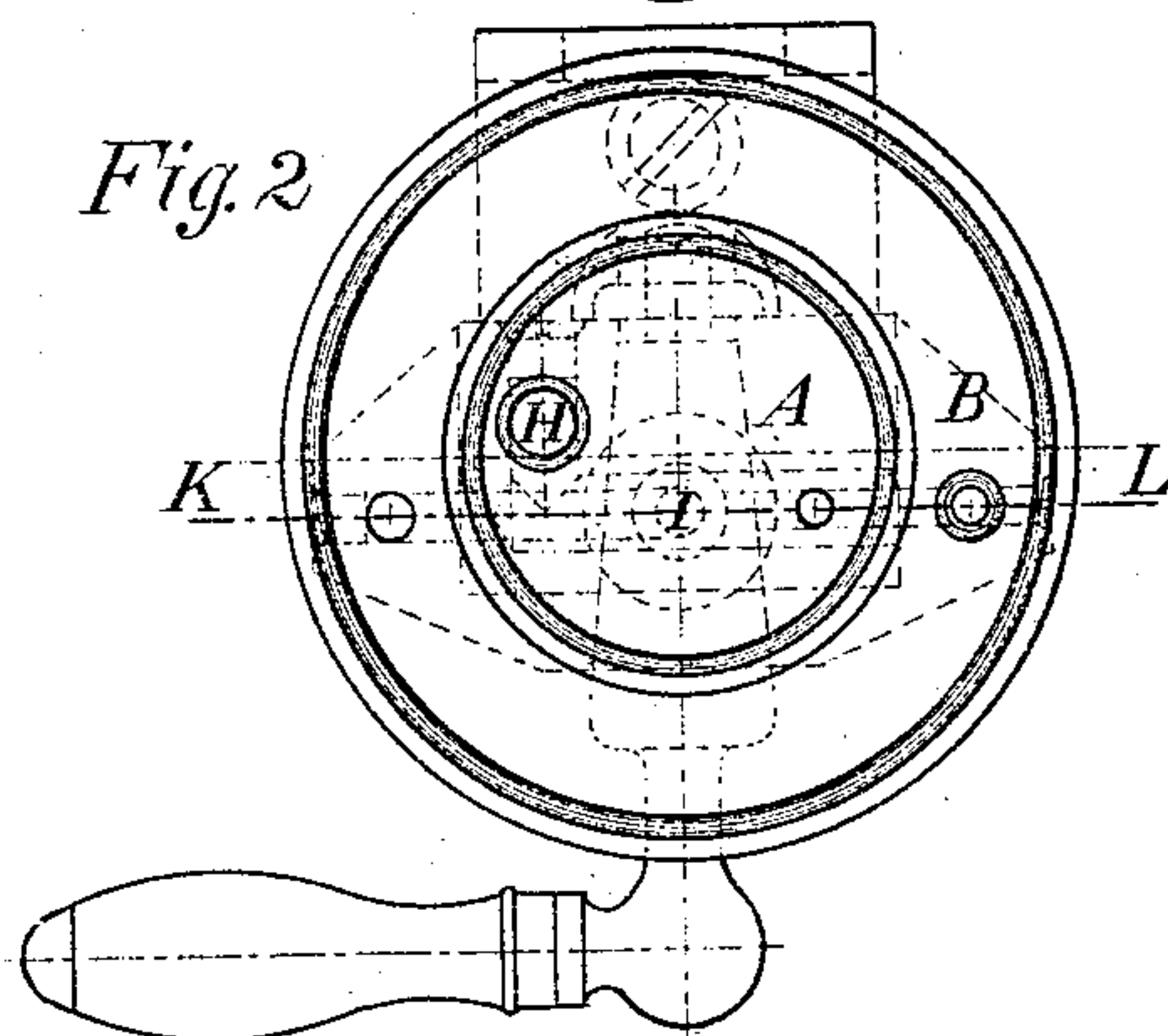
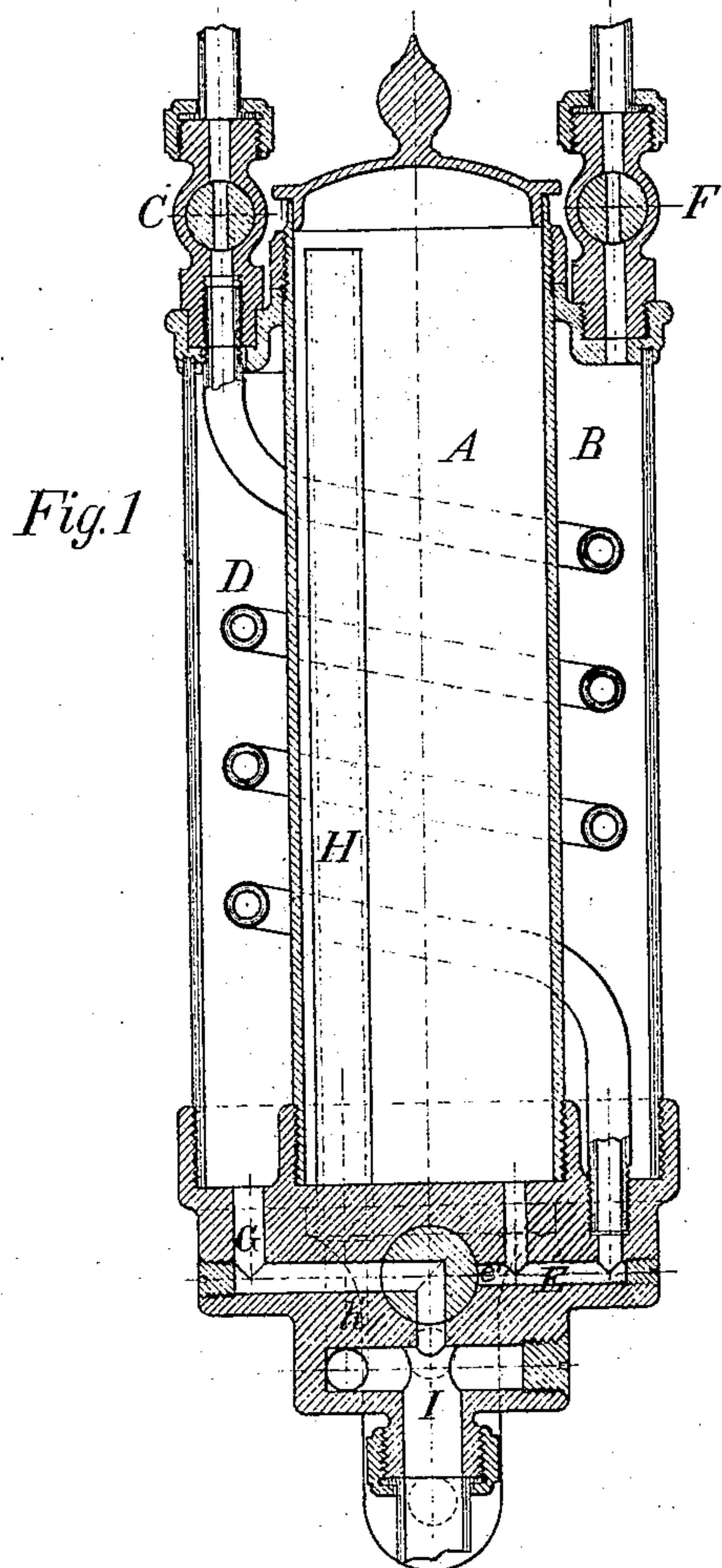


