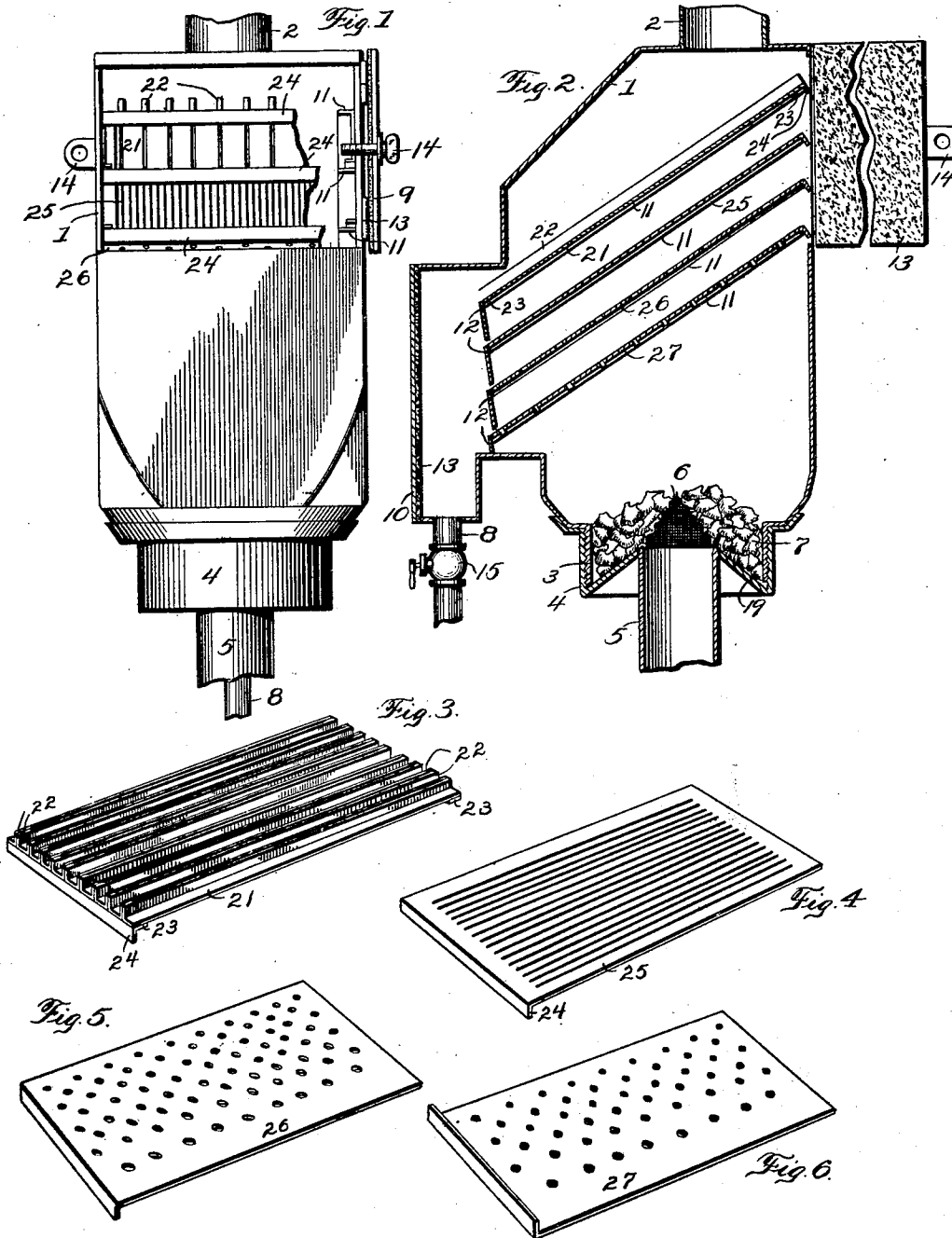


J. J. BETZOLD.

FILTER.

(Application filed Feb. 11, 1901.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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FILTER.

SPECIFICATION forming part of Letters Patent No. 678,857, dated July 23, 1901.

Application filed February 11, 1901. Serial No. 46,851. (No model.)

