

No. 640,579.

Patented Jan. 2, 1900.

J. J. MAYER.

FILTER.

(Application filed June 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.

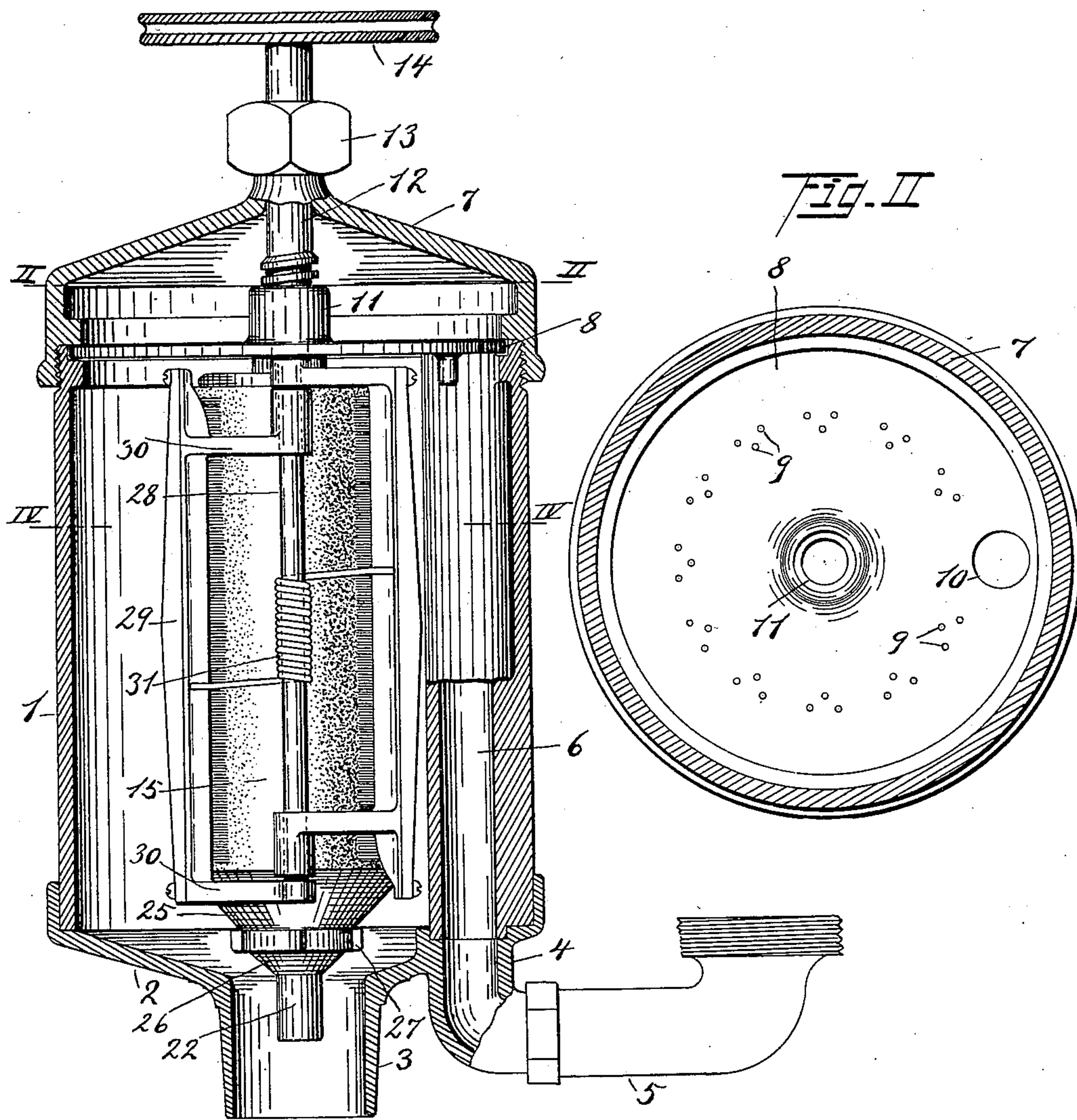


Fig. I

Witnesses:

*H. Biswold,*  
*R. F. Winding.*

Inventor.

*J. J. Mayer,*  
*by J. J. Fechner*  
Attorney.

