June 8, 1926. 1,587,897

W. J. CAMERON

SPECULUM

Filed July 27, 1925

Fig. 1.

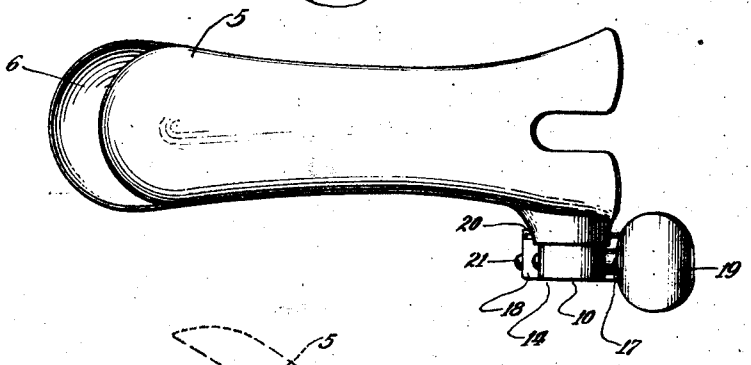


Fig. 2.

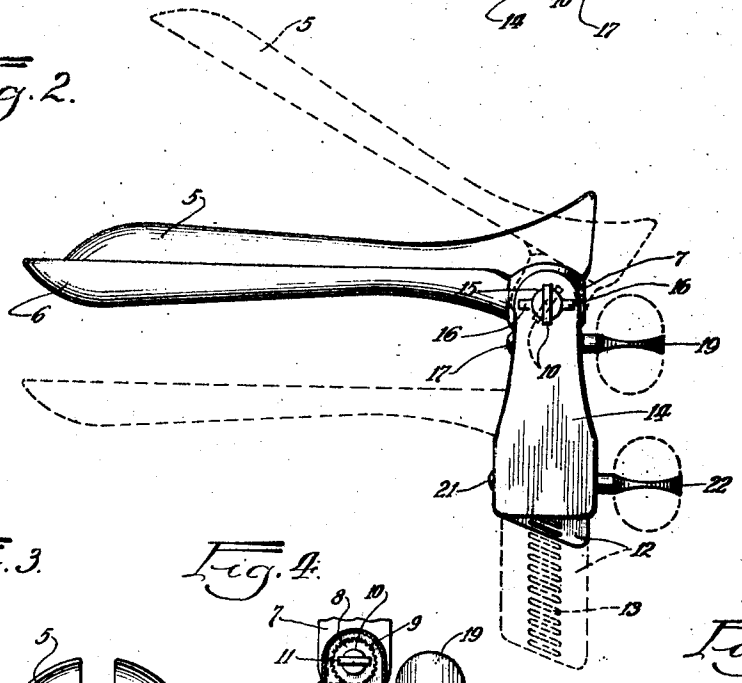


Fig. 3.

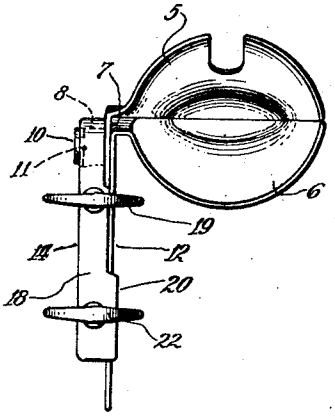


Fig. 4.

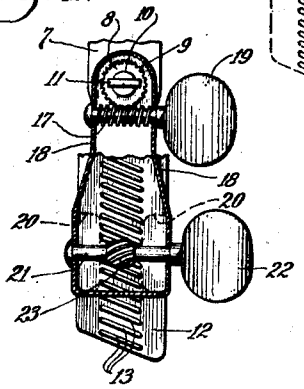
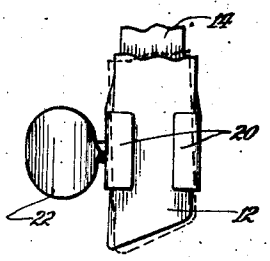


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILL J. CAMERON, OF CHICAGO, ILLINOIS.

