

(No Model.)

G. BRINCKMAN & F. WIEDERHOLDT.  
FILTER.

No. 545,221.

Patented Aug. 27, 1895.

Fig. 1

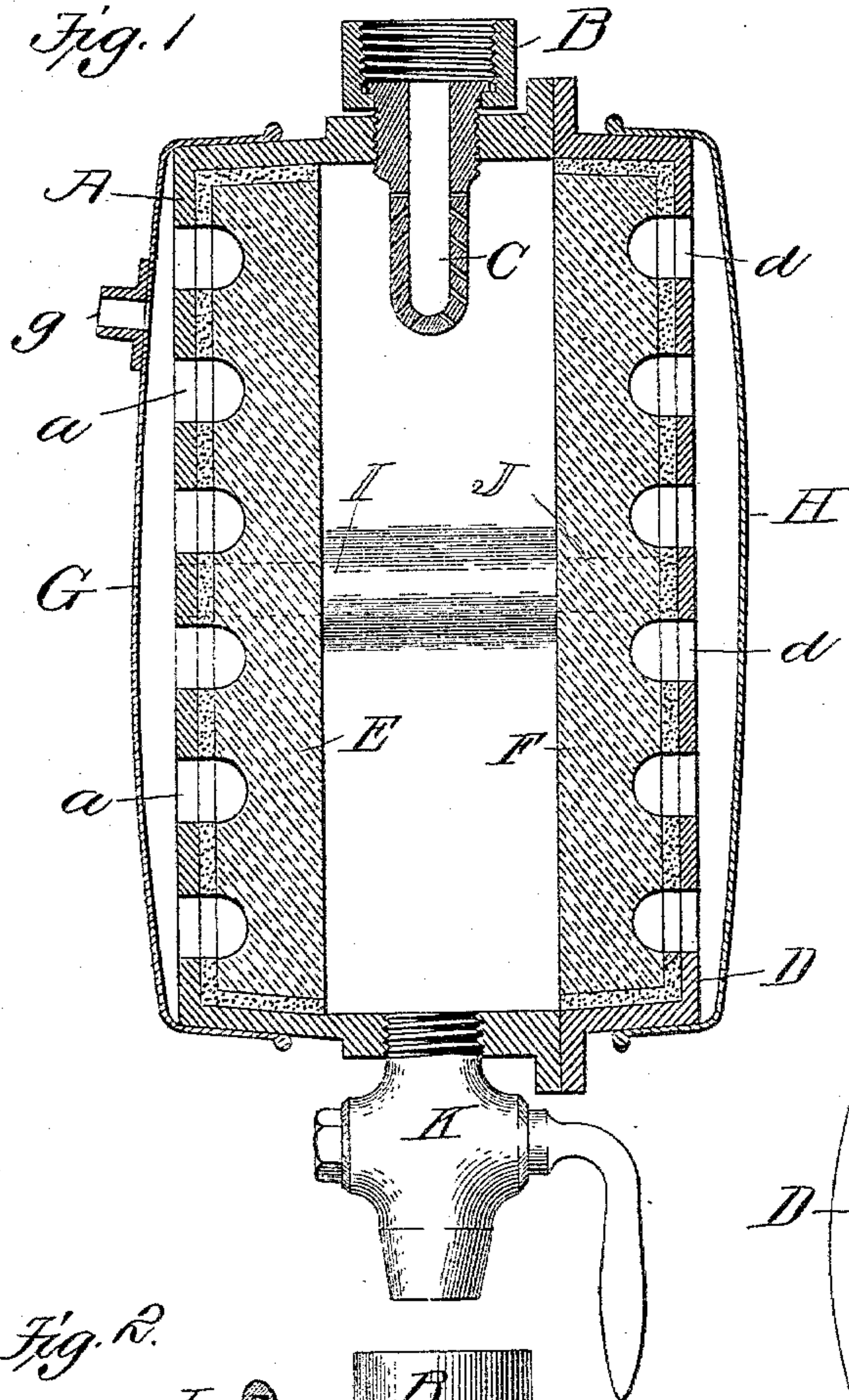


Fig. 2

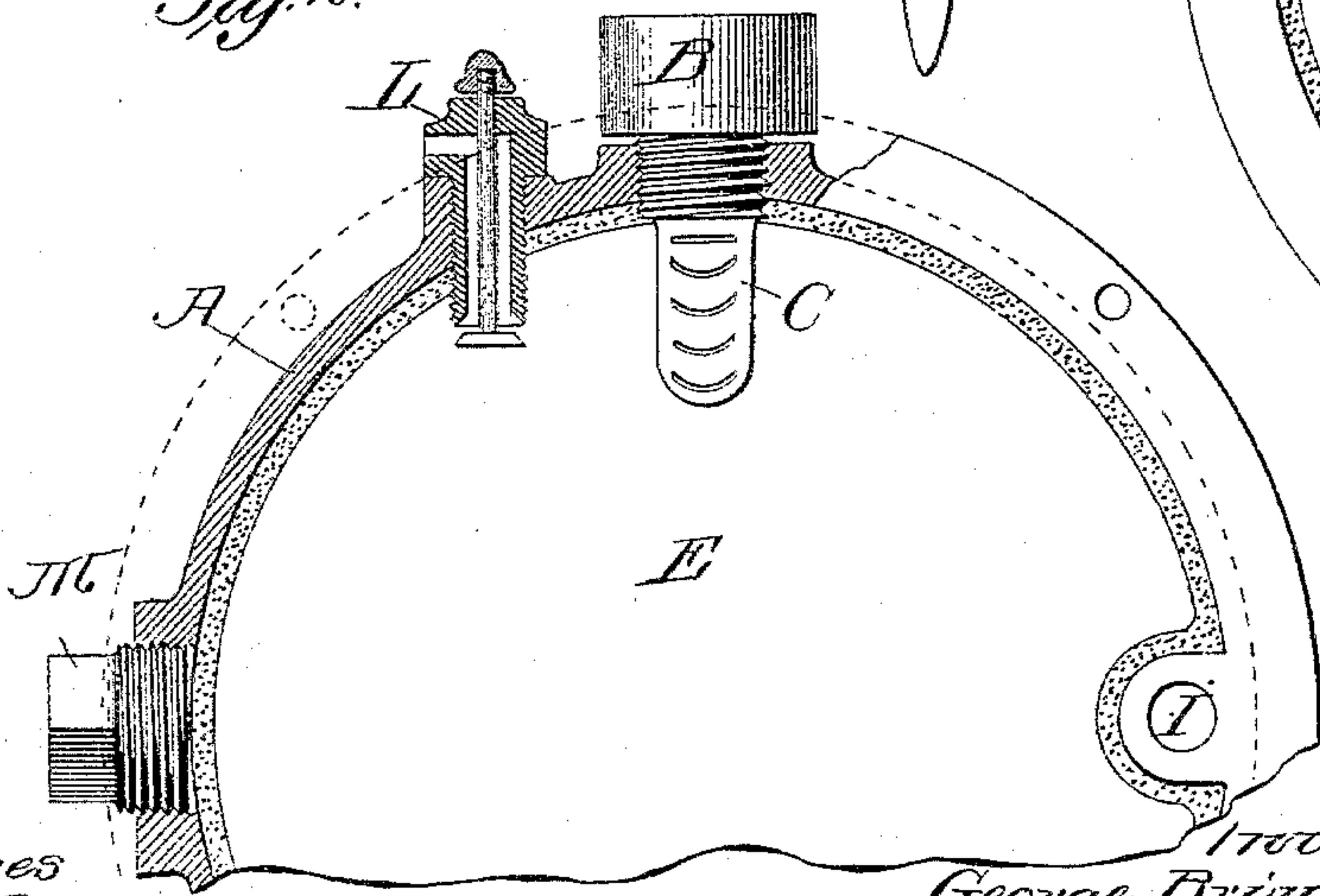
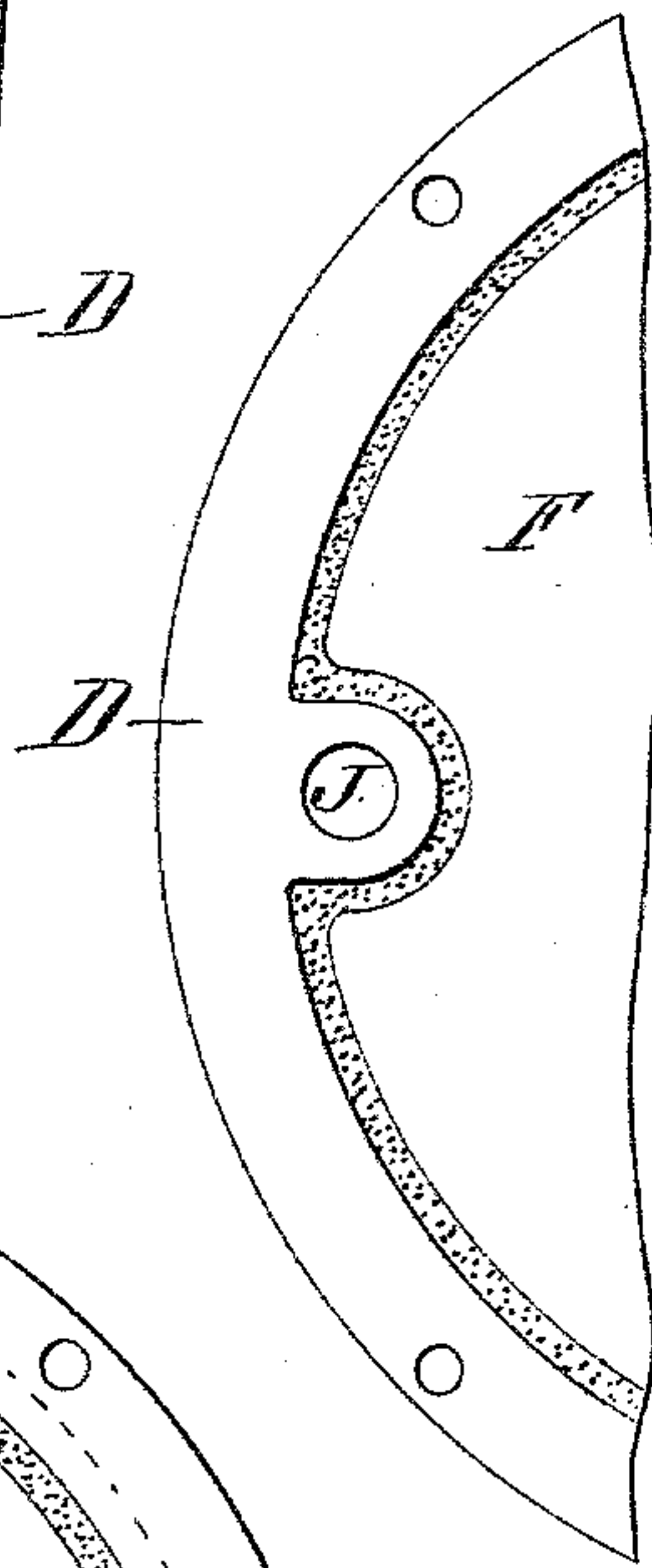


