Nov. 4, 1958 E. KAHN 2,858,826

VAGINAL SPECULUM

Filed Jan. 22, 1957 3 Sheets-Sheet 1

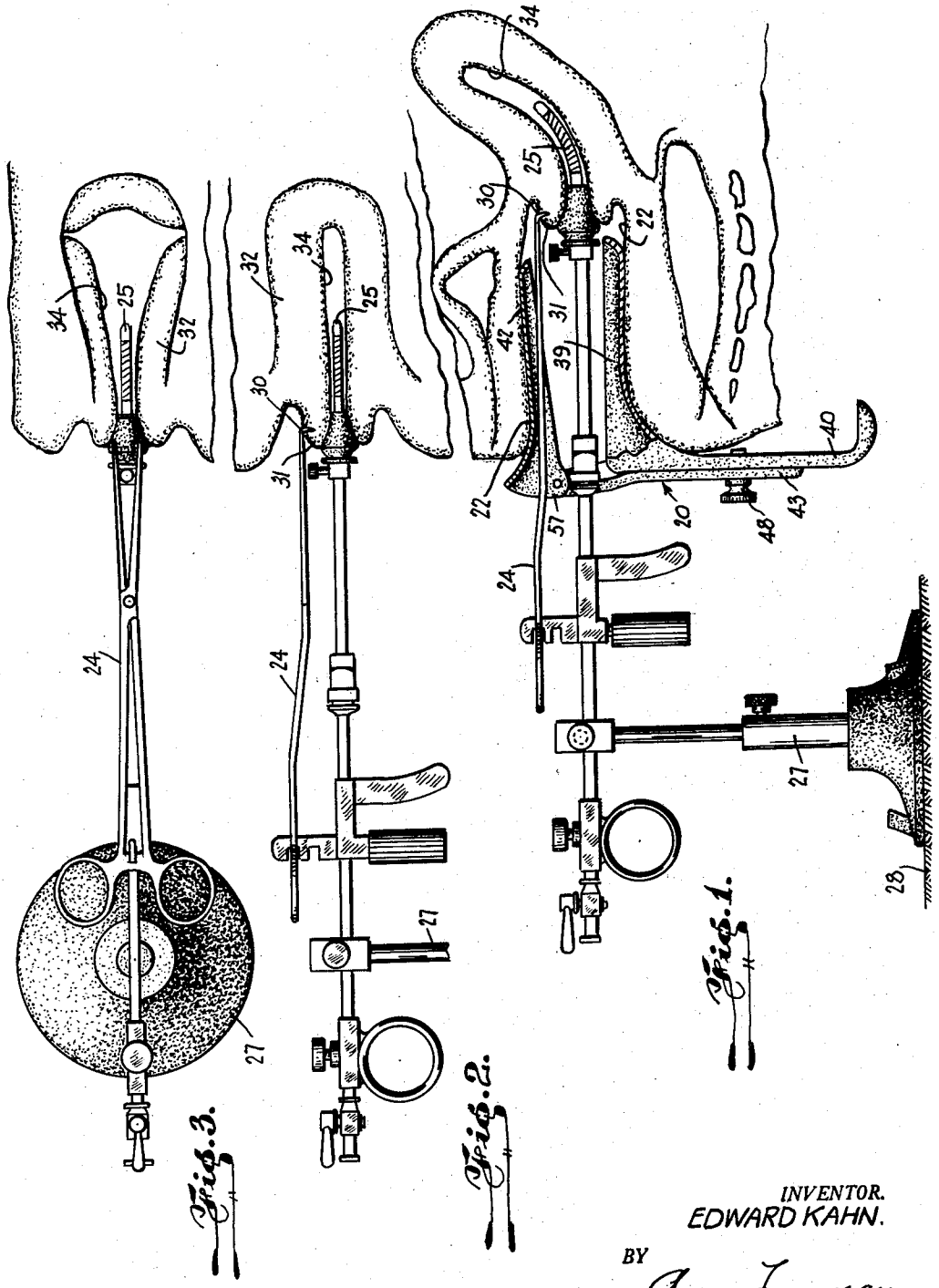


Fig. 3.

