

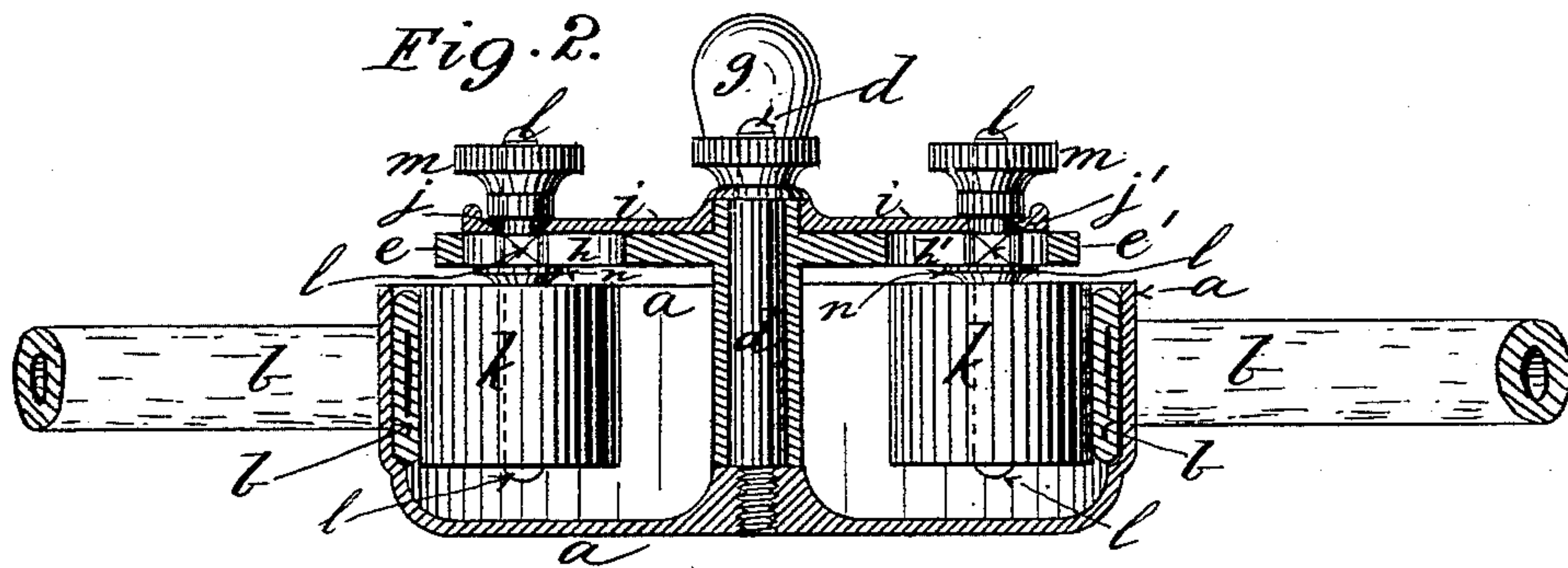
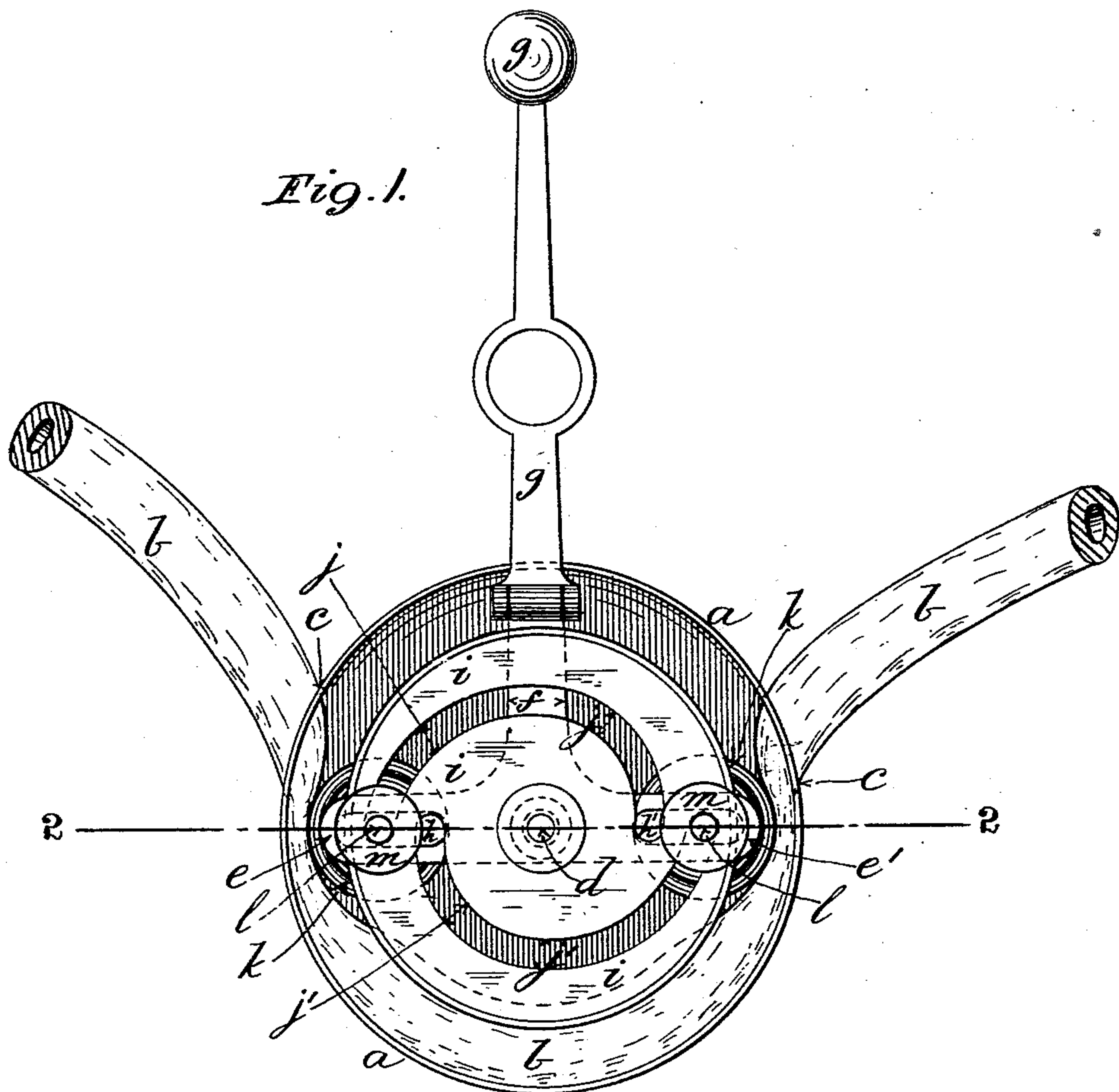
(No Model.)

