No. 692,377. Patented Feb. 4, 1902.

I. N. SPEER.

FILTER.

(Application filed May 15, 1901.)

(No Model.)

FIG. I.

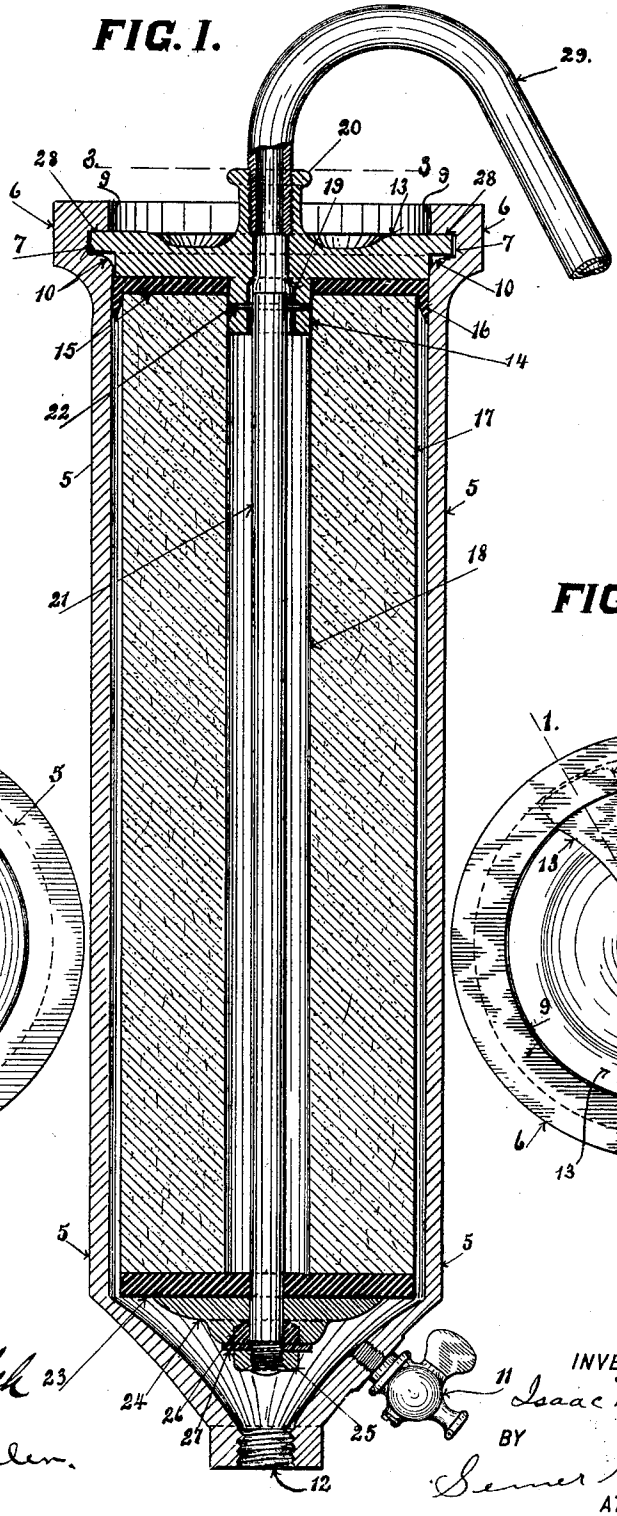


FIG. II.

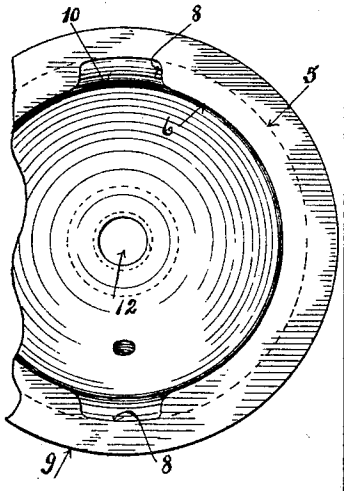
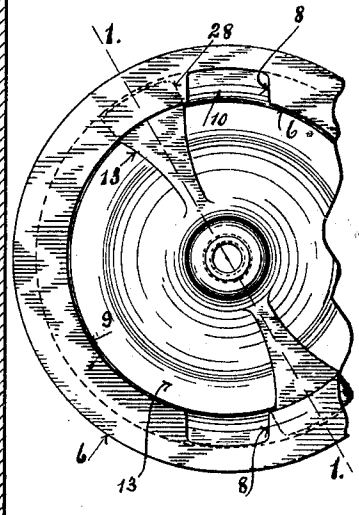


FIG. III.



