J. D. RAMSEY.

WATER PURIFIER.

APPLICATION FILED JAN. 17, 1912.

1,084,030.

Patented Jan. 13, 1914.

Fig. 1.

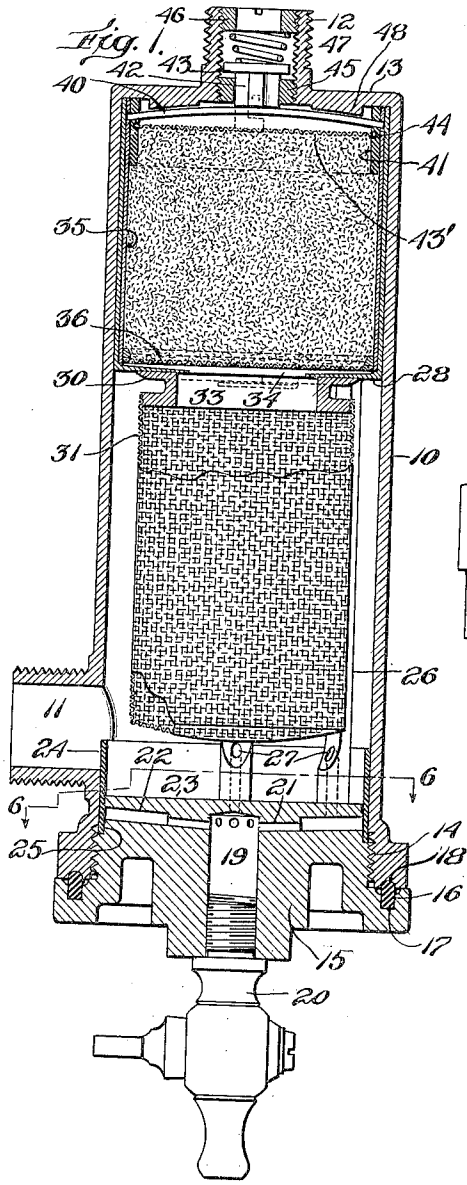



Fig. 2.

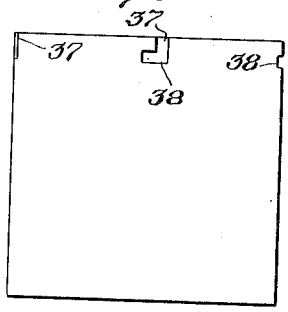



Fig. 3.

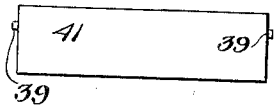



Fig. 4.

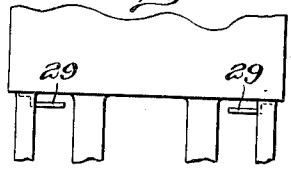



Fig. 5.

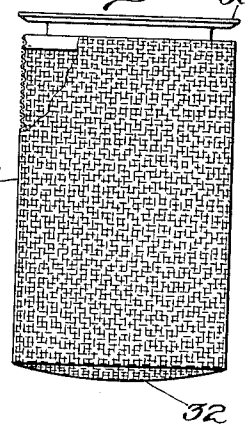
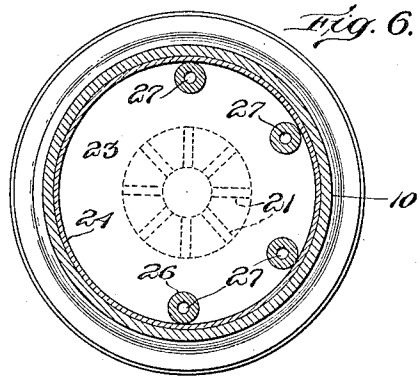



Fig. 6.




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# UNITED STATES PATENT OFFICE.

JOSEPH D. RAMSEY, OF BOSTON, MASSACHUSETTS.

## WATER-PURIFIER.

1,084,030. Specification of Letters Patent. Patented Jan. 13, 1914.

Application filed January 17, 1912. Serial No. 671,708.

*To all whom it may concern:*

Be it known that I, JOSEPH D. RAMSEY, a citizen of the United States, and resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Water-Purifiers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to apparatus for purifying water by straining and filtering the same, and is adapted to be interposed in service pipes in domestic or public installations.

Among the prominent objects of the invention are to provide an apparatus, the parts of which may be quickly taken apart and easily cleaned, and readily and expeditiously reassembled.