SPECULUM.

Application filed July 27, 1925. Serial No. 46,298.

My present invention relates generically to surgical instruments and has specific reference to that class known as speculums.

Such instruments usually consist of a pair of blades that are adapted to move away from each other to dilate a cavity into which the blades have been previously inserted when in closed arrangement, and with the present structure I am able to readily dilate the interior of the cavity to a greater extent than the orifice through which the blades are initially inserted. I accomplish this in an effective, dependable, and simple manner, and the parts are arranged and interlocked that they may be easily separated for the purpose of thorough sterilization. The assembly of the parts is such that the opening and tilting of the blades will not interfere with the free and ready access to the interior of the dilated cavity for examination, operation or treatment.

The structure comprises a hollow box-like holder through which winding spindles are journaled and the blades are provided with lateral arms that are disposed alongside of each other when in position upon the holder and may be adjusted by the winding spindles to separate the blades the desired extent and then tilt the upper blade to the desired inclination with respect to the lower blade. The lateral arms are so constructed and arranged that the lower blade may be moved to a lowered position below the lower end of the arm of the upper blade and the upper blade then tilted to substantially a right angle to the lower blade, whereupon said upper blade may be removed from the holder and thereafter the lower blade may be raised until it moves out of the retaining means on the holder. This permits the structure to be readily separated for the purpose of sterilizing or for the replacement of parts, should the latter be found necessary.

I prefer to carry out my invention and to accomplish the objects thereof in substantially the manner hereinafter fully described and as more particularly pointed out in the appended claims, reference being made to the accompanying drawings that form a part of this specification.

In the drawings:

Fig. 1 is a top plan of my improved speculum.

Fig. 2 is a side elevation thereof, showing the blades closed in full lines, and opened and tilted in the dotted lines.

Fig. 3 is a vertical end view, looking at the same from the end adjacent the holder.

Fig. 4 is a vertical sectional view through the holder or box, showing the co-operation of the parts.

Figure 5 is a fragmentary detail showing the manner of tilting the arms to assist in maintaining them in adjusted positions.

The drawings illustrate a typical or preferred embodiment of my invention and for the purpose of convenience, I have employed similar reference characters to designate like parts wherever they appear throughout the several views. The structure preferably comprises a pair of elongated blades, preferably formed from sheet metal and of concavo-convex shape in transverse section. The blades are arranged with their concaved portions facing each other and they are rounded at their distal ends and slightly tapered, as will be seen by reference to Fig. 2, while the lower blade 6 is slightly longer than the upper blade, so that it projects beyond the end of the latter to permit of the ready insertion of the structure into a cavity. At the opposite end, the upper blade 5 is formed with a short arm 7 that extends laterally downward from one edge longitudinal thereof and intermediate the ends of this arm there is a stud 8 projecting horizontally therefrom and provided with worm teeth 9 (Fig. 4). The outer end portion of the stud is reduced in diameter as at 10 and extending transaxially across the end of the reduced portion is a locking bar 11 of greater length than said reduced portion 10, so that its ends extend beyond the edge of the reduced portion 10, the purpose of which will hereinafter be described.

The lower blade 6 has a lateral arm 12 of greater length than the arm 7 of the upper blade and which is disposed alongside the arm 7 when the structure is mounted in the holder. The arm 12 is flat and the face thereof next the arm 7 is provided with a plurality of oblique parallel grooves 13, as seen in Figs. 2 and 4.