2 Sheets—Sheet 1.

E. LEE.  
SURGICAL PUMP.

No. 419,461.

Patented Jan. 14, 1890.



WITNESSES  
S. L. Schrader  
W. M. Byrne

INVENTOR  
Emmer Lee by  
Paul Bakewell  
his attorney

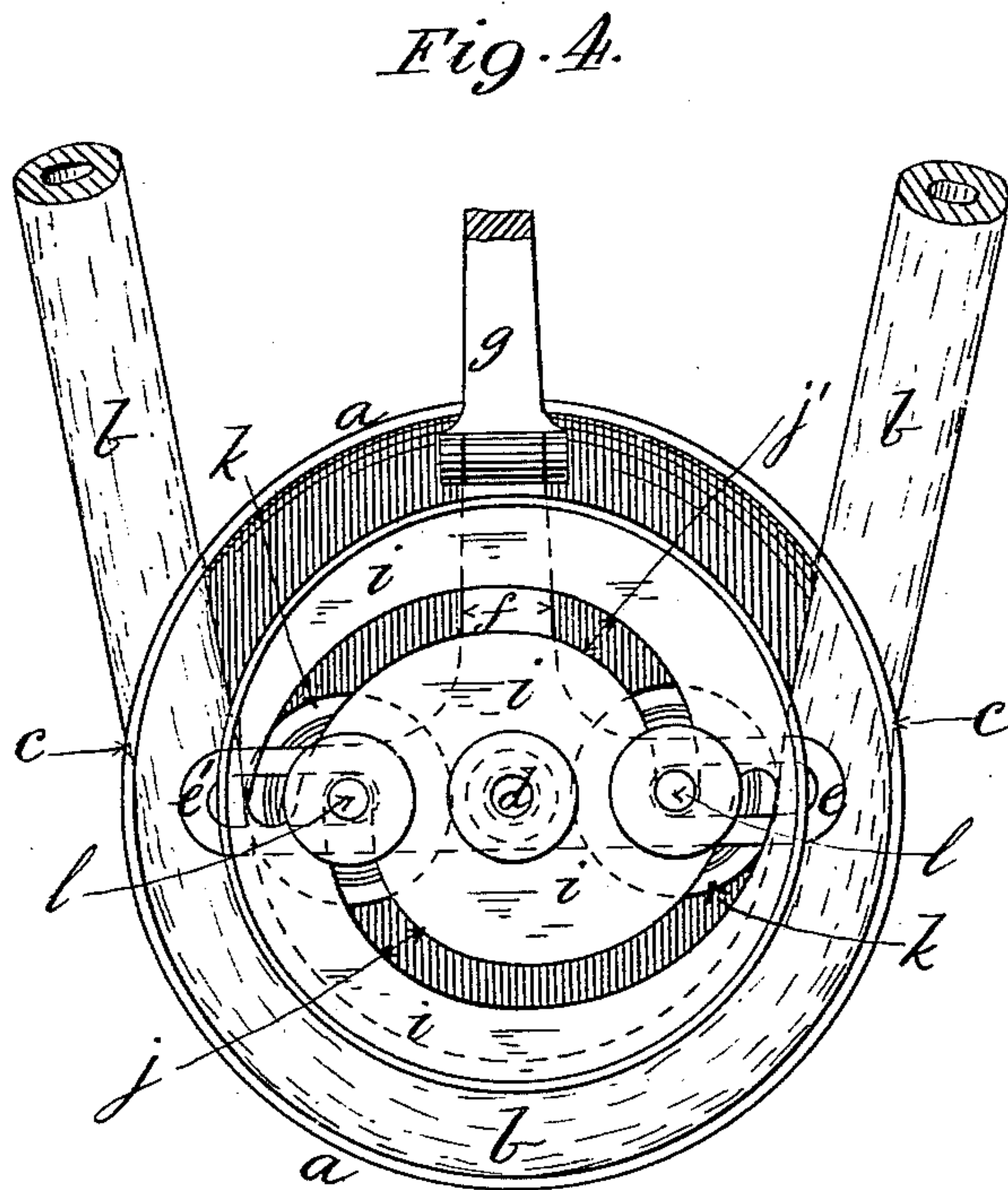
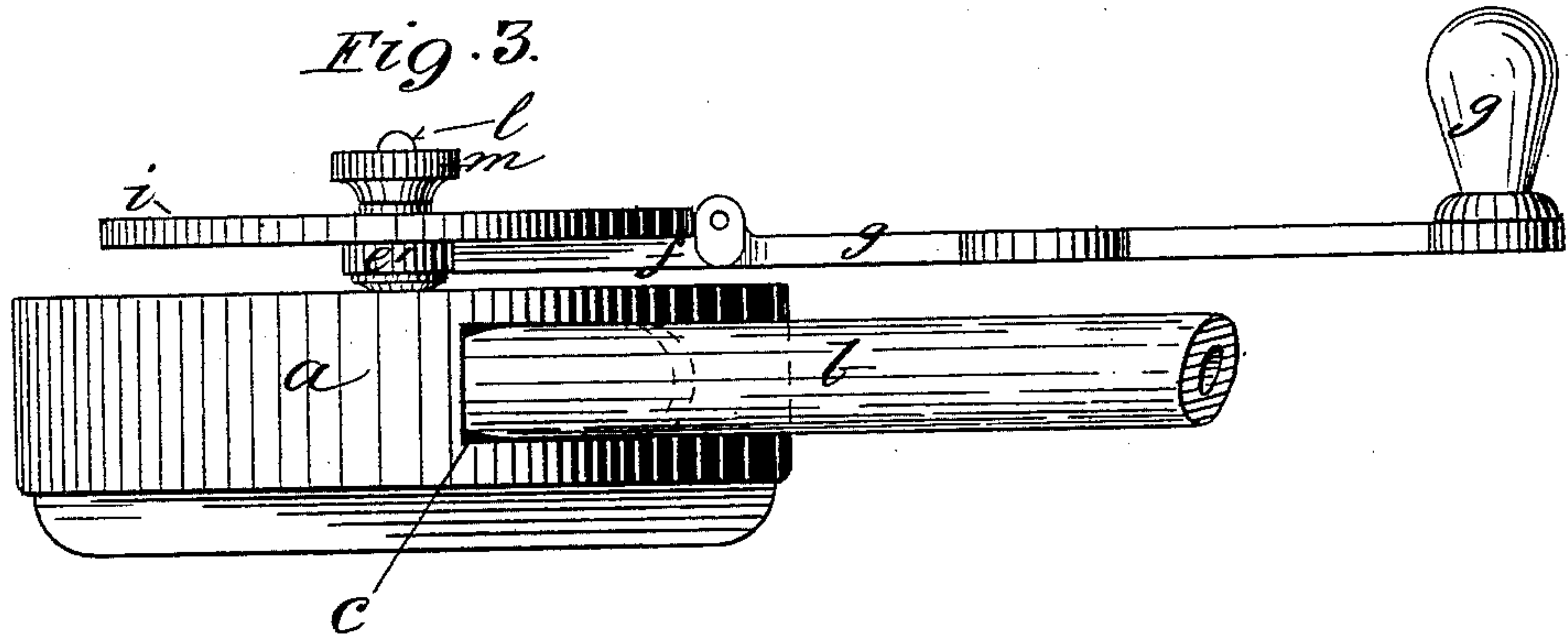
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# UNITED STATES PATENT OFFICE.

