

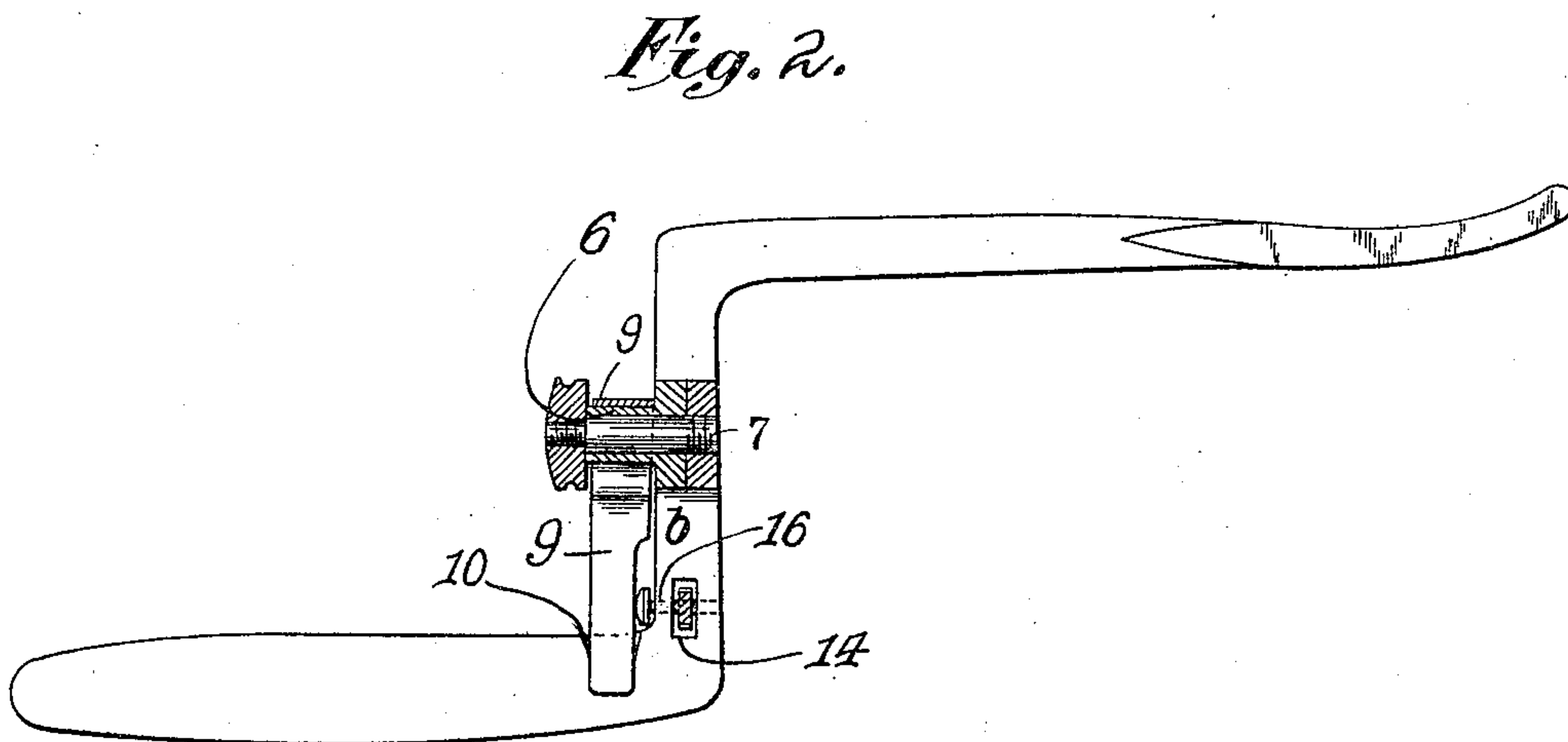
