

June 21, 1927.

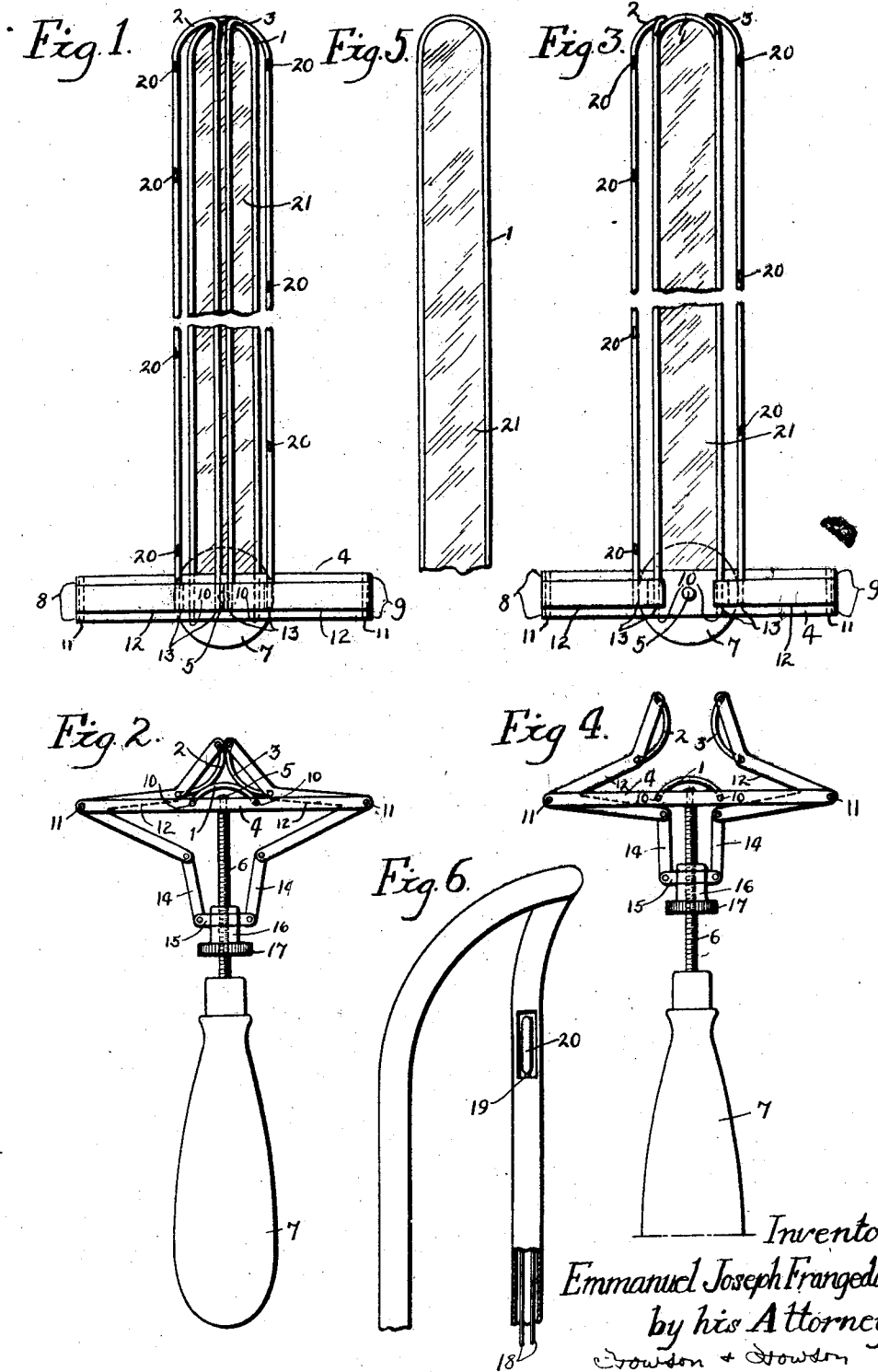
E. J. FRANGEDAKIS

1,633,443

COLOSCOPE

Filed Aug. 31, 1926

2 Sheets-Sheet 1



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Fig. 15.

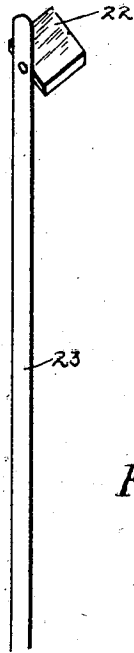


Fig. 12.

