

(No Model.)

2 Sheets—Sheet 1.

F. K. WAY.
FILTERING APPARATUS.

No. 552,078.

Patented Dec. 24, 1895.

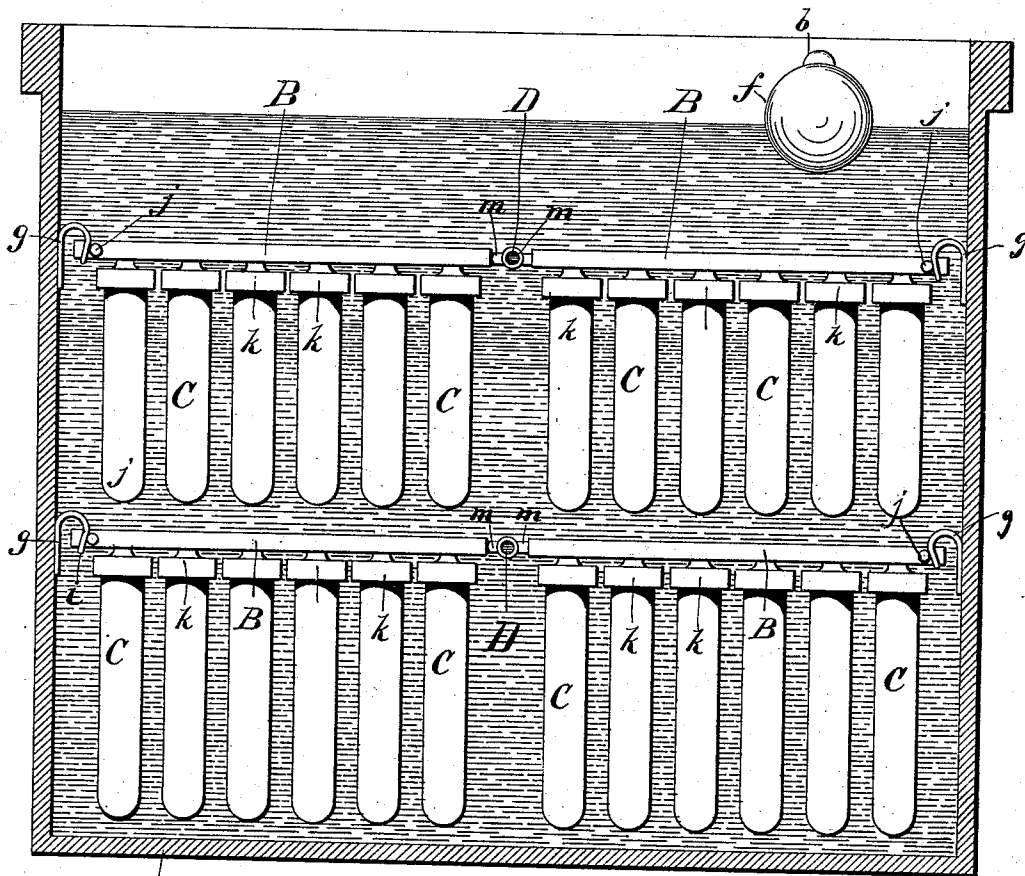


Fig. 1.

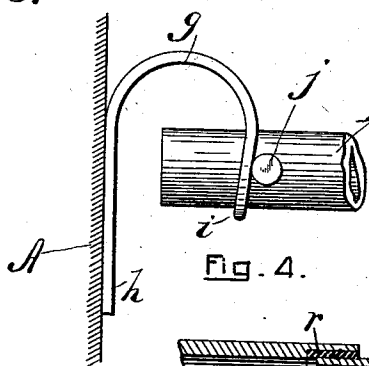


Fig. 4.

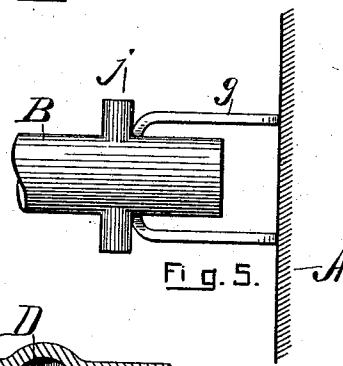


Fig. 5.

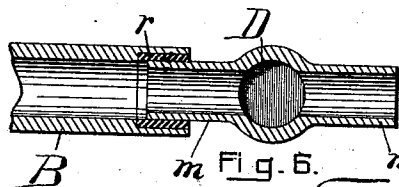


Fig. 6.

