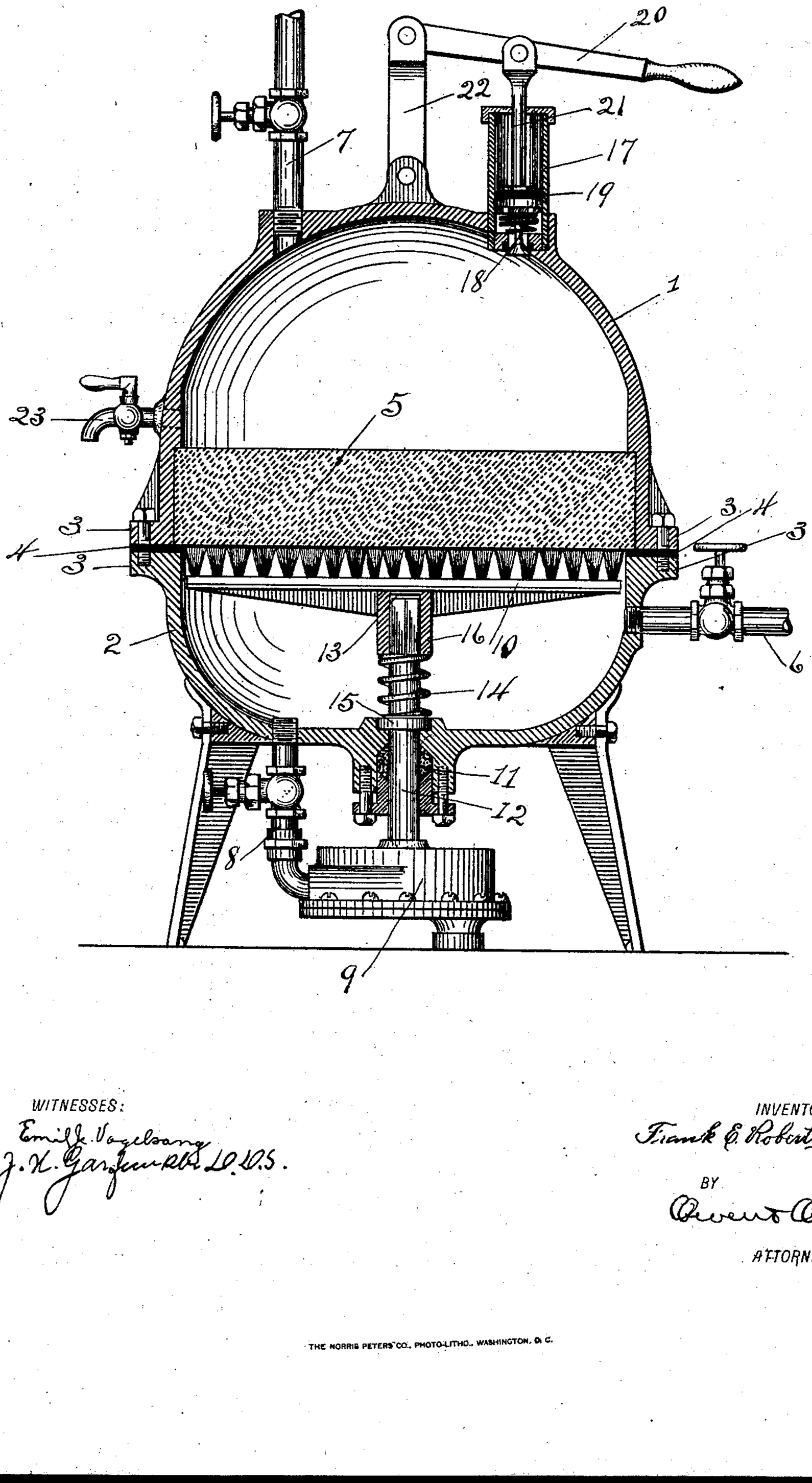
No. 724,944. PATENTED APR. 7, 1903.

F. E. ROBERTS.

FILTER.

APPLICATION FILED DEC. 12, 1902.

NO MODEL.



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FRANK E. ROBERTS, OF TOLEDO, OHIO.

FILTER.

SPECIFICATION forming part of Letters Patent No. 724,944, dated April 7, 1903.

Application filed December 12, 1902. Serial No. 135,020. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. ROBERTS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Filters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which forms a part of this specification.

My invention relates to improvements in pressure-filters; and its object is to provide a device for filtering water or other liquid which is so constructed and equipped as to enable the pores of the stone or filtering medium to be thoroughly cleansed and its exterior surface cleaned of all accumulations and refuse matter without necessitating the taking apart of the filter and to reduce the labor usually necessary in the care of the same to a minimum.

While the essential features of my invention are necessarily susceptible of modification, the preferred embodiment thereof is illustrated in the accompanying drawing, which is a vertical central section of my improved filter.

Referring to the drawing, 1 and 2 designate the casings of the two compartments of the filter, the meeting edges of said casings being formed with the shoulders 3 to enable the same to be securely bolted together, as shown, and are rendered air and water tight at such point by the washer or gasket 4. The stone or filtering medium 5 rests on the shoulder 3 of the casing 2 and fits snugly in a suitable groove provided in the adjacent inner edge of the casing 1. I wish it understood, however, that I claim nothing in the mode of securing the casings 1 and 2 together or in the mode of securing the stone 5 within the same.

6 and 7 are the pipes of ingress and egress, respectively, and 8 is the waste-pipe, which also supplies water to the motor 9, thus furnishing power for rotating the cleansing-brush 10. The motor 9 may be of any size or style, and in place of the brush 10 any style of wiper may be used.

