(No Model.) 3 Sheets—Sheet 1.

S. H. LINN.

ELECTRICAL SPECULUM.

No. 438,891. Patented Oct. 21, 1890.

Fig. 1.

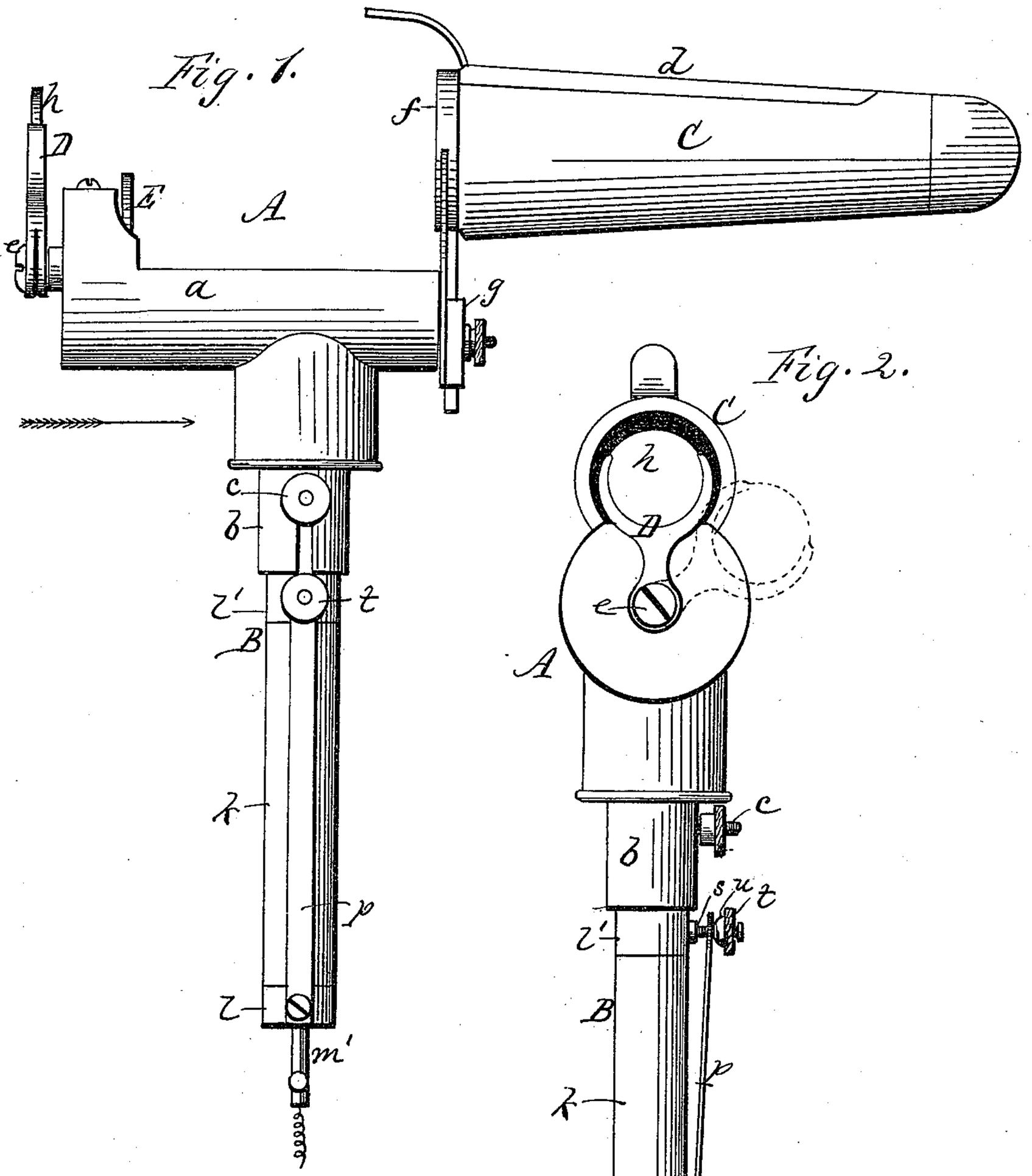

Fig. 2.

