

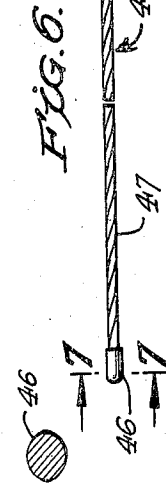
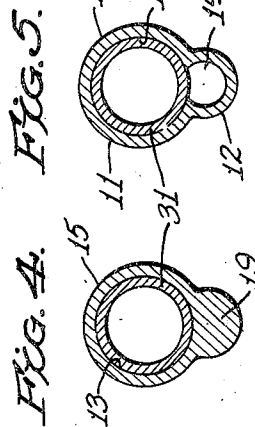
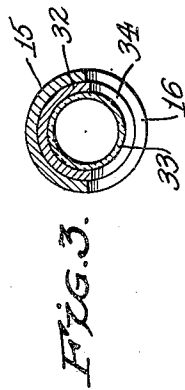
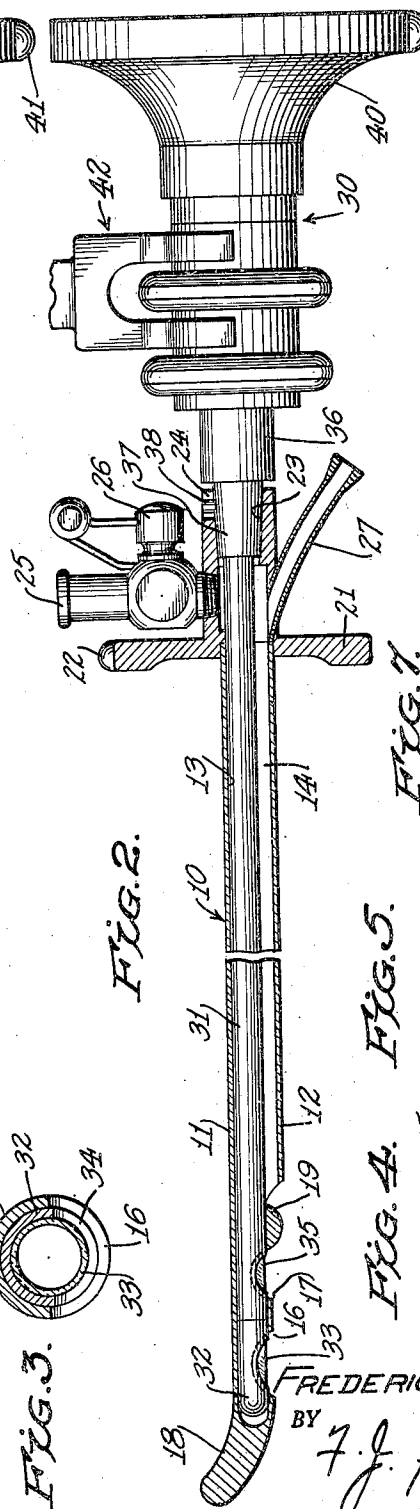
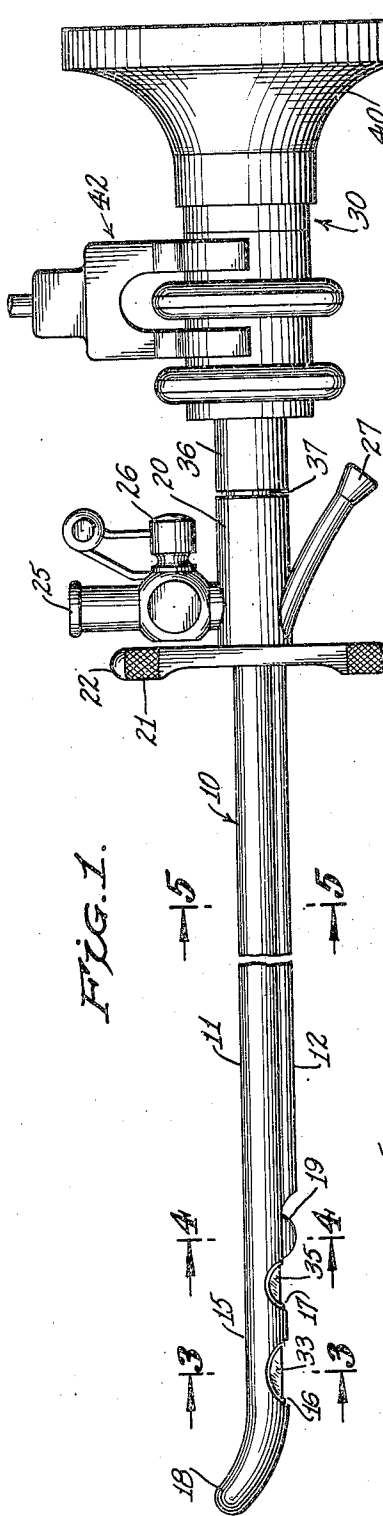
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CYSTOSCOPE

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CYSTOSCOPE

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3 Claims. (Cl. 128-7)

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This invention pertains to surgical instruments, and in one of its more specific aspects, to cystoscopes and the like that are adapted to be inserted into body passages for the purpose of examining, treating, and carrying out surgical operations in such body passages and internal organs.

