Dec. 8, 1931. G. W. BURCHETT 1,835,757

CONNECTING DEVICE

Filed Oct. 23, 1929

FIG. 1

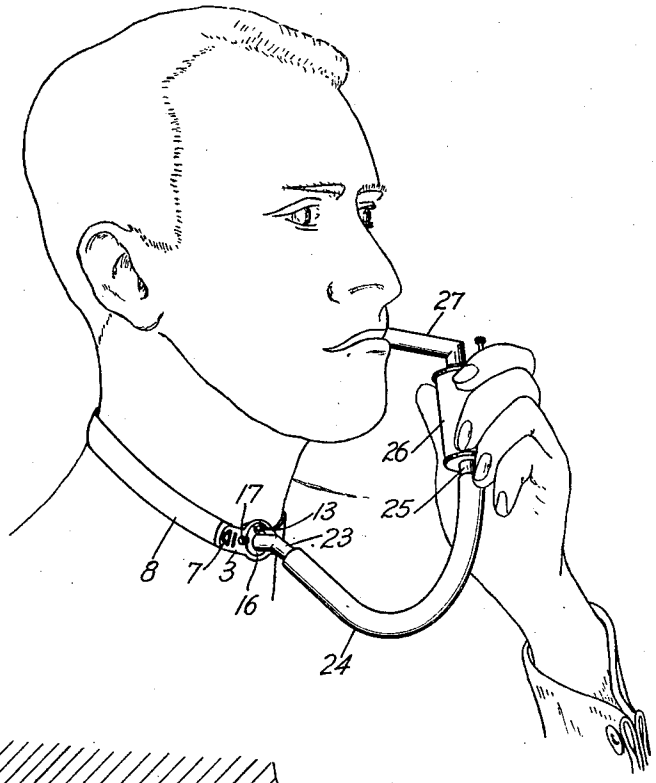


FIG. 2.

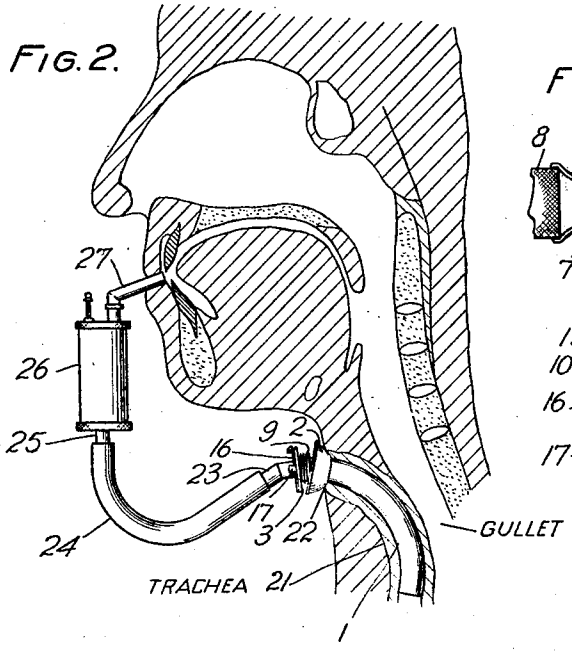
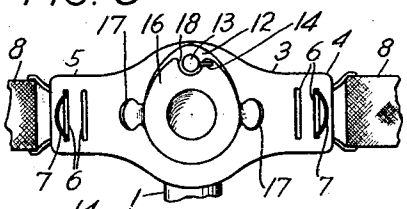


FIG. 3



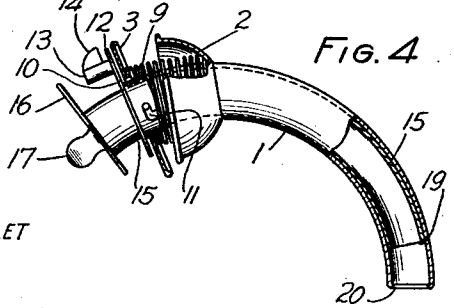


FIG. 4

INVENTOR
G. W. BURCHETT
BY
ATTORNEY

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UNITED STATES PATENT OFFICE

GEORGE W. BURCHETT, OF PEEKSKILL, NEW YORK, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

CONNECTING DEVICE

Application filed October 23, 1929. Serial No. 401,697.

This invention relates to connecting devices and more particularly to connecting devices adaptable for use in connection with artificial larynges.

It is an object of this invention to prevent accidental dislodgment from the outlet of the trachea of the connecting means, which connects the trachea to an inlet to an artificial larynx.

Features of this invention reside in a spring pressed tube which engages the trachea opening and is maintained pressed thereto, and in a hemispherical collar, which encircles the tube and is pressed against the neck so that air leakage between the tube and the trachea opening is prevented.