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2 Sheets—Sheet 2.

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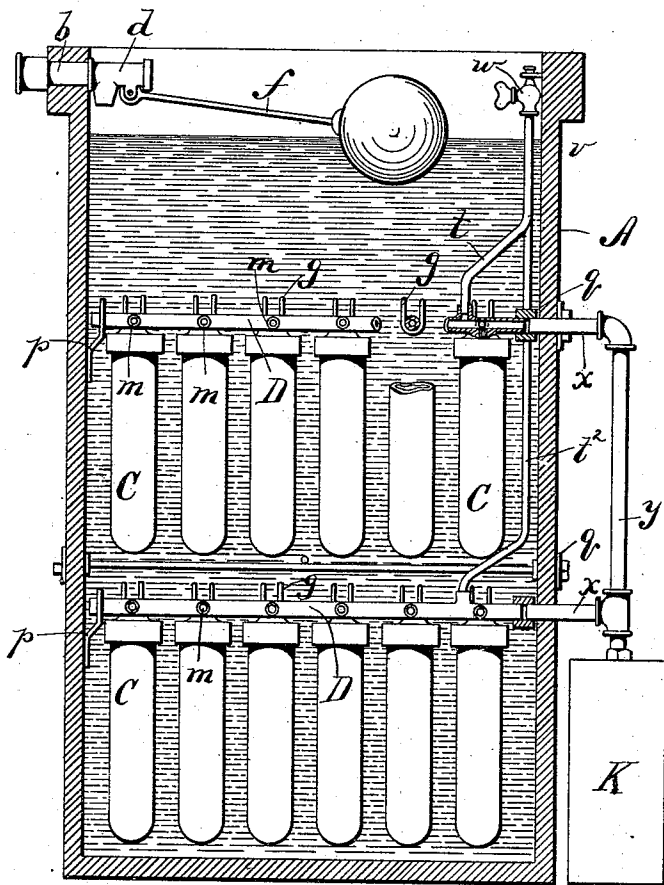


Fig. 2.

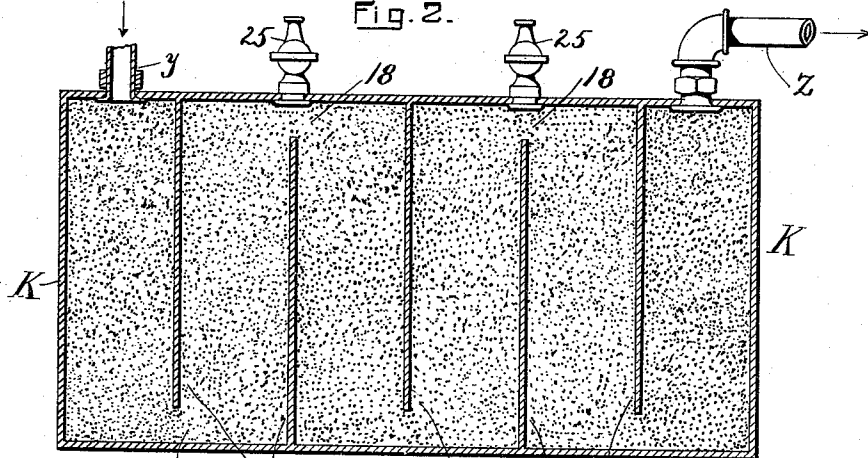


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANK K. WAY, OF CHELSEA, MASSACHUSETTS.

FILTERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 552,078, dated December 24, 1895.

Application filed January 8, 1894. Serial No. 496,130. (No model.)

To all whom it may concern:

Be it known that I, FRANK K. WAY, of Chelsea, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Filtering Apparatus, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section showing the reservoir of my improved filter-tank with the tube-racks in position; Fig. 2, a transverse section of the same; Fig. 3, a longitudinal section enlarged of the filter-box; Fig. 4, a side elevation of one of the tube-rack supports; Fig. 5, a top plan view of the same; and Fig. 6, a transverse section of the reservoir-discharge pipe, showing the method of attaching the tube-racks to the same.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to an apparatus for filtering water; and it consists in certain novel features hereinafter fully set forth and claimed, the object being to so arrange the parts that the filters may be readily removed for cleaning.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the tank or reservoir, which comprises a rectangular box open at its top, into which the supply-pipe leads at *b*. Said pipe is provided with a cock *d* operated by the usual ball-float *f*. At intervals on the end walls of the tank there are arranged spring-supporting brackets *g*. These are U-shaped in end elevation, as shown in Fig. 2, and are hook-shaped in side elevation, as shown in Fig. 4. The long arms *h* of the brackets are secured to the tank-wall, and their loop *i* is bent inward slightly out of parallelism with said arms.