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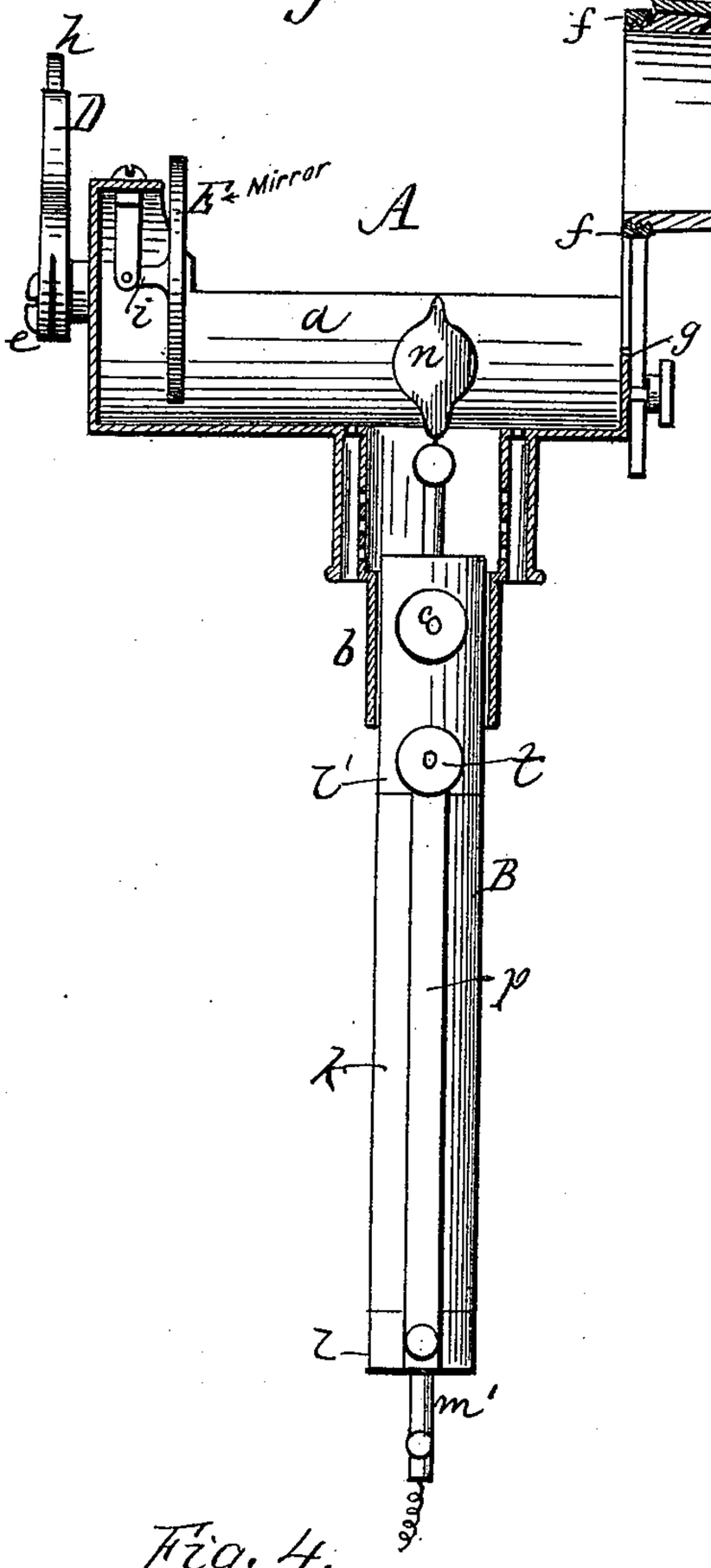
Fig. 3.



