(No Model.)

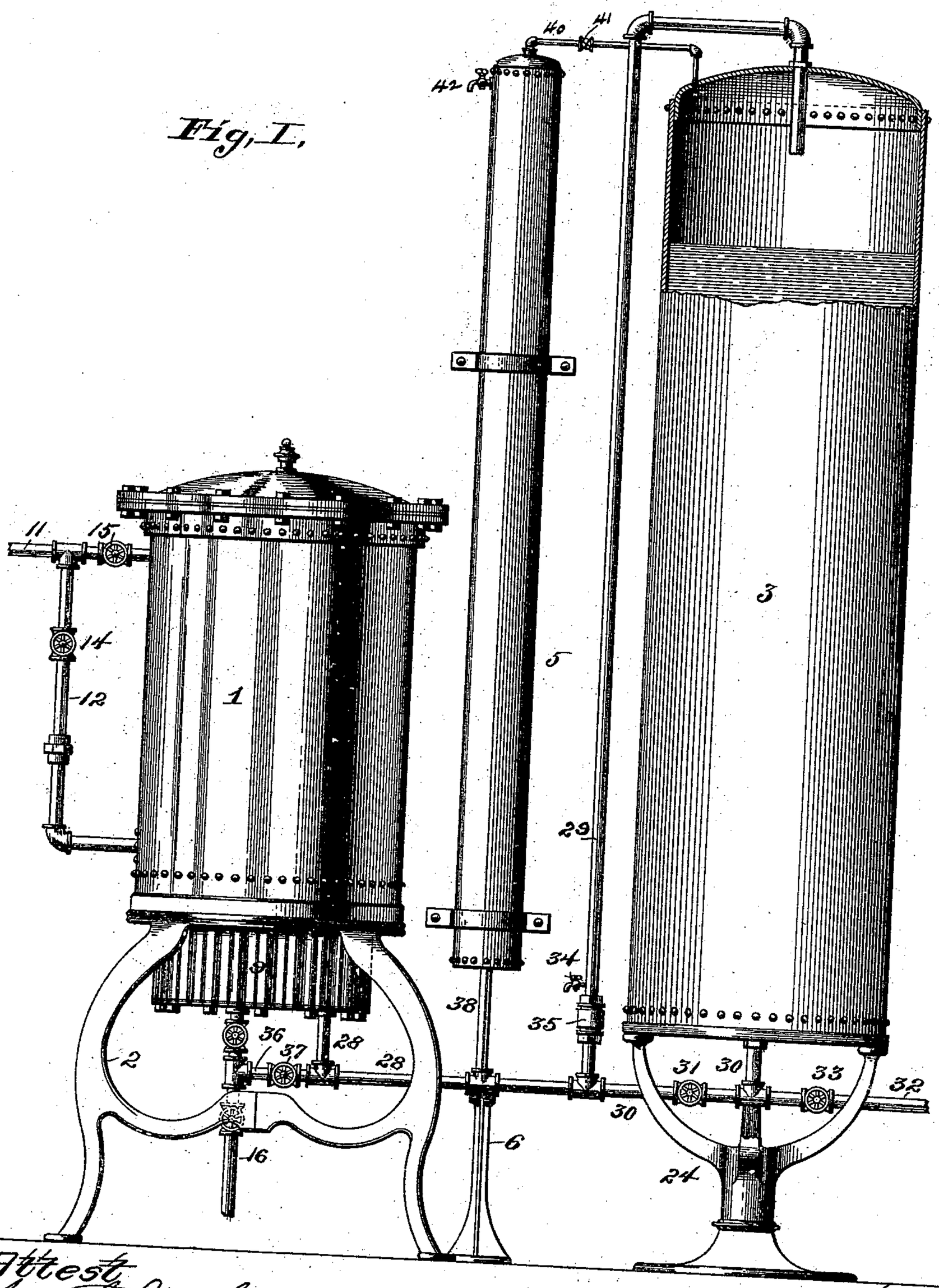
3 Sheets—Sheet 1.

A. H. KOHLMEYER.

WATER FILTER.

No. 550,979. Patented Dec. 10, 1895.

Fig. 1.



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(No Model.)

