June 14, 1932. J. B. BACON 1,863,234

SURGICAL APPARATUS

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Fig. 1.

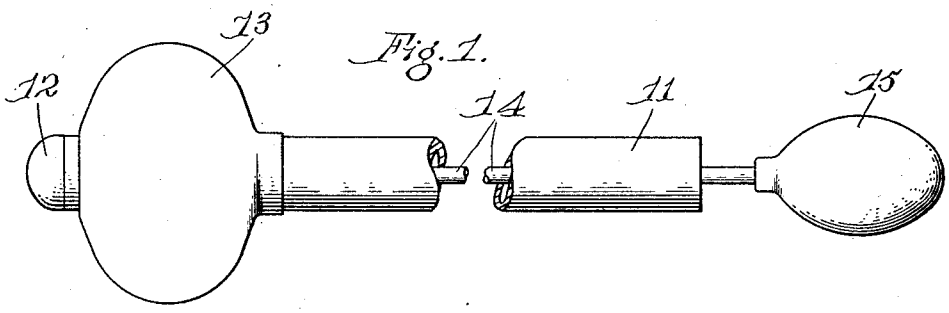


Fig. 2.

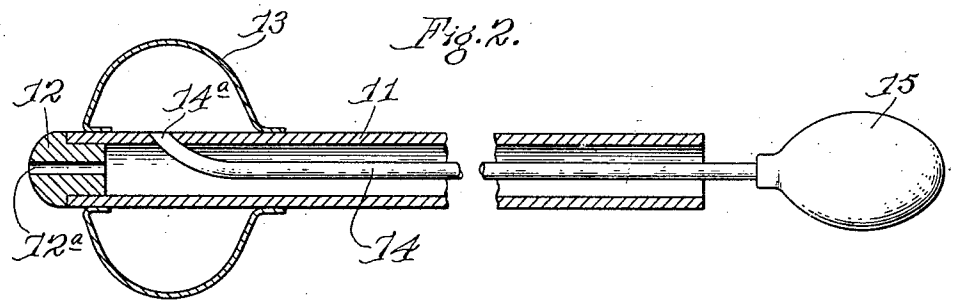


Fig. 3.

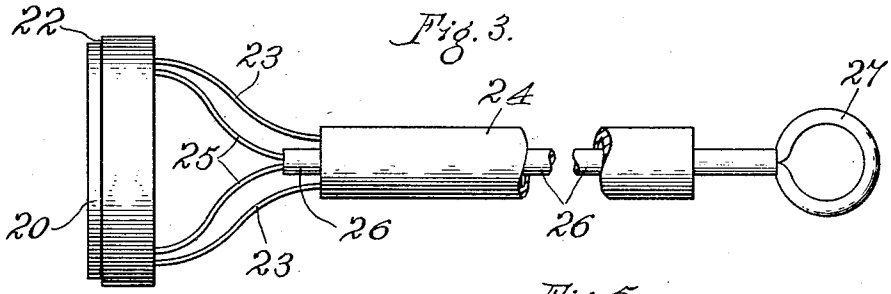


Fig. 5.

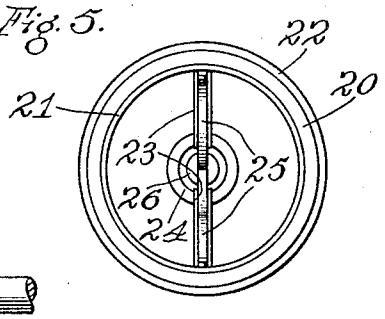
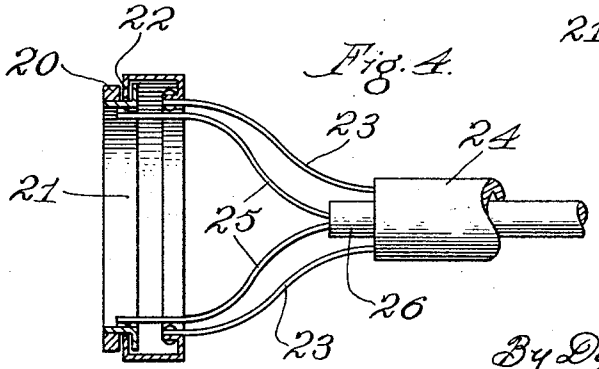


Fig. 4.



