

[54] SPECULUM

[76] Inventors: **Lester L. Blount**, 7762 Bolsa Ave.,
Midway City, Calif. 92655;
Armando C. Hernandez, 802 N.
Concord, Santa Ana, Calif. 92701

[22] Filed: Nov. 22, 1971

[21] Appl. No.: 201,086

[52] U.S. Cl. 128/17, 128/6

[51] Int. Cl. A61b 1/32

[58] Field of Search 128/6, 17, 18

[56] References Cited

UNITED STATES PATENTS

3,332,414	7/1967	Gasper	128/17
2,012,597	8/1935	Cameron	128/6
559,122	4/1896	Daily	128/18
3,246,646	4/1966	Murphy, Jr.	128/17

Primary Examiner—Lucie H. Laudenslager
Attorney—Vernon D. Beehler et al.

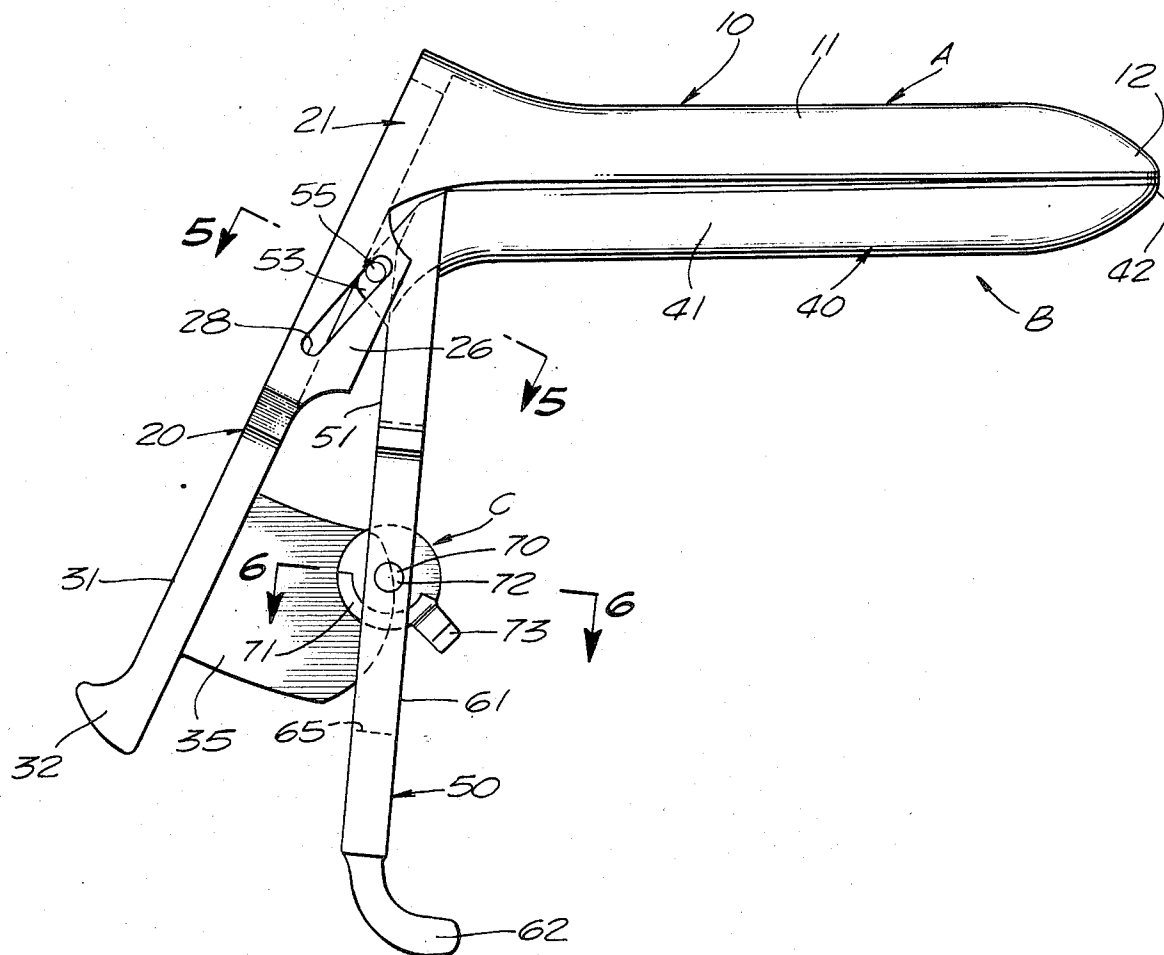
[57]

