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ENDOSCOPE

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This invention relates to endoscopic instruments, and more particularly to such instruments adapted to be introduced into and operated in body cavities with greater facility, and having improved characteristics whereby discomfort to the patient is minimized.

It is an important object of this invention to provide an endoscopic instrument having certain parts so arranged as to facilitate its introduction and withdrawal into and out of body passages, and to materially reduce the possibility of the instrument's being inserted in passages other than those intended by the operating surgeon.

Another object of the invention is to provide an instrument of the character indicated that is adapted to be moved through more or less tortuous body passages without tearing or otherwise injuring body tissue constituting part of the wall of the passage, such as in the region of the exterior vesical sphincter, in the course of manipulation.

Another object of the invention is to provide an endoscopic instrument having a plurality of fenestras formed in its sheath and an examining telescope rotatably mounted in the sheath in a manner to bring each fenestra successively in the field of vision of the telescope without disturbing the sheath after it has been disposed in a body passage, to thereby effectively reduce trauma and discomfort to the patient.

A further object of the invention is to provide an instrument of the character indicated with an improved arrangement of devices for readily effecting and positively maintaining deflection of a catheter or operating instrument, as required.

To the end that these objects may be attained, an instrument constructed in accordance with this invention may include a first device comprising an endoscopic tube having a plurality of lateral fenestras formed therein and spaced therearound; a second device comprising an examining telescope having a portion thereof in the first device and capable of including any one of the fenestras in its field of vision, depending upon its relative angular position with respect to the first device; and a third device rotatably coupled to the first device and removably secured to the second device in a manner to respectively permit relative angular movement and prevent axial movement between the first and second devices.

The endoscopic tube is provided with a beak or forward extension forming a universal connection therewith, preferably in the nature of a ball and socket joint, to permit free movement of the forward end part of the first device, and to

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facilitate its passage into and out of body cavities without injury to the walls of such cavities. By this arrangement, the instrument of this invention readily accommodates itself to bends in body passages and may be used in place of conventional instruments having either fixed concave or convex beaks. As will be readily apparent to persons versed in the art, the present instrument is capable of being advantageously employed as either a cystoscope or a urethroscope.

One of the features of this invention resides in the provision of an improved arrangement of elements for imparting deflection to a catheter or the like at the will of the operator. This includes a pivoted deflector that is adapted to be positively maintained in desired position, thereby obviating the possibility of its being accidentally moved during use.

The above enumerated objects, as well as other objects, together with the advantages of this invention, will be readily apparent to persons skilled in the art by reference to the following detailed description, taken in conjunction with the annexed drawings, which respectively describe and illustrate, by way of example, an instrument constructed in accordance with the invention.

In the drawings:

Figure 1 is a side elevation view of an endoscopic instrument embodying the devices of this invention;

Figure 2 corresponds to Figure 1, and depicts certain of the parts in central vertical cross section;

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

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

Figures 5 and 6 are transverse cross-sectional views taken along lines 5—5 and 6—6, respectively, of Figure 2;

Figure 7 is an enlarged view of the instrument shown in Figure 1, with certain parts omitted, with parts broken away, and with other parts in central vertical cross section, to better illustrate the deflector and devices for actuating the same;

Figure 8 is an isometric view of certain parts that cooperate in actuating the deflector;

Figure 9 is a transverse cross-sectional view taken along line 9—9 of Figure 7;

Figure 10 is a bottom plan view of a portion of the instrument shown in Figure 9;

Figure 11 is an enlarged transverse cross-sectional view taken along line 11—11 of Figure 2;

Figure 12 is an enlarged vertical cross-sectional