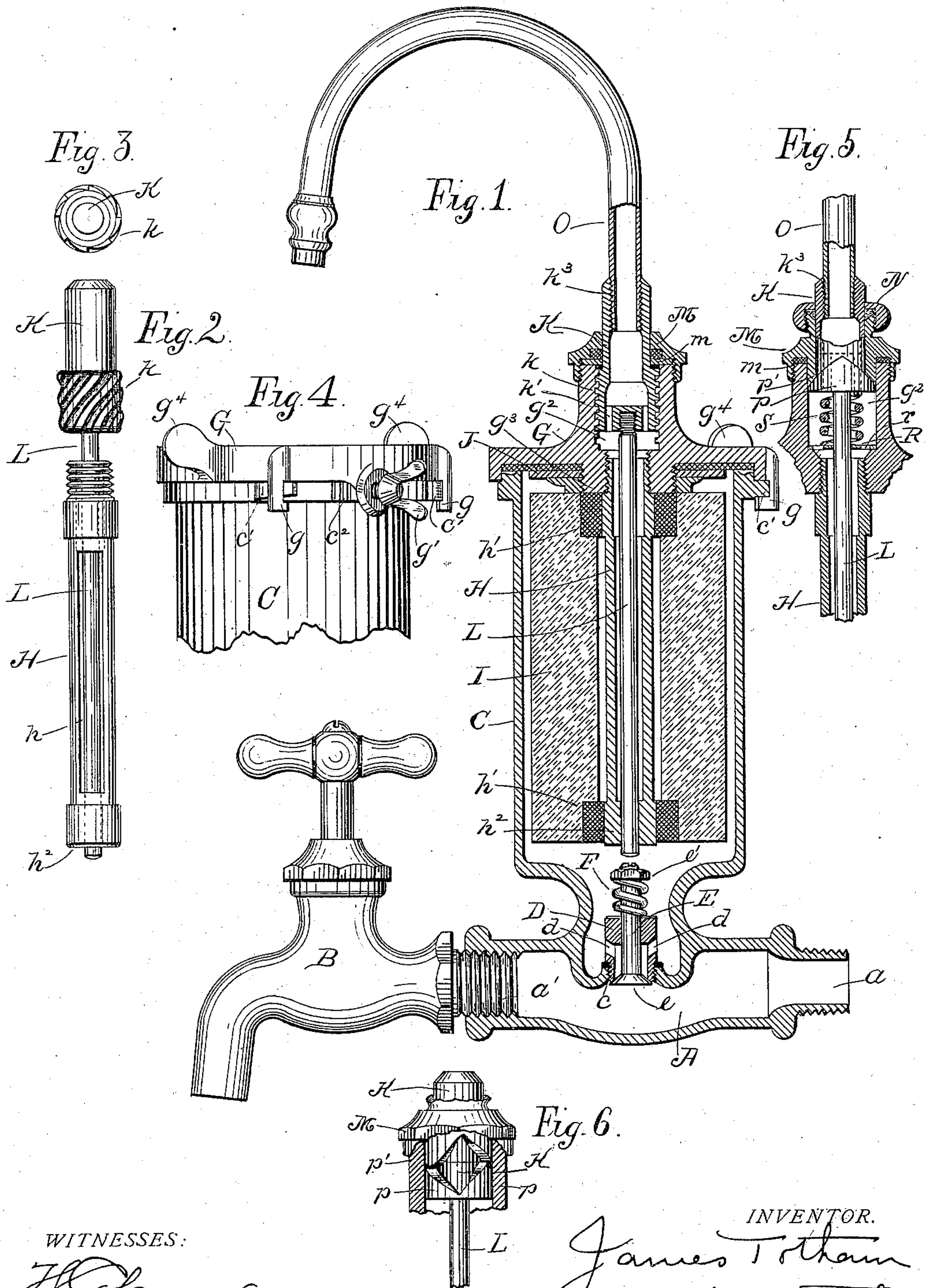


(No Model.)

J. TOTHAM.
FILTER.

No. 598,719.

Patented Feb. 8, 1898.



WITNESSES:

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FILTER.

SPECIFICATION forming part of Letters Patent No. 598,719, dated February 8, 1898.

Application filed July 12, 1897. Serial No. 644,248. (No model.)

To all whom it may concern:

Be it known that I, JAMES TOTHAM, of the city and county of New Haven, in the State of Connecticut, have invented a new and useful Improvement in Filters, of which the following is a full, clear, and exact description when taken in connection with the drawings, which form a part thereof, and in which—

Figure 1 represents a vertical section through a combined faucet and filter embodying my invention; Fig. 2, a detail side elevation of the filter-plug, filter-spindle, and operating-rod; Fig. 3, a bottom view of the filter-plug or cap-spindle; Fig. 4, a side elevation of the top of the filter; and Figs. 5 and 6, vertical sections through a part of the filter-cap plug, showing a modification of my invention.