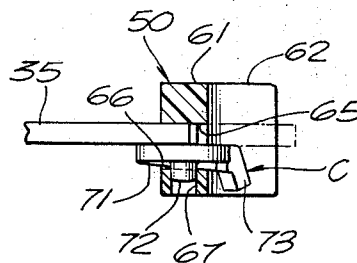
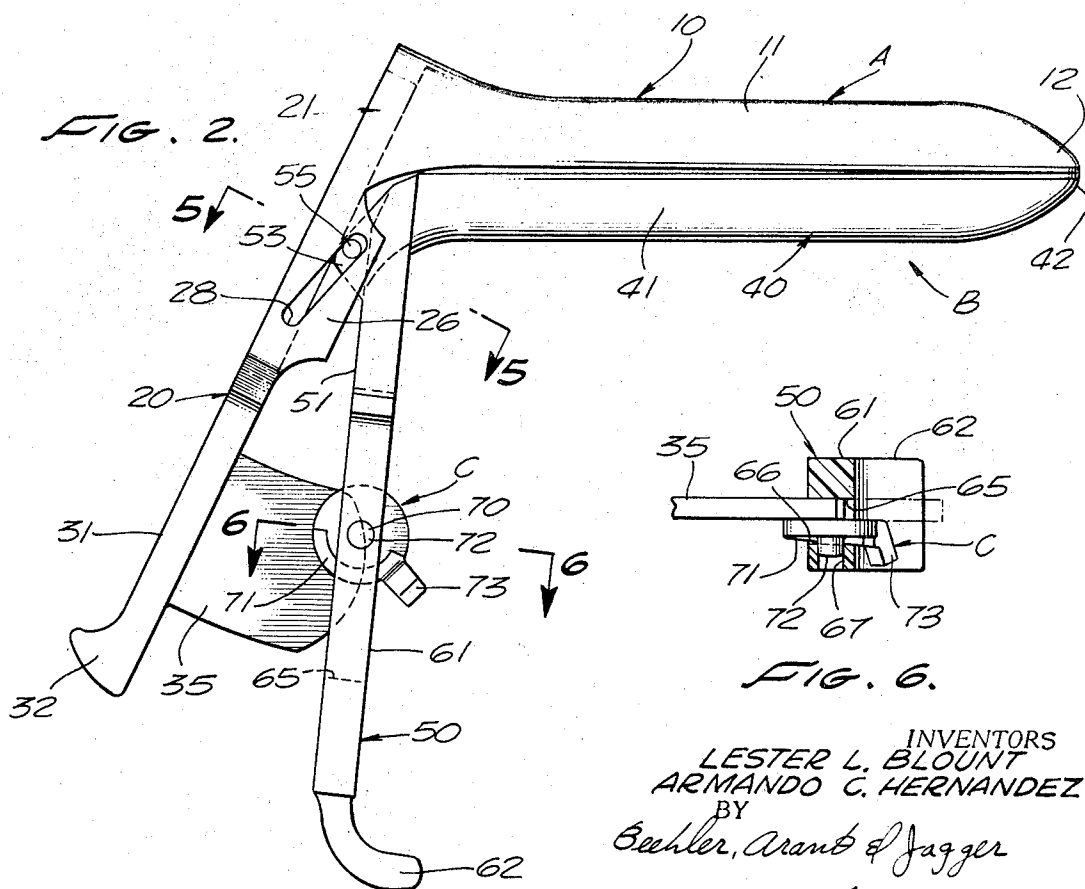