3 Sheets—Sheet 2.

A. H. KOHLMEYER.

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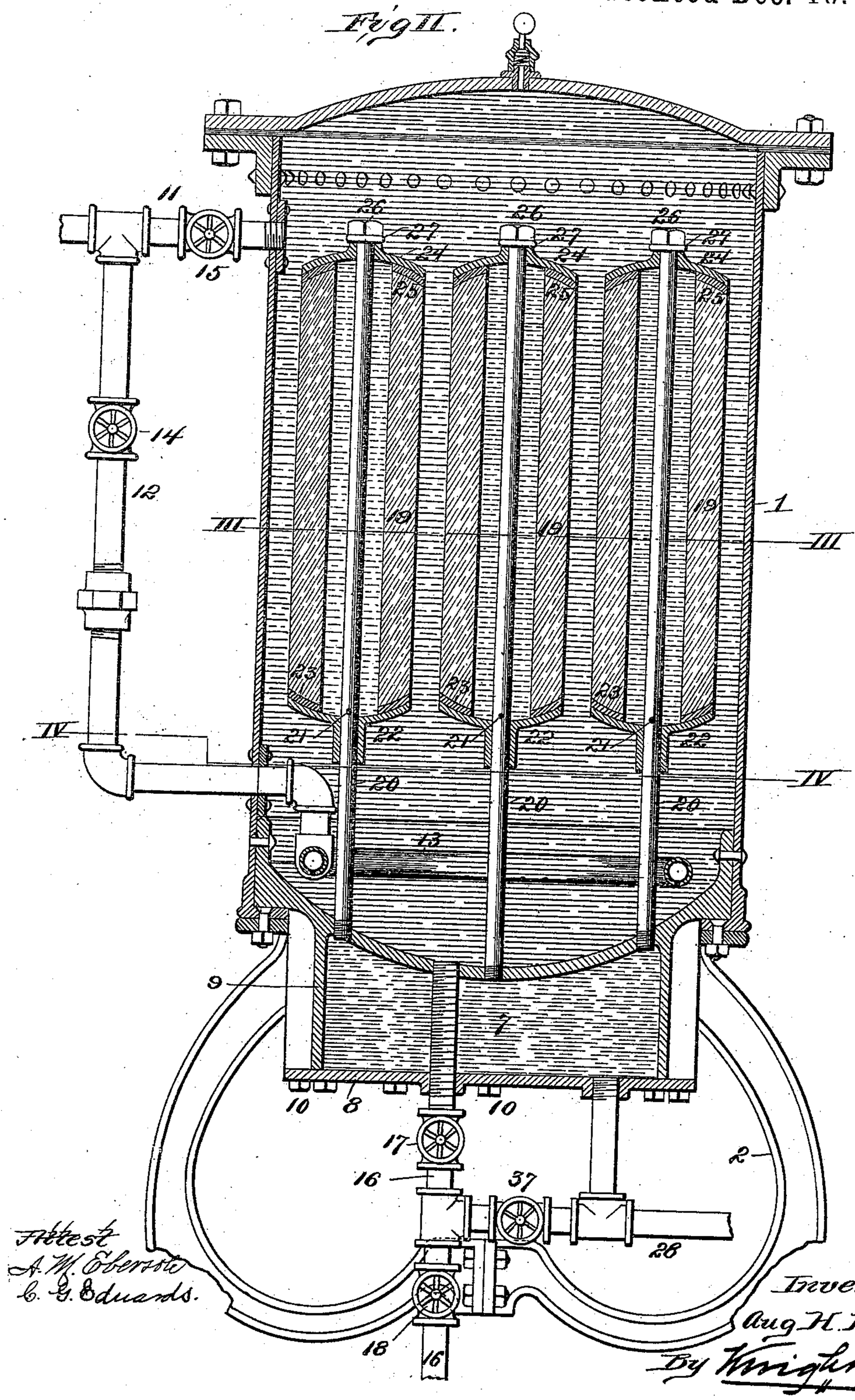
Fig II.



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(No Model.)

3 Sheets—Sheet 3.

A. H. KOHLMEYER.

WATER FILTER.

No. 550,979. Patented Dec. 10, 1895.

Fig. III.

