(No Model.) 2 Sheets—Sheet 1.

C. H. TRUAX.

SURGICAL PUMP.

No. 459,055. Patented Sept. 8, 1891.

Fig. 1.

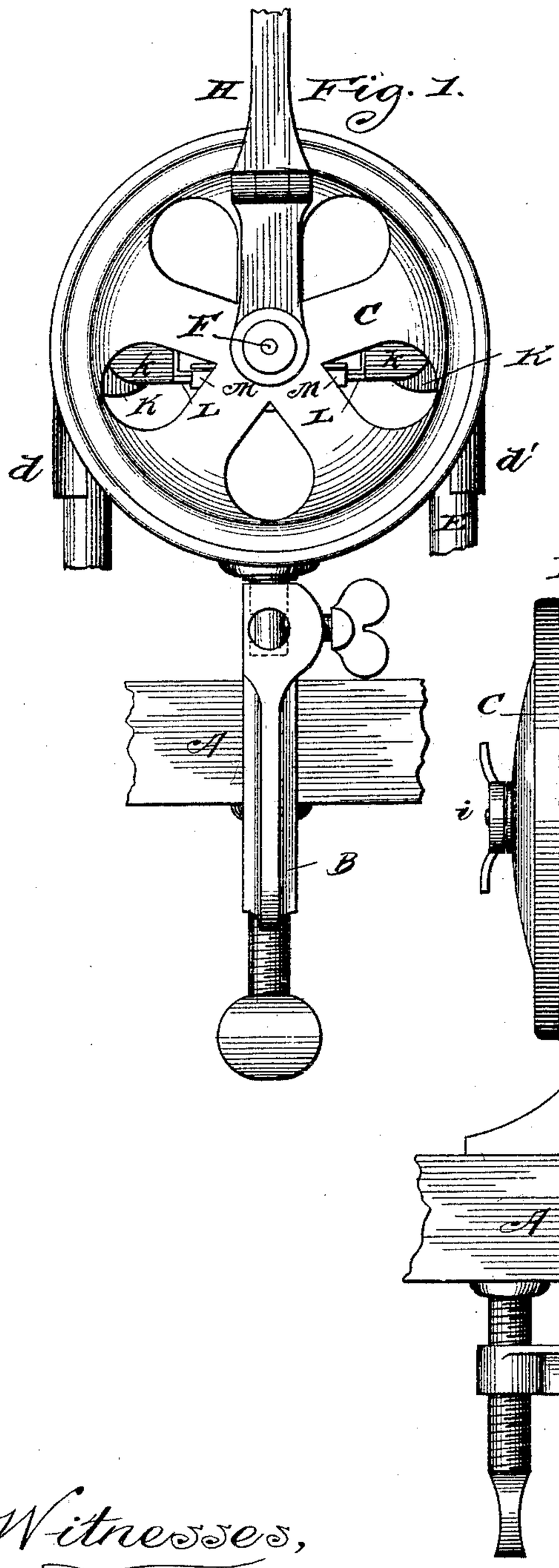


Fig. 2.