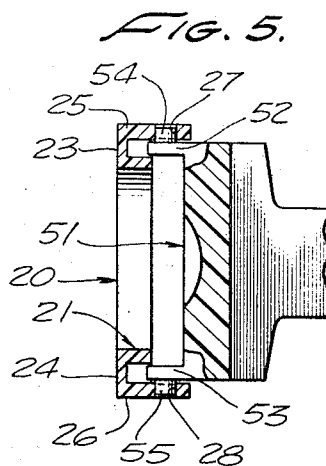
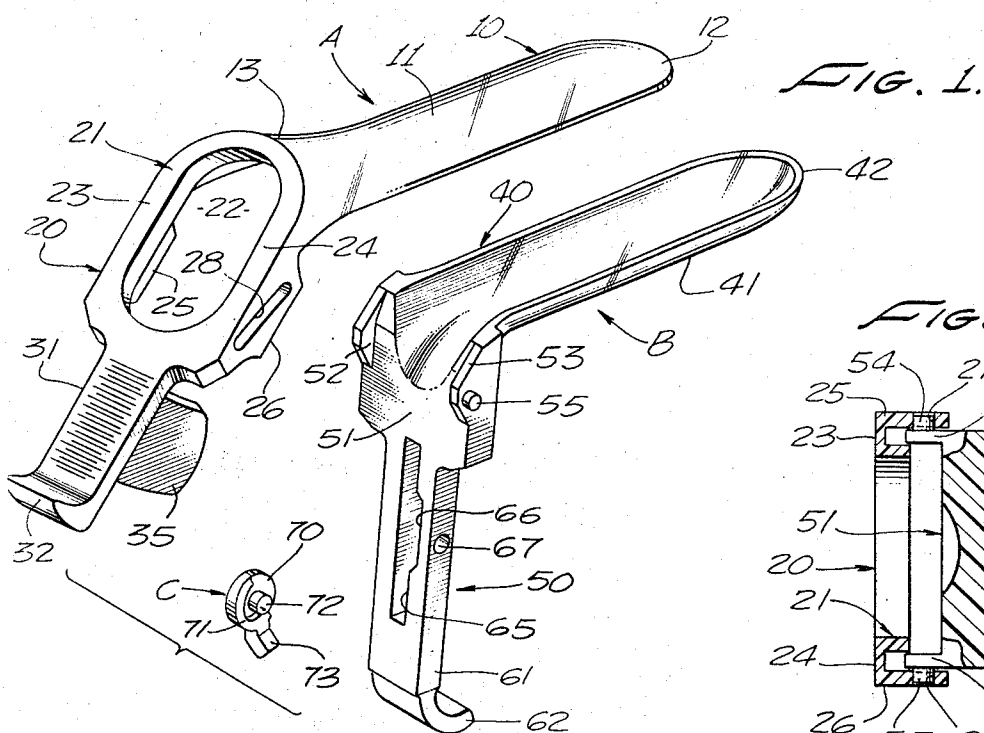
ABSTRACT