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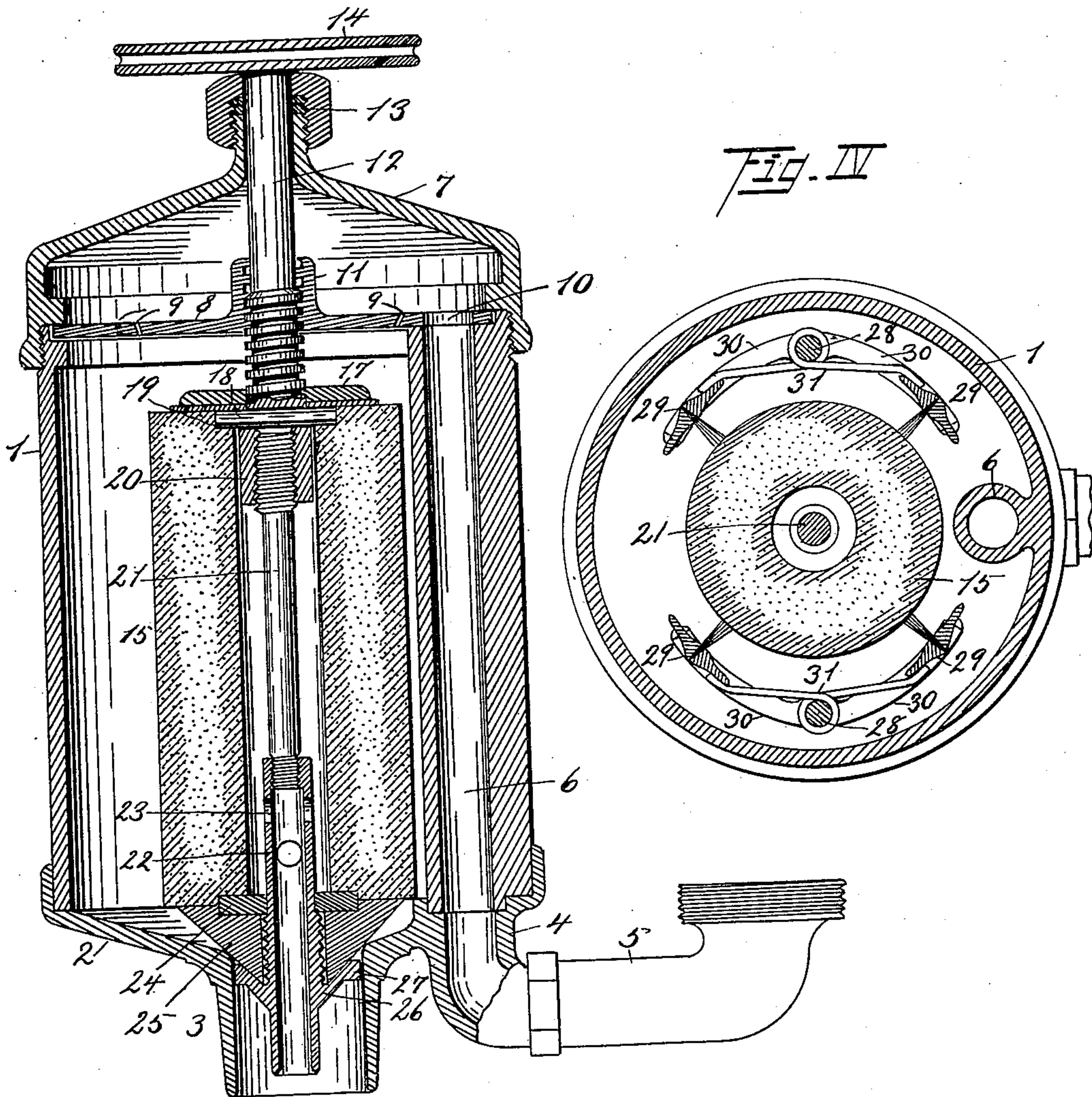


Fig. III

Witnesses:

*H. Griewold.*  
*K. J. Winding.*

Inventor.  
*J. J. Mayer.*  
by *G. J. Fecher*  
Attorney.



# UNITED STATES PATENT OFFICE.

JACOB J. MAYER, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE PLUMBERS BRASS AND IRON MANUFACTURING COMPANY, OF SAME PLACE.

## FILTER.

SPECIFICATION forming part of Letters Patent No. 640,579, dated January 2, 1900.

