May 10, 1949. M. V. BHAJEKAR 2,470,013

ENDOSCOPE HANDLE

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Fig. 1.

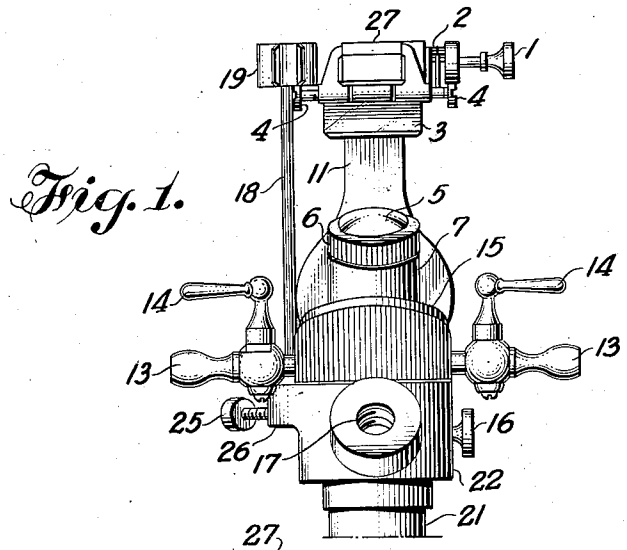


Fig. 2.

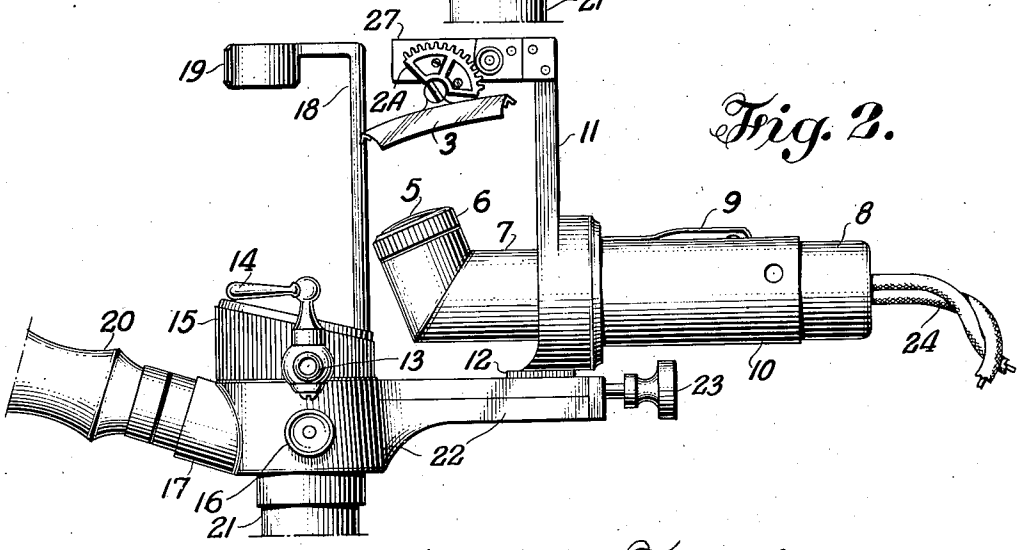
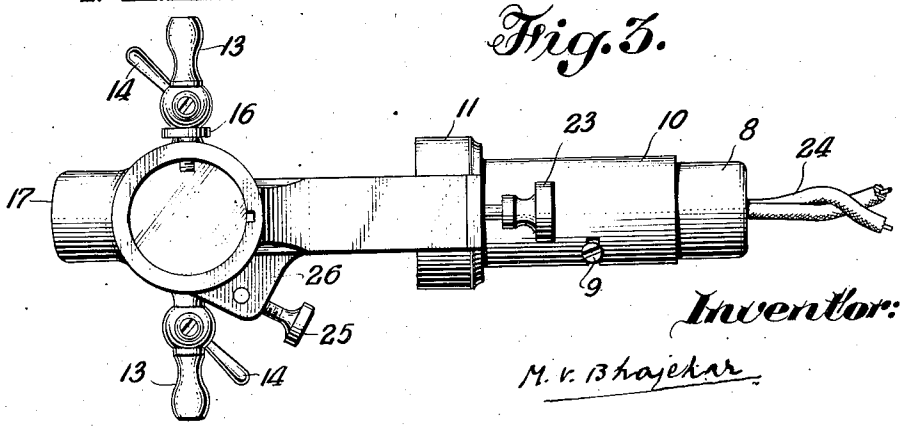


Fig. 3.



