

G. M. KNEUPER.
 FILTER.
 APPLICATION FILED JUNE 14, 1911.

1,061,755.

Patented May 13, 1913.

Fig. 1.

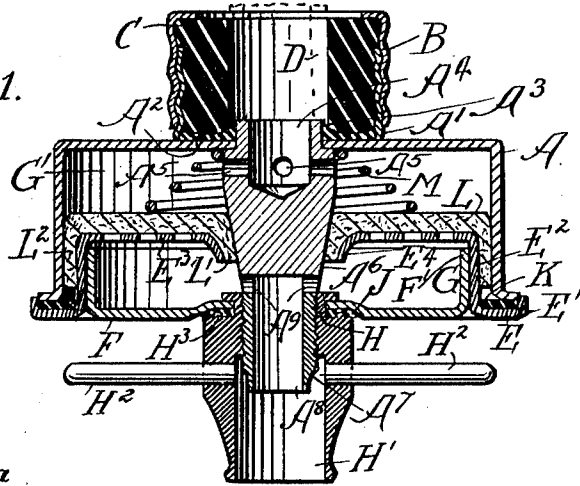


Fig. 1^a.

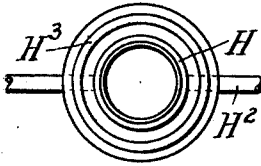


Fig. 2.

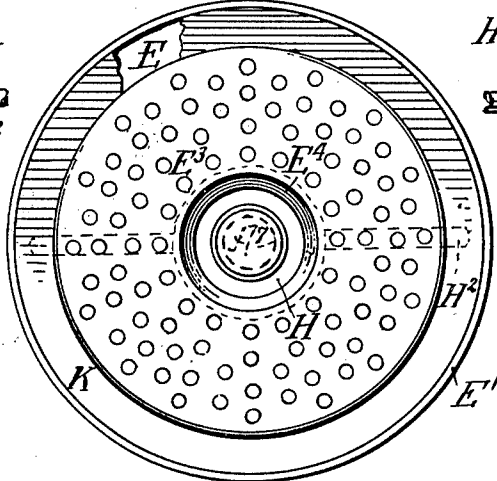


Fig. 1^b.

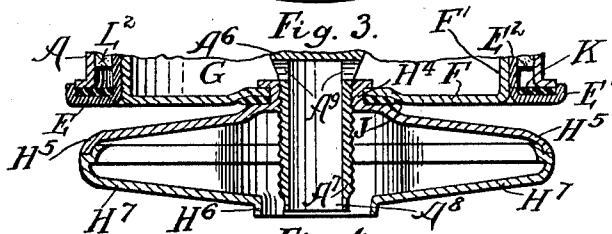
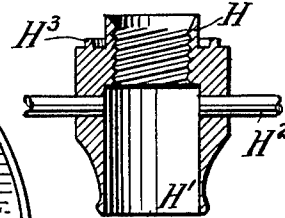
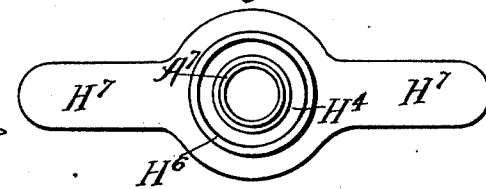


Fig. 4.



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FILTER.

1,061,755.

Specification of Letters Patent.

Patented May 13, 1913.

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To all whom it may concern:

Be it known that I, GEORGE M. KNEUPER, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Filters, of which the following is a specification.

My present invention relates to apparatus for filtering or purifying liquids, and has for its object to provide a very efficient filter which will be compact, strong to resist deformation even when it is handled roughly, and of light weight so as to facilitate its application to a faucet and reduce the expense of shipping.

The present invention is an improvement of the filter disclosed in Letters Patent of the United States No. 973868, granted to me on October 25, 1910.

In the accompanying drawings, Figure 1 is a central vertical section through one form of my improved filter; Fig. 1^a is a top view of the swivel nut before spreading its upper end; Fig. 1^b is a corresponding vertical section of the swivel nut; Fig. 2 is a top view of the lower part of the filter; Fig. 3 is a partial vertical section showing another form of my invention; and Fig. 4 is an inverted plan view of the handle shown in Fig. 3.

As shown in Figs. 1 and 2, the upper part of the filter consists of a shell A having suitable means for connecting it with a faucet or other source of water supply. For instance, the shell may be fitted with an upward tubular projection A', threaded to receive a nut B by means of which a rubber washer C, contained within the nut, may be compressed into tight engagement with the faucet indicated by dotted lines at D. The sleeve A' may be connected with the top of the shell A by soldering as at A² or otherwise. The solder may also serve to secure in place a tube A³ having at its upper end an inlet chamber A⁴ adapted to receive water or other liquid from the faucet D and to discharge said water into the shell A, through a number of openings A⁵ below the top of the shell A, it being understood that the upper end of the tube is above the top of the

shell. The central solid portion A⁶ of the tube A³ is tapered downwardly, and the reduced lower portion A⁷ is screw-threaded exteriorly and contains an outlet chamber A⁸ to which the filtered water has access through openings A⁹ and from which such water is discharged at the open lower end of the tube.

The shell A, consisting of a substantially plane top and a peripheral flange preferably formed with a slight flare at the bottom, is generally made from sheet metal by spinning, whereby the shell becomes very light, strong and elastic, being capable of withstanding considerable strains without permanent deformation.

