(No Model.)

J. GRAVES.

FILTER.

No. 550,680. Patented Dec. 3, 1895.

Fig. 1.

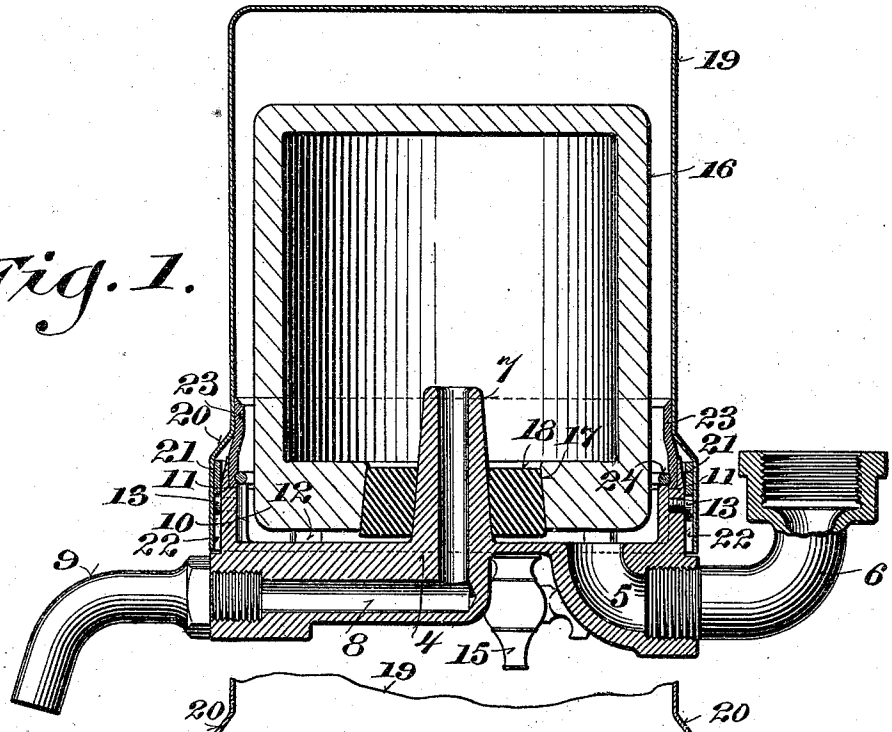


Fig. 3.

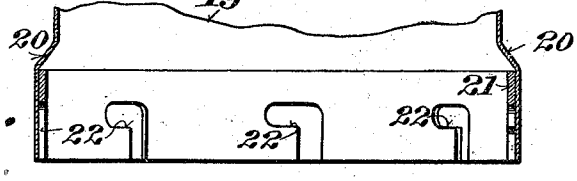
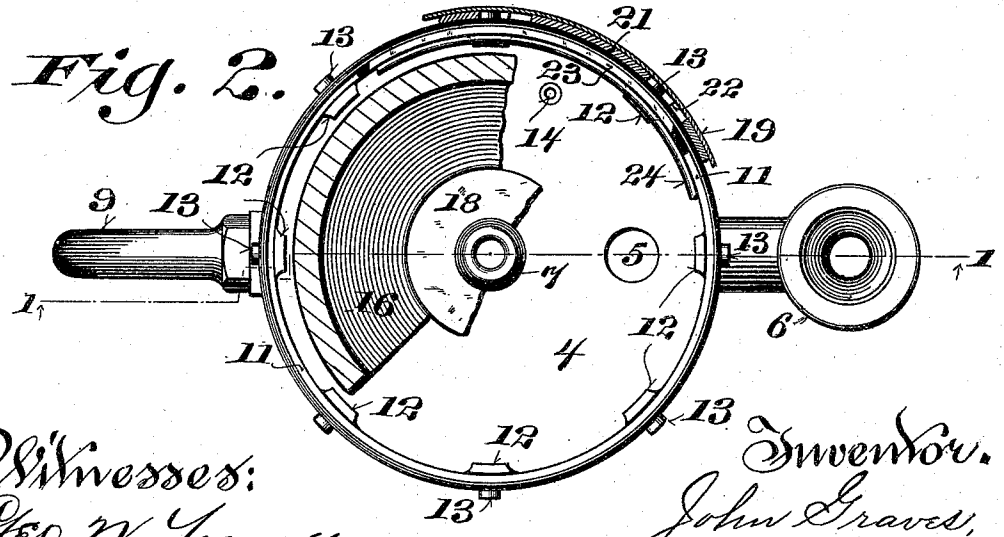


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN GRAVES, OF MILWAUKEE, WISCONSIN.

