

No. 652,966.

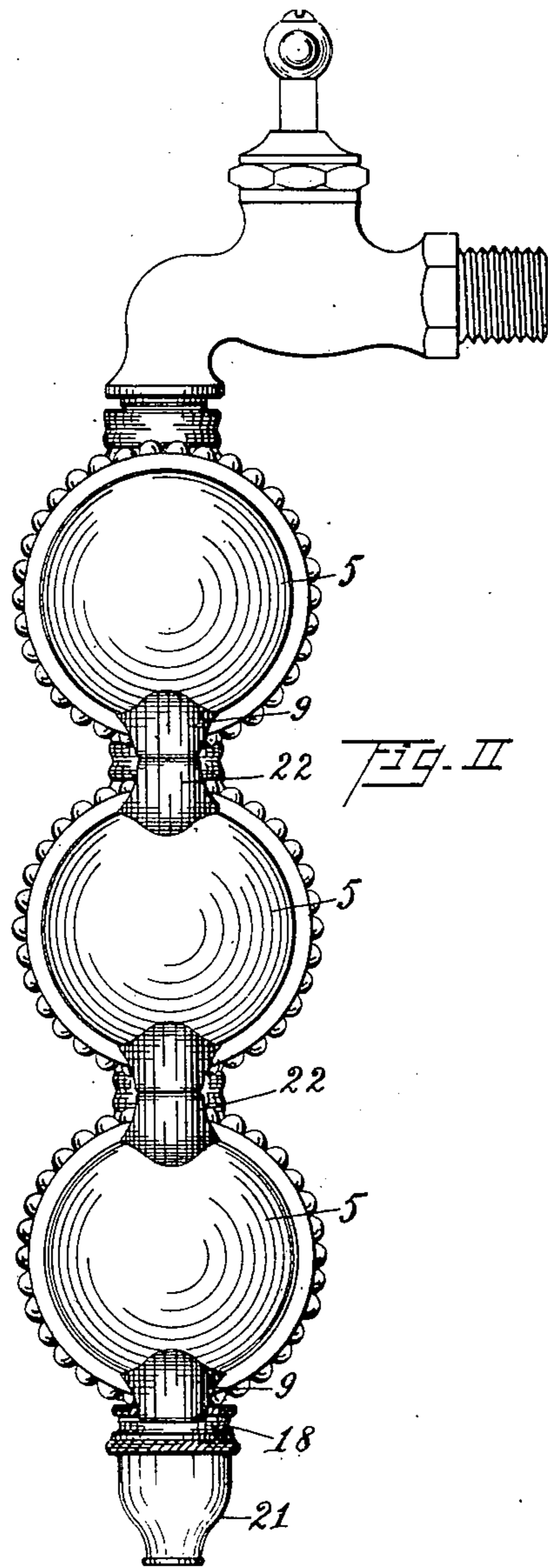
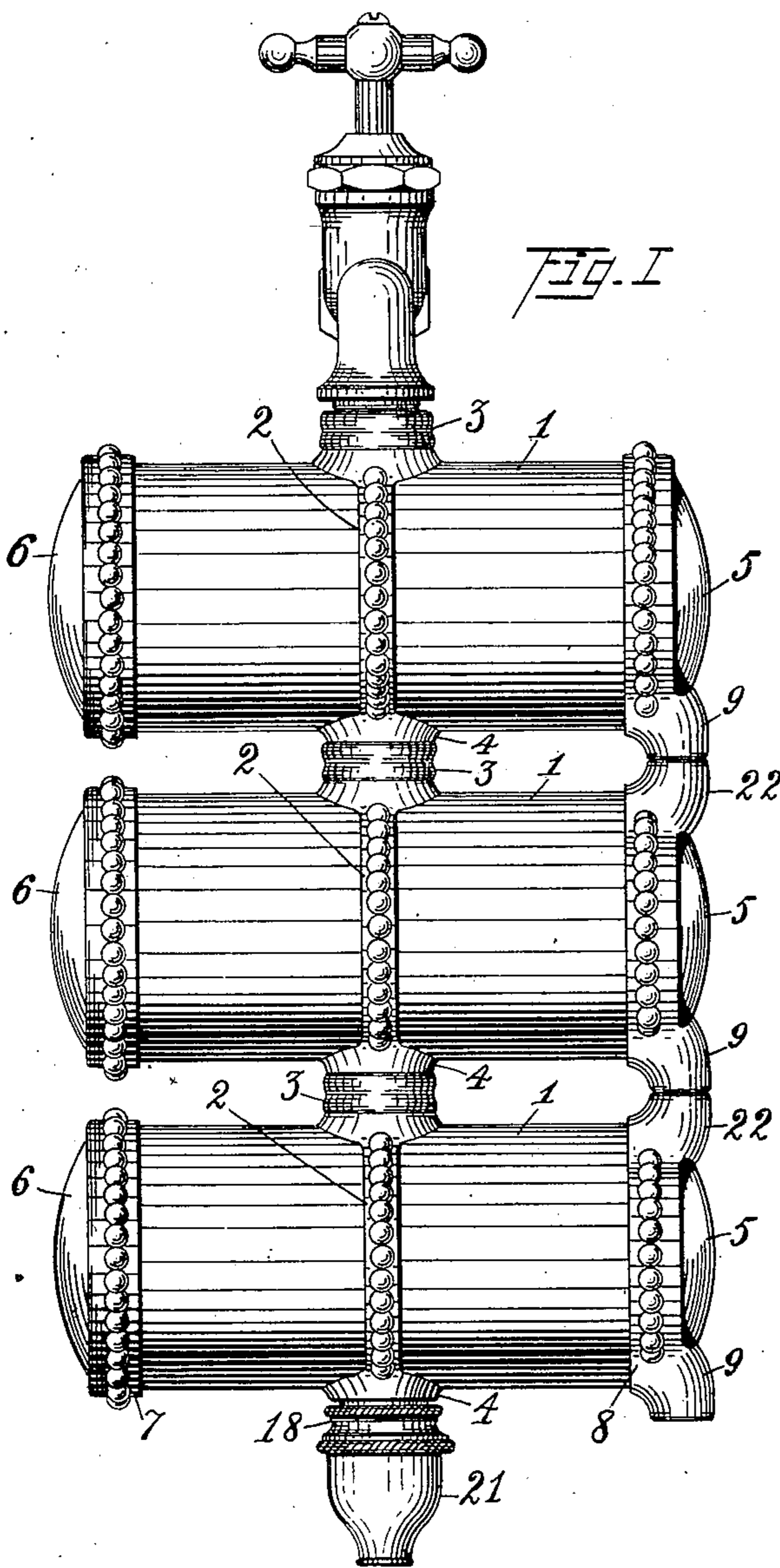
Patented July 3, 1900.