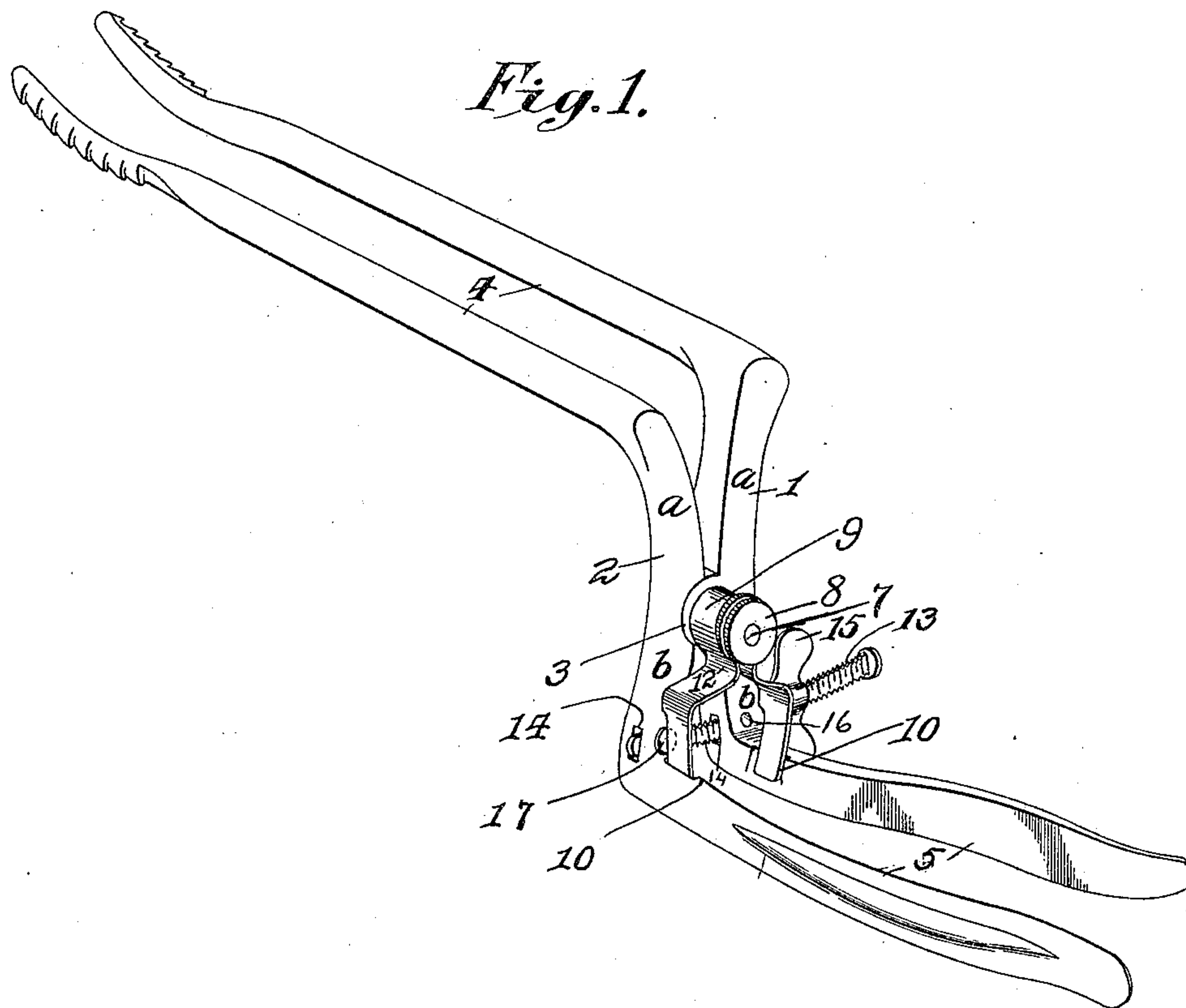
No. 810,675.

