This invention relates to instruments for examining and operating in the oral cavity, and particularly to trachea laryngoscopes.

One of the objects of the invention is to provide an instrument of this character which may be inserted within the throat and expanded therein, and which is so constructed that a full view of the larynx and windpipe is secured.

A further object is to provide a device of this character in which a handle is provided which is shiftable into either one of two positions, making the device suitable for use either when the patient is lying down or when the patient is sitting up.

A still further object is to provide a device of this character in which the vertebral cushion carried by lateral blades may be shifted backward or forward or held when immobility is necessary.

Another object is to provide a device of this character in which there is a spatula blade and lateral blades on either side of the spatula blade, the distal ends of which are provided with a vertebral cushion, and to provide means whereby the spatula blade and the lateral blades may be adjusted not only longitudinally but into any desired angular relation to each other.

Still another object is to provide a laryngoscope of this character wherein the body of the device is tubular, permitting the physician to look through the body of the device and thus into the oral cavity so as to make a complete examination of the larynx, the windpipe and allied parts.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation partly in section of an instrument constructed in accordance with my invention;

Figure 2 is a top plan view of the structure shown in Figure 1 without the handle;

Figure 3 is an under side plan view of the structure shown in Figure 1 without the handle;

Figure 4 is a rear end elevation of the structure shown in Figure 1;

Figure 5 is an elevation showing the manner in which the instrument may be used where the patient is lying down;

Figure 6 is an elevation showing the manner in which the instrument is used where the patient is sitting up.

Reverting to these drawings, 10 designates the body of the instrument, which is tubular in form for a distance, and extending from this tubular body portion is the spatula 11 which is semi-circular in cross-section and is slightly curved upward to its tip. The body 10 has a downward tubular extension 12 and the rear end of the body is formed with an elliptical sight opening 13. The downwardly projecting portion 12 of the body is closed at its end and provided with an outwardly projecting stud 14, while the top surface of the body is also provided with an upwardly projecting stud 15. A curved handle 16 is formed at one end with a socket 17 adapted to receive either of the studs 14 or 15 and be held thereto by means of a set screw 18. Thus the handle may be disposed either as shown in full lines in Figure 5 or as shown in Figure 6.

Pivotaly mounted upon the side wall of the body 10 and adjacent its forward end are the lateral blades 19. These blades are both alike and each blade consists of a straight shank which is gradually turned downward toward its distal end. The distal ends of these two blades are pivoted to a concave-convex vertebral cushion 20. The opposite ends of these blades 19 are connected by means of a U-shaped yoke 21 and each blade is formed with two longitudinally extending slots 22 and 23. The joint or hinge bolts 24 constituting pivots pass through the slots 22 and connect these lateral blades to the body 10 so that the rear ends of the blades may be raised or lowered as desired.

Mounted upon the rear end of the body 10 is an upwardly extending support 25, and passing upward through guides in this member 25 is the shank 26 of a U-shaped yoke 27 which extends over the upper surface of the body at the rear thereof and engages the outside faces of the shanks of the lateral blades 19 and is held thereto by thumb screws 29. These thumb screws may be turned inward a sufficient degree to lock the blades 19 from any forward and rear motion when immobility is desired. The screw-threaded shank 26 is engaged by a thumb nut 30 which, when screwed down, causes the rear ends of the lateral blades to be raised and the forward end depressed, thus separating or spreading the spatula blade and the lateral blades at their distal ends. Preferably the rear ends of the lateral blades 19 are connected by
means of a U-shaped yoke 21 which is pivoted to these blades and by which downward and forward movement of the lateral blades 19 and of the vertebral cushion 20 is secured. In the use of this device, the patient either lies down and turns the head backward so as to permit the introduction of the instrument into the mouth and throat, or the patient sits and holds the head forward and upward. In the first case, as illustrated in Figure 5, the handle 16 is disposed upon the post 14 and extends downward and toward the table entirely out of the way of the sight opening 13, so that when the instrument is expanded the physician has a full view down the throat and larynx to the windpipe and gullet.

