W. A. Dudley,

Lithomeldor.

No. 30,471. Patented Oct. 23, 1860.

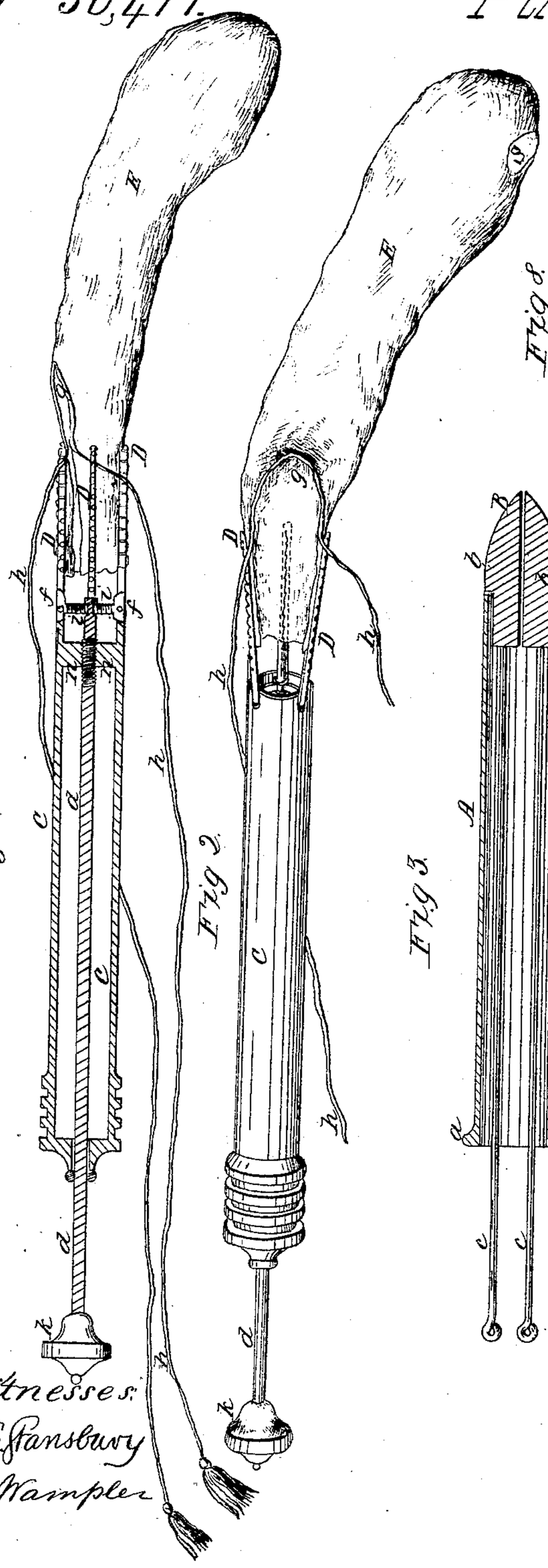

Fig 1.

Fig 2.

Fig 3.

Fig 4.

Fig 5.

Fig 6.

Fig 7.

Fig 8.

Witnesses:

Chas F. Stansbury

J. M. Wampler

Inventor:

W. A. Dudley M.D.

UNITED STATES PATENT OFFICE.

WILLIAM A. DUDLEY, OF PETERSBURG, VIRGINIA.

APPARATUS FOR REMOVING CALCULI.

Specification of Letters Patent No. 30,471, dated October 23, 1860.

To all whom it may concern:

Be it known that I, W. A. DUDLEY, of Petersburg, in the county of Dinwiddie and State of Virginia, doctor of medicine, have invented a new and useful Instrument or Apparatus for Inclosing, Dissolving, and Removing Calculi from the Human Bladder; and I do hereby declare the following to be a correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1, is a central longitudinal section of the captivator with the bag attached. Fig. 2, is a perspective view of the same, the blades being shown extended, and the stone in the bag. Fig. 3, is a central longitudinal section of the catheter with its head adjusted for effecting an entrance into the bladder. Fig. 4, is a view of a quarter of the catheter head with the rod to which it is attached. Fig. 5, is a side view of the tube through which the solvent is introduced into the bag. Fig. 6, is a full external view of the male catheter with the captivator passed into it, as when ready for operation. Fig. 7, is a rear end elevation of the catheter tube. Fig. 8, is a similar view of the catheter head.

The nature of my invention consists in the construction of an instrument or apparatus substantially such as is hereinafter described, whereby calculi in the human bladder, can first be inclosed, then broken down or dissolved by any suitable solvent, and then removed by washing in the manner to be now more particularly set forth.

To enable others to make and use my instrument, which I denominate a lithomeldor (stone dissolver), I will proceed to describe its construction and operation, referring to the drawings, in which the same part is marked by the same letter of reference, in all the figures where it occurs.

