

June 19, 1956

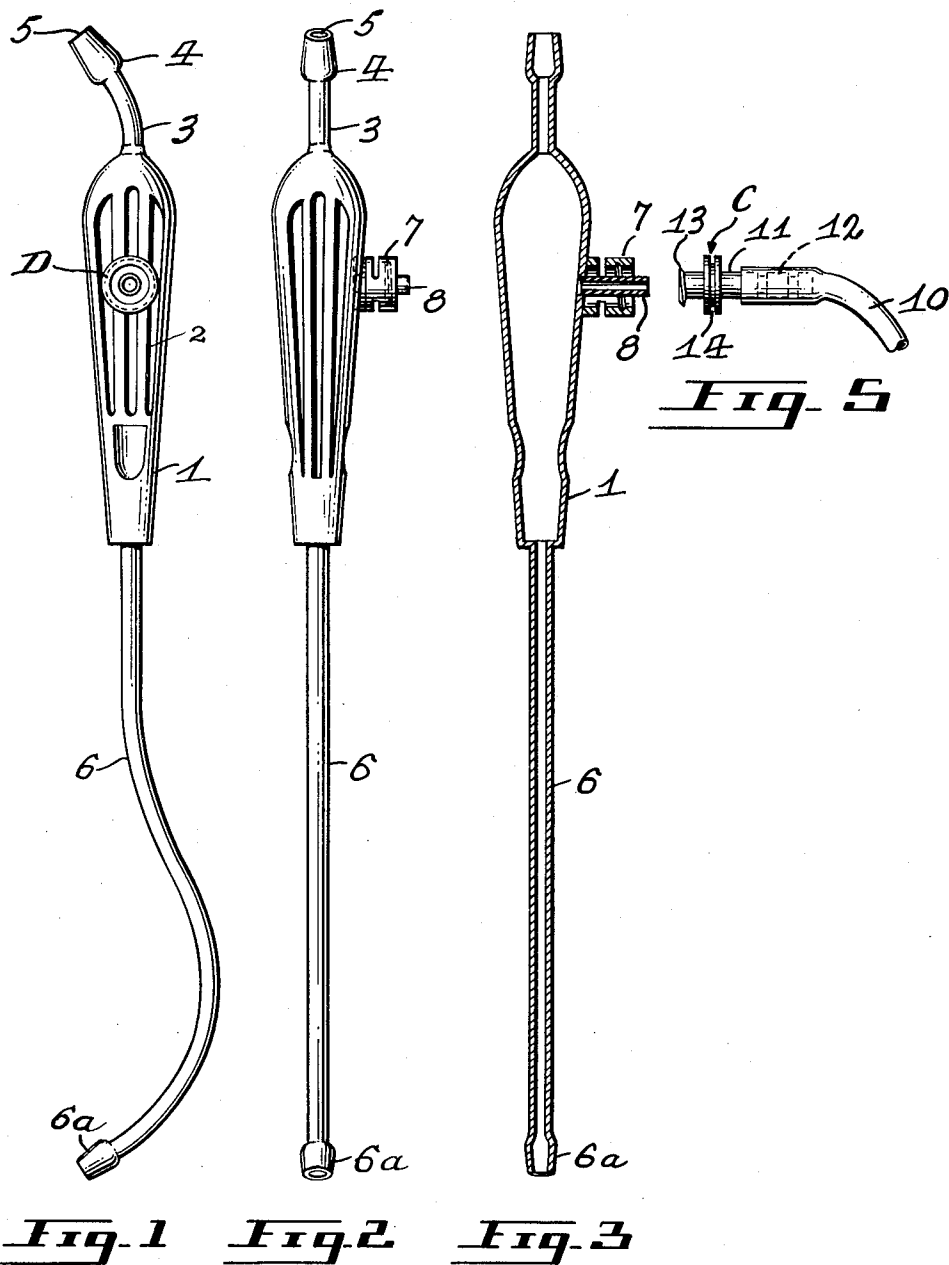
E. R. BIER

2,750,938

OROPHARYNGEAL AIRWAY AND SUCTION TUBE

Filed Jan. 24, 1955

2 Sheets-Sheet 1



Inventor
E. Roy Bier

By *Stevens, Davis, Miller & Hughes*
his Attorneys

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E. R. BIER

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2 Sheets-Sheet 2

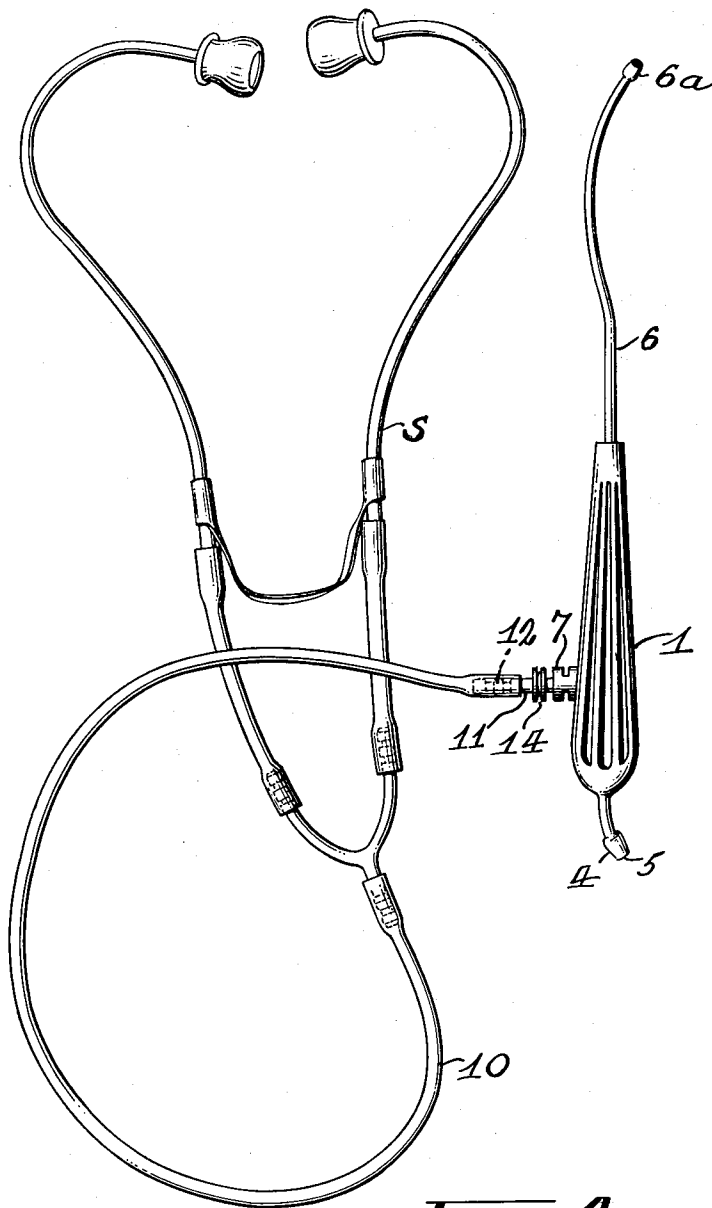


Fig. 4

Inventor
E. Roy Bier

By Stevens, Davis, Miller & Mosher
his Attorneys

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2,750,938

OROPHARYNGEAL AIRWAY AND SUCTION TUBE

Emanuel Roy Bier, Winnipeg, Manitoba, Canada

Application January 24, 1955, Serial No. 483,734

7 Claims. (Cl. 128—2)

This invention relates to an oropharyngeal airway with respiratory sound amplifying device for insertion in the throat and attachment to a listening means, such as a stethoscope.

At the present time there is no safe and efficient means of quickly determining the respiratory condition of a patient under anesthesia during the course of a surgical operation. This is a very important consideration in the field of surgery.

The fact is that a great percentage of deaths occurring in patients under anesthesia can be attributed to the inability of the anesthetist to detect promptly the existence of respiratory difficulties in the patient, and it can also be said that a high percentage of patients suffering from drug depression, diabetic coma, alcoholic stupor and head injuries die, not directly from the drug, injury or disease, but indirectly from asphyxia associated with an obstructed air passage.

The need for a safe, simple and efficiently functioning airway with means of quickly determining respiratory difficulties or respiratory embarrassment in a patient is therefore apparent.

It is the main object of the present invention to fill this need.

According to the present invention an oropharyngeal airway with respiratory sound amplifying device for insertion in the throat and attachment to a listening means comprises an elongated tube for insertion in the throat, a hollow sound amplifying chamber connected to an end of said tube and of substantially greater cross-sectional area than said tube, a first aperture in the wall of said chamber remote from said tube, and a second aperture in the wall of said chamber adapted for connection to a listening means.