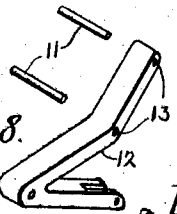


Fig. 8.

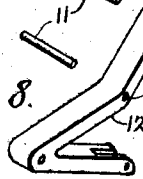


Fig. 7.

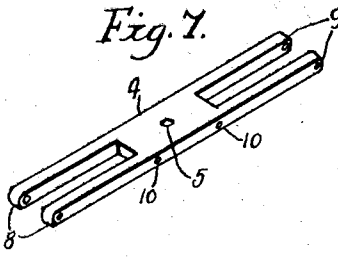


Fig. 10.



Fig. 9.

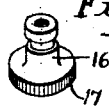


Fig. 11.



Fig. 13.

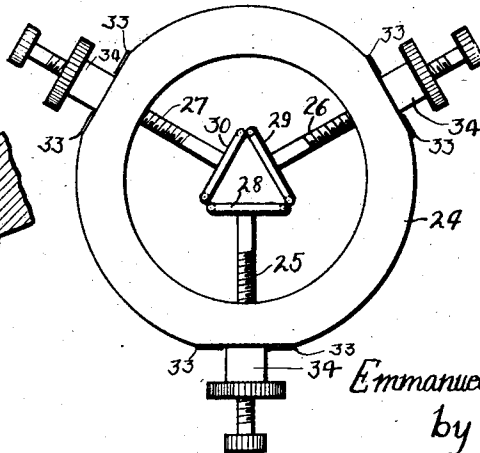
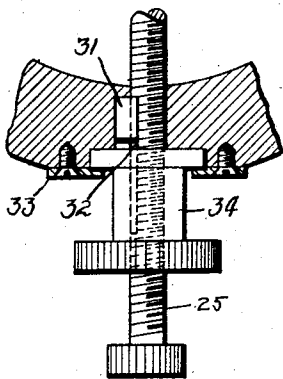


Fig. 14.



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UNITED STATES PATENT OFFICE.

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COLOSCOPE.

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This invention relates to improvements in instruments employed for examination of the rectum and colon, and the principal object of the invention is to provide an instrument that is readily and easily inserted and affords a relatively unobstructed and extended view of the mucous membrane of the gut.

In the attached drawings:

10 Figure 1 is a front elevation of an instrument embodying my invention;

Figure 2 is an inverted plan view of the instrument;

15 Figure 3 is a front elevation showing the arms spread apart;

Figure 4 is an inverted plan view with the arms spread;

20 Figure 5 is a front elevation of one of the arms;

Figure 6 is a fragmentary perspective of the outer end of one of the arms;

Figure 7 is a view in perspective of the arm supporting cross head;

25 Figure 8 is a view in perspective of one of the arm supporting levers;

Figure 9 is a view in perspective of the arm actuating nut;

30 Figures 10, 11 and 12, are views in perspective of the elements connecting the actuating screw with the levers;

Figure 13 is a plan view illustrating a modification;

35 Figure 14 is a fragmentary section illustrating details of the instrument shown in Figure 13, and

Figure 15 is a view of a mirror for use with my instrument.

40 With reference to the drawings, the device in its preferred form consists of three double arms 1, 2 and 3, which may be formed of looped wire of sufficient strength and rigidity. The arm 1 is rigidly fixed in a suitable supporting structure consisting of a base member or cross head 4 which is swivelly mounted at its center point 5 at one end of a threaded shaft 6, which shaft has fixed at its other end a handle 7.

45 The cross head 4 shaped, as shown in Figure 7, has its extremities bifurcated to form two sets of spaced arms, 8, 8, and 9, 9, respectively. At the part 8 mid section of the cross head is secured the relatively fixed arm 1, apertures or sockets 10, 10, being provided for reception of the ends of this arm; while between the arms 8, 8 and 9, 9 are pivotally mounted upon pins 11, 11, bell

crank levers 12, 12, which respectively carry in apertures or sockets 13, 13, the arms 2 and 3. The lower ends of the bell crank levers 12 are connected through links 14, 14 and a clamp 15, with a sleeve 16 having threaded engagement with the shaft 6. This sleeve has a knurled flange 17 which constitutes a finger-hold when the device is manipulated, as hereinafter described. It will be noted that with the aforescribed arrangement, the handle 7 projects substantially at a right angle to the arms 1, 2 and 3.