Application filed June 15, 1899. Serial No. 720,615. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB J. MAYER, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Filters, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents the outer casing of my improved filter in vertical section and the filtering body and brushes and the partition and stem in side view; Fig. II, a horizontal section of the filter on the line II II in Fig. I; Fig. III, an axial section of the filter; and Fig. IV, a horizontal section on the line IV IV in Fig. I.

The filter has a cylindrical casing 1, formed with a bottom 2, having a central outlet-nozzle 3 and an inlet-nipple 4 near its periphery, which inlet may be provided with suitable tubular coupling connection 5, by means of which the filter may be connected to a bib-cock or other supply-point for the water or other liquid to be filtered. A tube 6 passes upward along the inside of the casing to the top of the same from the water-inlet, carrying the water to the top of the casing. A cap 7 is secured over the open top of the casing to form a distributing-chamber, the bottom of which is formed by a partition-plate 8, clamped between the upper end of the casing and the cap. Said plate has a number of holes 9 formed through it, which holes are inclined toward the axis of the casing, so that the water may issue from the distributing-chamber in jets converging toward the axis of the filter and the filtering body therein. The partition-plate has an opening 10, through which the water passes from the vertical inlet-passage into the chamber. An internally-threaded hub 11 is formed through the center of the partition-plate, and a spindle 12 has a

corresponding thread fitting in said hub. Said spindle is journaled in a gland or packing-box 13 in the center of the cap and has a hand-wheel 14 or other handle for turning it. A tubular filtering body 15, of stone, carbon, composition, or other suitable porous filtering material, is secured to said spindle. The upper end of the tubular filtering body has a packed collar 17 bearing against it, which collar is screwed upon the spindle, and a pin 18, transversely inserted through the spindle and fitting into corresponding notches 19 in the body, holds the latter to turn with the spindle. The lower end of the spindle has a socket 20, into which the upper end of a rod 21 is screwed, the lower end of which rod is screwed into a socket formed in the upper end of a tube 22, projecting into the lower end of the axial bore of the filtering body and formed with openings 23, by means of which it communicates with the interior of the body. A collar 24 bears against the lower end of the body and is secured upon the tube, and a tapering valve 25, preferably of yielding material, such as rubber, is secured upon the tube to bear against the collar and has its lower end retained by a collar 26 upon the tube provided with guide-wings 27, which move within the outlet-nozzle. The valve has its seat against the bottom of the filter-casing at the upper end of the nozzle, thus controlling the annular outlet through the latter around the tube. Rods 28 are secured with their upper ends in the partition-plate, and pairs of brushes 29 have arms 30 hinged upon said rods, so as to swing toward and from the circumference of the filtering body upon said rods. Springs 31 are coiled upon the rods and have their ends bearing against the backs of the brushes, so as to force each pair of brushes together against the surface of the filtering body.

In practice after the filter is properly connected to the water-faucet or other supply the water may be admitted to or cut off from the filter by such faucet or cock. When filtered water is to be drawn, the filtering body and its valve are screwed down by the hand-wheel, and the water passing up through the vertical passage into the distributing-chamber will issue from the same through the ob-



lique holes in the partition in jets directed toward all points of the circumference of the filtering body. The water will pass through the filtering body and out through the filtered-water tube extending from the interior of the body. The converging jets of water will cause downward currents of water in the space around the filtering body, which on striking the bottom of the casing will return upward, so that the water is in constant agitation and will loosen lodged impurities from the surface of the body while being forced through the same. I have found by actual test that this agitation of the water within the filter causes a quicker flow through the filtering body than if the water is admitted to it in a solid quiet mass. When unfiltered water is desired, the hand-wheel is turned to raise the filtering body and the valve, when the water will freely flow out through the discharge-nozzle, the jets of water performing their function of agitation and cleansing. Each time the filtering body is raised or lowered to open or close the unfiltered-water outlet, the body is rotated against the brushes and also longitudinally moved, so that the impurities which have lodged upon the surface of the filtering body will be brushed off and may be flushed away when the outlet-valve is opened. The filter will thus be self-cleaning, as the body will be brushed and flushed whenever change is made from filtered to unfiltered water, or vice versa. The combined rotary and longitudinal movement of the filtering body against the brushes will perform a thorough and even cleaning throughout the entire length and circumference of the body, and such cleaning need not be specially attended to, but will be automatically performed whenever a change is made between filtered and unfiltered water.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth, respectively, in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a filter, the combination of a filtering-chamber, a hollow filtering body within the same and having a filtered-water outlet from its interior, and a series of oblique inlet water-jet openings at the end of the chamber and presenting oblique jets of water against all sides of the filtering body and toward the opposite end of the filtering-chamber, whereby constant forward-and-back agitation of the water within said chamber is attained, substantially as set forth.