In the other manner of using this device, where the patient sits, the instrument is inserted into the throat, but the spatula blade 11 is disposed downward instead of upward and the handle in this case is then engaged with the post 15 and extended downward beneath the chin of the patient, leaving the opening 13 entirely exposed. With this construction, if the thumb screws 29 be loosened, the blades 19 may be shifted longitudinally by means of the handle 31 or may be held in any adjusted position at any time by means of the thumb screws 29. By turning the nut 30, the blades may be spread apart to any desired extent so as to expand the interior of the larynx, the spatula blade lying against the tongue and the larynx, while the cushion lies against the vertebra in the manner illustrated.

The particular advantages incident to my invention reside in the fact that the blades 19 may be shifted longitudinally with reference to the spatula blade and that the instrument may be readily expanded and at the same time under no circumstances is there any obscuration of the vision through the opening 13. In my device there are no hinges exterior to the mouth, but my device is provided with blades which cross practically within the mouth and which, therefore, permit a full view of the larynx.

The blades 19 are intended to be shifted backward or forward in order to conform to the curves of the vertebra or spinal column, which vertebra are used as a support for the “cushion.” As the instrument is being introduced, the blades 19 are drawn backward or toward the operator. When introduced they are pushed away from the operator until they rest on the spinal column or vertebra and when the blades are in proper position they are held in place by the thumb screws. This instrument is self-retaining, in that it automatically remains in place after the thumb screws are set so that both hands of the operator may be free if this is necessary.

I claim:

1. A trachea-laryngoscope comprising a transversely curved spatula blade, a pair of lateral blades disposed entirely exteriorly to the opposite sides of the spatula blade and pivoted thereto, the lateral blades operating in planes exterior to the side edges of the spatula blade, and means for forcing the distal ends of the blades apart from that of the spatula blade.

2. A trachea-laryngoscope including a spatula blade having an annular rear end, lateral blades disposed entirely exterior to the side edges of the spatula blade for the entire length thereof and pivoted to the sides of the spatula blade for movement in planes entirely exterior to the side edges of the spatula blade, and means disposed adjacent the rear end of the spatula blade and mounted thereon whereby the lateral blades may be shifted to separate the distal ends of the lateral blades from the distal end of the spatula blade.

3. A trachea-laryngoscope including a spatula blade, a lateral blade pivoted to the side of the spatula blade and longitudinally shiftable with relation thereto, and means whereby the lateral blade may be longitudinally shifted in the direction of its length relative to the spatula blade and whereby the distal ends of the blades may be forced apart.

4. A trachea-laryngoscope including a spatula blade having an annular rear portion defining an unobstructed opening from front to rear, the forward portion of the spatula blade being transversely curved, and lateral blades mounted upon the sides of the spatula blade for longitudinal shifting movement in the direction of their length and for pivotal movement toward and from the spatula blade.

5. A trachea-laryngoscope including a spatula blade, a pair of lateral blades pivoted to the sides of the spatula blade means for forcing the distal ends of the lateral blades apart from that of the spatula blade, and a vertical cushion pivotally mounted upon the extremities of the lateral blades.

6. A trachea-laryngoscope including a slightly curved spatula blade, the greater portion of the blade being transversely curved and two lateral blades pivotally mounted upon the spatula blade, the lateral blades being curved away from the spatula blade at their distal ends, means mounted upon the rear end of the spatula blade whereby the lateral blades may be shifted to carry their distal ends toward or from the distal end of the spatula blade, and means whereby the lateral blades may be longitudinally shifted in the direction of their length.

7. A trachea-laryngoscope of the character described comprising a spatula blade having a tubular portion at its rear end defining an unobstructed opening extending
longitudinally through the rear end of the blade, the forward portion of the spatula blade being transversely curved, a pair of lateral blades, each blade being curved away from the spatula blade at its forward end and having the rear portion relatively straight, said lateral blades being pivotally connected to the forward portion of the annular part of the spatula blade and being disposed entirely exteriorly to the side edges of the spatula blade, and means mounted upon the rear end of the spatula blade whereby the lateral blades may be swung upon their pivots to carry the distal ends of the lateral blades toward or from the spatula blade.

8. A trachea-laryngoscope including a body having separable blades, the body having a sight opening disposed for observation on a line between the blades, a handle, and separated means upon the body whereby the handle may be connected at two separate points to the body to thereby permit the handle to be disposed in different positions out of the operator’s way in observing and operating.

