(No Model.) 2 Sheets—Sheet 1.

W. B. LINDSAY & W. E. TONNER.

FILTER.

No. 590,764. Patented Sept. 28, 1897.

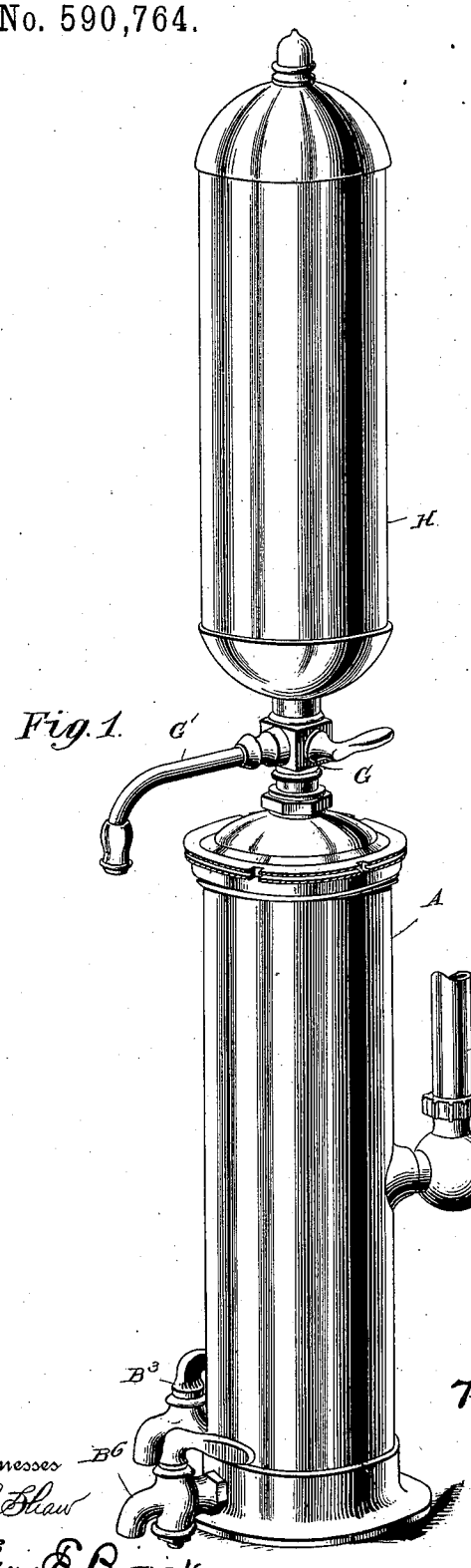

Fig. 1.