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ENDOSCOPE HANDLE

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2 Claims. (Cl. 128—4)

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The invention relates to an improvement on various instruments that are used for examination of body cavities, and the object of the present invention is to provide an instrument with proximal illumination to which can be fitted various appropriate tubes and thus enable the surgeon to examine one body cavity by different methods with the same instrument, or to examine different body cavities with different methods by the same instrument. The "endoscope handle" provides such an instrument with proximal illumination to which it is merely necessary to attach appropriate tubes.

At present there are two types of endoscopic instruments that are in use:

(a) Those with distal illumination and those with
(b) Proximal illumination

The disadvantages of the present instruments with distal illumination are:

(a) The lamps being small and delicate are easily fused
(b) These lamps are very expensive, and each lamp fits only one type of instrument
(c) The tube of the endoscopic instrument has to be of a size larger than necessary in order to accommodate the lamp
(d) The lamp is liable to be damaged during use
(e) It is difficult and it interferes with the manipulation if for any reason it becomes necessary to change the lamp while the instrument is in use

The disadvantages of the present instruments with proximal illumination are:

(a) Each instrument is for one particular use only
(b) For certain types of endoscopic examinations there are no instruments manufactured with proximal illumination
(c) There is no one instrument manufactured which can be used for examination of several body cavities
(d) There is no one instrument which can be used for more than one type of examination e. g. dry and/or inflation urethoscopy and sigmoidoscopy

The object of my invention is to avoid these difficulties.

The invention consists of an apparatus for endoscopic examination comprising of two horizontal pieces connected by a vertical piece at right angles. The upper piece is joined at one of its ends, while the angled piece so made by the upper horizontal and vertical piece is now connected by fitting the lower end of the vertical piece into the lower horizontal piece into a groove arrangement.

1. On the upper horizontal piece is fitted a concave mirror fitted with a cog-wheel arrangement by means of which the tilt of the mirror can be firmly and accurately adjusted.

2. Through the lower part of the vertical piece is inserted a tube which carries the source of illumination. On this tube is fitted a switch.

3. The free end of the lower horizontal piece is shaped into a socket for fitting into it various types of tubes. The rest of the piece is grooved, into which one end of the vertical piece is fitted by means of a screw arrangement. On the top of the socket can be fitted a tilted glass cap with two taps and two stop-cocks, for air inflation or fluid irrigation after insertion of the tube into the body cavity. On the rim of the socket on one side is a seat with a screw to hold an angular rod which has a clip at the end of its horizontal part to hold a small telescope. On the front of the socket rim is a screw-in seat for a handle. The mirror-light part can be moved away from or towards the socket by means of a screw.

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Figure 1 shows the front view of the instrument with its various parts numbered as follows:

The cog-wheel arrangement by the interaction of parts 2 and 2a for firmly and accurately tilting the concave mirror 3 by means of screw 1
The two taps 13 with stop-cocks 14 attached to the tilted glass cap 15
The screw-in seat 17
The screw 16 for holding firmly the endoscopic tube e. g. 21
The angular rod 18 with the clip 19 to hold a small telescope
The screw 25 for holding tightly the angular rod
The lens 5
The screws 4 for holding the mirror case

Figure 2 shows the side view of the instrument with its various parts numbered as follows:

The vertical piece 11, the upper horizontal piece 27 and the lower horizontal piece 22
One of the wheels 2a of the cog-wheel arrangement
The concave mirror in its case 3
The angled casing 7 with the lens 5 in front of the bulb and held in place by means of the screw ring 6
The tube 10 which carries the electric bulb
The switch 9 on the bulk carrying tube which can be worked by turning the ebonite piece 8
The tilted glass cap 15
The handle 20 and wires 24
The screw 23 whose movement can shift the mirror-light part of the instrument away from or towards the socket
The angular rod 18 with the clip 19

Figure 3 shows the lower aspect of the instrument with its various parts numbered as follows:

The seat 26 with the opening for holding the angular rod, and the screw 25 to hold the rod tightly