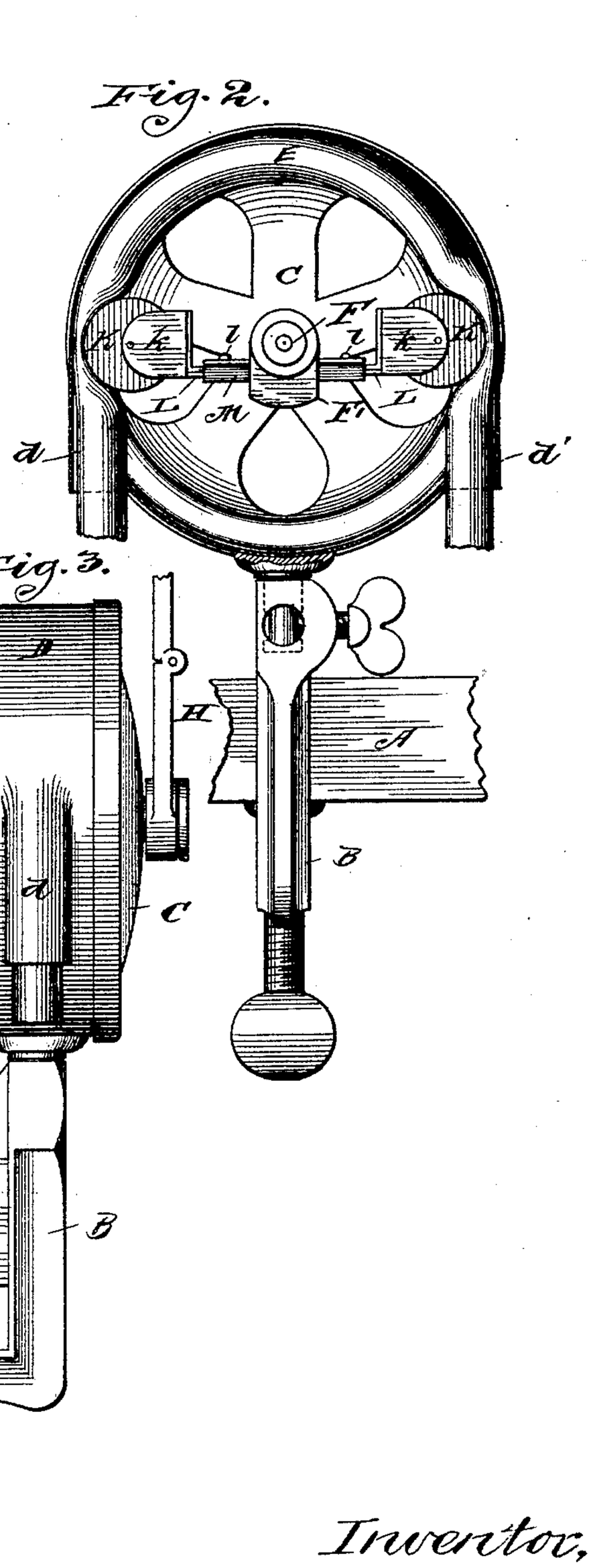


Fig. 3.

Witnesses,
F. G. Mann,
Frederick P. Goodwin

Inventor,
Charles H. Truax
By, Offield, Towle & Linthicum
Att'ys.

(No Model.) 2 Sheets—Sheet 2.

C. H. TRUAX.

SURGICAL PUMP.

No. 459,055. Patented Sept. 8, 1891.

Fig. 4.