A vaginal speculum including a pair of dilator blades each equipped with a handle, a viewing window formed in one of the handles for viewing the space between the blades, and adjustment means associated with the handles for adjusting the relative positions of the handles to thereby adjust the relative positions of the blades. The adjustment means include a sliding trunnion arrangement, which permits both a pivotal movement of one blade relative to the other, and also a relative longitudinal movement of the blade handles which provides an opening or closing action between the blades.

Further included in the adjustment means associated with the handles is a cam mechanism adapted for releasably locking the two blades in any fixed position within their plane of relative movement. A cam plate carried by one of the handles is located in the plane common to both the handle and its associated dilator blade, and projects through a longitudinal slot formed in the other handle. A rotating cam member supported from one wall of the slot is utilized for fastening the cam plate in any desired position.

9 Claims, 7 Drawing Figures





INVENTORS
LESTER L. BLOUNT
ARMANDO C. HERNANDEZ
BY
Becker, Aramb & Jagger
ATTORNEYS

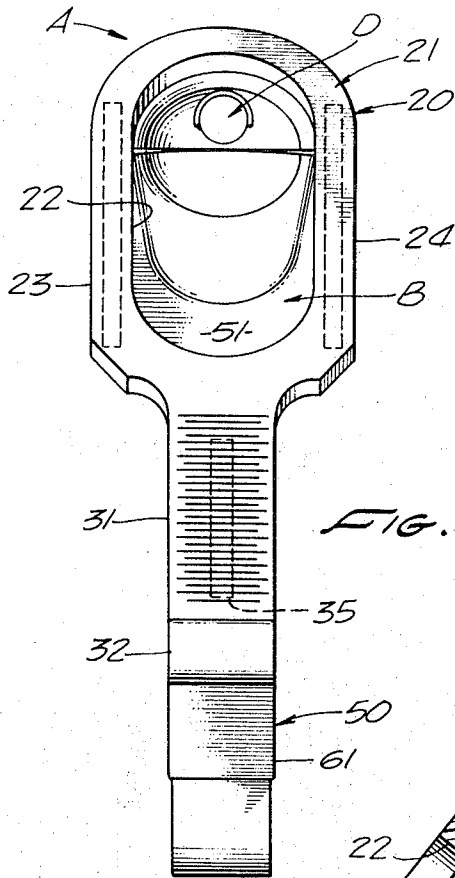


FIG. 3.

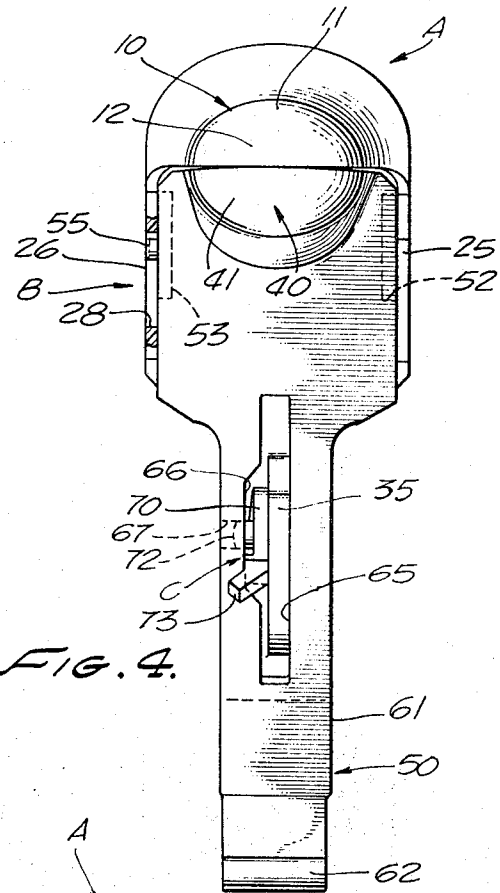


FIG. 4.

