

No. 866,433.

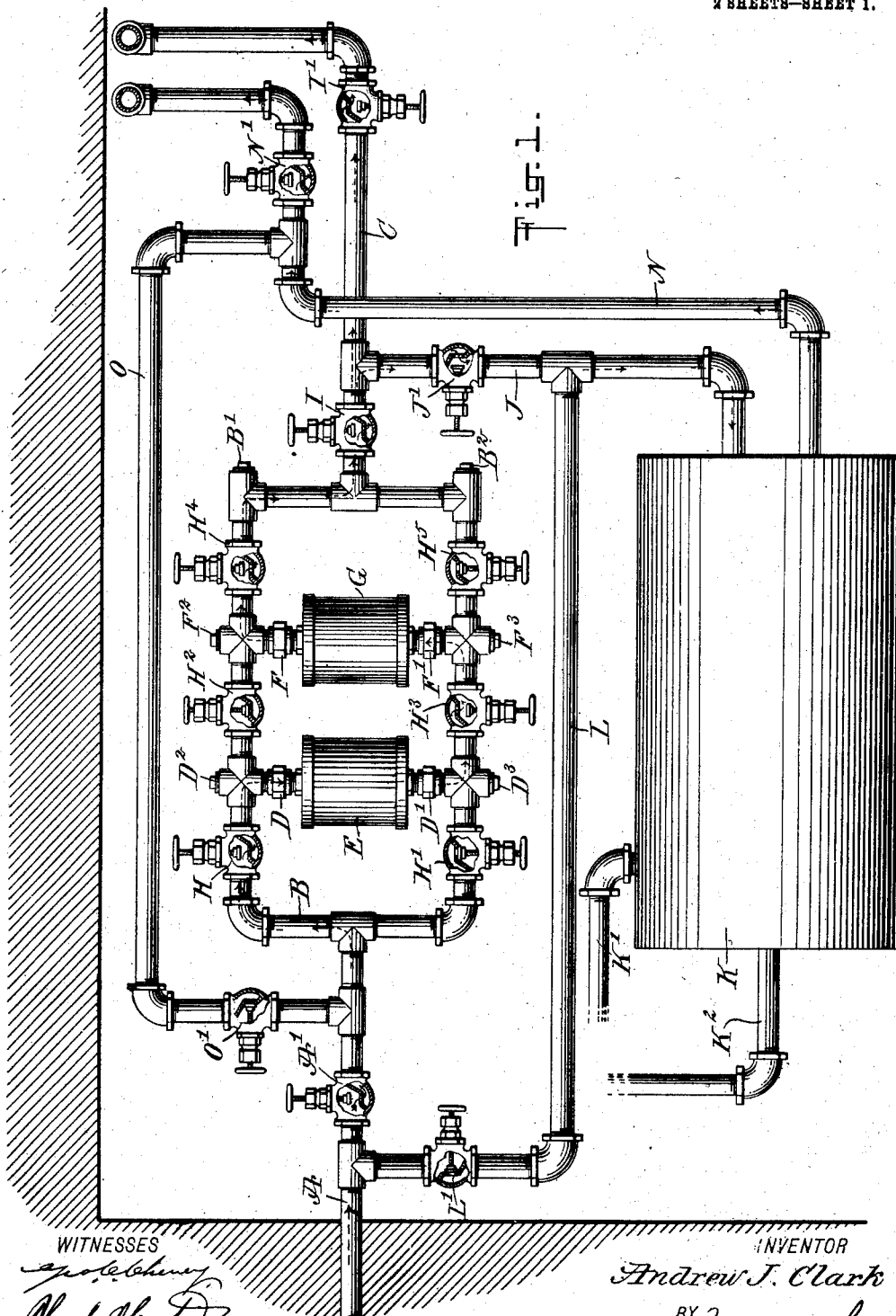
PATENTED SEPT. 17, 1907.

A. J. CLARK.

FILTER.

APPLICATION FILED MAY 10, 1907.