One convenient embodiment of the invention will now be described by way of example with respect to the accompanying drawings in which:

Fig. 1 is a side view of an oropharyngeal airway with respiratory sound amplifying device.

Fig. 2 is another side view of the device taken from the left of Fig. 1.

Fig. 3 is a longitudinal cross-section of Fig. 2.

Fig. 4 shows a stethoscope connected to the device shown in Figs. 1, 2 and 3, and

Fig. 5 shows an enlarged view of the stethoscope and attachment member shown in Fig. 4 for effecting connection with the sound amplifying device.

In the drawings a hollow elongated chamber 1 has surface corrugations 2 so as to form a suitable grip for the hands. Extending from the top of said chamber 1 is a neck projecting member 3 which has a passage extending axially therethrough, and a bulbous portion 4 which terminates in a tip 5. An extended rigid tube 6 projects from the other end of said chamber 1 and is so shaped that the portion adjacent said chamber is substantially straight and the portion thereof remote from said chamber diverges away from and converges towards the longitudinal axis of said straight portion. The tube 6 terminates in a thickened end portion 6a.

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A connecting device D comprises an internally threaded annular female connecting member 7 and, centrally located within the said female member 7, is a tubular duct 8 which extends both into said chamber 1 through the wall thereof and, in the other direction, beyond the outer edge of said female member 7.

Figure 4 shows a stethoscope S connected to the device shown in Figs. 1, 2 and 3. The stethoscope S is in normal form except that the diaphragm which is usually connected to the end of the extension tube (indicated as 10) is replaced by a connecting member C as shown in detail in Fig. 5. In the interest of greater clarity a portion of the stethoscope extension tube 10 has also been shown in Fig. 5. The connecting member C comprises a hollow cylindrical portion 11 having annular anchoring projections 12 at one end to grip the internal periphery of the tube 10 which is fitted over this end of the portion 11. The other end of the portion 11 is provided with a rim 13. The portion 11 is also provided with an annular flange 14 having a knurled periphery to facilitate gripping between the fingers. The dimensions of the tubular duct 8 are such that it will extend into said male connecting member C within the rim 13, and the rim 13, is capable of co-operating with the screw thread of the female member 8. In order to facilitate speedy connections, the female member 8 is provided with only one turn of threading.

The connecting device D is preferably located in the centre of the chamber 1, so that the air passage communicating between the chamber 1 and the stethoscope will be located at an enlarged portion of said chamber 1.

The tubular member 6, in combination with the hollowed chamber 1 and the neck projecting member 3, ensures a continuous passage of air from the end portion 6a to the tip 5. This continuous passage is best illustrated by Fig. 3 showing a cross-section of the instrument.

The manner in which the sound amplifying device combines with the stethoscope S so as to form respiratory listening means is clearly shown in the general view of the instrument on Fig. 4.

In the operation of the device, as soon as the patient has been anesthetized and before commencement of surgery, the tube 6 is placed down the throat to the required depth and into the oropharynx. This ensures that the patient's throat does not close and that an open air passage is maintained. If the patient's tongue has slipped into the throat prior to the insertion of the tubular member 6 said member can be used to retract or pull the tongue forward to its normal position. The instrument remains in the patient's throat during the course of the operation and allows an air passage through which the patient can breathe. The female member 7 is adapted for connection to the stethoscope connected to anesthetist's ears during the course of surgery. The chamber 1 serves to amplify sound. As the patient's breath passes through the chamber 1 the sound thereof is amplified and by attaching listening means to the connecting device "D" the anesthesiologist is able to determine immediately and simply the respiratory condition of the patient.

An important feature of this invention resides in the speedy interchangeability of the connecting member C with the cardiac diaphragm used for checking the heart sounds, and the connecting means D mounted on the chamber 1. When speaking of a cardiac diaphragm in this specification it is intended to refer to a cardiac diaphragm as a separate element and detached from the ear engaging and extension tube members of a stethoscope with which it is usually associated. The actual ear engaging and tube extension members of the stethoscope, are in operation attached to the anesthesiologist's person in the conventional manner.

At certain crucial stages during the course of surgical operations speed and efficiency are of the essence and the importance of the speedy interchangeability from the cardiac diaphragm to the connecting means D will therefore be apparent.

