

(No Model.)

J. W. MACKINTOSH.

APPARATUS FOR PURIFYING WATER.

No. 370,798.

Patented Oct. 4, 1887.

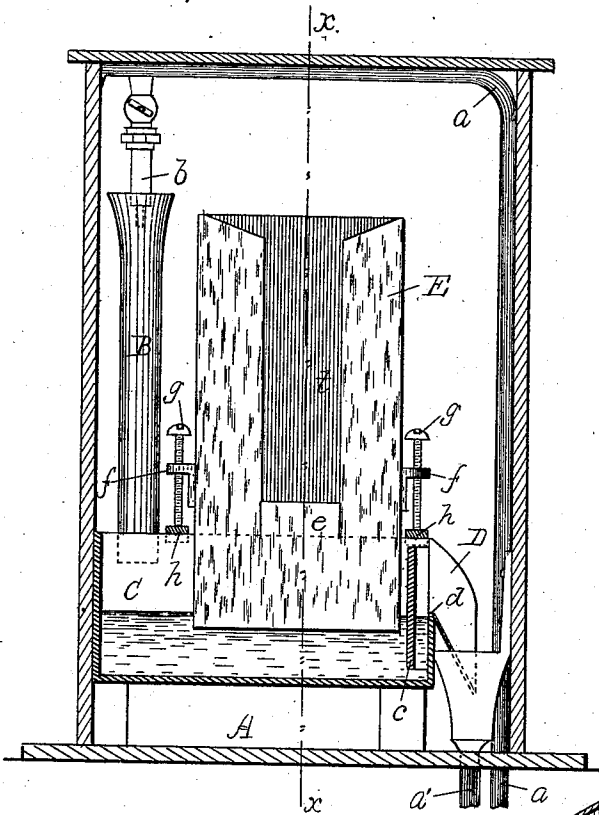


Fig. 1

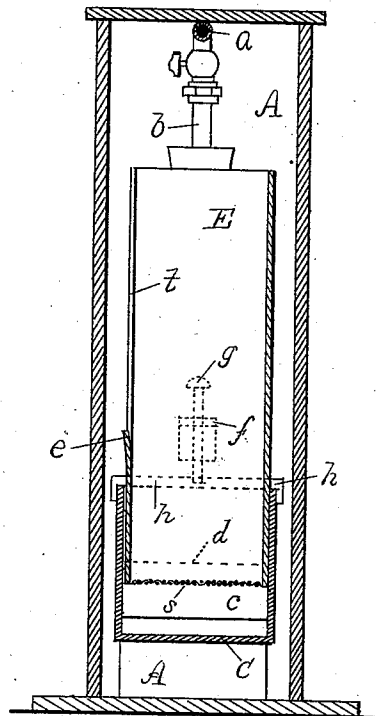


Fig. 2.

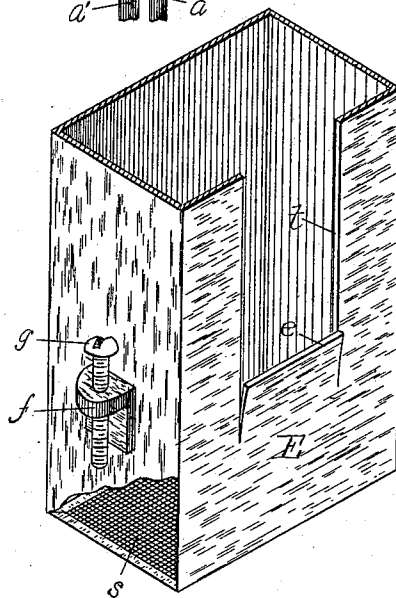


Fig. 3.

Witnesses.

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APPARATUS FOR PURIFYING WATER.

SPECIFICATION forming part of Letters Patent No. 370,798, dated October 4, 1887.

Application filed October 14, 1886. Serial No. 216,349. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. MACKINTOSH, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Devices for Purifying Liquids; 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 letters or figures of reference marked thereon, which form a part of this specification.

15 This invention relates to devices for purifying liquids in which water or other liquid, as it passes through the apparatus, is subjected to the influence of a disinfectant, preferably chloride of zinc; and it consists of apparatus 20 whereby more or less surface of said disinfectant, generally in cake form, may be exposed to the body of liquid; hence the quantity which is dissolved and carried onward in the fluid-current is regulated as circumstances may dictate.

25 In the drawings accompanying this specification, Figure 1 represents a vertical section of an apparatus embodying my invention, while Fig. 2 is a similar view, but transversely thereof on line *x x*. Fig. 3 is a sectional elevation of the disinfectant-supply box, taken isometrically.

Hitherto in apparatus of the class above premised it has been customary to use a receptacle containing a main chamber, in which the disinfectant was placed, being at first introduced in a dry condition and either as a powder or in the form of lumps. Subsequently by the admission of water it was rendered an integral mass or lump, care being taken by means of the insertion of a plug or core, afterward withdrawn, or by other means, to preserve a space for a channel through which the liquid afterward introduced may maintain a current. In this method it was necessary, in order to insure the final and complete consumption of the entire body of the disinfectant, that the water in this main chamber should constantly stand high enough to completely cover the mass of disinfectant, in consequence of which the water had constant action upon a

large area of exposed surface of said disinfectant, and thus of necessity dissolved and carried it away too fast, and no adequate means were employed for changing and regulating this exposed surface, so as to prevent the too rapid dissolution of the disinfectant and its consequent waste. Now, I find that it is preferable to use prepared cakes of disinfecting material and maintain them, all but a small immersed portion of the lowest cake, entirely above and away from the liquid, so that the percentage dissolved may be accurately regulated, and in the present instance I have endeavored to obviate and remedy the loss and waste which now occurs by my apparatus, as hereinafter described.

