A stethoscope in which two diaphragms are used to amplify sound. The diaphragms are axially spaced, and to one diaphragm a piece of stainless steel is attached and a magnetized metal is attached to the other diaphragm, whereby a magnetic field exists between the spaced diaphragms. In order to better transmit sound, the interior of the Y-fitting is coated with carbon.
STETHOSCOPE

BACKGROUND OF THE INVENTION

Skilled medical practitioners can discover abnormalities in the human body by listening carefully to the sounds produced by the body. Medical practitioners can adequately hear these sounds by means of a stethoscope which amplifies the sounds and transmits the sound to the ears of the practitioner. It is extremely important that the practitioner be able to hear and differentiate the various sounds produced by a normal and an abnormal heart. For example, the practitioner should be able to hear a heart murmur, rales, mitral insufficiency as well as other sounds emanating from the body.

In order to faithfully capture the sounds produced by the body, the diagnostic instrument used—the stethoscope—must be able to pick up the body sound and transmit it to the ear of the practitioner in an intensified and distinct manner. There must be no confusion between tones being perceived. The stethoscope must be capable of transmitting sound in the high and low frequency ranges. Low frequency sound waves emanate from the apex of the heart where the outer ventricular walls meet and are separated by the ventricular septum. High frequency sounds come from the upper atrial area of the heart.

Stethoscopes adapted to accomplish the above were necessarily expensive, bulky, and involved fine tooled parts and a valve arrangement.

SUMMARY OF THE INVENTION

This invention has for a principal object the provision of a stethoscope which can faithfully produce low and high frequency sounds with low attenuation.

It is a further object of the invention to provide a stethoscope having spaced diaphragms interconnected by a magnetic field.

It is yet another object of this invention to provide a stethoscope which is capable of producing high and low frequency sounds without the use of a valve.

It is still a further object of the invention to provide a stethoscope having a Y-fitting which is internally coated with carbon to augment sound reproduction through the binaural tubes.

It is another object of the invention to provide a stethoscope which is light in weight, simple to manufacture, and inexpensive and which maintains its character for durability, ruggedness and efficient, reliable sound transmission.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is an assembly, partly in section, depicting a stethoscope;

FIG. 2 is a side view taken along the line 2—2 showing the head of the stethoscope, and

FIG. 3 is an exploded view showing the components comprising the head of the stethoscope.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to FIG. 2, there is shown a portion of a stethoscope having a head 10. The head 10 comprises a housing 11 which receives most of the sound transmitting components. The housing is hollow and somewhat funnel shaped. The neck portion 12 can be threaded so as to attach to another member or it can be attached by any other known means such as friction fit or gluing, for example. The diaphragm receiving portion 13 of the housing can be made wider than the neck portion 12 so as to receive a first diaphragm 14.

The first diaphragm 14 can be secured within the diaphragm receiving portion 13 by gluing or a friction fit as long as the center body portion of the diaphragm is free to move to produce sound waves. The diaphragm 14 can be made of plastic approximately 0.03 inches in thickness or any other sound-transmitting material.

A lightweight material which can be in the form of a strip 15 is secured to the body of the first diaphragm 14. The material can be any type which is magnetizable. A second diaphragm 16 is axially spaced from the second diaphragm and is held against the peripheral rim 17 of the housing 11 by a threaded retaining ring 18 which is threadedly secured to the peripheral rim 17 of the housing 11. The second diaphragm 16 can be made of the same material as the first diaphragm 14; however, it is preferably slightly more rigid.

A magnetic member 19 which is lightweight and can be circular or any desired configuration is secured to the body of the second diaphragm 16. Thus, when the first diaphragm 14 touches the intumescence of a patient, the first diaphragm is moved by the transmitted beat and the magnetic field and sound wave move the second diaphragm 16 which amplifies the sound. Thus, the second diaphragm is moved by a pressure wave and a magnetic interconnection which serves to intensify the sound wave. The diaphragms are axially spaced approximately 0.18 to 0.25 inches depending upon the strength of the magnetic field so that the magnetizable element on the second diaphragm is within the magnetic field of the magnet on the first diaphragm.

The sound trunk comprises a hollow member having a tubular shaft 20 thereon. The sound trunk functions as a conduit to transmit sound waves into the tubing 34 of the stethoscope.

A cap 21 has internal threads enabling it to be secured to the threaded neck portion 12 of the housing. The tubular shaft 20 passes through an opening 22 in the cap in which the opening is slightly larger than the outside diameter of the shaft 20. The sound trunk can have a flange or grommet 23 thereon enabling it to be held within the cap 21.

A Y-fitting 24 is a sound chamber in which the sound waves are send through tubing 34 which can be rubber, neoprene, or any other known sound-transmitting material to the ear tubes 25 and 26 having ear engaging members 27 and 28 thereon. The Y-fitting comprises a hollow chamber 29 which can be plastic or metal in which the interior surface, including the arms, 31, 32, 33 is coated with a layer of carbon 30 which precludes the sound waves from reverberating and causing interference. A spring-metal separator 35 maintains the ear tubes 25 and 26 in spaced relationship.

It should be noted that while the embodiment of this invention was described so as to be applicable in the medical arts, the stethoscope also has adaptability to other arts. For example, it could be used as a diagnostic tool for electrical and combustion engines to ascertain where a malfunction exists. Thus it is apparent that while the embodiment of the invention herein disclosed is well calculated to fulfill the objects of the invention, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope of fair meaning of claims included hereafter.

What is claimed is:

1. In a stethoscope comprising,
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3. a housing containing at least two diaphragms therein in which each diaphragm is axially spaced from the other,
b. means for retaining said diaphragms within said housing to enable axial movement of said diaphragms for producing sound waves, and
c. earpiece means for transmitting the sound waves to a listener, and
d. magnetic means on said diaphragms in which the magnetic means comprises a magnetized material secured to one diaphragm and a magnetically responsive material on the other diaphragm whereby one diaphragm is magnetically responsive to the movement of the other.

4. In a stethoscope as defined in claim 1 further comprising a sound chamber connected to said housing and said earpiece means having an interior surface which is coated with a carbonaceous material.

3. In a stethoscope as defined in claim 1 in which one of said diaphragms is made of a stiffer material than the other diaphragm.

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