(No Model.)

C. C. MOORE.

WATER FILTER.

No. 565,416. Patented Aug. 4, 1896.

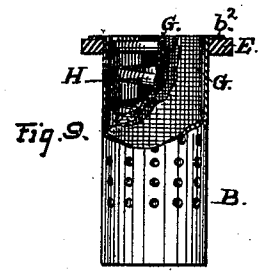

Fig. 9.

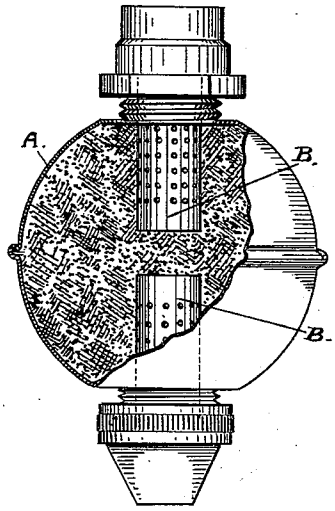

Fig. 1.

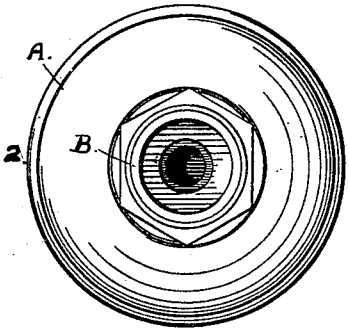

Fig. 2.

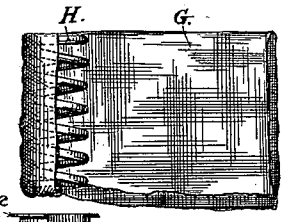

Fig. 8.

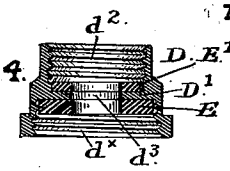

Fig. 4.

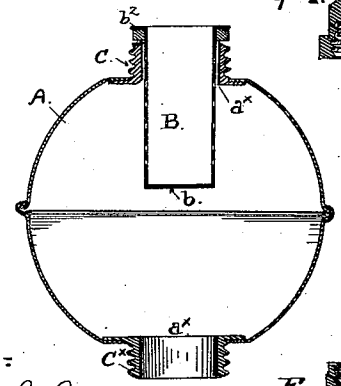

Fig. 3.

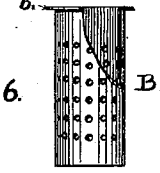

Fig. 6.

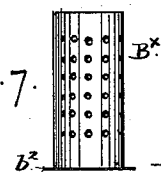

Fig. 7.

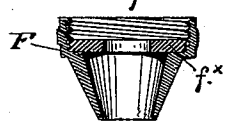

Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES C. MOORE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO FERDINAND L. VAN DEMARK, OF SAME PLACE.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 565,416, dated August 4, 1896.

Application filed September 17, 1895. Serial No. 562,800. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. MOORE, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Water-Filters, of which the following is a specification.

This invention relates to improvements in filtering attachments for water-faucets, and the same consists in certain novel parts and combination of parts producing an improved filtering device for water-faucets that has several useful features of construction and operation, as hereinafter set forth.

The following description explains at length the nature of my said improvements and the manner in which I proceed to produce, carry out, and apply the same, reference being had to the drawings that accompany and form part of this specification.

Figure 1 of the said drawings represents my improved filter in elevation, with the outer shell or body broken away to expose the parts inside. Fig. 2 is a top view. Fig. 3 is a vertical sectional view of the shell or body, with one of the filtering-cylinders set in the body. Fig. 4 is a view in cross-section of the removable screw-coupling on the top of the filter-body. Fig. 5 is a similar detail view of the removable nozzle on the bottom of the filter-body. Figs. 6 and 7 are elevations of the removable cylinders or tubes. Fig. 8 is a view in detail of the filtering diaphragm that is inserted in the filtering-cylinder, illustrating the manner of forming the same. Fig. 9 is a view on an enlarged scale of one of the filtering-cylinders and its internal diaphragm, the body of the cylinder being broken away at the upper part to show the internal construction and arrangement of the diaphragm.

A indicates a spherical shell with openings $a^{\times}$ in either side, and B $B^{\times}$, long and relatively narrow cups or cylinders with closed inner ends b, setting into the filter-body A through such openings from opposite ends, the closed bottoms of such cylinders being set into the chamber in such spherical shell.

C $C^{\times}$ are screw-threaded necks standing out from the spherical body on the top and the bottom of the shell around the openings $A^{\times}$.

