

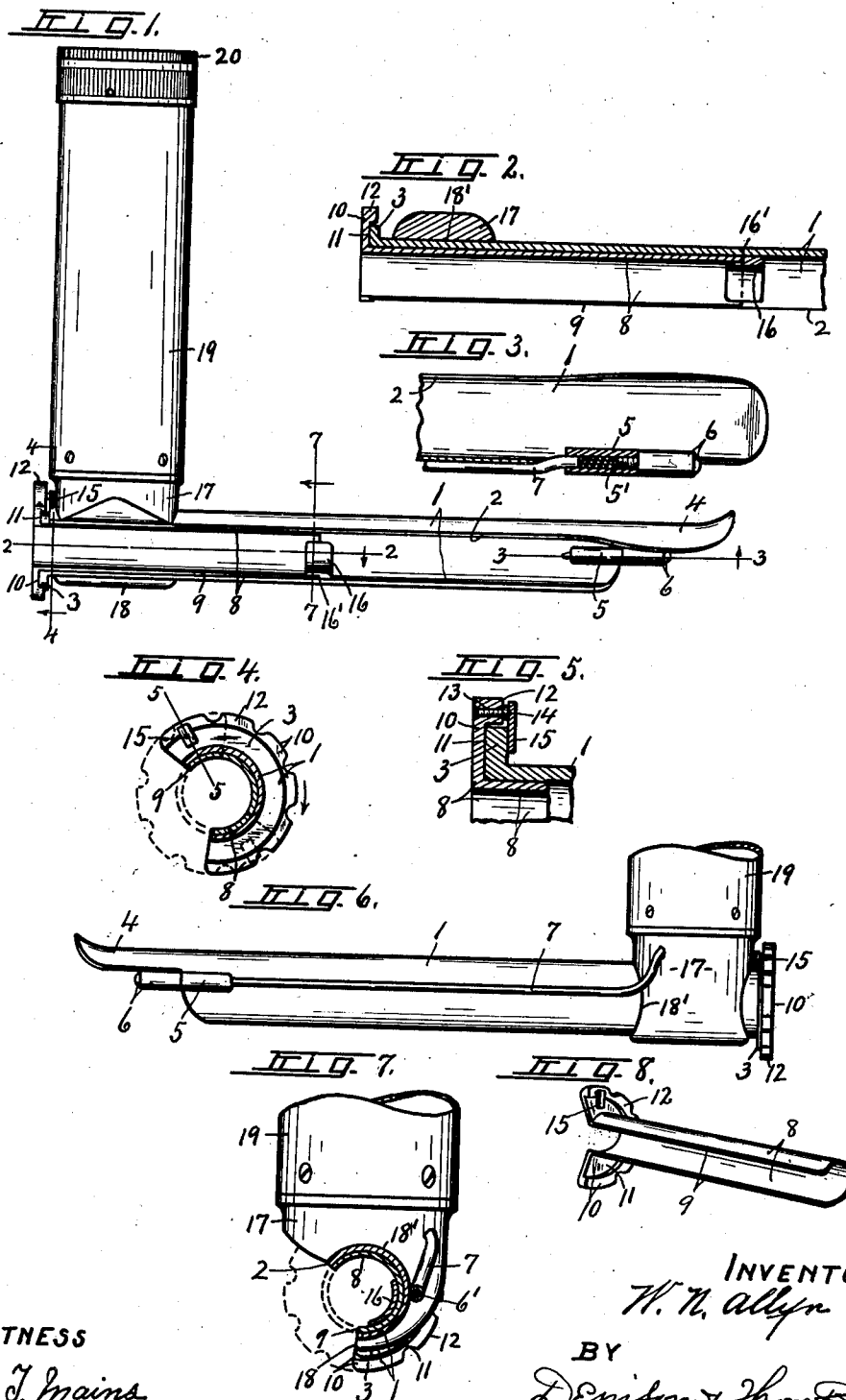
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LARYNGOSCOPE

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LARYNGOSCOPE

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2 Claims. (Cl. 128—11)

This invention relates to a laryngoscope of the tubular spatula type adapted to be inserted into the mouth and throat of a patient to facilitate the examination and treatment of various disorders of the larynx, trachea and other internal organs accessible through the mouth or throat.

In this type of instrument the tubular spatula serves the treble purpose of temporarily displacing the fleshy or cartilagenous parts of the mouth or throat leading to or adjacent the affected part; affording an unobstructed opening therethrough from end to end for optical location and examination of the affected organ or organs; and also for permitting the passage of remedial or surgical appliances therethrough for treating said organ or organs.

One of the objects of the invention is to provide the tubular spatula with a lengthwise slot in one side extending from end to end thereof to allow the laryngoscope to be displaced laterally and withdrawn from the mouth without disturbing the remedial or surgical appliance which may remain in operative position during such treatment.