Fig. 2.

Fig. 1.

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VAGINAL SPECULUM

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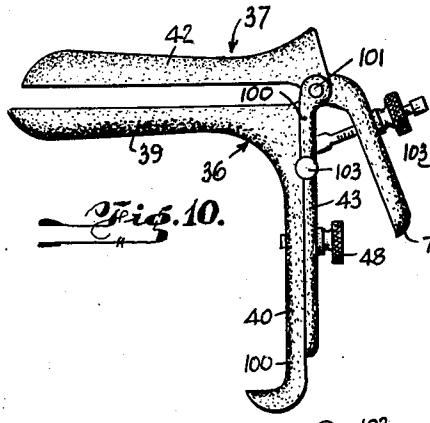


Fig. 10.

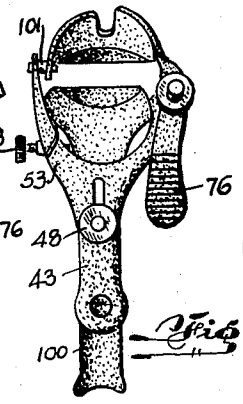


Fig. 11.

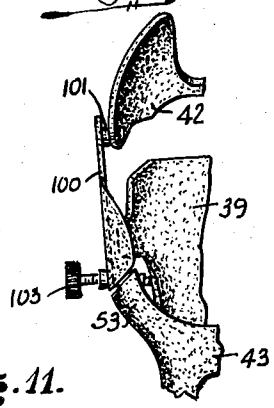


Fig. 13.

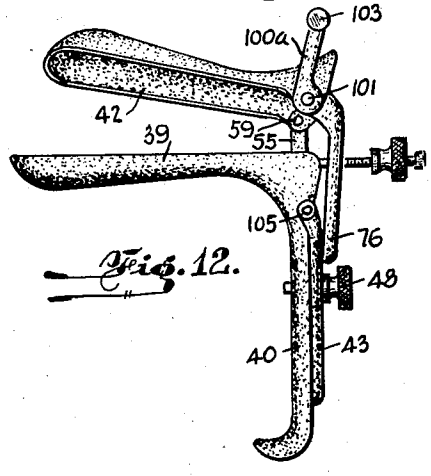


Fig. 12.

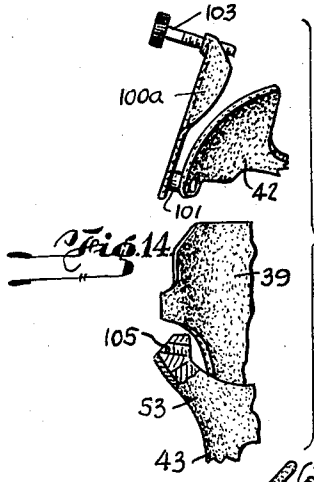


Fig. 14.

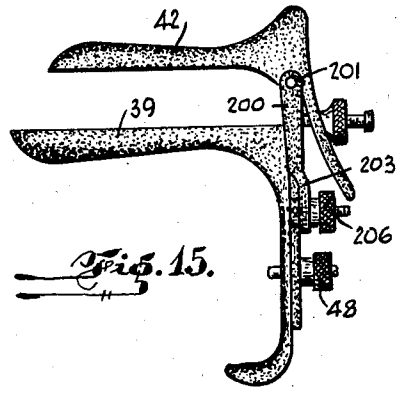


Fig. 15.

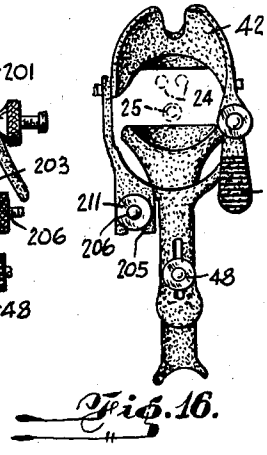


Fig. 16.