70 The arms 1, 2 and 3 normally lie together, as shown in Figs. 1 and 2, and in this position are readily insertable into the rectum. To facilitate insertion, the upper curved ends of the arms 1, 2 and 3 are turned inwardly so as to provide what in effect is a smoothly rounded tip for the instrument. When inserted to the desired extent, the arms 2 and 3 may be spread apart from the arm 1 by holding the knurled flange 17 of the sleeve 16, in one hand and rotating with the other the handle 7 and with it the shaft 6. This feeds the sleeve 16 upwardly on the shaft and spreads the arms 2 and 3, as illustrated in Figs. 3 and 4, without, however, affecting their substantial parallelism.

85 Preferably the arms 2 and 3 are made tubular, at least in one branch, to permit the mounting therein of electric wires 18 which are connected with small sockets 19 on the inner side of one or both of the branches of the arms 2 and 3, these sockets being adapted to receive small electric bulbs 20. Any desired distribution of these sockets and bulbs may be had, although in the present instance they are shown, see Fig. 1, in more or less staggered relation on the two arms, thereby to obtain a more uniform distribution of the light throughout the length of the arms. The arm 1 carries between its branches and securely mounted therein a mirror 21.

100 With the foregoing construction, it will be apparent that with the instrument inserted and the arms 2 and 3 spread as described the mucous membrane of more than two-thirds of the circumference of the gut will be exposed to view the entire length of the instrument, and that by turning the instrument through a slight angle that portion of the membrane covered by the mirror will be exposed. The instrument provides an effective device for examining the mucous membranes.

For the anus and lower part of the rectum, the instrument as described above will be found adequate for thorough and accurate examination. When introduced at greater depth, however, an auxiliary mirror may be used, as shown in Fig. 15. This mirror 22, which is of small size, is angularly arranged upon a shaft 23 and preferably is so mounted upon the shaft that the angle of the mirror may be varied. When this mirror is introduced, it is possible, by reason of the slight angularity thereof and with the fixed mirror 21, to obtain by reflection a clear view of portions of the mucous membrane which otherwise would not be visible.

It will, of course, be understood that the structural details of the device may vary largely, and in Figs. 13 and 14 I have illustrated a modification within the scope of the invention. In this instance, a rigid annular member 24 is employed in which are slidably mounted substantially radial rods 25, 26 and 27. Arms 28, 29 and 30, similar to the arms 1, 2 and 3, previously described, are rigidly secured to the inner ends of the rods 25, 26 and 27, respectively. The rods, which are threaded are prevented from turning on the member 24 by keys 31 which enter longitudinal slots 32 in the said rods, as shown in Fig. 14. In threaded engagement with each of the rods and rotatably secured to the member 24 by retaining plates 33 is a sleeve 34, by turning which the rods may be advanced and retracted to spread apart or bring together the arms 28, 29 and 30, as desired. The operation of this embodiment is in all essential respects the same as that previously described.

I claim:

1. In an instrument for anal examination, the combination with a plurality of substantially parallel arms adapted for insertion in the rectum, of means for spreading said arms transversely while retaining their substantial parallelism, at least one of said arms being

hollow and adapted for passage of electric wires, and sockets on the inner side of the arm and connected with said wires and adapted to receive electric bulbs.

2. In an instrument for anal examination, the combination with a plurality of substantially parallel arms adapted for insertion in the rectum, of means for spreading said arms transversely while retaining their substantial parallelism, at least one of said arms being hollow and adapted for passage of electric wire, sockets on the inner side of the arm and connected with said wires and adapted to receive electric bulbs, and a mirror secured in one of said arms beneath said electric bulbs.

3. In an instrument for anal examination, the combination with a plurality of substantially parallel arms adapted for insertion in the rectum, of means for spreading said arms transversely while retaining their substantial parallelism, at least one of said arms being hollow and adapted for passage of electric wires, sockets on the inner side of the arm and connected with said wires and adapted to receive electric bulbs, a mirror fixed in one of said arms beneath said electric bulbs, and a movable auxiliary mirror disposed at an angle to said fixed mirror.

4. In an instrument for anal examination, the combination with a plurality of substantially parallel arms adapted for insertion in the rectum, of means for spreading said arms transversely while retaining their substantial parallelism, and illuminating means mounted in at least one of said arms.

5. In an instrument for anal examination, the combination with a plurality of substantially parallel arms adapted for insertion in the rectum, of means for spreading said arms transversely while retaining their substantial parallelism, illuminating means mounted in at least one of said arms, and a mirror fixed in one of said arms beneath said illuminating means.

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