Connected with the motor 9 and extending upward through the stuffing-box 11 into the lower compartment of the filter is a vertical shaft 12. The upper end of this shaft is rectangular in shape and is adapted to fit loosely in a similarly-shaped socket 13, formed on the under side of the brush 10, thus causing the brush to respond to the rotary movement of the shaft and at the same time to have a limited longitudinal movement thereon.

To compensate for the wear on the under side of the stone 5 caused by the rotating and cleansing process of the brush 10, I provide the coiled spring 14, which rests on the collar 15, secured to the shaft 12, and presses against the annular shoulder or collar 16, forming the socket 13 of the brush, thus causing the brush, which is loosely mounted on the shaft 12, to at all times be held in engagement with the adjacent surface of the stone.

17 is an ordinary air-pump suitably secured to the casing 1 of the upper compartment and adapted when operated to force air therein. This pump is provided with the usual outlet-valve 18, communicating with said compartment, piston 19, and hand-lever 20, the lever being pivotally secured to the piston-rod 21 and connected at its fulcrum end to the casing 1 by the connecting-rod 22.

23 is an outlet-cock for filtered water, adapted to be used when it is desired to take the water directly from the filter.

In operation the water enters the lower compartment through the supply-pipe 6, is forced upward through the porous filtering medium 5 into the upper compartment, and from thence through the egress-pipe 7 to a storage-tank provided for the filtered water. In the filtration process it is well known that filters operating under constant pressure become quickly foul by the accumulation of impurities and refuse matter in and upon the filtering medium which closes the pores of the filtering-stone to such an extent as to seriously interfere with the percolation of the water. In my invention the surface of the stone is thoroughly cleansed of this accumulated matter by the rotary movement of the brush 10. When it is desired to set the brush in motion, the cock in the pipe 7 is closed and that in the pipe 8, leading to the motor 9, opened,

thus starting the motor 9, which in turn imparts motion to the shaft 12 and brush 10. It will be obvious, however, that the brush 10 will reach only the refuse matter accumulated on the surface of the stone and will have no effect upon the interior of the stone, leaving the pores still filled with the refuse that has been forced therein by the percolation of the water through the same. To overcome this difficulty, I provide the pump 17, which when operated forces air into the upper chamber, causing the filtered water therein to be forced back through the stone, cleaning the pores as it passes therethrough and causing the refuse matter to be carried off by way of the pipe 8.

My invention is particularly adapted for use in hotels and apartment-houses where large quantities of water are used and the filter is constantly becoming impaired by reason of the refuse gathering in and upon the stone.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a filter of the class described, a lower chamber, an ingress and egress pipe therein, an upper chamber, an egress-pipe therein, a filtering medium between said chambers, and an air-pump secured to the casing of said upper chamber for the purpose described.

2. A closed vessel, a filtering medium dividing said vessel into an upper and lower compartment, an inlet-pipe in said lower compartment, a cleaning element in said lower compartment yieldingly held in engagement with the under surface of said medium, a motor for rotating said cleaning element, a pipe adapted to take the waste water from said lower compartment to actuate said motor, and an egress-pipe leading from said upper compartment, substantially as described.

3. In combination, a vessel, a filtering medium in said vessel, a brush held in yielding engagement with said medium, means for imparting motion to said brush, and an air-pump on said vessel for the purpose described.

4. The combination, with a filter having a filtering medium therein, a shaft, a brush yieldingly mounted on one end of said shaft and adapted to engage with said filtering medium, and means connected to said shaft for causing said brush to rotate, of an air-pump to aid in the cleaning of said medium.

5. The combination, with a vessel having a filtering medium therein, of a motor, a shaft connected to said motor, a cleaning element mounted on said shaft and yieldingly held in engagement with said medium, and a pipe adapted to take the waste water from said filter and supply water to said motor.

6. A closed vessel, compartments in said vessel for filtered and unfiltered water, a filtering medium interposed between said compartments, an air-pump having communication with one of said compartments and adapted, when operated, to cause the filtered water to return through said filtering medium and cleanse the same, a cleaning element in the other compartment held in yielding engagement with said medium for cleaning the surface thereof, and means for rotating said element.

7. In combination, a vessel, a filtering medium in said vessel, a brush held in yielding engagement with said medium, a motor having connection with said brush and adapted to rotate the same when in motion, and means for forcing the filtered fluid back through said filtering medium for the purpose described.

8. In combination, a vessel, a filtering medium in said vessel, a shaft penetrating said vessel and extending within the same, a spring-pressed brush on said shaft adapted to have a yielding engagement with one side of said filtering medium, means from without said vessel for imparting motion to said shaft and brush, and means for compressing air on the other side of said medium and causing the water to return therethrough.

9. The combination, with a vessel having a filtering medium therein, of a motor, a shaft connected to said motor, and extending within said vessel, a brush mounted transversely on the end of said shaft in adjacent position to said filtering medium, means for yieldingly holding said brush in engagement with said filtering medium, and an air-pump for the purpose described.

10. A closed vessel, a porous filtering medium dividing said vessel into an upper and a lower compartment, ingress and egress pipes in said lower compartment, an egress-pipe in said upper compartment, a brush in said lower compartment to engage with the under surface of said medium, a motor mounted in adjacent position to said vessel and having connection with and adapted to rotate said brush, said motor fed by means of the egress-pipe in said lower compartment, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK E. ROBERTS.

Witnesses:
WILBER A. OWEN,
HARRY HOWE.