

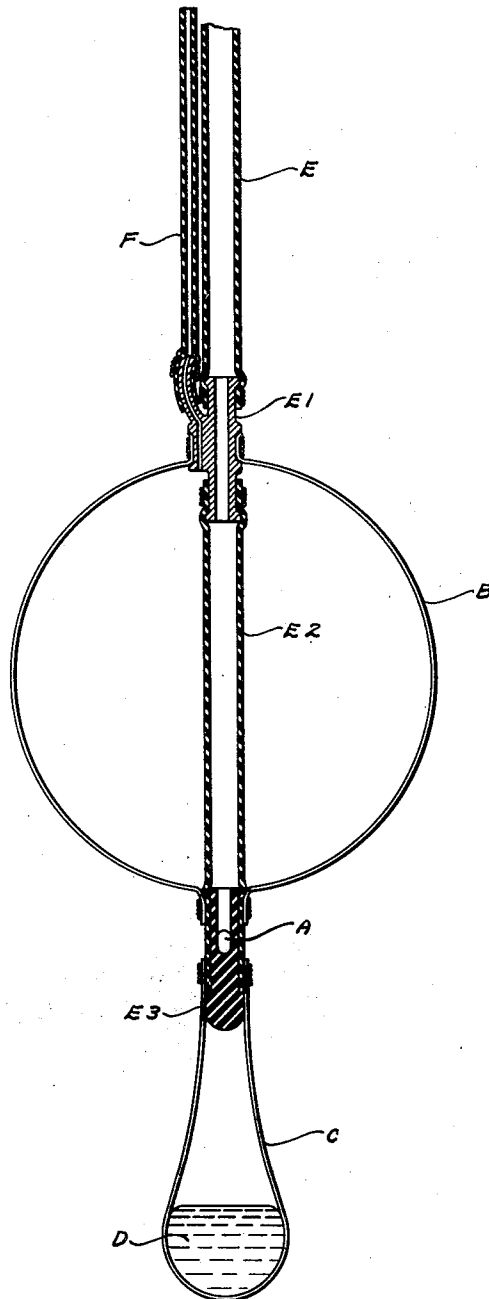
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INTUBATOR APPARATUS FOR INTESTINAL INTUBATIONS

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INTUBATOR APPARATUS FOR INTESTINAL INTUBATION

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This invention relates to improvements in intubator apparatus which is to be introduced anatomically through the mouth and esophagus for supplying or withdrawing substances from the stomach and intestines. The practice of intestinal intubation is carried out for a variety of reasons, the most important of which is the control of intestinal distention due to obstruction and functional or physiological imbalance in the bowel mechanism. In such instance intubation and suction is used to remove the gas and liquid contents of the obstructed bowel and thus relieves the distended condition, which frequently causes death, until the bowel either recovers its physical and functional condition or until it is again restored to normal by surgery.

The practice of intubation has been known for some time but prior to my invention there was considerable difficulty in directing the apparatus into the pyloric sphincter, and frequently such attempts were unsuccessful. Such practices have included the use of wires extended through the length of the tube in the attempt to direct the end of the tube into the pyloric sphincter or by weighting the end of the tube with the intent that it should find its way by gravity into the duodenum. An example of the latter is disclosed in British Patent No. 330,855, dated October 15, 1929.

In the apparatus which I have designed, and which overcomes many of the objections inherent in intubation devices constructed prior to my invention, the intubation tube is provided at its lower end with what I term a gravity director head that carries the weighting substance and is considerably more flexible than the material of the tube proper so that it will readily find its way into and below the duodenum. Thus the tube may be drawn into the lowest accessible point of the anatomy, and by regulating the position and posture of the patient any particular part of the alimentary tract may be reached.

In the accompanying drawing, which illustrates a preferred embodiment of the invention, the single figure is a diametrical sectional elevation through the lower end parts of the apparatus.

Referring to the drawing more particularly and by reference characters E designates a more or less conventional intubation tube which is of any

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desired length and may be connected at its upper end to suitable suction or supply means (not shown) depending upon whether substances are to be removed from or applied to the areas to be treated. This tube is connected by a suitable coupling or adaptor E1 to a tube section or extension E2 that terminates in a connector E3. The parts E1 and E3 are made of any suitable material and it is only necessary that the connector E3 be made of such material as will not amalgamate with the mercury with which it comes in contact if mercury is used for weight purposes. The tube E (and E2) must of course be sufficiently flexible to permit following the desired circuitous course, but must also be of such body and stiffness as not to collapse when suction is applied. This tube is provided at its lower extremity with a lateral orifice A through which the substances are drawn into the tube or expelled from it.

The director head C depends from the connector E3, to which its neck portion is tightly secured, and is constructed of thin very flexible material such as rubber to form an impermeable flaccid sack. To carry out its gravitational directing objective this sack C contains some heavy fluid or mobile substance D, such as mercury, lead shot, or small metallic spheres, which is of course sealed from any contact with the interior of the tube or with parts of the body.

The sack is capable of adapting itself closely to the surface contours of the part of the body with which it is brought into contact so that when the director head has drawn the apparatus to the position of the sphincter the heavy load of the sack presses upon the sphincter and the heavy fluid pressure in the thin-walled sack presses a small part of the wall of the sack through a small opening in the sphincter and progressively draws more of the sack into and through the sphincter until the whole sack has passed the sphincter drawing the intubator apparatus behind with its suction or delivery orifice and the pneumatic expanding plug.

