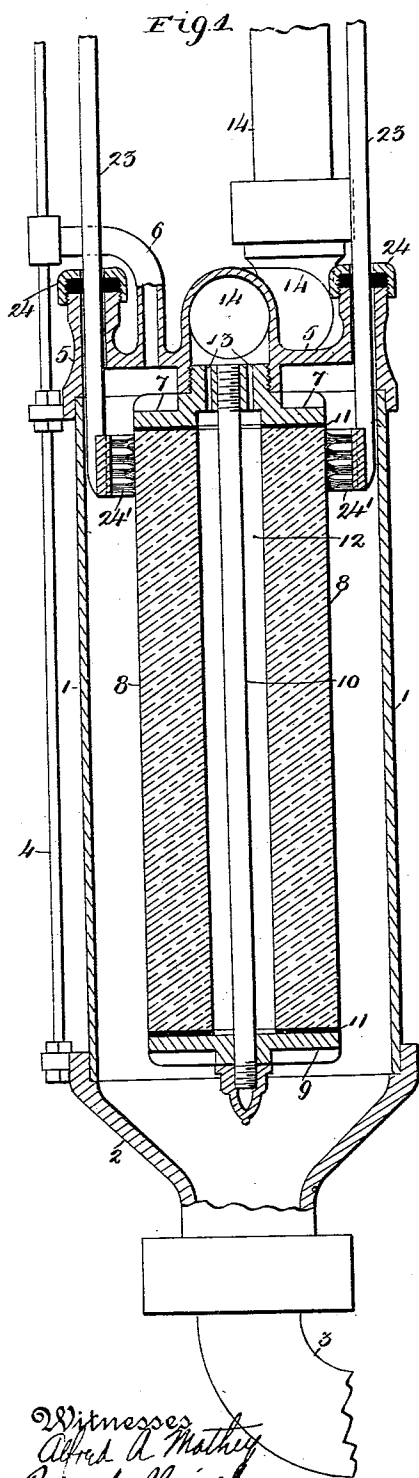


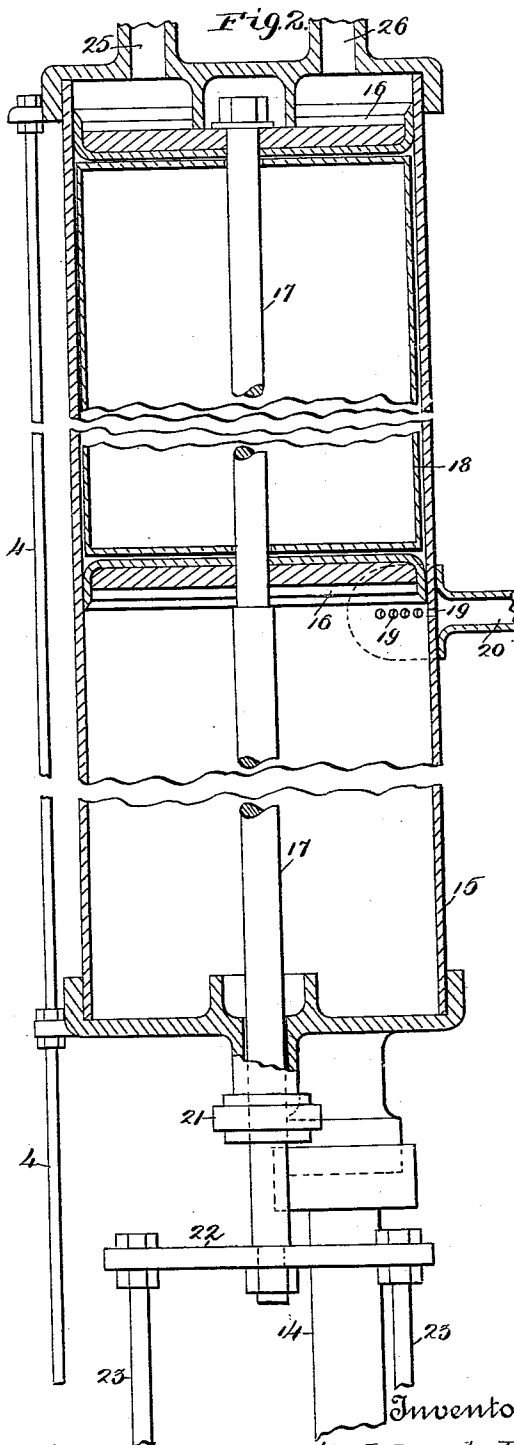
R. W. JACOB, Jr.
FILTERING APPARATUS.

