C. A. BROWN.

FLUID SAMPLING DEVICE.

APPLICATION FILED JULY 21, 1911.

1,056,254. Patented Mar. 18, 1913.

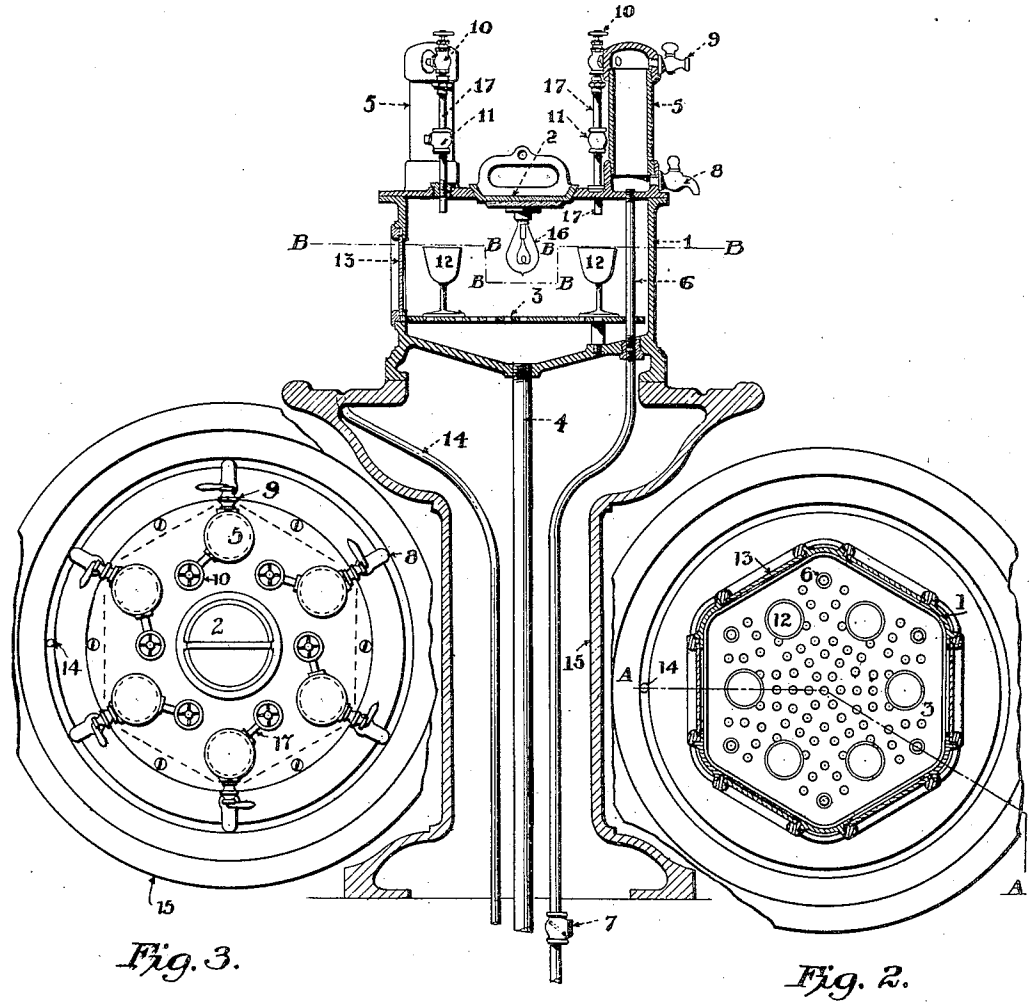

Fig. 3.

Fig. 2.

Fig. 1.

WITNESSES

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FLUID-SAMPLING DEVICE.

1,056,254. Specification of Letters Patent. Patented Mar. 18, 1913.

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To all whom it may concern:

Be it known that I, CHARLES ARTHUR BROWN, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Fluid-Sampling Devices; and I do hereby declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

One of the objects of my invention is the production of mechanism for mechanically collecting samples of fluids without the possibility of chemical or bacterial contamination or change.

Another object of my invention is to collect such samples without passing them through the source of pressure.

Another object of my invention is to make one source of negative pressure collect a large number of fluid samples from different points or levels and to convey these samples to a common center where they can be compared or examined.

Another object of my invention is to provide glass vessels for holding changing samples of fluids which are capable of being examined visually and compared with other samples in such a manner that the glass vessel may readily be removed and cleaned or replaced without undue expense.

