(No Model.) 2 Sheets—Sheet 1.

H. C. STIFEL.

WATER FILTER.

No. 582,403. Patented May 11, 1897.

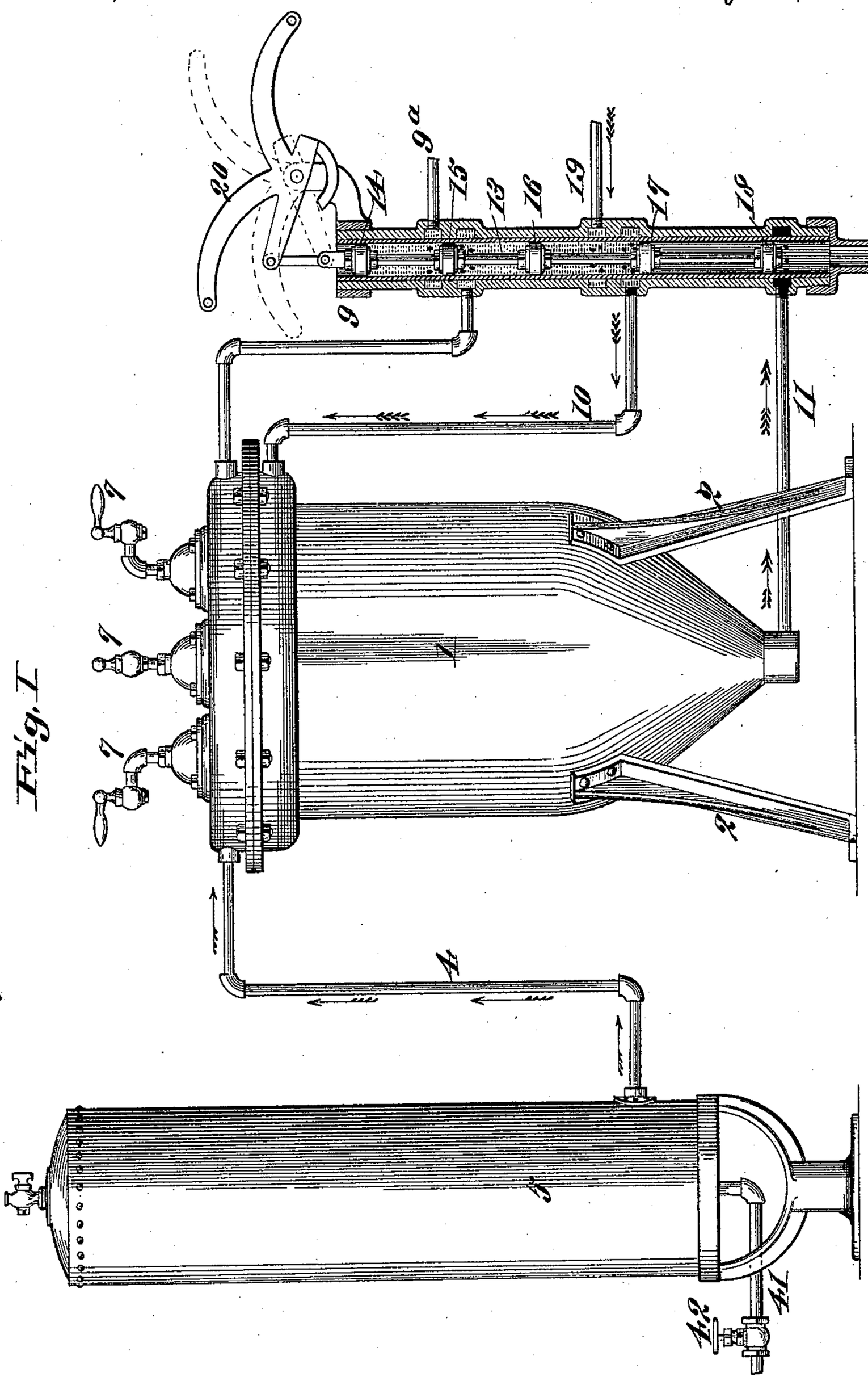

Fig. 1.

