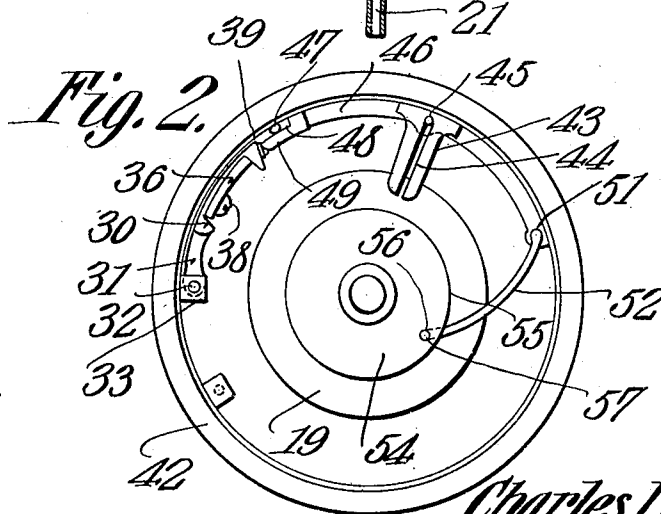
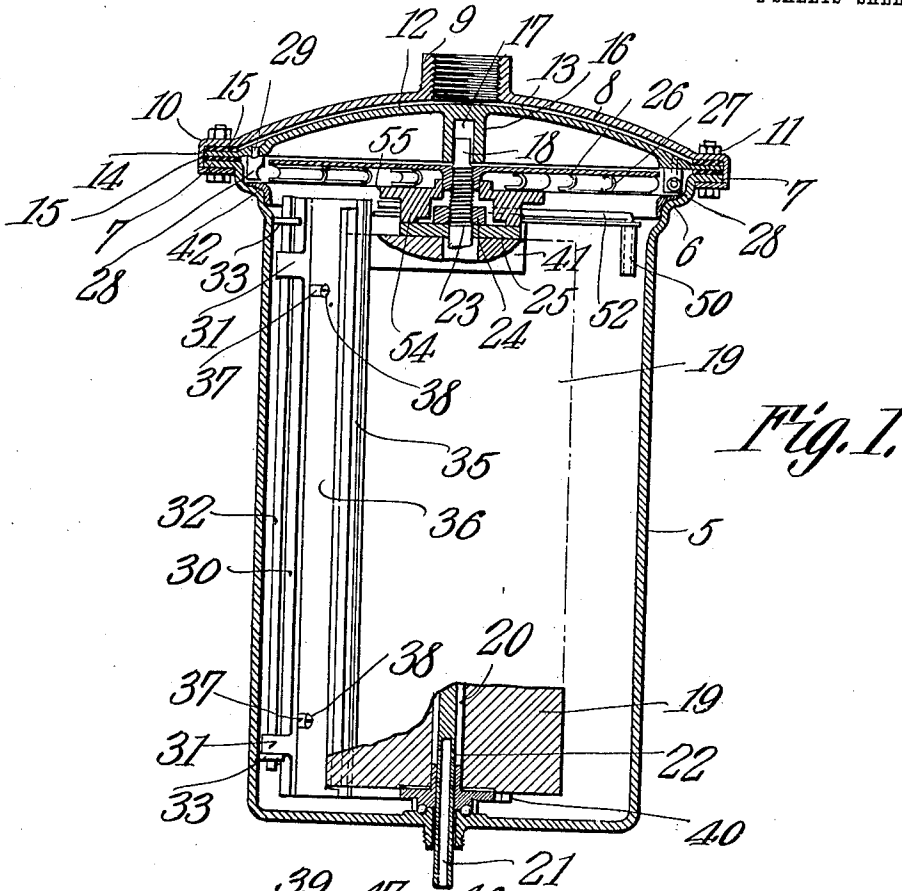


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Patented Feb. 23, 1909.  
2 SHEETS—SHEET 1.