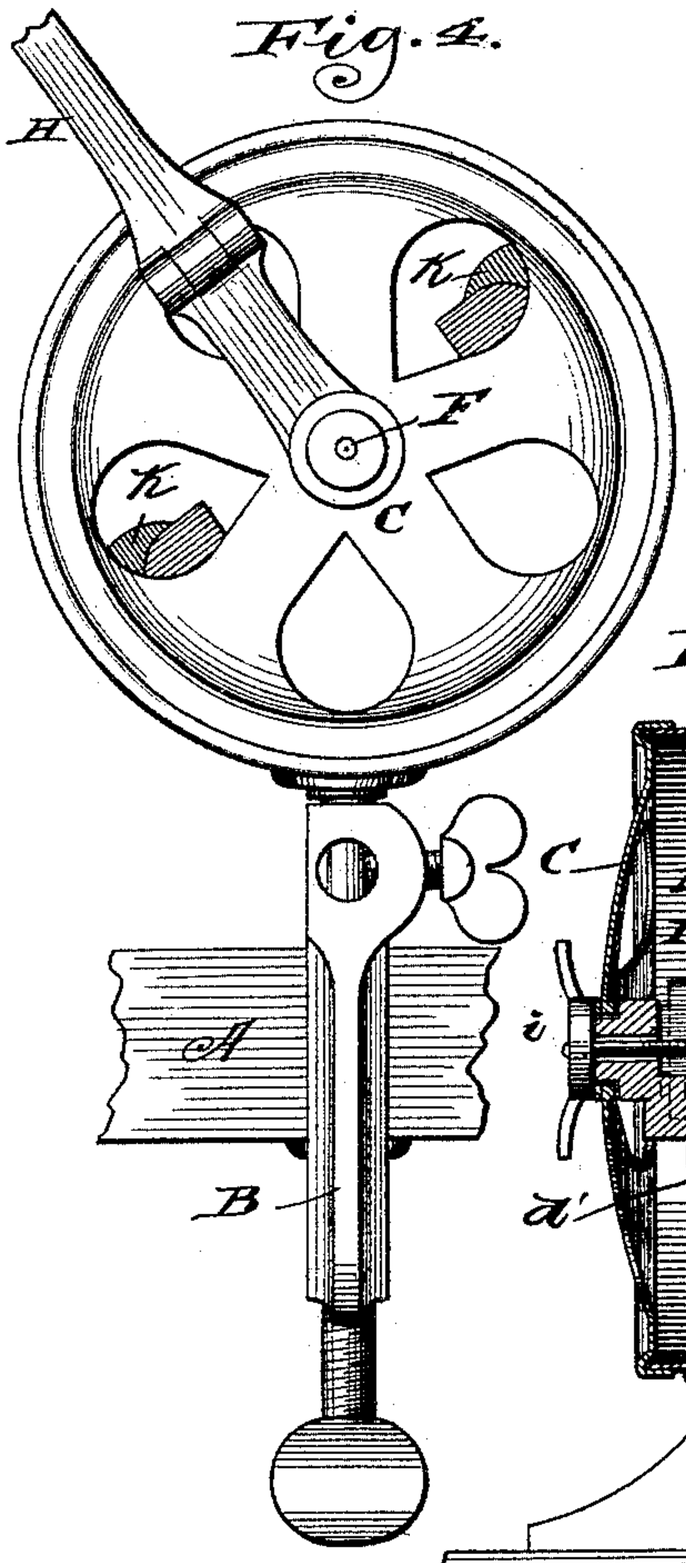


Fig. 5.