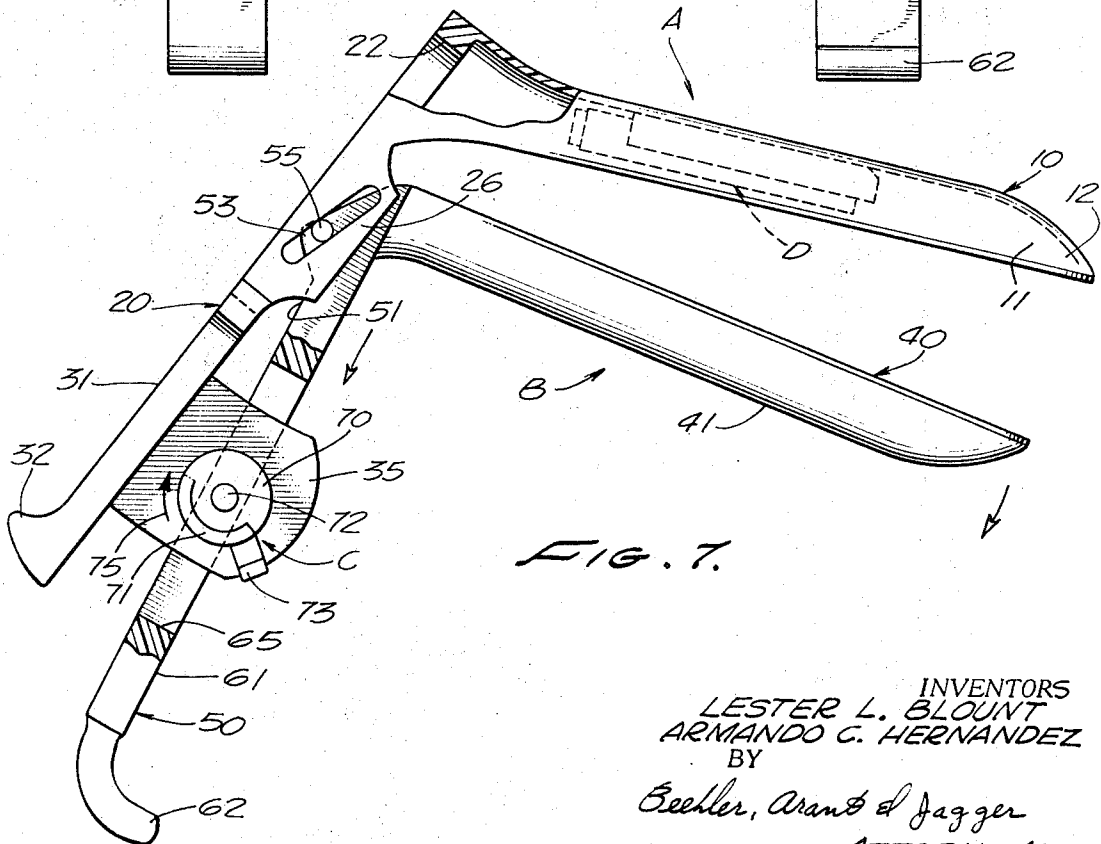


FIG. 7.

INVENTORS
LESTER L. BLOUNT
ARMANDO C. HERNANDEZ
BY
Becher, Aramb & Jagger
ATTORNEYS

SPECULUM

BACKGROUND OF THE INVENTION

In order to facilitate the examination and the treatment of the interior body cavities it is necessary to employ an instrument to dilate such cavities. Specula of various kinds have been devised for this purpose. In particular, it has been well known to utilize a vaginal speculum having a pair of dilator blades which are initially in a closed position, and which after insertion in the vagina are then separated. The handles attached to the respective blades have associated with them a position adjustment and fastening means, which is utilized for temporarily fastening the blades in their separated position while the physician completes his work.

While the instruments of this character which have been available heretofore have generally been considered entirely satisfactory, we nevertheless came to the conclusion that it might be possible to improve upon them.

For example, in the vaginal specula which were available heretofore, there has been some limitation on the range of adjustment of the relative position of the two blades. Based upon our experience we believe it would be advantageous to the physician to be able to select any desired lateral separation distance between the blades over a fairly wide range, and also to select any relative angular position of the blades over a fairly wide range, with the selections of lateral separation distance and angular adjustment being completely independent of each other.

When the blades are separated in the desired manner by the attending physician, it is then necessary that they be temporarily fastened in that relative position. It is very desirable that both the blade adjustment mechanism, and the blade fastening mechanism, be of such mechanical nature that they are very easy to operate.

The type of vaginal speculum which has been most commonly used is made of stainless steel, and has a long useful life, however, complete sterilization of the instrument is required after each usage. U. S. Pat. No. 3,246,646 issued April 19, 1966, however, discloses a vaginal speculum made of plastic material and which is disposable after a single usage. The adjustment mechanism and the fastening mechanism of that instrument, however, are not convenient for the physician to use. It would be desirable to have a speculum made of plastic, and hence disposable, which would be easy and convenient to use and adjust.