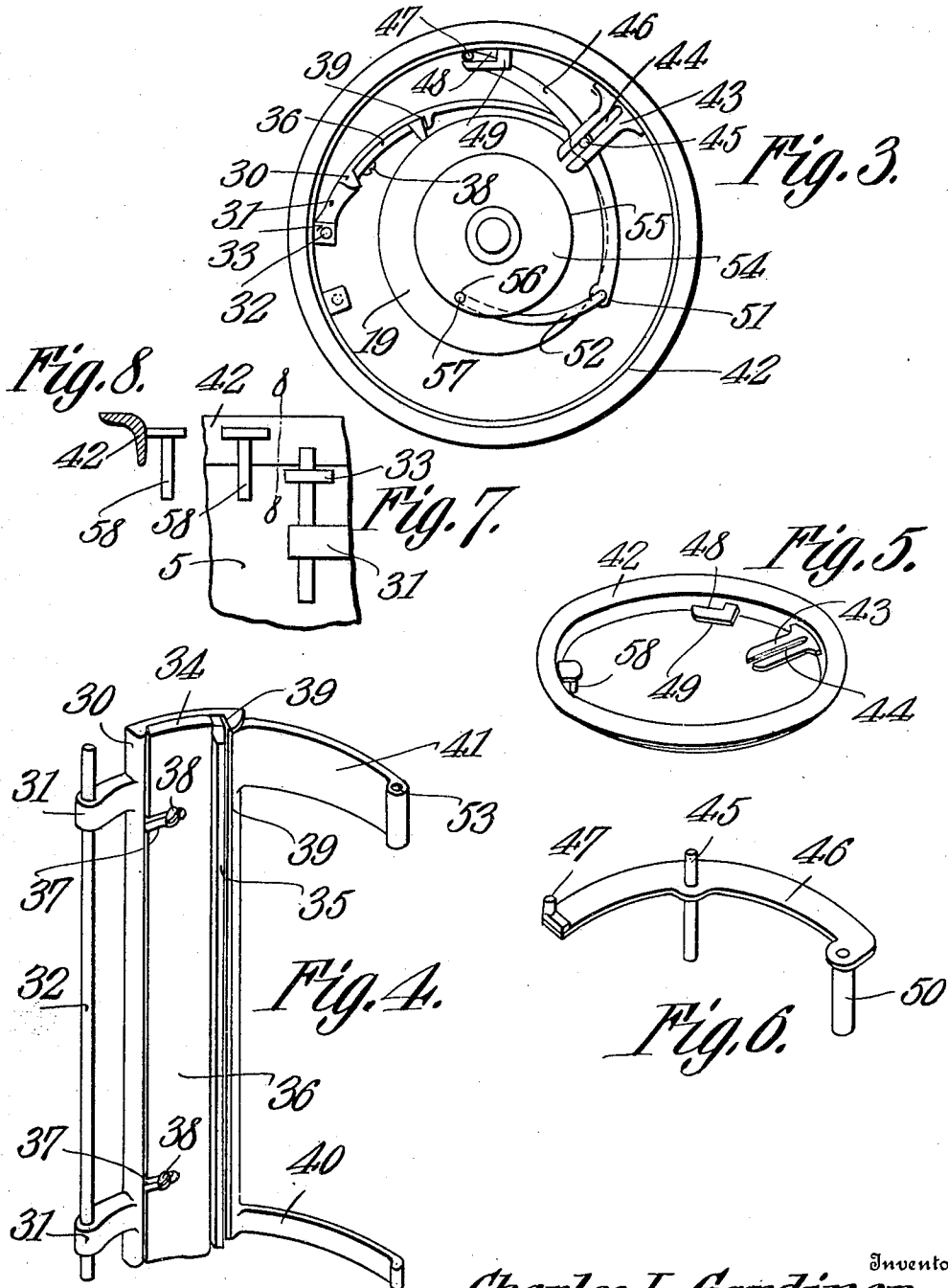
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# UNITED STATES PATENT OFFICE.

CHARLES L. GARDINER, OF BINGHAMTON, NEW YORK, ASSIGNOR TO THE 1900 WASHER COMPANY, OF BINGHAMTON, NEW YORK.

