

No. 714,956.

Patented Dec. 2, 1902.

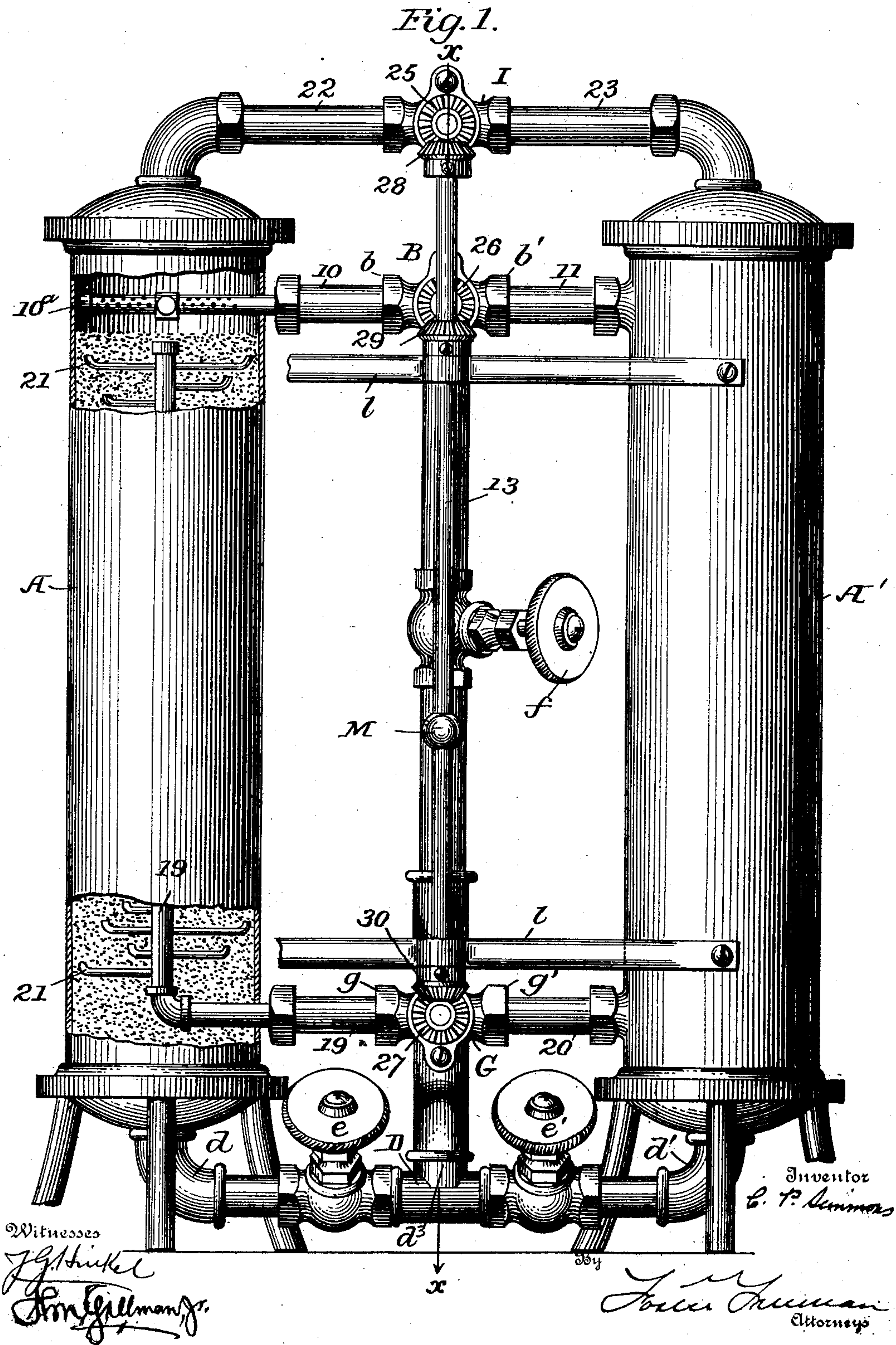
C. P. SIMMONS.

FILTER.

(Application filed Sept. 6, 1902.)

(No Model.)

2 Sheets—Sheet I.



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2 Sheets—Sheet 2.