SUMMARY OF THE INVENTION

According to one feature of the invention an infinitely variable adjustment between the two dilator blades is provided, throughout the entire range of adjustments that may be needed. That is, the lateral separation between the blades may be established at any value between zero and maximum, as desired, and the angle of opening between the blades may also be established at any value between zero and maximum, as desired.

In order to accomplish the infinitely variable position adjustment of the blades, a latch mechanism is provided which includes a trunnion on one of the handles which engages a pair of longitudinal slideways on the other handle. The slideways provide a fulcrum for the trunnion, and the position of the trunnion may be moved to any point along the length of the slideways.

According to another feature of the invention a latch mechanism is provided which is capable of fastening the handles, and hence the blades, in any selected relative position. An elongated slot is formed in one of the handles. A cam plate is integrally formed with the other handle, lying in the plane common to both the handle and its associated dilator blade and the cam plate projects through the slot of the first-named handle. A cam member supported from one wall of the slot is utilized to releasably fasten the cam plate in its selected position.

DRAWING SUMMARY

FIG. 1 is an exploded perspective view of our novel speculum;

FIG. 2 is a side elevation view of the instrument;

FIG. 3 is a top plan view of the instrument of FIGS. 1 and 2, additionally showing a small flashlight attached to one of the blades;

FIG. 4 is a bottom view of the instrument of FIG. 2;

FIG. 5 is a transverse cross-sectional view taken on the line 5—5 of FIG. 2;

FIG. 6 is a fragmentary cross-sectional view taken on the line 6—6 of FIG. 2; and

FIG. 7 is a view like FIG. 2 but showing the blades in their open position.

PREFERRED EMBODIMENT

Referring to FIGS. 1 to 7, inclusive, the presently preferred form of the invention will be described without reference to the flashlight D that is shown in FIGS. 3 and 7.

As best seen in FIG. 1, the instrument includes a first generally L-shaped member A and a second generally L-shaped member B. The forward arm 10 of member A provides a first dilator blade which has a forward surface 11 that is laterally convexly curved. The blade 10 also has a rounded nose portion 12, and while it is straight throughout most of its length the rearward portion 13 of its forward surface is bent or bulged in a forward direction. See FIGS. 2 and 7.

The rearward arm 20 of member A extends at an angle of about 120 degrees relative to the forward arm 10 (see FIGS. 2 and 7). A generally ring-shaped portion 21 is attached to the rearward end or base of the blade 10, and forms a viewing window 22 which is actually of a somewhat elongated or elliptical configuration. The respective lateral sides of the ring-shaped portion 21, on respective sides of window 22, are identified as 23 and 24, respectively, and are provided with downwardly depending flanges 25 and 26, respectively. The flanges have longitudinal slideways 27, 28, respectively, formed therein. While slideway 27 is not specifically shown in the drawings it is identical in configuration and arrangement to the slideway 28.

Also forming a part of the rearward arm 20 of L-shaped member A is a handle 31, which extends rearwardly from the ring-shaped portion 21 and in longitudinal alignment therewith. At its rearward extremity the handle 31 is provided with a handle tip 32 which is turned upwardly so as to prevent slippage of the hand of the physician. A cam plate 35 is attached to the under side of handle 31 and extends downward therefrom, in a direction somewhat parallel to the dilator blade 10, and lying in a plane common to both the dilator blade 10 and the handle 31.

Although our instrument may be fabricated in other ways, it is believed advantageous to fabricate the member A, for example, as an integrally formed member from relatively rigid plastic material. Thus a single mold may be utilized to form the part A on a large volume basis.

The L-shaped member B includes a forward arm 40 which provides a second dilator blade, having a rearward surface 41 which is convexly curved in the lateral direction. Blade 40 also has a rounded nose 42. The blade 40 is essentially straight throughout its length as best seen in FIGS. 2 and 7.