A number of advances have been made in recent years in the development of cystoscopic instruments. These developments have, for the most part, been directed to cystoscopes intended for use in the treatment of body passages and associated internal organs in adults. As is well known, the urethra and other body passages of the average infant and small child are very constricted, as compared with corresponding passages in adults, and tend to become greatly irritated by the introduction of present-day cystoscopes, oftentimes resulting in trauma. Additionally, youthful patients are frequently subjected to severe shock and pain upon the insertion and withdrawal of conventional cystoscopes into and from body passages.

The present invention provides a cystoscopic instrument capable of being readily and advantageously employed in examining, treating and/or operating on constricted internal body passages and organs associated therewith. The instrument may be considered as being in the nature of a miniature cystoscope in that its overall size is reduced, as compared with ordinary instruments now in use, and further in that the cross-section area is correspondingly smaller so as to permit of ready insertion into and removal from body passages with a minimum of danger of traumatization and discomfort to the patient.

One of the outstanding features of the invention resides in the provision of a unitary tubular sheath comprising a pair of arcuate, preferably right circular cylindrical, elements intersecting along substantially parallel lines lying in a common plane intermediate the axes of the elements. One of these elements is preferably larger than the other. The interiors of the arcuate elements define merging passages for respectively accommodating a surgical telescope and a catheter or operating instrumentality. The larger of these elements, adapted to receive the telescope, is provided with a pair of apertures for respectively transmitting light rays and affording a field of vision for the telescope objective lens. The smaller of the elements, adapted to receive the catheter, terminates rearwardly of the apertures and is so arranged with respect to a bridge carried by the sheath that an end of a catheter or

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the like is deflected into the field of vision of the instrument.

Another feature of the invention lies in the provision of a structure wherein the parts may be readily assembled, dismantled and sterilized separately. As will be apparent from the detailed description that follows, the telescope may be removed from the sheath and the sheath may then be sterilized by immersion in boiling water, while the telescope itself may be sterilized in any preferred manner.

Despite its relatively small size, the instrument of this invention has wide application and flexibility in use in that it may be employed with equal facility for purposes of diagnosis, treatment and surgical operation, as required.

It is the primary object of this invention to provide a relatively small sized cystoscope capable of being advantageously employed for purposes of diagnosis and treatment of young children, particularly infants.

This invention has for another object the provision of an instrument of the character indicated having improved features of construction, whereby the instrument may be readily inserted into a constricted body passage, manipulated, and subsequently withdrawn with a minimum of discomfort to the patient and with reduction in the possibility of traumatization.

The invention has for another object the provision of a cystoscopic instrument having various parts so arranged as to be easily and quickly assembled, operated, dismantled, and sterilized.

A further object of the present invention is to provide a cystoscope that is simple and sturdy in design, that is reasonable in manufacturing and maintenance costs, and that is capable of successfully performing its intended functions in an effective manner.

The foregoing objects, as well as other objects, together with the advantages attainable by the practice of this invention, will be readily understood by persons versed in the art upon reference to the following detailed description, taken in conjunction with the annexed drawing, that respectively describe and illustrate an arrangement of devices embodied in a preferred form of the invention.

In the drawing:

Figure 1 is a side elevational view of a cystoscopic instrument constructed in accordance with this invention;

Figure 2 is a view similar to Figure 1 with certain parts in central longitudinal cross section;

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Figure 3 is a cross-sectional view taken along line 3—3 of Figure 1;

Figure 4 is a cross-sectional view taken along line 4—4 of Figure 1;

Figure 5 is a cross-sectional view taken along line 5—5 of Figure 1;

Figure 6 is a view in side elevation, and on a reduced scale, of an obturator adapted to be employed with the instrument illustrated in Figures 1 and 2; and

Figure 7 is a cross-sectional view taken along line 7—7 of Figure 6.

Referring now to the drawings wherein like reference characters denote corresponding parts throughout the several views, and more particularly to Figures 1-5, inclusive, a preferably unitary endoscopic sheath, generally indicated by numeral 10, includes a pair of parallel arcuate segmental elements 11 and 12 disposed one above the other. Elements 11 and 12 are preferably portions of hollow right circular cylinders, as illustrated in Figure 5, and intersect along parallel lines lying in a common plane intermediate their axes, element 11 being substantially larger in cross-section area than element 12. The interiors of these elements define merging corresponding passages 13 and 14 for the reception, respectively, of a surgical telescope, to be described further along, and a catheter or other instrumentality. Coaxial with element 11 and constituting a forward extension thereof is a tubular member 15 having a light aperture 16 and a viewing aperture 17 that are spaced from each other and from the forward end of arcuate element 12. Tubular member 15 terminates in a curved beak 18 rounded at its free end to facilitate introduction of the instrument into a body passage, and to assist the operator in guiding the instrument past "bends" encountered in certain body passages, such as in the region of the external vesical sphincter. Intermediate viewing aperture 17 and the forward end of arcuate element 12 is a rounded bridge or abutment 19 that serves as a deflector for directing the forward end of the usual catheter (not shown) in a generally forward and downward direction opposite viewing aperture 17.