The improved construction is arranged to provide a sediment receiving cup or pocket which can be opened up in a manner to quickly and completely remove all deposits of sediment, there being provision for drainage from the device when the water supply is cut off, so that the solid or semi-solid sediment alone remains in the pocket or cup, without any considerable quantity of water being left therewith to flow out and cause annoyance in cleaning the device. The arrangement of parts is such that the water is enabled to pass freely through the purifying means and out at the outlet of the device, without seeping through any accumulated sediment, or stirring up the same in any way, such sediment being out of the path of the flowing current and protected therefrom so that it is not disturbed until the receiving cup is taken apart, when the filter is to be cleaned and renewed.

The invention further provides a removable cup for holding a supply of filtering material, such as charcoal, or the like, and in practice these cups are interchangeable, so that when the device is to be cleaned and the filter renewed, a newly prepared filter cup may be substituted for a used one without loss of time.

Further features of the invention relate to an improved arrangement of check valve in combination whereby this valve is normally held open to permit the free flow of water, but when the parts are disassembled is permitted to close, so that water standing in the pipes which deliver from the device cannot flow back and flood through the filter.

The above and other objects of the invention will be better understood from the following detailed description, taken in connection with the accompanying drawings, and will be thereafter pointed out in the appended claims.

Referring to the drawings, Figure 1 is a central vertical section through my improved apparatus; Fig. 2 is an elevation of the filter cup; Fig. 3 is an elevation of a cap ring adapted to be fitted in the top of the filter cup; Fig. 4 is a fragmentary detail, showing the lower part of the filter cup holder and its supporting rods at right angles to Fig. 2; Fig. 5 is an elevation of the strainer member; and Fig. 6 is a transverse section on line 6—6 of Fig. 1.

The casing, or housing, 10 of my improved device is preferably cylindrical, and in use is set upright with a lateral water supply connection 11 at its lower portion, and a delivery nipple connection 12 extending from its upper closed end 13. The lower end of this casing is internally threaded at 14 to receive a screw plug 15, there being a gasket packing 16 between these members preferably fitted in an annular groove 17 in the plug 15, and adapted to fit up into a corresponding annular groove 18 in the flanged lower end of the housing. The plug 15 has a central bore 19, into which is threaded a drain plug 20, this bore ending near the top of the plug, and communicating through radial passages 21 with a cupped out horizontal annular space 22 formed in the upper portion of the plug. The top of plug 15 has a plane face 23, as shown, forming the bottom of a sediment pocket or cup, the sides of which are formed by a thimble 24 fitting down over a slightly reduced portion at the top of the plug, against a shoulder 25. This thimble is fitted so as to have a holding fit with and be easily slidable on to and off from its seat on the plug, and when slid upward, so as to permit the sediment deposit to be removed, it is guided on rods 26 which extend upward integrally with or fixed to the plug 15. This thimble preferably extends up a little into the inlet passage 11, as seen in Fig. 1, so as to present a barrier to and deflect the water upward, whereby stirring up of the sediment by the inflowing current is avoided. The lower ends of the rods 26 are provided with drain passages 27, extending from a point near the top of the sediment cup down through the top portion

of the plug into communication with the annular space 22, and thence through the passages 21 to the drain cock, thus permitting the water contained in the housing to drain off from the top of the sediment when the inlet supply is cut off.

The rods 26 upstanding from the plug 15 carry at their upper ends a holder 28 for the filter cup, this holder closely fitting the interior of the housing and being adapted to have its top engaged with the top 13 of the housing, when the parts are assembled and the plug 15 screwed into place. The holder 28 has depending clips 29 adapted to engage under a flange 30 at the top of a strainer member 31, which is shown as cylindrical in form, though other forms may be substituted, and extends down to near the top of the sediment cup with an annular space between it and the housing. The rods 26 are spaced so as to leave a sufficient opening at one side to permit the strainer member to be inserted into engagement with the clips 29, or removed for cleaning, etc. The strainer member is closed at its bottom, as seen at 32, and at its top has a free passage 33 registering with an opening 34 in the filter holder, whereby the water having been strained through the strainer mesh, is permitted to pass upward therethrough. The filter cup 35 is formed to have a close slidable fit down into its holder, and a strainer mesh 36 is secured across the same near its bottom so as to leave a small space between it and the holder bottom, thus making the whole area of the strainer effective for straining the water as it passes up through the opening 34. The upper portion of this cup has bayonet slots 37 formed therein, terminating in horizontal portions 38, adapted to receive pins 39, preferably consisting of the ends of a bar 40, extending diametrically across the top of a cover thimble 41, and projecting through holes therein. The bar 40 thus serves at the same time as a bail for removing and replacing the cover thimble 41, and its ends serve to lock the thimble to the filter cup. This bail also performs a third function, by engaging depending wings 42 of a check valve 43, so as to hold the same lifted off its seat when the parts are in operative position.