When necessary the metallic content of the sack enables the progress and position of the apparatus to be observed and determined with the aid of X-ray and fluoroscope.

In order to retain the orifice end of the tube

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in any desired advanced position, and to form a dam or closure above any given section of the intestine, there is provided a flexible stop or plug in the form of a balloon or thin rubber bag B, the upper and lower ends of which are sealed with respect to the couplings E2 and E3 by suitable tape or windings, as indicated. This bag is of course deflated when introduced but is inflated as may be desired by air forced into it through a small tube F running parallel with and adjacent to the tube E. When the intubation has been completed this bag is deflated to facilitate the removal of the apparatus.

It is understood that suitable modifications may be made in the apparatus as hereinabove set forth, provided such modifications come within the spirit and scope of the appended claims. Having now therefore disclosed and described the essential characteristics of the invention, what I claim to be new and desire to protect by Letters Patent is:

1. Intestinal intubator apparatus comprising a flexible tube provided with a director head attached to the distal end thereof so as to depend axially therebeyond, the director head consisting of a thin-walled flaccid sack loaded with a heavy fluent substance capable of adapting itself closely to the surface contours of the part of the body with which it is brought into contact and thereby adapted, by gravitational action on the said fluent substance, to pass through a small opening or sphincter in the body and thereupon to pull the attached end of the tube endwise behind the director head and through such opening or sphincter in the manner hereinbefore described.

2. Intestinal intubator apparatus comprising a flexible tube for endwise insertion in the anatomy and being provided at its leading end with a director sack which extends axially beyond the end of the tube and for containing a heavy substance whereby the sack will draw the leading end of the tube endwise behind the sack and into the body by gravitational action, said sack being formed of thin-walled flaccid material and said substance being fluent in character whereby the sack will adapt itself closely to the surface contours of the body with which it is brought into contact and whereby it may pass through small openings such as a sphincter to draw the tube therebeyond.

3. Intestinal intubator apparatus comprising a flexible tube for endwise insertion downwardly in the anatomy and being provided at its leading end with a director sack which depends axially below the lower end of the tube and for containing a heavy substance in advance of the tube end whereby the sack will draw the tube endwise behind it into the body by gravitational action, said sack being formed of thin-walled flaccid material and said substance being fluent in character whereby the sack will adapt itself closely to the surface contours of the body with which it is brought into contact and whereby it may pass through small openings such as a sphincter to draw the tube therebeyond, said tube having an orifice near the director sack, through which substances may pass to or from the interior of the tube.

4. Intestinal intubator apparatus comprising a flexible tube for endwise insertion in the anatomy and being provided at its leading end with a director sack which depends from the end of the tube for containing a heavy substance that will be spaced beyond the end of the tube whereby the weighted sack will draw the tube endwise

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into the body by gravitational action, said sack being formed of thin-walled flaccid material and said substance being fluent in character whereby the sack will adapt itself closely to the surface contours of the body with which it is brought into contact and whereby it may pass through small openings such as a sphincter to draw the tube therebeyond, the interior of said director sack being sealed with respect to the interior of the tube and with respect to the exterior of the sack.

5. Intestinal intubator apparatus comprising a flexible tube for endwise insertion in the anatomy and being provided at its leading end with a director sack depending below the extremity of the tube and containing a heavy substance whereby the sack will draw the tube into the body by gravitational action, said sack being formed of thin-walled flaccid material and said substance being fluent in character whereby the sack will adapt itself closely to the surface contours of the body with which it is brought into contact and whereby it may pass through small openings such as a sphincter to draw the tube therebeyond, said tube having an orifice near the director sack, through which substances may pass to or from the interior of the tube, and an inflatable bag secured about the tube above said orifice and sack to serve as an intestinal plug when inflated.

6. A device for treating the gastro-intestinal tract which is characterized by a head comprising a flexible bag attached to the distal end of an intestinal intubation tube of predetermined size and form, the wall of said bag being of less thickness than the wall of the intubation tube and said bag containing a predetermined amount of a motile liquid metallic element and being of a sufficient size to permit the free and easy flow of said element in said bag, and means closing communication between the bag and distal end of the tube.

7. A device for treating the gastro-intestinal tract which comprises tube means adapted to be passed into the gastro-intestinal tract, said tube means being of a predetermined length, size and form and having an opening therein for venting the contents of said tract, a head for said tube means, said head comprising a thin flexible bag attached to the distal end of said tube means and a predetermined amount of a motile liquid metallic element contained in said bag, said element being sufficient in amount to weight said head without interfering with the free flow and easy movement of said element in said bag or impairing the motile and labile properties of said element, the wall of said bag being of less thickness than the wall of the intubation tube, and means closing communication between the bag and distal end of the tube.

8. A device for treating the gastro-intestinal tract which comprises tube means of sufficient length for passage into such tract and having an opening near its distal end for venting contents of the tract, a director head for said tube means in the form of a thin walled flexible bag attached to the distal end thereof so as to depend therefrom, the wall of said bag being of less thickness than the wall of the intubation tube and a predetermined amount of motile metallic substance contained in the bag, said substance being sufficient in amount to weight said head and draw the tube endwise behind the bag without interfering with the free flow and easy movement of said substance in said bag or impairing the motile and labile properties of said substance,

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and means closing communication between the bag and distal end of the tube.

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