(No Model.)

A. A. WILLSEY.

WATER FILTER.

No. 261,574. Patented July 25, 1882.

FIG I

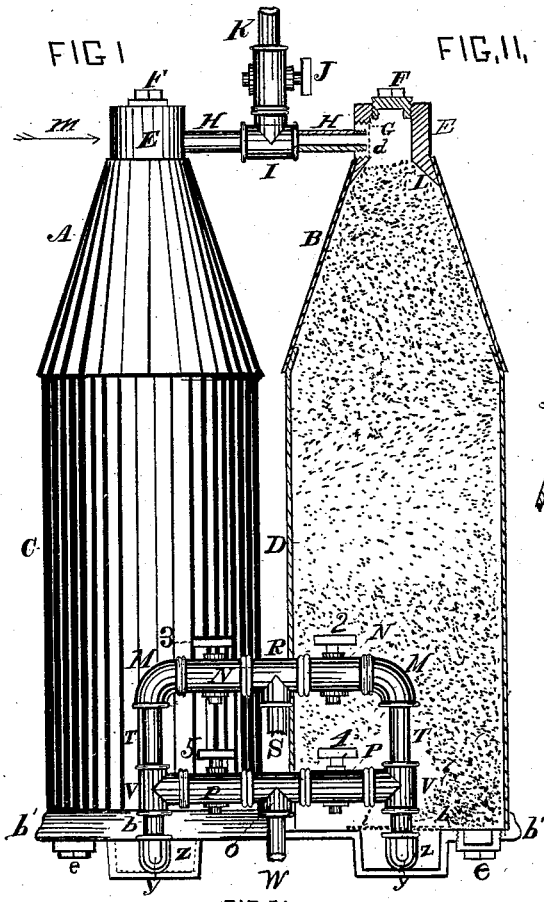
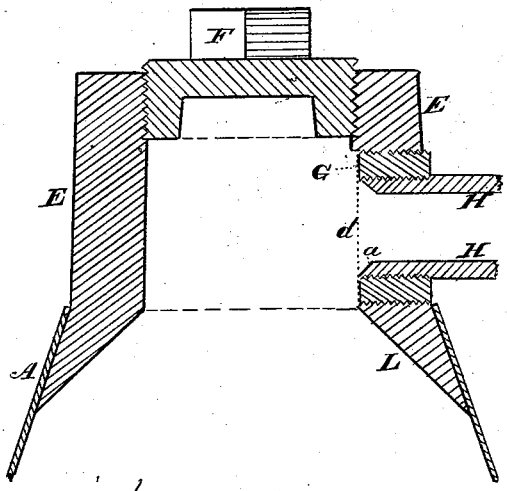


FIG II



8 inches

FIG III

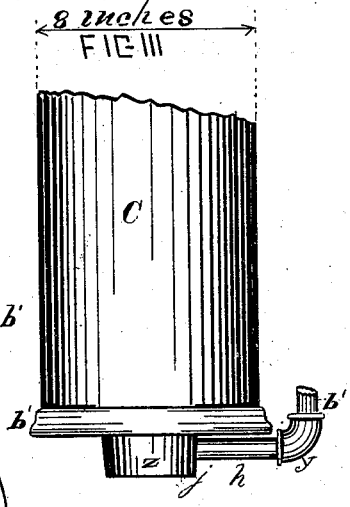


FIG IV

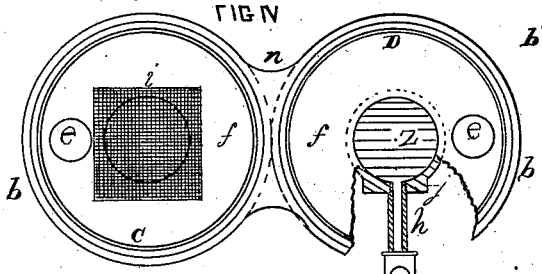


FIG V

WITNESSES

George W. Cook.

Adolf Helle.

INVENTOR

Anna A. Willsey.

By G. L. Chapin. Atty.

UNITED STATES PATENT OFFICE.

ANNA A. WILLSEY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO G. L. CHAPIN, OF SAME PLACE.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 261,574, dated July 25, 1882.

Application filed October 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, ANNA A. WILLSEY, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Water-Filters, of which the following is a specification, reference being had to the accompanying drawings, illustrating the improvement, in which—

Figure I is a side elevation and section of a two-chambered water-filter embodying my invention and improvement; Fig. II, a section of the top pipe-connection; Fig. III, a broken elevation of one of the filtering-chambers and lower pipe-connection, looking in the direction of Fig. I, as indicated by dart *m;* Fig. IV, a top or plan view of the single bottom plate forming the lower heads to the filtering-chambers, a portion of one head being broken away more clearly to show the lower pipe-connection; Fig. V, an enlarged section of a portion of the base-plate and other parts.

The object of the present invention is to prevent the displacement of sand in separate double-barreled or doubled sand-filtering chambers, and to attain a cheaper construction and a better means for filtering and cleaning the filter.