Therefore, before the commencement of a surgical operation the anesthesiologist can fasten the cardiac diaphragm used with a stethoscope to the chest wall or other suitable location and in that way he can listen to the heart sounds of the patient. This fastening could be effected very conveniently with the use of adhesive tape or other similar material.

After examination of the heart and the administering of the anesthetic, the cardiac diaphragm is left taped to the anesthetized patient's person. It is then a simple procedure for the anesthesiologist to switch his stethoscope from the cardiac diaphragm to the connecting means D on the chamber 1. When the anesthesiologist wishes to become informed as to whether any cardiac decompensation exists in the patient he merely switches the connecting member C from the connecting means D and attaches it to the cardiac diaphragm. This change takes only 2 or 3 seconds to complete. If it is discovered that respiratory deterioration or cardiac decompensation does exist in the patient, suitable steps can then be taken immediately to remedy either condition by possibly administering a larger percentage of oxygen or artificial respiration or else giving such cardiac or respiratory stimulants as the particular emergency calls for.

It can therefore be clearly seen that the advantage of being able to detect such failings in a patient's condition in a matter of seconds by means of this interchangeability enables more immediate action to be taken to remedy such failings.

Suction is an effective, simple and important aid in establishing and maintaining an airway and the construction of the present instrument is such that it can also be used separately as a ready and dependable suction tube at any desired time throughout a surgical operation.

To use the instrument in such a manner a rubber hose and suitable suction apparatus should be fitted over the neck projecting member 3 so that, in operation, mucus and other fluids can be drawn from the throat and mouth regions through the tip 6a passing through the chamber 1 and the neck projecting member 3. The advisability of locating the connecting means D centrally on the chamber 1 will now become apparent for as can be seen from Fig. 1 if the locking means D were located low on the chamber 1 and at a narrow portion of said chamber 1 the passage through the tubular duct 8 may be hindered by mucus and other fluids. Using the instrument as a suction device foreign bodies can also be successfully removed from the pharynx, larynx and often from the throat.

The absence of sharp or square edges on the tube 6 guards against injury to the patient's throat during insertion and extraction of said member. The tubular member 6, being properly shaped to fit the throat does not irritate the laryngeal nerves or carotid plexus of nerves and therefore traumatic laryngospasm is minimized.

I claim:

1. An oropharyngeal airway with respiratory sound amplifying device for insertion in the throat and attachment to a listening means comprising an elongated tube for insertion in the throat, a hollow sound amplifying chamber connected to an end of said tube and of substantially greater cross-sectional area than said tube, an unobstructed aperture in the wall of said chamber remote from said tube, and connected to a short neck-projecting member, a short tubular duct provided in the wall of said chamber, and locking means for holding a listening means in connection with said duct.

2. An oropharyngeal airway with respiratory sound amplifying device for insertion in the throat and attachment to a listening means comprising an elongated tube for insertion in the throat, a hollow sound amplifying chamber connected at one end to an end of said tube and of substantially greater cross-sectional area than said tube, an unobstructed aperture in the wall of the opposite end of said chamber and connected to a short neck-projecting member, and a short tubular duct provided in the wall of said chamber at a point intermediate said tube and said aperture and locking means for holding a listening means in connection with said duct.

3. A device as claimed in claim 1 in which said elongated tube is rigid, that portion of the tube adjacent said chamber being substantially straight and that portion of the tube remote from said chamber being curved outwardly and inwardly of the longitudinal axis of the straight portion of said tube.

4. A device as claimed in claim 1 in which said elongated tube is of substantially uniform bore.

5. A device as claimed in claim 1 in which the walls of said chamber are of rigid material.

6. An oropharyngeal airway with respiratory sound amplifying device for insertion in the throat and attachment to a listening means comprising a rigid elongated tube of substantially uniform bore for insertion in a human throat, a hollow sound amplifying chamber having walls of rigid material and connected at one end to an end of said tube and being of substantially greater cross-sectional area than said tube, that portion of said tube adjacent said chamber being substantially straight and that portion of the tube remote from said chamber being curved outwardly and inwardly of the longitudinal axis of the straight portion of said tube, an unobstructed aperture in the wall of said chamber remote from said tube, a short neck-projecting member connected to said unobstructed aperture, a short tubular duct provided in the wall of said chamber located at a point intermediate said elongated tube and said unobstructed aperture, and locking means for holding listening means in connection with said duct.

7. An apparatus as in claim 6 in which said listening means is a stethoscope.

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