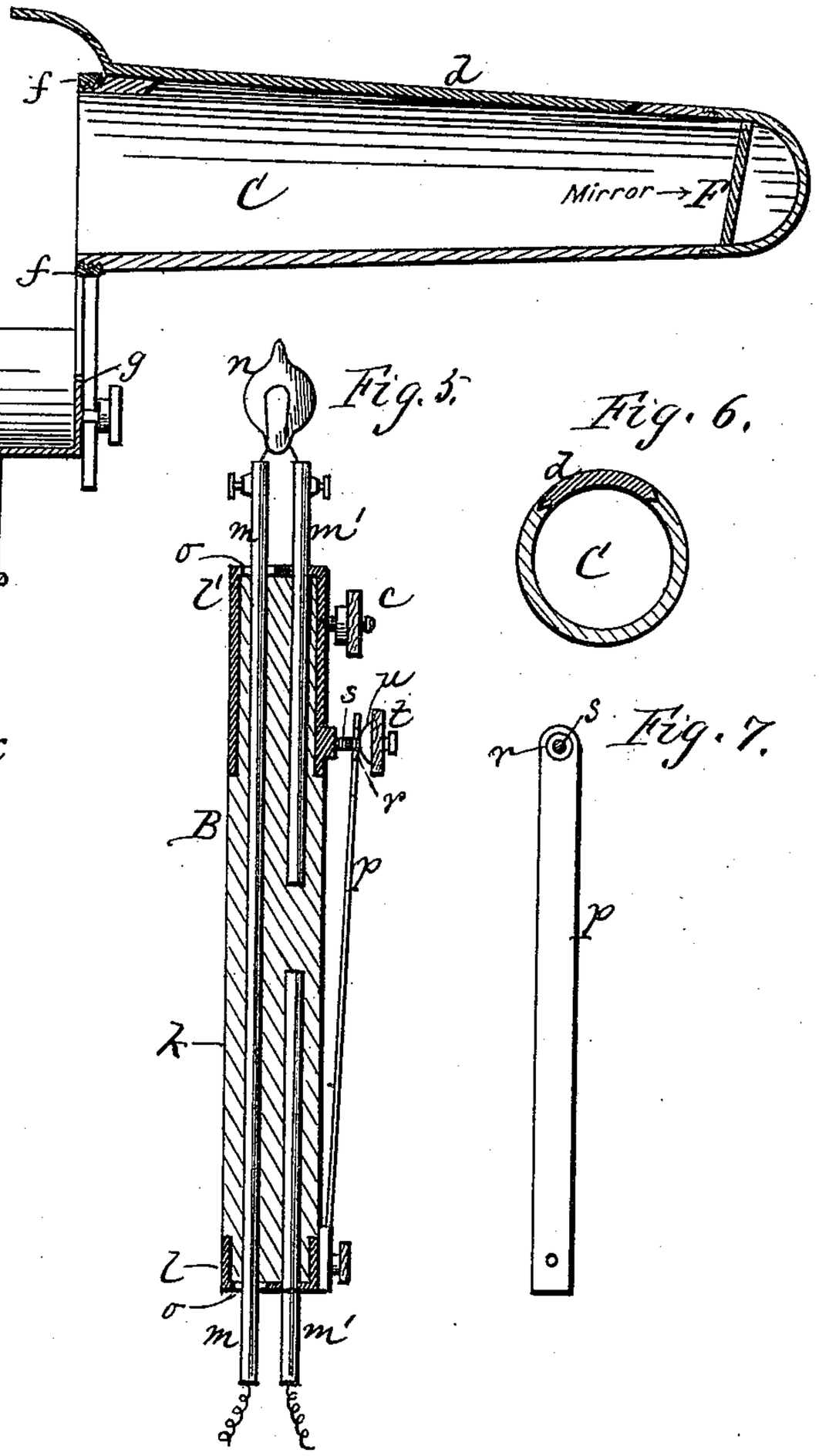


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 4.