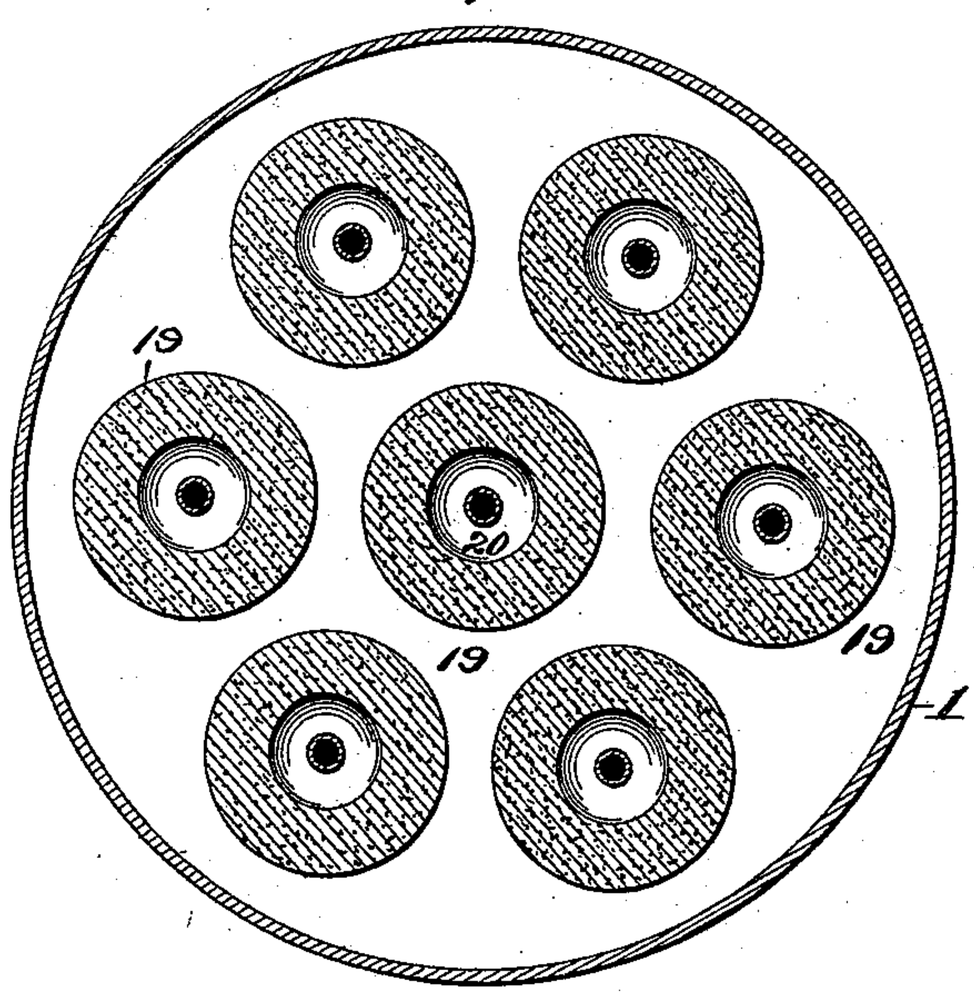

Fig. IV

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UNITED STATES PATENT OFFICE.

AUGUST H. KOHLMEYER, OF ST. LOUIS, MISSOURI.

WATER-FILTER.

SPECIFICATION forming part of Letters Patent No. 550,979, dated December 10, 1895.

Application filed December 4, 1893. Serial No. 492,665. (No model.)

To all whom it may concern:

Be it known that I, AUGUST H. KOHLMEYER, 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.

My invention relates to certain improvements in the class of water-filters shown and described in my Patent No. 510,548, granted December 5, 1893.

My present invention has principally for its object to provide an auxiliary tank or chamber, into which a portion of the filtered water passes and compresses the air therein for the purpose of automatically cleansing the stones of the filter without using any of the water or without reducing the pressure in the main clear-water tank or cylinder.

Another principal object of the invention is to provide a means of securing the stones in place, whereby they are automatically righted or adjusted to a vertical position in their supports when the retaining-nuts are tightened.

My present invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is an elevation, partly in section, of my improved filter. Fig. II is an enlarged vertical section of the filtering cylinder and stones. Fig. III is a transverse section taken on line III III, Fig. II. Fig. IV is a similar view taken on line IV IV, Fig. II.

Referring to the drawings, 1 represents the filtering-cylinder, supported on a suitable base 2.

3 represents the clear-water cylinder or tank supported on a suitable base 4 or otherwise, and 5 represents an auxiliary tank supported on a base 6 or otherwise.

At the lower end of the cylinder 1 is a chamber 7, the bottom 8 of which is secured in place by bolts cast in the lower portion 9 of the cylinder and having nuts 10, which fit beneath the bottom 8.

11 represents the main supply-pipe from the water main or other source of supply and which discharges, preferably, into the upper end of the cylinder 1. Connecting with this pipe is a branch 12, extending to near the bottom of the cylinder and connected to a perforated pipe 13 in the form of a ring located in the lower part of the cylinder. This branch 12 is provided with a valve 14 and the pipe 11 is provided with a valve 15. When it is desired to wash out the cylinder, the valve 15 is closed and the valve 14 opened, when water will be discharged through the ring 13 and sprayed over the bottom of the cylinder, from whence it and the mud will be discharged through a pipe 16, provided with valves 17 18 and connected with the sewer or other place of discharge. When the filter is in operation, the valves 17 and 18 are of course closed.