The cover thimble 41 has fitted thereto a strainer disk 43′, this disk being shown as pressed into an annular groove 44 and held in place thereby, the provision of this annular groove permits the strainer to be thus removed and renewed easily, as it is simply pressed into place therein and displaceable by pressure, without other manipulation. The nipple 12 is internally threaded, having a seat ring 45 for the valve 43 fitted in its inner portion, and a stop ring 46 in its outer portion against which a spring 47 presses to hold the valve normally seated. This construction avoids the necessity for machining any part of the housing to form an accurate seat for the valve, such seat being formed by the face of the ring 45 so that it is only necessary that the housing nipple be provided with ordinary threads and the check valve can be readily fitted therein.

As the strainer and filter cup carried by the plug 15 are removed from the housing, a layer of water of course remains at the top of the filter cup above the strainer 43′. In order that this water may not extend up to the top of the sides of cup as it is removed, I preferably provide an annular filling flange 48, depending from the top 13 which normally occupies a considerable part of the space in the top of the cup, so that as the cup is lowered, the water remaining does not come to the top thereof, and as the cup is removed, danger of spilling the water is avoided.

My improved apparatus thus provides a construction capable of purifying water rapidly and effectively as it is forced therethrough. In many cases where the water is not especially muddy it may not be necessary to have the filter cup filled with filtering material, the strainer cup 31 and the other strainers serving to remove miscellaneous foreign matter of any appreciable size, all such matter dropping down into the sediment cup to be removed at intervals when the device is cleaned.

Among the important advantages of my improved construction are its capability of being disassembled for cleaning without danger of water flowing out in any considerable quantity as soon as the parts are loosened, this being obviated, as explained, by the check valve 43, which seats as the withdrawing of the strainer holder is begun and the drain passages 19, 21, 22, 27 which permit all the water in the casing to drain out as soon as the drain cock is opened. It is to be observed that this drainage takes place from the top of the passage 27 without stirring up or disturbing the sediment in the sediment cup, and by reason of the fact that all the drain passages extend or incline downwardly, an effective suction is created which insures the complete withdrawing of the water. The elastic gasket ring 16 being fitted in the groove 17, which is enlarged at its top as shown, is capable of some little degree of compression even after it makes a watertight fit with the groove in the upper flange 18, this being for the purpose of insuring the proper seating of the filter cup on the closed top 13, and also insuring that the flange 18 shall come to a fit with the mating flange on the plug 15 which normally carries the gasket, thus effecting the important result of permitting a complete and close seating both of the cup holder against

the end 13 and of the plug flange against the open end of the housing by a single adjusting movement which would be impossible with an ordinary flat packing ring. Upon removal of the plug with the strainer and filter cup carried thereby, the sediment cup may be instantly and completely emptied and cleansed by simply sliding up the thimble 24 above the plane bottom 23 of the cup. The thimble 24 is normally fitted on to the reduced upper portion of the plug so as to have some little spring friction grip thereon, though being readily removable by hand, this friction grip being for the purpose of insuring that the thimble will remain fitted on the plug top as the plug is removed, and not separate therefrom by frictional engagement with the housing, which would empty the sediment cup prematurely as the plug is taken out. It is to be observed that the strainer element 31 is instantly and very readily removable from its carrier, and when so removed, it can be easily cleaned both outside and inside. The filter cup is likewise conveniently removable from its holder, and, as stated, these are intended in practice to be interchangeable, so that the operative does not need to stop to empty out a filter cup and fill it with new material when the filter is to be renovated, but instead, a new cup with fresh filter material can be inserted in the holder and the old ones renewed at leisure.

While the invention in its broader aspects is not limited to this, or other details, I also consider the improved arrangement of the filter cup cover with the bar 40 serving the three-fold function of a lifting bail, a lock for the cup cover, and a means for holding the check valve open, to be a valuable feature of improvement.