2 SHEETS—SHEET 1.



WITNESSES

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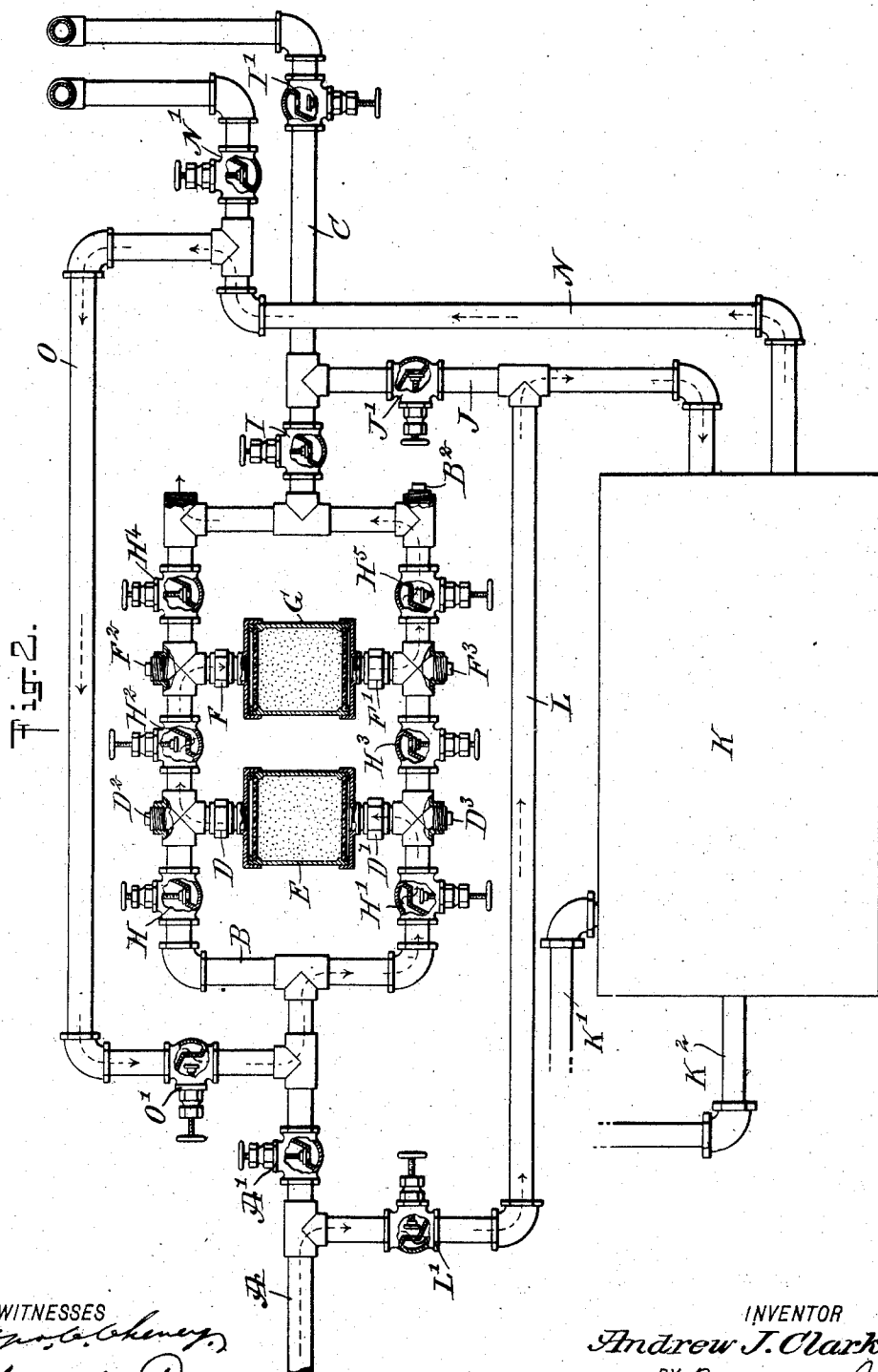
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WITNESSES

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FILTER.