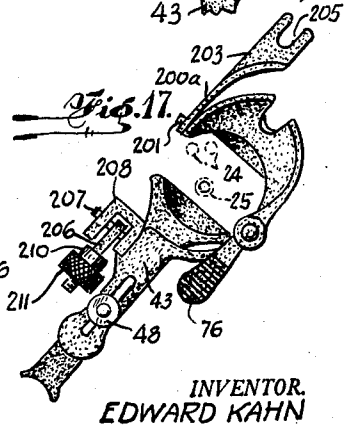


Fig. 17.

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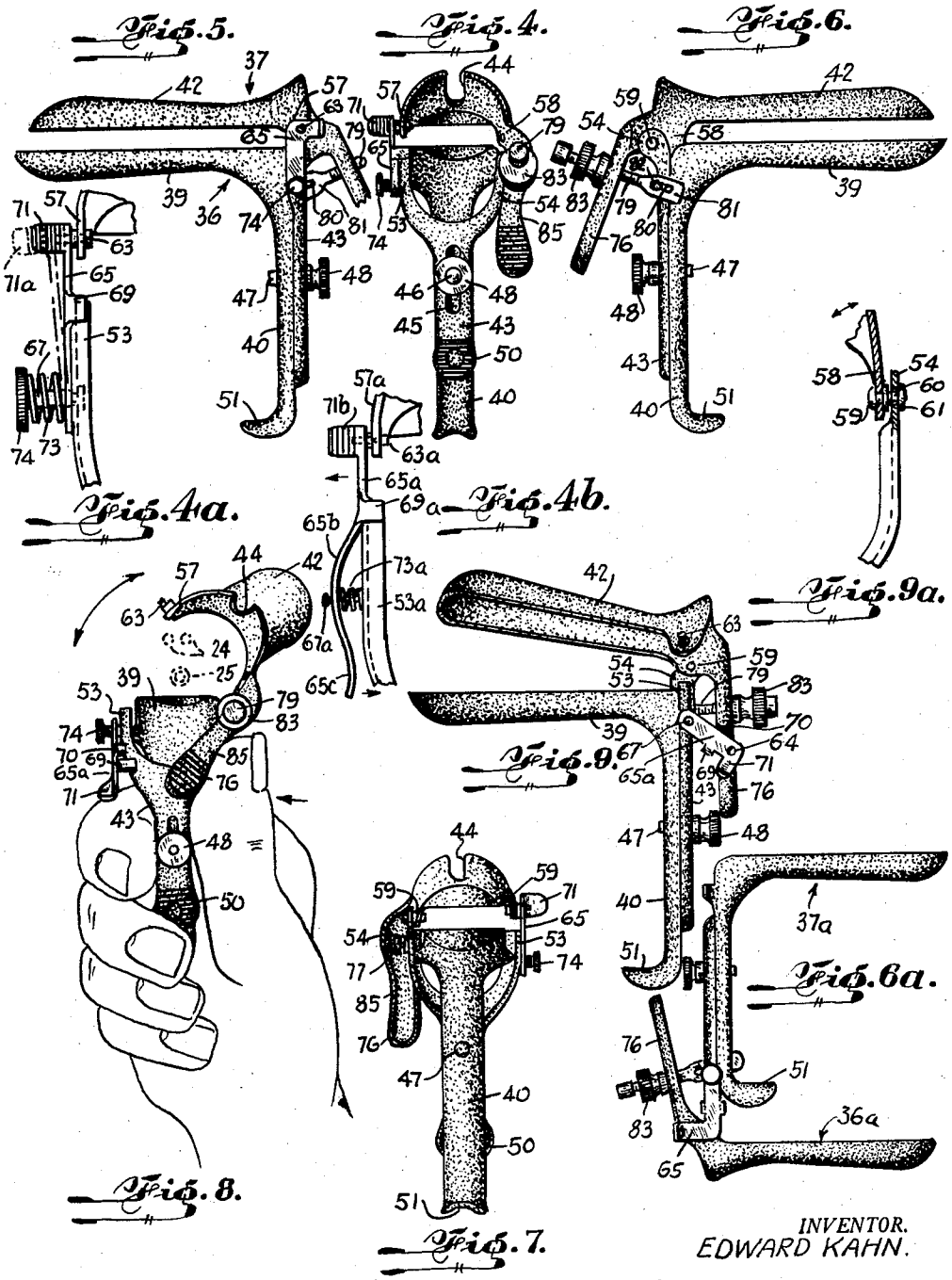
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Nov. 4, 1958 E. KAHN 2,858,826