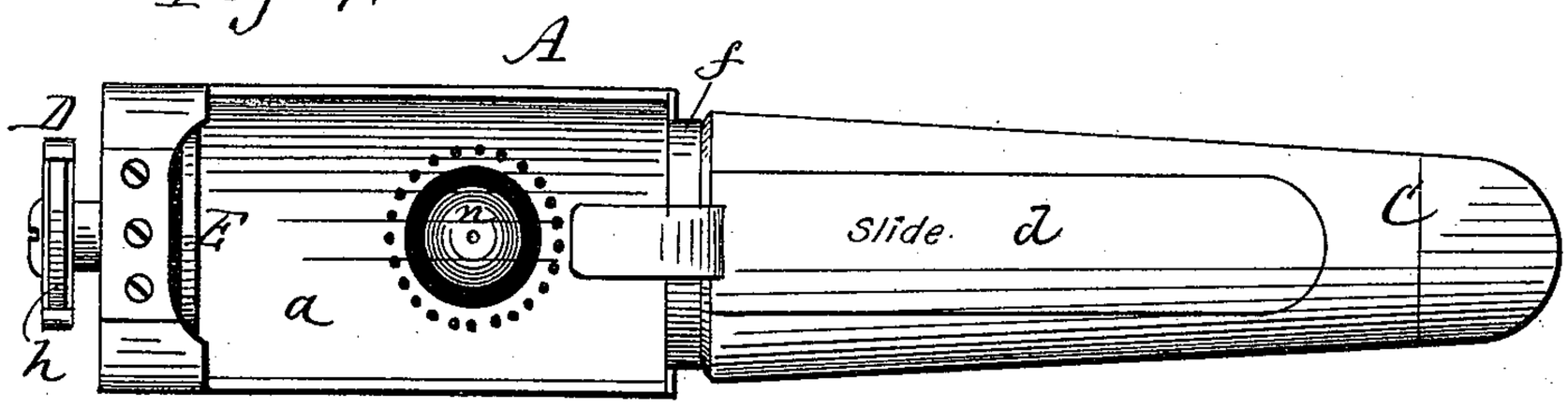


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Fig. 8.

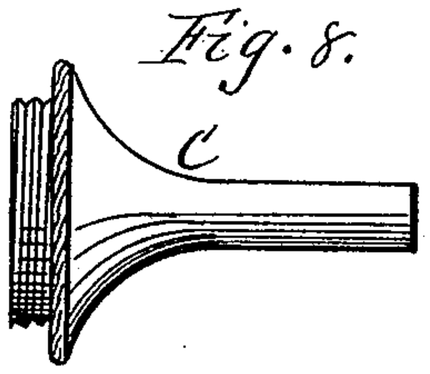


Fig. 9.

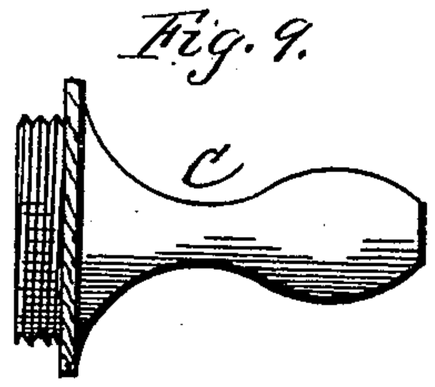


Fig. 10.

