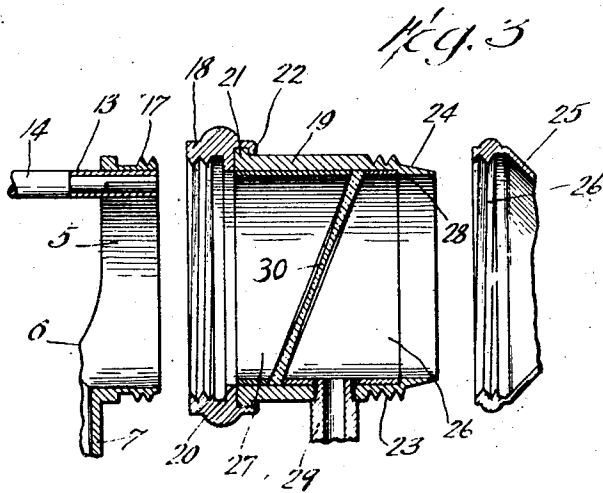
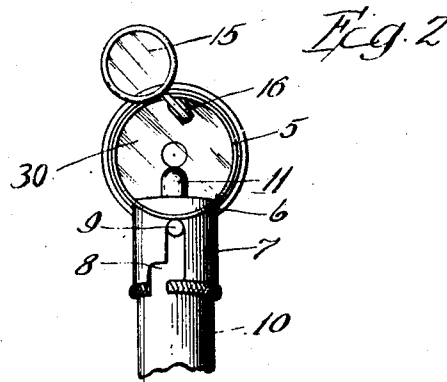
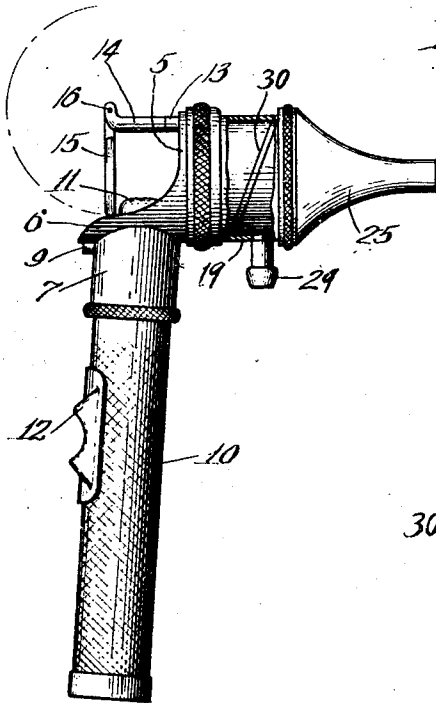


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1,693,021

W. J. CAMERON
DIAGNOSTIC INSTRUMENT
Filed Jan. 12, 1927



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UNITED STATES PATENT OFFICE.

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DIAGNOSTIC INSTRUMENT.

Application filed January 12, 1927. Serial No. 160,636.

My present invention relates to an instrument for use in making examination and diagnosis, and has particular reference to a structure that may be readily inserted into a cavity, such as nasal and oral cavities, where-
 5 by an inspection may be had of the membrane and tissue upon the interior of the cavity.

With the present instrument, the interior of the cavity may be illuminated during exam-
 10 ination or inspection and the parts that are illuminated will be magnified so that a more minute inspection may be had by the physician or surgeon. As it is sometimes desirable to inject air into the cavity I have provided
 15 convenient means for performing this function and at the same time rendering airtight the portion of the instrument not within the cavity to prevent loss of air, lessening of pressure, as well as to avoid blowing of the air
 20 in the reverse direction where it may interfere with the sight of the operator. This arrangement for rendering the instrument air-tight also provides a portion of the means for projecting the light through the instru-
 25 ment and does so without liability of a backward reflection of the light rays into the eyes of the operator, and it also provides a means for correcting the outer or main lens. The conical or tapered portion of the instrument
 30 that is inserted into the cavity and the intermediate portion thereof are swiveled to the head or barrel portion so that the first mentioned parts may be rotated upon their axes for conveniently using the instrument.

