

(No Model.)

F. C. TICE.
DILATING IRRIGATOR.

No. 572,736.

Patented Dec. 8, 1896.

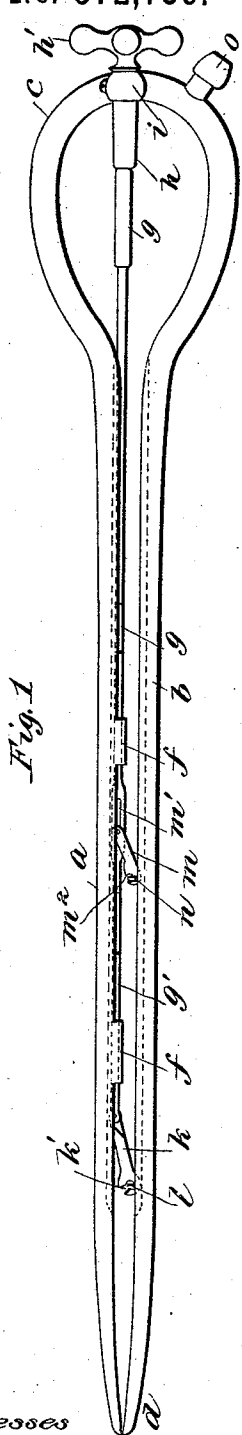


Fig. 1

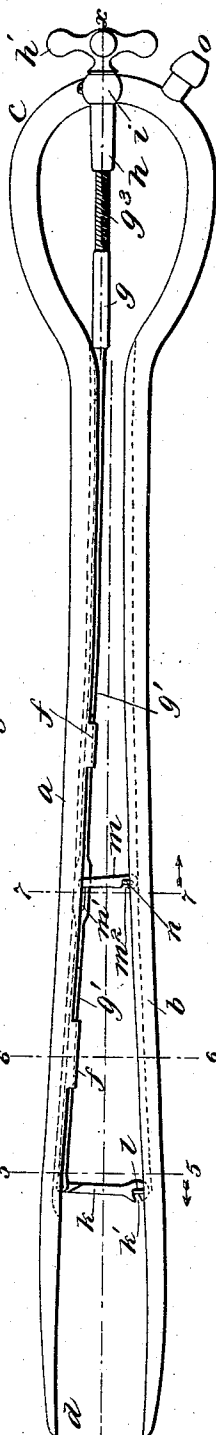


Fig. 2

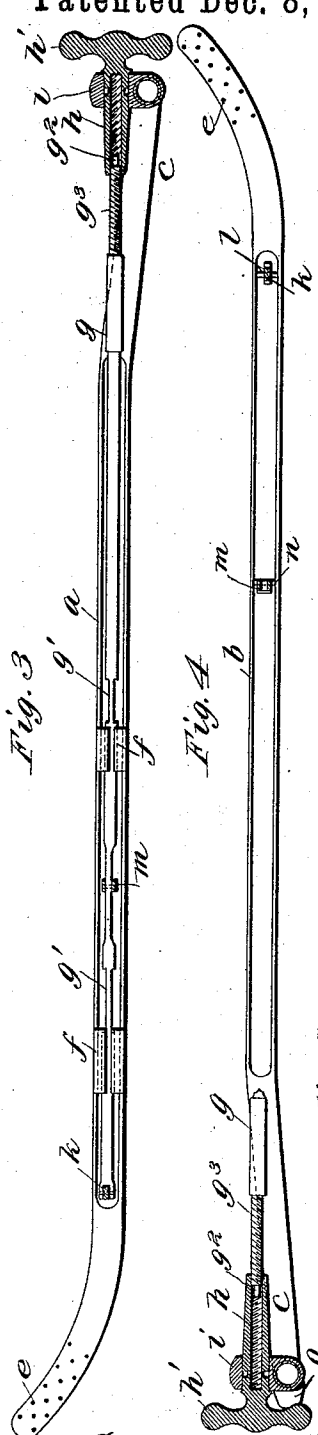


Fig. 3

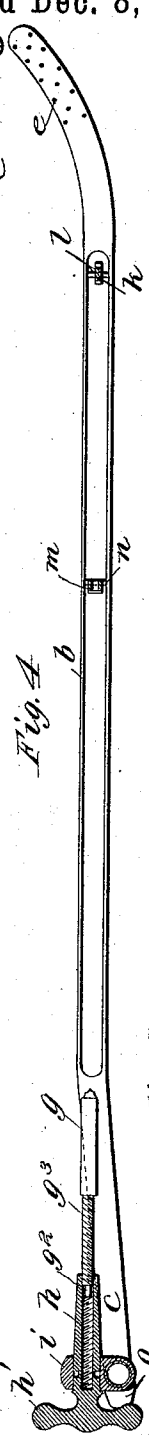


Fig. 4

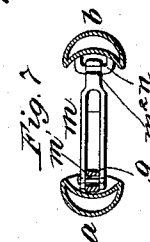


Fig. 5



Fig. 6



Fig. 7

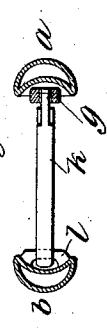


Fig. 8

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UNITED STATES PATENT OFFICE.

FREDERIC CLIFFORD TICE, OF ROANOKE, VIRGINIA.

DILATING-IRRIGATOR.

SPECIFICATION forming part of Letters Patent No. 572,736, dated December 8, 1896.

Application filed May 31, 1895. Serial No. 551,321. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC CLIFFORD TICE, a citizen of the United States, residing at Roanoke, in the county of Roanoke, in the State of Virginia, have invented a certain new and useful Improvement in Dilating-Irrigators, of which the following is a full, clear, and exact description.

My invention relates to surgical instruments, and has for its objects to provide for the dilation and irrigation of the parts at the same time. For example, in the treatment of the uterus after accouchement it is desirable to secure the free and unobstructed injection of the irrigating fluid and its return and discharge. It is desirable to secure the positive dilation of the member by direct separation of the parts of the instrument without a sliding movement of one of the dilating members upon the other.