To all whom it may concern:

Be it known that I, JOHN JOSEPH BETZOLD, a citizen of the United States, and a resident of Fresno, Fresno county, State of California, have invented certain new and useful Improvements in Filters; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to water distribution, and more especially to that class of devices therein known as "filters;" and the object of the same is to produce an improved filter of the cistern-supply type.

To this end the invention consists in a construction substantially such as herein described, and illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation of this filter with the door open, this type employing three slides. Fig. 2 is a central vertical section of my filter of a type employing four slides. Figs. 3, 4, 5, and 6 are perspective details of the slides.

Referring to the drawings, the numeral 1 designates a casing having an inlet 2 at its top and a threaded outlet 3 at its bottom, around which screws a cap 4, from which depends the exhaust-pipe 5, that carries off the filtered water. Within the cap and over the inner end of this pipe I preferably locate a conical or convex sieve 6, and around the same may be charcoal or other antiseptic filtering material, as indicated at 7 in Fig. 2.

8 is the waste-pipe for the exhaust of the dirty water and sediment. This pipe leads from the bottom of the rear side of the casing 1, as best indicated in Fig. 2, and said casing is provided with doors 9 and 10 at the front and rear for permitting access to its interior, although the door 10 could be omitted.

Within the casing on suitable cleats 11 are mounted several slides, (best illustrated in Figs. 3, 4, 5, and 6,) and these slides stand in an inclined position, extending from their higher ends just inside the front door 9 downward to points just inside the rear door 10. Here stops 12 are provided, which hang beneath the respective slides, so as to prevent water in the chamber adjacent the door 10 from backing up under one of the slides.

This backing up is prevented by reason of the fact that the water coming downward through the slide trickles out in a fine sheet beneath the lower edge of the stop and is under such pressure that the water in the chamber cannot simultaneously flow in the opposite direction. Hence if it were forced to have an outlet from the chamber it would pass over the uppermost slide and mingle with the unfiltered water, which would not be objectionable. Each door has suitable packing 13 for rendering it water-tight and some fastening means 14 for holding it closed. In addition to standing in an inclined position the slides are superimposed and spaced one above another, so that the foreign matter and impurities caught by each slide are directed downward into the space just mentioned and carried off through the waste-pipe 8 without choking the slide or impeding the progress of the clear water therethrough to the next slide. Thus if this device is used in filtering rain-water as it comes from the roof down the spout leaves and twigs are diverted by the uppermost slide, and the space within the casing is of such size that the waste-pipe 8 may have a faucet 15, which need be opened only occasionally. The conical or convex strainer 6 is also of such size at its base as to leave quite a chamber within the cap 4, and the imperforated bottom of this chamber may flare downward and outward from the strainer, as indicated at 19 in Fig. 2, whereby any particles that do pass through the slides will be caught in and may be emptied from such chamber. The uppermost slide 21 is formed with a series of troughs. This construction results from making the slide of a number of narrow strips of metal with their adjacent edges 22 turned upward to equal heights and standing very close to each other, so as to leave narrow slits between them. The ends of these strips are supported on cross-pieces 23, of which the uppermost one has a flange 24 for holding the slides in place. Thus the water falling on this slide will enter the downwardly-inclined grooves or troughs, and all leaves and particles will be quickly carried off, while a portion will only pass through the slide when it rises within the trough to a sufficient depth to enter and drip through said narrow slits. The next slide in logical order of sequence is

a slotted plate, (best seen at 25 in Fig. 4.) This is simply a flat plate cut with a large number of extremely-fine slits and preferably having a flange 24 at its upper end, like the slide above described. Care is to be taken in cutting the slits that they are made by very thin knives and formed in such manner that no bur or flange will be struck through, so as to project from the lower side of the slide. In that type of my filter which employs four slides the third in the logical order of sequence is a plate 26, perforated with the finest holes that can be formed therein without any bur at their lower ends, and the lowermost slide in either type of this filter is a similar plate 27, perforated with very fine holes, which are preferably formed by needles, so that burs will result, my idea and experience being that where the water passes finally through holes of this character and drips from the burs certain impurities of organic (vegetable and mineral) character cling to and are retained by the burs. I cannot explain this phenomena; but at any rate I consider it advisable to use a plate of this type for the lowermost slide. All the slides preferably have flanges 24 at their upper ends which abut against the upper ends of the cleats 11 within the casing, while the lower ends of the slides rest against the stops 12. In use the slides are inserted, the doors closed, and proper connections with the inlet and outlets made. The dirty water falls upon the trough-like slide 21 and the coarsest impurities run into the waste-space. The water passes through the fine slits in this plate, thence through the slits in the slide 25, and thence through the perforated slide or slides, each shedding its impurities to the waste, and finally the water passes through the charcoal, if used, and through the strainer to the reservoir or receptacle from which it is drawn for use. From time to time the faucet in the waste-pipe is opened, and on less frequent occasions the slides are removed through the door 9 and cleansed and replaced.