VAGINAL SPECULUM

Filed Jan. 22, 1957 3 Sheets-Sheet 3



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United States Patent Office

2,858,826

Patented Nov. 4, 1958

2,858,826

VAGINAL SPECULUM

Edward Kahn, Queens Village, N. Y.

Application January 22, 1957, Serial No. 635,316

10 Claims. (Cl. 128—17)

This invention relates to surgical instruments and, more particularly, to a metal vaginal speculum having means permitting a side opening when required.

The metal Graves vaginal speculum has been found quite satisfactory for various routine examinations and treatments of the vaginal canal and cervix uteri, and is acknowledged to be the most popular type of speculum used for the purpose. The Graves speculum has many advantages amongst which are its simplicity of operation; the good exposure obtained by its use; the fact that it has a stem or "handle" which permits handling of the instrument without contaminating the sterilized blades that enter the vagina, the handle or stem also facilitating maneuvering the instrument into position for improved exposure of the cervix; and the fact that, by a simple reversal of the blades by the use of its stem and set screw, it converts to a Sims speculum which has its own special uses for exposing the cervix in the Sims or knee-chest positions.

The Graves speculum, however, has certain shortcomings for special diagnostic and treatment procedures that have been developed since the Graves speculum was originally designed, and so the present invention has been devised to bring the Graves speculum "up to date" without having to modify the classic simplicity of design or operation that has made it so popular for general use.

The special procedures for which the improvements have been devised are: hystero-salpingography (utero-salpingography), hysterography (uterography), and cervicography, for the investigation and treatment of female infertility due to non-patency of the fallopian tubes, defects in development, or other pathological conditions (salpingography), and for the investigation and treatment of defects in development, or other pathological conditions of the uterine cavity (hysterography), and of the cervical canal (cervicography).

An object of this invention, therefore, is to provide a metal speculum that is simple in construction, and provided with a mobile supporting arm removably locked in place to perform functionally as does the fixed supporting arm on the left side of the conventional Graves speculum, but capable of being unlatched when required to provide a temporary open side for special procedures, wherein the speculum is readily removed from the vaginal canal without disturbing other instruments positioned therewith, and which will overcome the aforementioned operational difficulties.

Another object of this invention is to provide a Graves type of speculum, having a pair of relatively movable blades pivotally connected and in which the pivot at one side thereof may be disconnected to permit the withdrawal of the speculum longitudinally and transversely relative to adjacent instruments positioned within the vaginal canal.

Still another object of the present invention is to provide a Graves type speculum having a side opening and removable joint connection for removing and introducing the speculum in the vaginal canal independently of other instruments positioned therewithin.

A still further object of this invention is to provide a side opening Graves type of speculum that may be readily converted to a Sims type of speculum.

All of the foregoing, as well as additional objects and advantages of this invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing, wherein:

Fig. 1 is a diagrammatic view showing a speculum partly in section, and made in accordance with the present invention, in operative association within the vaginal canal, together with a tenaculum and cannula.

Fig. 2 is a view similar to Fig. 1, with the speculum removed from the vaginal canal, and the cervix under traction by the tenaculum.

Fig. 3 is a top plan view of the apparatus shown in Fig. 2.