PATENTED JAN. 23, 1906.

G. F. RICHTER.  
DILATOR.

APPLICATION FILED APR. 24, 1905.

2 SHEETS—SHEET 1.



Attest:  
*Edgeworth L. L. L.*  
*Larry Braeger*

*Gustav J. Richter* Inventor:  
by *H. L. L.* Atty

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2 SHEETS—SHEET 2.

Fig. 3.

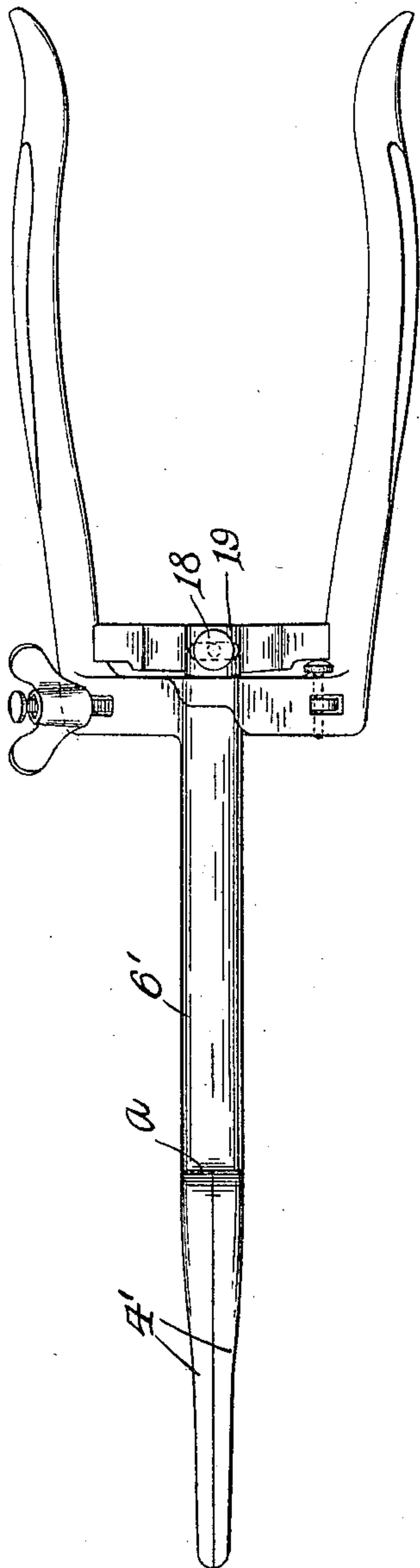
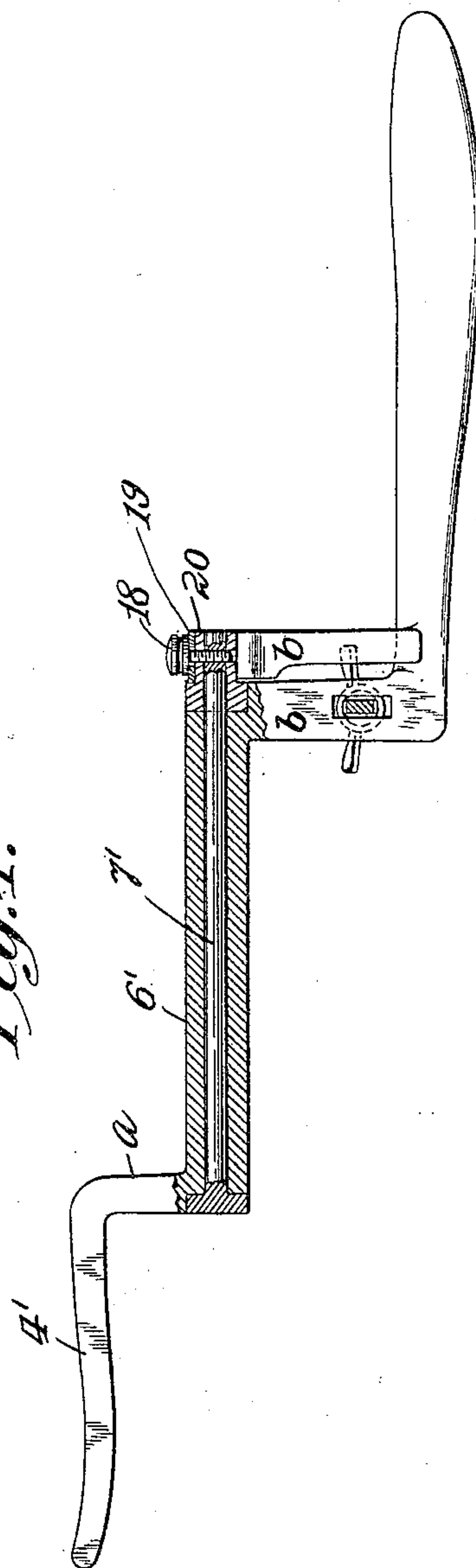


Fig. 4.



Attest:  
*Edgeworth Keane*  
*Harry Praeger*

*Gustav F. Richter*  
by *H. Kimball*

Inventor:

Atty



# UNITED STATES PATENT OFFICE.

GUSTAV F. RICHTER, OF NEW YORK, N. Y.

## DILATOR.

No. 810,675.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed April 24, 1905. Serial No. 257,030.

*To all whom it may concern:*

Be it known that I, GUSTAV F. RICHTER, a citizen of the United States, residing in the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Dilators, of which the following is a full, true, and concise specification.

