

No. 827,780.

PATENTED AUG. 7, 1906.

F. BENOIT.
FILTER.

APPLICATION FILED SEPT. 6, 1904.

Fig. 1

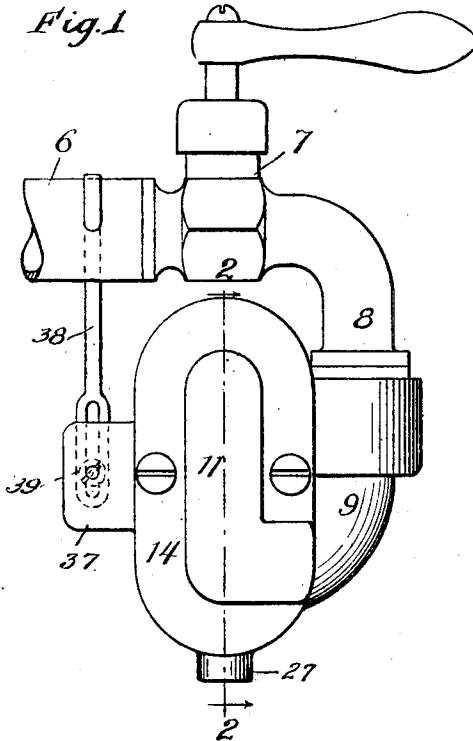


Fig. 2

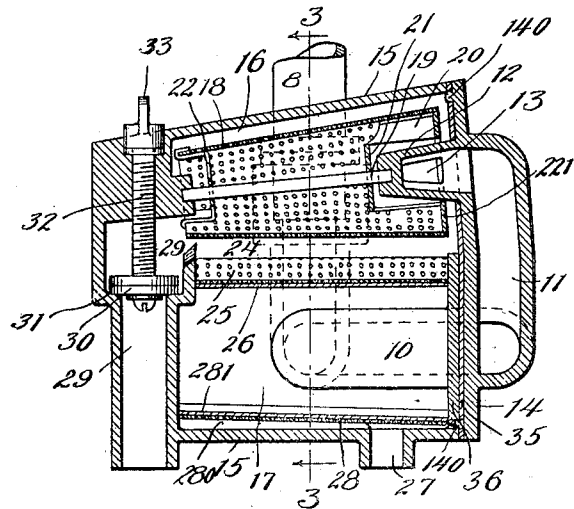


Fig. 4

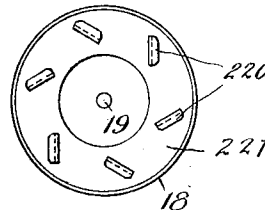


Fig. 5

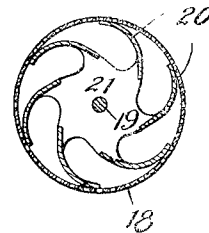
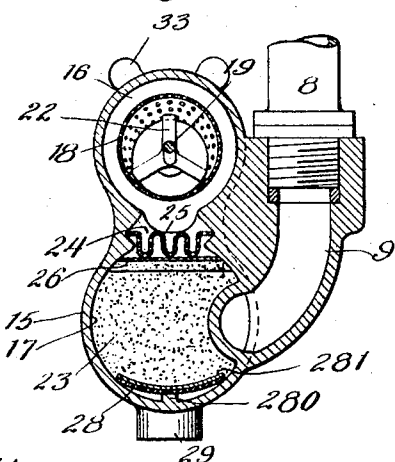


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

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FILTER.

No. 827,780.

Specification of Letters Patent

Patented Aug. 7, 1906.

Application filed September 6, 1904. Serial No. 223,328.

To all whom it may concern:

Be it known that I, FREDERICK BENOIT, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Filters, of which the following is a specification.

This invention relates to filters adapted to be attached to hydrants.

The nature of the filter, which is intended to be an improvement upon previous constructions, is fully disclosed in the subjoined description and in the accompanying drawings, forming a part of such description; and the invention consists in the novel construction of parts and devices and the novel combinations of parts and devices hereinafter set forth.

Referring to said drawings, Figure 1 is an elevation of the invention and the faucet to which it is attached. Fig. 2 is a section of the filter on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Fig. 2. Fig. 4 is an end view, and Fig. 5 a vertical section, of the rotary separator.

In said drawings, 6 represents the hydrant or water-supply pipe, and 7 the faucet controlling the discharge of the water and which may be of any desired construction. My improved filter may be attached directly to the discharge-nozzle 8 of the faucet, as best shown at Fig. 3, the nozzle being threaded into the upper end of the receiving-passage 9 of the filter. Passage 9 connects with a horizontal passage 10, and this in turn leads into a vertical passage 11, which opens into the hollow stud 12, having a port 13 in its side. This stud 12 and also the passage 11 may be formed integral with the removable end or cap 14.

