No. 675,042. Patented May 28, 1901.

J. HEPBURN.

APPARATUS FOR TESTING URINE.

(Application filed Jan. 31, 1901.)

(No Model.)

Fig. 4.

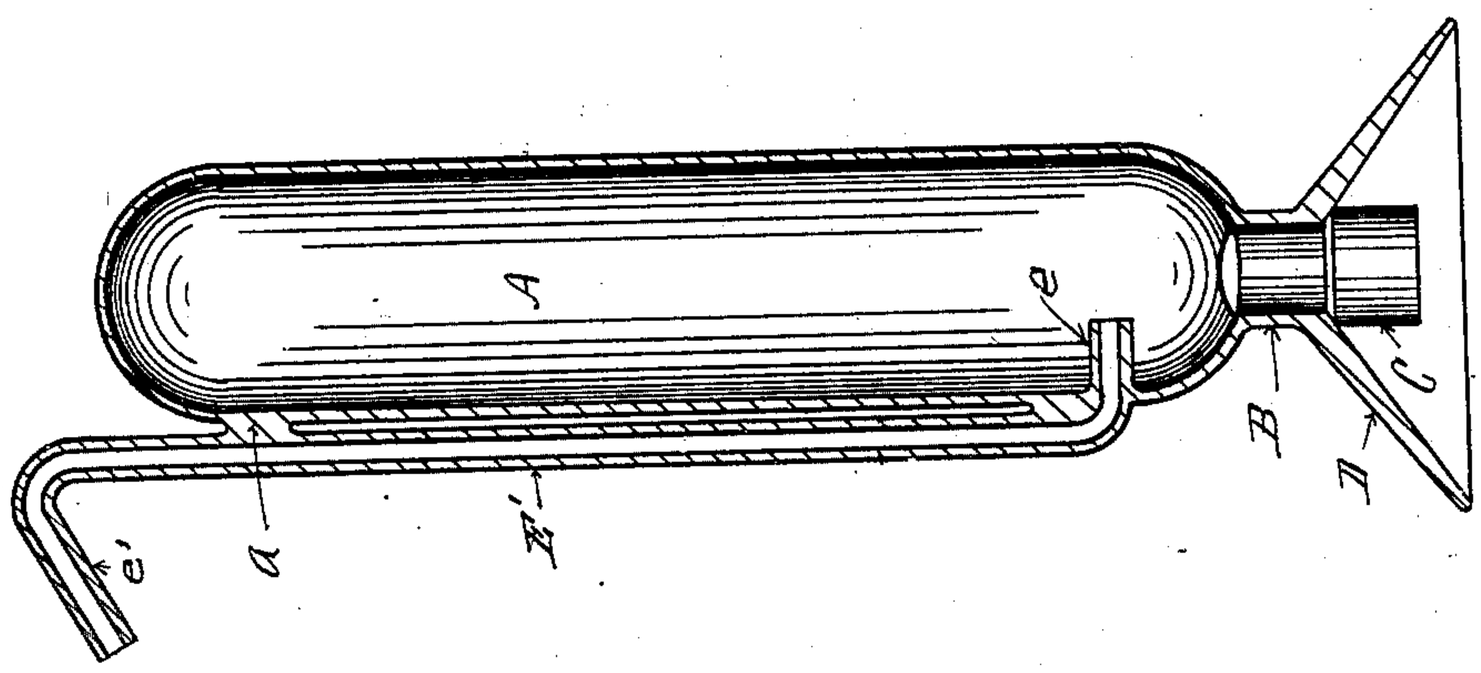


Fig. 3.