All parts are of the desired proportions, though my preference is shown in the drawings. I prefer aluminium for the material, though that is not absolute necessary. The size of the device will depend upon the capacity which the filter must have. I do not limit myself to the precise details of construction save as set forth below.

What is claimed as new is—

1. In a filter, the combination with the casing having inlet and outlet apertures at its top and bottom and a waste-outlet at the bottom of one side, and a series of slides within the casing inclined downward toward the space above said waste-outlet, the slides being themselves filters of differing character; of a cap removably surrounding the outlet and having an outwardly-flaring bottom through whose center extends the exhaust-pipe, a conical sieve standing over the inner end of the exhaust, and filtering material surrounding

the sieve within said cap, substantially as described.

2. In a filter, the combination with the casing having inlet and outlet at its upper and lower ends and openings in its front and back respectively high and low, doors for closing said openings, and packing for rendering the doors water-tight; of cleats on the inner sides of the casing inclined downward from points within the front door to points opposite but slightly remote from the rear door, stops across the casing at the lower ends of said cleats leaving a chamber just inside the rear door, an exhaust for dirty water at the bottom of this chamber, and slides removably insertible through the front door and supported by said cleats, each slide being itself a filter, as and for the purpose set forth.

3. In a filter, the combination with a casing having front and rear doors respectively high and low, an inlet at the top and outlet at the bottom of the casing, an exhaust for dirty water leading from a point just inside the rear door, and a faucet in said exhaust-pipe; of a series of filter-plates supported within the casing and inclined downward from just inside the front door to a point some distance inside the rear door, and a supplemental filtering device surrounding the inner end of the outlet for clear water, as and for the purpose set forth.

4. In a filter, the combination with a casing having inlet and outlet at its top and bottom, and a waste-outlet at one side of its bottom; of a series of filter-plates located within the casing between the inlet and outlet and inclined downward toward said waste, the uppermost plate being channeled in the direction of its length, as and for the purpose set forth.

5. In a filter, the combination with a casing having inlet and outlet at its top and bottom, and a waste-outlet at one side of its bottom; of a series of filter-plates located within the casing between the inlet and outlet and inclined downward toward said waste, the uppermost plate being channeled in the direction of its length, the plate next beneath being provided with fine slots, and the plate next beneath that being provided with fine perforations, substantially as described.

6. In a filter, the combination with a casing having inlet and outlet, and an exhaust for the waste; of a series of inclined filter-plates of which the uppermost is composed of a series of troughs whose upright sides are slightly spaced from each other, the lowermost is a plate perforated with fine holes surrounded by depending burs, and other filter-plates interposed between these two, as and for the purpose set forth.

7. In a filter, the combination with the casing having inlet and outlet at its upper and lower ends and an opening in its front near the top thereof, and a door for closing said opening; of cleats within the casing inclined downward from points just inside the door,

transverse stops at right angles to said cleats and each extending downward from the plane of a pair of cleats nearly to the plane of the pair beneath, said stops being spaced from the rear of the casing so as to leave a chamber between, a dirty-water exhaust for this chamber, and filtering-slides removably supported by said cleats, as and for the purpose set forth.

10 8. In a filter, the combination with the casing having inlet and outlet at its upper and lower ends and containing a lateral chamber having a dirty-water exhaust; of a series of

stops extending transversely across the casing and forming one side of said chamber, 15 and a series of filtering-slides inclined downward toward said chamber and each terminating at the upper edge of its stop and slightly remote from the lower edge of the stop above, as and for the purpose set forth. 20

In testimony whereof I have hereunto subscribed my signature.

JOHN JOSEPH BETZOLD.

Witnesses:

W. P. THOMPSON,
Mrs. J. M. STATON.