ELMER LEE, OF ST. LOUIS, MISSOURI.

## SURGICAL PUMP.

SPECIFICATION forming part of Letters Patent No. 419,461, dated January 14, 1890.

Application filed May 4, 1889. Serial No. 309,640. (No model.)

*To all whom it may concern:*

Be it known that I, ELMER LEE, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Surgical Pumps, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of surgical pumps in which a moving pressure is applied to an elastic tube, and wherein means are provided to enable the pressure to be readily and quickly adjusted to different-sized tubes and released therefrom when not in use, as well as to facilitate access to and the disconnection of the parts for cleaning purposes.

It consists in features of novelty, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a plan of my improved surgical pump with pressure applied to the tube; Fig. 2, a sectional elevation thereon on line 2 2 in Fig. 1; Fig. 3, a side elevation of the pump at right angles to line 2 2 in Fig. 1; and Fig. 4, a similar view to Fig. 1, broken away, with the pressure removed from tube.

Like letters of reference denote like parts in all the figures.

*a* represents a cylindrical cup open at the top and containing an elastic tube *b*, which partly encircles the interior of the cup *a*, and thence projects through two holes *c*, formed opposite to each other through the circular wall of the cup *a*, the free ends of the tube *b* being respectively connected with the suction and delivery vessels or attachments, according to the surgical uses to which the pump may be applied.