FILTER.

SPECIFICATION forming part of Letters Patent No. 550,680, dated December 3, 1895.

Application filed August 17, 1894. Serial No. 520,557. (No model.)

To all whom it may concern:

Be it known that I, JOHN GRAVES, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Filters, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in filters.

The objects had in view are the provision of means whereby a tight joint is formed against leakage of the water contained in the space between the outer cap or cover and the filtering-stone, the provision of an improved fastening mechanism between the outer cap or cover and the bottom portion of the device which is not only simple in construction, but, furthermore, possesses the maximum amount of strength to resist the strain occasioned by the severe pressure often exerted upwardly against the cap or cover, and, furthermore, the peculiar arrangement and disposition of the inlet in such manner as not to interfere with the removal of the cap, so that access may be obtained to the interior at all times.

With the above objects and others in view the invention consists of the devices and parts or their equivalents, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view on the line 1 1 of Fig. 2. Fig. 2 is a plan view with parts in section and parts broken away; and Fig. 3 is a sectional fragmentary view of the outer cap, showing clearly the slotted band secured to the inner side thereof.

Like numerals of reference denote like parts in all the figures of the drawings.

Referring to the drawings, the numeral 4 indicates the bottom of the filter, which is provided with an inlet-passage 5, the outer end of which is interiorly threaded to receive the threaded end of a pipe-coupling 6. Extending upwardly from the center of the bottom is a conically-shaped tube 7, the lower end of said tube communicating with a horizontal outlet-passage 8, the outer end thereof being threaded to receive the threaded end of an outlet-pipe 9. An annular integral rim or flange 10 extends upwardly from the bottom, said rim or flange being formed with an annular shoulder 11. Lugs or projections 12 are formed adjacent to the inner side of the rim or flange 10 and extend upwardly a slight distance above the annular shoulder, as clearly shown in Fig. 1. Projecting laterally from the outer side of the rim or flange 10 are a series of short studs or pins 13, arranged, preferably, equidistant apart. The bottom 4 is also provided with an air-vent 14, which communicates with a cock 15.

The numeral 16 indicates a hollow cylindrical filtering-stone, the bottom thereof being provided with an opening 17, in which is fitted a rubber packing 18, provided with a central conical opening, through which the central tube 7 of the bottom passes and extends up into the filtering-cylinder for a desired distance.

The outer cylindrical cap or cover is designated by the numeral 19. This cap or cover near its lower end is inclined outwardly, as indicated at 20, whereby the circle described by the lower portion of the cap which surrounds the flange or rim 10 of the bottom is greater than the circle described by the remaining portion of the cylindrical cap. Against the inner side of this lower enlarged end is suitably secured a band or ring 21, provided with angular slots 22, preferably of inverted-L-shaped form, arranged equidistant apart at positions corresponding to the studs or pins 13. As this band is secured directly against the inner surface of the cylindrical cap, it will be seen that said cap forms an outer side for the slots, thereby forming practically angular recesses.

Resting upon the top of the shoulder 11, back of the upwardly-projecting ends of the lugs 12, is an annular washer 23, preferably composed of rubber. Supported upon the tops of the lugs or projections 12 and bearing against the rubber is a metallic band 24, which serves to hold the washer firmly in place.

In adjusting the parts together the washer 23 and the ring 24 are first inserted in place in the manner just described. The cylindrical cap or cover is next passed over the filtering-stone, and as soon as the incline 20 contacts with the upper edge of the rubber 23 said rubber will be forced inwardly, finally bearing tightly against the lower end of the

reduced portion of the cap and thereby effecting a joint which diminishes to the minimum the possibility of leakage of the water contained in the space between the outer cap and the inner filtering-stone. In adjusting the cap to place care must be taken that the vertical portions of the slots 22 register with the studs or pins 13. When a proper register is secured, the studs will pass up into said slots until the horizontal portions of the slots are reached. The cap is then turned in the proper direction to permit the studs or pins to enter said horizontal portions of the slots, whereby said cap is locked firmly in place. When it is desired to remove the cap, it is obvious that all that is necessary to be done is to turn the same in a direction opposite to that first described until the studs or pins register with the vertical portions of the slots, when of course the cap may be readily lifted out of place.