No. 555,098.

Patented Feb. 25, 1896.



Witnesses
Alfred A. Mather
Robt. H. Hise



Inventor
Robt. W. Jacob Jr.
By his Attorneys,
Keller & Starck

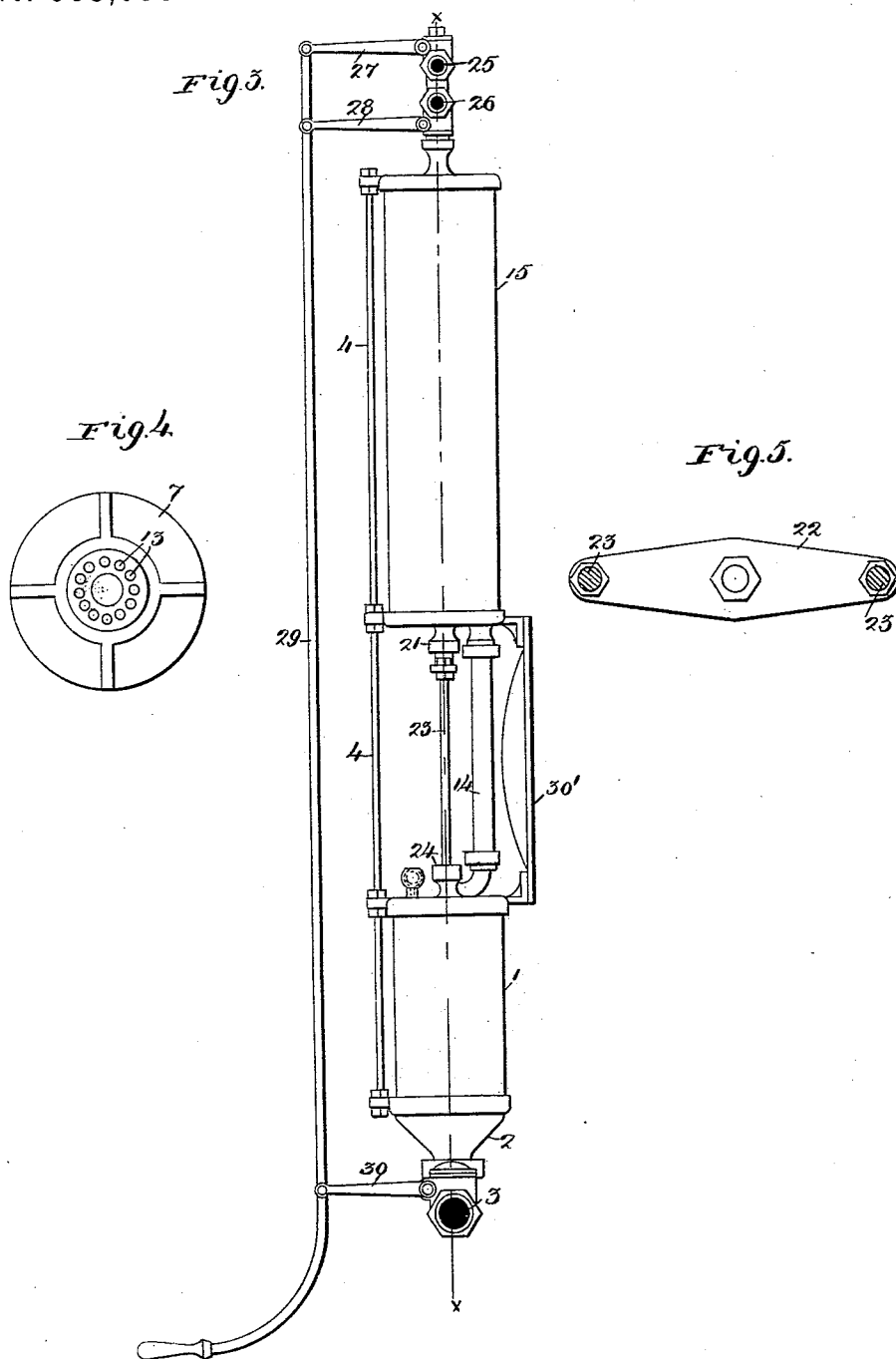
(No Model.)