My invention relates to dilators, and more particularly to uterine dilators; and the invention has for its object the production of an instrument of the said class which may be used with convenience in the more or less inaccessible quarters for which it is designed and which possesses certain features of construction and operation whereby the serviceability of the instrument is materially enhanced, as will be hereinafter fully disclosed, and more particularly pointed out in the accompanying claims.

Referring to the accompanying two sheets of drawings, which form a part hereof, Figure 1 is a perspective view of a uterine dilator embodying my invention. Fig. 2 is a longitudinal vertical section thereof through the fulcrum-joint. Fig. 3 is a top plan view of a modification, and Fig. 4 is a longitudinal vertical section of Fig. 3 through the fulcrum-joint thereof.

The dilator shown herein comprises two lever members 1 and 2, working on a common fulcrum-joint 3 between them and opposed to each other, so that their relative approach at one end produces a relative separation at the other. Each member is provided at opposite ends with a blade 4 and a handle 5, respectively disposed at an angle with the longitudinal axes of the said members and preferably at a right angle therewith, and the said angle or angles are so chosen that the blades 4 and handles 5 are respectively parallel with each other, or substantially so. The pivotal axis of the fulcrum-joint 3 is also so disposed as to be substantially parallel with the blades and handles, so that mutual approach of the handles in parallel position will effect the mutual separation of the blades 4, also in parallel position, and vice versa. The fulcrum-joint 3 is comprised of a tubular extension or barrel 6, provided on one of the lever members—for example, 1—in the direction of the handles and a pin 7 on the other member 2, which is received by said extension and retained therein by means of the thumb-nut 8, screwed onto the end of said pin. Other kinds of retaining means may obviously be

employed, however, for holding the members of the fulcrum-joint together. The extension or barrel 6 is preferably longer in its axial direction than the thickness of either lever member, so that a longer bearing-surface is thereby provided for the fulcrum-joint than would otherwise be possible without the extension or an undesirable or impractical thickness of the said lever members, the appropriate length of said bearing-surface being such a one that will not bind when the opening or closing force is applied at the extremities of either the blades or the handles. Combined with the foregoing elements I provide a bow-spring 9, adapted to exert an opening force upon the handle ends of said lever members. This spring, which may assume various forms, is constructed to embrace the tubular extension 6, with its two free ends located in seats 10 in the region of the junction of the handles with their respective lever members. The spring is confined upon the tubular extension by the same means which retain the pin 7 therein—viz., the thumb-nut 8—and also by means of seats 10, which are preferably formed as slight depressions or recesses in the handles 5, so located as to hold the free ends of the spring close against the two lever members. It will be understood, however, that the spring 9 may be held in position either by the thumb-nut 8 or the seats 10 alone, if desired, and, furthermore, that other forms of confining means may be employed with equal effect. In order to guard against accidental displacement of the spring in a vertical direction, it may sometimes be desirable to contract the spring by bending it inward underneath the extension 6, as shown at 12 in Fig. 1.

The relative separation of the blades 4 is intended to be produced by means of the flat screw 13, which is secured at one end within a slot 14 in one or the other of the lever members 1 or 2, being preferably located in the handle-sections of said members, and the said screw passes through a similar slot 14 in the handle-section of the opposite lever, beyond which it carries a wing-nut 15. By the proper rotation of the nut the handle ends of the levers are brought together and the blades caused to separate, the extent of such movement being accurately gaged by means of the scale marked on one or both of the flat sides of the said screw. The screw is capable of ready reversal of position with respect to the lever members, so that the nut and pro-



jecting end of the screw may be disposed upon either side of the instrument. To this end cross-apertures 16 are provided in both the levers, intersecting the slots 14, and the pin 17 is adapted to be inserted interchangeably in either aperture, entering a hole in the end of the screw. The pin has a rather large head and is so located with respect to the spring 9 that when the latter is in position, as above described, the said head will lie between the same and the adjoining lever member, the pin being thereby locked or retained in position so long as the spring is confined on its tubular extension by the seats 10 or by the nut 8, or both.

When it is desired to disassemble the parts of the instrument, as is frequently necessary for sterilizing the instrument, it is only required to loosen the thumb-nut and remove the spring, whereupon the pin and screw may be taken out and then the hinge-pin 7 withdrawn from its barrel.