W. JANDUS.
FILTER.

(No Model.)

(Application filed Nov. 14, 1899.)

3 Sheets—Sheet 1.



Witnesses:

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Inventor:

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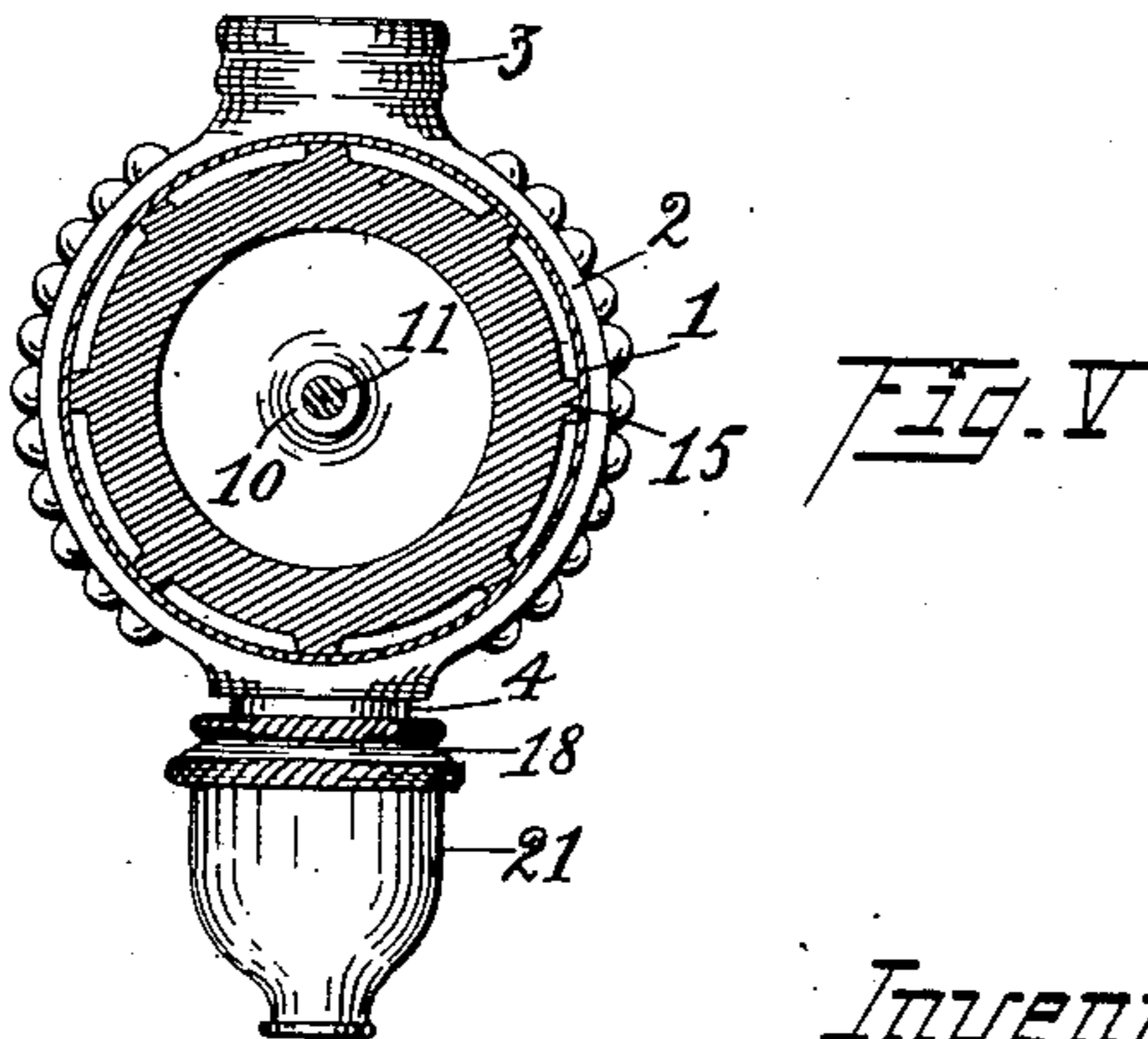