To these ends my invention consists of a combined dilator and irrigator composed of two hollow connected arms which are provided near the free ends with holes or perforations to permit the injection of a liquid, and means connecting the two arms whereby they may be positively moved toward each other for insertion and removal and away from each other for dilating the member, the said means consisting, essentially, of a longitudinally-movable rod arranged upon one of the arms and connected by movable joints with the other arm, all of which will hereinafter more fully appear.

In the accompanying drawings, illustrating my invention, in the several views of which like parts are similarly designated, Figure 1 is a plan view of the dilator and irrigator closed. Fig. 2 is a similar view with the arms separated for dilating. Fig. 3 is a longitudinal section taken in the plane of line *x x*, Fig. 2, and looking in the direction of the arrow 3; and Fig. 4 is a similar view taken in the same plane and looking in the direction of the arrow 4. Fig. 5 is a cross-section taken at line 5 5, Fig. 2, looking toward the left. Fig. 6 is a cross-section taken at line 6 6, Fig. 2; and Fig. 7 is a cross-section taken at line 7 7, Fig. 2, and looking toward the right.

My combined dilator and irrigator comprises two hollow arms *a b*, preferably formed by bending a tube upon itself, although, of

course, these arms may be made separate and united at the bend *c*. Near their free ends *d* these arms are preferably convergent, although this is a feature not necessary or essential to the proper working of my device, and these ends are provided with holes or perforations *e*, (see Figs. 3 and 4,) formed to distribute the irrigating liquid in various directions. The tubular arms may be of any desired cross-section, but I prefer that they be half-round and grooved or made concave on adjacent faces to receive parts hereinafter described and for compactness.

