

(No Model.)

2 Sheets—Sheet 1.

H. ROESKE.

FILTER.

No. 402,543.

Patented Apr. 30, 1889.

Fig. 1.

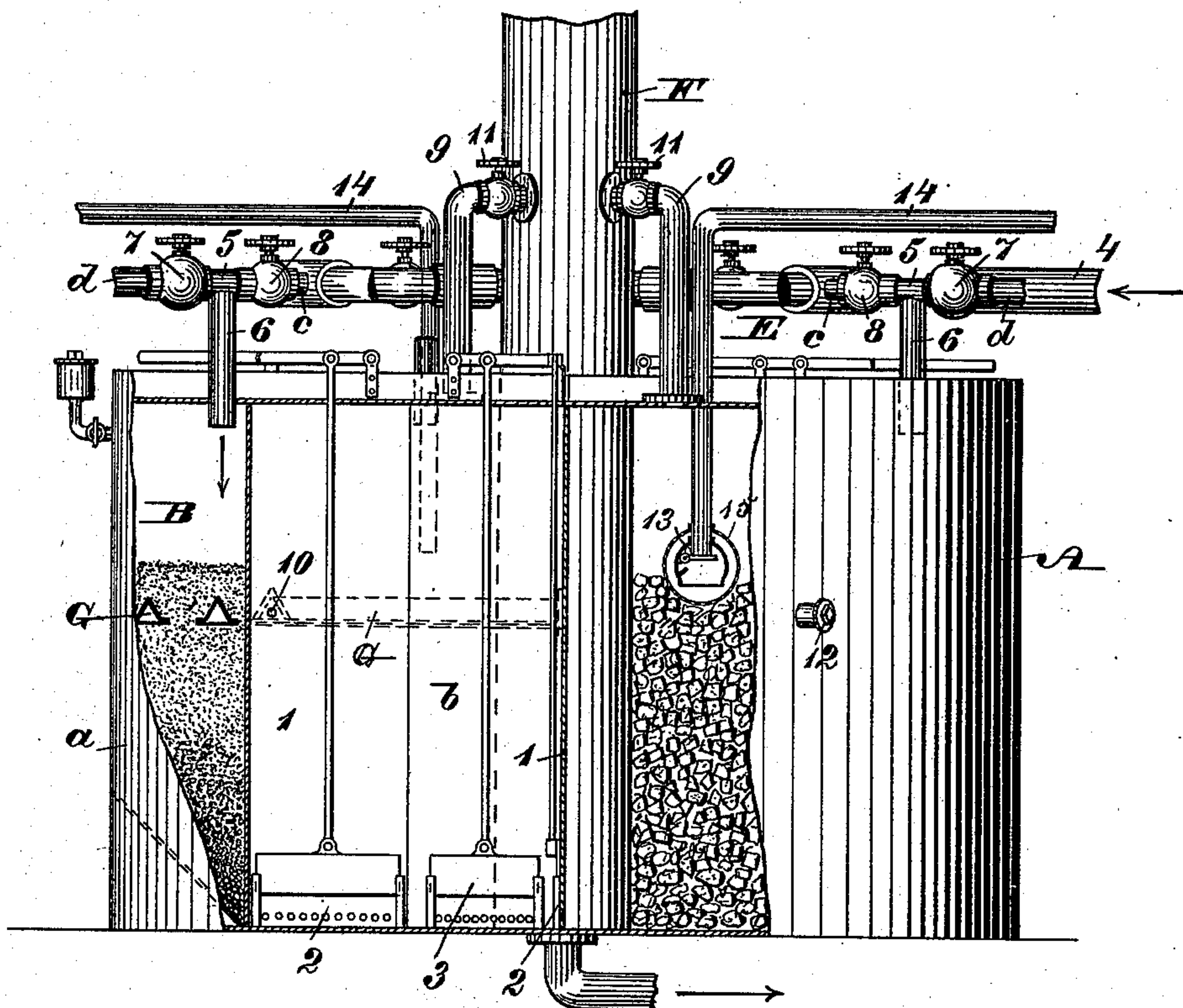
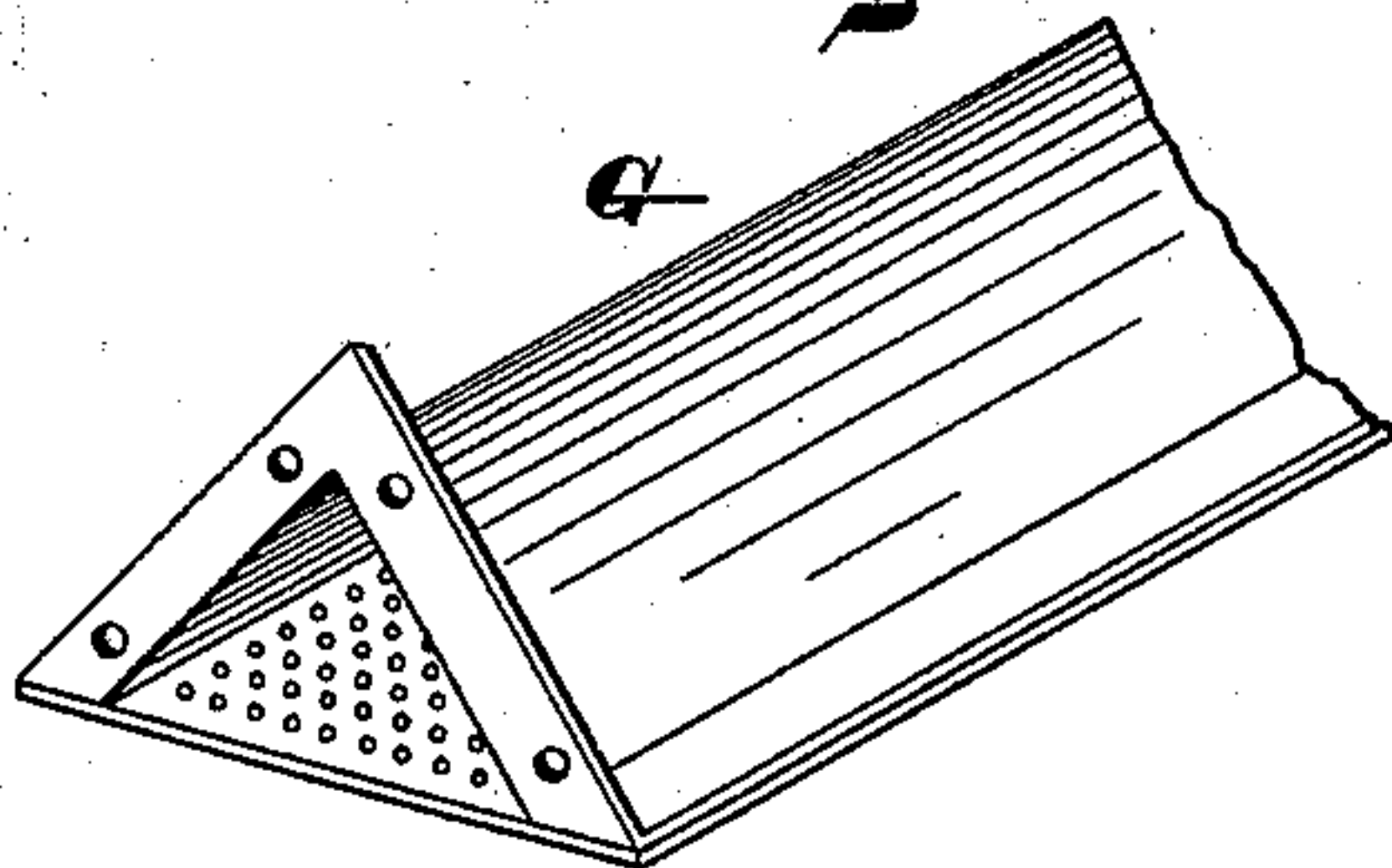