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ISAAC N. SPEER, OF ST. LOUIS, MISSOURI.

FILTER.

SPECIFICATION forming part of Letters Patent No. 692,377, dated February 4, 1902.

Application filed May 15, 1901. Serial No. 60,306. (No model.)

To all whom it may concern:

Be it known that I, ISAAC N. SPEER, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Filter, of which the following is a specification.

My invention relates to that class of filters which are adapted to be attached directly to a water-supply pipe and receive the water under pressure and to that class of filters in which the filtering-body is adapted to be readily removed from the case, cleaned, and replaced in the case; and my invention consists of the novel features herein shown, described, and claimed.

Figure 1 is a vertical central section of a filter constructed in accordance with the principles of my invention and taken on the line 1 1 of Fig. 3. Fig. 2 is a top plan of the filter with the discharge-pipe removed. Fig. 3 is a view analogous to Fig. 2 with the filtering-body removed.

Referring to the drawings in detail, the case 5 is a hollow cylinder, wide open at its upper end and normally closed at its lower end, the only openings in the lower end being the drain-cock and the supply-pipe connection, and these openings may be in the side or at any point to communicate with the muddy-water chamber, and both the drain-cock and the supply-pipe are normally closed. An enlargement 6 is formed at the upper end of the case 5, and an internal annular groove 7 is formed in this enlargement. The two entrances 8 lead from the upper end of the case to the groove 7 and at opposite sides of the center of the case. That portion of the bore 9 of the case which is above the groove 7 is enlarged slightly, and shoulder 10, which is below the groove, is rounded, thus making an enlarged and tapered entrance to the case. A drain-cock 11 leads from the lower end of the case, and a supply-pipe may be screwed into the opening 12 at the lower end of the case.

The cap-plate 13 is adapted to pass into the entrance of the case and fit closely at a point below the shoulder. A hub or boss 14 extends downwardly from the center of the cap-plate, a rubber gasket 15 is placed in position against the lower face of the cap-plate with the hub extending through the gasket, and a flange 16 extends downwardly and outwardly from the periphery of the gasket. The filtering body or stone 17, of tripoli or other suitable material, is cylindrical, fits loosely within the case, and has a central bore 18, extending from end to end. The stone 17 is placed in position against the lower face of the gasket with the hub extending into the bore 18. An opening 19 is formed through the center of the cap-plate and hub and the nipple 20, which extends upwardly from the cap-plate. The tie-rod 21 is inserted loosely into the opening 19 and secured in position by the pin 22, inserted through the hub and loosely through the tie-rod, as required to form a universal joint. It sometimes happens that the ends of the filtering-body are not at right angles to the peripheral surface, and then this swinging motion of the tie-rod is important, because the rod will adjust itself to the angle of the end of the stone. The tie-rod extends downwardly through the bore of the stone to a point below the lower end of the stone, a rubber washer 23 is placed on the tie-rod against the lower end of the stone, a metal washer 24 is placed against the rubber washer, and a nut 25 holds the metal washer in position to close the lower end of the bore of the stone. The opening through the metal washer is enlarged at the lower side, and a rubber washer 26 is placed in this enlargement and is held in place by the plate 27. The clamping-lugs 28 extend upwardly and outwardly from the cap-plate to engage in the groove to suspend the filtering-body in the case, and the lugs pass into and out of the groove through the entrances. The discharge-pipe 29 is attached to the nipple 20.