The arm *a* is provided with the longitudinally-slotted clips *f*, spanning its groove, and these clips receive a sliding rod *g*, the said rod, in order to engage and be retained by said clips, being of greater width throughout its length than the slots in the clips excepting at points *g' g'*, where it is cut away so as to be passed in and out of the slotted clips. By this provision of the removable rod and slotted clips access may be freely had to all parts of both for purposes of cleaning, in addition to facilitating the assembling and dismemberment of the instrument. The rod has its rear end provided with a guide-point *g²* and a screw-thread *g³* next before, and this end is engaged by a nut or internally-screw-threaded sleeve *h*, so that by rotation of said nut or sleeve the rod may be moved lengthwise of the arm. The nut or sleeve is provided with a handle or hand-wheel *h'*, by which it may be rotated, and said nut is swiveled in a boss *i* on the bend *c* in any usual way to permit the rotation of the nut.

The rod *g* is provided with a link *k*, which is pivoted to its forward end and has a hook *k'*, which engages a loop *l*, bridging the groove on arm *b*. A second link *m* is pivoted in a longitudinal slot *m'* in the rod *g*, and also has a hooked end *m²*, which engages with a loop *n*, bridging the groove on the arm *b* adjacent to it. The link *k* folds away from the rod *g*, while the link *m* is slotted longitudinally, (see Fig. 7,) so as to fold up about the said rod. (See Fig. 1.) These links serve to cause the arms *a* and *b* to approach toward and recede from one another upon proper longitudinal motion of the rod *g*, effected by the rotation of the nut or sleeve *h*, and hence the instrument may be given the closed position

of Fig. 1 for inserting and removing it, and may also be given the extreme open position shown in Fig. 2 for purposes of dilation and irrigation, and, further, as is obvious, may be given any intermediate positions.

The nipple *o* is provided for connection with a device for supplying the irrigating fluid, although other means may be employed for this purpose.

It will be noticed that the outer link *k* is pivoted directly to the rod *g*, and ordinarily this one link would be sufficient to dilate or expand the instrument; but if one link alone were used the pressure of the parts being treated would cause the arms *a b* to be bent or sprung more or less and lead to uncertainty as to the exact location and dilation of the ends of the same. Moreover, it is desirable in this class of instruments that the separation of the arms *a b* at points remote from the ends shall not be proportionately the same as at the ends, but be only such as to secure a free channel for the egress of the irrigating liquid, and with this object in view I have made the link *m* much shorter than it would be if the arms were to be separated proportionately the same from end to end and have attached the same to the rod *g* by the sliding connection *m'*. The effect of this is that while the arms are thus permitted to separate to form a channel between them for the egress of the irrigating liquid and are braced by the intermediate link *m*, yet said link prevents the wide separation of the arms that would take place at that point if it were not present or if it were of the same length in proportion to its distance from the bend as the link *k* is to its distance from said bend.

The operation of my device is as follows: The nut or sleeve is turned so as to bring the arms close together, and the hose or other liquid supply is fixed to the nipple *o*. The instrument is then inserted into the cavity the distance desired and the nut or sleeve turned to slide the rod *g* in its groove under the clips toward the free end of the instrument. This sliding movement of the rod causes the links *k* and *m* to effect the direct separation of the arms *a b* without any sliding movement of one arm upon the other, and since the rod *g* is on the inside of the arm *a* and in the groove it does not in its movement come in contact with or irritate the parts being treated. The link *k* serves to widely separate the ends of arms *a b*, while the link *m* acts to prevent too wide separation of the arms at points remote from the ends, and yet braces the arms.

The separation of the arms forms a channel for the egress of the irrigating liquid.

When the instrument is properly adjusted in the cavity, the irrigating liquid is allowed to flow through both arms toward the ends, whence it emerges through the holes in the form of a spray and then runs out or escapes from the cavity between the arms *a b*.

The parts having been treated, the nut or

sleeve is turned to retract the sliding rod *g* and draw the arms *a b* close together, when the instrument is removed.

By this construction I combine in one instrument a dilator and an irrigator capable of use for either purpose, as desired, and also for conjoint use in treating diseased or injured cavities. The irrigating fluid can be sprayed in all directions and its outflow is insured together with the detritus displaced by it.