Fig. 3.



Witnesses.

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(No Model.)

2 Sheets—Sheet 2.

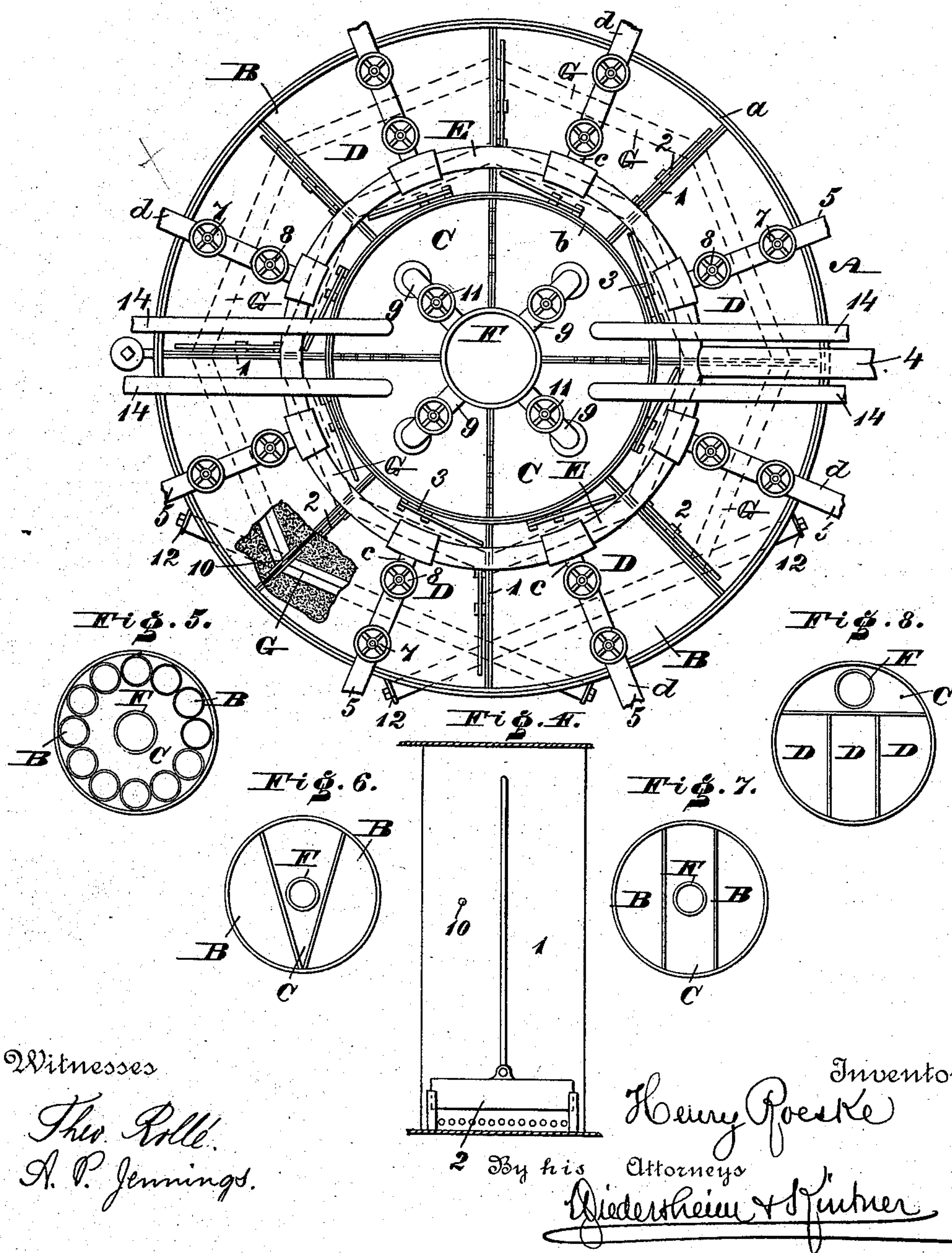
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Fig. 2.



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UNITED STATES PATENT OFFICE.

HENRY ROESKE, OF PHILADELPHIA, PENNSYLVANIA.

FILTER.

SPECIFICATION forming part of Letters Patent No. 402,543, dated April 30, 1889.

Application filed October 27, 1888. Serial No. 289,268. (No model.)

To all whom it may concern:

Be it known that I, HENRY ROESKE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Filters, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a filter formed of a double-chambered tank, the primary chamber having compartments which may be placed in and out of communication with each other and with the secondary chamber, the latter being in communication with a stand-pipe as the exit for the filtered fluid. By this provision the fluid will be found to be effectively filtered.

The invention also consists of means for flushing or cleansing the filter, as will be hereinafter fully set forth.