No. 866,433.

Specification of Letters Patent.

Patented Sept. 17, 1907.

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To all whom it may concern:

Be it known that I, ANDREW J. CLARK, a citizen of the United States, and a resident of Santa Cruz, in the county of Santa Cruz and State of California, have invented a new and Improved Filter, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved filter, arranged to insure a thorough filtering of the water or other liquid, and to permit convenient and quick cleaning of the filter whenever it is desired to do so.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the views.

Figure 1 is a side elevation of the improvement, the valves being shown in section and in position for filtering the liquid, and Fig. 2 is a like view of the same, showing the valves in position for cleaning the filter.

The supply pipe A having a valve A' is connected with a continuous or endless pipe B, from which leads the discharge pipe C, conducting the filtered water to a suitable place of discharge. The endless pipe B is connected by branch pipes D, D' with the ends of a filtering cylinder E, containing charcoal, pumice stone or other suitable filtering material, and the said endless pipe B is also connected by branch pipes F and F' with another filtering cylinder G of the same construction as the filtering cylinder E. Any desired number of filtering cylinders, such as shown at E and G may be connected in the manner described with the endless pipe B.

The endless pipe B is provided with a number of valves H, H', H², H³, H⁴ and H⁵, of which the valves H and H' are arranged between the supply pipe A and the branch pipes D, D', the valves H², H³ are arranged between the branch pipes D, F and D', F', and the valves H⁴, H⁵ are arranged between the branch pipes F, F' and the discharge pipe C, will be readily understood by reference to the drawings.

The discharge pipe C is provided with two valves I and I', and from the said discharge pipe C at a point between the valves I, I' leads a pipe J to a hot water tank K of any improved construction and which may be connected by pipes K', K² to the ordinary range or cooking stove for heating, or the hot water tank K may be heated by other suitable means. The pipe J is provided with a valve J', and from it leads at a point between the valve J' and the tank K a supply pipe L having a valve L' and connected with the main sup-

ply pipe A in the rear of the valve A'. From the hot water tank K leads the hot water supply pipe N to a suitable place of discharge, and the said pipe N is provided with a valve N', and from the pipe N at a point between the tank K and the valve N' leads a pipe O to the main supply pipe A; at a point between the valve A' and the endless pipe B the pipe O is provided with a valve O'.

Now when it is desired to send the liquid to be filtered successively through the filtering cylinders E and G, the valves H, H³, H⁴, I, I', J' and N' are opened, while the valves H', H², H⁵, L' and O' are closed, as indicated in Fig. 1, so that the water flows from the main supply pipe A into the endless pipe B, and through the valve H into the branch pipe D, to then pass through the filtering cylinder E and out of the same by way of the branch pipe D' back into the endless pipe B through the open valve H³ into the branch pipe F' and through the filtering cylinder G, but in a reverse direction in which the liquid was flowing through the filtering cylinder E. The filtered liquid after leaving the filtering cylinder G passes through the branch pipe F back into the endless pipe B, and through the valve H⁴ into the discharge pipe C, from which the filtered water can flow to its place, that is, when the valve J' is opened, a portion of the filtered water may flow into the hot water tank K to be heated therein and pass by the hot water pipe N to a place of discharge.

From the foregoing it will be seen that the water or other liquid to be filtered passes successively through the filtering cylinders E, G and the filtering material contained therein, so as to render the liquid absolutely pure, it being understood that more than two such cylinders can be used, as previously explained, and the water or other liquid is passed through the same in succession by having the proper connections with the endless pipe B.

Now when the liquid to be filtered is not very impure and it is desired to filter a large quantity of such liquid in a comparatively short time, then the liquid can be sent simultaneously through both filtering cylinders E and G, and in this case the valves H⁴ and H' are closed, while the valves H, H², H³ and H⁵ are opened, and consequently the water B can pass simultaneously through both branch pipes D and F, into and through the filtering cylinders E and G, to then pass out of the same, by the branch pipes D', F' back into the endless pipe B, and from the latter by way of the open valves H³, H⁵ into the discharge pipes C and J.