Many of the sampling devices now used consist of pumps whose suction end is in the source from which the sample is to be taken. The fluid to be sampled is made to pass through the pump and is forced to the point where the sample is to be examined. In this type of device, if water is to be sampled, the water in passing through the pump is necessarily brought in contact with the moving parts of the pump, the bearings and stuffing boxes of the pump being subject to lubrication, which may introduce more or less of the lubricant into the water to be sampled Leaks around the stuffing boxes of said pumps may result in bacterial contamination of the sample; exceedingly small leaks producing a considerable contamination. This is particularly true where the suction lift of these pumps is considerable. In the case of filtered waters which are relatively free from bacteria and where these waters are subjected to bacteriological examination a very small amount of contamination may vitally affect results.

The device of my invention is calculated to eliminate any contamination resulting from the pump or source of pressure and secure an accurate and uncontaminated sample. Thus I may, as in the form of my invention illustrated and described herein, cause the water to be sampled to pass through the sampling device before reaching the pump or source of pressure.

Other objects of my invention and the invention itself will be best understood by reference to the following description, when taken in connection with the accompanying illustrations, showing one specific embodiment of my invention, while the scope will be more particularly pointed out in the appended claims.

Figure 1 shows a sectional elevation on line A—A—A of Fig. 2 of one form of my invention. Fig. 2 is a horizontal section on line B—B—B—B—B of the apparatus shown in Fig. 1. Fig. 3 is a plan view of the top of the apparatus shown in Fig. 1.

Referring now to the drawings and to the form of my invention shown therein, I show a duct 4, leading to a source of negative fluid pressure. This may consist of a pump suction, but I prefer to use the suction of an ejector as a source of such negative pressure. It will readily be understood that any source of negative fluid pressure may be employed, but I prefer to use a device which will be free from impulses. An ejector will produce a vacuum or partial vacuum at its suction and the suction chamber thereof can be connected to the duct 4 of the main vacuum chamber 1 of the sampling device. This chamber 1, is provided with a perforated false bottom 3.

In the main vacuum chamber 1 are placed as many ordinary glass goblets 12 as there are sources from which samples are desired. Above the main vacuum chamber 1 are placed a number of individual vacuum chambers 6, one individual vacuum chamber being provided for each source from which a sample is to be taken. The number of these individual vacuum chambers 5 is therefore governed entirely by the number of sources from which a sample is desired.

A duct 17 leads from the top of each individual vacuum chamber 5 into the main vacuum chamber 1, the end of the duct 17 in the main vacuum chamber 1 terminating above the goblet 12 which is to hold the changing sample of the source from which

it is taken. This duct 17 is provided with two valves 10—11, one of which 10 is a positive valve which may be fully opened or entirely closed to allow of flow through the duct or to stop said flow. The other valve 11 is preferably of the lock type and is used merely to partially throttle the flow through the duct 17 and to introduce sufficient friction or throttling effect to regulate the flow through the duct 17 in accordance with the desired demand. In the top of each individual vacuum chamber 5 there is likewise inserted a pet-cock 9 or valve in such a manner that atmospheric pressure may be introduced into the individual vacuum chamber or prevented from entering said chamber as may be desired. At or near the bottom of each individual vacuum chamber 5 there is inserted a pet-cock or bib 8 from which the water collected in the individual vacuum chambers 5 may be withdrawn at pleasure. At the same or another point near the bottom of the individual vacuum chamber 5 there is inserted a duct 6, which connects the individual vacuum chamber 5 with the source from which the sample is to be taken. This duct 6 is provided with a check valve 7 which permits the water to flow freely into the individual vacuum chamber 5, but prevents it from flowing from the individual vacuum chamber 5 to the source from which the sample is taken. The main vacuum chamber 1 is likewise provided at its top and approximately at its center with a ground joint handhole plate 2. When a vacuum or partial vacuum is produced in the main vacuum chamber 1 this ground joint handhole plate 2 is seated by said vacuum or negative pressure and forms a tight fitting joint. When the negative pressure is released the plate 2 can then be lifted from its seat without loosening any bolts or nuts. This handhole plate 2 is provided, as shown, with an electric light bulb 16 which is connected with the electric lighting system of the plant and the samples may thus be compared under exactly similar light conditions at all times. The main vacuum chamber 1 is likewise provided with as many glass covered portholes 13 as there are samples to be examined.