It also consists of other novel features, as will be described and claimed.

Figure 1 represents a partial side elevation and partial vertical section of a filter embodying my invention. Fig. 2 represents a top or plan view thereof, partly broken away. Fig. 3 represents a perspective view of a detached portion on an enlarged scale. Fig. 4 represents a view of a portion of one of the partitions detached. Figs. 5, 6, 7, and 8 represent top or plan views of different-shaped tanks on reduced scales.

Similar letters and numerals of reference denote corresponding parts in the several figures.

Referring to the drawings, A represents a closed tank constructed with concentric walls *a b*, in the form of an annulus, producing two chambers, B C. Within the outer or filtering chamber, B, are vertical partitions 1, which extend radially and divide said chamber into a number of compartments, D, each partition having at bottom a valve, 2, whereby the several compartments may be placed in and out of communication. At the bottom of the wall *b* there are valves 3, which are located relatively to the compartments D, whereby the inner chamber, C, may be placed in and out of communication with said compartments. The valves are connected with suitable stems, the handle portions or levers whereof are within convenient reach outside of the filter.

Supported above the filter is a fluid-distributing pipe, E, in the present case of circular form, the same having connected with it a supply-pipe, 4, and branch pipes 5, the latter extending radially therefrom and having depending pipes 6, said pipes 6 passing through the top wall of the filter and opening into the filtering-chamber B. Each branch pipe 5 is provided with two valves, 7 and 8, for purposes to be hereinafter explained.

Within the chamber C is a stand-pipe, F, which is tightly connected with the top and bottom walls of said chamber and in communication with said chamber by means of pipes 9, which are secured to the stand-pipe and top wall of the chamber.

The stand-pipe may have an outlet at top or bottom, or both, as desired.

Within the chamber B are flushing and cleansing flues or canals G, which are of triangular form in cross-section, so as to have peaked roofs for causing the descending fluid to be deflected down said roof to the sides thereof, preventing clogging of the bottoms of the flues, which bottoms, being perforated, are in communication with the chamber B, it being noticed, however, that the flues are located within the filtering material or bed of said chamber. The filtering material employed in the chamber B is preferably gravel, sand, &c., and that in the chamber C is preferably coke in granular or crushed condition.

One end of each of the channels G leads from an opening or port, 10, in the partition 1 of the chamber B, the other end either being connected with a plug, 12, on the outer wall of the chamber or connected with another channel at an opening or port, 10, so as to form a continuous channel or passage through two compartments, D. A number of the channels G may be thus connected, as shown in Fig. 2, so as to form a continuous passage nearly around the chamber before it finds an outlet to the atmosphere at a plug, 12.

The pipes 9 are provided with valves 11 for opening and closing communication between said pipes and the stand-pipe F. At the outer ends of the flues G are plugs 12, which are screwed to the wall *a*, whereby said ends may be opened and closed.

In order to introduce steam or hot water into the chamber C when so required, I em-

ploy pipes 14, which enter said chamber and are connected with a steam-generator, said pipes having check-valves 13 at their discharge ends.

5 The operation is as follows: The valves 7 are closed and the valves 8 opened by proper rotation of the same. The outer ends of the flues G are also closed by means of the plugs 12. The valves 3 are opened, so that the
10 chambers B C are in communication. The valves 2 may also be opened, so that several compartments D are also in communication. Water or fluid to be filtered is admitted into the distributing-pipe E through the supply-
15 pipe 4 and reaches the branch pipes 5, from whence it is directed by the pipes 6 into the chamber B or compartments D thereof. The fluid now flows downwardly through the filtering material and passes through the valves
20 2 into the secondary chamber C, in which it rises, and so reaches the pipes 9, by which it is directed into the stand-pipe F, and thus conveyed to the place of service. It will be seen that the fluid is effectively filtered in its pas-
25 sage through the chambers B C, owing to the different filtering materials therein.