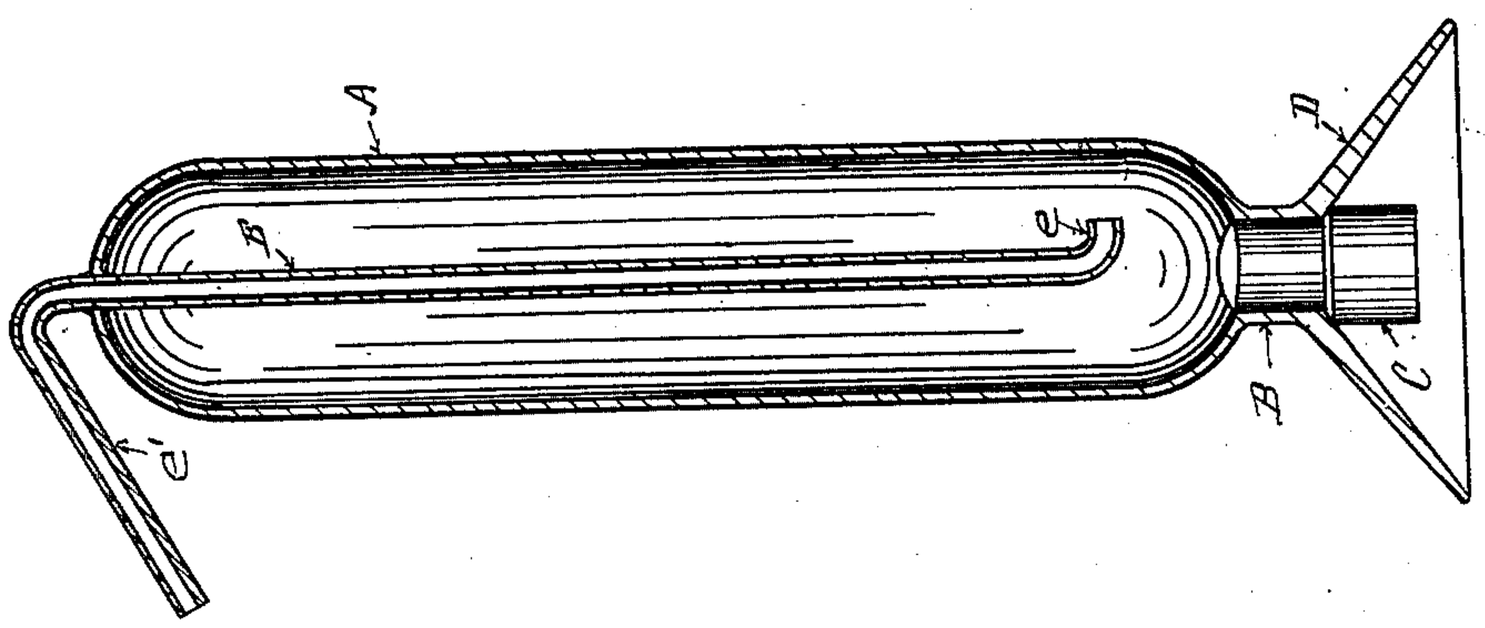


Fig. 1.

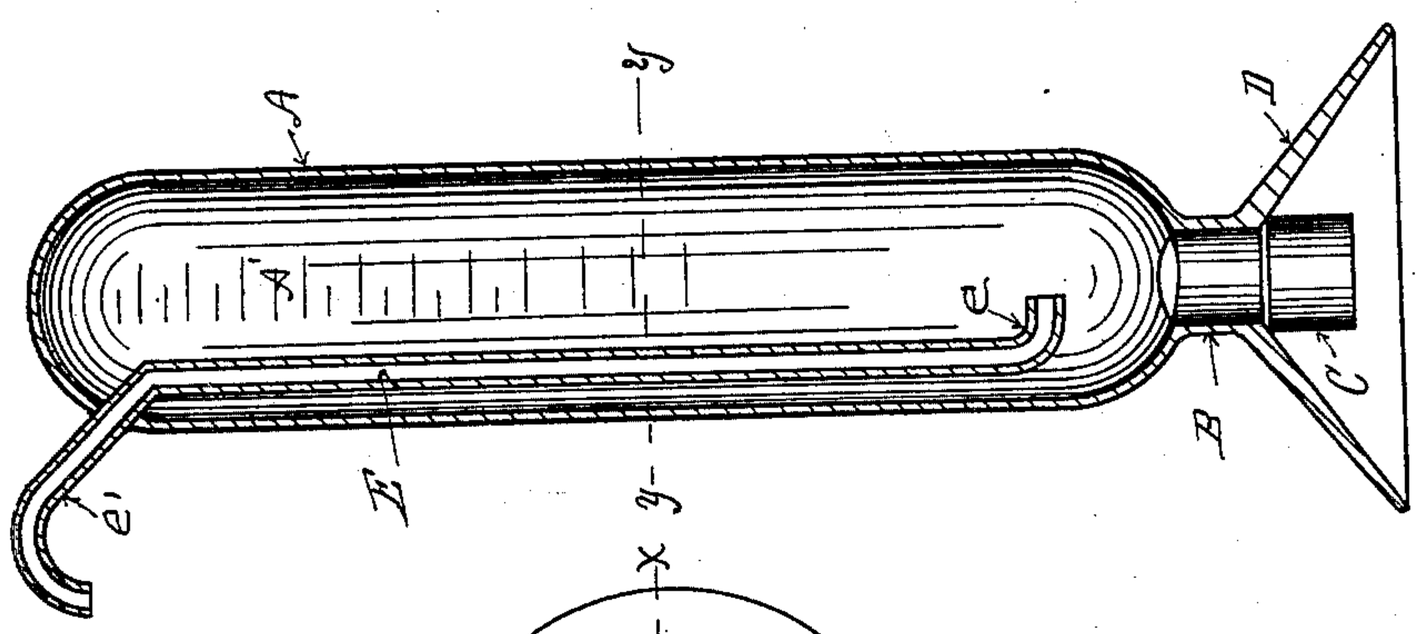
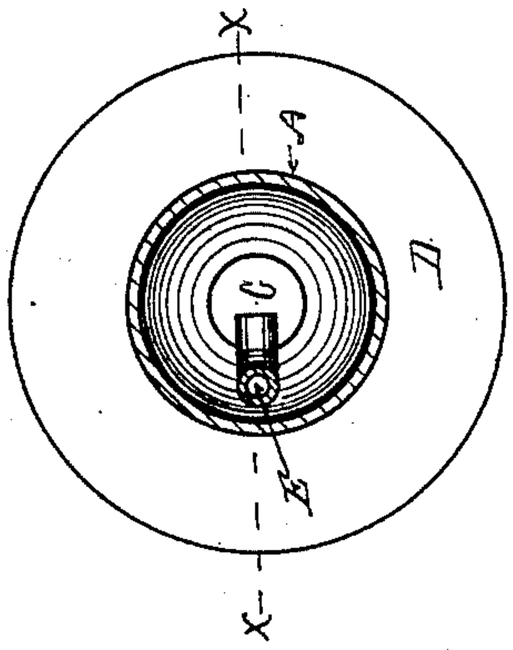