The main body or casing 15 of the filter is divided into two horizontal chambers, preferably cylindrical in form and as shown at 16 and 17. The stud 12 enters the upper one of these and delivers the water thereto. In this upper chamber, which I call the "separator-chamber," I locate a perforated rotatable cylinder 18, supported upon a pivot-wire 19, one end of which is supported in a recess formed in the inner end of stud 12 and the other end in a recess formed in the end wall of chamber 16. In the receiving end of the perforated cylinder I arrange a series of tangential wings

or blades 20, preferably curved into the form shown at Fig. 5 and so locate them relative to the stud 12 that the water as it issues from the port 13 in the side of the stud strikes them and causes thereby rotation of the cylinder, the blades forming a water-wheel very analogous to the "turbine-wheels," so called. By this construction the cylinder is caused to rotate quite rapidly when the water is under full headway and less rapidly when the force and speed of the current is abated. The cylinder is supported from the pivot-wire 19 by the head 21, which may be integral with the blades, and by the spider 22 at the inner end of the cylinder, and the blades are secured at their free ends by means of integral lips 220, which pass through openings in and are bent down upon an annulus 221.

The chamber 17 contains a body of charcoal 23 or other filtering medium, and hence may be called the "filtering-chamber." A longitudinal opening 24 is formed between chambers 16 and 17, and in this passage I place the corrugated perforated metal strip 25 and the flat perforated strip 26, the former over the latter. The water escaping from the separator-chamber by way of passage 24 moves through the strips 25 and 26 into the filtering-chamber and after percolating through the filtering medium passes out at the bottom opening 27, which is guarded by a screen 28, supported upon a rib 280 to prevent the loss of the filtering material. A layer of cloth or filtering-paper 281 is also preferably laid over the screen 28, so the fine charcoal may not escape with the water.

The separator-chamber is also given a second outlet at its inner end. This outlet, which is shown at 29, is provided with a valve 30 and a seat 31 for such valve, and the stem 32 of the valve is threaded in the metal of the filter-casing and extends to the outside of the filter and is there provided with a thumb-piece 33, whereby it may be turned. This outlet is located so that it is adapted to give exit to such of the water and matter carried thereby as pass longitudinally through the separator-cylinder instead of escaping through its side perforations, and it will be noted that the cylinder extends in the direction of the outlet 29 to a point beyond the opening 24, so that the cylinder retains control of the solids and impurities until they have passed so far

beyond the said opening that they do not find their way into it, but instead are more likely to be drawn into outlet 29.

In practice the valve 30 is not usually closed, because it is always desirable to give free escape to all such solids and impurities as may be separated from the body of water by the revolving cylinder. I prefer to keep it open partially while filtering, so a part only of the water will be caused to move through the filtering-chamber, while the escape of the solids, &c., is permitted by the outlet 29. This outlet is also adapted to prevent excessive pressure on the water in the filtering-chamber by diverting a portion of the water from said chamber. The separator, in conjunction with the outlet 29, relieves the filtering-chamber of much of the work of purification, and consequently the latter does not need to be cleansed so often as it would otherwise.

The cleansing of the filtering medium in chamber 17 is effected whenever needed by wholly closing valve 30 and turning on the full force of water at the faucet 7. At other times I prefer to open said valve part way and also to open faucet 7 partially. When the full volume of water is desired to be drawn without filtering, it is only necessary to open valve 30 widely.

It will be noted that all the water treated in the filter first enters the revolving cylinder 18, by which it is thoroughly agitated and thrown into commotion. In this commotion any solids or coagulated bodies in the water too large to pass through the perforations of the cylinder work their way to the inner end of the cylinder and pass out by outlet 29. In this manner a separation of the larger solids and coagulated globules from the mass of the water is effected, much resembling the bolting operation in flour-making.

A packing 35 is inserted between the cap 14 and the body of the casing, and a retainer-piece 36 of rubber or the like, is placed in the end of chamber 17 to confine the filtering material. The filter may be supported additionally by the wing 37 cast upon the casing and the hook 38, grasping the supply-

pipe 6, as seen at Fig. 1, and attached to said wing by the set-screw 39, the hook having an elongated slot to receive the screw. This wing-and-hook connection may also be relied upon as the sole support of the filter in cases where the nozzle 8 is not threaded. The cap 14 is preferably provided with lugs 140 for positioning the packing 35.

By turning on the full force of the water and closing valve 30, as stated, the separating-chamber will be flushed and any accumulations of dirt, &c., carried off. It will be noted that the axis of cylinder 18 is inclined downward in the direction of the movement of the water. This is a feature of value, as it facilitates the movement toward the outlet 29.

I claim—

1. A filter wherein are combined a filtering-chamber, a separating-chamber having a perforated cylinder rotated by the incoming water and communicating with the filtering-chamber, and a separate outlet for the matter separated by said cylinder.

2. A filter wherein are combined a filtering-chamber, a separating-chamber having a perforated cylinder rotated by the incoming water and communicating with the filtering-chamber, and a separate valved outlet for the matter separated by said cylinder.

3. A filter for use upon hydrants having a main passage for the water, a separating-chamber located in and forming part of said passage, said separating-chamber having a moving separating device actuated by the water, and a filtering-chamber receiving water from said separating-chamber and having a separate outlet.

4. A filter for use upon hydrants having a main passage for the water, a separating-chamber located in and forming part of said passage, said separating-chamber having a rotating separating device and a winged wheel for operating same, and a filtering-chamber receiving water from said separating-chamber and having a separate outlet.

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Witnesses:

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