Fig. 4 is a rear elevational view of one form of speculum made in accordance with the present invention.

Fig. 4*a* is an enlarged fragmentary view showing the pivot bearing latch construction of the speculum shown in Fig. 4.

Fig. 4*b* is a view similar to Fig. 4*a* but showing a modification of the latch.

Fig. 5 is a side elevational view of the speculum shown in Fig. 4.

Fig. 6 is a view similar to Fig. 5, showing the opposite side of the speculum.

Fig. 6*a* is a side elevational view of the speculum shown in Figs. 4 to 6 converted from a Graves type to a Sims type of speculum.

Fig. 7 is a front elevational view of the speculum shown in Fig. 6.

Fig. 8 is a view similar to Fig. 4, showing the speculum in an open position in the hand of an operator.

Fig. 9 is a view similar to Fig. 9 with the speculum in a side-open position.

Fig. 9*a* is an enlarged fragmentary view similar to Fig. 4*a* showing the other pivotal connection of the speculum.

Fig. 10 is a view similar to Fig. 5, showing a modified form of the present invention.

Fig. 11 is a rear elevational view of the device shown in Fig. 10.

Fig. 12 is a view similar to Fig. 10, showing the device in a side-open position.

Fig. 13 is an enlarged fragmentary view of the device shown in Fig. 10, showing a pivotal connection thereof.

Fig. 14 is a view similar to Fig. 13, showing the parts in an open position.

Fig. 15 is a side elevational view of the still further modified form of the present invention.

Fig. 16 is a rear elevational view of the speculum shown in Fig. 15.

Fig. 17 is a view similar to Fig. 16, showing the parts in an open position.

Referring now to Figs. 1 to 3 of the drawing, a speculum **20** made in accordance with the present invention is shown in operative association with the vaginal canal **22** of a female human body. As is more clearly discussed in my Patent No. 2,482,622, dated September 20, 1949, the speculum **20** is used in connection with a tenaculum **24** to provide access to the cervix by the cannula **25**. Both the tenaculum and cannula extend through the housing or opening defined by the speculum and are supported on an adjustable base **27** that is secured to the examination table **28**. The teeth **30** of the tenaculum are arranged to grip the anterior lip **31** of the cervix **32** and draw it towards the opening of the vaginal canal, as more clearly shown in Fig. 2. In this position, the cannula **25** is properly positioned within the straightened cervico-

uterine canal for the X-ray visualization of the adjacent areas. Because of the novel construction of the speculum of the present invention, the speculum is capable of being removed from the cervix, without disturbing the position of the tenaculum and cannula that are supported on the adjustable base.

Referring now to Figs. 4 to 9 of the drawing, one form of the present invention is shown to include a speculum **20** having a lower blade assembly **36** and an upper blade assembly **37**. The lower blade assembly **36** is of an inverted L-shaped configuration and includes a lower blade **39** and a perpendicularly related integral leg **40**. The upper blade assembly **37** includes a Y-shaped yoke **43** and an upper blade **42** pivotally supported thereon, for a jaw-like movement relative to the lower blade **39**. The rearward upper edge of the upper blade **42** is provided with an open slot **44** to permit the manipulation of instruments inserted through the speculum. As is more clearly shown in Fig. 4, the base of the yoke **43** is provided with an elongated vertical slot **45** through which extends the threaded portion **46** of a stud **47** which is secured to the leg **40** of the lower blade assembly. A thumb screw **48** threadingly engaged with the stud **47** is adapted to be rotated into securing engagement with the yoke **43** to maintain it in a desired vertical position relative to the lower blade assembly **36**. A serrated thumb plate **50** at the base of the yoke **43**, together with a finger bar flange **51** at the bottom of the leg **40**, provides an expedient means for adjusting the relative vertical position of the upper and the lower blade assemblies which may be maintained by the thumb screw **48**.