Another object is to provide the tubular spatula with a tubular closure movable at will to and from a position across said slot so that when placing the instrument in the mouth or throat the slot may be closed to prevent the entrance of portions of the tongue and other organs which otherwise might obstruct the central opening or passage and thus prevent a clear vision of the affected organ or free passage of the remedial and surgical appliance therethrough.

A further object is to provide means brought into action through relative turning movement of the closure and spatula about their common axis for holding those parts against relative axial movement when in one position and for permitting their axial displacement when in another position whereby both parts may be separately sterilized and cleansed.

Other objects and uses will be brought out in the following description.

In the drawing:

Figure 1 is a side elevation of a preferred construction of my improved laryngoscope in which the tubular closure is open.

Figures 2, 3 and 4 are enlarged detail sectional views taken respectively on lines 2—2, 3—3, and 4—4, Figure 1.

Figure 5 is a further enlarged detail sectional view taken on line 5—5, Figure 4, the closure

being shown by dotted lines in its closed position.

Figure 6 is a reverse face view of the device shown in Figure 1 in which the upper portion of the battery handle is broken away.

Figure 7 is an enlarged detail sectional view taken on line 7—7, Figure 1.

Figure 8 is a perspective view of the detached closure shown in Figure 1.

As illustrated, this laryngoscope comprises an axially elongated tubular spatula 1, the cross sectional form of which is generally that of a cylindrical sector slightly greater than a semi-cylinder to form a lengthwise slot 2 in one side extending from end to end thereof for a purpose hereinafter described.

The proximal end of the segmental tube 1 is provided with an outturned flange 3 of about the same circumferential length as the cylindrical portion of said tube, the opposite end of the tube being open and provided with an outwardly curved extension 4 of less circumferential length than the tube and preferably arranged wholly at one side of the axis of the tube to assist in displacing the internal organs of the mouth and throat when the device is in use, the remaining portions of the end edges of the tube being rounded to facilitate its entrance into the larynx and adjacent organs.

This distal end of the tube 1 is provided with an axially extending lamp socket 5 in one side thereof opposite the slot 2 for receiving a small incandescent electric lamp 6 which is screw threaded into the socket 5 and may be removed or replaced at will.

This socket contains the usual yielding electric contact member 5' adapted to be connected to the lamp 6 and to suitable wires 6' which, in turn, are enclosed in a relatively small conduit 7 extending along the outer face of the tube 1 and soldered or otherwise secured thereto, as shown more clearly in Figures 3, 6 and 7.

A cylindrical tubular sector 8 is telescopically inserted into the proximal end of the spatula tube 1 to extend a considerable portion of the length thereof and is adapted to turn therein about the axis of the tube 1 to form a closure movable angularly to and from a position across the slot 2, the exterior diameter of the closure member 8 being approximately equal to the interior diameter of the main tube 1 so as to afford an easy turning and sliding fit therein.

This closure 8 is provided in one side with a lengthwise slot 9 of approximately the same circumferential width as the slot 2 with which it

is adapted to register when the closure 8 is turned about its axis to one position, as shown more clearly in Figures 4 and 7.

The distal end of the tubular closure 8 is open and the opposite end is provided with an out-turned flange 10 of about the same circumferential length as the flange 3 with which it is adapted to engage.

The flange 10 is of greater radial depth than the flange 3 and is provided with an arcuate recess 11 concentric with its axis, thus forming an arcuate rib 12 which is also concentric with said axis, the recess 11 serving to receive the flange 3 while the rib 12 is adapted to overlie the periphery of the flange 3, as shown more clearly in Figure 5.

The flange 10 is provided with a threaded socket 13 in which is secured a screw 14 carrying a locking member 15 which is adapted to engage the inner face of the flange 3 when the closure 8 is turned to one position, as shown in Figures 4 and 5, thereby locking the tubular members 1 and 8 against relative axial movement, it being understood that the locking member 15 is rigidly secured to the flange 10 to hold it against relative turning movement thereon.

This locking member 15 is relatively narrow circumferentially as compared with the circumferential length of the flanges 3 and 10 and is also located near one end of the flange as shown in Figures 4 and 8, so that when the closure 8 is turned about its axis to bring the locking member 15 into registration with any part of the adjacent end of the slot 2, the tubular closure 8 may be withdrawn endwise from the proximal end of the tubular spatula 1, thus permitting both tubes to be conveniently and thoroughly sterilized and cleansed internally and externally from end to end.

When the tubular closure 8 is inserted into the proximal end of the spatula tube 1, as shown more clearly in Figures 1 and 2, the inner end thereof which is slightly beveled is adapted to interlock with the front end of a relatively thin segmental ring 16 which is brazed or otherwise secured to the inner peripheral walls of the central opening of the tube 1, as shown more clearly in Figures 1 and 2, said segmental ring having its front edge provided with a slot 16' for receiving the adjacent end of the closure 8, to hold the latter against radial movement.