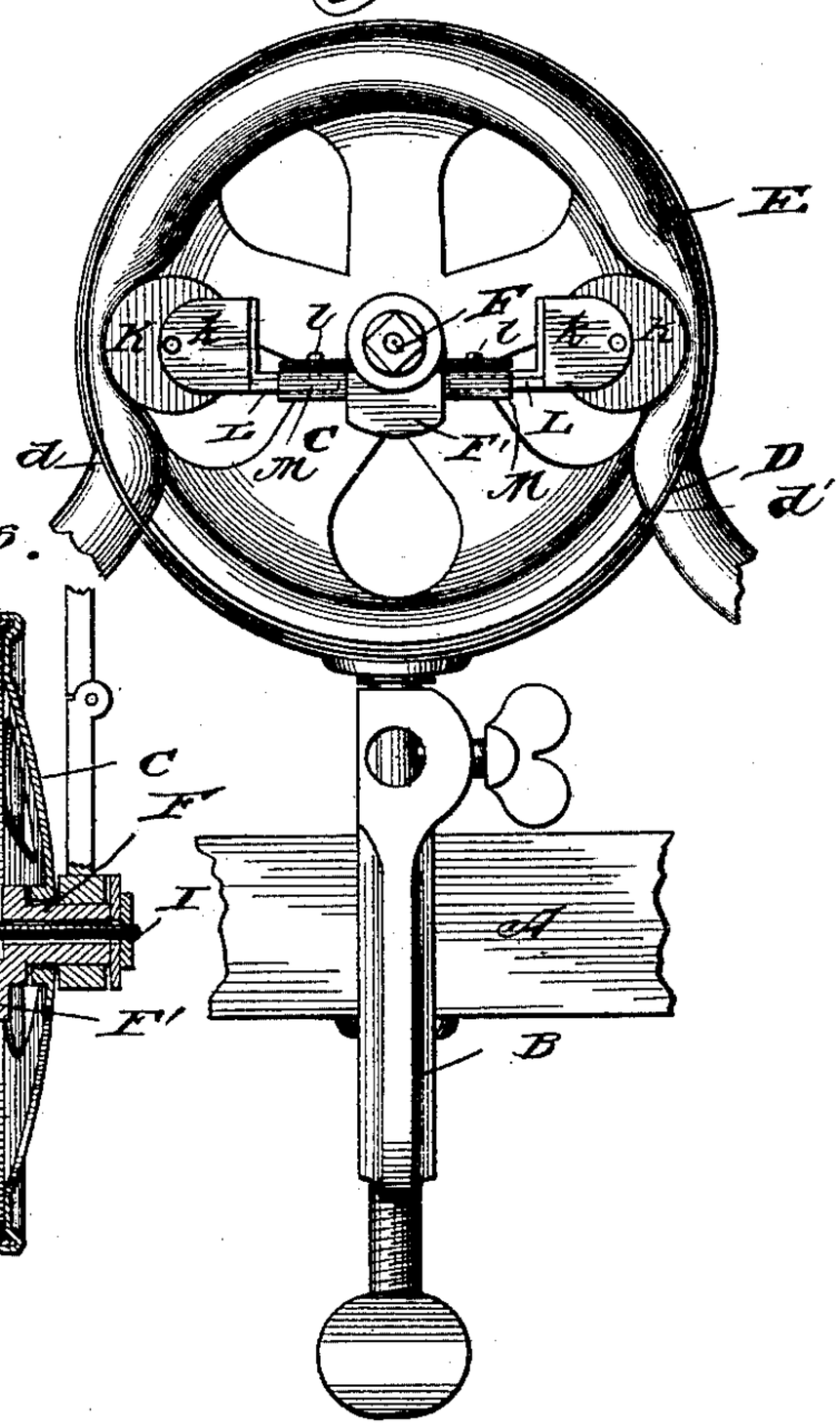


Fig. 6.

Fig. 8.