By firmly securing the slotted band to the inner side of the cap in the manner pointed out it is obvious that a most secure lock for the cap is attained. Heretofore in devices of this character considerable trouble has been experienced owing to the breaking of the locking means when the cover is subjected to a severe upward pressure, as is frequently the case in this class of devices. Actual tests have proven, however, that in my device the peculiar form of locking mechanism will withstand all strain thereon occasioned by the upward pressure exerted on the cap.

In operation the water passes through the inlet-passage 5 into the space between the outer cap 19 and the filtering-stone 16. It then percolates slowly through the filtering-stone, which is of any suitable foraminous substance best adapted for the purpose. After it reaches a certain height in the chamber of the filtering-stone it passes through the tube 7 into the outlet-passage 8 for discharge.

Besides the advantages already mentioned as possessed by my device, attention is also directed to the fact that the inlet is arranged in the bottom of the filter in such manner as not to interfere in the least with the free removal and replacing of the cap or cover. In several devices now in use the inlet is at the top of the cap or cover, so that it is impossible to gain access to the interior without uncoupling the inlet-pipe.

The fact that the inlet 5 leads to the space between the outlet cap or cover and the filtering-stone instead of directly into the filtering-stone possesses advantages, inasmuch as in such case all sediment and dirt will settle in said space, and as access thereto (especially when the cap or cover is removable) is much more readily gained than to the interior of a filtering-stone the dirt and sediment can be removed with the slightest amount of trouble. Furthermore, should the inlet lead directly into the filtering device it would be absolutely necessary to have the filtering device of a very thick and strong substance capable of withstanding severe pressure. In my arrangement, however, the filtering device need not necessarily be of such heavy material, as it is obvious that the pressure thereon is much less severe.

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

1. In a filter, the combination, of a bottom piece formed or provided with an upwardly-extending annular flange, said flange provided at distances apart with outwardly-extending studs or pins, inlet and outlet pipes, a filtering device, and a cap or cover having its lower end formed of two thicknesses of metal, the inner layer or thickness of metal having recesses formed therein to receive the studs or pins, and thereby lock the cap or cover in place, substantially as set forth.

2. In a filter, the combination, of a bottom piece formed or provided with an upwardly-extending annular flange, said flange provided at distances apart with outwardly-extending studs or pins, inlet and outlet pipes, a cap or cover having its lower end fitting around the annular flange, and a band secured to and against the inner side of the lower end of the cap or cover, said band provided with inverted L-shaped slots to receive the studs or pins, substantially as set forth.

3. In a filter, the combination, of a bottom piece provided with an upwardly-extending rim or flange, a washer resting upon said rim or flange, a filter supported by the bottom piece, and a cap or cover fitted over the filter, said cap or cover having a lower contracted portion adapted to bear against the upper edge of the washer, as said cap or cover is inserted in place, to form a water-tight joint, substantially as set forth.

4. In a filter, the combination, of a bottom piece provided with an upwardly extending rim or flange formed with a shoulder, and with inner upwardly extending lugs or projections, the upper ends thereof extending above the shoulder, a washer seated on said shoulder back of the upwardly extending ends of the lugs or projections, a band resting on the upper ends of the lugs or projections and bearing against the washer, and a cap or cover having a contracted portion adapted to bear against the upper edge of the washer as said cap or cover is inserted in place, whereby a water-tight joint is formed, substantially as set forth.

5. In a filter, having a suitable inlet and outlet, the combination, of a bottom piece provided with an upwardly extending rim or flange, said rim or flange having studs or pins projecting outwardly therefrom, a filtering device supported on the bottom piece, a washer resting on the flange or rim, a cap or cover having a contracted portion adapted to bear against the upper edge of the washer, as said cap or cover is inserted in place, whereby

a water-tight joint is formed, and a band secured to the inner side of the cap or cover, and lying adjacent to the rim or flange, when the cap or cover is inserted in place, said band provided with angular slots adapted to receive the pins of the rim or flange, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN GRAVES.

Witnesses:
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