The proximal end of the spatula 1 is rigidly and permanently secured by brazing or otherwise to a supporting head or bracket 17 having one side formed with a lengthwise slot 18 of approximately the same circumferential length as and registering with the slot 2 in the tubular member 1 so that the slot 18 may extend entirely across the adjacent end of the head 17 to form a continuation of the slot 2, as shown more clearly in Figures 1 and 7.

That is, the head 17 is provided with a cylindrical arcuate recess 18' of about the same radius as the outer periphery of the adjacent end of the tubular member 1 and in which the latter is seated and permanently secured.

This supporting head 17 serves to receive and support a battery handle 19 which, together with the head 17, extend outwardly from the tubular member 1 at right angles thereto, as shown more clearly in Figures 1, 6 and 7.

This battery handle is adapted to receive one or more dry batteries which, in turn, are electrically connected to each other and to the adjacent ends of the wires 6' and to a suitable

switch, not shown, but which is preferably located in the outer ends of the handle 19, the connection between the battery and switch and also between the battery and wires 6' being substantially the same as that employed in the battery handles for flash lights and similar elements.

An angularly movable switch-operating member 20 is suitably mounted upon the outer end of the battery handle 19 for opening and closing the lamp circuit, this construction being also common in battery handles of this type and is somewhat similar to that shown in my Patent No. 1,516,133, November 18th, 1924.

Referring again to the tubular closure 8, it will be noted that the flange 10 constitutes a handle by means of which the closure may be turned about its axis and inserted or withdrawn axially into and out of the proximal end of the tubular spatula 1, said flange having its periphery serrated, as shown in Figures 4 and 8, to facilitate manipulation of the closure.

It is now clear that when the various parts of this device are assembled in the manner described, the central openings in the tubular members 1 and 8 will be co-axial and will form a continuous central opening therethrough from end to end for the reception of remedial or surgical appliances which may be directed therethrough to the particular organ or organs under examination.

Operation

When it is desired to examine the larynx, epiglottis, esophagus, trachea, pharynx or other organs accessible through the mouth of the patient, the closure 8 may first be turned to its closed position across the slot 2 after which the handle 19 may be firmly grasped in the hand of the operator, thus permitting the tubular spatula 1 to be inserted through the mouth and directed by proper manipulation to the particular internal organ or organs under examination, at which time the switch member 20 may be operated to energize the lamp 6, thereby illuminating the internal organs which are then readily visible by the application of the eye to the proximal end of the tube 1.

The closing of the closure 8 serves to prevent the entrance of portions of the tongue and other fleshy internal parts of the mouth or throat into the central opening through the tube 1 so that when the latter is directed to the particular organ or organs under examination there will be a clear sight opening from the proximal to the distal end of said tube for examination of the illuminated organs whereby the surgeon or other operator may readily determine what remedial or surgical appliances may be necessary to correct the affected part or parts of the patient.

These appliances may then be inserted through the central openings of the tubular members 1 and 2 for treatment of the affected part and if it should be necessary to retain any one of these appliances in operative position after the examination and diagnosis is completed, the closure 8 may be turned to its open position, thus permitting the laryngoscope to be displaced laterally from the retained appliance which is then free to pass through the slots 2 and 9 after which the entire device may be withdrawn from the mouth ready for reuse when desired.

It is, of course, obvious that the remedial or surgical appliances to be used may be placed in operative position within the tubular members

1 and 2 either by inserting the same endwise into the proximal end thereof when the member 8 is closed or, when the latter is open, said appliances may be inserted laterally into the tubular members 1 and 8 through the slots 2 and 9 whereupon the device with the remedial or surgical appliance therein may be inserted into the mouth and throat for examination and treatment in which case the lamp 6 would be energized to illuminate the internal parts and thus permit the examination and operation to progress with precision as directed optically through the central opening in the tubes 1 and 8.

The apparatus shown and described is particularly useful in the examination of anatomical organs which are accessible through the mouth but obviously the same device may be used as a speculum for the examination and treatment of other internal organs of the body without departing from the spirit of the invention.

What I claim is:

1. In a laryngoscope, co-axial tubular mem-

bers, one within the other, and each provided with a lengthwise opening through one side, said members being relatively adjustable about their axis to open and close said openings, one of said members being displaceable axially from the other member, and means controlled by the relative turning of said members for preventing their axial displacement when in one position and for permitting such axial displacement when in another position.

2. In a laryngoscope of the character described, a tubular spatula-segment, and a tubular closure-segment, said segments being each open at one side and arranged coaxially one within the other and relatively adjustable about their axis for opening and closing the open sides thereof, the proximal ends of said segments being provided with means for holding the segments against axial movement when adjusted rotarily to one position and for permitting their axial movement when adjusted to another position.

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