## WATER-FILTER.

No. 913,636.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed May 5, 1908. Serial No. 431,017.

*To all whom it may concern:*

Be it known that I, CHARLES L. GARDINER, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented a new and useful Water-Filter, of which the following is a specification.

This invention relates to water filters and more particularly to a cleaning device for automatically removing any deposits of mud, slime and the like from the surface of the filtering medium.

The object of the invention is to provide a cleaning device in which the abrading member is automatically moved in contact with the filter stone as the latter is revolved by the action of the water, thus polishing the exterior surface of the stone and maintaining the latter in a clean sanitary condition.

A further object of the invention is to provide a guide ring or member operatively connected with the swing gate of the abrading member, said guide ring serving to insure a firm contact of the abrading member against the filter stone as the latter revolves and also serving to center the parts and prevent rattling or wobbling of the same.

A further object is to provide means for limiting the swinging movement of the abrading member so as to prevent the filter stone from being reduced in size beyond a predetermined cross sectional diameter by the action of said abrading member.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification: Figure 1 is a longitudinal sectional view of a water filter constructed in accordance with my invention. Fig. 2 is a top plan view of the same with the cover and water wheel removed showing the cleaning element in normal or inoperative position. Fig. 3 is a similar view showing the position assumed by the cleaning element when the filter stone is revolved. Fig. 4 is a perspective view of the swing gate detached.

Fig. 5 is a perspective view of the guide ring detached. Fig. 6 is a similar view of the segmental operating lever detached. Fig. 7 is a detail front elevation of a portion of the interior of the casing showing the stop lug of the guide ring. Fig. 8 is a vertical sectional view taken on the line 8—8 of Fig. 7.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The filter comprises a casing or housing having its upper portion off set to form an annular shoulder 6 and thence extended laterally to produce a circumferential flange 7, which latter forms a support for the top plate or cover 8.

The top plate 8 is provided with a nipple 9, the interior walls of which are threaded for connection with a hydrant or other suitable source of water supply, said cover being provided with a depending flange 10 which overlaps the flange 7 of the casing and is secured thereto by bolts or similar fastening devices 11.

Arranged beneath the top or cover 8 is a diaphragm 12 preferably curved to conform to the shape of the cover and spaced from the latter to form an intermediate chamber or compartment 13 adapted to receive the water from the hydrant or other source of supply.

The diaphragm 12 is provided with a marginal flange 14, which latter is interposed between the flanges 10 and 7 and is spaced from the same by suitable washers or gaskets 15.

Depending from the central portion of the diaphragm 12 is a lug 16 having a socket 17 formed therein and constituting a bearing for the upper end of a vertically disposed shaft 18.

Secured to and mounted for rotation with the shaft 18 is a porous filter stone 19 preferably cylindrical in shape and provided with an interior bore, spaced from the shaft, to form an intermediate water receiving chamber 20, there being a longitudinal opening 21 formed in the lower end of the shaft 18 and communicating with the chamber 20 by means of apertures 22, thereby to permit the discharge of the filtered water.

The upper end of the shaft 18 is threaded at 23 for engagement with a clamping nut 24, which latter bears against a plate or

washer 25 carried by the upper end of the filter stone.

Disposed in spaced relation to the plate 25 is a circular plate or disk 26 having its lower face provided with a plurality of radiating blades or pockets 27, which latter receive the impact of a stream of water issuing from suitable discharge nozzles 28 depending from the diaphragm 12, there being suitable depressions 29 formed in the upper surface of the diaphragm at each depending nozzle 28 so as to permit the ready flow of water from the chamber 13 through said nozzles to the blades of the water wheel. The circular plate 26 of the water wheel is provided with a centrally disposed opening the interior walls of which are threaded for engagement with the threads on the shaft 18 whereby rotary movement imparted to the water wheel will effect a corresponding rotary movement of the filter stone.

