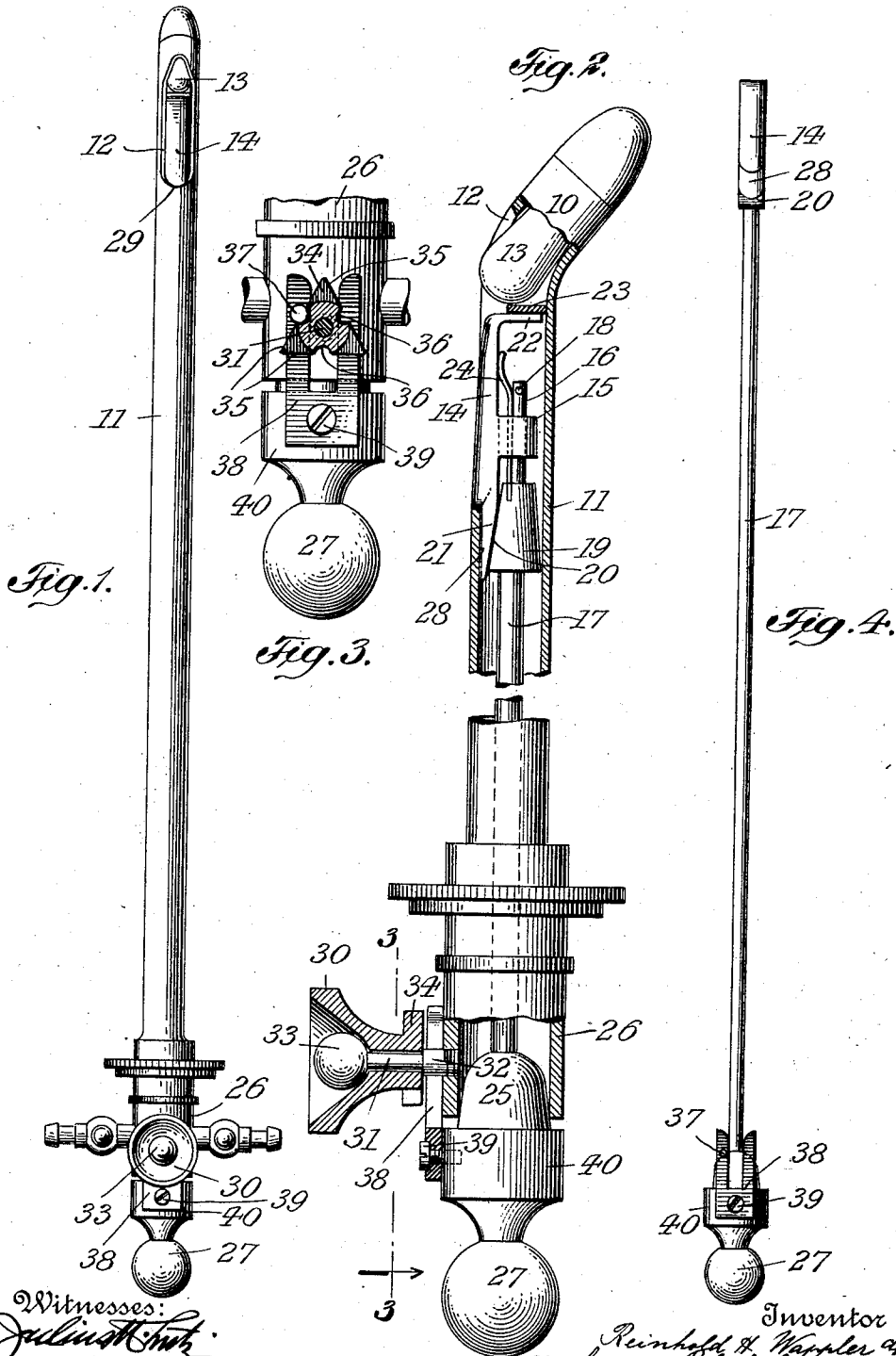


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CYSTOSCOPE.
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1,021,810.

Patented Apr. 2, 1912.



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UNITED STATES PATENT OFFICE.

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CYSTOSCOPE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, REINHOLD H. WAPPLER and ROBERT JUNG, citizens of the United States and Germany, respectively, and residing at New York city, county and State of New York, have jointly invented a new and Improved Cystoscope, of which the following is a specification.

This invention relates to a cystoscope of novel construction and more particularly to novel means for closing the observation opening at the end of the cystoscope in such a manner that no protruding edges are exposed which would be liable to scratch or otherwise painfully injure the patient during the introduction of the instrument.

In the accompanying drawing: Figure 1 is an elevation of a cystoscope embodying our invention; Fig. 2 is an enlarged side view of Fig. 1, partly in section and partly broken away; Fig. 3 a section on line 3—3, Fig. 2, and Fig. 4 an elevation of the plunger.

Near its bent free end 10, the cystoscope tube 11 is provided with a fenestral opening 12 and an incandescent lamp 13 which permit a close inspection of the internal parts under medical treatment, the usual lens system (not shown) being fitted into tube 11. When the cystoscope is to be introduced into the human body, the lens system is withdrawn while opening 12 is closed by an obturator or filler 14 which is so constructed that no protruding edges are formed either on the obturator or on the tube, thereby preventing the patient from being injured or subjected to pain.