Member B also has a rearward arm 50 which extends at an angle of about 95° to the forward arm 40. The rearward arm 50 includes a base 51 attached to the rearward end of blade 40, having on its lateral edges raised flanges 52, 53 from which the trunnion pins 54, 55 project laterally outward. See FIG. 5. Handle 61 projects rearwardly from the base 51 and in longitudinal alignment therewith. At the rearward extremity of handle 61 a handle tip 62 is formed, which is curved downward so as to prevent the attending physician from losing his grip on the instrument.

The handles 31, 61 are adapted to be generally parallel when the blades 10, 40, are in a generally parallel relationship. More specifically, however, when the blades 10, 40 are precisely parallel as shown in FIG. 2 the handles 31, 61 are separated by an angle of about 25°, as best seen in FIG. 2. If the handles are brought more closely into parallel relationship, with a separation angle of about 10° as shown in FIG. 7, then the blades 10, 40 are separated by an angle of about 15° with their forward ends 12, 42 being separated more widely than their rearward or base ends.

Handle 61 has an elongated slot 65 formed therein, the purpose of which is to receive the cam plate 35. The slot 65 is enlarged on one side at 66, and a hole 67 is formed in one side of the handle 61 and opening into the recessed portion 66 of the slot 65.

In the assembled form of the instrument the trunnion pins 54, 55 are engaged in the longitudinal slideways 27, 28 respectively. When each of the members A and B is integrally formed from relatively rigid plastic material, as is preferred, then the members are capable of sufficient resilient deformation so that the trunnion pins may be engaged into the slideways. However, if the members are not sufficiently resiliently deformable for that purpose, then the ears or flanges 52, 53 may be formed with holes for receiving the pins, and the pins may be inserted and fastened as a separate operation in conjunction with the assembly of the members A and B together.

It will be evident that when the pins 54, 55 are engaged in the slideways 27, 28 it is also necessary to insert the cam plate 35 of member A through the elongated slot 65 of member B. In the fully closed position of the blades as shown in FIG. 2 there is only a limited or partial insertion of the cam plate. Where the blades are opened at an angle as shown in FIG. 7 there is a more full insertion of the cam plate into the slot.

The cam C is utilized for fastening the cam plate 35 in its selected position. The cam C includes a flat circular base 70 having a ramp 71 formed upon a portion of the circumference of its upper surface. A pin 72 projects from the center of the upper surface of base 70. A handle 73 projects radially outward from one edge por-

tion of the base 70. Cam C is preferably integrally formed from relatively rigid plastic material.

In assembling the instrument the cam C is first placed within the slot 65, and is moved laterally into the recessed portion 66 of the slot so that the cam pin 72 is engaged in the hole 67. The blades A and B are assembled together subsequently, with cam plate 35 then entering the slot 65 and filling up the remaining space beside or beneath the base 70 of cam C. FIGS. 2 and 7 both show the cam C in its locked position in which the higher portion of ramp 71, adjacent handle 73, engages the inner wall of the slot recess 66. The locking action is shown by an arrow 75 in FIG. 7. When it is desired to unlock the cam the handle 73 is rotated in the opposite direction, so that the lower portion of the ramp 71 is engaging the side wall of the slots. Cam plate 35 is then loosened, permitting the relative position of members A and B to be changed.

It will be noted that the length of slot 65 is somewhat greater than the length of cam plate 35, and the hole 67 which positions cam C is located at about the longitudinal center of the slot 65. Therefore, in the closed position of the blades as shown in FIG. 2 the cam C engages the relatively lower and relatively forward portion of cam plate 35, while in an open position of the blades as shown in FIG. 7 the cam C engages a relatively rearward portion of the cam plate 35.

It will be noted that the longitudinal slideways 27, 28 do not lie precisely parallel to the plane of the rearward arm 20 of member A, but rather their forward ends are downwardly inclined and their rearward ends are upwardly inclined, at an angle at about 10° relative to the arm 20. The reason for this angular inclination of the slideways is that it provides a more positive opening action of the instrument.