In order to flush or cleanse the filter, each compartment D is flushed or cleansed separately. For this purpose I close the valves
30 11 of the pipes 9, open the valve 7 of the desired compartment, and close the valve 8 thereof. The water or fluid supplied now enters the several compartments, excepting the one to be flushed or cleansed, and reaches
35 the latter-named compartment through the bottom valves, 2. The fluid reversed then rises and so reaches the pipe 6 of said compartment, the same now serving as an exit and discharging the impure fluid through the
40 outer end, *d*, of the branch 5. The fluid in the several compartments also enters the flues G through the perforated bottoms thereof, and passes from one compartment to another through the ports 10 in the partitions 2. As
45 the fluid escapes from the flue in the compartment to be flushed or cleansed, it rises through the filtering material to the pipes 6, said material thus being subjected to two volumes of ascending fluid, that at the bot-
50 tom entering through the valve 2, and that near the top from the flue G. By these means the filtering material is raised and loosened, whereby the impurities may be liberated and said material cleansed and refreshed.

55 The several compartments may be successively flushed or cleansed, as is evident.

As a larger volume of water is discharged during the cleansing and flushing operations than is supplied to the filtering chamber, and
60 the pipes 6 become the waste or discharge pipes, they are accordingly made of larger diameters or capacities than the inner ends, *c*, of the branch pipes 5 and the valves 8. The same is true of the valves 7, which are also
65 larger than the valves 8 of the outer ends of the branch pipes, *d*, which are larger than the inner ends, *b*, thereof, as will be seen in Fig. 1.

The check-valves 13 prevent the entrance of water into the steam-pipes 14, the outlet ends of which have connected with them guards
70 15, formed of a vessel of finely perforated or reticulated material, whereby the filtering substance is prevented from clogging the outlet ends of the steam-pipes and the check-
75 valves thereat. When the plugs 12 are unscrewed, the flues or canals may be cleansed through and through by a swab or other implement, it being evident that when the filter is being flushed or cleansed and said plugs
80 are removed some of the impure fluid may be directed from the compartments D to the exterior of the tank through the canals or flues G, said impure water leaving the filter-
85 ing material and entering said canals or flues through the open bottoms thereof, as has been stated.

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

1. A filter having a primary filtering-chamber
90 provided with partitions forming compartments, valves at or near the lower portions of said partitions, a secondary chamber in communication with the primary chamber, valves between said chambers, and discharge-
95 pipes connected with the secondary chamber, substantially as described.

2. A filter having an outer and an inner chamber, each divided into compartments, valves affording communication between said
100 compartments, a stand-pipe with pipes leading from each of said inner compartments, and a supply-pipe with branch pipes leading into each of said outer compartments, said parts being combined substantially as de-
105 scribed.

3. A filter having primary and secondary chambers, a supply-pipe, a distributing-pipe, a branch pipe connected with said distribut-
110 ing-pipe and primary chamber, two valves connected with the branch pipe, and a discharge-pipe with a valve connected with the secondary chamber, the parts named being combined substantially as described.

4. In a filter having a chamber with filter-
115 ing material therein, a flue having a peaked closed roof and perforated bottom located in said filtering material and connecting with a plug on the outer wall of the outer chamber, said parts being combined substantially as
120 described.

5. A filter having a partitioned chamber and a flue or canal within the filter-bed thereof, said flue being closed at top, perforated at
125 bottom, and open at its ends, one end communicating with the atmosphere through an opening in the outer wall of the chamber and the other end communicating with a parti-
130 tion of the chamber, the opening in said wall being provided with a closing cap or plug, the parts enumerated being combined substantially as described.

6. A filter having primary and secondary chambers, with means of communication be-

tween the same, a supply-pipe, a distributing-pipe, with a branch pipe connected with the primary chamber, two valves on the branch pipe, partitions in the primary chamber forming compartments, with valves between the same, a discharge-pipe connected with the secondary chamber, and flues or canals within the filter-bed of the primary chamber communicating with said chamber, the partition thereof, and the atmosphere, the several parts being combined substantially as described.

7. The distributing-pipe E, in combination with the branch pipe 5, attached thereto, having a conveying-pipe, 6, leading into the filtering-chamber, said branch pipe having valves 7 8, of different capacities, and said

conveying-pipe and the outlet end *d* of the branch pipe being of greater diameters than the inlet ends *c* of said branch pipe, substantially as described.

8. A filter having a filtering-chamber with partitions therein, the latter having ports affording communication between adjacent compartments, and channels leading from said ports to the atmosphere outside of said chamber, said parts combined substantially as and for the purpose set forth.

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Witnesses:

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