The apparatus or instrument consists of a catheter A, with its head B, an internal tube C, with its arms or captivators D, and bag E, and a golden solvent tube F, for the injection or withdrawal of the solvent at will.

The outer tube or catheter is in the form of an ordinary cannula of the proper size for entering the urethra and of equal caliber from end to end, and having an annular flange *a* around its outer end. To facilitate its entrance into the urethra it is provided with a head B, which is of ovoidal shape, and is made up of four pieces *b*, of similar shape to that shown in Fig. 4. Each of these pieces has attached to it a rod *c* and is of a size to pass readily through the catheter A, and yet when the four are put together, their flat sides touching each other, they form a head of larger diameter at one point than the catheter (see Fig. 3.) The rods *c* are for the purpose of introducing and extracting the pieces *b* that form the head B. When the head is in its proper position the four rods *c* project from the end of the catheter A, in the manner shown in Fig. 3. Their positions are also shown in Figs. 7 and 8.

When the head B, is removed from the catheter A, the said catheter tube A is prepared to receive the inner tube C, which is of the size to slip freely into the catheter. This tube has running through its center a rod *d* having at one end a milled button *k*, by which it can be turned, and at the other end which is threaded and passes through nut *n*, the three expanding arms D, D, D. These arms are pivoted at *f*, to the tube C, and have lugs *i* projecting at right angles from their pivoted ends toward the center of the tube C, where they are so attached to the rod *d* that when said rod is advanced it throws the arms D, into the expanded position shown in Fig. 2. To these arms, which are perforated with numerous holes for that purpose, is attached the bag E, in which the calculus is to be inclosed. There is an opening *g*, in the bag, between two of the arms D, through which the stone is to be introduced into it. Strings *h* are attached to the bag to facilitate its extraction from the bladder. These strings pass along in grooves in tube C, between that tube and the outer tube or catheter A.

The bag E, is made of any suitable material so prepared as to be capable of resisting the action of the solvent employed to reduce the stone, which solvent may be acid, alkaline, or neutral, according to the previously ascertained character of the stone to be removed, and the preparation of the bag will be varied accordingly.

Fig. 5, represents a tube of gold which is introduced into the bag E, through tube A, when the tube C, is withdrawn, and through which the solvent is injected by means of a glass or other proper syringe.

The first figures of the drawing represent

the apparatus on an exaggerated scale. Fig. 6, is a view of an instrument of the actual, though smallest size for use.

The male catheter may be either straight or curved. In the case where curved, the inner tube must be made in part flexible, readily adaptable to the curve of the catheter, the rod actuating the captivator arms, to be made universal jointed, for purposes of adaptability also.

Having thus fully described the construction of my apparatus, its operation may be stated as follows. The head B, having been properly attached to the catheter A, by its parts *b* being introduced by means of the rods *c* through the catheter, the catheter is introduced into the uretha, the ovoidal shape of the head facilitating its entrance. When the catheter is in the bladder, the pieces *b* are one by one withdrawn, leaving the catheter with its bore perfectly free. The bag E, rolled into a proper shape and size for that purpose, is then introduced into the bladder through catheter A, and followed by tube C to the arms D, of which it is attached as before described. These arms are closed when they pass through A, in the manner shown in Fig. 1, but when the bag is fully within the bladder, these arms are expanded by means of turning the rod *d* until they attain any desired degree of expansion. When in this position the mouth of the bag is open as shown in Fig. 2, and by gently and skilfully turning it, and working the arms D, the stone can be caught and introduced into the bag. When there, the arms D, are closed by turning the button *k* so as to partially withdraw the rod *d*, and then the tube C, is withdrawn from the catheter, carrying with it the open end of bag E. The bag is long enough to extend through the catheter, while its closed end, containing the stone remains in the bladder. Its open end, when far enough withdrawn, is attached by the cords to the annular flange of catheter A. The golden tube Fig. 5, is now introduced into the bag through its opening and through the catheter A. The solvent to be applied to the dissolution of the stone is injected through the golden tube, and when it has performed its office, is withdrawn by an exhausting syringe, and the contents of the bag, washed out by continued injections of soft water. When the whole of the solid matter contained in the bag, has been removed by washing, the bag and catheter are withdrawn and the operation is completed.

Having thus fully described the construction and operation of my instrument or apparatus, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the bag E, and arms D for the purpose of catching and inclosing the stone to be subjected to the action of a solvent substantially as described.

2. The detachable segmental head B^7 applied to the catheter or cannula of an instrument of this description for the purpose of facilitating its introduction as set forth.

3. The combination of the tube C, and its arms D, and bag E, with a catheter A, forming a new and useful instrument, for the inclosure, dissolution and removal of calculi from the human bladder, substantially as set forth, without resorting to the use of the knife.

The above specification, signed and witnessed this seventh day of September, A. D. 1860.

W. A. DUDLEY.

Witnesses:

CHAS. F. STANSBURY,

EDW. F. BROWN.