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**Salinometer Pots.**

No. 153,431.

Patented July 28, 1874.



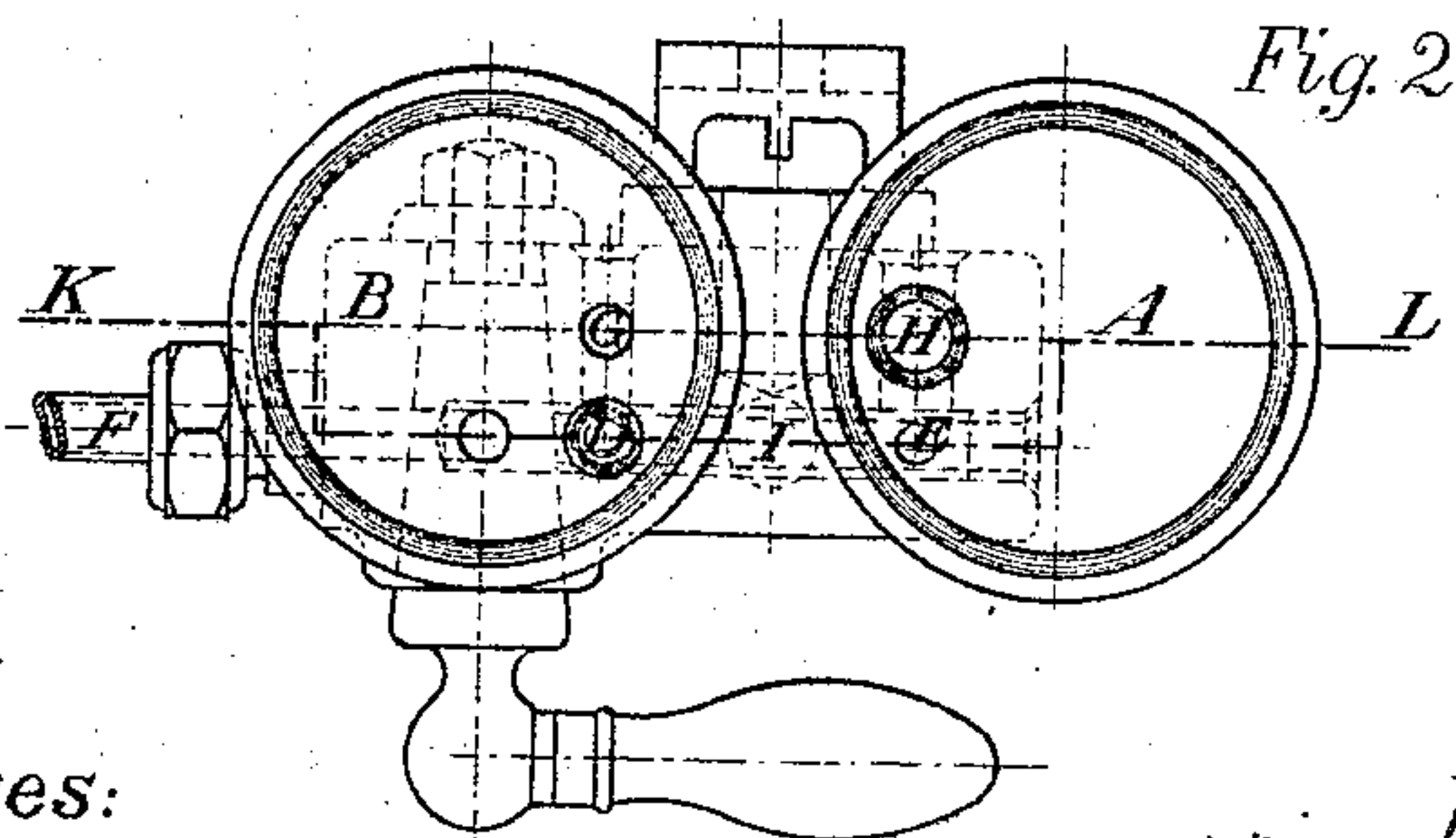