A part of the switch 9 on the tube 10 with the ebonite piece 8

The screw 23

The socket 28

The stop-cocks 14 and the taps 13

The instrument consists of three main parts joined to each other at right angles. Through the vertical piece 11 is inserted a tube 10 in which is fitted an ordinary battery bulb. In front of this bulb is placed a small lens 5 so that the rays of the bulb may be concentrated before they reach the mirror 3. On the tube which is outside the angled part is fitted a switch 9 so that the lamp can be easily extinguished by turning the ebonite piece 8. On the upper horizontal part 27 is fitted a concave mirror 3 whose tilt can be adjusted by means of a cog-wheel gear arrangement formed by wheels 2 and 2a. This gear is worked by screw 1. The free end of the lower horizontal piece 22 is shaped into a socket 28 to take in different endoscopic tubes. On the top of the socket can be fitted a glass cap 15 with two taps 13 one on each side of the glass cap for air inflation or fluid irrigation and controlled by stop-cocks 14. On one side of the socket is a screw 16 to hold firmly the endoscopic tube e. g. 21. On the front of the socket-rim is a screw-in seat 17 for a handle 20. On one side of the socket-rim is a seat 26 with an opening and a screw 25 to hold tightly the angular rod 18 with the clip 19 which can carry a small telescope. The mirror carrying part 27 together with the light carrying middle part 11 with the tube 10 are mounted into the socket carrying part 22 by means of a groove and screw 23 arrangement. Turning this screw 23 enables the operator to move the mirror-light part away from or towards the socket 28. This socket 28 is adapted to take in various endoscopic tubes e. g. single or extension tubes.

The action and interaction of the various parts is as follows:

The idea in introducing this invention is to provide the surgeon with a single instrument with which he can with ease examine several body cavities by merely attaching the appropriate endoscopic tubes. The wires 24 are attached to an 8 volt transformer. By turning the ebonite piece 8 the switch 9 is put into action and the bulb which is enclosed in the angled case 7 is lighted. The ebonite piece and the wire connections are enclosed in the tube 10. The angled case 7 with the lens 5 can be removed easily by pulling it towards the socket, as it is fitted by a mere slip joint into the piece 11. The rays of the bulb pass through the lens 5 and are then projected on the mirror 3. The lens is secured in its place by screw ring 6. By turning screw 1 the tilt of the concave mirror is adjusted through the interaction of the wheels 2 and 2a which make the cogwheel gear arrangement, so that the rays can be made to pass down the tube 21. Screws 4 merely help to hold the mirror-case in position. If it is intended to make the endoscopic tube air-tight—as for inflation sigmoidoscopy—the tilted glass cap with the taps 13 and stop-cocks 14 is fixed on the top of the socket 28. By turning the stop-cocks the tube can be put into communication with the external air. If so desired one tap may be closed while the other is left open. By means of the screw 16 the endoscopic tube can be held tightly into the socket. If it is necessary to use the handle 20 it can be screwed into its seat 17. When it is desired to use magnification a small telescope can be fitted into the clip 19. It is then merely necessary to turn it into position so that it is brought in the line of the axis of the tube. When it is not required, it can be turned away out of view to one side. The angular rod 18 is fixed into its seat 26 and held there firmly by means of screw 25. If one wishes to move the mirror-light part away from or towards the socket, as it is necessary to do when changing over from a bigger to a smaller tube, it can be easily done by turning the screw 23, which moves the part backwards or forwards.

The distinguishing features of the instrument which I have devised are as follows:

1. The instrument is for examination of different body cavities.
2. The glass cap is removable and adjustable and therefore the instrument can be made air-tight only when so desired.
3. The distance between the bulb and the mirror is fixed.
4. The line of the axis of the mirror and the tube is adjustable.
5. The mirror-light part is movable in its relation to the socket in which different tubes can be fitted.
6. Irrigation of the body cavity can be done with this instrument for which special taps and stop-cocks are provided.
7. The size of the operating instrument which can be passed into the tube is restricted only by the size of the tube itself and its movement is not hampered by its being held in a special compartment of its own.

I claim:

1. An endoscope handle, for endoscopic examination tubes, with proximal illumination made up of two horizontal pieces joined by a vertical piece; one end of the upper horizontal piece is immovably fixed to one end of the vertical piece while the other end of the horizontal piece has a tilting concave mirror attached thereto with a cog-wheel arrangement for changing the angle of the mirror; the other end of the vertical piece is attached to one end of the lower horizontal piece in such a way that the whole vertical piece, through about the middle of which is inserted the illuminating apparatus, together with the fixed upper horizontal piece can be moved in a horizontal direction away from or towards the socket which forms the free end of the lower horizontal piece, and in which socket can be fitted various endoscopic tubes, while a tilted removable cap having a transparent face and fitted with taps and stop-cocks adapted for irrigation, insufflation and inflation purposes can be fitted to close the proximal end of the socket.

2. An apparatus as claimed in 1 to which can be attached a handle.

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