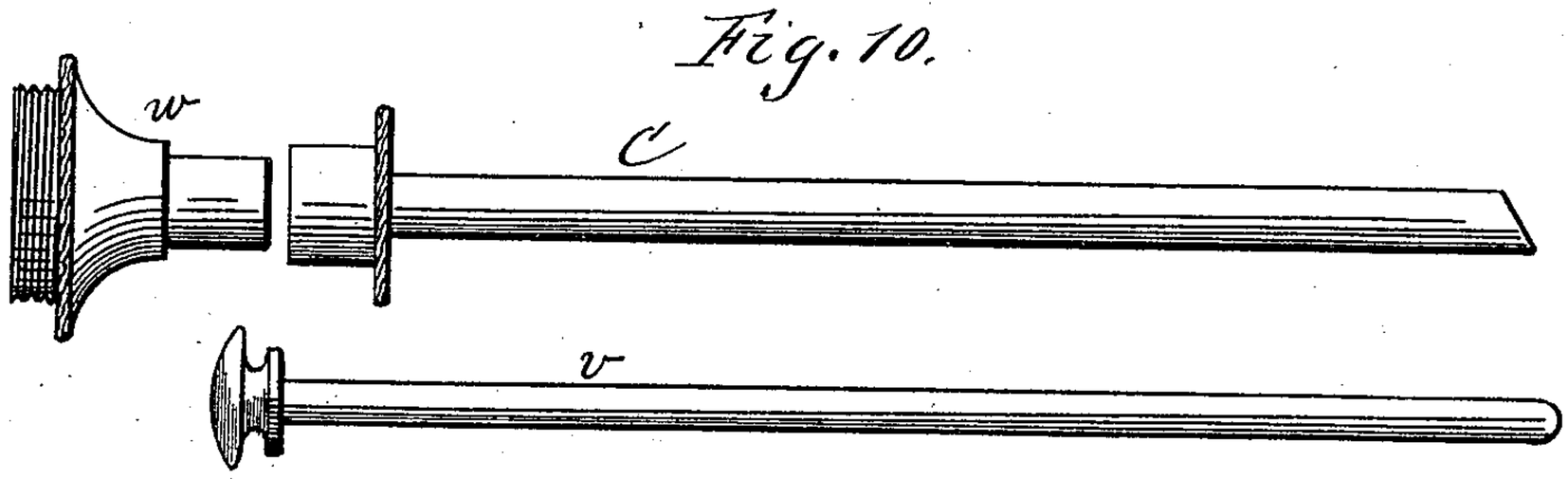
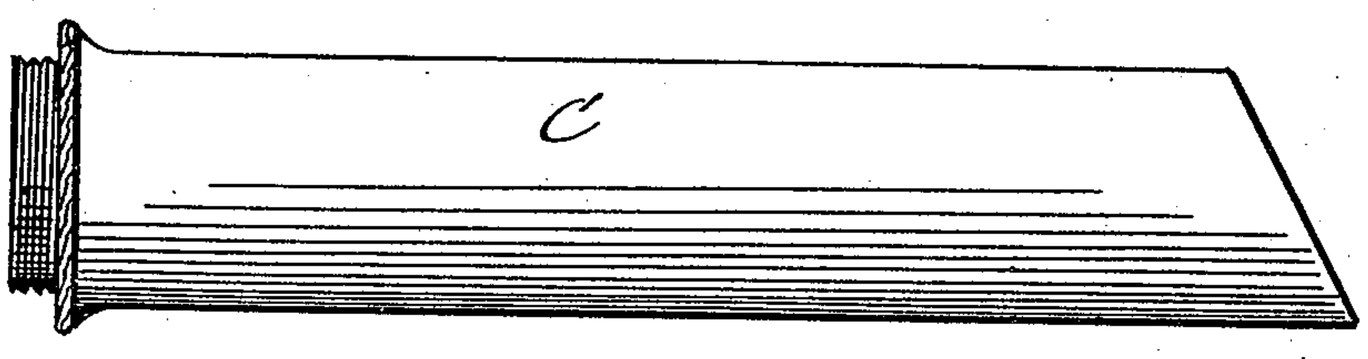


Fig. 11.



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John H. Hopkins

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UNITED STATES PATENT OFFICE.

SAMUEL H. LINN, OF ROCHESTER, NEW YORK.

ELECTRICAL SPECULUM.

SPECIFICATION forming part of Letters Patent No. 438,891, dated October 21, 1890.

Application filed March 30, 1889. Serial No. 305,484. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. LINN, of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Electrical Speculums; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this application.

My improvement relates to speculums in which the illuminating agent is an electric light combined with the instrument in such a manner that the rays are reflected to the interior by a mirror. The design is to combine the electric-light attachment with the speculum in a more convenient and simple form than has heretofore been done, and so arrange it that it can be readily applied and removed and be adjusted to different heights and positions without trouble.

To this end the invention consists in the construction and arrangement hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation showing the instrument arranged as a rectal speculum. Fig. 2 is a rear elevation looking in the direction of the arrow in Fig. 1. Fig. 3 is a longitudinal vertical section of Fig. 1. Fig. 4 is a plan view. Fig. 5 is a longitudinal vertical section of the electric attachment removed from place. Fig. 6 is a cross-section of the rectal speculum. Fig. 7 is a diagram showing a face view of the circuit-breaker of the electric attachment. Fig. 8 is a view of the speculum for the ear. Fig. 9 is a view of the speculum for the nose. Fig. 10 is a view of the urethral speculum. Fig. 11 is a view of the vaginal speculum.

A indicates the frame in which the parts are mounted, the same consisting of an open half-cylinder *a* and socket *b*, in the latter of which rests the electric attachment B, which can be applied and removed at pleasure, being held in place, when inserted, by a set-screw and nut *c*.