One of the objects of the present invention resides in providing a diagnostic instrument that is simple in construction, novel in the arrangement of its parts, effective and depend-
 40 able in performing the functions for which it is designed, and which may be readily taken apart for cleaning or sterilization.

I prefer to carry out my invention and to accomplish the several objects thereof in substantially the manner hereinafter fully described and as more particularly pointed out
 45 in the claims, reference being made to the accompanying drawings that form a part hereof.

In the drawings:

50 Figure 1 is a longitudinal side elevation of my instrument mounted upon a suitable handle.

Figure 2 is a view looking at the left hand end shown in Figure 1.

55 Figure 3 is a vertical axial section of the

instrument, drawn to a larger scale with the ends broken away.

The accompanying drawings are schematic and disclose a typical or preferred embodiment of my invention, and in these drawings
 60 I have employed similar reference characters to designate like parts wherever they appear.

The instrument preferably comprises a barrel portion 5 of which is cylindrical, while the remaining portion 6 is semi-cylindrical
 65 or concavo-convex in section and projects rearwardly from the lower part of the cylindrical portion and is provided with an opening from which a tubular stub 7 projects that is
 70 arranged with its axis at about five degrees (5°) oblique to the vertical for convenience in use. The stub is provided with a bayonet-slot 8 to coact with a pin 9 at the upper end of the
 75 elongated cylindrical handle 10 to affect the coactive relation between these members. The upper end of the handle, which is inserted in the stub 7, carries an angular miniature
 80 lamp or bulb 11, that is adapted to be moved up or down and into or out of alinement with the axis of the barrel by means of the slide element 12 so that the lamp may illuminate
 85 the parts under inspection. In the upper segment of cylindrical portion 5 there is a small socket 13 to receive the shouldered end of a rod 14 while the opposite end of this
 90 rod carries a lens 15 through the medium of the hinge 16, which permits the lens to be positioned in alinement with axis of said barrel, or to be swung to one side, or to be
 95 folded over flat upon the rod, as will be understood.

The outer end of the cylindrical portion 5 of the barrel is provided with external threads 17 to receive the internally threaded
 95 annulus or ring 18 so that the latter may be screwed thereon or the conical-shaped end piece, hereinafter described, may be screwed
 100 on said threads 17, depending upon the service desired. A rotatable sleeve 19 has a swiveled connection at one end with the ring 18, said connection being formed by provid-
 105 ing an external flange or bead 20 upon the adjacent end of the sleeve and the interior of the ring is provided with an annular shoulder 21 against which the end of the sleeve
 110 abuts, and in the assembling of the device, after positioning the parts in the manner just described the edge of the ring is turned inwardly or spun over to provide an inturned flange 22, thus permitting either the ring or

the sleeve extension to be rotated independently of each other. The end portion of the exterior sleeve 19 is provided with external threads 23, and beyond the threads the sleeve is slightly tapered as shown at 24. The conical terminal piece or head 25 above mentioned, having internal threads 26 at its widest end, may be removably screwed upon the threads 23 of the sleeve extension. The arrangement permits the axial alinement of the cylindrical portion of the barrel, the sleeve, and the terminal piece or head so that when the lamp or bulb 11 is elevated to the proper position the light rays therefrom will pass axially through all of these elements and out through the apex of the terminal piece or head and thus illuminate the area of the cavity under examination and treatment. Also when the head is screwed upon the sleeve the tapered portion 24 will be fitted snugly against the tapered inner surface of the head and provide a tight fit or joint. The fact that the three main members of the instrument are detachable from each other permits an interchangeability thereof, such for example as mounting the conical head directly upon the threads 17 of the barrel, the sleeve 19 being interposed between the head and barrel when it is desired to treat infected parts with medicaments in a gaseous or vaporous form.