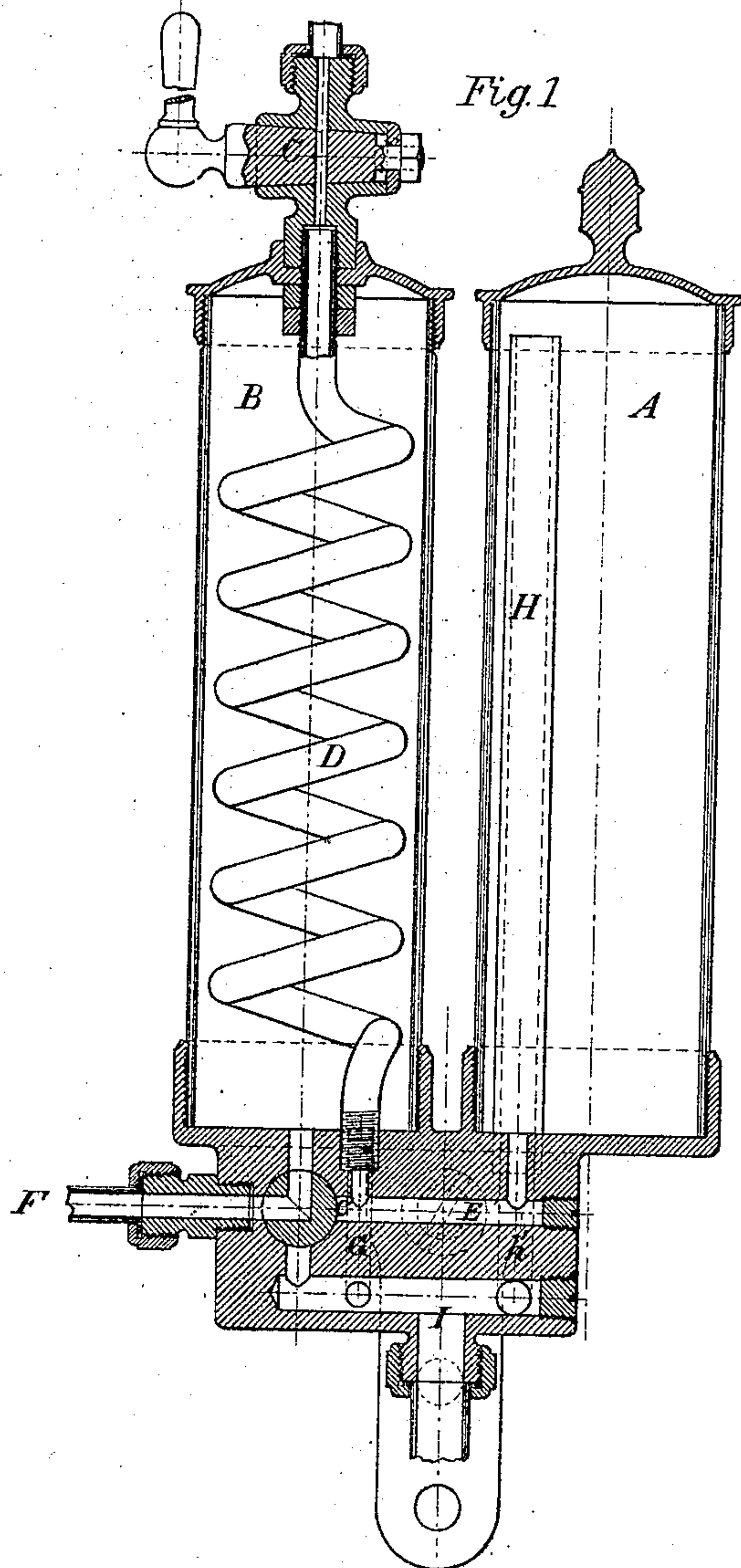
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# UNITED STATES PATENT OFFICE.