Fig. 3



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# UNITED STATES PATENT OFFICE.

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## FILTER.

SPECIFICATION forming part of Letters Patent No. 545,221, dated August 27, 1895.

Application filed October 5, 1894. Serial No. 524,947. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE BRINCKMAN, a subject of the Emperor of Germany, and FERDINAND WIEDERHOLDT, a citizen of the United States, residents of the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Filters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, wherein like letters of reference refer to like parts, and in which—

Figure 1 is a vertical cross-sectional view. Fig. 2 is a detail view, partly in section, and taken at right angles to the view illustrated in Fig. 1; and Fig. 3 is an inside face view of the removable filtering-stone and its supporting-plate.

Our invention relates to a new and useful invention in filters; and it consists, generally stated, in peculiar features of construction, arrangement, and combination of the several parts comprising our filter, which will hereinafter be described, and more fully pointed out in the claims.

The object of our present invention is to construct what is known as a pressure-filter, which is adapted to be arranged in the length of a supply-pipe, said filter being so constructed that the water or other fluid may pass therethrough unobstructed by the manipulation of the several cocks, and when it is desired to obtain filtered water the cock at the bottom of the straightway of the filter is shut off, and the pressure of the water forces the same through the filtering-stones on both sides of the straightway into chambers for the fluid, which chambers are preferably connected on the inside of the casing, so as to permit a pipe to be attached to one of said chambers to draw the filtered water off in a single stream.

In the drawings, A indicates the casing or shell, which is formed with a threaded opening at its top to receive a coupling B, by which the filter may be attached to the supply-pipe. The end of this coupling projects inwardly into the shell in the form of a spray-nozzle C,

which spray-nozzle is preferably made by sawing or otherwise forming small slits in the sides of the coupling next to the filtering-stone, through which the water is forced in a thin sheet against the surface of the filtering-stone.

The open end of the casing A is closed by a flange-cap D, which is bolted or otherwise secured thereto to make a water-tight joint.

The end walls of the casing A and the cap D are formed with openings *a* and *d*, through which may pass the filtered water from the filtering-stones E and F. The filtering-stones are arranged in the casing A and cap D as follows: Said parts being formed with the openings *a* and *d*, before referred, to are laid face up on a suitable table or support, or if desired a bed of sand, which would partially fill the opening in the end wall and upon the bottoms of the parts is laid a bedding of cement, which is spread out so as to fill all of the openings *a* and *d*, leaving a surplus around the edges. The filtering-stones are now placed in position and forced to their seats, forming a tight joint with the end wall of the casing and cap and causing the surplus cement to fill the spaces between the edge of the stones and the walls of the casing and cap. The cement is now packed around the edges and leveled off, and the inner face of the stone preferably scraped, so as to remove the adhering cement deposited during the operation of embedding the stones. After the cement has become set and dry small cavities are bored through the openings *a* and *d* to some depth into the stone, thus removing the cement from said openings and by boring into the stone exposes a larger filtering-surface for the water, which thereby increases the capacity. The object of this method of seating the filtering-stones by embedding them in cement is to make a solid wall to resist the lateral pressure of the water, and the object of boring the holes *a* and *d* after the stones have been so embedded is to remove the cement from said openings, permitting a free passage of the water therethrough, and by boring into the stone a larger filtering area is presented



for the filtered water, which compensates for the filtering area taken up by the metal end walls.

