

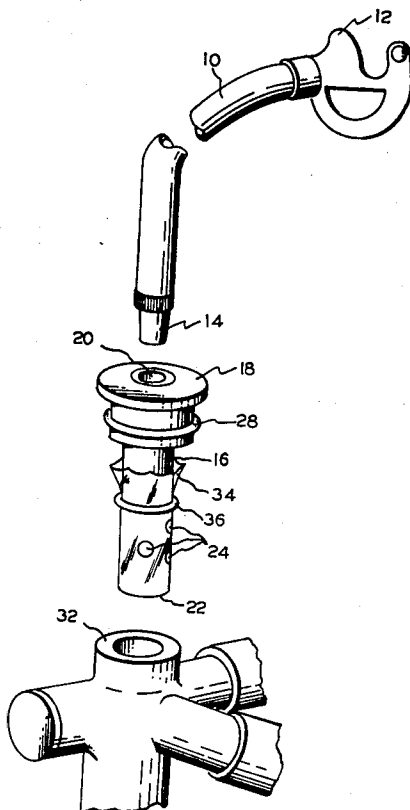
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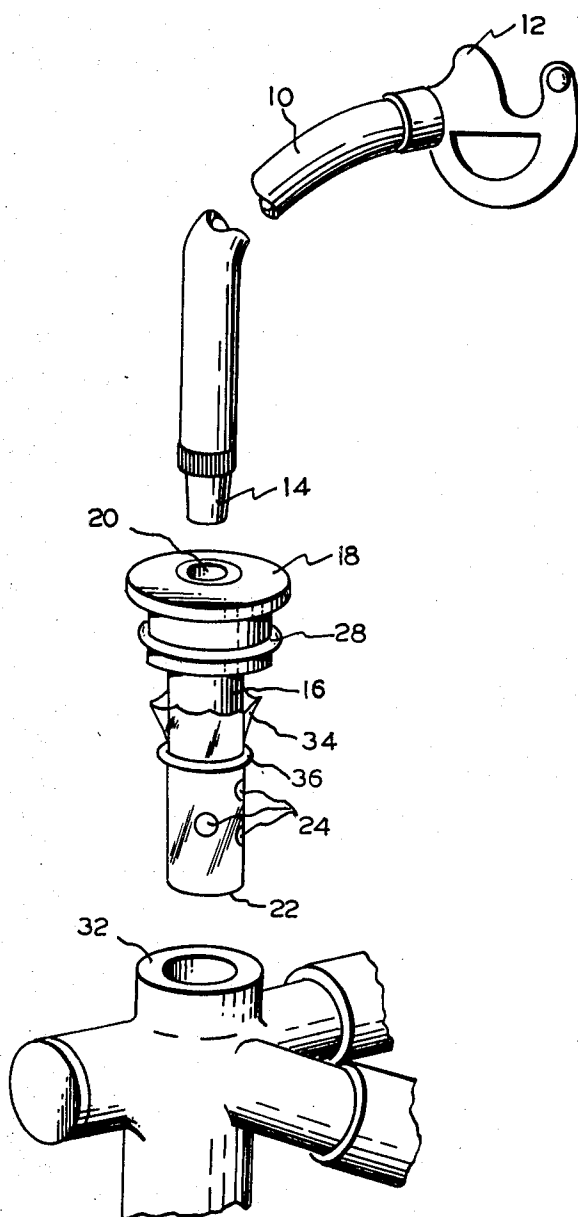
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ABSTRACT: A listening device including a diaphragm to determine whether a respiratory obstruction exists in breathing passages of a patient including a fitting having an opening and a passage extending through the length thereof, a plastic membrane closing off one end of the passage of the fitting, a flexible tube having one end connected to the passage of the fitting, and an ear piece secured to the other end of the flexible tube.



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APPARATUS FOR LISTENING TO BREATHING SOUNDS DURING ANESTHESIA

This is a continuation of application Ser. No. 302,253, filed Aug. 15, 1963, now abandoned.

The present invention relates to a device for listening to the breathing sounds while a patient is subject or being subjected to anesthesia, and more particularly relates to a new and improved medical device in the nature of a stethoscope for providing listening capabilities to the breathing sounds of a patient during and after the administration of anesthetic to such patient. One of the objects of the present invention provides means for listening to the breathing of a patient during anesthesia to enable the determination of whether or not there is adequate respiratory exchange of the patient during anesthesia.

Another feature and object of the present invention is to provide listening apparatus including a diaphragm to enable the determination of whether or not respiratory obstruction exists in the breathing passages while a patient is subject to anesthesia without consequent loss of the anesthetic.