The inner face of the rubber flange 16 is beveled, so that there is a wide wedge-shaped space between the flange and the outer surface of the stone, while the outer surface of the flange is adapted to fit tightly against the inner surface of the case, as required to form a water-tight joint between the upper end of the stone and the case. As before suggested, the stone is suspended in the case. When the faucet or the stop-cock of the supply-pipe is open, water will pass into the case through the opening 12 and pass upwardly around the stone to the flange 16 and into the space be-

tween the flange and the stone, and the pressure of the water will press the flange outwardly against the inner face of the case. The continued pressure of the water will cause it to filter through the stone to the bore 18 and pass upwardly and outwardly through the supply-pipe 29. The mud will gather on the outer surface of the stone, and when it is desired to clean the stone the supply-pipe 29 is grasped as a handle and the stone is rotated until the lugs 28 will pass upwardly through the entrances 8. Then the stone is raised bodily out of the case, after which it may be scrubbed and cleaned. When out of the case, the flanges 16 may spread slightly, thus making it advisable to slightly enlarge the entrance to the case and provide the rounded shoulder 10. When the stone is returned to the case, the edge of the flange 16 will pass into the enlarged upper end of the bore 9 and against the shoulder 10, and by the inclined surface of said shoulder the edge of the flange will be contracted or deflected inwardly and then pass downwardly tightly into the case. The lugs 28 will pass into the entrances 8 and then into the groove 27. It is not necessary that the supply-pipe be attached to the lower end of the case. It may be attached at any point below the gasket.

The drain-cock serves as a vent to let the air out of the cylinder when the filtering-body is inserted and also as a means of letting the muddy water out of the cylinder, and since the water comes to the cylinder under pressure the drain-cock may be attached to the side of the cylinder or at any point to communicate with the muddy-water chamber.

I claim—

1. In a filter, a cylindrical case open at one end, there being an internal annular groove at the open end of said case and entrances to said groove, a cap-plate adapted to close the end of said case, a gasket against the lower face of the cap-plate, a flange extending from said gasket, a filtering-body against said gasket and within said flange, and lugs extending from said cap-plate to engage in said groove and pass in and out through the said entrances, substantially as specified.

2. In a filter, a cylindrical case open at one end, there being an internal annular groove at the open end and entrances to said groove the main entrance to the case being enlarged outside the groove, and there being an inclined surface or shoulder below the groove, a cap-plate adapted to close the end of said case, a gasket against the lower face of the cap-plate, a flange extending from said gasket, a filtering-body against said gasket and within said flange and lugs extending from said cap-plate to engage in said groove and pass in and out through the said entrances, substantially as specified.

3. In a filter, a cylindrical case open at one end, there being an internal annular groove at the open end and entrances to said groove, the main entrance to the case being enlarged outside of the groove, and there being an inclined surface or shoulder below the groove, and a filtering-body adapted to have lugs engage in said groove and a compressible gasket to pass beyond the inclined shoulder, substantially as specified.

4. In a filter, a cylindrical case open at one end, there being an internal annular groove at the open end of said case and entrances to said groove, a cap-plate adapted to close the end of said case, a gasket against the lower face of the cap-plate, a flange extending from said gasket, a filtering-body against said gasket and within said flange, and lugs extending from said cap-plate to engage in said groove and pass in and out through the said entrances, a supply-pipe communicating with the muddy-water chamber and a drain-cock leading from the muddy-water chamber.

5. In a filter, a cylindrical case open at one end, there being an internal annular groove at the open end of said case and entrances to said groove, a cap-plate adapted to close the end of said case, a gasket against the lower face of the cap-plate, a flange extending from said gasket, a filtering-body against said gasket and within said flange, and lugs extending from said cap-plate to engage in said groove and pass in and out through the said entrances, a supply-pipe communicating with the muddy-water chamber and a drain-cock leading from the muddy-water chamber, said filtering-body being hollow and there being a discharge-opening from the filtering-body through the cap-plate.

6. In a filter, a case open at one end, a cap-plate, a filtering-body having a central bore, a rod loosely hinged to said cap-plate and extending through said bore, means at the lower end of said rod for closing said bore, a compressible gasket at the upper end of said filtering-body, and means of suspending the filtering-body in the case, substantially as specified.

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Witnesses:
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