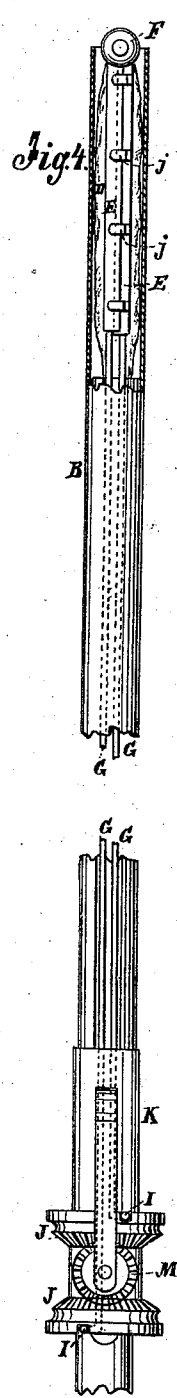
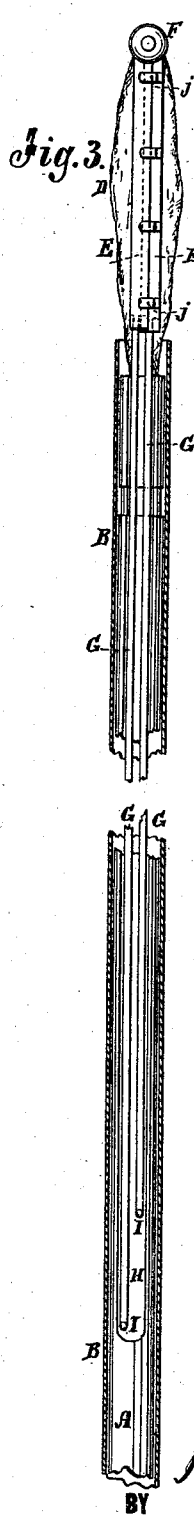
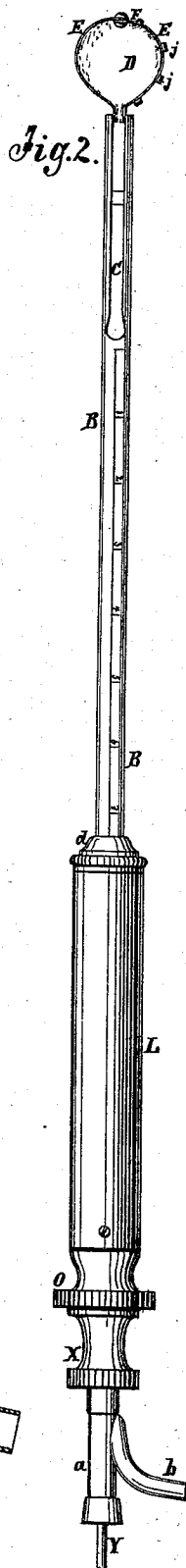
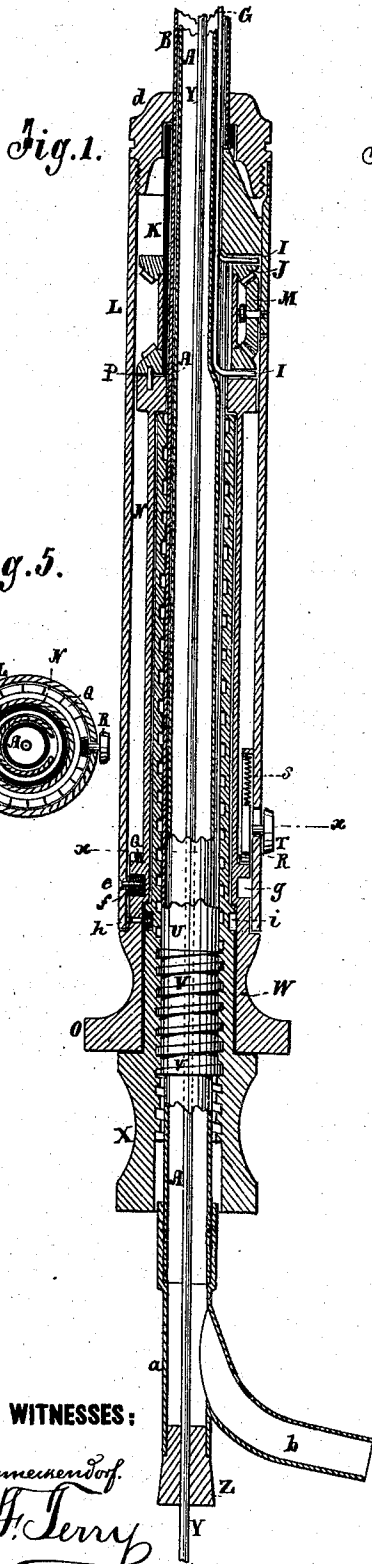


H. W. BRADFORD.  
Litholycites.

No. 156,477.