In the drawings, A represents a box or case, in which are placed a supply-pipe, *a*, and drip-cock *b*, through which the water or other liquid to be disinfected is furnished and delivered through the spout or funnel B into a disinfecting-tank, C, whence it is discharged through the pipe *a'* after combining with a certain amount of the chloride of zinc, which has a great affinity therefor. This tank is to be made preferably of hard rubber, to prevent chemical action thereupon by the chloride or other salt, and is provided with an interiorly vertically-arranged partition, *c*. The latter does not extend quite down to the bottom of the tank, and thereby a passage is afforded for the overflow of the liquid into the spout D. Moreover, this partition extends above the lower or overflow edge, *d*, of said spout, but is not quite flush with the top of the tank; hence, in case obstruction should occur below, there is no possibility of overflowing the tank at the top.

The box for retaining the supply of disinfectant, generally in cake form, is shown at E as composed of metallic plates or an integral plate bent to a proper form, and is further provided with a perforated bottom. In lieu thereof, wire-cloth *s* may be employed. To ascertain at a glance whether the supply of disinfecting material needs replenishing, I have cut out or slotted the front of this box E, as shown at *t*. To prevent the cakes as they feed downward by gravity from striking against the edge of the plate *e*, I have bent this outwardly, and thereby obviated any dif-

ficulty which might arise from the cakes of disinfecting material lodging and sticking against it, which would prevent proper feed movement.

5 To adjust the immersion of the supply-box or its height with respect to the level of the liquid in the tank, I have affixed two interiorly-screw-threaded ears, *f f*, with which engage two adjusting-screws, *g g*. The latter rest
10 upon and are supported by two bars, *h h*, which straddle the tank C and are adjustable thereupon. Thus it is evident that in order to expose more or less of the surface of the disinfectant, and thereby cause more or less rapid
15 dissolving of the material composing it, the adjusting-screws are altered to lower or raise, respectively, the supply-box containing the chloride of zinc or other salt. After a few trials the proper position can readily be ascer-
20 tained to suit any particular location where more or less of the disinfectant is required.

I have found the most uniform results have been secured by employing a fine wire or perforated bottom in the supply-box, which is
25 slightly immersed in the liquid in the tank. Thereby I permit only a small portion of the disinfectant to be in contact with the liquid, the bulk being held above in an undissolved condition and fed along by gravity, the cakes
30 above falling as the submerged ones dissolve through contact with the liquid passing through the apparatus. Since the liquid which has been fully influenced by the disinfectant is denser, it is found at the extreme lower por-
35 tion or bottom of said tank, and, being in a fit condition to pass away, I make the outlet at the bottom thereof, and then extend the discharge-pipe or the partition forming the same almost to the top of said tank C.

40 The operation of this apparatus is as follows: The disinfectant, preferably in cake form, is introduced within the supply-box E, which is filled. Liquid is then admitted into the tank C, and the adjusting-screws *g g* are altered to
45 permit the supply-box to be immersed a suitable distance, carrying with it the cakes. Thus the area of their submerged portions is dependent upon circumstances and the will of the workman. Hence a certain area of disin-
50 fecting material is exposed to the effects of the

liquid and a greater or less amount is absorbed in a given time, dependent upon the immersed surface.

The essential feature, and what I consider embodies the gist of my invention, is the ad- 55
justment of the apparatus by which the amount of disinfecting material exposed to the liquid may be regulated, and combined therewith the continuous gravity feed dependent upon and operated by the wasting away or dissolving of
60 such material in the liquid. Hence the proper percentage thereof is united with the liquid to thoroughly disinfect it, and at the same time the feed is automatic and positive, while no unnecessary waste occurs. 65

I claim—

1. The combination, with the disinfecting-tank C and its supply and discharge pipes *a a'*, of the supply-box E, with an open or perforated bottom and adjustably mounted upon
70 the tank, whereby the fluid contents of the latter are more or less impregnated with the disinfectant, substantially as herein stated.

2. In combination with the tank C, its overflow-spout D, and bars *h h*, the supply-box E, 75
provided with the perforated bottom *s*, the ears *f f*, and the adjusting-screws *g g*, co-operating with said bars or supports to regulate the immersed surface of the disinfectant, substantially as herein described. 80

3. The supply-box E, constructed as described, the tank C, and its overflow-spout D, in combination with the partition *c*, arranged within said tank to compel the impregnated liquid to pass from the bottom and be dis- 85
charged through said spout, substantially for purposes set forth.

4. In a device for purifying liquid, the disinfectant-supply box constructed with a foraminous bottom, *s*, supporting-brackets *h h*, the 90
opening *t*, and curved plate *e*, the entirety being adjustably mounted upon liquid-containing tank, substantially as herein stated.

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

JOHN W. MACKINTOSH.

Witnesses:

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LEMUEL STANWOOD.