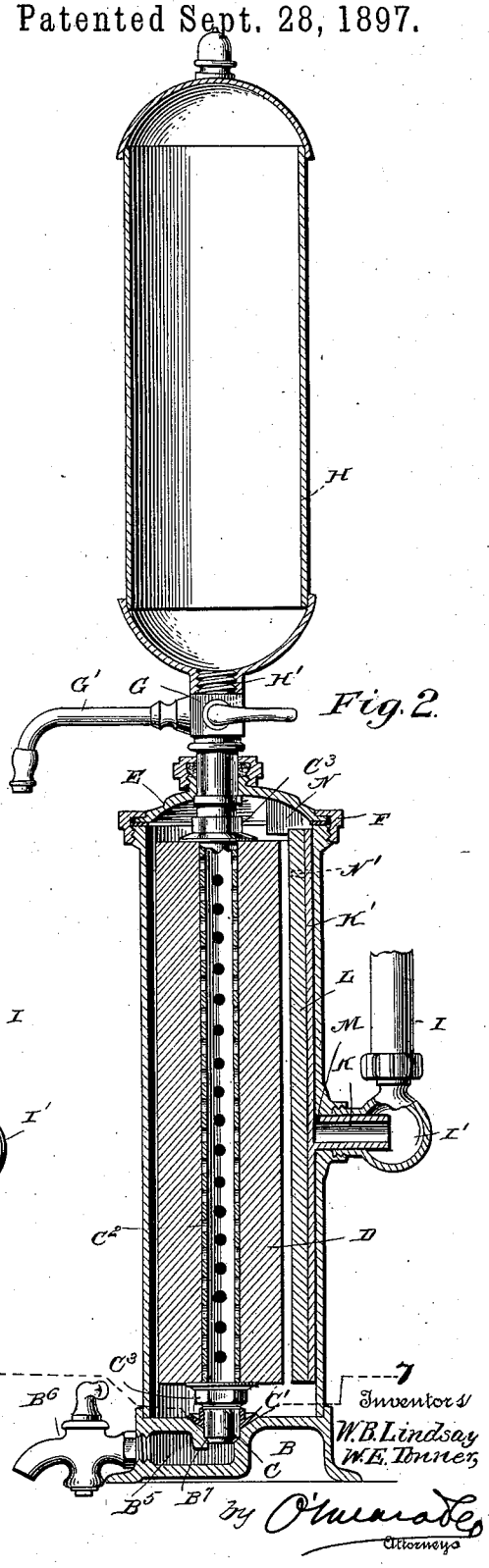

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

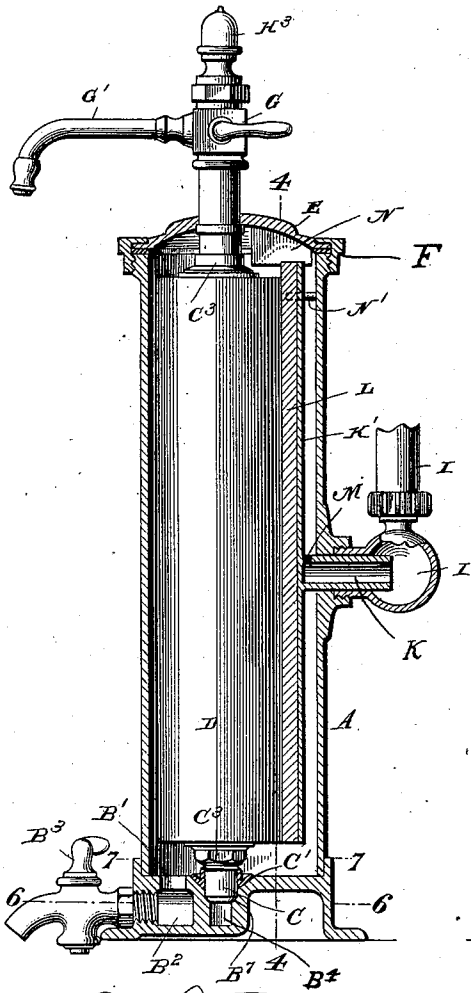


Fig. 4.

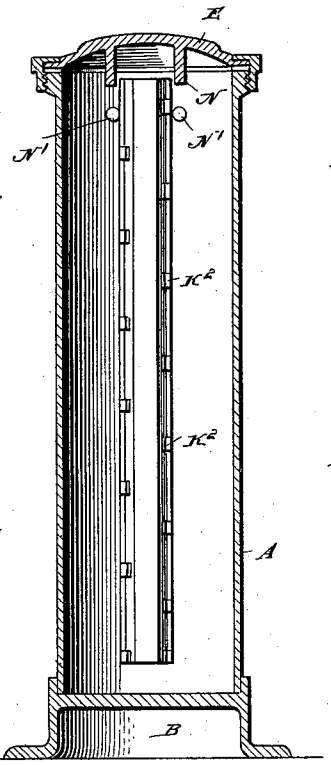


Fig. 5.

