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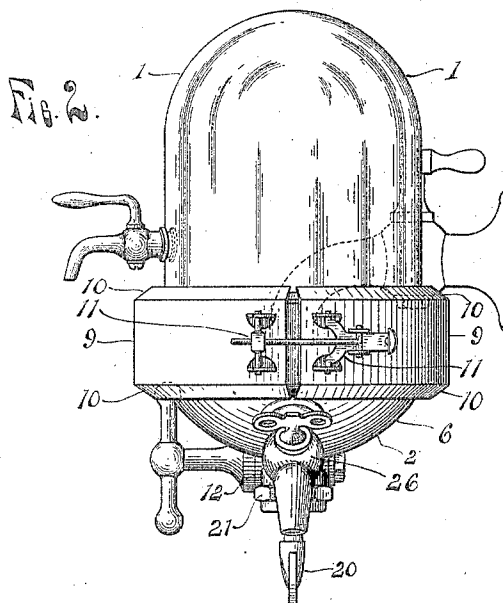
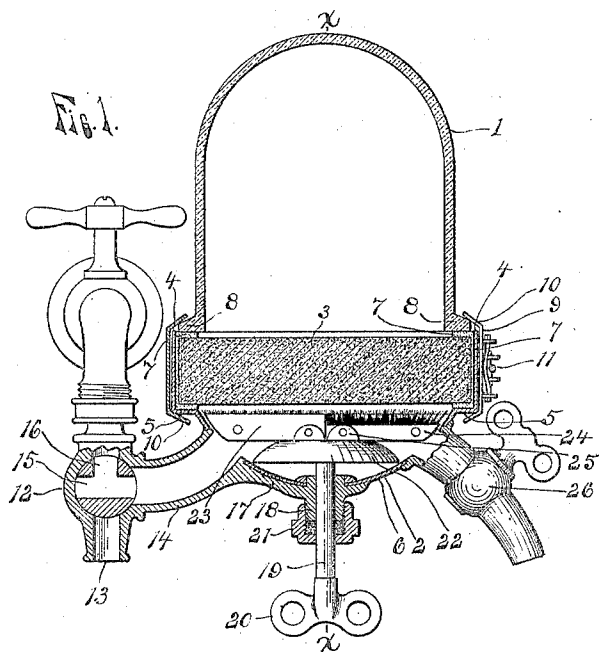
PATENTED MAY 15, 1906.

J. S. BARNES & L. A. ROSIER.

FILTER.

APPLICATION FILED APR. 17, 1905.

2 SHEETS—SHEET 1.



WITNESSES:
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Paul S. Miller

INVENTORS.
John S. Barnes.
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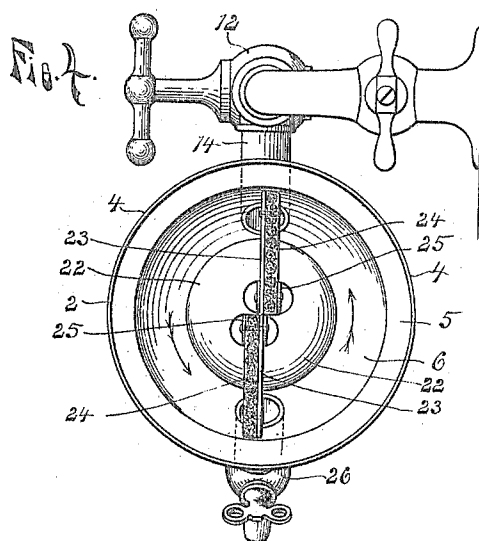
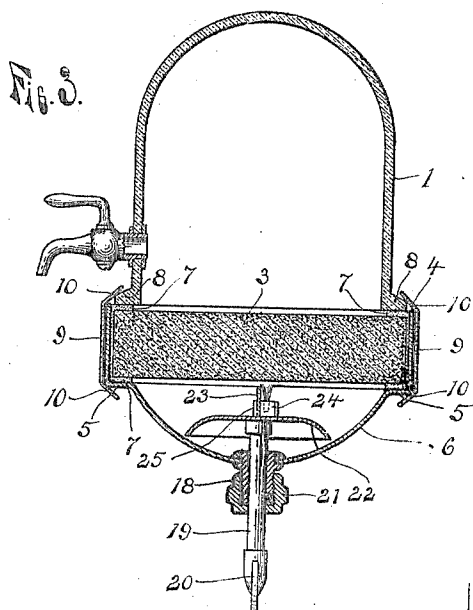
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UNITED STATES PATENT OFFICE.

