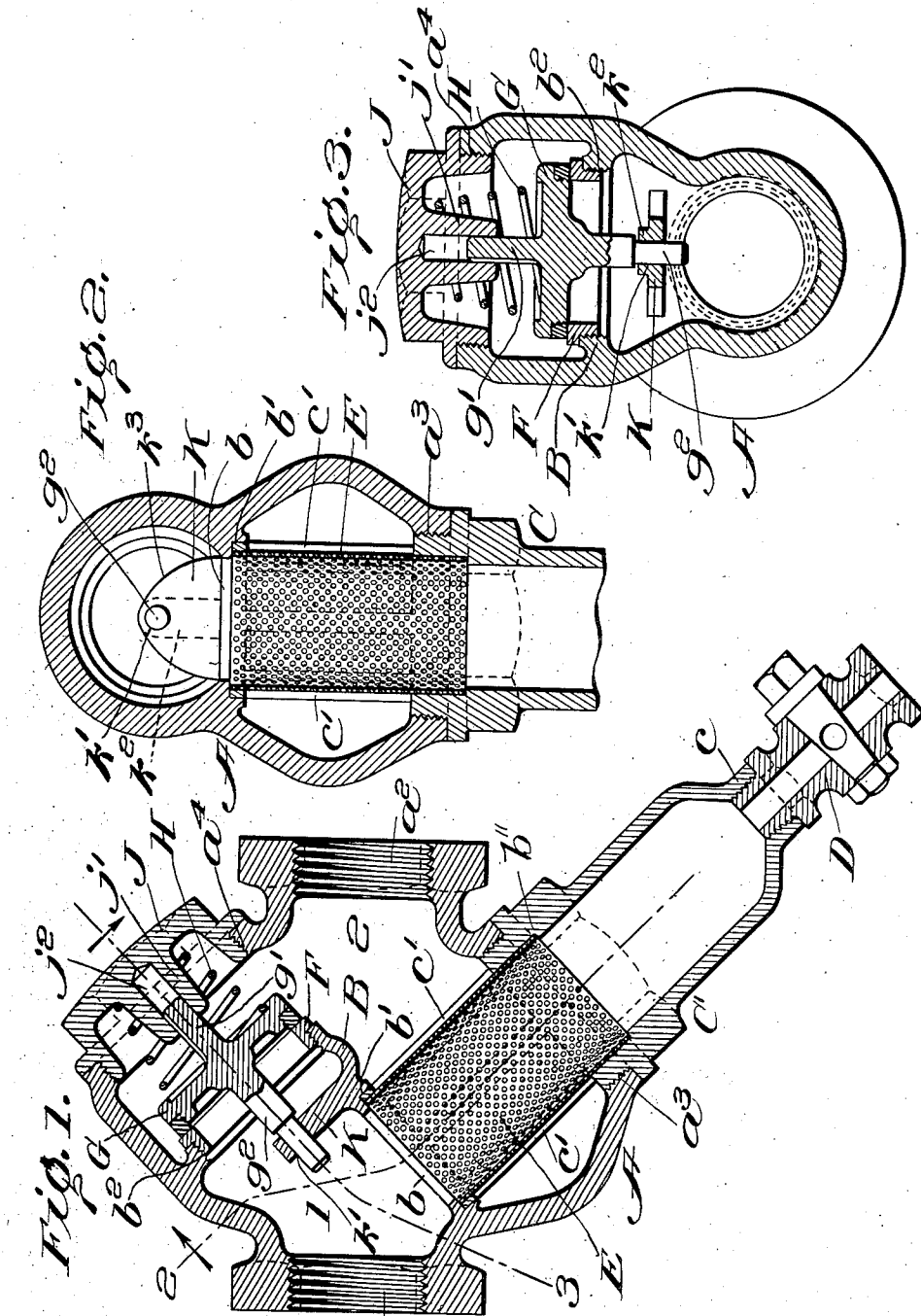


F. E. PENDLETON.
 SELF CLEANING FILTER.
 APPLICATION FILED APR. 2, 1908.

1,062,793.

Patented May 27, 1913.

2 SHEETS—SHEET 1.



Witnesses
 Allan H. Hoose,
 J. Richards

Inventor
 F. E. Pendleton
 By W. F. Maynard
 Attorney.

APPLICATION FILED APR. 2, 1908.