D is a removable coupling having a screw-thread $d^{\times}$ to fit the neck C, and a threaded socket d^{2} to screw onto the threaded end of a water-faucet.

D′ is a flange in the center of the coupling having a central circular aperture d^{3}, and E E′ are packing-rings fitting tightly against such flange D′ from beneath and also from above. The former of these packing-rings is pressed tightly down against the end of the neck C when the coupling is screwed into place on the filter-body, in which position it clamps between it and the neck C the flanged rim b^{2} of the cylinder B, when the cylinder is inserted into the body A.

The function of the top ring E′ is to produce a tight joint between the coupling and the end of the faucet to which the filter may be attached.

The body of each cylinder before mentioned is perforated with numerous holes and the bottom or inner end is closed, so that the water can pass from the outside to the inside, or vice versa, only through those perforations.

G is a filtering-diaphragm formed of several layers of bolting-cloth or fine silk or similar fine fabric laid around and against the inner face of the cylinder, over the perforations therein, and H is a spiral coil of stiff spring-wire of the same height as the cylinder and of proper diameter to fit within the cylinder and inside the layers of filtering fabric. The function of this coil H is to hold the fabric closely against the interior wall or surface of the surrounding cylinder and keep the central space at all times open and to prevent the diaphragm from collapsing under the pressure of the water, whether such pressure be from the outside inward or in the opposite direction.

In bringing the fabric into such shape for insertion into the filtering-cylinder a strip of proper length to produce the required thickness or number of layers and in width about twice the length of the cylinder B is doubled down upon itself, as shown in Fig. 8. The coil H being laid against the folded fabric, the same is evenly rolled or wound closely around the spiral from end to end, covering the same with several turns or layers, as the length of the fabric may afford, after which the edges of the fabric at the bottom are turned up into the end of the spiral and the

tube thus formed is inserted into the metal cylinder in the filter-body and pressed down into place.

The nozzle F, that holds the lower cylinder $B^{\times}$ in place, is threaded to fit the neck on the body A and is provided with a packing $f^{\times}$ to produce a tight joint between the neck and the filtering-cylinder.

When the two cylinders B $B^{\times}$ are in place in the filter-body, they are in line with each other on the vertical diameter of the filter-body and their closed ends are turned toward each other inside the body. Thus the water from the end of the faucet in flowing through the filter passes first into the open center of the upper filtering-cylinder B and through its layers of filtering-cloth and out through the apertures in the cylinder into the surrounding space or chamber, from whence it finds an outlet through the lower cylinder $B^{\times}$ and its contained layers of filtering-cloth into the central space and finally through the nozzle on the bottom of the filter. In the upper cylinder, therefore, the sediment or extracted matter is deposited on the inside of the tubular filtering-diaphragm, composed of cloth, while in the lower cylinder such matter is deposited on the outer layer of the cloth, or that surface which lies next to the perforated body of the cylinder, because the flow of water is in the opposite direction, or from the outside to the inside.

The filtering-cloth in both cylinders is readily cleansed from time to time by simply reversing the flow of water through the filter. For that purpose both the coupling and the nozzle are detached and the filter-body is reversed. By unscrewing the body A from the coupling D and then removing the nozzle F the filter-body is turned end for end and then united to the couplings and nozzle as before, so that the force of the stream when the water is turned on will act in the opposite direction and thus wash off the deposit on the filtering-cloth in both cylinders. At such time the stream is allowed to flow through the filter until it is well washed and the water runs clear at the nozzle.

The interior of the filter-body is packed with charcoal or other similar filtering medium where the same is found necessary by the character or condition of the water to be filtered. Such substance or material is inserted by removing one of the cylinders and then replacing it and screwing on the coupling when the chamber is filled.

The filtering-cloth in either cylinder is readily renewed without disturbing the cylinder and the surrounding body of charcoal simply by drawing out the wire spiral and rewrapping it with new cloth.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described filter comprising the filter-body A, removable coupling D, removable nozzle F, perforated cylinders with closed inner ends, the removable spiral coils fitted into said cylinders, and the filtering fabric wound around the said coils before they are inserted in place and held against the inner walls of the said cylinder by said coils when so inserted, combined for operation as set forth.

2. The combination, with the filter-body having openings at top and bottom on its vertical diameter; of the perforated cylinders with closed ends fitted into the body and provided with flanges, the removable screw-coupling D and nozzle F, and the tubular filtering-diaphragm G and inner coils H as a means of holding the said diaphragm against the inner faces of the cylinder for operation, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

CHAS. C. MOORE. [L. S.]

Witnesses:

EDWARD E. OSBORN,

M. REGNER.