Positioned within the sleeve 19, and preferably sealed against the walls thereof is a wall 30 of light-transmitting material. This wall I prefer to make in the form of a lens and arrange the same at an angle of approximately 23.5° to the vertical or in a plane at an angle of 76.5° at the axis of the sleeve so that there will be no back reflection of the light rays into the eyes of the operator. The transparent wall is maintained in position by means of two counter-part bushings 26 and 27 that are formed by taking a cylinder of thin metal and cutting the same obliquely at the angle desired for the wall 30 and inserting the same into the sleeve with the transparent wall between the oblique edges. At one end of the sleeve a shoulder 28 is provided against which the adjacent end of bushing 26 abuts. The juncture between the transparent wall 30 and the sleeve 19 is preferably made air-tight so as to prevent air, gas or vapor passing through the sleeve in a direction towards the lamp 11. The means for admitting air, gas or vapor into the sleeve upon the side of the oblique wall 30 opposite the lamp consists of a tubular stub 29 that is screwed into an opening made in the sleeve, thereby providing an inlet port so that when said stub is connected with a hose the gas or vapor will pass through said port into the sleeve and conical head and will be discharged from the outlet port at the small end of the head 25. The oblique wall, as before suggested, may be in the form of a lens of a minus power so as to afford a means for readily cor-

recting the viewing lens 15 that is positioned between the lamp and the operator's eye.

This correcting may be required when the sleeve 19 is interposed in the instrument because of the fact that lens 15 has a focal length equal to the distance from itself to the orifice in the end of the head when the intermediate sleeve 19 is omitted, and of course the insertion of the sleeve lengthens the instrument to a corresponding extent. On account of the tilt of the lens wall 30 it will be of more or less oval contour to properly fit within the sleeve which is circular in cross-section.

What I claim is:

1. A surgical instrument comprising a hollow body providing a cylindrical sight passageway and providing means for directing the light rays beyond the body, a lamp at one end of said passageway, an air-inlet stub communicating with the interior of said passageway to illuminate an object beyond the passageway, and a light transmitting wall extending across said passageway between said lamp and stub and sealed to the wall of the passageway whereby to permit the discharge of air from the end of the passageway opposite the lamp.
2. A surgical instrument comprising a hollow body providing a cylindrical sight passageway and providing means for directing light rays beyond the body, said body divided transversely into a plurality of sections, means for permitting the axial rotation of one of said sections independently of the other section, a lamp at one end of said passageway to illuminate an object beyond the passageway, a light transmitting wall mounted obliquely in the rotatable section of the body, and sealed to the wall of the passageway, and means for admitting air to the passageway upon the side of the wall opposite the lamp.
3. A surgical instrument comprising a barrel, a swivel ring removably mounted thereon, a tubular sleeve rotatably secured at one end to said ring, a conical tip removably mounted upon the opposite end of said sleeve, means for admitting air to the interior of the sleeve, a transparent inclined wall in said sleeve between said means and the swiveled end thereof, and a source of illumination at the end of the instrument opposite the tip and movable transverse to the barrel into and out of the axis of the latter.
4. A surgical instrument comprising a hollow body providing a cylindrical passageway, said body divided transversely into a barrel section, a sleeve section and a head section, a supporting handle connected to said barrel section, a lens movable into and out of axial alinement with said barrel section, a transparent wall sealed to the interior of the sleeve section, and an inlet stub entering said sleeve section upon the side of the wall opposite said lens.

5 5. A surgical instrument comprising a hollow body providing a cylindrical passageway, said body divided transversely into a barrel section, a sleeve section and a head section; a supporting handle connected to said barrel section, a bulb carried by said handle and movable laterally of the barrel into and out of the same, a lens movable into and out of axial alinement with said barrel section, a transparent wall sealed to the interior of the sleeve section, and an inlet stub entering said sleeve section upon the side of the wall opposite said lens. 10

Signed at Chicago, in the county of Cook and State of Illinois, this 28th day of December, 1926. 15

WILL J. CAMERON.

CERTIFICATE OF CORRECTION.

Patent No. 1,693,021.

Granted November 27, 1928, to

WILL J. CAMERON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 86 and 87, claim 1, strike out the words "to illuminate an object beyond the passageway" and insert the same after "passageway" in line 84, same claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of February, A. D. 1931.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

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