Other features, including a tube inserted in the spring pressed tube, above mentioned, and which may be removed from the spring pressed tube and washed and sterilized, and a neck band attachment by which the connecting device is supported, in position, are shown in the drawings in which Fig. 1 is a pictorial view showing the application of the improved connecting device to a person using an artificial larynx; Fig. 2 is a view of a person using an artificial larynx with the new trachea connection inserted in the trachea or wind pipe; Fig. 3 is a front elevational view of the trachea connection with the ends of a neck band attached thereto; Fig. 4 is a side elevational view of the trachea connection with certain portions broken away to disclose the spring mechanism and the inner tube member.

In a good many instances where persons have been afflicted with some malignant disease of the throat or larynx, a surgical operation has been performed and the larynx removed. In such cases the wind pipe or trachea is terminated in an opening made in the base of the neck.

Removal of the larynx deprives the person of the power of speech and to overcome this handicap an artificial voice instrument commonly known as an artificial larynx has been provided. This artificial larynx is usually an instrument having an inlet connection for air, a vibratory element, by which a tone is produced and an outlet tube which may be inserted in the mouth of the user so that the tone may be modulated and formed into words.

To supply air to the artificial larynx a tube is attached to the inlet connection and to either an apertured plate held over the trachea opening or a tube inserted therein. This apertured plate or inserted tube is known as a trachea connection.

The apertured plate type of connection having no direct connection with the trachea opening but depending entirely for support upon a harness strapped about the neck and shoulders of the user, frequently becomes moved out of line of the trachea opening or will not follow the natural movements of the neck of the user.

When a tube has been used as a trachea connection it has been found that the tube will often become accidentally dislodged from the trachea opening or will be expelled therefrom by natural movements of the neck muscles.

The connection device of this invention is adapted for use as a trachea connection and when so used and supported in the manner hereinafter described will not become accidentally dislodged from the trachea opening nor will it be expelled therefrom by the movements of the muscles of the neck.

In some instances a comparatively short tubular trachea connection is desired, in other instances a comparatively long one which will reach far down into the trachea. Some persons want a single tube trachea connection and others want an outer tube to remain in the trachea and an inner tube which may be inserted in and withdrawn from the outer tube so that the inner tube may be washed or sterilized and the bore of the tube cleared of such secretions as may from time to time collect therein.

The connecting device described herein is adaptable to all of the requirements above mentioned; both inner and outer tubes may be used if desired or if only one tube is required the inner tube may be removed and the outer tube suitably connected to an artificial larynx. The tube or tubes may be cut off at any point

along the unbroken portion if shortening of the tube is desired.

In the drawings in which like numerals represent like parts, 1 is a tapered tube preferably having a curvature as shown to correspond with the curvature of the outlet end of a trachea; 2 is a hemispherical bell-like member attached to the tube 1 near its larger end; 3 is a flange member loosely supported on the larger end of the tapered tube 1 and having wing portions 4 and 5 in each of which are provided paired slots 6 to receive attachment means 7 on the ends of band 8 which encircles the neck of the user.

On the tapered tube 1 and between the bell-like member 2 and the loose flange 3 is a spring 9 which constantly urges the loose flange 3 toward the larger end of the tapered tube 1 and presses the bell-like member 2 against the neck of a user. To prevent the spring 9 from pushing the loose flange 3 off the end of the tapered tube 1 there is provided a flange 10 which by suitable means, such for instance, as a bayonet connection 11, is secured to the larger end of the tapered tube 1. On an extended portion 12 of the flange 10 is rotatively secured a latch or turn button 13 having a fin 14 to prevent removal of an inner tube from the tapered tube 1 as will be explained.

Sliding within the tapered tube 1, is an inner tube 15 of slightly smaller diameter than the tube 1 and having a taper and curvature corresponding substantially with the taper and curvature of the tube 1 and having at its larger end a flange 16 provided with means 17 by which it may be grasped and withdrawn from the tapered tube 1. The flange 16 has a cut out portion 18 for accommodation of the latch or turn button 13.

The inner tube 15 in Fig. 4 is shown partially withdrawn from the tapered tube 1 but when inserted therein to full traverse, the smaller end 19 extends down to and makes light contact with the smaller end 20 of the tube 1. The flange 16 on the larger end of the inner tube 15 also engages the flange 10. By rotating the latch or turn button 13 so that a fin 14 is moved over the flange 16 as shown in Fig. 3, the inner tube 15 is held against dislodgment from the tube 1.

To use this connecting device as a trachea connection, in connection with an artificial larynx, the tube 1 is inserted in the trachea 21 as shown in Fig. 2. The neck band 8 is placed about the neck of the user as shown in Fig. 1 and the ends 7 are secured to the wing portions 4 and 5, respectively, of the flange member 3. The neck band 8 is sufficiently tightened about the neck of the user to move the flange member 3 toward the neck and to cause a slight compression of the spring 9. The spring 9 will continuously urge the bell-like member 2 against the trachea opening as shown at 22 in Fig. 2 and will prevent leakage of air around the tube 1 at this point. The inner tube 15 is then slid down into the tapered tube 1 and the flange 16 brought into contact with the flange 10. The latch or turn button 13 is then rotated so that a fin 14 projects over the flange 16 and the inner tube 15 is held against dislodgment from the tapered tube 1.