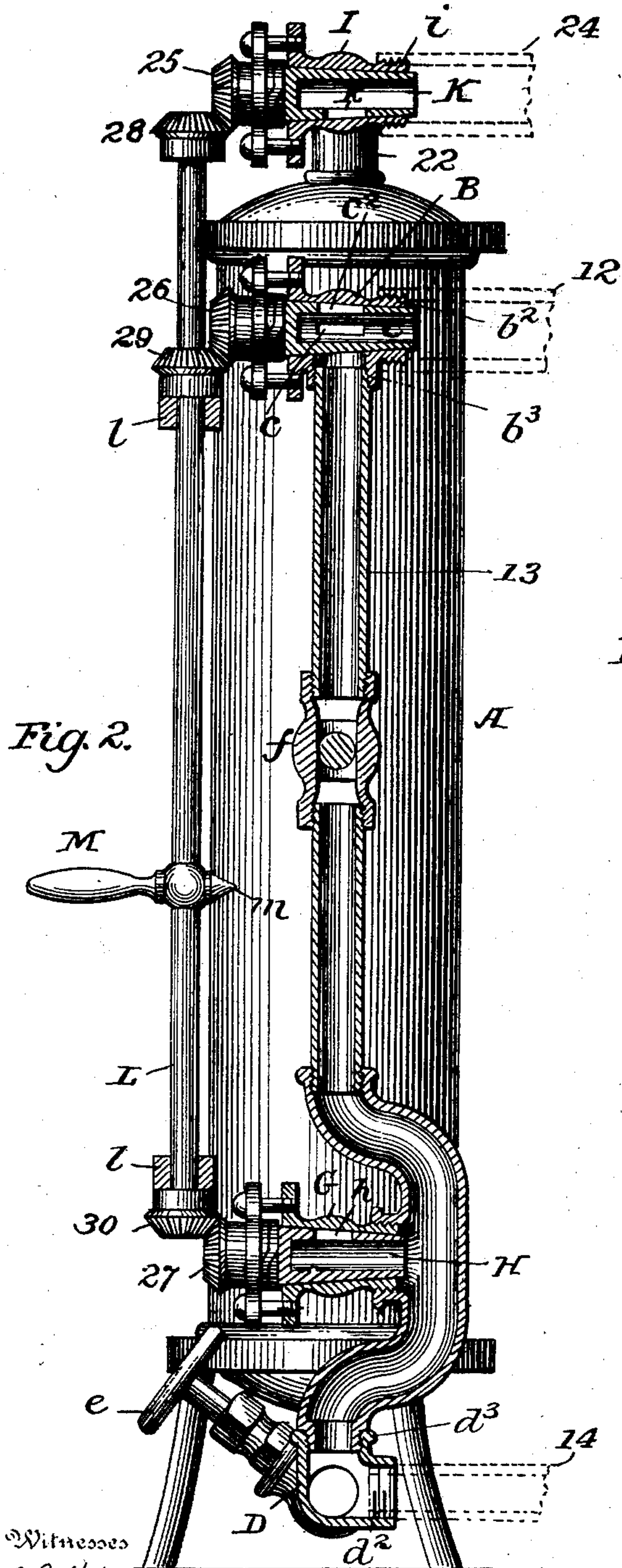
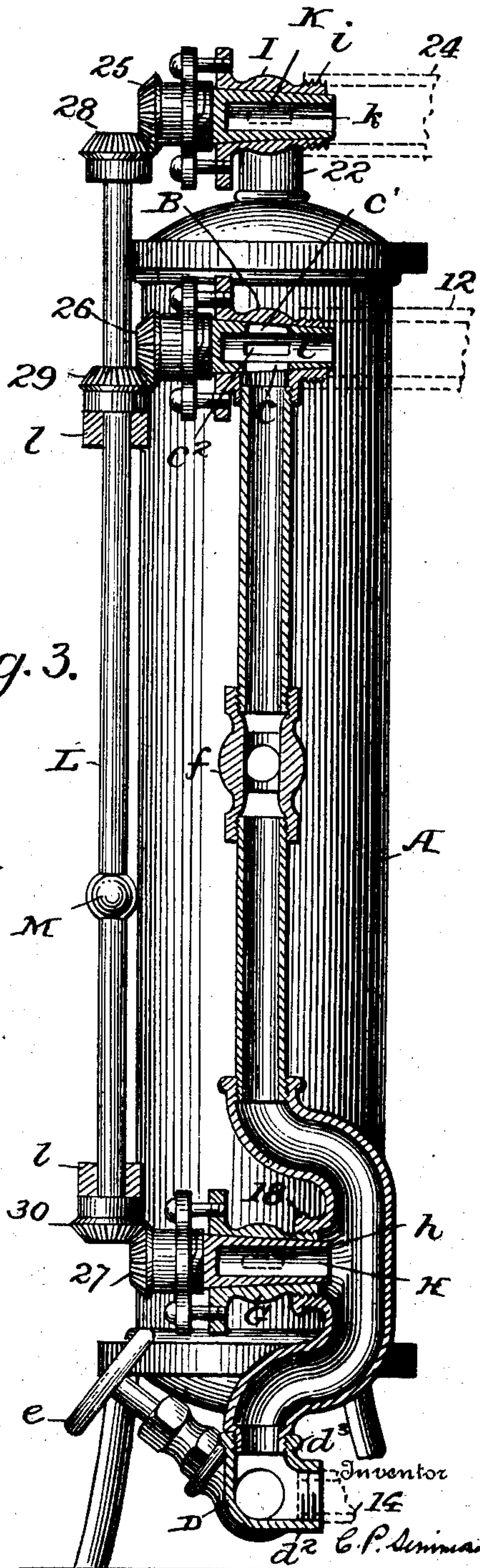


Fig. 2.