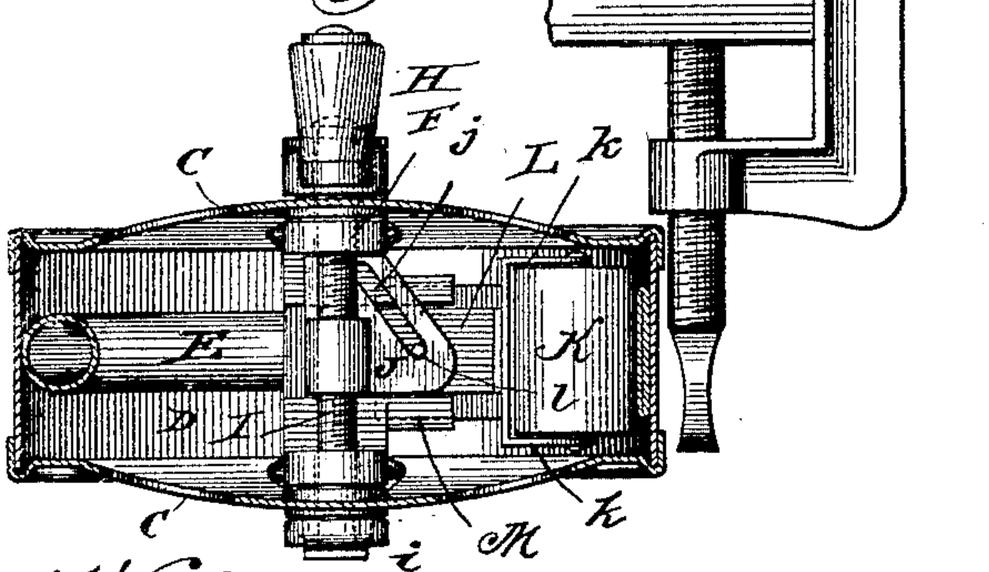
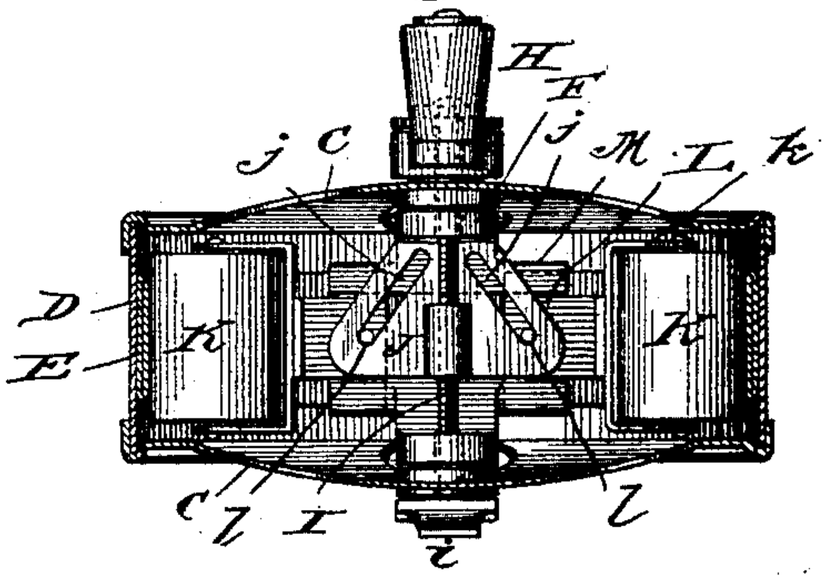


Fig. 7.



Witnesses,
D. F. Mann,
Frederick P. Goodwin

Inventor,
Charles H. Truax
By Offield, Towler & Linthicum
Attys.

UNITED STATES PATENT OFFICE.

CHARLES H. TRUAX, OF CHICAGO, ILLINOIS.

SURGICAL PUMP.

SPECIFICATION forming part of Letters Patent No. 459,055, dated September 8, 1891.

Application filed March 9, 1891. Serial No. 384,273. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. TRUAX, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Surgical Pumps, of which the following is a specification.

My invention relates to that class of surgical pumps in which a flexible tube having a portion of its body located within a cylindrical casing and its ends projected through apertures in the peripheral wall thereof is caused to deliver a liquid by the application of pressure thereto from a traveling roller or rollers having a sliding connection, with an arbor journaled transversely of the casing and having outside thereof an operating-handle.

Heretofore in the construction of surgical pumps of this character where a single pressure-roller was used the elastic tube was coiled around the interior of the chamber and its ends lapped by each other. Where two rollers mounted on opposite sides of the rotating arbor were employed to compress the tube to cause the movement of the liquid therethrough, the periphery of the casing has been apertured at separated points, falling upon the same side of a line passing transversely through the center of the casing, and in such construction elastic tubing has been admitted to the interior of the casing through said slots or apertures in its peripheral wall, the tube entering the casing in a direction at right angles. The result of this arrangement was that the traveling rollers, upon striking the end of the tube where it entered the casing, would cause a violent pulsation or shock to the liquid, and in passing off would also leave abruptly, causing the liquid to pulsate violently. This is objectionable in all surgical operations and also in other uses to which pumps of this character are applied. To remedy this defect I have improved the construction of the casing by providing a tangential inlet for the tube, and this is readily done by slitting the peripheral wall of the casing circumferentially and by turning out the slitted portion so that the tube enters the casing tangentially, and the application of the roller thereto is gradual, thus preventing any shock or pulsating effect to the liquid or fluid being delivered through it. The same construction may be applied with good results to the exit-aperture of the tube.

A further object of my invention is to provide simple and effective means for varying the extent of the thrust of the pressure device and for locking it in its adjusted position.