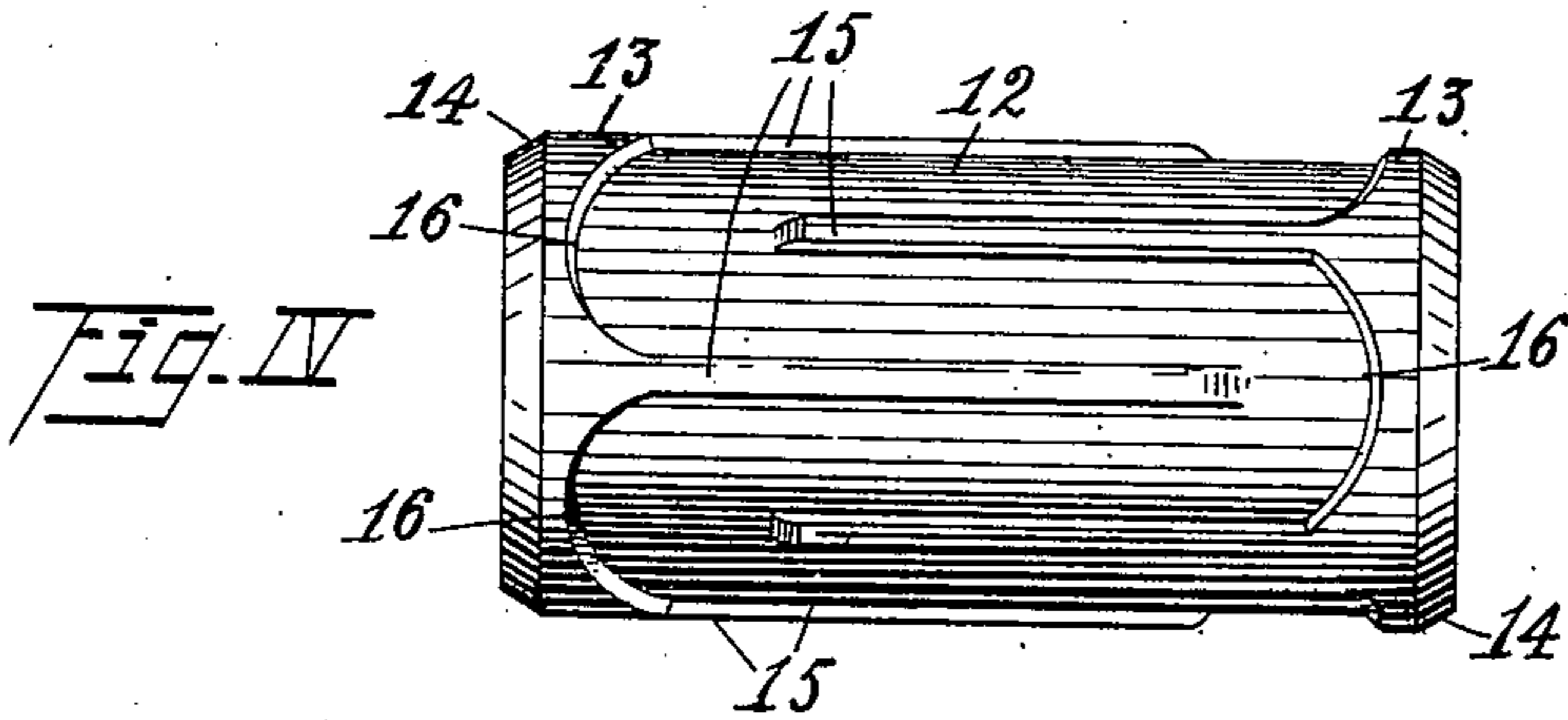
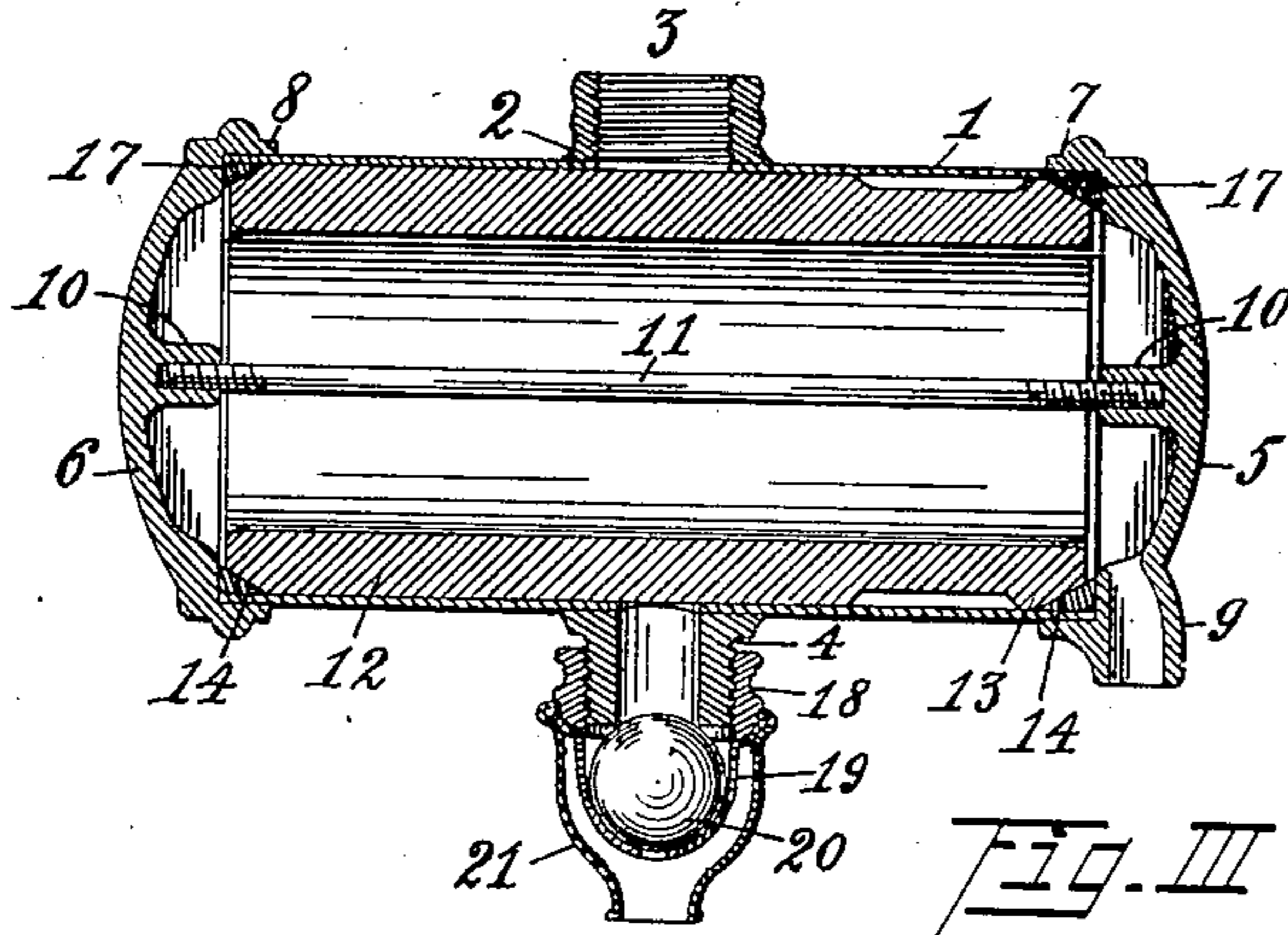
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Witnesses:

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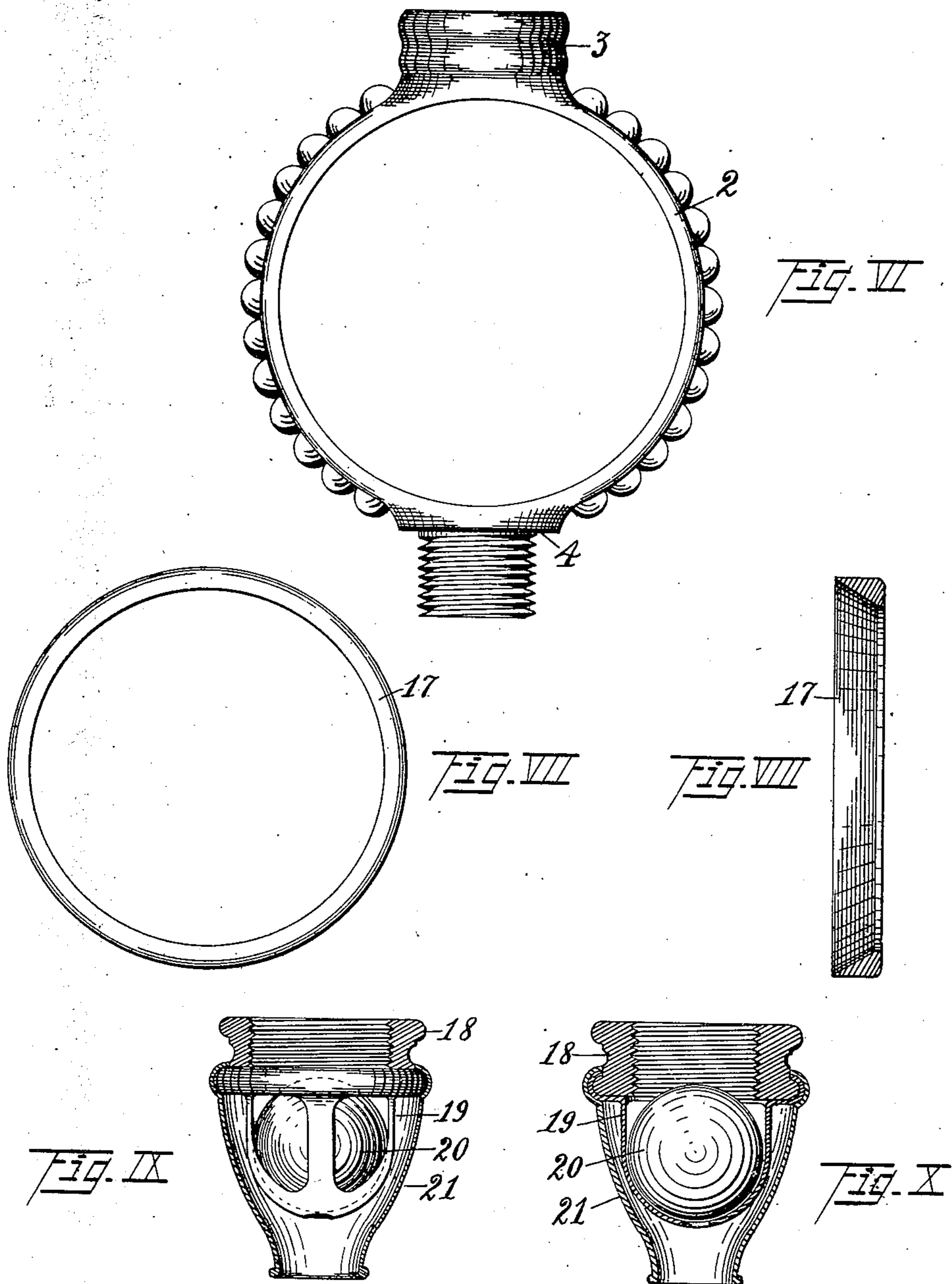
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UNITED STATES PATENT OFFICE.