C is the rectal speculum, of ordinary form and provided with a slide *d*, by removing which, after the speculum has been inserted, the passage can be examined or operated upon. The speculum is provided at its rear end with a screw-thread that screws into a socket *f*, that slides up and down in a bearing *g* at the front end of the cylinder *a*, by which means it can be adjusted to the right position.

D is an eye-piece, pivoted at *e* to the rear end of cylinder *a*, so as to swing laterally, and provided with a convex lens *h*, that stands in line with the speculum.

E is a mirror at the rear of the apparatus, pivoted at *i*, to be adjusted to different angles, and F is another mirror located inside the speculum and near its front end, and set at such an angle as to throw the light upward. These two mirrors are on opposite sides of the electric light, and are designed to reflect the light in opposite directions, so as to meet and concentrate on the upper interior side of the speculum, where the opening is made for the examination of the passage in which the speculum is inserted.

The electric-light attachment B consists of a cylinder of hard rubber *k* or other non-conducting material, provided with metallic conducting-caps *l l'* at the ends. The electrodes consist of two rods *m m'*, which pass longitudinally through the block *k* and are surmounted by an ordinary arc lamp *n*. The rod *m* is insulated by passing through holes *o o* in the metal caps *l l'*. The rod *m'* has a break in the center, as shown in Fig. 5, by which the current is cut off from the two ends. *p* is a circuit closer and breaker consisting of a flat spring attached at its bottom to the lower cap *l* and provided at its upper end with a hole *r*, that rests around a screw *s* of the upper cap *l'*, but without coming in contact with said screw. *t* is a nut on the screw *s*, provided with a non-conducting pad *u*, of hard rubber or other material. The natural elasticity of spring *p* throws it off away from cap *l'* and against pad *u* and breaks the circuit. By pressing the spring up against cap *l'* the circuit is closed and the lamp is ignited. The electric-light attachment by being of the cylindrical form described can be readily inserted and removed, thus leaving the speculum free at any time. It can also be adjusted higher or lower in its socket, thereby adjusting the light in proper position to be reflected into the speculum. It will be seen that all the parts composing the electric-light attachment are combined in the cylinder B, which is of less diameter than the socket *b*. Therefore the attachment can be readily applied

and removed. This enables the speculum to be first adjusted in place in the cavity and the electric attachment to be then applied, thus allowing freedom of movement in fitting the instrument and obviating the danger of breaking or disarranging the light. The speculum is inserted in the usual manner, the slide *d* is removed, and the light is then turned on. The light is reflected forward into the tube by the mirror E and backward by the mirror F, and the rays meeting are thrown up on the under side of the tube and against the part covering the opening in the tube, brilliantly illuminating the same.

Fig. 8 shows a speculum adapted to the ear, Fig. 9 one adapted to the nose, Fig. 10 one adapted to the urethra, and Fig. 11 one adapted to the vagina. These are all provided at the rear end with screw-threads adapted to screw into the same socket *f*. The speculums are therefore interchangeable. *v*, in Fig. 10, shows a plug or rod which is placed in the urethral speculum before the latter is inserted, and is then withdrawn, after which the rear end of the speculum is inserted in a socket-piece *w*, which in turn is screwed into the socket *f*. Speculums of this kind may also be used to insert in the stomach or any other passage of the body.

Having described my invention, I do not claim, broadly, an electric light attached to a speculum.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a speculum, the combination, with the frame A and speculum C, of the electric-light attachment consisting of the cylinder B, provided with a lamp and electrical connections and adapted to be fitted removably in a socket *b* of the frame, as herein shown and described.

2. In a speculum, the combination, with the frame A and speculum C, of the non-conducting cylinder B, adapted to be fitted removably in a socket *b* of the frame, the lamp *n*, attached to the top of the cylinder, the electrodes *m m'*, passing through the cylinder, one being entire, the other with a break, the conducting-caps *l l'* at the ends of the cylinder, and the circuit-breaker *p*, consisting of a spring attached to one of the caps, but separated from the other by its natural elasticity, as shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

SAMUEL H. LINN.

Witnesses:
R. F. OSGOOD,
WM. J. MCPHERSON.