19 represents the filtering-stones, (of tripoli or other suitable substance,) of which there may be any number. I have shown seven. These stones are supported within the cylinder 1 by means of pipes 20, having small perforations 21, through which the filtered water passes from the interior of the stones into the chamber 7. On the pipes 20 are lower cup-shaped disks 22, shrunk or otherwise secured to the pipes, and against which (with an interposed gasket 23, if desired) rest the lower ends of the stones. At the upper ends of the pipes are similar cup-shaped disks 24, fitting loosely on the pipes, and which bear (with interposed gaskets 25, if desired) against the upper ends of the stones. Over the disks 24 are the nuts 26 on the pipes. By tightening the nuts the filtering-stones are clamped between the disks 22 and 24. I prefer to place washers 27 between the nuts 26 and the disks 24, so as to be sure of a water-tight joint.

The clear-water tank 3 is connected to the chamber 7 of the tank 1 by means of a pipe 28, from which rises a vertical pipe 29, that discharges the clear water into the top of the tank 3. The tank 3 may be located at any convenient place and at any desired distance from the cylinder 1, and it may be drained into the pipe 16 by means of a pipe 30, connecting it to the pipe 28. The pipe 30 would be provided with a valve 31, which while the tank 3 is being filled with clear water is closed. The clear water is drawn from the tank 3 through means of a pipe 32, provided with a valve 33 or otherwise. The pipe 29 is provided with a petcock 34 for admitting

air to the tank 3 when it is desired to drain the latter. The pipe 29 is further provided with a check-valve 35 to prevent air escaping back through the pipe 29 when it is compressed in the tank 3 to a degree equaling or in excess of the pressure of the water from the cylinder 1. By this arrangement, also, no water from the tank 3 escapes to cleanse the filter when there is a reduction in the supply-pipe, the valve 31, which is normally closed, and the check-valve 35 preventing it, so that only the water from the auxiliary tank 5 is used for cleaning the filter, as hereinafter explained.

The chamber 7 of the cylinder 1 may be drained through means of a pipe 36, connecting the pipe 28 with the pipe 16, this pipe 36 having a valve 37. The tank 5 is connected to the pipe 28 by means of a pipe 38. As the water passes from the cylinder 1 to the tank 3, a portion of it enters the auxiliary cylinder 5 and compresses the air therein until the air-pressure equals the pressure of the water. The water then stands in the auxiliary cylinder under the tension of the air-pressure, and when the water-pressure in the supply-pipe 11 is reduced the air-pressure in the cylinder 5 will force the water therein back through the pipe 38 28, pipes 20, the small perforations 21, and the filtering-stones 19, thus cleansing the stones, as in my application referred to, the small perforations 21 retarding a rapid reflux of the water, so as to prevent danger of breaking the stones. This takes place each time there is a reduction of pressure in the supply-pipe 11, and the cylinder 5 is filled again each time the pressure in the pipe 11 resumes its normal condition.

By providing the auxiliary cylinder 5 the stones are thus cleansed without diminishing the supply of water in the clear-water tank 3 or without diminishing the pressure of the compressed air in the tank 3.

If it is desired at any time to utilize the air-pressure in the tank 3 through the cylinder 5, it may be done through means of a pipe 40, which connects the upper end of the tank 3 with the cylinder 5, this pipe being provided with a valve 41. The cylinder 5 is provided with a petcock 42, through which air may be admitted when it is desired to drain the cylinder.

By the use of the cup-shaped disks 22 and 24 the filtering-stones 19 will be automatically righted or adjusted to a vertical position when the nuts 26 are tightened. The concave inner surfaces of the disks bearing against the convex ends of the stones effects this result.

I claim as my invention—

1. In a water filter, the combination of a cylinder, filtering stones located within the cylinder, a clear water tank communicating with the filtering stones, an auxiliary tank cylinder also communicating with the stones, and a pipe connecting the upper end of the auxiliary cylinder with the clear water tank, substantially as and for the purpose set forth.

2. In a water filter, the combination of a cylinder, a chamber at the bottom of the cylinder, filtering stones located within the cylinder, perforated pipes supporting the filtering stones, and forming a communication between the interior of the stones and the chamber at the bottom of said cylinder, a clear water tank, a pipe forming a communication between said chamber and the top of said clear water tank, an auxiliary cylinder communicating with the last mentioned pipe, and a pipe provided with a valve and forming a communication between the upper end of said clear water tank, and said auxiliary cylinder; substantially as and for the purpose set forth.

3. In a water filter, the combination of a filtering tank, a storage tank, an auxiliary tank, a pipe forming a communication between the filtering tank and the auxiliary tank, a pipe forming communication between the filtering tank and the storage tank, and a check valve in the last mentioned pipe, substantially as and for the purpose set forth.

AUGUST H. KOHLMEYER.

In presence of—
A. M. EBERSOLE,
C. G. EDWARDS.