Patented Nov. 3, 1874.



INVENTOR:

*H. W. Bradford*  
*Munroe*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

HENRY W. BRADFORD, OF RANDOLPH, MASSACHUSETTS.

## IMPROVEMENT IN LITHOLYCITES.

Specification forming part of Letters Patent No. **156,477**, dated November 3, 1874; application filed August 15, 1874.

*To all whom it may concern:*

Be it known that I, HENRY W. BRADFORD, of Randolph, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Litholycite, of which the following is a specification:

The invention relates to litholycites, wherein are now employed a bag and spring, jaws that are to be inserted within the bladder; and consists in the improvement thereof, as hereinafter fully described and pointed out in the claims.

Figure 1 is a longitudinal sectional elevation of a portion of the instrument, showing the apparatus for withdrawing the protecting-tube and opening and closing the bag. Fig. 2 is a side elevation of the instrument complete, with the bag open. Fig. 3 is a section of a portion, showing the bag closed after receiving the stone; and Fig. 4 is a side elevation of a portion with the outer case removed, showing the gear for opening and closing the bag. It is also a section of another portion, showing the manner in which the spring and the bag are confined in the outer tube for inserting and withdrawing from the bladder. Fig. 5 is a transverse section of the instrument, taken on the line *xx* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents the inner tube of the apparatus, which is arranged within another tube, B, which fits over it snugly, and forms the confining-tube for holding the bag and the springs within such compress as will admit of inserting them in the bladder and withdrawing them from it. The tube B has a slot, C, extending from the inner end about the length of the bag D and the spring-jaws E. These jaws have the edge of the mouth of the bag fastened to them. They are pivoted together at one end by the ball-hinge F, and at the other end are connected to a small steel rod, G, one to each, between tubes A and B, extending along side by side in a groove or channel, H, in tube A, a suitable distance to connect by a cranked arm, I, at the outer end, with a bevel cog-wheel, J, fitted to turn on a tube, K, within a case, L, two of said wheels being used, one for each rod, and the wheels being geared together by an idle wheel, M, so

that they will turn in opposite directions when the wheel J, nearest to the outer end of the apparatus, is turned by a tube, N, which connects with it by the stud-pins P, and extends out at the end of the case L, where it is provided with a milled disk, O, for turning it. This tube has a ratchet at Q, by which it is to be held in any desired position by a pawl, R, which is pressed into it by a spring, S, and out by a stud-pin, T. The outer tube V has a screw-threaded portion on the outer end, which works in a long screw-nut, W, fitted within tube N, and projecting out of it below disk O, to form a handle, X, by which to turn it for forcing the tube B out over the springs E and the bag and back. Y is the small tube of platinum to be inserted after the stone has been secured in the bag, for conducting nitric acid into it for dissolving the stone, so that it will flow out through tube A. Platinum is used on account of being the substance best capable of resisting action by the acid. This tube will be made tight at the outer end by a cork or other suitable plug, Z, in the end of a short tube, *a*, attached to the end of A, and having a branch, *b*, for discharging the matters escaping from the bladder into a vessel for receiving them. *d* is a screw-cap at the top of the case L, for closing it thereat and suitably confining the several tubes. The tube N is secured against dropping out at the lower end of the case by a screw, *e*, and a nut, *f*, the screw being fitted in the case L, and screwing at the inner end into the nut which fits in the groove *g* of the tube. The long nut W is secured in the same manner in the tube N by a screw, *h*, passing through said tube into a nut, *i*, in a groove in the nut W. One of the springs of the bag has little clips *j* on it, under which the other one closes, so that the two are held tightly together to prevent the acid from leaking out.

The rods G may be worked by hand for opening and closing the bag; but, for greater convenience and certainty, I prefer to employ the apparatus I have here represented, or any other by which they may be conveniently worked.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The inner tubes A, having the bag D attached to it, and the groove H for the rods, the outer tube B, rods, and springs or jaws, combined and arranged substantially as specified.

2. The combination of tube N, gear-wheels J M, and case L with the rods G and tubes A B, substantially as specified.

3. The combination of nut W with tubes A B and case L, substantially as specified.

HENRY W. BRADFORD.

Witnesses:

DANIEL H. HUXFORD,  
CLARENCE H. DEANE.