The invention consists, first, in filters having two tapered sand-filtering chambers which are separately at their bottoms or larger ends connected with bottoms or a base-plate provided with pipe attachments and screens and their top ends provided with pipe attachments and pipes, in combination with delivery, induction, and water pipes, waste-pipe, and cocks, whereby during the filtering process the water passes upwardly through both chambers and compresses the sand to attain filtered water, and at the time when one chamber is to be cleaned the upward pressure of water in the other chamber remains the same, while in the chamber being cleaned the upward pressure of the sand is removed and the water passing down through it has an increased area, better to remove the extraneous matter therefrom; second, in pipe-connections at the tops of the chambers, provided with holes for filling in the sand, and also with side pipes and discharge-pipe; third, in pots or pipe-connections projecting below the bottoms of the filtering-chambers, whereby a single pipe may be used with each pot and the insides of the chambers may not be taken up by elevated screens, as the whole is hereinafter fully described and shown.

In carrying the invention into practice the filtering-chambers may be tapered from bottom to top and in dimensions may be in proportions as follows: two feet high, eight inches at the bottom, and five inches and a half at the top; or they may be tapered one-third of the distance down from the top, as shown at A C B D in the drawings, so as to prevent the displacement of sand by the upward pressure of water. The chambers may be of cast-iron or of sheet-iron; but sheet-iron is preferable, in that it is less expensive and lighter. Of course the size of the filter will have to be determined by the amount of water to be filtered. The size given will under twenty pounds pressure filter about one hundred and twenty gallons per hour. The strength of iron to sustain a given pressure is too well known to require a specification in that regard. When sheet-iron is employed the joints can be riveted and galvanized with zinc, and for house or smaller filters the cone-chambers may be soldered to bottoms and to upper pipe-connections, E E, thus saving a large expense in bolts, time, and packing.

The connections E E are provided with flanges L L for the attaching of the tops of the cone-chambers, and with openings through which the sand is put in the chambers, and with plugs F to stop the holes.

A reducing-pipe, G, may be first tapped into the pipe-connections E, and then the pipes H screwed into the reducer, that an enlarged screen-surface may be had between the filtering-chamber and discharge-pipes H K, as shown at *d*.

A T-pipe, I, connects the pipes H H and pipe K, the latter being provided with a cock, J, to be used as hereinafter described.

The screens *d* are simply to prevent sand from entering the pipes H H when it is being put in the chambers and when the filter is being moved, and is not a strainer, inasmuch as the tapered sand-chambers hold the sand from rising and being displaced, as is the case with cylindrical chambers.

The bottoms *f f*, I prefer to cast in one piece, as it then prevents the twisting of the pipes in moving the filter, and with flanges *b' b'*, inside of which the bottoms of the chambers A C B D are placed and soldered.

Pots or pipe-connections Z Z are formed below the bottoms *f f*, and pipes *h* communicate therewith and with elbows *y y*.

Pipes *b b* communicate with T-pipes *v v*, and a horizontal communication between pipes *v v* consists of pipes P P, provided with stop-cocks 4 5, and of a pipe, O, communicating with which is a waste-pipe, W.

An upward communication is formed between T-pipes *v v* by means of pipes T T, elbows M M, pipes N N, provided with cocks 2 3, and also T-pipe R, connecting a supply-pipe, S.

Pipe-connections Z Z are covered with suitable screens.

Plugs *e e* are tapped into the bottoms *f f*, by the removal of which the sand may be driven out of the filtering-chambers, the bottoms at *j* being thicker to provide a suitable screw-thread surface.

Pipes for reversing the current of water in filters are old; but the form of the pipes and their arrangement are new so far as I know, especially the single pipe-connections at the pots *z z* and the two horizontal pipes.

Coarse sand is used at the bottoms and tops of the filtering-chambers, and fine, sharp, clean sand at the middle, although any suitable filtering material may be used.

Operation: In the drawings all the cocks are represented as closed. To filter water, connect supply-pipe S to the water-main or hydrant. Then open cocks J 3 2 and leave cocks 4 5 closed. To clean chamber A C, shut cocks J 3 4 and open cocks 5 2. To clean chamber B D, close cocks J 2 5 and open cocks 3 4. To remove the sand from chamber A C, remove the plug *e* at its bottom and shut all the cocks but cock 2. To remove the sand from chamber B D, close the plug *e* and remove the plug at the bottom of the other chamber (first shutting cock 2) and open cock 3.

I claim and desire to secure by Letters Patent—

1. In water-filters, two separate tapered sand-filtering chambers, A C *f*, B D *f*, combined with inlet-pipes *h b b* T T and N N S and outlet-pipes I, H H, and K, so that the incoming impure water shall first be subjected to the larger sand area alike in both chambers, and then be subjected to a gradual decreased sand area till the filtering process is complete, and combined with lower discharge-pipes, P P, O, and W, so that either chamber may be cleaned of extraneous matter by a downward flow of water from the other chamber wherein the filtering process is continued, the cleaning process commencing at the top or small end of the chamber, and the cleansing-water being subjected to a gradually-increased sand area till the bottom of the chamber is reached and the extraneous matter removed, substantially as and for the purpose specified.

2. In a water-filter, the pipe-connections E E, provided with holes for filling in the sand, with plug-stoppers F F, in combination with side pipes, H H, and discharge-pipe K, as specified.

3. In water-filters, the two tapered filtering-chambers A C, B D and bottoms *f f*, in combination with the pots or pipe-connections Z Z, with screens above, as and for the purpose specified.

October 17, 1881.

ANNA A. WILLSEY.

Witnesses:
ADOLF HEIN,
G. L. CHAPIN.