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UNITED STATES PATENT OFFICE.

ROBERT W. JACOB, JR., OF ST. LOUIS, MISSOURI.

FILTERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 555,093, dated February 25, 1896.

Application filed April 8, 1895. Serial No. 544,850. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. JACOB, JR., a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Filtering Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in filtering apparatus; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a middle vertical section of the lower portion of the apparatus, taken on the line *xx* of Fig. 3. Fig. 2 is a section, taken on the same line, of the upper portion of the apparatus. Fig. 3 is a side elevation of the complete apparatus. Fig. 4 is a plan view of the top cap-plate of the filtering-cylinder, and Fig. 5 is a top plan view of the cross-bar to which the cleaning-brushes are attached by means of depending rods.

The object of my invention is to construct a filter apparatus in which the filtering-diaphragm, be the same of carbon, tripoli, tiling, or any other suitable material, may be cleansed by suitable brushes controlled by mechanism operated directly by pressure from the hydraulic head or main water supply. It consists in details which may be described as follows:

Referring to the drawings, 1 represents the main filter-chamber having a discharge-basin 2 at the bottom thereof, from which leads a discharge-pipe 3. The casting constituting the basin 2 is secured to the chamber by means of suitable tie-rods 4, the said rods serving, too, to secure the top plate or cover 5 to the said chamber. From the top plate or cover leads a pipe 6 of reduced diameter connecting directly with the main water supply. From the inner surface of the cover 5 depends an interiorly-screw-threaded rim, to which is secured a perforated metallic cap-diaphragm 7, forming one end of a filtering cylindrical plate 8 confined within the filter-chamber, the opposite end of the diaphragm being closed by the terminal-plate 9. The parts are firmly united by the tie-rod 10 which

passes through the inside of the cylindrical diaphragm, suitable packing 11 being interposed between the parts to make a watertight joint.

As the water enters the filter-chamber at increased velocity through the pipe 6 it percolates through the walls of the filtering-diaphragm, passing into the interior chamber 12 thereof, thence passing through the openings or passages 13 of the top cap-plate 7 into a conducting-pipe 14, leading from the top plate 5 of the filter-chamber. Thence it enters the superposed drum 15, which is mounted above the filter-chamber. Within the drum 15 is adapted to reciprocate a double piston 16 connected by a piston-rod 17 and separated by a guiding floating cylinder 18. As the water enters the drum 15 by the pipe 14 it forces the piston 16 and the piston-rod 17 to its highest position, or that indicated in Fig. 2, permitting the filtered water to escape through the series of openings 19 leading to the delivery-pipe 20. The lower end of the piston-rod passes through a stuffing-box 21, below which the outer end of the piston-rod is secured to a cross-bar 22, from whose free ends depend the bars 23, which pass through suitable stuffing-boxes 24 in the top plate 5 and whose inner ends carry a band provided with annularly-disposed brushes 24', which are adapted to embrace the filtering-diaphragm 8, as best seen in Fig. 1. With the position of the piston as indicated in Fig. 2 the brushes, which are connected to said piston as explained, will occupy the position as shown in Fig. 1—that is, they will be at the upper end of the filtering-diaphragm 8. If the piston 16 be now forced in a reverse direction, it is obvious that the brushes 24' will sweep along the outer surface of the filtering-diaphragm and thus clear such surface of any accumulations of dirt, vegetable matter and the like that might accumulate about and adhere to such surface during the filtering operation, and thus said brushes will keep the surface of said diaphragm clean for the free and easy passage of water through said diaphragm. In this manner the filtering process would remain practically uninterrupted. The depression or downstroke of the piston 16, and consequent depression of the brushes is accomplished as follows:

With the upper end of the drum 15 communicates a main supply-pipe 25 and a waste-pipe 26. Each is provided with an ordinary gate-valve (not shown) controlled respectively by levers 27 and 28, whose free ends are pivotally secured to and operated by a handle 29, to the lower end of which is pivotally secured the lever 30 controlling a similar valve (not shown) mounted in the waste-pipe 3.