Patented May 27, 1913.

2 SHEETS—SHEET 2.



INVENTOR

F. E. Pevdleton

BY

b1
 Paul McGrath
 ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK E. PENDLETON, OF MONTCLAIR, NEW JERSEY.

SELF-CLEANING FILTER.

1,062,792.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed April 2, 1908. Serial No. 424,687.

To all whom it may concern:

Be it known that I, FRANK E. PENDLETON, a citizen of the United States, and a resident of Montclair, Essex county, and State of New Jersey, have invented certain new and useful Improvements in Self-Cleaning Filters, of which the following is a specification.

My invention relates to filters and has for its object to provide means for use in a line of water pipe to separate sand, gravel or any other solid material from the water passing through the pipe.

The device is so constructed that it is simple in operation, thoroughly reliable and may be easily taken apart for cleaning. The parts are also so constructed and arranged that the inner surface of the screen is kept clean by the flow of water and the suspended material is separated from the water by the greater weight and sudden change in the direction of the flow of water.

While the device is specially adapted for separation of sand or other material from water passing through the pipe, it is to be understood that it is not to be confined to this use, as it may be used also as a filter to separate dust, sand or any other material carried by any liquid, fluid or gas.

The invention is illustrated in the accompanying drawings forming a part of this application, in which:

Figure 1 is a longitudinal vertical section of the apparatus. Fig. 2 is a section on line 2 of Fig. 1. Fig. 3 is a section on line 3 of Fig. 1. Fig. 4 is a longitudinal section of a modification. Fig. 5 is a section of a detail. Fig. 6 is a perspective view of one form of the screen or filter used in my apparatus. Fig. 7 is a modification.

Referring to the drawings in which the same reference character indicates the same part in the several views: the part marked A represents a casing which may be made of cast iron, brass, or any other suitable material. This casing is provided with screw-threaded openings a^1 , a^2 , a^3 and a^4 . To the opening a^1 is threaded a pipe through which water is supplied to the casing, and to the opening a^3 is threaded a pipe which leads the water from the casing, said pipes not being shown on the drawing.

B is a wall dividing the casing into two compartments 1 and 2. In this wall is an opening b which is preferably circular. Around this opening on the side of the compartment 2 is a recess b^1 . The wall B is pro-

vided with another opening b^2 for a purpose to be hereinafter described.

C is a trap consisting of a short length of pipe or casting having one end c reduced and screw-threaded to receive a blow-off cock D. The wall of this pipe near its opposite end is cut away to form the openings c^1 . Fitted inside of this pipe and covering the openings is a screen E, preferably made of perforated metal, although in some cases wire mesh or other suitable material may be used. The exterior of the pipe or casting is provided with screw-threads which fit into the screw-threaded openings a^3 of the casing with its inner end in the recess b^1 of the wall B. The parts are so constructed and fitted that the opening b in this wall communicates with the inside of the trap C, and the openings c^1 in the wall of the trap preferably extend from the screw-threaded opening a^3 in the casing to the wall B. The trap is arranged at about an angle of 45° to the opening a^1 so that the device can be used equally well in a vertical or horizontal position, and the relative arrangement of the wall and the trap is such that the water passing through is suddenly changed in direction, causing a whirl or rotation in the water so that the sand, gravel or other solid material heavier than the water will be thrown to the bottom of the trap, which thereby forms a pocket C^1 , and the water flowing in the direction of the trap will impinge upon the inside of the screen and scour the same to keep it clean and free so that the water can readily pass through it. While the openings c^1 are shown rectangular, they may be any other shape. The screen E which covers these openings c^1 is shown as extending from the pocket C^1 to the wall-opening b and as being clamped between a shoulder formed by the recess b^1 and a shoulder b'' formed in the trap and surrounding the mouth of the pocket. Screw-threaded in the opening b^2 of the wall B is a valve seat F.