The yoke **43** includes a pair of upwardly extending ears **53**, **54**, which are arranged to support the upper blade **42** through a pair of similar downwardly extending ears **57**, **58**. A pivot pin **59** secured to the downwardly extending ear **58**, as shown in Fig. *9a*, extends through an enlarged opening **60** in the upwardly extending ear **54** of the yoke, and is secured therein by means of the enlarged head **61** thereof. The enlarged opening **60** in the ear provides somewhat of a universal joint connection for the upper plate **42** so that it may be rotated to substantially any angle relative thereto, as more clearly shown in Fig. 8. The other downwardly extending ear **57** of the upper blade is provided with a rigid pivot pin **63** that is arranged to be received within an opening **64** (Fig. 9) in the rotatable trunnion latch plate **65** that is pivotally supported on the upwardly extending ear **53** of the yoke by means of a pivot pin **67**. This plate has a perpendicularly extending forward lug **69** and a somewhat smaller rearward lug **70** that are arranged to receive the upwardly extending ear **53** of the yoke therebetween when placed in a vertical position. A flanged finger plate **71** that flares outwardly from the latch plate **65** provides a means for rotating the trunnion plate into and out of the vertical ear engaging position shown in Fig. 5, wherein the pivot pin **63** is rotatably secured within the opening **64** of the plate. Movement out of the vertical position is resisted by the forward lug **69** and a coil spring **73** which encircles the pivot pin **67** and acts between the plate **65** and the enlarged head **74** of the pin.

The opposite side of the upper blade **42** is provided with a downwardly extending serrated thumb plate **76** that has a vertically elongated slot **77** (Fig. 7) intermediate its length. This slot is arranged to receive a threaded stud **79** having an enlarged opening **80** at one end **81** thereof for rotatably receiving a pin **82** fixed to the side of the upwardly extending ear **54** of the yoke **43**. The threaded end of the stud **79** extends through the enlarged opening **80** in the thumb plate and is threadingly engaged with a thumb screw **83** which abuts the thumb plate so as to maintain it in a selective open position. The side of the thumb plate **76** is provided with a depression **85** which may be engaged by a thumb to urge the upper blade about a longitudinal axis of the speculum to an inclined position when the opposite side

of the blade is moved out of its rotatable engagement with the trunnion plate **65**.

In using the speculum, the trunnion plate **65** is swung into securing engagement with the pivot pin **63** and the adjustable thumb screw **83** threaded outwardly to permit the complete closing of the upper blade **42** relative to the lower blade **39**, and the yoke **43** lowered relative to the lower blade assembly to its lowermost position. The speculum is then inserted into the vaginal canal and the upper and lower blade assemblies moved vertically apart sufficiently to expose as much of the cervix as possible, the blade assembly being held in the desired position by means of the thumb screw **48**. By exerting a pressure on the thumb plate **76** the upper blade **42** is rotated upwardly relative to the lower blade **39** more completely to expose the cervix and upper vagina, the desired position thereof being maintained by the set screw **83** which may be rotated into abutment with the upper portion of the thumb plate. The instruments necessary for the gynecological procedures are then inserted into the vaginal canal through the opening or housing defined between the upper and lower blades of the speculum, as more clearly shown in Figs. 1, 2, and 3. With these instruments in proper position, it is necessary to withdraw the speculum to permit X-ray visualization of the studied parts. This is done by urging the trunnion latch plate **65** out of its normally vertical position in engagement with the upwardly extending ear of the yoke 43 to a released position **65***a* by exerting an outward pressure on the finger plate **71** to urge it to its extended position **71***a* as shown in Fig. 4*a*. This movement releases the pivot pin **63** from engagement with the opening **64** in the trunnion plate **65** so that the instruments **24**, **25**, which are maintained within the vaginal canal, may pass through the opening provided by the removal of the pivotal connection. In withdrawing the speculum, a pressure is exerted in the depression **85** of the thumb plate **76** so as to rotate the upper blade **42** of the speculum to the position shown in Fig. 8 so that the other instruments are not disturbed. The thumb screw **48** may also be loosened so as to permit the upper and lower blade assemblies **36**, **37**, to be closed vertically together to facilitate the withdrawal of the speculum. Should it be desired to reinsert the speculum in the presence of the other instruments, the steps outlined above may merely be reversed and the speculum returned to the initial position.