EDWIN FITHIAN, OF UNITED STATES NAVY.

## IMPROVEMENT IN SALINOMETER-POTS.

Specification forming part of Letters Patent No. **153,431**, dated July 28, 1874; application filed June 8, 1874.

*To all whom it may concern:*

Be it known that I, EDWIN FITHIAN, an engineer in the United States Navy, of Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Salinometer-Pots; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1, Sheet 1, is a vertical section on line K L of Fig. 2, showing a cold-water pot, a hot-water pot, a coil of pipe for the introduction of hot water, an over-flow pipe for the escape of hot water, and induction and eduction passages for both hot and cold water, with cocks for controlling the passage of such water; and Fig. 2, Sheet 1, is a plan view, showing the location of the parts above named. Figs. 1 and 2, Sheet 2, represent modifications of the arrangement shown in Sheet 1, the same views being given.

Corresponding letters refer to like parts in all the figures.

This invention relates to salinometers, which are used to indicate the density or saltiness of water in steam-generators, and other vessels in which brine or salt water is used; and it consists in a pot for salinometers, constructed in such a manner as to admit of there being passed through it constant or intermittent streams or jets of cold and hot water, for the purpose of reducing the temperature of the hot water which is to be gaged or tested to or below the point at which ebullition ceases, so that the density of the water in the vessel to which it is attached can be measured or ascertained with exactness by inserting a hydrometer into the hot-water compartment thereof. And it further consists in the combination and arrangement of some of the parts of which it is composed, as will be more fully explained hereinafter.

In salinometer pots or cases, as heretofore constructed, great difficulty has been experienced in gaining access to the hydrometer placed therein, on account of the fact that, as

the chamber or compartment in which it is placed is in direct communication with the interior of the generator, the temperature of the water in such chamber is such as to render the scalding of the observer quite certain in attempting to open it for the purpose of observing the position or condition of said hydrometer. Another and more serious objection to these devices, as heretofore constructed, consists in the fact that no adequate provision has been made for rapidly reducing the temperature of the water in the chamber in which the hydrometer is placed, to or below the point at which ebullition ceases; and hence no really accurate measure of the density or specific gravity of the water can be obtained until it has been cooled by the radiation of its heat into the surrounding atmosphere.