In the accompanying drawings, Figure 1 is a side elevation of the pump with its attaching-bracket fixed in position for use, some of the parts being broken away and showing the tangential inlet and outlet for the delivery-tube. Fig. 2 is a similar view showing one wall of the casing removed to expose the interior construction. Fig. 3 is an edge view of the pump. Figs. 4 and 5 are views similar to views 1 and 2, but showing the pump without the tangential inlet. Fig. 6 is a transverse sectional elevation through the casing of the pump; and Figs. 7 and 8 are sectional plan views, the latter showing the improved adjusting means applied to a pump having a single roller.

The pump may be affixed to a support, as A, by means of the bracket B, the pump proper having a cylindrical casing, the side walls whereof are marked C, and these side walls may be apertured or imperforate, as desired.

As shown in Figs. 1, 2, and 3, the peripheral wall D of the pump has the tangential inlet-openings *d d'*, which fall upon the same side of a plane passing through the center of the pump. These openings are formed by incising the peripheral wall of the pump circumferentially and at a distance apart corresponding substantially to the thickness of the tube, and then the metal between the incisions is struck out, so as to allow the tube to enter and leave the casing on a line tangential to the periphery thereof. The result of this arrangement is that when the rollers first contact with the tube the pressure is gradual and increases as the roller moves around in its orbit, until, when it reaches the end of the tangential inlet, the full force of the roller is applied.

In Figs. 1 to 5, inclusive, the usual cylindrical apertures are shown. Through these tangential inlets or apertures, as the case may be, is passed a flexible tube E, the body of

which inside the casing rests against the peripheral wall. Centrally of the casing is journaled an arbor F, which is rotated by the handle H, which may be jointed, as shown. The arbor has an offset portion or crank F′ therein, and the ends of the arbor are longitudinally perforated for the passage of a threaded rod I.

J is a cam-plate having a threaded connection with the rod I and slots *j* therein. The pressure devices or rollers K are journaled in yoke-arms *k*, the arms or shanks of the yoke L being adapted to move in ways formed by the flanged plates M, which project from opposite sides of the offset portion F′ of the arbor. These yoke-arms L have studs or pins *l* thereon which work in the cam-slots *j*. A threaded rod I has a thumb-piece *i* applied thereto exterior to the casing, and this thumb-piece affords means for turning the rod and moving the plate J in line with the arbor, the result of this movement being to adjust the rollers radially and therefore vary the extent of their thrust upon the tube, thus providing for a positive adjustment in either direction. The same principle may be readily applied to a pump having a single pressure-roller, as shown in Fig. 8 of the drawings. In this instance the plate has only one wing and one slot, and one roller, with its support, is omitted.

A pump of this character is exceedingly simple in its construction, while being effective in its operation. The arbor may be cast with the flanged plates for the yoke-arms thereon. The yoke may also be cast and the cam-plate may have its body stamped from sheet metal, with a threaded sleeve soldered thereto for engagement with the rod, or may be cast from brass integrally with the sleeve.

I do not here claim, broadly, the plurality of traveling pressure devices having sliding connections with an arbor and adjusting mechanism located within the casing and between the pressure devices and arbor, as that is claimed in my application Serial No. 383,574.

I claim—

1. In a surgical pump having a cylindrical casing and an elastic tube passing through the casing, a rotatable arbor and a traveling pressure device having a sliding connection with the arbor, an operating-rod projected through the side walls of the casing and having a threaded connection with a plate having an inclined slot therein, and a pin connected with the pressure device and adapted to travel in said slot, whereby the pressure device may be radially adjusted from its arbor, substantially as described.

2. A surgical pump of the class described, having a cylindrical casing whose peripheral wall has a portion or portions thereof projected tangentially and apertured to provide openings for the passage of the delivery-tube, substantially as described.

CHARLES H. TRUAX.

Witnesses:
C. C. LINTHICUM,
FREDERICK C. GOODWIN.