In all figures similar letters of reference represent like parts.

This invention relates to filters, and is shown applied to that class in which separate outlets are provided for filtered and unfiltered water, and has for its object certain improvements, such as the provision of a self-closing valve separating the filter from the inlet-pipe operated by mechanism from a turning outlet, means for readily removing the filtering substance for cleaning, and other improvements set forth hereinafter.

In the drawings, A represents a pipe with its inlet end *a* adapted to be screwed into an ordinary supply-pipe, while its outlet end *a'* is adapted to carry a faucet B. Through this pipe A unfiltered water may pass directly from the supply-pipe to the faucet B. On one side of the pipe A is a cylindrical shell C of a filter formed integral with or secured to the pipe A and an opening *c* into the pipe, in which opening is screwed a hollow cylindrical valve-seat D, with lateral perforations or slots *d*. A spindle E, extending through the valve-seat D, is capable of longitudinal movement therein and has formed at its lower end a valve E, adapted to close the lower end of the valve-seat. A nut *e'* is screwed onto the upper end of the spindle E, and a coiled spring F surrounds the spindle and bears on the nut *e'* and top of the valve-seat D, tending thereby to normally force the spindle E upward and hold the valve *e*

in its position in the valve-seat. By this means the valve *e* is normally and automatically held in its seat and the opening between the pipe A and filter C closed.

At intervals on the exterior of the upper edge of the shell C are flanges *c'*, and the top G of the filter is provided with corresponding flanges or clamps *g*, which engage the flanges *c'* to fasten the parts together, while a set-screw *g'* engages notches or teeth *c²* on the edge of the shell C. Thumb-plates *g⁴* are provided on the top G to rotate the top when fastening or unfastening the parts of the filter. Through the top G extends a passage *g²*, the lower end of which is internally screw-threaded for the reception of the upper end of a hollow filter-spindle H, having longitudinal slots *h*. Rubber bushings or sleeves *h'* at the upper and lower ends of the spindle H fit into and carry the hollow porous-stone cylinder I, through which the water is filtered.

When it is desired to cleanse the exterior of the cylinder I, (that portion on which the sediment collects,) it is only necessary to loosen the set-screw *g'*, turn the top G so that the clamps *g* are disengaged from the flanges *c'*, and lift the top, when the cylinder I is raised therewith and may be removed for cleansing. Between the upper edge of shell C and top G washers J may be secured by screwing them onto the downwardly-extending portion *g³* of the top.

Into the passage *g* or, more properly, into an upward extension thereof a hollow cylindrical plug or cap spindle K is adapted to be screwed, and the screw-threads *k* on the interior face of the passage *g²* and the exterior of the plug K are, as shown in Fig. 2, coarse or quick threads, so that but a portion of a turn of the plug K raises or lowers the same in the passage *g²* materially. The bottom of the plug K is provided with perforations *k'* and is also internally threaded to receive the upper end of an operating-rod L, which depends therefrom through the hollow filter-spindle H and out of the lower end *h²* thereof, having a water-tight fit therewith.

Around the plug K fits the cap M, which is screwed onto the upper end of the top G. Washers *m*, of brass, felt, and rubber, are in-

terposed between the plug K, top G, and cap M. The upper end k^s of the plug K is internally threaded to receive the lower end of a curved outlet O.

5 In operation, as above stated, the unfiltered water flows through the pipe A to the faucet B, as the valve e normally closes the opening into the filter C. When filtered water is desired, the outlet O is turned and the plug K
10 secured thereto, whereupon the plug K is forced downward on the quick thread k . The operating-rod L, being rigidly connected to the plug K, is likewise forced downward in the filter-spindle H (in which it is capable of
15 lengthwise movement) until it bears on the upper end of valve-spindle E, forcing it downward against the tension of spring F and opening the valve e . Valve e being opened the water passes through the slots d in the valve-seat D and enters the shell C, whence it percolates through the stone cylinder I. After entering the interior of the cylinder I the water passes into the filter-spindle H, through the slots h , up into the passage g^2 in the top
20 G. From the passage g^2 water enters the interior of plug K through the perforations k' , and thence to the outlet O. To stop the flow of the filtered water, turning the outlet O and plug K in the reverse direction raises
30 the rod L from abutment on the valve-spindle E, which is thereby released to be raised by the spring F to close the valve e . A feature of this construction is that the screw-threading k on the plug K and interior of the
35 passage g^2 instead of having the usual single starter or one end of the thread has a number of starters or threads, (shown as eight in Fig. 3,) so that by removing the cap M and unscrewing the plug K the plug K and with
40 it the outlet O may be turned on a horizontal plane to assume various positions relative to the filter C, so that the outlet O may project in any desired direction.