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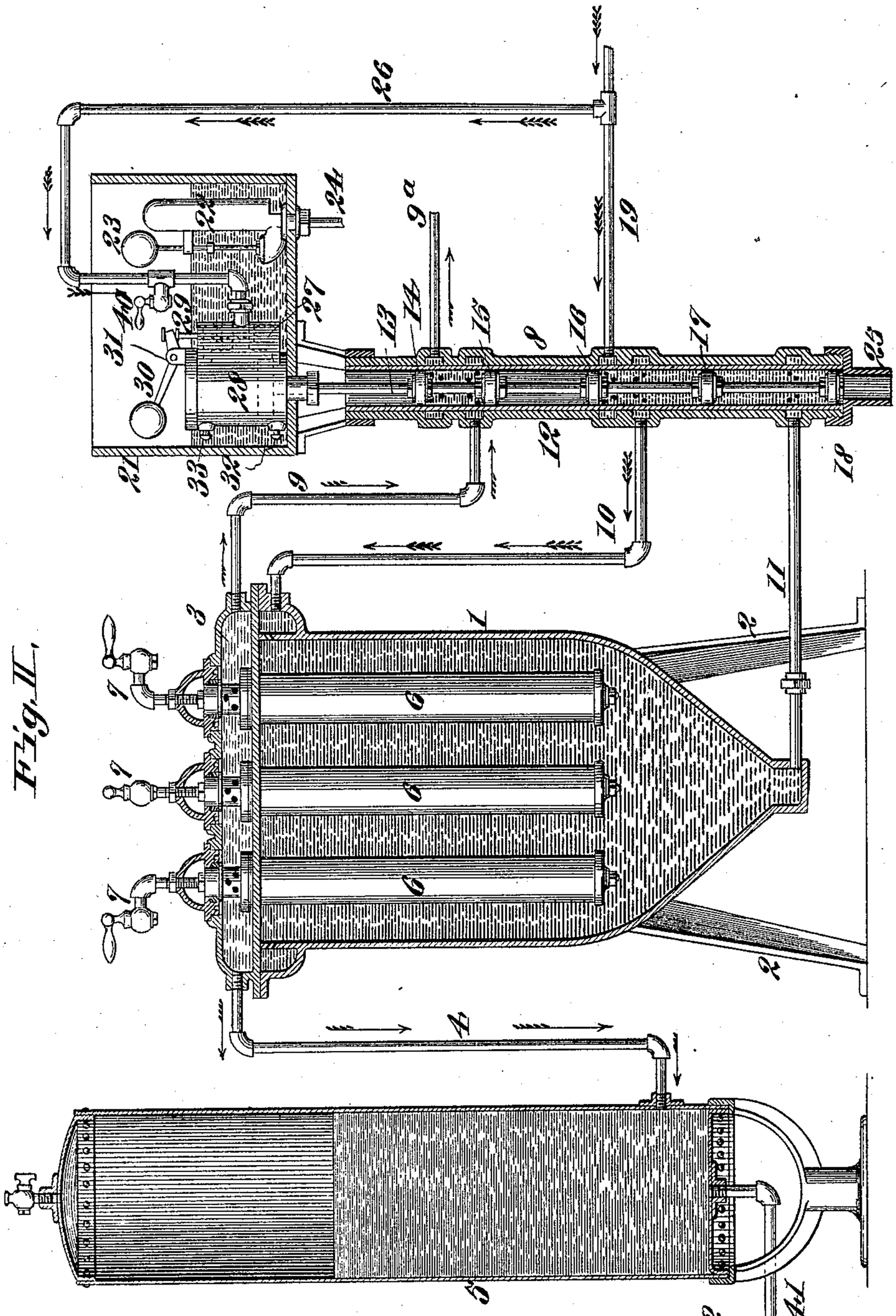

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HERMAN C. STIFEL, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN TRIPOLI COMPANY, OF CARTHAGE, MISSOURI.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 582,403, dated May 11, 1897.

Application filed July 16, 1894. Serial No. 517,640. (No model.)

To all whom it may concern:

Be it known that I, HERMAN C. STIFEL, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Water-Filters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to an improvement in water-filters wherein there are employed a filtering-tank, a storage-tank, a valve device, means for operating the valve device, and connecting-pipes whereby the filter may be cleansed as often as may be desired by water passing from the storage-tank back through the filtering-stone and at the same time passing from the supply-pipe through the filter to the waste-pipe; and this invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a side elevation of my improved filter, the valve device being shown in section and being shown in connection with a lever by which it is operated by hand. Fig. II is a vertical section, the valve device being shown supplied with a mechanism by which the valve device is automatically operated.

Referring to the drawings, 1 represents a filtering-tank which may be supported on suitable legs 2. At the top of the tank is a clear-water chamber 3, from which extends a discharge-pipe 4, leading to a tank 5. Within the tank 1 is one or more filtering-stones 6, through which the water passes and is discharged into the clear-water chamber 3.

7 represents petcocks arranged over the filtering-stones.

8 represents a valve device communicating with the clear-water chamber 3 through means of a pipe 9 and communicating with the upper part of the filtering-tank through means of a pipe 10, and also communicating with the lower part of the tank 1 through means of a pipe 11. The valve device consists of a tube 12, within which is a rod 13, carrying valves or pistons 14, 15, 16, 17, and 18. The pipe 9 communicates with the space between the valves 14 and 15 when the parts are in their normal position, and communicating with this space is also a pipe 9^a, leading to the storage-tank or place of use. The pipe 10 communicates with the space between the valves 16 and 17, and the pipe 11 communicates with the space above the valve 18 when the parts are in their normal positions.