In Figs. 3 and 4 a further development of the invention is illustrated. In these figures the blade-section and handle-section of one lever member are separated by the barrel 6', but the said member still retains its first described function, and the other member is similarly formed, the handle and blade sections thereof being separated by the fulcrum pin or shaft 7', which is received within the barrel 6'. The set-screw 18 locks the end of the shaft rigidly to its handle-section, and thereby retains the shaft within the barrel, as shown in Fig. 4, and it also serves to confine the spring 19 upon the tubular extension or boss 20 on the said handle-section by passing through the slot therein. In this form of instrument the blades 4' 4' are comparatively short, and the angles between them and the blade-sections of their lever members constitute abutments or stops, which are adapted to limit the extent to which the blades may be inserted into the uterus. It will be obvious that the barrel portion of the instrument which is intended to be inserted within the vagina may be of any desired or suitable length without obstructing access to the uterus. The ends of the blades of both of the forms illustrated may also be curved or serrated to any extent, as may be desired.

It will be observed that the difference between the two forms of the invention illustrated herein consists mainly in the location of the handle-sections of the levers upon the members of the fulcrum-joint. In Figs. 1 and 2 the sections *a* and *b* of each lever are located at the same end of the fulcrum-joint 1, while in Figs. 3 and 4 they are respectively attached to the opposite ends thereof; but in both cases the fulcrum is parallel with the handles and has a long bearing-surface.

Having described my invention, what I claim, and desire to secure by United States Letters Patent, is—

1. A uterine dilator, comprising two lever members each provided with a blade and a handle respectively disposed at an angle thereto and substantially parallel with each other, in combination with a fulcrum-joint between said members having its pivotal axis substantially parallel with said handles and comprised of a tubular extension on one lever member and a pin on the other received thereby.

2. A dilator comprising two opposed lever members each provided with a blade and a handle, a fulcrum-joint between said lever members and an extension on one of them, in combination with a spring on said extension having its free ends bearing against said handles.

3. A uterine dilator, comprising two opposed lever members each provided with a blade and a handle respectively disposed at an angle thereto and substantially parallel with each other, a fulcrum-joint between said lever members having its axis substantially parallel with said blades and handles and comprising a tubular extension on one lever member and a pin on the other received thereby, in combination with a spring embracing said tubular extension adapted to exert an opening tendency upon the handle ends of said lever members.

4. A uterine dilator, comprising two lever members each provided with a blade and a handle respectively disposed at an angle thereto and substantially parallel with each other, a fulcrum-joint between said members having its axis substantially parallel with said blades and handles and comprising a tubular extension on one of said members and a pin on the other received thereby, in combination with means for retaining said pin therein and a spring confined on said extension by said means and arranged to exert an opening tendency upon the handle ends of said lever members.

5. A dilator, comprising two opposed lever members each provided with a blade and a handle, a tubular extension provided on one member and a pin on the other received by said extension to afford a fulcrum-joint for said members, in combination with a bow-spring embracing said extension, and seats provided in the region of the juncture of said handles and lever members for retaining the free ends of said spring.

6. A dilator, comprising two opposed lever members each provided with a blade and a handle substantially parallel to each other, a tubular extension provided on one member and a pin on the other received thereby, in combination with a bow-spring embracing said extension and contracted below the same to prevent the accidental removal of said spring therefrom.

7. A dilator comprising two lever members each provided with a blade and a handle, a



5 screw for forcing relative movement thereof, means for securing one end of said screw to one member and a spring acting upon said members and retaining said means in operative position.

10 8. In a dilator, two lever members each formed with a blade and a handle, a screw for forcing relative movement thereof located in slots therein, a cross-aperture intersecting one of said slots and a pin in said aperture having holding engagement with said screw, in combination with an extended fulcrum-joint between said members, a spring confined thereon and serving to confine said pin in its aperture.

15 9. In a dilator, two lever members, a tubular barrel forming a part of one member and a pin forming a part of the other and received in said barrel, a blade and a handle respectively provided for each member and disposed substantially parallel with the pivotal axis formed by said pin and barrel.

10. In a dilator, two lever members com-

prising respectively of a blade-section, barrel and handle section, and a blade-section, pin and handle section, said pin and barrel constituting a fulcrum-joint for said members and blades and handles respectively for said members disposed substantially parallel with the pivotal axis of said joint. 25

11. In a surgical instrument, a pair of lever members respectively having handles extending at an angle thereto and a transverse fulcrum-joint for said members provided with an axial extension, in combination with a spring confined on said extension with its free ends bearing respectively against said handles. 30

In testimony whereof I have signed my name to the specification in the presence of two subscribing witnesses. 35

GUSTAV F. RICHTER.

Witnesses:

H. G. KIMBALL,  
FRED W. MOFFETT.