For the same purpose of securing strength and durability combined with lightness, the body of the filter's lower part is preferably also made from sheet metal by spinning. This body is made in two sections each preferably produced by spinning. One of these sections comprises an annular seat portion E, a peripheral outer flange E', an inner cylindrical wall E², a perforated plate E³ located at the top and provided with a central opening, and a downwardly tapered inner flange E⁴ at said opening. The other section of said body comprises a head F with a central opening and a peripheral flange F' which is adapted to be fitted into the opening of the chamber G surrounded by the wall E², the two sections being made so accurately that they can be put together only by the application of great pressure and will then remain connected permanently to form a strong and durable body for the lower part of the filter.

Through the head F extends a swivel nut formed of a tubular body having at its upper end a sleeve H screw-threaded to fit the lower portion A⁷ of the tube A³, said sleeve projecting upward through the head F and having its extremity upset or enlarged to prevent separation of the nut from the head. The lower end of the tubular body projects considerably below the lower end of the tube A³ (although this is not essential) and the lower portion of the tubular body is interiorly smooth and forms a nozzle H'. Diametrically opposite studs or

pins H^2 are fitted into the body of the nut to form a handle.

The nut is free to turn in the head F, and a washer J of lead or other suitable material may be applied between a horizontal surface on the nut and the lower surface of the head F. Preferably an annular rib H^3 is projected upwardly from the said horizontal surface of the nut. This rib confines that portion of the washer which lies inward of the rib, and thus prevents said portion from spreading outward and preserves the washer in such a condition as to insure a tight joint even when the nut is screwed down very hard.

The lower end of the tube A^3 might project entirely through the swivel nut if desired (when the parts are assembled as in Fig. 1), but in any event, it is preferable that in the position of use the lower end of the tube A^3 be below the screw-thread of the nut so that the filtered water issuing from the tube may not be whirled or sprayed by coming in contact with a screw-thread.

A rubber washer K, contained in the chamber between the outer flange E' , the seat portion E, and the inner flange or wall E^2 , is adapted to make a tight joint with the edge of the shell A when the two parts of the filter are forced together by turning the swivel nut. With the swivel nut and washer J constructed as shown in Fig. 1, the washer K may be dispensed with if the lower edge of the shell A and its seat E are made accurately enough to secure a proper fit.

A sheet or disk L of filtering material placed on the perforated plate E^3 , has a central opening to receive the tapered portion A^6 of the tube A^3 so that when the nut is tightened, the inner edge of said sheet will be bent as shown at L' and compressed between the inner edge of the plate E^3 and the tapered portion A^6 . The outer edge of the filtering material will also be bent at the same time, as shown at L^2 and securely clamped between the inner wall E^2 and the outer or peripheral wall of the shell A. A coiled spring M is preferably interposed between the upper wall of the shell A and the filtering material L, so as to force the latter toward the perforated plate E^3 .

The water admitted to the inlet chamber A^4 from the faucet D enters the upper chamber G' of the filter through the openings A^5 and is distributed in said chamber, the water striking the inner wall of the shell before it can impinge on the filtering material L, so as to avoid the injurious effect of strong jets projected against the filtering material locally. As explained above, the filtering material is clamped firmly both at its inner and at its outer edge, so as to insure an absolutely tight joint. The pressure forces the water through the filtering

material and the perforated plate E^3 into the lower chamber G, from which the filtered water passes out through the openings A^9 and chamber A^8 . The spring M not only holds the filtering material L against the perforated plate E^3 , but may also assist in breaking up the jets of water issuing from the openings A^5 .

In Figs. 3 and 4 I have illustrated a somewhat different construction of the swivel nut, the other parts of the filter being the same as in Figs. 1 and 2. The swivel nut of Figs. 3 and 4 comprises an upper handle section made with a sleeve H^4 (corresponding to the sleeve H) which is screw-threaded to receive the lower portion A^7 of the tube A^3 , the upper end of the sleeve being enlarged as described with reference to Fig. 1. The upper handle section also comprises arms H^5 extending in diametrically opposite directions, and the swivel nut further has a lower handle section made with a centrally apertured boss H^6 and arms H^7 . The two handle sections are connected by forcing the edge of one into the other under great pressure, or in any other suitable manner. As described above with reference to Fig. 1, the lower end of the tube A^3 is preferably below the screw-thread of the nut, in the position of use, as will be seen in Fig. 3. In this latter figure, the lower end of the tube A^3 is shown almost flush with the bottom opening of the nut; this, however, is not essential. The filtered water issuing from the tube will not be whirled or sprayed by coming in contact with a screw-thread; in fact, with the arrangement shown in Fig. 3, the water issuing from the outlet A^8 will not come in contact with the swivel nut at all.

The above described filter is very strong and durable yet of very light weight. It is readily taken apart for cleaning or for renewal of the filtering material and as quickly put together again. The filtering surface is very large relatively to the size of the filter, and thus a very efficient action is obtained. By-passing is prevented by the means for tightly clamping both edges of the filtering material. These features and the provisions made to prevent the unfiltered water from being projected against a limited area of the filtering material, insure a long life of such material, so that the filter may be used for a long time before renewal of the filtering material becomes necessary. The filtered water is discharged in an even jet free from any whirling action.

Various modifications may be made without departing from the nature of my invention as set forth in the appended claim.

I claim:

A filter comprising an upper part, a lower part comprising a section dished upwardly and perforated at the top, and another sec-

tion which is substantially flat and has an upwardly directed peripheral flange fitted tightly into the lower portion of said dished section, filtering material adapted to be
5 clamped between said parts, and means for forcing one of said parts toward the other.

In testimony whereof I have signed this

specification in the presence of two subscribing witnesses.

GEORGE M. KNEUPER.

Witnesses:

GEO. ALEXANDER,

P. C. DOYLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