JOHN S. BARNES AND LEO A. ROSIER, OF DETROIT, MICHIGAN.

FILTER.

No. 820,903.

Specification of Letters Patent.

Patented May 15, 1906.

Application filed April 17, 1905. Serial No. 256,154.

To all whom it may concern:

Be it known that we, JOHN S. BARNES and LEO A. ROSIER, citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Filters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in filters in which a stone or a similar substance is employed as the filtering medium; and its object is to so construct the device that the same may be very quickly and easily taken apart for the purpose of cleansing the same and also to provide suitable means for cleaning and smoothing the surface of the stone in a thorough and expeditious manner without the necessity of taking the device apart, said means being so arranged as to in no way interfere with the flow of the water across the face of the stone.

A further object of the invention is to provide the device with means for deflecting the incoming water against the under surface of the stone and causing it to circulate across the surface of the same to wash away any impurities or particles removed therefrom by the cleaning means before mentioned and to provide the same with certain other new and useful features and the advantages of the particular construction, arrangement, and combination of parts, all as hereinafter more fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of a device embodying the invention; Fig. 2, a side elevation of the same; Fig. 3, a vertical section on the line *xx* of Fig. 1, and Fig. 4 a plan view of the cup or lower part of the casing with the stone removed therefrom.

As shown in the drawings, the casing of the filter consists of an upper glass bell 1, forming the chamber or receptacle for the filtered water, and the lower cup-shaped portion 2, in which the filtering-stone 3 is held, said lower portion being formed of sheet metal with a circular rim 4, forming a chamber within which the circular flat stone fits, the stone resting upon a shoulder or horizontal portion 5, formed between the said rim and the lower hemispherical portion 6, which forms a chamber below the stone. To secure the bell to the cup and make a tight joint between the same, a packing is provided consisting, preferably, of a continuous rubber band 7 of less di-

ameter when in its normal condition than the diameter of the stone and which is considerably wider than the thickness of the stone, so that when stretched over the stone to engage its central longitudinal portion with the edge of said stone the edges of the band will be drawn inward by reason of their flexibility and will lie flat upon the upper and lower surfaces of the stone, and on the lower end of the bell is formed an outwardly-extending flange 8 of a diameter to just fit within the rim 4 of the cup and seat upon the edge of the rubber band or packing, said flange being engaged by and pressed firmly down upon the packing by a detachable metal band 9, having inwardly-inclined edges 10 to engage the shoulder 5 and said flange on the bell. The ends of this clamping-band are drawn toward each other and firmly held by a suitable clamping-fastener 11 of any desired construction, which may be quickly released to remove the band.

The packing-band extending across the edge of the stone all the way around prevents any water from percolating laterally through the edge of the stone, and the edges of the band extending inward upon the upper and lower surfaces of the stone form a packing to prevent the water from escaping between said stone and the flange on the bell or between the stone and the shoulder on the cup. The inclined edges on the clamping-band when said band is drawn firmly about the cup force the bell down upon the stone with the packing between and also force the stone down firmly into the cup with the packing between said stone and the shoulder 5, so that all leakage is effectually prevented, and the bell and stone may be quickly removed for cleaning by simply releasing the fastener 11. It will also be noted that when the band is in position its edges which lie upon the upper and lower surfaces of the stone are thicker than its middle portion, as they are stretched less, and therefore they form a very efficient packing.