Witnesses
J. H. Hinkel
J. H. Hinkel

Fig. 3.



Inventor
C. P. Simmons
J. H. Hinkel
Attorneys

UNITED STATES PATENT OFFICE.

CHARLES P. SIMMONS, OF BALTIMORE, MARYLAND.

FILTER.

SPECIFICATION forming part of Letters Patent No. 714,956, dated December 2, 1902.

Application filed September 6, 1902. Serial No. 122,396. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. SIMMONS, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Filters, of which the following is a specification.

This invention relates to water-filters in which two filtering-chambers are employed; and the object of the invention is to provide a system of pipe connections between the two chambers and the inlet for the unfiltered water and the outlet for the filtered water and to provide such connections with valves and mechanism to operate a plurality of such valves simultaneously for the purpose of dividing and directing the flow of the incoming current of water in different directions, as may be desired.

The invention will be fully described hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, partly broken away, of a filter constructed in accordance with my invention. Figs. 2 and 3 are vertical sections taken on the line $x x$ of Fig. 1, showing the valves in different positions.

The filtering-chambers are indicated by A A' and are substantial duplicates of each other.

B indicates a valve-casing provided with four threaded nipples, (indicated, respectively, by b , b' , b^2 , and b^3), the first two being opposite each other in a horizontal plane. A pipe 10 extends from the nipple b into the upper end of the chamber A, and a similar pipe 11 extends from the nipple b' into the upper end of the chamber A', and the extensions, as 10^a, of these pipes 10 and 11 within the chambers are preferably perforated, as shown in Fig. 1. The supply-pipe 12 is connected to the nipple b^2 , and a pipe 13 is connected to the nipple b^3 , for a purpose to be hereinafter explained.

The chambers A and A' are provided with discharge-pipes d and d' , respectively, at their lower ends, and these pipes are connected to a coupling D, which, in addition to the two threaded nipples to which the pipes d and d' are connected, is provided with two threaded nipples d^2 and d^3 , to the former of which the service-pipe 14 is connected, while the lower end of pipe 13 is connected to the

nipple d^3 . Each pipe d d' is provided with a valve, (indicated, respectively, by e and e'), by means of which the flow of filtered water from the chambers may be cut off when desired.

Within the casing B is a hollow plug C, open at its inner end and provided with three lateral water-passages c , c' , and c^2 , adapted to register with the nipples b , b' , and b^3 , according to the position of the plug. The passages c and c' are opposite each other, and when the plug C is in the position shown in Fig. 2 the water from the supply-pipe 12 will enter the open end of the plug C, thence out through the passages c c' into pipes 10 and 11, respectively, and into the chambers A and A', where it will be filtered and delivered through pipes d and d' to the service-pipe 14, and this is the normal position of the parts.

The pipe 13 is provided with a valve f intermediate its ends, and near its lower end it is provided with a threaded nipple 18, to which is secured a valve-casing G, and this casing is provided with two nipples g g' , opposite each other, and from these nipples pipes 19 and 20 respectively lead into the lower ends of the chambers A and A', and these pipes extend upwardly within the chambers to a point just below the surface of the filtering material in said chambers. The upper ends of the pipes 19 and 20 are closed, and each pipe is provided with a large number of radiating branch pipes, (indicated by 21 in Fig. 1,) which branch pipes are of varying lengths and are bent up and left open at their outer ends, so that when water is supplied to the pipes 19 and 20 it will be discharged in a series of small jets from the pipes 21 throughout the body of the filtering material.

A hollow plug H is fitted to turn in the casing G, and its inner end is open in order that water from the pipe 13 may enter it. The plug is provided with a water-passage h , adapted to register with either of the nipples g g' , but normally—that is, when water is being filtered in both chambers A A'—this passage will be in the position indicated in Fig. 2, and no water can pass from the pipe 13 to either of the pipes 19 and 20.

From the upper ends of the chambers A A' pipes 22 and 23 respectively lead to a valve-casing I, provided with a threaded nipple i , to

which a waste-pipe 24 may be connected. A hollow plug K is fitted to turn in the casing I and is provided with a water-passage *k*, adapted to register with either of the pipes 22 and 23. Normally, however, this passage occupies the position shown in Fig. 2 and will not register with either of said pipes.

Each of the plugs K, C, and H is provided at its outer end with a bevel-pinion, (indicated, respectively, by 25, 26, and 27.)