From the bottom of the interior of the cup *a* projects a central upright stud *d*, around which, at a level somewhat above the edge of the cup *a*, is fulcrumed a horizontally-arranged lever composed of two equal and opposite arms *e e'*, and preferably a third arm *f*, arranged at right angles to the arms *e e'*, and connected to the handle *g*. Vertically through the arms *e e'* are formed slots *h h'*, which extend from near the ends of the arms *e e'*, respectively, to a suitable distance toward the central stud *d*. Bearing on the upper side of the levers *e e' f*, and pivoted centrally to the stud *d*, is a circular plate *i*, through

one half of which is formed a cam-shaped slot *j*, and through the other half a similar slot *j'*, the two slots *j j'* having equal throws and curvatures from the pivot *d* in opposite directions and their terminal portions in line with each other, and the slots *h h'* diametrically with the plate *i* at each semi-revolution of the latter.

Within the cup *a* are two rollers *k*, mounted vertically on their spindles *l*, the upper screwed end portions of which project, respectively, through the slots *h j* and *h' j'*, and are provided above the plate *i* with nuts and washers *m*, by which, in combination with collars *n* on the spindles *l*, bearing against the under side of the lever-arms *e e'*, the spindles *l*, with the rollers *k*, lever *e e' f*, and plate *i* may be clamped together or released at pleasure.

In operation, as seen in Figs. 1 and 2, the spindles *l* of the rollers *k* are located and fixed to the lever *e e' f* and plate *i* at their maximum distance apart in the slots *h h'* and terminal portions of the slots *j j'*, respectively, farthest from the pivot *d*, so that the rollers *k* compress and close the elastic tube *b* against the circular wall of the cup *a*, whereby on turning the lever *e e' f*, say, to the right hand by its handle *g* the moving pressure of the right-hand roller *k* along that portion of the tube *b* within the cup *a* will induce a vacuum, and so draw air or fluid through the right-hand end of the tube *b* and force the air or fluid which occupies the tube *b* in advance of the said roller *k* through the left-hand end of the tube *b* until the left-hand roller *k* arrives against the right-hand portion of the tube *b*, when the operation is repeated, and so on during the rotation of the handle *g*, thereby causing a continuous and uniform flow of the air or fluid through the tube *b* from right to left.

By turning the handle *g* to the left hand the above operation will be reversed in like manner; or, in other words, the air or fluid will be drawn through the left-hand end and delivered through the right-hand end of the tube *b*.

When not required for use, the pressure is relieved from the tube *b* by unscrewing the nuts *m*, which unclamps the spindles *l* from the lever-arms *e e'* and plate *i*, when by par-



tially rotating the latter on its pivot  $d$  the cam-shaped slots  $j j'$  ride over the respective spindles  $l$ , and thereby retract the latter, with the rollers  $k$ , toward each other along the slots  $h h'$  until further movement of the plate  $i$  is prevented by the arrival of the ends of the slots  $j j'$ , nearest to the pivot  $d$ , against the spindles  $l$ , or in the position seen in Fig. 4, when the rollers  $k$  will be at their minimum distance apart and clear of the tube  $b$ , which resumes its natural condition. In like manner, by fixing the spindles  $l$  at any point along the slots  $j j'$ , and so varying the distance of the rollers  $k$  from the pivot  $d$ , the pressure may be adjusted to varying-sized tubes.

By this invention, which may be used as an aspirator, stomach and cupping pump, or otherwise, wherever the production of a vacuum is required for removing or forcing gas or fluid in surgical or other operations, the aseptic property of the instrument is perfectly assured, as, owing to the cup  $a$  being open and the ease and rapidity by which, on simply unscrewing the nuts  $m$ , the various

parts can be disconnected and removed, no accumulation of dirt, corrosion, or foreign substance can occur, which obviously is a matter of vital importance in an instrument of this nature dealing with the delicate cavities and channels of the human frame.

I claim as my invention—

In a surgical pump, the combination of an open cylindrical cup having a central stud, opposite arms fulcrumed at right angles to said stud and having slots, a circular plate pivoted to said stud and having cam-shaped slots, through which and through the slots of the arms project spindles having nuts and collars, with rollers mounted on said spindles, and an elastic tube located partially within the cup, substantially as shown, and for the purpose described.

In testimony whereof I affix my signature, in presence of two witnesses, this 29th day of April, 1889.

ELMER LEE.

Witnesses:

S. L. SCHRADER,  
PAUL BAKEWELL.