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN HEPBURN, OF WARREN, PENNSYLVANIA.

APPARATUS FOR TESTING URINE.

SPECIFICATION forming part of Letters Patent No. 675,042, dated May 28, 1901.

Application filed January 31, 1901. Serial No. 45,446. (No model.)

To all whom it may concern:

Be it known that I, JOHN HEPBURN, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Instruments for Testing Urine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to improvements in instruments for testing urine, and relates particularly to instruments used in testing urine for sugar by means of the yeast process, wherein the urine is placed in a receptacle and yeast added thereto and if there is sugar therein fermentation takes place and the gases generated thereby operate to displace such portion of the fluid as is occupied by the gases generated. Heretofore this has been done in various ways—as, for example, by means of a bottle with a tube extending down through the cork into the bottom thereof; but it is difficult to operate this device, for the reason that it is difficult to close the neck of the bottle so as to entirely prevent the escape of the gases generated. To overcome this difficulty, I have devised an oblong vertical receptacle, preferably made of glass, having its upper end closed, and having a neck formed on the lower end thereof having an opening adapted to be closed with a cork, said neck terminating in a funnel, which forms a base upon which the receptacle will stand upright, and opening into the lower part of the receptacle there is a small tube, which extends upward above the upper end of the receptacle and preferably bends to one side thereof, so that as the gases rise in the upper part of the receptacle the fluid displaced thereby is forced out through said tube.

The features of this invention are hereinafter set forth and described, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of my improved instrument for testing urine on the line $x\,x$ in Fig. 2. Fig. 2 is a transverse section of the same on the line $y\,y$ in Fig. 1. Fig. 3 is a vertical central section of a modified construction of my invention. Fig. 4 is a like section of another modified form of the construction of the same.

The body of this device consists substantially of an upright cylindrical shell A, preferably made of glass, and having its upper end closed and its lower end provided with a hollow neck B, adapted to receive a cork C, said neck terminating in a base D, which flanges outward and downward from the lower end of the neck B, so as to operate as a base to support the body A in an upright position, and when the device is inverted to operate as a funnel to facilitate the filling of the body A.

In the forms of the device shown in Figs. 1 and 2 I secure a small tube E in the upper part of the body A, preferably by sealing it into the same when the device is made. This tube E extends down into the body A nearly to the bottom thereof, where the end e is preferably turned laterally, so as not to readily receive the fluid when the body A is being filled through the neck B, and the upper end e' of the tube extends to a little distance above the top of the body A and is preferably turned to one side, so that fluid flowing therefrom will fall into a suitable receptacle therefor.

In Fig. 4 the body A, neck B, cork C, and base D are the same as hereinbefore described; but the tube E′ extends down outside of the body A to near the bottom thereof, where it passes through the side wall of the body A and is sealed therein, and is also preferably secured at a to the side of the body A.

In Fig. 1 I have shown a scale A′ on the body A, which may be marked thereon to show the amount of fluid expelled therefrom by the gases of fermentation. It may, however, be made and used without a scale, if desired.

In operation this device is inverted, the cork C removed, and a suitable amount of yeast is then placed in the body A, which is then filled full of the urine which it is desired to test. The cork C is then again securely inserted in the neck B, during which operation the surplus of urine will pass out through the tube, so that when the cork is secured the body A will remain entirely occupied by

the urine and yeast therein. The device is then stood upright upon the base D, and if sugar exists in the urine the yeast acting thereon will produce fermentation, and the gas generated thereby will rise to the top of the body A and will expel a like volume of the fluid through the tube E or E′ until fermentation ceases.

Having thus described my invention, so as to enable others to construct and use the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

The combination in an instrument for testing urine, of an upright cylindrical body having the upper end thereof closed, a hollow neck on the lower end of said body adapted to receive a cork, a conical base on said neck, and a tube sealed into said body and extending downward therein nearly to the bottom of said body and having its upper end extending above the top of said body and curved laterally therefrom, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN HEPBURN.

Witnesses:

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