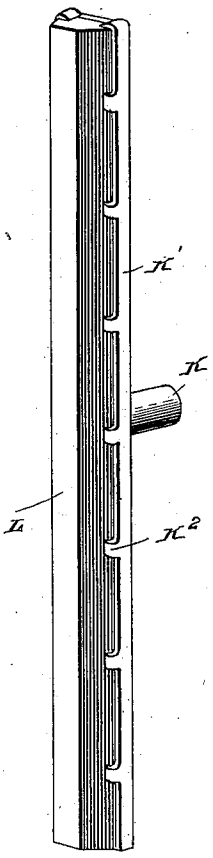


Fig. 8.

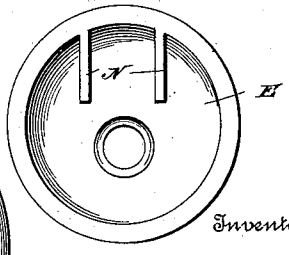


Fig. 6.

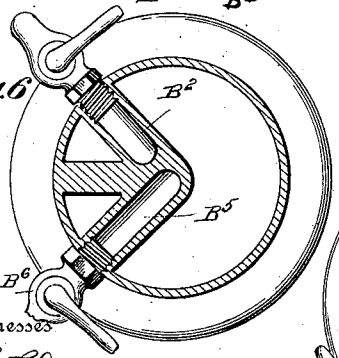
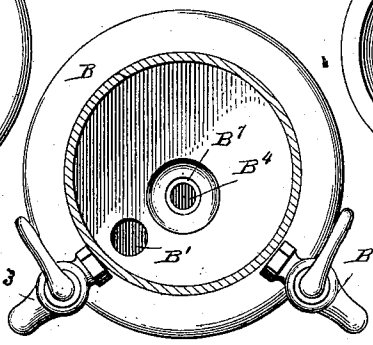


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM B. LINDSAY AND WILLIAM E. TONNER, OF STEUBENVILLE, OHIO.

FILTER.

SPECIFICATION forming part of Letters Patent No. 590,764, dated September 28, 1897.

Application filed May 21, 1897. Serial No. 637,577. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. LINDSAY and WILLIAM E. TONNER, residing at Steubenville, in the county of Jefferson and State of Ohio, have invented a new and useful Filter, of which the following is a specification.

This invention relates generally to filters, and more particularly to that class of filters known as "porous wall," and is in the nature of an improvement upon the subject-matter of our Patent No. 584,732.

The object of our invention is to provide an exceedingly cheap, simple, and efficient construction of filter and one which will filter very rapidly.

Another object of the invention is to provide means for cleaning the exterior surface of the filtering-cylinder upon which the sediment collects.

Another object of the invention is to provide a filter in which the filtering-cylinder can be rapidly cleaned without removing or disturbing any of the parts of the filter.

Another object of the invention is to provide a reservoir attachment in connection with the filter proper, by means of which a definite amount of filtered water can always be kept on hand.

Another object is to provide a tubular connection between the reservoir and filtering-cylinder.

Another object of the invention is to provide a filter from which filtered or unfiltered water can be drawn at will.

With these various objects in view our invention consists, essentially, in the employment of a cylindrical casing preferably composed of drawn metal and provided with a cast-metal base and a removable top and porous filtering-cylinder arranged eccentrically within the casing, and a cleaner arranged between the filtering-cylinder and casing and adapted to be projected against said cylinder by the unfiltered water whenever desired.

The invention consists also in the peculiar construction and arrangement of the tube, whereby the eccentric arrangement of the filtering-cylinder is attained; and the invention consists also in providing suitable guides for insuring a positive movement of the cleaner.

The invention consists also in providing suitable outlets within the base, by means of which filtered or unfiltered water can be drawn from the cylinder.

The invention consists also in certain details of construction and novelties of combination, all of which will be fully described hereinafter and pointed out in the claims.