The holder is an elongated box-like member, the outer wall 14 whereof is provided adjacent its upper end with an aperture 15, which has rectangular extensions or enlargements 16, extending in a horizontal direction, so as to provide what might be termed

a double key-slot. This permits the upper blade 5 to be placed in a vertical position or aligning longitudinally with the holder and the cross bar 11 on its arm 7 may be inserted from the back of the holder through the wall 14 until the reduced portion 10 of the stud positions itself in the aperture 15, with the end of the stud against the inner surface of the wall 14. A slight rotational or hinging movement of the blade 5 will move the ends of the bar 11 past the location of slots 16 and out of alinement therewith and thus maintain the blade 5 rotatably upon the holder. The means for rotating the stud 8 consists of a thumb screw, the threaded shank 17 of which is journaled in the side walls 18 of the box so as to be tangent to the periphery of the stud 8 and with the teeth in mesh with the teeth 5 on the stud, so that by rotating the wing end 19 of this thumb screw, the blade 5 may be adjusted to divers angles.

Adjacent the lower ends of the side walls 18, the latter are provided with lateral extensions in the form of ears 20 that extend towards each other and are disposed parallel with the front wall 14, so as to provide a guide in which the arm 12 of the blade may be inserted and moved longitudinally of the holder, both towards and away from the upper blade. The means for moving arm 12 and the blade 6 consists of a spindle 21 journaled in the side walls 18 of the holder and said spindle is provided upon its outer end with wings 22. The axis of this spindle 21 is parallel to and in vertical alinement with the axis of the thumb screw for tilting the upper blade and intermediate the side walls of the holder this spindle 21 is provided with an enlargement upon which worm teeth are formed that are in mesh with the oblique parallel grooves 13 in the face of the arm 12, so that by rotating the wing 22, the arm and the blade carried thereby may be moved up and down towards or away from the other blade.

As will be noted by reference to Fig. 4 the enlargement on the spindle 21 is spherical or globular in shape and the teeth are spirally disposed permitting the arm 12 to pivot thereon when the blades have been moved away from each other. There is a slight "play" between the arm and the ears 20 so that the pressure of the cavity orifice, which would have a tendency to close the blades, will tilt or cant as indicated in dotted lines in Fig. 5, which will cause the edges of the arm to bear against diagonal corners of the guide formed by the ears 20, in the manner of the well-known Sparks retractor.

From the foregoing, it will be seen that the blades may be separated the desired distance apart in parallel relation to each other and the upper blade may then be tilted to the desired angle with respect to its companion blade. Also it will be seen that by tilting the upper blade to its fullest extent, that is at substantially a right angle to the lower blade, and then lowering the lower blade until the upper end of its arm is below the lower end of the arm 7, the upper blade may be moved laterally away from the holder, after which the lower blade may be removed from the holder by an upward movement sufficient to pass the same out of engagement with the worm teeth 23 on the actuating spindle 21.

What I claim as new is:—

1. A speculum comprising a pair of concavo-convex blades each provided with a lateral arm, a stud projecting from the arm of the upper blade and having teeth upon its circumference, rack teeth upon the arm of the lower blade, a common support for said arms, a worm spindle rotatably mounted in said support and engaging the teeth of said stud, a toothed spindle rotatably mounted in said support and engaged with said rack teeth, and means for maintaining one of said arms in assembly with said support whereby the other arm is maintained against accidental displacement.

2. A speculum comprising a pair of movable blades, a support for said blades, a stud projecting from one of said blades and journaled in said support, means mounted in said support for rotating said stud to tilt the respective blade, and a rack and pinion having connection with the other blade and with said support whereby the latter blade is moved towards and away from the tiltable blade, the construction of said support being such as to permit a canting of the rack whereby to assist frictionally in maintaining the rack in divers adjusted positions.

3. A speculum comprising a pair of movable blades, a support for said blades, an arm on one of said blades having sliding adjustment with respect to said support, a stud projecting from the other blade, a cross piece extending transversely of the end of said stud, said support provided with a key-slot through which said cross-piece is inserted whereby to removably retain the stud in rotatable engagement with said support, and separate means for moving the respective blades.

Signed at Chicago, Cook County, Illinois, this 22nd day of July, 1925.

WILL J. CAMERON.