The filter-tube racks comprise a pipe B, having closed ends and laterally-projecting studs *j*. Supported by suitable gaskets or couplings *k* a series of filter-tubes C are pend-

ent from the pipes B. These tubes are formed from biscuit-porcelain or other suitable porous material, and are substantially of the shape of the ordinary test-tube. The gaskets or caps *l* close the tops of the tubes and open into the supporting-tubes B. Arranged transversely and centrally of the reservoir are the discharge-pipes D. These pipes have laterally-projecting branch pipes or nipples *m* at intervals for connection with the tube-supporting pipes B. The discharge-pipes are held in brackets *p*. (See Fig. 2.) The ends of the tube-supporting pipes B, opposite that supplied with the projections *j*, are tapped and a rubber bushing *r* (see Fig. 6) is inserted.

The filter-tubes are arranged in series, and each supporting-tube B is held in position by forcing its bushed end onto the nipple *m* of one of the discharge-pipes D and dropping its opposite end into a U-shaped bracket *q*, the arms or projections *j* engaging the free end of said bracket and bending it inward, so that while supporting the tube it at the same time forms a spring-clamp, preventing its accidental displacement. All these parts are arranged an appreciable distance below the water-line of the tank, and air-tubes *t*, respectively clamp the discharge-pipes D, and joining at *v* project above the water-line of said tank, where they are supplied with a cock.

Pipes *x* pass through the wall of the reservoir and connect with each discharge-pipe D by a coupling *q*, said pipes being joined outside the tank by a vertical pipe *y*, which leads into the top of a filter-box K. This box at the opposite end has a discharge-pipe *z*, which may be connected with any suitable receptacle for the filtered water. Within the box is arranged a series of vertical partitions 15 16, the partitions 15 extending from the top of the tank nearly to the bottom, leaving a passage 17 for the water, and the alternating partitions 16 being arranged to leave a passage 18 near the top of the tank. The tank is entirely filled with silica, ground quartz, infusorial earth or any suitable filtering material through which the water must pass to reach the discharge, and the discharge-pipe is screened in the usual manner to prevent the escape of such material. Two air-cocks open through the box K, and are preferably arranged over the passages 18, so that any air

which may pass into the box from the tank can be discharged to relieve the pressure in said box.

- 5 In the use of my improvement water is maintained at a normal level in the reservoir A by means of the float-valve. The filter-tube racks being disposed below the normal water-level in manner described, the water, percolating therethrough and into the pipes
10 B, passes into the discharge-pipes D. Air being admitted through the tubes t^2 into the discharge-pipes D, a free flow is set up through the pipe y into the filter-tank K. Sufficient air-pressure is afforded by this means to force
15 the water through the filtering material in said tank. The partitions 15 and 16 cause the water to traverse a much greater distance through such material than if passed directly across the box. All foreign substance which
20 may not have been entirely removed by the filtering-tubes is taken up by the material in the box K, and the water discharged through the pipe z is practically free from such foreign matter.
25 By admitting air to the discharge-tubes of the reservoir through the pipes t^2 , substantially no resistance is offered thereby to the normal atmospheric pressure of the water in

the reservoir, which will cause it to force through the filter-tubes and fill them, so that a flow will be set up through the rack-tubes B. 30

I do not confine myself to employing any number of racks or filter-tubes, nor to the particular arrangement thereof herein shown, as they may be adjusted in any suitable manner below the water-line of the reservoir. 35 Moreover, for most purposes the water, after passing from the reservoir into the pipe y , is sufficiently filtered without the use of the tank K, so that said tank may, if desired, be omitted; but in supplying water for drinking purposes I deem its use preferable. 40

Having thus explained my invention, what I claim is—

In a filtering apparatus, a reservoir or tank 45 in combination with a discharge pipe traversing the tank below its water level; a nipple thereon; a series of filter-tubes opening into a supporting-pipe having one end detachably connected to said nipple; and a spring clamp 50 on said tank supporting the opposite end of said pipe.

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Witnesses:

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