The cleaning element forming the subject matter of the present invention comprises a swing gate or holder 30 having spaced lugs 31 extending laterally from one longitudinal edge thereof and connected by a rod or pin 32, which latter, is pivotally mounted in corresponding lugs 33 secured to or formed integral with the interior wall of the casing 5, as best shown in Figs. 1 and 7 of the drawing. The swinging gate or holder is provided with a vertically disposed seating groove 34 for the reception of an abrading element 35, the latter being preferably in the form of a stick of carborundum or the like. The abrading member 35 is clamped in position on the swinging gate or holder by means of a plate 36 having transverse slots 37 formed therein for the reception of screws or similar fastening devices 38, there being a strip of rubber or other yieldable material 39 interposed between the abrading stick 35 and the adjacent wall of the slot 34 in order to form a yieldable seat for said abrading member. Extending laterally from the opposite longitudinal edge of the swinging gate or holder 30 are spaced arms 40 and 41, which latter are curved to conform to, and normally bear against, the interior walls of the casing 5.

Slidably mounted on the annular shoulder 6 is a guide member or ring 42 having spaced fingers 43 extending laterally from the inner face thereof and forming between them an elongated slot 44 adapted to receive the adjacent end of the pivot pin 45 of a segmental actuating lever 46. One end of the actuating lever 46 is provided with a vertically disposed stud 47, which enters the recess 43 of a hook 49 carried by and extending in a horizontal plane from the ring, as shown. The opposite end of the segmental lever 46 is provided with a depending sleeve 50 adapted to receive the angular extension 51 of a connecting rod or link 52. The lower end of the

pin 45 is journaled in a bearing or socket 53 formed in the curved arm 41 of the swinging gate or holder, whereby said lever is free to swing laterally with the pin 45 as an axis when the cleaning device is in operation.

Surrounding the shaft 18 and loosely mounted on the plate 25 is a friction actuated power transmission member or disk 54 provided with a peripheral flange 55 having an opening 56 formed therein for the reception of the angular extension 57 of the connecting rod 52 so that when the filter stone 19 is rotated by the water wheel the disk or attaching member 54 will also be rotated and through the medium of the lever 46, rod 52 and guide member 42 actuate the abrading member to effect the cleaning of the filter stone.

As a means for limiting the inward movement of the swinging gate there is provided a stop lug 58 which depends from the inner edge of the guide ring 42 and is disposed in the path of movement of the adjacent lug 33 so that when the filter stone is cut or worn away until the cross sectional diameter of the stone is of the same diameter as the body of the disk 54, the lug 58 will engage the lug 33 and thereby render the abrading element inactive.

In operation water is admitted to the chamber 13 through the nipple 9 and is spread over the surface of the diaphragm 12 in the form of a thin film, the liquid from the chamber 13 passing through the discharge nozzles 28 and being directed against the blades 27 of the water wheel thereby to rotate the same. As the filter stone 19 revolves the disk 54 by frictional contact therewith, will be partially revolved thus exerting a pull on the connecting rod 52 and through the medium of the segmental lever 46 and guide ring 42 move the swinging gate on its pivot 32 inwardly until the abrading strip 35 bears against the exterior face of the filter stone. As the filter stone wears away the swinging gate will be automatically forced inwardly so as to maintain the strip 35 in constant contact with the filter stone. When the diameter of the filter stone is approximately the same as the diameter of the body portion of the disk 54, the lug 58 will engage the lug 33 and prevent further inward movement of the swinging frame, in the manner before stated.

Attention is here called to the fact that the guide member or ring 42 is slidably mounted on the shoulder 6 and not only serves to insure a firm contact of the abrading stick or element against the filter stone as the latter revolves, but also serves to center the parts and prevent rattling or wobbling movement of the same.

It will of course be understood that the water will percolate through the filter stone into the chamber 20 and thence into the tube

21 where it may be drawn off if desired through a suitable cock or turning plug provided for this purpose.

From the foregoing description it is thought 5 that the construction and operation of the device will be readily understood by those skilled in the art and further description thereof is deemed unnecessary.