12 is a two-way valve adapted to be attached to any ordinary faucet or water-supply pipe and is provided with a downwardly-extending discharge-nozzle 13 and a laterally-extending and upwardly-curved discharge-pipe 14, adapted to be secured to the cup 6 and to discharge water into said cup through an opening therein in an upward direction against the lower surfaces of the stone. The plug of the valve 12 is formed with a passage

or way 15, extending directly through said plug and also with a way 16, opening laterally from said passage, so that when the plug is in the position shown in Fig. 1 water will pass directly from the faucet into the filter, or when turned so that the passage 15 is in a vertical position water may be drawn from the faucet without passing through the filter.

Formed integral with the pipe 14 is a supporting-arm 17, extending beneath the cup and formed with a bearing 18, adapted to fit within an opening in the axis of the cup and secured therein by brazing or otherwise. Extending vertically upward through this bearing is a pin 19, provided with a handle 20 at its lower end, by means of which the pin may be turned or moved longitudinally in its bearing, and a packing-nut 21 engages the screw-threaded outer end of the bearing to prevent leakage around the pin. Secured to the upper end of this pin is a deflector 22 in the shape of an inverted cup formed of sheet metal, and secured to and extending horizontally across the top of said deflector through the axial line of the pin is a horizontally-extending abrasive member or scraper 23, formed of a strip of metal set on edge and of a length to extend across the lower surface of the stone. A block in which is secured bristles or other suitable material to form a brush 24 is secured at one side of the scraper, with its bristles extending a short distance above the horizontal plane of the upper edge of the scraper, said brush being of a length to reach from one end of the scraper to the axial line of the pin or axis of the casing, and a similar brush is secured to the opposite end of the scraper at its opposite side. Ears 25, by means of which the scraper and brushes are secured to the deflector, may be formed by severing portions from the metal of the deflector and turning the same up at each side of the scraper and brushes.

A discharge-opening is formed in the cup 6 opposite the intake opening or pipe 14, and a draw-off cock 26 is secured in said opening, by means of which a circulation of water may be had through the cup to wash out all of the impurities removed from the lower surface of the stone by the scraper and brushes. The deflector is so shaped and proportioned as to deflect the incoming water upward against the stone and cause the same to flow across the face thereof when the pin is moved vertically to bring the brushes or scraper into engagement with the stone, the normal position of said scraper and brushes being such that they do not engage the stone or interfere with the flow of the water across its face, and therefore the surface is thoroughly cleansed by the stream of water while being scraped and brushed. By arranging the brushes so that their bristles project above the horizontal plane of the upper contact edge of the scraper the brushes may be used independ-

ently of the scraper by forcing the pin upward only far enough to bring the bristles, and not the scraper, into contact with the stone, and by providing two brushes, one at each side of the scraper and adjacent to opposite ends thereof, when the pin is forced inward to bring the scraper into contact with the stone and the scraper is turned in the direction indicated by the arrow in Fig. 4 the bristles of both brushes will be bent away from the scraper and will not interfere with its operation. With this construction all of the advantages of a brush for removing the impurities from the pores of the stone are combined with the advantages of a scraper which will keep the surface of the stone smooth and remove any incrustation which has become too hard to be detached by a brush. The stone with its packing fits snugly within its chamber in the lower part of the casing, and were it not for the vertically-movable pin extending through the casing below the stone there might be some difficulty in removing said stone; but by pressing inward upon the pin the scraper will contact the stone and force the same from the chamber, thus greatly facilitating its removal.

When the draw-off cock 26 is closed and the three-way valve turned to admit water to the filter under pressure, the water is gradually forced up through the stone, compressing the air in the bell and creating a pressure therein, so that when the water-pressure is turned off and the cock opened this air-pressure in the bell will force the water therein back through the stone, and thus clean the pores; but it has been found that in order to secure the best results it is necessary from time to time to remove the stone and give it a thorough cleansing by boiling or otherwise, and to facilitate its removal and also for the purpose of thoroughly cleaning the interior of the bell and cup the detachable clamping-band for holding the parts together has been provided, so that the parts may be removed with the least possible trouble.