In the drawings forming a part of this specification, Figure 1 is a perspective view of a filter constructed in accordance with our invention, the reservoir attachment being connected thereto. Fig. 2 is a detail sectional view of said filter with the reservoir. Fig. 3 is a detail sectional view of the filter without the reservoir, the filtering-cylinder being shown in side elevation. Fig. 4 is a vertical section on the line 4 4 of Fig. 3. Fig. 5 is a detail perspective view of the cleaner. Fig. 6 is a horizontal section on the line 6 6 of Fig. 3. Fig. 7 is a horizontal section on the line 7 7 of Figs. 2 and 3, and Fig. 8 is an inverted bottom plan view of the top.

In the practical embodiment of our invention we employ an outer cylindrical casing A, which in practice is preferably constructed of a drawn-metal tube, said casing being provided with a cast-metal base B, which has an opening B′ in the bottom thereof leading into the passage B^2, in which is arranged a cock or faucet B^3 and by means of which unfiltered water can be drawn from the casing whenever desired. An opening B^4 is produced in the bottom of the base to one side of the center and communicates with the passage B^5, in which is arranged a cock or faucet B^6, through which filtered water is drawn, as more clearly shown and explained hereinafter. The opening B^4 is provided with shoulders B^7, upon which rests a central tube C, passing entirely through the filtering-cylinder D, and adjacent to the bottom of the tube C is arranged a washer C′, which fits upon the countersunk portion of the opening B^4, thereby providing a tight joint, inasmuch as the pressure of the water within the cylinder will always hold the said washer tight upon its seat.

The filtering-cylinder D, through which the tube C passes, is preferably constructed of Tripoli stone, although it will of course be understood that any other porous material may be used, and it will of course be understood that a series of perforations, such as shown at C^2, are necessary in order to per-

mit the water passing through the porous cylinder to collect within the central tube. This tube C is securely connected with the porous cylinder by means of the nuts C^3 at the top and bottom, and at its upper end the tube passes eccentrically through a cap-piece E, which is secured upon the top of the casing by means of a clamping-ring F, and at the upper end of the tube C is arranged a multiple cock G, having a discharge-spout G', and provided with a valve of such construction that the water can be cut on or off, as desired, or it can be permitted to flow up into the reservoir H, which is screwed upon a nipple H', projecting upwardly from the cock G, as most clearly shown in Fig. 2. When the reservoir H is not used, the nipple H' is closed by means of a solid cap H^3, as most clearly shown in Fig. 3.

I indicates a water-supply pipe which is constructed with an enlargement I' and enters the casing A about midway its height, and located in said pipe where it enters the casing is a tubular piston K, attached to a plate K', which securely holds the cleaner L by means of the lugs K^2, bent around the sides of the cleaner, as most clearly shown in Fig. 5, and it will of course be understood that any other means of connecting the plate K' and cleaner can be adopted, if desired.

The tubular piston K entirely occupies the supply-pipe where it enters the casing and is provided with a discharge-opening M in the top thereof through which the water passes into the filter, said water being sprayed upwardly against the top of the filter and then permitted to flow down the sides of the filter medium, thus expediting the filtering.

Parallel guides N, cast integral with the top E, depend therefrom and serve to guide the movement of the cleaner as it is moved back and forth by hydraulic pressure, and we also prefer to arrange guide-pins N' upon the interior of the casing A, as most clearly shown in Figs. 3 and 4, in order to guide the movement of the cleaner, as before mentioned.

By arranging the filtering-cylinder eccentrically within the casing we are enabled to use a drawn-metal tube for the casing and are also enabled to use a larger filtering-cylinder and at the same time provide ample room for the cleaner.

By providing the reservoir upon the top of the filter a definite quantity of filtered water can always be had in cases of emergency, but for all practical purposes our filter will perform the filtering operation with such rapidity as to fulfil all ordinary household necessities.