19 represents a pipe communicating with the space between the valves 16 and 17, and which, with the pipe 10, forms the supply-pipe of the apparatus.

In Fig. I, I have shown a lever 20, connected to the stem 13, and by which the stem and its valves are moved.

In Fig. II, I have shown an automatic device for moving the stem and its valves, and which consists of a tank 21, within which is a siphon 22, provided with an ordinary float and valve 23. The siphon communicates with the pipe 24, leading to the waste-pipe 25 beneath the valve device, or leading to some other point of discharge.

26 represents a pipe leading from the supply-pipe 19 into the valve-chest 27 of a cylinder 28. The valve of the chest 27 is provided with a stem 29, connected to a float 30, the stem of which is pivoted at 31 to the head of the cylinder 28. Within the cylinder is a piston connected to the stem or rod 13. The cylinder 28 is provided with a lower vent 32 and an upper vent 33, leading from the cylinder into the tank 21.

Referring to Fig. II, the operation of the device is as follows: The parts being in the position shown, the water will pass from the supply-pipe 19 through the valve device and through the pipe 10 into the filter outside of the stones. Percolating through the stones, it passes into the chamber 3, and through the pipe 9, through the valve device, and through the pipe 9^a to the storage-tank or place of use, and a portion of the water passes through the pipe 4 into the tank 5. When it is desired to clean the filter, the rod 13, with its valves, is raised to the position shown in Fig. I. Water will continue to pass now through the pipe 19, the valve device, and the pipe 10 into the filter, but instead of passing through the filtering-stones it passes out through the pipe 11 into the valve device beneath the valve 18,

which has been raised above the pipe 11, and in passing through the filter washes the interior of the tank and the exterior of the stones of mud and sediment. While this is taking place the supply to the storage-tank or to the place of use is closed off by the valve 15, as shown in Fig. I, and the pressure on the inlet side of the filtering-tank being removed, by virtue of the fact that the water is passing out through pipe 11, the clear water in tank 1 will be forced by the compressed air therein (the tank being closed and the air which it contains being compressed to the pressure of the water in the supply-pipe) back through the filtering-stones and escape through the pipe 11 into the waste-pipe 25. With this arrangement, and with the disposition of the valves on the stem 13 with relation to the respective pipes, I obtain a flow of water from the supply-pipe through the filter, outside of the stones, and at the same time obtain a flow of filtered water through the stones, and the two currents acting together serve to clean the stones and tank quite effectually of sediment and dirt.

The valve device may be operated by the lever 20 by hand or it may be operated automatically through means of the mechanism contained in the tank 21 by water passing through pipe 26 and dripping into the tank through a valve or other passage-way 40. When the water in the tank 21 reaches the float 30 and moves the valve in the chest 27, permitting water to pass from the pipe 26 beneath the piston in the cylinder 28, this raises the stem 13 and the valves or pistons connected therewith to the position shown in Fig. I. As soon as the water in the tank 21 reaches the float 23 the siphon is operated and the water wastes from the tank 21, and the valve in the chest 27 will be sent back to its original position by the weight of float 30 and the piston in the cylinder 28 will descend, moving the stem 13 and its valves back to their original positions, when the filtering process will resume.

41 represents a pipe provided with a valve 42 and which communicates with the tank 5. When desired, water may be drawn from the tank 5 through this pipe.

I claim as my invention—

1. In a water-filter, the combination of a filtering-tank, supply and waste passages for said tank, a pressure-tank receiving filtered water from the filtering-tank, a valve-casing through which the supply and waste pipes communicate directly to the filtering-tank, and a valve device in said casing movable to permit a direct flow from the service-pipe and under service-pressure, through the filter-chamber and out said waste-passage, to flush the filter outside of the stones, and simultaneously permitting clear water from the pressure-tank to pass through the filter-stones to said waste substantially as set forth.

2. In a water-filter, the combination of a filtering-tank, a pressure and storage tank containing clear water connected with said tank, a clear-water service-pipe communicating with the pressure and storage tank, through the clear-water chamber of the filter, a suitable water-supply for said filtering-tank, and a valve device consisting of a casing having openings therein forming connections between the supply and filtering tank, filtering-tank and waste-pipe, and pressure and storage tank and place of use, and a valve-rod carrying valves for said openings, and movable to cut off the clear-water service-pipe and open the main supply to the flushing-outlet through the filter and the pressure-tank to the said outlet through the stones, substantially as and for the purpose set forth.

HERMAN C. STIFEL.

In presence of—
E. S. KNIGHT,
C. G. EDWARDS.