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SURGICAL APPARATUS

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Fig. 6.

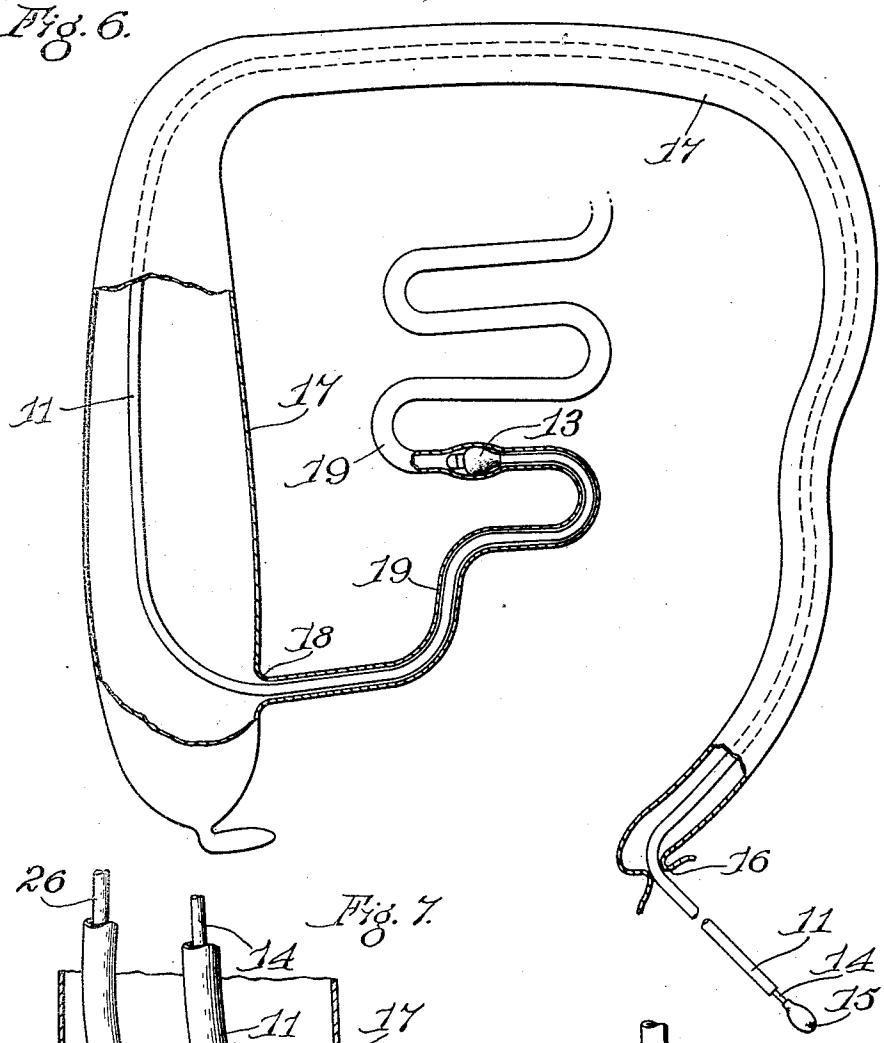


Fig. 7.

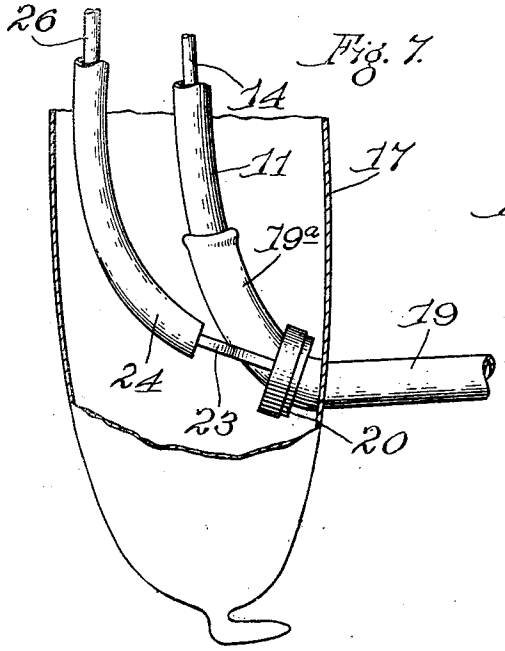
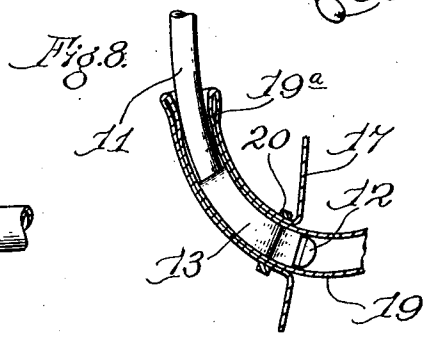


