, because, as is well known, the bell body piece is more useful for registering low pitched murmurs and the diaphragm body piece is more useful for registering high pitched murmurs, and because the bell piece is capable of demonstrating rumbling diastolic murmurs of mitral stenosis which are inaudible with the diaphragm piece, and conversely, because the latter piece records the hissing or blowing murmurs of aortic regurgitation which cannot be heard with the bell piece.

In the use of these two forms of stethoscopes, prior to my invention, physicians have been required either to remove the aurals of one instrument from their ears and replace them with the aurals of the other instrument or to detach one body piece from tubes leading to the aurals and attach the other body piece to the same tubes.

Each of these methods has been found to be very objectionable because of the necessity of disposing of one instrument and procuring another during an examination, which not only made the work of the examining physician difficult but, due to loss of time between the applications of the two body pieces, the results of the examinations were less satisfactory than they would have been with less loss of time.

The object of this invention is to overcome these objections by the provision of an instrument having the two body pieces connected to a single pair of aurals permanently incorporated in its construction and having provision for the quick application or use of either piece, thereby saving much time for the examining physician, making his work less difficult, bettering the results of the examinations and thereby giving him

more complete information for the treatment of his patients than heretofore, and prolonging the life of instruments of this general character.

The invention consists of the elements and the combinations of them hereinafter described and claimed.

In the accompanying drawings, illustrating the invention,

Figure 1 is a perspective view of a stethoscope showing one form of embodiment of the invention.

Figure 2 is a longitudinal section through a portion of the instrument on line 2—2 of Fig. 3.

Figure 3 is a similar section, on line 3—3 of Fig. 2.

Figure 4 is a side view of a portion of the instrument.

Referring to the drawings, 4 designates a valve casing and 5 a tapered, partially rotatable valve member extending transversely therethrough and seated therein. The smaller end of the valve member 5 is provided with a removable screw 6 having a head which engages the casing 4 and retains the member 5 seated in the casing and permits it to be turned therein; and the larger end of the valve member is provided with a suitable handle 5^a formed thereon or secured thereto by means of which the valve member may be turned.

The bell body piece 7 is formed integral with and extends from the valve casing 4 and its free end portion is formed by a hard rubber contact part 8 screwed into the part thereof which is formed integral with the casing 4, as shown in Fig. 2. The bell body piece 7 is made tapered or flaring, having a tapered or flaring interior forming a sound collecting space or chamber 9 open at its outer end and having its inner end terminating in a sound inlet passage 10 leading to the valve member 5.

The diaphragmed body piece 11 also is formed integral with and extends from the valve casing 4 with its axis set at an angle, preferably a right angle, as shown, to the axis of the bell body piece 7. The body piece 11 has a head on its free end portion enclosing a sound collecting chamber 12 the outer end of which is closed by a disc-like sound diaphragm 13 held in place thereon

by a ring or collar 14 screwed on to the part of the body piece 11 which is formed integral with the valve casing 4. The inner end portion of the chamber 12 terminates in a sound inlet passage 15 which leads to the valve body 5.

The valve casing 4 has a part 16 formed integral therewith and extending therefrom opposite to the bell body piece 7 and provided with two round diverging portions or stems 17. This part 16 has a sound outlet passage therein comprising a trunk portion 18 leading from the valve member 5 and two branch portions 19 diverging from the trunk portion 18 and extending through the stems 17 of the part 16.

Connected to and leading from the stems 17 of the part 16 is a pair of flexible rubber tubes 20 connected to a pair of aurals 21. The aurals 21 are connected by the usual spring 22 and they are adapted to be inserted into and removed from the ears of the person using the instrument in the usual manner.

The inlet passage 10 and the trunk portion 18 of the outlet passage are in alignment or substantially so and the inlet passage 15 extends at right angles to the passage 10. The valve member 5 is provided with a passage 23 extending straight through the same transversely thereof, and it is also provided with a passage 24 extending through one side thereof at right angles to the passage 23 and opening into the same. The valve member passages 23 and 24 are so arranged relatively to the inlet passages 10 and 15 and the outlet passages 18 that when the valve member 5 is moved to the position shown in Figs. 2 and 3, the passage 23 will connect the inlet passage 10 with the outlet passage 18 and the valve casing 4 will close the passage 24, and that, when the valve member 5 is turned a quarter revolution in the direction of the arrow in Fig. 3 by turning the valve handle 5^a from the position shown by full lines to the position shown by dot-and-dash lines in Fig. 4, the bottom of the valve casing 4 will close one end of the valve passage 23, and the other end portion of the passage 23 and the passage 24 will connect the inlet passage 15 and the outlet passage 18.

The end portion of the valve member 5 carrying the handle 5^a is provided with a stop pin 25 arranged to engage two shoulders 26 and 27 formed in the valve casing 4 to limit the turning movements of the valve member when the handle 5^a is moved

to the full line and to the dot-and-dash line positions shown in Fig. 4, respectively.

It will now be understood that when the valve handle 5^a is moved to the full line position, communication will be established between the bell body piece 7 and the aurals 21 while communication of the diaphragmed body piece 11 will be cut off, and that when the valve handle 5^a is moved to the dot-and-dash line position, communication will be established between the diaphragmed body piece 11 and the aurals 21 while communication of the bell body piece 7 will be cut off. It will be understood also that, after the examining physician places the aurals in his ears he may readily use either of the two body pieces and quickly change from the use of one to the other by simply moving the valve handle 5^a without removing the aurals from his ears and without changing to any material extent the positions of his hands relatively to his patient or to either of the two body pieces of the instrument.

The angles of the axes of the two body pieces and their positions on the valve casing are so relatively arranged that the physician may easily and quickly change from the use of one body piece to the use of the other during the examination of a patient.

I claim as my invention:

A stethoscope comprising a valve casing, a valve member movable therein, a bell body piece formed integral with the casing and having a sound inlet passage leading to the valve member, a diaphragmed body piece formed integral with the casing and having a sound inlet passage leading to the valve member, and a part formed integral with the casing and having a sound outlet passage provided with a trunk portion leading from the valve member and two branch portions diverging from the trunk portion, the valve member being constructed to open communication between either of the inlet passages and the outlet passage when moved and to close either of the inlet passages when moved to open the other, the axes of the inlet passages and the trunk portion of the outlet passage radiating from the valve member substantially in a single plane and the axes of the branch portions of the outlet passage being in a plane which extends substantially at right angles to the first named plane.

In testimony whereof I affix my signature.

CHARLES J. PILLING.