It will be recognized that the speculum is provided with a pivotal connection at each side of the upper and lower blade as in the conventional Graves type speculum so that the leverage available is the same as with the conventional Graves speculum, giving two fixed pivot points for the upper blade of the speculum so that resistance of the vaginal canal is readily overcome with minimum manipulation. Also, one of the pivots may be disengaged or unlatched so as to permit the withdrawal of the speculum without disturbing other positioned instruments within the vaginal canal. If desired, the upper and lower blade assemblies **36**, **37**, may be reversed, as shown in Fig. **6***a* so as to provide a Sims type speculum for use in a conventional manner, the removable pivot construction not interfering therewith.

In the modification shown in Fig. **4***b*, it will be seen that the latch plate **65***a* is bowed outwardly as at **65***b* to fit over and slidingly engage pin **67***a* and terminates in a finger piece **65***c* which, when pressed by an operator's thumb, will remove the latch plate **65***a* from engagement with the pivot pin **63** in the upper blade **42**, the coil spring **73***a* serving to bias the latch plate into engagement with the pivot pin **63**.

Referring now to Figs. 10 to 14, a modified form of the present invention is shown wherein the parts are identical with those hereinbefore described except for the arrangement of the removable pivot assembly at

one side of the speculum. As hereinbefore explained, one side of the upper blade **42** is pivotally secured to an upwardly extending ear **54** of the yoke **43** by means of a "lost motion" type of pivot pin **59** (see Fig. *9a*) which gives substantial universal movement of the blade relative to the lower blade **39**. The opposite side of the upper blade **42** is provided with a fixed pivot pin **101** to which a rotatable trunnion link **100** is secured. The free end of the trunnion link **100** is provided with a rotatable thumb screw **103** which is arranged to engage with a threaded bore **105** in the side of the upwardly extending ear **53** of the yoke, as more clearly shown in Fig. 14. In using this form of speculum, the pivotal connection between the upper and lower blades may be broken merely by threadingly disengaging the thumb screw **103** from engagement with the bore **105** in the yoke, so as to permit rotation of the latch link to an inoperative position **100***a*, as shown in Figs. 12 and 14, in which position the speculum may be rotated, if necessary, to clear any instruments extending through the speculum as it is withdrawn from the vagina.

Referring now to Figs. 15 to 17, a still further modified form of the present invention is shown which is substantially identical to those hereinbefore described, except for a still further modified arrangement of the removable pivot link assembly. As more clearly shown in Fig. 17, a fixed pivot **201** rotatably supports the lever **200** from one side of the upper blade **42**. This lever **200** is provided with a broadened portion **203** at its free end which has an outwardly opening U-shaped slot **205** that is arranged to receive a stud **206** rotatably supported in a U-shaped bracket **208** that is secured to the side of the yoke **43**. In a closed operative position of the speculum, the link **200** is in a lowered position so that the broadened portion **203** is disposed between the bracket **208** and the shoulder **210** of a thumb screw **211** that is threadingly engaged with the stud **206**. The thumb screw permits the securement or release of the link therein. In moving the link **203** from a closed position, as shown in Fig. 16, to an open position **200***a*, as shown in Fig. 17, the speculum may be withdrawn from the vaginal canal without interfering with the other instruments **24**, **25**, in a manner similar to that hereinbefore explained.