Fig. 8.



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UNITED STATES PATENT OFFICE

JOSEPH B. BACON, OF MACOMB, ILLINOIS

SURGICAL APPARATUS

Application filed July 6, 1931. Serial No. 549,021.

This invention relates to improvements in surgical apparatus and, more especially, such apparatus designed for diagnostic and operative purposes.

Among the features of my invention is the provision of surgical apparatus adapted for use in diagnosis of the large and small intestines, more especially for the location of obstructions therein. By the use of my invention, it is possible to insert an exploratory instrument through the large intestine and then into the small intestine without necessitating any incision therein.

By the use of my invention it is also possible to perform an operation for treating invagination or intussusception of the small intestine into the large intestine in a relatively simple and expeditious manner.

Other features and advantages of my invention will appear more fully as I proceed with my specification.

In that form of device embodying the features of my invention shown in the accompanying drawings—

Figure 1 is a view in side elevation; Fig. 2 is a vertical sectional view; Fig. 3 is a view in side elevation of the instrument used in operating in the case of intussusception of the small intestine into the large intestine; Fig. 4 is a vertical sectional view of the instrument shown in Fig. 3; Fig. 5 is a similar view in end elevation; Fig. 6 is a diagrammatic view showing insertion of the instrument of Figs. 1 and 2 through the large intestine and into the small intestine; Fig. 7 is a similar view showing the application of the instrument of Figs. 3, 4 and 5 in the case of intussusception of the small intestine into the large intestine; and Fig. 8 is a similar view in section, showing the insertion of the instrument of Figs. 1 and 2 preparatory to performing the operation referred to.

The apparatus includes two instruments, namely, an exploratory instrument, as shown in Figs. 1 and 2, and an instrument as shown in Figs. 3, 4 and 5 for supporting a clasp ring which is used in performing the operation for the treating of intussusception of the small intestine into the large intestine.

I shall first describe the construction and operation of the exploratory instrument shown in Figs. 1 and 2. This includes a flexible tube or hose 11 preferably made out of rubber and provided with a rounded end-piece 12, which has a central aperture 12^a. The end of the tube 11 carries a distensible, dilatable or stretchable member 13, here shown as being made of thin rubber or similar material adapted to be inflated with air so that the same may be distended, as desired.

For the purpose of inflating the member 13, there is provided a smaller air tube 14 inside of the tube 11. The outlet end of this tube, as indicated by 14^a, is inserted through the wall of the tube 11 inside of the member 13. The other end of the tube 14 is provided with a well-known type of rubber bulb 15 with a suitable valved air inlet (not shown) which may be used for forcing air through the tube 14 into the member 13 to distend the same. The bulb 15 may be slipped off of the end of the tube 14 for deflating the member 13, or any suitable air escape may be provided for this purpose.

The instrument shown in Figs. 1 and 2 may be used for diagnostic and exploratory purposes. The distensible member 13 will permit the use of this instrument through both the large and small intestines. By inflating or deflating the member 13, as desired, the passage of the instrument through the intestines is greatly facilitated. For example, the instrument with the member 13 in a completely deflated position may be inserted at the rectum 16 (see Fig. 6) and the member 13 then inflated to the desired size to aid in facilitating passage through the large intestine 17. After the end of the instrument has reached the point 18 where the small intestine 19 enters the large intestine, the member 13 may again be deflated to the size desired to facilitate entry of the end of the instrument into the small intestine 19 through which it may be forced the desired distance.

