No. 825,178. PATENTED JULY 3, 1906.

R. P. BARNSTEAD.

DOMESTIC WATER STILL.

APPLICATION FILED APR. 20, 1905.

Fig. 1

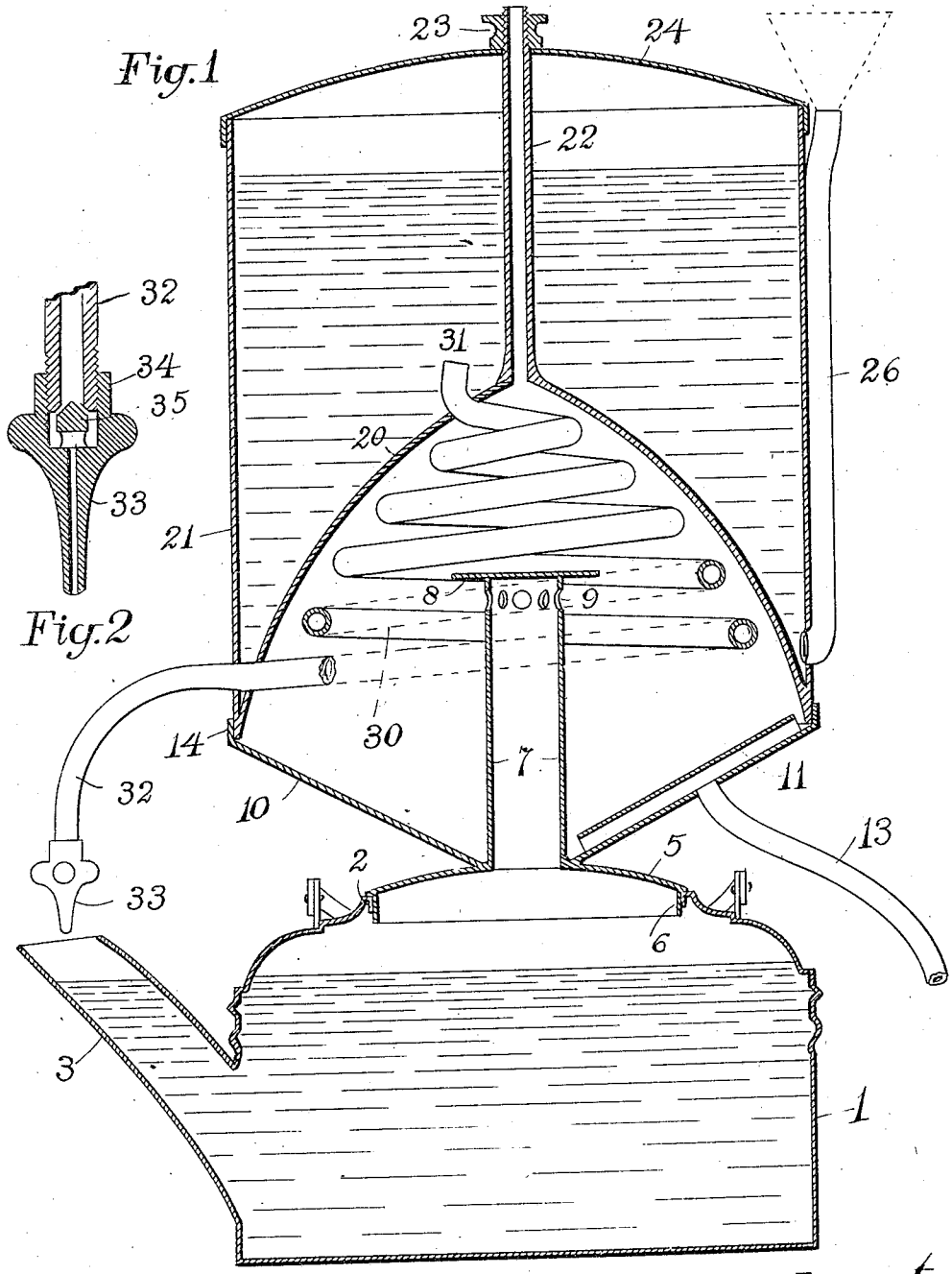



Fig. 2




Attest;

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# UNITED STATES PATENT OFFICE.

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## DOMESTIC WATER-STILL.

No. 825,178. Specification of Letters Patent. Patented July 3, 1906.

Application filed April 20, 1905. Serial No. 256,608.

*To all whom it may concern:*

Be it known that I, ROBERT P. BARNSTEAD, a citizen of the United States, and a resident of Boston, in the county of Suffolk, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Domestic Water-Stills, of which the following is a full, clear, and exact description.

The object of this invention is the construction of means for the production of pure water, which can be used in connection with an ordinary tea-kettle and numerous advantages be obtained thereby, as hereinafter set forth.

Referring to the drawings forming a part of this specification, Figure 1 is a vertical central section of the improved still made in accordance with my invention. Fig. 2 is a sectional detail view, on an enlarged scale, of the adjustable nozzle forming part of the apparatus.

The tea-kettle 1, with which my invention is illustrated as connected, is of the customary sheet-metal type with nose 3 and opening 2. The base of the condenser forming part of this still consists of the member 5, made substantially like in appearance and size the lid of such a tea-kettle, but proportioned to fit quite tightly into said opening 2 to insure against leakage of steam and of accidental overturn. From the center of said base rises the tube 7, having its upper end closed by an overhanging cap 8, close beneath which are several lateral apertures 9. Fixed to the juncture of said tube and base is the rather flat cone 10, having an upwardly-rising flange 14 at its periphery, within which flange fits the lower edge of the cylinder 21. About midway of the cone 10 is the discharge-pipe 13, through which the distillate is lead wherever desired, the inner end of said pipe being protected by the hood 11, open at the apex and periphery of the cone.