Obturator 14 is provided with an inner eye 15 which loosely embraces the outer reduced end 16 of a plunger or rod 17, an accidental disengagement of eye 15 from rod section 16 being prevented by a transverse pin 18 of said section. Rod 17 carries a relatively fixed collar 19 having a beveled face 20 that is adapted to engage a corresponding bevel 21 on obturator 14. The latter is provided with a finger 22 adapted to engage an abutment 23 fast in tube 11 while a spring 24 secured to collar 19 and passing loosely through eye 15 tends to swing the outer end of obturator 14 outward. Rod 17 carries further a conical plug 25 adapted to provide a liquid-tight closure for a sleeve 26 fast on tube 11, while a knob or handle 27 on rod 16 serves for in-

serting said rod as well as obturator 14 into tube 11 and for withdrawing them therefrom.

When the obturator is inserted into the cystoscope, the former occupies its outermost position on rod section 16, until finger 22 bears against abutment 23 whereby its further advance is checked. During the continued forward movement of rod 17, the beveled face 20 of collar 19 by engaging the bevel 21 of obturator 14 will gradually force the rear end of the latter outward until an offset 28 on the obturator abuts against the inner surface of tube 11, the relative proportions of the parts being such that when opening 12 is properly closed, plug 25 provides a tight closure of sleeve 26 as illustrated in Fig. 2. In this position of the parts, obturator 14 substantially fills opening 12 and particularly renders nugatory or blankets the curved rear edge 29 of said opening, which hitherto caused the principal pain during the insertion of the cystoscope.

Additional means are provided which act as a lock for the obturator and prevent an accidental removal thereof, while permitting a ready withdrawal of the obturator without exerting an objectionable pull on the instrument, which would also be apt to give rise to pain. These means are shown to consist of a cup-shaped knob 30 which loosely turns on the reduced end 31 of a screw 32 tapped into sleeve 26, a ball 33 preventing a disengagement of the knob from the screw. At its base, knob 30 is provided with an integral triangular plate 34, each edge 35 of which has a central notch 36 adapted for the reception of a stud 37. The latter is fast on one prong of a fork-shaped member 38 secured by a screw 39 to a collar 40 arranged between plug 25 and handle 27 and integral therewith. Member 38 straddles screw 32 intermediate sleeve 26 and plate 34, thereby insuring an axial movement of rod 17 within tube 11 during the last stage of its advance, thus effecting a true juxtaposition of obturator 14 and window 12.

In use, the obturator is inserted into tube 11, so that stud 37 will bear against one of the edges 35 of plate 34 until it becomes seated in its central notch 36. Knob 30 is now turned to advance rod 17 until the outer face of obturator 14 is flush with the

outer face of tube 11 and sleeve 26 has been closed by plug 25, whereupon the cystoscope is inserted into the human body. Knob 30 is then rotated in the opposite direction to uncouple plug 25 and to withdraw collar 19 from bevel 21, thereby permitting spring 24 to force the rear end of obturator 14 inward, thus permitting a ready withdrawal of the latter. Lenses or other devices (not shown) may finally be introduced into the cystoscope tube for inspecting or treating the internal diseased parts of the patient.

We claim:

1. In a cystoscope, a tube provided with a fenestral opening, a rod adapted to be inserted into said tube, an obturator slidable on said rod, an abutment adapted to be engaged by the obturator, and means actuated upon an advance of the rod for projecting the obturator into the fenestral opening of the tube.

2. In a cystoscope, a tube provided with a fenestral opening, a rod adapted to be inserted into said tube, an obturator slidable on said rod and having a bevel, an abutment adapted to be engaged by the obturator, and means on the rod adapted to engage the bevel of the obturator.

3. In a cystoscope, a tube provided with a fenestral opening, a rod adapted to be inserted into said tube, an obturator slidable on said rod and having a bevel, an abutment adapted to be engaged by the obturator, and a beveled collar on the rod that is adapted to engage the bevel of the obturator.

4. In a cystoscope, a tube provided with a fenestral opening, a rod adapted to be inserted into said tube, an obturator slidable on said rod and having a bevel, an abutment adapted to be engaged by the obturator, a beveled collar on the rod adapted

to engage the first named bevel for projecting the obturator into the fenestral opening of the tube, an offset on the obturator which is adapted to engage the inner face of the tube, and a spring for withdrawing said offset from engagement with the tube.

5. In a cystoscope, a tube provided with a fenestral opening, an obturator adapted to be projected into said opening, a rod carrying the obturator, and means for reciprocating said rod.

6. In a cystoscope, a tube provided with a fenestral opening, an obturator adapted to be projected into said opening, a rod carrying the obturator, a rotatable knob and means for operatively connecting the knob to the rod.

7. In a cystoscope, a tube provided with a fenestral opening, an obturator adapted to be projected into said opening, a rod carrying the obturator, a sleeve on the tube, a screw tapped into said sleeve, a knob rotatable on said screw and having a triangular notched plate, a forked member carried by the rod and straddling the screw, and a stud on said member that is adapted to engage the plate-notches.

8. In a cystoscope, a tube provided with a fenestral opening, a sleeve on the tube, a rod adapted to be inserted into the tube, an obturator and a plug carried by the rod and adapted to be inserted into the fenestral opening and sleeve respectively, a knob rotatably mounted on the sleeve and having a triangular notched plate, and a stud movable with the rod and adapted to engage the plate-notches.

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