In Figs. 7 and 8, I have shown a condition in which there is invagination or intussusception 19^a of the small intestine 19 into the large intestine 17. In such case, the end of the exploratory instrument 11, after being passed through the large intestine, is inserted (pref-

erably in an entirely deflated condition) into the invaginated portion 19ª of the small intestine, as shown in Figs. 7 and 8. The instrument of Figs. 3, 4 and 5 is then used to snap the rubber clasp ring 20 over the invaginated portion 19ª of the small intestine close to the wall 17 of the large intestine, as shown in Fig. 8. The ring 20 will contract around the tubing 11 of the exploratory instrument. The ring is allowed to remain in the position shown in Fig. 8 until the double walls of the small intestine under the ring heal or grow together, whereupon the invaginated folded end 19ª will sluf off. The exploratory instrument may then be removed.

I shall now describe more in detail the construction and operation of the instruments of Figs. 3, 4 and 5 used for placing the clasp ring 20 in the position above described. This instrument includes a supporting ring 21 carrying the clasp ring 20 in a stretched condition. Surrounding the ring 21 back of the clasp ring 20 is a ring 22 carried by the bail or fork 23 mounted on the end of the rubber tube or flexible member 24. The ring 21 which carries the clasp ring 20 is supported by a bail or fork 25 carried on the end of a smaller rubber tube or flexible rod 26 inside of the tube 24. The end of the member 26 is provided with a handle 27. Inspection of Fig. 4 will show that relative movement between the rings 21 and 22 may be utilized to force the clasp ring 20 off of the supporting ring 21. Such relative movement can be effected by pulling of the member 26 outwardly with respect to the tube 24. In the use of the apparatus, the exploratory instrument is first put in the position shown in Figs. 7 and 8. The rings 21 and 22 are then slipped over the outer end of the same and forced up through the intestines until they reach the position shown in Fig. 7. The handle 27 is then pulled outwardly causing the ring 22 to slip the clasp ring 20 off of the supporting ring 21, whereupon it will snap into the position shown in Fig. 8. The rings 21 and 22 are then withdrawn, leaving the clasp ring 20 in place until the healing operation above described is substantially completed.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as permissible, in view of the prior art.

In order to direct the end of the instrument from the large intestine 17 into the entrance 18 of the small intestine, an incision is preferably made in the region of the appendix, and the end of the instrument thus directed by the hand of the operator.

As shown in Fig. 8 the ring is allowed to remain in position until the double wall of the intestine under the ring heals or grows together. When such walls are pressed together by the ring for a sufficient length of time they naturally heal or grow together. After this occurs the folded end 19ª slufs off. After this the ring 20 may be removed with the tube 11 or else discharged from the intestine through the rectum.

What I regard as new, and desire to secure by Letters Patent, is:

1. Apparatus adapted for use with flexible intestinal exploratory apparatus, including; a clasp ring; means for supporting said clasp ring, said means adapted to be inserted over said flexible exploratory apparatus; and means for slipping the clasp ring off of the supporting means.

2. Apparatus as claimed in claim 1, in which the means for supporting the clasp ring includes a ring and the means for slipping the ring off of the said supporting means includes another ring lying outside of said supporting ring.

3. Apparatus adapted for use in connection with flexible intestinal exploratory apparatus, including; a clasp ring; a supporting ring for the clasp ring, said supporting ring adapted to be slipped over the flexible exploratory apparatus; a flexible member attached to the supporting ring adapted for use in passing said supporting ring over the flexible exploratory apparatus; and means for slipping the clasp ring off of the supporting ring.

4. Apparatus as claimed in claim 3, in which the means for slipping the clasp ring off of the supporting ring includes an outer ring surrounding the supporting ring and lying back of the clasp ring, said outer ring being provided with a flexible member arranged substantially parallel with the flexible member attached to the supporting ring, whereby relative movement may be imparted to said flexible members to cause relative movement between the two rings above mentioned to cause the clasp ring to be slipped off of the supporting ring.

5. Apparatus of the character described, including: a flexible member adapted for insertion in the intestine, said member being provided with a dilatable end; a clasp ring; means for supporting said clasp ring; said supporting means adapted to be slipped over said flexible member; and means for slipping the clasp ring off of the supporting means.

In witness whereof, I have hereunto set my hand, this 18 day of June, 1931.

JOSEPH B. BACON.