In operation the filtering-cylinder is arranged within the casing after the cleaner has been properly adjusted, the cap set in place and clamped down by means of the clamping-ring. The reservoir can be attached or not, as desired. The filter is then connected with the water-main and water permitted to flow therein. The water quickly passes through the filtering-cylinder and accumulates within the central tube and also within the reservoir and can be drawn off either through the discharge-cock G' or through the cock B^6, as preferred. Should unfiltered water be desired at any time, it can be drawn off through the cock B^3, as before described.

In order to clean the filter, the cock B^3 is opened and the cock G closed, and the pressure of the water immediately forces the cleaner against the filtering-cylinder, and by revolving the cylinder two or three revolutions by either the reservoir or cock G' all sediment is immediately removed from the exterior surface of the filtering-cylinder and drawn out through the cock B^3.

In case the reservoir is used an additional cleaning can be had by cutting off the pressure from the main opening, the cock G permitting the water contained within the reservoir to flow back within the tube C and out through the filtering-cylinder into the casing and out through the cock B^3. In this manner not only the exterior surface of the filtering-cylinder is cleaned, but the entire filtering-stone. The guides always insure the positive action of the cleaner.

It will thus be seen that we provide an exceedingly cheap, simple, and efficient construction of filter and one which can be thoroughly cleaned without removing any parts of the filter or interfering in any manner whatsoever with its operation.

It will also be seen that we provide a filter which permits either filtered or unfiltered water to be drawn from the main.

In practice we prefer to use a natural-stone filtering medium and a natural-stone cleaner, but it will of course be understood that it is within the scope of our invention to use the filtering-cylinder and cleaner of any material whatsoever.

By means of the tubular connection between the filtering-cylinder and reservoir the filtering-cylinder can be revolved by simply turning the reservoir, and this tubular connection is one of the essential features of our invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a filter, the combination with the casing of the inner filtering-cylinder arranged eccentrically within said casing, the detachable cover, the cleaner arranged between the casing and filtering-cylinder, the supply-pipe and the tubular piston located in said supply-pipe and provided with the discharge-opening, the filtering-cylinder having the pipe leading from each end, substantially as shown and described.

2. In a filter, the combination with the casing having a base provided with a plurality of passages each passage being provided with a draw-off cock, the filtering-cylinder arranged eccentrically within the casing and provided with a tube seated within the opening therein and communicating with one of

the passage-ways of the base, a detachable cap, means for securing the same, the cleaner having the tubular piston attached thereto and the supply-pipe leading into the casing, substantially as shown and described.

3. In a filter, the combination with the casing having a base constructed as described, of the revolving filtering-cylinder arranged within the casing and having a tube extending entirely through said filtering-cylinder, a draw-off cock connected to the upper and lower ends of said tube, and the reservoir detachably connected to the upper end of said tube, substantially as shown and described.

4. In a filter, the combination with the outer case and the filtering-cylinder arranged as described and the cleaner arranged between the casing and filtering-cylinder and the reservoir attached to the upper end of the tube passing into the filtering-cylinder, substantially as shown and described.

5. In a filter, the combination with the casing having the base provided with a plurality of passage-ways each having a draw-off cock connected thereto, the filtering-cylinder arranged eccentrically within the case, the cleaner arranged between the case and filtering-cylinder, the tubular piston having an aperture therein, the plate provided with the clamping-lugs, the guide-pins, the detachable top and guide-lugs, the clamping-ring, all arranged and adapted to operate substantially as shown and described.

6. In a filter, the combination with the casing having a base constructed as described, and the filtering-cylinder arranged therein, the cleaner constructed as described and arranged between the filtering-cylinder and the casing, said cleaner having a tubular piston connected therewith, said tubular piston being arranged in the supply-pipe leading into the casing, the tube extending from the filtering-cylinder, the detachable cap and means for securing the same and the revolving cylinder arranged upon the upper end of said tube, the draw-off cock, the discharge-spout, all arranged and adapted to operate substantially as shown and described.

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WILLIAM E. TONNER.

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