In all the foregoing embodiments of the present invention, the upper and lower blade assemblies may be reversed so as to adapt the speculum for use as a Sims speculum of the type shown in Fig. **6***a*. Accordingly, this speculum provides the operator with a practical Graves type of speculum for routine use with the added advantage of special usage in modern procedures in sterility studies and treatment and X-ray diagnosis of cervical, uterine, and tubal abnormalities, and aid in their treatment. Therefore, while the present invention has been described with particular reference to the specific forms shown in the drawing, it is to be understood that such is not to be construed as imparting limitations upon the invention, which is best defined by the claims appended hereto.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A speculum comprising, in combination, an upper blade assembly and a lower blade assembly defining a longitudinal housing therebetween, one said blade assembly having a pivotal mounting at one end for rotation relative to the other said assembly to effect jaw-like movement therebetween, said mounting comprising a pair of transversely spaced pivots, one of said pivots comprising a fixed universal joint, and the other of said pivots being selectively displaceable to provide access to the interior of said housing transversely throughout the entire length thereof.

2. A speculum, comprising, in combination, a pair of upper and lower blades defining a longitudinal housing therebetween and having a pivotal connection at one end for relative rotation thereof about a transverse axis, said pivotal connection comprising a pair of transversely spaced pivot structures, one of said pivot structures being fixed and the other being selectively removable to provide access to the interior of said housing transversely of the speculum throughout the entire length thereof, said fixed pivot structure comprising a direct pivotal connection between said upper and said lower blades, and said selectively removable pivot structure comprising a lever connected at one end to one of said blades and having means at an opposite end for removable securing engagement with the other of said blades.

3. A speculum as set forth in claim 2, wherein one of said blades includes an outwardly extending pressure plate for rotating said one blade relative to said other blade, and adjustment means acting between said pressure plate and said other blade for selectively limiting the extent of movement of said blades toward a closed position.

4. A speculum comprising, in combination, a pair of upper and lower blade assemblies defining a longitudinal housing therebetween and being pivotally connected at one end for limited relative rotation therebetween about a transverse axis, said one end including a pair of transversely spaced pivotal connections between said blade assemblies, one of said connections comprising a stationary and substantially universal joint between said blade assemblies, the other of said connections comprising a selectively displaceable joint between said blade assemblies to permit access to the interior of said housing transversely of the speculum throughout the entire length thereof, and adjustment means acting between said blade assemblies for selectively limiting the pivotal movement of said blade assemblies toward a closed position.

5. A speculum as set forth in claim 4, wherein one of said blade assemblies includes an outwardly extending pressure plate for rotating one of said blade assemblies relative to the other of said blade assemblies about said transverse axis when both of said transversely spaced pivotal connections between said blade assemblies are in operative position, and for rotating one of said blade assemblies relative to the other of said blade assemblies about a longitudinal axis when said selectively displaceable joint between said blade assemblies is in an inoperative position.

6. A speculum as set forth in claim 4, wherein said selectively displaceable joint between said blade assemblies comprises a lever pivotally engaged at one end to one of said blade assemblies and rigidly but removably engaged at the other end to the other of said blade assemblies.

7. A speculum as set forth in claim 4, wherein said selectively displaceable joint between said blade assemblies comprises a lever pivotally engaged at one end to one of said blade assemblies for rotation between a fixed operative position with said assembly to a rotatable inoperative position, the other end of said lever having pivot means engageable with mating pivot means on the other of said blade assemblies when said lever is in said fixed operative position.

8. A speculum as set forth in claim 7, wherein said lever includes spring biased positioning means for retaining said lever in both of said operative and inoperative positions.

9. A speculum as set forth in claim 4, wherein said selectively displaceable joint between said blade assemblies comprises a lever pivotally engaged at one end to one of said blade assemblies, and lock means carried at the other end of said lever for selective engagement with the other of said blade assemblies to secure said lever in fixed position relative thereto.

10. A speculum as set forth in claim 4, wherein said selective displaceable joint between said blade assemblies

comprises a lever pivotally engaged at one end to one of said blade assemblies and lock means carried by the other said blade assembly for selective engagement with the other end of said lever to secure said lever in a fixed position relative to said other of said blade assemblies.

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