Fixed to the lower edge of the cylinder 21 is the dome 20, designed to compose the condensing-chamber of this still and terminating in the tube 22, rising upward through the cover 24 of the said cylinder, its extremity being threaded and fitted with a nut 23. The space thus inclosed between said dome and cylinder is for the cold water, by which the condensing-chamber is chilled and the steam converted into water. To introduce the water into said space, the pipe 26 is secured to the exterior of the cylinder 21, rising from near the bottom of the latter, through which it communicates with the interior, while its upper end is open at approximately the same level as the upper edge of said cylinder. By applying a suitable funnel to the upper end of said pipe 26 water can be poured in until said space is substantially filled. The advantage of this arrangement will be set forth hereinafter.

Within the condenser-chamber is located a worm 30, whose upper end 31 is open to the space within the cylinder 21 and takes water therefrom and whose other end is extended out through the wall of said dome and cylinder and terminates immediately above the open nose 3 of the tea-kettle. This worm-terminus is provided with an adjustable nozzle 33, by means of which the flow through the worm can be checked to correspond closely with the outflow from the pipe 13 and the level of the water in the tea-kettle maintained at substantially a uniform height. The means whereby I render said nozzle adjustable is to provide its upper section 2' with screw-threads fitting corresponding threads on the end of the worm-terminus 32, and to fix a small taper plug 35 within the nozzle immediately below the open end of said terminus, said plug being arranged not to interfere with the flow of water through the nozzle itself. By screwing this nozzle up until said plug contacts with the end of said terminus the flow is wholly cut off, while a slight turn downward gives the flow or drip required.

The worm 30 is made to conform quite closely to the dome 20, although not quite in contact therewith, and its object is twofold: First and most important is the heating given thereby to the overflow from the cylinder 21, so that water supplied to the tea-kettle is almost at the boiling-point when it enters the same, and hence less heat is needed to vaporize it.

The second advantage consists in the additional faculty for condensation provided in the condensing-chamber. The worm being below the boiling-point in temperature serves to condense whatever steam strikes its surface.

The purpose of the overhanging cap 8 is to aid in throwing the steam from the apertures 9 directly outward into contact with the worm and dome, and thereby to reduce the amount of vapor which might otherwise escape from the chamber through the tube 22.

Another most important feature is that of the supply-pipe 26, by means of which the cold water provided for the cylinder is introduced into the bottom thereof, thus insuring that it shall be only the warmest of the contents of said cylinder that shall overflow therefrom to the worm, the coldest remaining to perform its task of condensation.

In use this water still stands upon the stove the same as any other tea-kettle and with an ordinarily hot fire produces over a gallon per hour of pure distilled water. A glance into the nose of the kettle shows whether the level of the water within is being maintained, for if the level sinks to a point below the opening between the kettle and its nose the steam will escape from the latter instead of passing up through the condensing-chamber. By a little adjusting of the nozzle 33, however, it can be readily ascertained about how much water should be allowed to drip into the nose 3 to equal the amount rising in steam.

To insure that the cylinder 21 is properly filled, it is only necessary to occasionally pour therein a quantity slightly in excess of the distillate accumulated during the same time.

In case the water in the cylinder becomes too hot for properly condensing the vapor in the condensing-chamber a part thereof can be removed and replaced by cold water. The imperfect condensation will be made evident by the escape of steam from the pipe 22.

The value of the coil 30 is that it condenses a great part of the steam in the condenser-chamber, and consequently relieves the dome 20 from a large proportion of this task, thereby saving the water in the cylinder 21 from becoming heated as quickly as it would otherwise be. Moreover, since the water within said coil is passing on to the tea-kettle and being steadily renewed such coil is maintained at a proper temperature to condense whatever steam strikes it. While this is the theory because of which I introduce the coil 30 within the condensing-chamber, its great utility and value are amply demonstrated in actual use, the economy in heat and the large supply of distillate produced being very marked.

When no more distilled water is desired, the condensing device is simply lifted off the tea-kettle, the nozzle 33 closed, and the same set on its base-flange 6 upon any suitable shelf or table provided therefor. Then the proper lid of the tea-kettle is restored thereto and the normal functions of the latter resumed.

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. The combination with a shell constituting a condensing-chamber and means for surrounding the same with water, of a water-boiling receptacle disposed to supply steam to said chamber, and a worm located within said chamber; one end of said worm communicating with the water surrounding said shell, and the other end connecting with said water-boiling receptacle.

2. The combination with a shell constituting a condensing-chamber, and means for surrounding the same with water, of a water-boiling receptacle disposed to supply steam to said chamber, and a worm located in said chamber; one end of said worm penetrating said shell and open to the surrounding water close above said shell, and the other end of the worm communicating with said water-boiling receptacle.

3. The combination with a centrally-elevated shell constituting a dome-shaped condensing-chamber, and means for surrounding the same with water, of a water-boiling receptacle disposed to supply steam to said chamber, and a worm located in said chamber; said worm being shaped and located to closely approach the surface of said shell, and having one end penetrate said shell near the highest part thereof and open to the water thereat; the other end of said worm passing out through the lower part of said shell.

4. The combination with the tea-kettle having the open top and nose of a base fitted to said top, a condenser-chamber supported by said base, means for admitting steam from said kettle through said base to said chamber, a water-container about said condenser-chamber, a worm within said condenser-chamber communicating at its upper end with said container and having its other end extended outward and terminating directly over said nose, and a discharge for said chamber for the distillate.

In testimony that I claim the foregoing invention I have hereunto set my hand this 17th day of April, 1905.

ROBERT P. BARNSTEAD.

Witnesses:

FRED G. TILTON,

A. B. UPHAM.