When it is desired to clean the filter, the liquid is caused to flow in the reverse direction through the filtering cylinders E and G, and for this purpose it is necessary to open the valves H', H², H⁵, I and I' and to close the valves H, H³, H⁴, O' and L', so that the water

flows successively through the filtering cylinders E and G, but in a reverse direction from the one previously explained, so that the impurities are carried out of the filtering cylinders E and G. to be discharged through the pipe C into a sink or other suitable place of discharge. By this arrangement the filtering material contained in the filtering cylinders E and G is fresh and clean as well as the pipes, and this operation can be conveniently carried out at any time. When, however, it is desired to thoroughly clean the filter then a cleaning compound such as lye or the like is used and introduced into the endless pipe B by way of a removed plug D² or D³ at the ends of the branch pipes D, D', and after the cleaning compound has been introduced, the corresponding plug is returned, and then the valves A', J' and N' are closed and the valves L', O' are opened, to permit the cold water from the main supply pipe A to pass under full force by way of the pipes L and J into the hot water tank K, in which the water is heated. The hot water then under full force passes by way of the pipes N and O into the supply pipe A in front of the valve A', to then pass into the endless pipe B and by way of the open valve H or H' to the lye or other cleaning compound, to take the same along and through the filtering cylinders E and G, to finally discharge the water impurities and lye by way of the discharge pipe C into a sink or other place of discharge. Thus by the arrangement described, boiling hot water together with lye or other cleaning material is forced through the cylinders E and G in either direction or simultaneously, as the operator desires, it only being necessary for the operator to open and close the corresponding valves in the endless pipe B, to govern the direction of the flow through the filtering cylinders E and G.

If desired, the water, lye and impurities instead of being discharged through the pipe C may be directly discharged from the endless pipe B, and for this purpose it is necessary to close the valve I and remove the corresponding end plug B' or B² in the endless pipe B (see Fig. 2), located at points between the valves H⁴, H⁵ and the beginning of the discharge pipe C.

Although I have shown and described one preferred mode of filtering the liquid, it is evident that the apparatus may be varied without deviating from the spirit of my invention, and hence I do not limit myself to the particular construction and arrangement of pipes and valves, as above described and illustrated in the drawings.

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

1. A filter comprising a plurality of filtering cylinders each provided with filtering material, pipes connected with the ends of the said cylinders and with each other to form an endless pipe, a supply pipe leading to the said endless pipe, a discharge pipe leading from the said endless pipe, valves in the said pipes for controlling the flow of the liquid to be filtered in such a manner that the liquid flows from the said supply pipe successively through the plurality of filtering cylinders and then to the discharge pipe, or flows in reverse direction through the said filtering cylinders for cleaning purposes, and a hot water tank having valved pipe connections with the said supply pipe and the said discharge pipe.
2. A filter comprising an endless valved pipe connected with a water supply and with a discharge, a plurality of filtering cylinders provided with filtering material and each connected at both ends with the said endless pipe, and cleaning plugs in the endless pipe adjacent to the ends of the said filtering cylinders.
3. A filter comprising an endless valved pipe connected with a water supply and with a discharge, a plurality of filtering cylinders provided with filtering material and each connected at both ends with the said endless pipe, and discharge plugs in the endless pipe at the outlet thereof.
4. A filter comprising a plurality of filtering cylinders, each provided with filtering material, pipes connected with the ends of the said cylinders and with each other, to form an endless pipe, a supply pipe leading to the said endless pipe, a discharge pipe leading from the said endless pipe, and means in connection with the pipes for controlling the flow of the liquid to be filtered, whereby to pass said liquid through all or any of the filters and in either direction.

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

ANDREW J. CLARK.

Witnesses:

HUGH S. GORDON,
H. E. MACKENNEY.