The rearward end of sheath 10 communicates with the interior of a hollow coupling unit 20 and is affixed thereto in any desired manner to form a fluid-tight connection therewith. Coupling unit 20 is provided with a forward flange 21 that has a marker 22 to indicate the position of beak 18 when the instrument is in use. Coupling unit 20 is also provided with a frusto-conical rear passage 23, coaxial with arcuate element 11, and a longitudinal slot 24 for the reception of an aligning pin. Secured to and communicating with the interior of coupling unit 20 is a conduit 25, for transmitting or withdrawing suitable irrigating liquid into or from sheath 10 as allowed by a control petcock 26, and a curved catheter guide tube 27.

Reference is now had to Figures 2 and 3 for an understanding of the construction of a surgical telescope 30 that is adapted to be inserted into sheath 10, to the position shown in Figure 2, and removably secured to coupling unit 20. Telescope 30 includes a tubular body 31 having a coaxial removable tip 32 at its forward end for housing a lamp 33 that is adapted to transmit light rays through a window 34 (Figure 3) formed therein. Mounted in tubular body 31 is an objective lens 35 that commands a lateral and substantially conical field of vision. Objective lens 35 consti-

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tutes one of the lenses of a system, otherwise not shown, but which may be the same as or similar to the arrangement shown in Reinhold H. Wappler Patent No. 1,021,809 granted April 2, 1912, to which reference may be had for details of construction of the lens system. A collar 36, including a frusto-conical forward portion 37, embraces tubular body 31 and carries a laterally projecting aligning pin 38. Telescope 30 includes a conventional eyepiece 40 having a marker 41. A detachable electrical contact terminal 42 transmits electrical energy from a source (not shown) to lamp 33 to energize the lamp in the usual manner.

Figures 6 and 7 illustrate an obturator 45 that is adapted to plug the forward end of arcuate element 12 at such times as the instrument is being inserted into a body passage. This obturator consists of a head 46 that is preferably generally elliptical in cross section (Figure 7), a flexible shank 47, and a handle 48 having a tapered forward portion.

The instrument is prepared for use by assembling the above described devices until the parts are in the relative position shown in Figures 1 and 2. It will be observed that pin 38 is in registration with slot 24 and that frusto-conical portion 37 of the telescope collar 36 is in frictional engagement and forms a snug fluid-tight fit with corresponding passage 23 in coupling unit 20. Also, the telescope tubular body 31 is positioned in passage 13 of sheath 10, and lamp 33 and objective lens 35 are in alignment with apertures 16 and 17, respectively. Before the instrument is inserted in a body passage, the forward end of arcuate element 12 is plugged off by obturator 45. This is accomplished by inserting obturator head 46 into guide tube 27 and moving the same through passage 14 and along the telescope tubular body 31 until the free end of the obturator head protrudes beyond the forward end of arcuate element 12 and forms an effective and smooth closure therefor. It will be observed that by virtue of the flexibility of shank 47, manipulation of the obturator through guide tube 27 and passage 14 is facilitated. When the obturator is in plugging position, tapered end 49 of handle 48 forms a fluid-tight seal with the free end of guide tube 27.

The instrument having been thus assembled, it is inserted into a body passage in the usual manner and moved to the desired position for carrying out a treating or surgical operation. The obturator is then withdrawn and a catheter or other instrumentality is passed through guide tube 27, passage 14 and beyond the forward end of arcuate element 12. Upon continued forward movement of the catheter or other instrumentality, it is deflected forwardly and laterally with respect to sheath 10 by abutment 19 to the desired position within the field of vision of objective lens 35.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the appended claims.

I claim:

1. In a cystoscopic instrument, a tubular sheath comprising a first arcuate segmental element and a second arcuate segmental element, said elements intersecting along substantially parallel lines lying in a common plane intermediate the axes of said elements, the interiors of

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said elements defining a pair of merging passages, said passages being accessible from the proximal end of the instrument to receive, respectively, a telescope and a catheter.

2. In a cystoscopic instrument, a tubular sheath comprising a right circular cylindrical first element and a right circular cylindrical second element having a smaller diameter than said first element, said elements intersecting along parallel lines lying in a common plane intermediate the axes of said elements, the interiors of said elements defining a pair of merging passages, said passages being accessible from the proximal end of the instrument to receive, respectively, a telescope and a catheter.

3. In an instrument of the character described, a tubular sheath comprising a first arcuate segmental element having at least one aperture in its forward end portion and a second arcuate segmental element terminating rearwardly of said aperture, said elements intersecting along substantially parallel lines lying in a common plane outside the axis of either element, the interiors of said elements defining a pair of merging passages, said passages being accessible from the proximal end of the instrument to accommodate, respectively, a telescope for viewing through said aperture and a catheter, and an abutment carried by said first element and projecting laterally thereof, said abutment being disposed in-

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intermediate said aperture and the forward end of said second element and being adapted to deflect an end of a catheter moved through said second element into the field of vision of said telescope through said aperture.

FREDERICK J. WALLACE.

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