A further object of the invention is to provide listening apparatus to determine whether or not there are changes in the depth of breathing during anesthesia as compared with normal breathing depth without loss of the gas mixture.

A complete understanding of the invention may be had from the following description of a particular embodiment of the invention. In the description reference is made to the accompanying drawing of which:

The figure is an exploded view of the apparatus of the present invention, partially in side elevation and partially in perspective, showing the preferred arrangement of the present invention.

Referring now more particularly to the drawing and to the reference characters marked on the drawing, there is shown a flexible plastic tube 10 having at one end thereof a conventional attachment earplug 12. The flexible tube 10 and the plastic earpiece 12 contain a continuous conduit for the passage of air or sound along the tube to the earpiece so that one having the earpiece applied to his ear may hear sounds that are transmitted and conveyed therealong.

The other end of the flexible tube 10 connects to an adapter 14 having a tapered end disposed for being received snugly within an opening.

A flanged coupling or fitting 16 has a flanged portion 18 through the center of which is an opening 20 which extends along the length of the fitting 16 to the distal end 22. Additional openings 24 are provided in the distal portion of the fitting 16 to provide additional channels for the opening 20. An O-ring 28 is provided about the neck of the flanged fitting for providing a sealing effect or sealing means if the fitting 16 is inserted in another member. An exemplary embodiment of such other member is a Y-channel 32 of a face mask, similar to those that are available commercially. The fitting 16 is shown to couple within an opening of the Y-channel 32, and the O-ring 28 seals the opening from loss of gas mixture used for anesthetizing a patient, as it passes along the passage into the face mask.

The fitting 16 may be coupled or connected to a conduit for passing anesthetic along the length of such conduit from a source of supply to a face mask. After the face mask is applied to a patient and during the passage of gas along the conduit to the face mask and subsequent absorption thereof by the patient, certain sounds occurring during anesthetization of the

patient are transmitted along the gas flow in the reverse direction, are conveyed from the patient to the face mask and subsequently along the conduit. By the use of the fitting inserted into the conduit, such fitting having the plastic membrane secured thereto, the sounds are conveyed through the plastic membrane into the medium within the fitting and thus along the flexible tube 10 to the earpiece 12. Thus it is possible within the scope of the present invention to provide novel and useful means for listening to the breathing sounds occurring during anesthetization of a patient. While one is listening to the breathing sounds in accordance with the device of the present invention, there is no loss or escapement of the anesthetic or other gas which may pass along the conduit or which may be present in the face mask.

The plastic membrane 34 is securely held onto the fitting 16 by an O-ring 36. The plastic membrane 34 extends to cover all of the openings 24 that are along that end of the fitting 16 which is inserted into the face mask or conduit respectively.

The fitting of the invention may be conveniently machined from metal stock or otherwise constructed of such material that it has enduring qualities and does not affect or otherwise react with the gas or other media which may pass along the conduit.

The adapter 14 is appropriately tapered as is shown in the drawing for fitting within the exterior end of the fitting 16 to provide an airtight coupling thereto.

The O-rings may be constructed of rubber or any elastomeric material for the purposes of providing resilient cooperation between the respective parts, such parts being those to which the O-rings may be a mechanical engagement.

It should be understood that the specific apparatus herein illustrated and described is intended to be representative only of the concept of the invention, as there are many changes that may be made therein without departing from the clear teachings of the invention. Accordingly, reference should be made to the following claims in determining the full scope of the invention.

I claim:

1. A device for listening to breathing sounds during anesthetization of a patient comprising:
 - a flanged fitting 16 received within an opening of a conduit 32 passing anesthetic or other gas, said fitting having a passage 20 throughout its length;
 - a plastic membrane 34 closing off one end of the passage 20 from escapement of the anesthetic or other gas from said conduit;
 - an elastomeric O-ring 36 securing the plastic membrane 34 onto said fitting;
 - a flexible tube 10 having one end received into the other end of the passage of the fitting;
 - an earpiece 12 secured to the other end of the flexible tube, said breathing sounds of said patient being heard while anesthetic is applied; and
 - an adapter 14 securely engaging the flexible tube 10 to the fitting 16 so that sounds are coupled from the plastic membrane 34 through the flexible tube to the earpiece 12.
2. The invention according to claim 1 wherein said conduit 32 is a Y-coupling for a face mask.
3. The invention according to claim 2 wherein an O-ring 28 is inserted on the flanged fitting 16 positioned between the flanged portion 18 and the conduit 32 to seal off escapement of anesthetic or other gas from the conduit of the face mask.