I desire it to be understood that the particular construction embracing the various features disclosed is to be taken as illustrative and not restrictive, and that the invention is not to be considered as limited to this illustrative embodiment, or in any other way, except as set forth in the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the kind described, comprising an upright housing, a strainer mounted therein, a sediment cup removably mounted in the lower portion of said housing, said cup being composed of parts capable of disassemblage to permit cleansing thereof, and a water tight closure for said housing, said sediment cup being mounted wholly within said housing with leakage therefrom prevented by said water tight closure.

2. A device of the kind described, comprising an upright housing, water purifying means mounted therein, and a sediment cup removably mounted in the lower portion of said housing, said cup being composed of a bottom portion and a side portion formed as a thimble slidably fitted to the bottom portion for removal to permit cleaning.

3. A device of the kind described, comprising an upright housing, water purifying means mounted therein, and a removable lower end for said housing, carrying a sediment cup, said cup being composed of a bottom portion and a side portion in slidable frictional engagement with the bottom portion to permit removal for the purpose stated.

4. A device of the kind described, comprising an upright housing, a lateral water inlet at its lower portion, a water outlet in its upper portion, water purifying means in said housing, and a removable closure for the lower portion of said housing, carrying a sediment cup, said cup having a removable thimble constituting its side portion extending up partly across the water inlet.

5. A device of the kind described, comprising a housing having a fixed closure at one end and a removable closure at the other end, a holder for water purifying means adapted to be fitted against said fixed closure, said holder being arranged to be held in place by said removable closure, and packing means yieldable to a substantial degree between said removable closure and said housing, to permit said holder to be seated against said fixed closure and said removable closure to be fitted to said housing by further movement in a single adjustment.

6. A device of the kind described, comprising an upright housing having a water inlet at its lower portion and a water outlet at its upper portion, and a removable closure for the bottom of said housing, carrying water purifying means, said purifying means consisting of a filter holder fitting the upper portion of said housing and a strainer depending therefrom in spaced apart relation to the lower part of said housing.

7. A device of the kind described, comprising an upright housing having a water inlet at its lower portion and a water outlet at its upper portion, a removable closure for the bottom of said housing, carrying water purifying means, said purifying means consisting of a filter holder fitting the upper portion of said housing and a strainer depending therefrom in spaced apart relation to the lower part of said housing, and a sediment cup formed on the top of said removable closure in position to receive sediment from said strainer.

8. A device of the kind described, com-

prising an upright housing having a water inlet at its lower portion and a water outlet at its upper portion, and a removable plug fitted in the bottom of said housing and carrying a sediment cup at its top, said plug having upstanding arms supporting water purifying means, there being drain passages down through said arms and through said plug from near the top of said cup for the purpose stated.

9. A device of the kind described, comprising an upright housing having a lateral water inlet at its lower portion and a water outlet at its top, and a removable plug fitting the bottom of said housing and supporting water purifying means, said means consisting of a filter cup fitting the upper portion of said housing and a strainer held in depending relation thereto.

10. A device of the kind described, comprising an upright housing, a water inlet at its lower portion, a water outlet at its top, water purifying means mounted in said housing and removable from the bottom thereof, and a check valve in said water outlet adapted to close the same as said water purifying means is removed.

11. A device of the kind described, comprising an upright housing, a water inlet at its lower portion, a water outlet at its top portion, and a filter cup removably mounted in the upper portion of said housing, said cup having a cover provided with a removable bail and said bail being arranged to serve as a locking device for the cover.

12. A device of the kind described, comprising an upright housing having an inlet connection at its lower part and an outlet connection at its top, a filter cup fitting the upper portion of said housing, and a removable cover for said cup, said cover having a bail with projections arranged to also serve as a locking device to hold the cover in place and said outlet connection having a check valve arranged to be held open by said bail when in place.

13. A device of the kind described, comprising an upright housing, a water inlet connection at its lower part and an outlet connection at its top, a removable plug fitted to the bottom of said housing, water purifying means supported by said plug, said means consisting of a filter cup fitting the upper portion of said housing and a strainer removably fitted to the bottom of said cup by a spring clip and flange connection, and a removable thimble fitting the top of said plug to form therewith a sediment cup capable of disassemblage for cleansing.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOSEPH D. RAMSEY.

Witnesses:
C. L. ROGERS,
R. G. HERSEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."