G and H are end-closing caps, which are introduced upon the end of the casing and cap D, said caps G and H being preferably made of thin sheet metal, which is bulged at its middle to form chambers for the filtered water, and the side flanges are tapered outwardly so that when said end-closing caps are introduced upon the parts A and D they may be forced home by pressure to form a watertight joint, at the same time securing permanency. In order to make this close joint, the side walls of the parts A and D are also preferably tapered to correspond with the flanges of caps G and H, and when the caps G and H are introduced the side walls of the parts A and D are painted or coated with shellac or other substance to insure a tight joint.

I indicates an opening formed on the inside of the casing A, which leads to the chamber formed by the cap G, and registering with opening I is an opening J, formed in the cap D, said opening J leading from the chamber formed by cap H, the object of said connection I J between the chambers for the filtered water being to connect them, so that but one outlet-pipe is necessary to carry off the filtered water, which may be done by connecting the pipe to nipple *g* on the casing G. This nipple *g* is preferably located at the upper end of the casing G, so that when it is desired to clean the inner faces of the filtering-stone the supply may be cut off and the cock K, at the lower end of the straightway, opened. The back pressure of the water from both the chambers for the filtered water will have a tendency to loosen the particles on the inner faces of the filtering-stone and dislodge them, so that they will fall off and pass out cock K. After this has been practiced a sufficient length of time, water may be admitted through the supply-pipe, and passing through nozzle C will be sprayed with force against the inner faces of the stones, and any remaining foreign particles will be flushed off through the cock K. In order to facilitate this operation of cleaning the filter, we arrange at the top of the casing A an automatic air-valve L, which, when the pressure is removed in the straightway chamber by cutting off the supply and the cock K opened, will admit air at the top of the water in said straightway and permit the same to run out cock K. This relief of the pressure from the inside of the filtering-stones will permit the back-pressure of the filtered water to act with more effect to dislodge the foreign particles on the inner filtering-surfaces. When the cock K is closed and the supply-pipe opened, the straightway will quickly be filled up, and, the pressure being exerted on the under side

of the air-valve, will close the same to prevent the passage of water therethrough and permit the pressure to force the water through the filtering material. At the side of the casing A we preferably form an opening, which is closed by a blind plug M, which plug may be removed when desired to permit the insertion of a brush to clean the filtering-surfaces should they become coated to such an extent with foreign particles that the back-pressure and the nozzle C would not be sufficient to dislodge them properly.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a filter, the combination with a casing, formed with a perforated end wall, of a filtering stone in said casing in juxtaposition to said perforated end wall, a cap G forming a chamber beyond said perforated end wall a perforated end closing plate for closing the open end of the casing, a filtering stone mounted in said plate, and a cap H forming a chamber beyond said perforated end closing plate, substantially as described.

2. In a filter, the combination with a casing formed with perforated end walls, of filtering stones in juxtaposition to said perforated end walls, cement which is interposed between said filtering stones and perforated end walls, said cement being bored out at the perforations, the boring extending somewhat into the outer faces of the filtering stones, caps G and H on the ends of the casing forming chambers for the filtered water, and an opening I—J which connects said chambers inside the casing, substantially as described.

3. In a filter, the combination with the casing formed with an opening I, of the perforated plate D formed with an opening J which registers with opening I of the casing, of the end caps G and H forming chambers for the filtered fluid, which said openings I—J connect, substantially as described.

4. In a filter, the combination with the casing, of filtering stones located in each end thereof, an inlet nozzle formed with slits in its sides nearest the filtering stones, located at the top of the casing and between the filtering stones, an outlet cock for unfiltered water located at the bottom of the casing and between the stones, end closing caps for the casing forming chambers for the filtered water which chambers are connected by opening I—J inside the casing, and an outlet pipe for filtered water which is located near the upper edge of one of said closing caps, substantially as described.

5. In a filter, the combination with a suitable casing having perforated end walls, of filtering stones arranged in the casing near the walls, said stone being recessed at each perforation in the end plates, caps G—H upon the ends of the casing for the filtered water,



a spray nozzle C formed with slits in its sides nearest the filtering stones, an outlet cock K arranged at the bottom of the casing, and an air valve L which is mounted in the casing  
5 between the two filtering stones near the inlet nozzle C, substantially as described.  
In testimony whereof we hereunto affix our

signatures, in presence of two witnesses, this 24th day of August, 1894.

GEORGE BRINCKMAN.

FERDINAND WIEDERHOLDT.

Witnesses:

F. R. CORNWALL,

HUGH K. WAGNER.