G is a relief valve which is held to this seat F by a spiral spring H, one end of which rests against the back of the valve and the other rests against the under side of the cap J which is screw-threaded in the opening a^4 . This cap has an inwardly projecting lug j^1 with a recess j^2 therein into which fits the outer stem g^1 of the valve. As shown, the spring surrounds the lug j^1 and the valve stem g^1 . The other side of the valve is provided with another stem g^2 .

which projects through an opening k^1 in the diaphragm K. This diaphragm is thickened at the center at k^2 , as shown, to strengthen the same and also to give a proper bearing for the valve stem g^2 . This valve, it is seen, projects at substantially right angles from that part of the wall in which is the opening b^2 , and the outer edge of this diaphragm is curved at k^3 so that its greatest area is adjacent to the wall B, as more clearly shown in Fig. 2 of the drawing. By making the diaphragm this shape it covers the full area of the projected stream of water and no more, leaving as large an opening as possible around it for the flow of water when the valve is unseated. This diaphragm acts as a baffle to hold back the sediment carried by the water, and it prevents the same from lodging under the relief valve. This sediment, if not held back, would in course of time clog under the relief valve and prevent the same from freely opening. As shown, the valve is arranged at an angle of about 45° to the inlet opening a^1 . This permits a more compact construction and lessens the resistance to the flow of water when the valve is unseated.

The operation of the apparatus is as follows: Water being forced through the opening a^1 with the valve seated will enter the compartment 1, pass into the trap C and through the screen into the compartment 2, and out through the opening a^2 through a pipe not shown. Any sand or other material to be separated will be held back by the screen and thrown to the bottom or pocket C^1 of the trap to be removed through the blow-off cock D at the proper time without removing any of the parts. If by any means the screen should become clogged so that water will not pass freely from the compartment 1 to the compartment 2 through the trap, and the pressure in the first compartment becomes sufficiently high to unseat the relief valve G, the water will then pass to the second compartment through the opening b^2 upon the unseating of the relief valve G.

The diaphragm K, as above stated, is so constructed and arranged that the sediment will be kept back from the valve so that the valve will be readily unseated, and also the area of the diaphragm is such that there will be a free flow of water when the valve is unseated.

The trap C is so constructed that it can be readily removed from the casing A for cleaning, repairing, or any other purpose.

While I have shown in the assembled construction a screen consisting of circular perforations, Fig. 6, yet it is to be understood that I may use such a screen as shown in Fig. 7, or any other suitable screen. In some cases it may not be necessary to provide

the casing with the relief valve G. When such a valve is to be dispensed with the device may be simplified and constructed as shown in Fig. 4 of the drawing.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention could be made without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

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

1. In a device of the class described, a casing having an inlet opening and an outlet opening and an opening to receive a trap, a wall in the casing dividing said casing into an inlet and an outlet compartment, said wall having two openings therein one of which communicates with the trap, said trap extending into the outlet compartment and having openings therein which permit free communication from the inlet to the outlet compartment through the opening in said wall, a screen covering the opening in the trap, and a relief valve normally closing the other opening in said wall.

2. In a device of the class described, a casing having an inlet opening and an outlet opening, a wall inside of the casing dividing the same into two compartments, two openings in said wall, a trap communicating with one of said openings, said trap consisting of a tube projecting into one of the compartments and having an opening in the wall thereof which will permit free communication from one compartment to the other through said opening in the wall, a screen covering the opening in the trap, a diaphragm projecting from said wall, and a relief valve normally covering the other opening in the wall.

3. In a device of the class described, a casing having an inlet opening and an outlet opening, a wall inside of the casing dividing the same into two compartments, two openings in said wall, a trap communicating with one of said openings, said trap consisting of a tube projecting into one of the compartments and having an opening in the wall thereof which will permit free communication from one compartment to the other through said opening in the wall, a screen covering the opening in the trap, a diaphragm projecting from the wall and having its greatest area adjacent to said wall, and a relief valve normally covering the other opening in the wall.

4. In a device of the class described, the combination with a casing having an inlet and an outlet that are oppositely disposed and in substantial alinement, of an inclined

partition wall interposed between the inlet and outlet and having an opening there-through and another opening in the lower wall of the casing in line with the partition
5 wall opening, a trap pocket detachably secured in the casing opening and depending from the casing, said pocket having an upper open mouth and a shoulder therein, an open ended tubular screen having its upper end
10 abutted against the partition wall and surrounding the opening therethrough and its

lower end fitted into the mouth of the pocket and abutted against the shoulder therein, and a draw-off cock carried by the lower depending end of the pocket.

15

In witness whereof I have hereunto set my hand at the city, county and State of New York, this 31st day of March, 1908.

FRANK E. PENDLETON.

In presence of—

ALLAN W. FOOSE,

I. RICHARDS.