L indicates a vertical shaft supported to turn in bearings *l l*, which are supported by the chambers A A', and to this shaft are adjustably secured bevel-pinions 28, 29, and 30, meshing, respectively, with the pinions 25, 26, and 27. The shaft L is provided with a lever or handle M, having a pointer *m*, projecting from the opposite side of the shaft.

It frequently becomes necessary to wash the filtering material in the chambers A and A', and such washing must be conducted in one chamber at a time. If it is desired to wash the material in chamber A' and assuming the plugs K, C, and H to be in the positions indicated in Fig. 2 and that the valve *f* is closed, the lever M must be turned so the pointer *m* is toward the chamber A', and this will result in turning the plugs K, C, and H to the positions indicated in Fig. 3, and the passages *k* and *h* (indicated in dotted lines in said figure) will be in communication with chamber A', while the passage *c*² will be in communication with the chamber A and the passage *c* in communication with pipe 13, and there will be no communication between the supply-pipe 12 and the pipe 11. Water will then flow from the supply-pipe into the top of chamber A, be filtered in its passage down through the chamber A, and pass through pipes *d d'* into the bottom of chamber A', up through this latter chamber, out through the passage *k* to the waste-pipe 24, carrying with it impurities that may have lodged in the filtering material. If now it is desirable to subject the filtering material to more vigorous washing, the valve *f* will be opened, and unfiltered water will pass from the supply-pipe 12 through passage *c* into pipe 13 and thence into plug H and through passage *h* into pipe 20, from whence it will escape in a series of jets from the numerous small tubes similar to those indicated by 21 in Fig. 1, and this will have the effect of agitating the entire body of filtering material, and thereby greatly facilitate the washing of such material. The material in chamber A may be treated in the same manner by turning the lever M in the opposite direction.

Sometimes it may be desirable to supply unfiltered water to the service-pipe, and this may be accomplished by turning the plugs K, C, and H a half-revolution from their positions shown in Fig. 2, opening valve *f* and closing valves *e* and *e'*, and then the only open passage from the supply-pipe to the service-pipe will be through the pipe 13.

Without limiting myself to the precise de-

tails of construction illustrated and described, I claim—

1. The combination of two filtering-chambers, a main water-supply pipe, branch supply-pipes leading from the main supply-pipe into the upper ends of the chambers, discharge-pipes leading from the upper ends of said chambers, branch supply-pipes leading into the lower ends of the chambers and connected to the main supply-pipe, valves to control the flow of water through the said pipes, a rod supported to turn in its bearings, and connections between said rod and said valves whereby all the valves may be operated simultaneously, substantially as set forth.

2. The combination of two filtering-chambers, a four-way-valve casing, a supply-pipe connected to said casing, pipes 10 and 11 connected to said casing and respectively leading into the upper ends of the chambers, a pipe 13 also connected to said casing and leading downwardly therefrom, a hollow plug C open at its inner end fitted to turn in said casing and having three water-passages adapted to register with pipes 10, 11 and 13, a discharge-pipe leading from the lower end of each chamber and both connected to a service-pipe, discharge-pipes leading from the upper ends of said chambers and connected to a three-way-valve casing I, a hollow plug K open at its inner end fitted to turn in the casing I and having a water-passage adapted to register with either one of said upper discharge-pipes, a three-way-valve casing connected to and communicating with pipe 13 near its lower end, pipes 19 and 20 leading from said casing into the lower ends of the chambers, a hollow plug H, open at its inner end, fitted to turn in said casing and having a water-passage adapted to register with either of said pipes 19 and 20, and gearing to turn the plugs C, K and H simultaneously, substantially as set forth.

3. The combination of two filtering-chambers, a four-way-valve casing, a supply-pipe connected to said casing, pipes 10 and 11 connected to said casing and respectively leading into the upper ends of the chambers, a pipe 13 also connected to said casing and leading downwardly therefrom, a hand-operated valve in said pipe 13, a hollow plug C open at its inner end fitted to turn in said casing and having three water-passages adapted to register with pipes 10, 11 and 13, a discharge-pipe leading from the lower end of each chamber and both connected to a service-pipe, a hand-operated valve in each of said discharge-pipes, discharge-pipes leading from the upper ends of said chambers and connected to a three-way-valve casing I, a hollow plug K open at its inner end fitted to turn in the casing I and having a water-passage adapted to register with either one of said upper discharge-pipes, a three-way-valve casing connected to and communicating with pipe 13 near its lower end, pipes 19 and 20

leading from said casing into the lower ends
of the chambers, a hollow plug H, open at its
inner end, fitted to turn in said casing and
having a water-passage adapted to register
5 with either of said pipes 19 and 20, and gear-
ing to turn the plugs C, K and H simultane-
ously, substantially as set forth.

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

CHARLES P. SIMMONS.

Witnesses:

EDWIN CRUSE,
W. CLARENCE DUVALL.