The instrument may be readily disassembled for cleansing purposes, and its parts are so open and unobstructed as to preclude lodgment of matter that might adhere in use, thus rendering easy the keeping of the instrument in an aseptic condition.

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

1. A combined dilator and irrigator, consisting of two hollow, separable arms united at one end, and having holes or perforations in their free ends and adapted to be supplied with and discharge an irrigating fluid, a rod mounted to slide on one of said arms, and means connecting said rod with the other arm, whereby the said arms may be directly separated or retracted without sliding movement of one arm upon the other, substantially as described.

2. In a combined dilator and irrigator, the combination of two hollow, separable arms, united at one end and having holes or perforations in their free ends, and adapted to be supplied with and discharge an irrigating liquid, a sliding rod mounted on one of said arms, links connecting said rod with the other arm, and means for sliding said rod to effect the positive separation and approach of said arms, substantially as described.

3. In a combined dilator and irrigator, the combination of two hollow, separable arms united at one end and having holes or perforations in their free ends, and adapted to receive and discharge an irrigating liquid, one of said arms being provided with a longitudinal groove or channel, a rod mounted to slide in said groove, links connecting said rod with the other arm, and means for sliding or moving said rod to effect the positive separation and approach of said arms, substantially as described.

4. In a combined dilator and irrigator, the combination of two hollow, separable arms united at one end and having holes or perforations in their free ends, and adapted to receive and discharge an irrigating liquid, one of said arms being provided with a longitudinal groove and clips bridging said groove, a rod mounted in said groove and under said clips and means for connecting said rod with the other arm, whereby upon movement of said rod in opposite directions the arms will be separated and brought together respectively, substantially as described.

5. In a combined dilator and irrigator, the combination of two hollow, separable arms, having holes or perforations in one end of

each of said arms and adapted to receive and discharge an irrigating fluid, a rod mounted on the inside of one of said arms, links connecting said rod with the other arm, and a screw-threaded sleeve for positively moving said rod to separate or bring together the said arms, substantially as described.

6. In a combined dilator and irrigator, the combination of two hollow, separable arms, having holes or perforations in one end thereof and adapted to receive and discharge an irrigating fluid, one of said arms being provided with clips or loops slotted longitudinally, a rod adapted to slide under said clips or loops, links connecting said rod with the other arm, and means for sliding said rod when confined under said clips or loops, substantially as described.

7. In a combined dilator and irrigator, the combination of two hollow, separable arms having holes or perforations in one end and adapted to receive and discharge an irrigating fluid, a rod mounted to slide upon one of said arms, links connecting said rod to the other of said arms, one of said links remote from the end of said rod having a sliding connection with said rod and being shorter than the remaining link, substantially as described.

8. In a combined dilator and irrigator, the combination of two hollow, separable arms, united at one end and provided near said end with a fluid supply or inlet device, a rod mounted to slide upon one of said arms, an end link and an intermediate link connecting said rod with the other arm, the end link

being of a greater length in proportion to its distance from the union of the arms than the length of the intermediate arm in proportion to its distance from the union of said arms, substantially as described.

9. A combined dilator and irrigator, comprising hollow, separable arms adapted to be supplied with and discharge an irrigating fluid independently of and also in conjunction with its dilating function, and means to separate said arms, consisting essentially of a longitudinally-movable rod arranged upon one of the arms and connected by movable joints with the other arm, substantially as described.

10. A combined dilator and irrigator, comprising hollow, separable arms adapted to be supplied with and discharge an irrigating fluid independently of and also in conjunction with its dilating function, and means to separate said arms, consisting essentially of a longitudinally-movable rod, slotted clips upon one of the arms adapted to retain the rod while in use and permit its longitudinal movement and also adapted to admit of the ready removal or detaching of the rod for cleansing purposes, and links connected with said rod and connecting with the other arm, substantially as described.

Signed at New York city, State of New York, this 18th day of May, 1895.

FREDERIC CLIFFORD TICE.

Witnesses:

CRITTENDEN J. SMITH,
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LOUIS J. SOMERVILLE.