An added feature is shown in FIG. 5. The sides 23, 24 of the window 22 have recesses 27a, 28a cut in their under surfaces. The tips of the flanges or ears 52, 53 fit up into these recesses, thus giving a more positive guidance to the relative movement between the members A and B.

ALTERNATE FORMS

According to one alternate form of the invention a small flashlight D is attached to the interior upper surface of the blade 10. A button switch on the upper end of the flashlight is used to turn it on. See FIGS. 3 and 7. This greatly facilitates the work of the physician since he does not have to look for a flashlight as a separate piece of apparatus, and then hold it in one hand while performing his examination or treatment. The flashlight D is preferably utilized in the disposable form of the instrument, so that following usage the entire instrument including the flashlight is thrown away.

While a rotary cam C has been illustrated herein, it will be understood that other types of cams may be utilized if desired, in conjunction with the cam plate 35.

As will be understood by those skilled in the art, what has been described are preferred embodiments in which modifications and changes may be made without departing from the spirit and scope of the accompanying claims.

We claim:

1. A vaginal speculum comprising:
a first generally L-shaped member providing a first dilator blade and a handle therefor;

a second generally L-shaped member providing a second dilator blade and a handle therefor, said first member fitting over said second member and said handles being adapted to be separated by an angle of about 25° when said two blades are in closed parallel relationship;

means for supporting said two members in movable relationship to each other, so that said two blades may be separated by a desired distance, and concurrently opened to a desired angle up to a maximum of about 25°, including a trunnion formed on the handle of said second member and a pair of longitudinally extending slideways formed on said first member and adapted to be engaged by the pins of said trunnion;

and means for releasably fastening said members in a selected relative position, including a cam plate which depends downwardly from the handle of said first member and is located in the plane common to the blade and handle of said first member, an elongated slot formed in the handle of said second member and adapted to receive said cam plate therein, and a cam member received in said slot and cooperable with said cam plate for fastening said cam plate relative to said handle of said second member.

2. A speculum as claimed in claim 1 wherein said cam member is rotatably supported from one wall of said slot.

3. A vaginal speculum comprising:

a first generally L-shaped member providing a first dilator blade and a handle therefor;

a second generally L-shaped member providing a second dilator blade and a handle therefor, said first member fitting over said second member and said blades being adapted to be separated at their distal ends when said two handles are in closed parallel relationship;

attachment means supporting the corner portion of said first member from the corner portion of said second member in both pivotal and slidable relationship therewith so that the proximal portions of

said blades may be separated by a desired distance and the distal ends thereof may concurrently be opened;

and means for releasably fastening said members in a selected relative position, including a cam plate which depends downwardly from the handle of said first member and is received within an elongated slot formed in the handle of said second member, and a cam member received in said slot and supported from one wall thereof and selectively rotatable for exerting a locking pressure upon said cam plate.

4. A speculum as claimed in claim 3 wherein when said blades are precisely parallel, the angle between said two handles is about 25°.

5. The speculum claimed in claim 3 wherein said first generally L-shaped member includes a generally ring-shaped portion attached to the rearward end of said blade forming a viewing window; and wherein said attachment means includes downwardly depending flanges formed on respective sides of said viewing window, a longitudinal slideway formed in each of said flanges, and a trunnion formed on said handle of said second member and having pins adapted to engage said slideways.

6. A speculum as claimed in claim 5 wherein the forward ends of said slideways are inclined downward at an angle of about 10° relative to said handle of said first member.

7. A speculum as claimed in claim 5 wherein said slideways have smooth longitudinally extending surfaces which are relatively tightly engaged by the pins of said trunnion.

8. A speculum as claimed in claim 5 wherein said trunnion has upwardly extending ears, and said ring-shaped portion of said first member has longitudinally extending recesses formed in its under surface adjacent said flanges and which are engaged by said ears.

9. A speculum as claimed in claim 3 wherein said cam member is rotatably supported from a hole in one side of said slot.

* * * * *

45

50

55

60

65