The trachea connection now being in place a fitting 23 which may for instance be an elbow as shown in Fig. 2 or a plain piece of tubing and which is connected to a tubing 24 leading from the inlet connection 25 of an artificial larynx 26 is slid into the inner tube 15.

The artificial larynx 26 being connected through the trachea connection above described with the trachea 21 and the outlet 27 of the artificial larynx being held in the mouth of the user as shown in Figs. 1 and 2, when air is expelled from the trachea 21 a tone will be produced by the artificial larynx 26 and this tone proceeding through the outlet 27 into the mouth of the user may be modulated and formed therein into words.

With the flange 3 being loosely supported on the tapered tube 1 and held by the neck band 8, and the spring 9 pressing the bell member 2 against the trachea opening and keeping the tapered tube 1 pressed into the trachea, it will be seen that accidental dislodgment of the trachea connection is prevented, while freedom of movement of the throat and neck muscles is permitted. Also, universal movement of the connection 23 and the attaching means to the artificial larynx is permitted without any disruption of the connection to the trachea.

It will be apparent that various lengths and forms of tubes may be used and other changes made in the structure shown without departing from the spirit and scope of this invention.

What is claimed is:

1. In a trachea connection, a tubular member to be inserted in a trachea, an outlet portion to connect to an artificial voice instrument, means to support the trachea connection on the person of a user, and energy storing means on the outlet portion to prevent accidental dislodgment of the tubular member from the trachea.

2. In a trachea connection, comprising a tubular member for insertion in a trachea, an outlet portion for connection to an artificial larynx and means to support the trachea connection on the person of a user, a flange attached to the tubular member, a flange loosely supported on the tubular member and pressure means between the two flanges to prevent accidental dislodgment of the tubular member from the trachea.

3. In a trachea connection, comprising a tube having an inlet portion to engage an outlet of a trachea, an outlet portion to attach to

an inlet to an artificial voice instrument and means to support the trachea connection on the person of a user, a flange loosely supported on the outlet portion of the tube, a collar encircling the tube and attached thereto, and compression means between the collar and flange.

4. In a trachea connection, comprising a tube having an inlet portion to enter the outlet of a trachea, an outlet portion to attach to an inlet to an artificial larynx and means to support the trachea connection on the person of a user, a flange loosely supported on the outlet portion of the tube, means to prevent removal of the flange from the tube, a hemispherical collar attached to the tube and a spring between the flange and collar.

5. In a trachea connection, an outer tubular member for insertion in a trachea, an inner tube inserted in the outer tubular member for attachment to an artificial larynx, means to support the trachea connection on the person of a user and energy storing means on the outer tubular member to prevent its accidental dislodgment from the trachea.

6. In a trachea connection, a curved and tapered outer tubular member for insertion in a trachea, a curved and tapered inner tube inserted in the outer tubular member for connecting to an artificial larynx means to support the trachea connection on the person of a user, and energy storing means supported on the outer tubular member to prevent dislodgment of the outer tubular member from the trachea.

7. In a treachea connection, outer and inner tubular members for insertion in a trachea and connection to an artificial larynx respectively, a neck band support for the trachea connection, a flange loosely supported on the outer tubular member for attachment to the neck band, a flange attached to the outer tubular member and pressure means between the flanges to prevent dislodgment of the trachea connection from the trachea.

8. In a trachea connection to be supported about the neck of a user of an artificial larynx and comprising outer and inner tubular members for insertion in a trachea and connection to an artificial larynx respectively, a neck band attached to the outer tubular member, pressure means on the outer tubular member cooperating with the neck band to keep the outer tubular member pressed within the trachea and means to lock the inner tube within the outer tube.

9. In a trachea connection to be supported about the neck of a user of an artificial larynx, an outer tube for insertion in a trachea, an inner tube for connection to an artificial larynx, a neck band support for the outer tube, a flange loosely supported on the outer tube and attached to the neck band support, a collar attached to the outer tube, pressure means between the loosely supported flange and collar and means to hold the inner tube in the outer tube.

10. In a trachea connection adapted to be supported about the neck of a user of an artificial larynx, a tube having an inlet portion to enter a trachea opening, an outlet portion to be attached to an inlet to the artificial larynx, a flange loosely supported on the outlet portion of the tube, a neck band attached to said flange, a hemispherical cup member encircling and attached to the tube, and a spring between the flange and cup member to press said cup member against the outer wall portion of an outlet of a trachea.

In witness whereof, I hereunto subscribe my name this 19th day of October, 1929.

GEORGE W. BURCHETT.