10 With the parts in the position as indicated in Fig. 3 and which also corresponds to the position of the inner parts as shown in Figs. 1 and 2, the valves controlled by the levers 27 and 30 are closed, and the valve controlled by

15 the lever 28 and which operates the upper waste-pipe 26 is opened—that is to say, pipes 25 and 3 are closed and pipe 26 is open—the piston 16 being in its highest position and admitting the escape of the filtered water

20 through the delivery-pipe 20. If the handle 29 now be depressed so as to open pipes 25 and 3 and close the discharge-pipe 26, the main water supply will force the piston 16 downward, closing the openings leading to the

25 discharge-pipe 20, and forcing the brushes downward along the outer surface of the cylindrical filtering-diaphragm, cleansing the surface of the latter and permitting the dirty water to escape through the waste-pipe 3.

30 This operation can be repeated indefinitely, thus insuring a constant passage of water through the cleansed filtering-diaphragm and a constant supply of filtered water, the device being readily operated by a simple manipulation of the handle 29. The drum 15

35 and the filter-chamber 1 are connected and reinforced by a plate 30', which can be secured to the wall or any convenient place.

By my present device the brushes are operated by the main water supply or head, the device being always in position to be cleansed upon the proper manipulation of the operating-handle. It is of course understood that

40 I do not limit myself to the character of the materials used for the filter-plate, nor to the precise form of said plate, nor to the precise location of the brushes with reference to said plate.

Having described my invention, what I

50 claim is—

1. In a filtering apparatus, a main filter-chamber, a filtering-diaphragm within the same, a suitable brush or cleaning device co-operating with the filtering-diaphragm,

55 a main supply-pipe leading to the filter-chamber, intermediate connections between the brush and main supply-pipe for driving the brush in one direction along the filtering-dia-

phragm by pressure from the main supply, a second supply-pipe and suitable connections 60 between it and the brush for reciprocating the brush in the opposite direction along the surface of the filtering-diaphragm, substantially as set forth.

2. In a filtering apparatus, a main filter-chamber, a supply and waste pipe for the same, a filtering-diaphragm mounted within the chamber, a suitable supply-drum, a conducting-pipe leading from the filtering-diaphragm to the supply-drum, a delivery-pipe 70 and a waste-pipe leading from said drum, a piston in said drum adapted to be moved in one direction by the flow of water from the filter-chamber to the drum, and suitable brushes controlled by said piston and adapted 75 to brush the walls of the filtering-diaphragm, substantially as set forth.

3. In a filtering apparatus, a suitable drum, a main water-supply pipe and waste-pipe leading therefrom, a reciprocating piston 80 within said drum adapted to be forced in one direction by the main water-supply, a piston-rod connected to said piston, a suitable filtering-chamber, a filtering-diaphragm mounted within the same, a communicating pipe be- 85 tween the drum and filter-chamber, a series of brushes carried by the piston-rod and adapted to sweep along the surface of the filtering-diaphragm upon the movement of the piston, and a discharge-pipe for the filtering- 90 chamber, substantially as set forth.

4. In a filtering apparatus, a suitable filtering-chamber having a supply-pipe and a waste-pipe, a drum communicating with said chamber, a supply-pipe and waste-pipe lead- 95 ing from said drum, a piston adapted to reciprocate within the drum, a piston-rod secured to the piston and having suitable connections operating in the filter-chamber, a series of brushes controlled by said piston-rod, lever-controlled valves in the supply and waste pipes of the drum and in the waste-pipe of the filter-chamber, an operating-handle connected to the levers of said valves whereby the supply-valve for the drum and 105 waste-valve for the filter-chamber may be closed and the waste-valve for the drum simultaneously opened, or vice versa and the piston and parts carried thereby alternately reciprocated, substantially as set forth. 110

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

ROBERT W. JACOB, JR.

Witnesses:

ALFRED A. MATHEY,
ROB A. HEISEL.