The method of operation is as follows: When the source of negative pressure creates a vacuum or partial vacuum in the duct 4, this will cause a vacuum or partial vacuum in the main vacuum chamber 1, seating the handhole plate 2 and making a tight joint thereof. The vacuum in the vacuum chamber 1 will then be transmitted to each of the individual vacuum chambers 5 if the proper valves 10—11 be open. If the air relief valve 9 and sampling bib valve 8 be closed, this negative pressure will be transmitted to the suction supply line 6 leading from each of the individual vacuum chambers 5 and the pressure of the atmospheric air upon the source from which the sample is taken will cause a portion of the water to be sampled to pass through the duct 6 into the individual vacuum chamber 5 until it is filled, when it will overflow through 10—11—17 into the goblet 12, which in turn will overflow into the main vacuum chamber 1 and will be withdrawn from the same by the ejector through the duct 4, thus maintaining a constant flow through the individual vacuum chambers 5 and the goblet 12 associated therewith. By closing the positive valve 10 between the individual vacuum chamber 5 and the main vacuum chamber 1 the flow through the individual vacuum chamber 6 will be stopped. The check valve 7 on the suction supply line 6 of the individual vacuum chamber 5 will prevent the water returning to the source from which it came. By opening the air relief valve 9 and the bib 8 the water contained in the individual vacuum chamber 5 may be withdrawn under proper bacteriological precautions and will serve as an accurate sample of the source from which it is taken. A waste pipe is shown at 14 to carry off any fluid which falls upon the ledge of the member 15.

It will be understood that I may use any suitable means for producing a source of negative pressure and that I have herein shown only one form of my invention. It will also be obvious to those skilled in the art that numerous and extensive departures from the forms and details here shown may be made without departing from the spirit of this invention, the same being shown solely for the purpose of clearly illustrating one specific embodiment thereof.

I claim:—

1. In a device of the class described, the combination of a main vacuum chamber, a plurality of companion vacuum chambers, means to connect said main chamber to said companion chambers, means to collect a fluid, a plurality of sources of fluid and a source of negative pressure connected to said main chamber adapted to cause fluid to flow from said sources to said collecting means.

2. In a device of the class described, the combination of a gas tight chamber, a source of fluid, means connecting said source and said chamber for conducting fluid from the source to the chamber, means in said chamber to catch and retain fluid from said source and a source of negative pressure for causing fluid to flow from said source to said retaining means.

3. In a device of the class described, the combination of a gas tight chamber, a source of fluid, means connecting said source and said chamber for conducting fluid from said source to the chamber, a plurality of auxil-

iary chambers associated with the main chamber, means in said main chamber to catch and retain a portion of the liquid from said source and means to cause the liquid from said source to flow through said chambers and to said retaining means.

4. In a device of the class described, the combination of a main vacuum chamber, a plurality of companion vacuum chambers associated therewith, a source of negative pressure for causing fluid to flow through said chambers, means to catch and retain fluid thus caused to flow into said main chamber and means in the walls of said main chamber whereby the fluid caught and retained may be inspected.

5. In a device of the class described, the combination of a main vacuum chamber, a second vacuum chamber connected therewith, a source of pressure for creating a flow of fluid through said chambers and transparent means in the walls of said chamber permitting the inspection of the fluid in the chamber.

6. In a device of the class described, the combination of an air tight chamber having an opening therein, a cover for said opening adapted to be placed in the opening and to form an air tight connection therewith, a source of fluid, means in the main chamber adjacent said opening to catch and retain fluid, and means to cause fluid to flow from said source into said retaining means.

7. In a device of the class described, the combination of an air tight chamber, means to cause fluid to flow into said chamber, means in said chamber to catch and retain fluid flowing therein, a glass wall in said chamber on one side of said retaining means and a source of light on the other side thereof.

8. In a device of the class described, the combination of means to collect a plurality of fluid samples, a source of negative pressure for causing fluid to flow into said means, and means for permitting an examination of said samples.

9. In a device of the class described, the combination of a source of fluid, a chamber, a source of negative pressure for causing fluid from said source to flow into said chamber, means in said chamber to catch and retain fluid therein, and a lamp in said chamber, said retaining means being between the lamp and the walls of the chamber.

10. In a device of the class described, the combination of a chamber, a source of fluid, means to cause fluid from said source to flow through said chamber, a source of light, and means whereby the fluid flowing through the chamber may be inspected, said fluid flowing between the source of light and said last named means.

11. In a device of the class described, the combination of a main chamber, a secondary chamber communicating therewith, a duct connecting such chambers, a valve controlling said duct, a source of fluid, means to connect said source with the secondary chamber, means in the main chamber to catch and retain fluid therein, means to cause fluid to flow from said source to said retaining means, a lamp in said main chamber and transparent means in the walls of the main chamber.

In witness whereof, I hereunto subscribe my name.

CHARLES ARTHUR BROWN.

Witnesses:

I. D. SEILER,

H. A. FRENAYE.