The object sought to be attained by this invention is the remedying of the above-recited and other objections, and the production of a pot or case for devices of this character, which, while its hot-water chamber is in full communication with the interior of the generator, and the water is flowing therefrom into said hot-water chamber, or while it is therein, it may be cooled to or below the temperature at which all ebullition ceases, by being brought into contact with surfaces the opposite sides of which are exposed to the action of cold water; and hence a correct measure of the specific gravity of such water be obtained, and, at the same time, all danger of injury to the observer be removed, and all delay in making the observations avoided.

With a view to the production of the above-recited results, I construct my pot or case A for the reception of the hydrometer, and of the hot water from the generator, in such a manner that it can be placed within and form the inner wall of the cold-water chamber B, as shown in Fig. 1 of Sheet 1 of the drawings; or it may be a separate chamber, and placed by the side of chamber B, as shown in Fig. 1 of Sheet 2. In either case, it is proper that it should be supplied with a cap, which can be readily removed for the insertion of the hydrometer, and for gaining access thereto. It is also to be provided with an overflow-pipe, H, which is so arranged therein as not to interfere with the insertion of the hydrometer,



and also to form a passage for the escape of the water after it has risen to the desired height in the chamber. The induction of the water from the generator to this chamber is effected by means of a pipe which is to be connected with the generator at the proper point, and with the upper end of a cock, C, which is screwed into the upper head of the cold-water chamber. This cock may be used to open or close the communication between the generator and a coil of pipe, D, which passes around the hot-water chamber, and through the cold-water one, as shown in Fig. 1 of Sheet 1, or through it only, as shown on Sheet 2. The lower end of this coil, in either case, is to be attached to the lower head of the instrument, in such a manner as to cause it to communicate with a passage, E, which conducts the hot water from said coil to the chamber A, as shown, in which it rises as high as the upper end of the overflow-pipe H, down through which it passes to the general outlet I, through the passage *h'* formed in the lower head.

The method of introducing the cold water into its pot or chamber B is shown in Fig. 1; and consists in a cock placed in the upper head thereof, which is capable of closing the communication between said chamber and its source of supply. After passing said cock, the cold water enters its chamber, B, and is made to fill it to any desired height, its egress therefrom being through the aperture G in the lower head of the case, from which it passes into the general delivery I, its passage being regulated by means of a cock placed in the passage G, which is also capable of being used as a means of drawing off the water from the hot-water chamber A by turning it one-fourth of a revolution from the position in which it is shown in Fig. 1 of Sheet 1.

From the above description, and from an inspection of the drawings, it will be seen that the function of this device is to cool the water as it comes from the generator to such an extent as to enable the observer to get a correct gage of its specific gravity, and that it performs this function by reason of the peculiar construction of the pot or case, as a whole, and of the relation which certain of its parts sustain to others, these being such that, as the hot water enters through the cock C, it is conducted through a coil of pipe which is surrounded by water which is of a lower temperature than that which is within it, and, after

having been discharged from the coil, is delivered into a chamber which is also surrounded, or partially surrounded, with comparatively cold water, and that its temperature is thus reduced, the amount of which reduction may be controlled by the cock F, which may be made to regulate the amount of cold water passing through the chamber B, or such regulations may be effected by the cock in the outlet-passage from such chamber.

The combination and arrangement of the parts herein shown and described is regarded as of great importance, on account of the fact that it provides for the passage through the pot of constant streams of hot and cold water, and thus enables the observer to make his observations every two, three, or five minutes, or as often as may be deemed necessary, without any loss of time on his part, and without the danger of being scalded.

The device shown on Sheet 2 of the drawings is regarded as the equivalent only of that shown on Sheet 1, the mode of operation in both being identical, it varying only in form and in the point at which the cold water is introduced.

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

1. The combination, in a salinometer-pot, of a hot and cold water chamber separated from each other, they being arranged substantially as herein described, for the purpose of cooling the hot water which passes through the pot to or below the point at which ebullition ceases, for the purpose set forth.

2. In combination with the hot and cold water chambers of a salinometer-pot, a coil of pipe for conducting the hot water from the steam-generator to the cooling-chamber of the pot, substantially as and for the purpose set forth.

3. In combination with the hot and cold water chambers of a salinometer-pot, the discharge-passages E, G, *h'*, and I, which together are made to form a general delivery for both hot and cold water, substantially as set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

EDWIN FITHIAN.

Witnesses:

CHAS. H. MURRAY,  
WM. E. HODGE.