2. In a filter, the combination of a filtering-chamber formed with an inlet and an outlet, a valve controlling said outlet, a filtering body in said chamber and connected to move said valve to open and close the same and provided with a filtered-liquid outlet, a brush bearing against the filtering-surface of said

body, and means for moving said filtering body in its relation to the brush, substantially as set forth.

3. In a filter, the combination of a filtering-chamber, a filtering body and a brush in said chamber, said brush bearing against the surface of the body and one of said elements being movable in its relation to the other to produce brushing action, and a valve for the chamber and connected to the movable one of said latter elements to be moved together with the same to open or close, substantially as set forth.

4. In a filter, the combination of a cylindrical filtering body, a brush bearing against the surface of the same, means for simultaneously imparting rotary and longitudinal movement to one of said elements in its relation to the other, and a controlling-valve in said filter connected to one of said elements to be moved into open and closed position by the same, substantially as set forth.

5. In a filter, the combination of a filtering-chamber, a tubular filtering body in the same having a filtered-water outlet, a distributing-chamber having a water-inlet, and a partition separating said latter chamber from the filtering-chamber and formed with oblique jet-openings directing the water in oblique jets against the surface of the filtering body, substantially as set forth.

6. In a filter, the combination of a filtering-chamber having an unfiltered-water outlet, a tubular filtering body in the same having a filtered-water outlet, a distributing-chamber having a water-inlet, a partition separating said latter chamber from the filtering-chamber and formed with oblique jet-openings directing the water in oblique jets against the surface of the filtering body, and a valve controlling the unfiltered-water outlet, substantially as set forth.

7. In a filter, the combination of a filtering-chamber having an unfiltered-water outlet, a distributing-chamber having a water-inlet, a partition separating said chambers and formed with oblique jet-openings converging toward the axis of the filtering-chamber, a tubular filtering body axial within the filtering-chamber and provided with a filtered-water outlet from its interior through the unfiltered-water outlet, and a valve around the filtered-water outlet adapted to close the unfiltered-water outlet, substantially as set forth.

8. In a filter, the combination of a cylindrical filtering body, two brushes longitudinally arranged to bear against the circumference of the body and having a spring bearing against them to draw them toward each other and toward the filtering body, and means for rotating one of said elements in its relation to the other, substantially as set forth.

9. In a filter, the combination of a cylindrical filtering body, two brushes longitudinally arranged to said body and having a spring drawing them toward each other and against the body, and means for rotating one



of said elements in its relation to the other, substantially as set forth.

5 10. In a filter, the combination of a cylindrical filtering body, two brush-frames hinged together with their edges longitudinal to said body and having brushes at their free edges facing the body and a spring forcing said brushes toward each other and against the body, and means for rotating one of said elements in its relation to the other, substantially as set forth.

15 11. In a filter, the combination of a cylindrical filtering body, a pintle parallel with the axis of said body, two brush-frames hinged to said pintle and provided with brushes at their free edges facing the filtering body, a spring coiled around the pintle and having its ends bearing against the backs of the brushes, and means for rotating the filtering body or  
20 the brush device, one in its relation to the other, substantially as set forth.

12. In a filter, the combination of a filtering-chamber formed with an unfiltered-water

outlet in its bottom, a distributing-chamber above the filtering-chamber and having a water-inlet, a partition between said chambers and formed with a central threaded bearing and with jet-openings inclined toward the axis of the filtering-chamber, a tubular filtering body having a threaded stem in the bearing of the partition and an outlet-tube from its interior extending through the unfiltered-water outlet and a valve surrounding said tube and having a seat over said outlet, and brushes arranged to have longitudinal bearing against the filtering body and having springs forcing them against the same, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 13th day of June, A. D. 1899.

JACOB J. MAYER.

Witnesses:

WM. SECHER,  
K. F. WINDING.