9. A trachea-laryngoscope including a spatula blade, a pair of laterally disposed blades pivotally connected to the spatula blade, the spatula blade being formed to provide a longitudinally extending sight passage, a handle, and separated means upon the spatula blade whereby the handle may be connected at two separate points to the spatula blade.

10. A trachea-laryngoscope including a spatula blade having a tubular rear portion extended laterally in one direction and the rear end being formed with a sight opening, lateral blades pivotally connected to the tubular body of the spatula blade, means for shifting the lateral blades to carry their distal ends toward or from the distal end of the spatula blade, a handle, and means disposed upon the top of the spatula blade and upon the extension of the body of the spatula blade whereby the handle may be attached at either place.

11. A trachea-laryngoscope, including a tubular body portion having a longitudinally extending, transversely curved blade, the tubular body portion being open at its rear end to provide a sight opening, laterally disposed blades having each a pair of longitudinally extending slots, pivot members passing through the forward slots of the lateral blades and engaging the forward end of the body portion of the spatula blade whereby the lateral blades may be shifted, and means at the rear ends of the lateral blades whereby the lateral blades may be longitudinally shifted.

12. A trachea-laryngoscope including a tubular body portion having a longitudinally extending, transversely curved blade, the tubular body portion being open at its rear end to provide a sight opening, laterally disposed blades having each a pair of longitudinally extending slots, pivot members passing through the forward slots of the lateral blades and engaging the forward end of the body portion of the spatula blade whereby said blades may be shifted in the direction of their length, means for swinging the lateral blades upon their pivots comprising a member mounted upon the rear end of the spatula blade, a yoke having pivotal clamping engagement with the rearmost slots of the lateral blades and having a screw-threaded shank extending out through said member, and a nut upon said shank whereby the member may be shifted.

13. A trachea-laryngoscope including a spatula blade formed at its rear end to provide a tubular body increasing in diameter toward its rear end, the entire rear end being open to provide a sight opening, laterally disposed blades pivotally mounted upon the tubular body and longitudinally adjustable thereon, means for holding the laterally disposed blades in their adjusted positions, and a curved handle adapted to be engaged with the tubular body of the spatula blade at either one of two separated points.

14. A trachea-laryngoscope comprising a spatula blade formed at its rear end to provide a tubular body, the tubular body being laterally and rearwardly extended adjacent its rear end and there being a sight opening having an area equal to the entire rear end of the body and said extension, lateral blades pivotally mounted upon the tubular body, means mounted upon the tubular body whereby the lateral blades may be adjusted, a stud extending from the tubular body at right angles to the axis thereof, a stud extending from said extension and rearward at an angle to the tubular body, and a handle adapted to be engaged with either of said studs.

15. A trachea-laryngoscope including a tubular body carrying a longitudinally extending spatula blade, the rear end of the body being open to provide a sight opening, lateral blades pivotally mounted at their forward ends upon the tubular body and carrying a vertebral cushion at their distal ends, means for pivotally shifting the lateral blades relative to the spatula blade comprising a standard mounted upon the rear end of the tubular body, a yoke embracing the rear end of the tubular body and the rear end of the lateral blades and pivotally connected thereto, the yoke having a screw-threaded shank passing up through...
said standard, and a nut engaging the screw-threaded shank and the outer face of the standard.

16. A trachea-laryngoscope comprising a transversely curved spatula blade, lateral blades disposed exteriorly to the side edges of the spatula blade and pivoted to the sides of the spatula blade, means for forcing the distal ends of the blades apart, and a vertebral cushion pivotally mounted upon the extremities of the lateral blades.

17. A trachea-laryngoscope comprising a transversely curved spatula blade, a pair of lateral blades disposed exteriorly to the side edges of the spatula blade and pivoted to the spatula blade, said laterally disposed blades extending beyond the spatula blade and being curved away from the spatula blade at their outer ends, means for forcing the distal ends of the lateral blades 20 apart from that of the spatula blade, and a vertebral cushion pivotally mounted upon the extremities of the lateral blades.

In testimony whereof I hereunto affix my signature.

DONALD TAYLOR ATKINSON.