A modification of the construction of the
45 plug K whereby an automatic return is given the outlet O when the hand of the user is removed therefrom is shown in Figs. 5 and 6. Instead of the quick threads on its extension the plug K is provided with an upwardly-extending angular cam p and on the bottom of
50 cap M is a corresponding downwardly-projecting cam p' . A disk R is fitted in the passage g^2 with perforations r , and a spring S bears on its upper face and the lower face
55 of the plug K. Owing to the inclined edges of cams p and p' and the constant upward pressure on the plug K by the spring S the plug K and cap M will be constantly forced to assume the position shown in Fig. 5, where
60 the cams interlock each other, for when turned from that position, as shown, Fig. 6, the cams will tend to slide on their inclined edges to their normal position.

The normal position of the plug K and cap
65 M is adjusted to be when the operating-rod L (attached to plug K) is raised from contact with the valve-spindle E and the valve

e closed. Upon turning the outlet O and plug K the inclined edges of the cams p and p' tend to force the plug K downward and
70 with it the operating-rod L to bear on valve-spindle E to open valve e ; but as soon as outlet O is released spring S tends to force the plug K back to its normal and raised position.
75

A stuffing-box or packing N is shown in Fig. 5 affixed to the top of the cap M to make the connection at that point absolutely watertight.

Having now described my invention, (which
80 may vary greatly from the details of construction without departing from the spirit thereof,) what I claim, and desire to secure by Letters Patent, is—

1. The combination with a direct-flow pipe
85 for unfiltered water; of a shell rigidly secured thereto and adapted to contain filtering material; an opening from said direct-flow pipe into said filter; an independent valve for closing said inlet; and a spring for automatically closing said valve in said inlet, substantially as described.
90

2. In a filter, the combination with the shell in which is the filtering material; of an outlet constantly permitting the passage of water
95 from the interior of said shell, and capable of turning on its axis; an inlet to said shell; a valve for closing said inlet; a spring automatically closing said valve in said inlet; and mechanism for opening said valve as said
100 outlet is swung on its axis, substantially as described.

3. In a filter, the combination with the shell in which is the filtering material; of an outlet therefrom capable of a limited longitudinal
105 movement therein; an inlet thereto; a valve mounted on a spindle for closing said inlet; a spring bearing on said valve-spindle to normally close said valve in said inlet; and mechanism connected to said outlet and
110 moved longitudinally therewith by which said valve may be opened upon the movement of said outlet, substantially as described.

4. In a filter, the combination with the shell in which is the filtering material; of an outlet
115 therefrom capable of a limited movement therein; an inlet thereto; a valve for closing said inlet; means for automatically closing said valve in said inlet; and an operating-rod connected to said outlet to open said valve
120 upon the movement of said outlet, substantially as described.

5. In a filter, the combination with the shell of a hollow filter-spindle therein; a hollow cylinder of filtering material mounted on said
125 filter-spindle; an outlet from said shell capable of a limited movement therein; an inlet to said shell; a valve-spindle capable of limited longitudinal movement in said inlet and carrying a valve adapted to close said inlet;
130 a spring bearing on said valve-spindle to normally close said valve in said inlet; and an operating-rod extending through said filter-spindle, connected to said outlet to bear on

said valve-spindle and open said valve upon the movement of said outlet, substantially as described.

5 6. In a filter, the combination with the shell in which is the filtering material; of an outlet capable of a limited turning movement in said shell; means for automatically returning said outlet to its normal position; an inlet to said shell; a valve for closing said inlet; 10 means for automatically closing said valve; and an operating-rod connected to said outlet and adapted to open said valve upon the movement of said outlet from its normal position, substantially as described.

15 7. In a filter the combination with the shell containing the filtering material; of an outlet capable of a limited longitudinal movement in said shell; means for automatically returning said outlet to its normal position; 20 an inlet to said shell; a valve for automat-

ically closing said inlet; means for automatically closing said valve; and mechanism adapted to open said valve upon the movement of said outlet from its normal position, substantially as described.

25 8. In a filter, the combination with the shell having a removable top; of a hollow filter-spindle depending from said top; an outlet connected to said filter-spindle; a hollow cylinder of filtering material mounted on said filter-spindle; an inlet to said shell; means for 30 automatically closing said inlet; and mechanism for fastening said top to the shell, substantially as described.

In witness whereof I have hereunto set my hand this 8th day of July, A. D. 1897. 35

JAMES TOTHAM.

Witnesses:

J. J. HENDERSON,
SAMUEL H. FISHER.