Having thus described the invention what 10 is claimed is:

1. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a cleaning element, and a connection between the cleaning and 15 filtering elements for automatically moving said cleaning element into engagement with the filter element when the latter is revolved.

2. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a transmission member carried by the filter element, a cleaning element having one end thereof pivotally 20 mounted within the casing, and a connection between the other end of the cleaning element and the transmission member.

3. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a transmission member carried by the filter element, a cleaning element engaging the transmission member, and a guide member slidably mounted 30 within the casing and operatively connected with the cleaning element.

4. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a cleaning element operatively connected with the filter element and movable into engagement there- 35 with when the filter element is rotated, and a guide ring mounted for rotation within the casing and operatively connected with the cleaning element.

5. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a swinging gate pivotally connected with the casing, an abrading member carried by the swinging gate and movable into engagement with the exterior walls of the filter element, and a 40 guide ring slidably mounted within the casing and operatively connected with the swinging gate.

6. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a swinging gate pivotally connected with the interior wall of the casing and movable into engagement with the exterior surface of the cleaning element when the latter is rotated, an abrading 55 member carried by the swinging gate, a guide member slidably mounted within the casing and operatively connected with the swinging gate, and means carried by the guide member for limiting the inward movement of the 60 swinging gate.

7. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a swinging gate pivotally connected with the casing, an abrading element carried by the swinging 70 gate and adapted to engage the filter element, a guide ring mounted for rotation within the casing and provided with spaced guide fingers, a friction actuated transmission member carried by the filter element, a lever 75 operatively connected with the transmission member, and a pin extending between the guide fingers and serving to pivotally connect said lever with the swinging gate.

8. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a transmission member carried by the filter element, a swinging gate pivotally connected with the casing, an abrading member carried by the 80 swinging gate, a guide ring slidably mounted within the casing, a lever having its intermediate portion pivotally connected with the swinging gate and operatively connected with the guide ring, and a rod forming a con- 85 nection between one end of the lever and the transmission member.

9. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a transmission disk carried by the filter element, a swinging gate pivotally connected with the casing, an abrading member carried by the swinging gate, a guide ring slidably mounted within the casing and operatively connected with 90 the swinging gate, a connection between the free end of the swinging gate and transmission disk for automatically moving the abrading material in contact with the filter element when the latter is rotated, and 95 means for limiting the inward swinging movement of said gate.

10. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a transmission disk carried by and frictionally engaging the 100 filter element, a swinging gate pivotally mounted within the casing, an abrading member carried by the swinging gate, a guide ring slidably mounted within the casing and provided with spaced inwardly extending guide fingers, a horizontally disposed hook carried by said ring, a segmental lever hav- 105 ing its intermediate portion pivotally mounted on the swinging gate and one end thereof provided with a lug engaging the hook on the guide ring, and a rod forming a connection between the opposite end of the segmental lever and disk, the pivotal axis of the lever being extended vertically between the guide 120 fingers of the governor.

11. A filter including a casing having an inlet and outlet, a filter element mounted for rotation within the casing, a transmission member carried by and mounted for rotation 130

independently of the filter member, a cleaning element pivotally mounted for swinging movement within the casing, and a connection between the free end of the cleaning element and the transmission member whereby the cleaning element is moved into engagement with the filter element when the filter element is rotated.

12. A filter including a casing having an inlet and outlet, a shaft journaled in the casing, a filter stone mounted for rotation with the shaft, a transmission disk surrounding the shaft and mounted for rotation independently of the filter element, said disk being provided with a peripheral flange having an opening formed therein, a swinging gate pivotally mounted within the casing, an abrading element carried by the swinging

gate, a guide ring slidably mounted within the casing and provided with spaced guide fingers, a segmental lever having its intermediate portion pivotally connected with the swinging gate and one end thereof disposed in engagement with the guide ring, the pivot of the lever being disposed between the fingers of the guide ring, and a rod having one end thereof connected with the segmental lever and its opposite end extended within the opening in the flange.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES L. GARDINER.

Witnesses:

HARRY L. BARKER,  
CHARLES E. SWEET.