By making the bell of glass it can be seen at a glance whether the filter is doing its work properly or not, as the color of the water will indicate whether all of the impurities have been removed, and by making the brushes and scraper vertically movable in the casing, so that they are normally held by gravity out of contact with the stone, the water has free access to its whole lower surface, and the bristles do not become permanently bent by such contact.

Having thus fully described our invention, what we claim is—

1. In a filter, the combination with a casing and a filtering-stone in the casing, of a horizontally-extending strip forming a scraper, adapted to be forced into engagement with the stone and turned, a brush supported ad-

5 adjacent to the scraper and movable therewith with the ends of its bristles extending a short distance beyond the contact edge of the scraper, and means for operating the scraper and brush.

2. In a filter, the combination with a casing and a filtering-stone in the casing with a chamber above and below the same, of a strip forming a scraper rotatably supported intermediate its ends to turn in a horizontal plane and adapted to be raised into engagement with the stone, a brush secured at one side of the scraper and extending from one end thereof to the axis of the pivot of the same, a brush secured at the opposite side of the scraper and extending from the opposite end of the same to said axis, the ends of the bristles forming said brushes being extended a short distance above the horizontal plane of the upper edge of the scraper, and means for raising and turning said brushes and scraper.

3. In a filter, the combination with a casing having an upper and a lower chamber, and a filtering medium between said chambers, of a pin extending vertically upward through the bottom of the lower chamber and movable longitudinally, a pipe opening into the lower chamber at one side thereof, and a circular inverted-cup-shaped deflector secured to the upper end of said pin and normally supported thereby with its lower edge below the lower edge of the open end of the pipe and adapted to be raised by the pin to deflect the water from the pipe upwardly against the lower surface of the stone and cause the same to flow across said surface.

4. In a filter, the combination with a casing made in parts and means for detachably securing the parts together, of a filtering-stone, a chamber in the lower part of the casing to receive the stone and within which it fits, a pin extending into the casing below the stone and rotatively and longitudinally movable, a cup-shaped deflector secured to the inner end of said pin, ears formed on said deflector, a scraper secured to said ears and extending diametrically across the lower face of the stone, and a handle on the outer end of the pin by means of which the same may be turned and forced inward.

5. In a filter, the combination of a casing

consisting of a glass bell formed with an outwardly-extending flange at its lower end and a lower cup portion formed with a circular rim, a lower hemispherical portion forming a chamber for the unfiltered water and a shoulder formed between said portion and rim, a filtering-stone resting upon said shoulder within the rim, a packing-band engaging the edge of the stone and extending between the flange on the bell and said stone and said shoulder and stone, a clamping-band encircling the casing and provided with inwardly-turned inclined edges to engage the flange on the bell and the shoulder on the lower part of the casing, and means on the ends of said band for drawing said ends toward each other and for detachably securing the same.

6. In a filter, the combination of a bell forming a chamber for filtered water and provided with a flange at its lower end, a cup formed of sheet metal with an upwardly-extending rim and a lower portion formed with an intake and a discharge opening and an axial opening in its bottom, a filtering-stone adapted to fit within the rim, a packing-band engaging the edge of the stone, a clamping-band having inwardly-turned edges engaging the flange on the bell and the cup, means for detachably securing the ends of said band, a pipe adapted to be attached to a faucet secured within the inlet-opening of the cup, an arm on said pipe extending beneath the cup and provided with a bearing projecting through the axial opening in the cup and secured therein, a pin rotatively and longitudinally movable in said bearing, a packing-nut on the outer end of the bearing to prevent leakage around the pin, a handle on the outer end of the pin, a deflector secured to the inner end of said pin, means for engaging and cleaning the surface of the stone secured to said deflector, and a draw-off cock secured in the discharge-opening in the cup.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN S. BARNES.
LEO A. ROSIER.

Witnesses:

OTTO F. BARTHEL,
THOS. G. LONGSTAFF.