WILLIAM JANDUS, OF CLEVELAND, OHIO.

FILTER.

SPECIFICATION forming part of Letters Patent No. 652,966, dated July 3, 1900.

Application filed November 14, 1899. Serial No. 736,984. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JANDUS, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Filters, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a side elevation of a battery of my improved filters; Fig. II, an end elevation of the same; Fig. III, an axial section of the filter; Fig. IV, a side view of the filtering-body; Fig. V, a transverse section of the filter; Fig. VI, a view of the central casting of the filter-casing; Figs. VII and VIII, a plan view and a section, respectively, of the packing-gasket; Fig. IX, a section of the waste-water-valve device, showing the collar and the outer casing of the same in section and the ball-cage in elevation; and Fig. X, a section of said device with casing and ball-cage in section.

The filter invention forming the subject-matter of the present application is an improvement upon and development of the filter invention for which application for Letters Patent was filed by me on the 22d day of April, 1899, Serial No. 714,068, and allowed July 17, 1899.

The filter has a cylindrical casing 1, around the middle of which a ring 2 is secured, preferably by sweating, and which ring has formed upon it, at opposite points, an inlet-nipple 3 and an outlet-nipple 4, the bores of which correspond to and register with holes in the walls of the tubing forming the casing. The inlet-nipple has an interior screw-thread adapting it for attachment to a bib-cock or other water-fixture. The outlet-nipple is externally threaded for the attachment and adjustment of the waste-valve mechanism or

for screwing said outlet-nipple into the inlet of another filter unit, when a number of filter units are used in series to form a battery. The inlet-nipple is screw-threaded to receive the corresponding thread of the outlet-nipple of another filter unit. Two flanged heads 5 and 6 fit with their peripheral flanges 7 and 8 over the ends of the casing. One, 5, of said heads has an outlet 9 formed in it for the outlet of filtered water, such outlet extending downward. The inner faces of the heads have central lugs 10, formed with screw-threaded sockets, into which the threaded ends of a stay-bolt 11 fit, so that the heads may be drawn against the ends of the casing. The filtering-body 12 is cylindrical and has annular shoulders 13 at its ends. Said shoulders are as nearly as possible of the same diameter as the inside diameter of the casing. The ends of the filtering-body are beveled at their edges at 14. The cylindrical body is tubular, and the outer side of the body is formed with ribs 15 or partitions of the same height as the end shoulders and alternately projecting from said shoulders at the opposite ends, so that a shallow tortuous channel is formed around the filtering-body between the latter and the casing. The ends of the windings of said channel are rounded, as shown at 16, so that a free and unobstructed flow is provided for the water in the channel at the bends in the same, and no lodgment for sediment or any solid matter will be found at the bends. Annular gaskets 17, substantially wedge-shaped in cross-section, are fitted between the bevels of the filtering-body and the sides of the casing, at the ends of the latter, and are held in the annular grooves formed by said parts by means of the heads, which are clamped to bear against the faces of said gaskets. By this construction of the filter-body and casing and the gaskets and heads only a very slight annular slit is formed at the end joints, and said slit is closed by the thin edge of the gasket. A very small surface of the joint is exposed to the interior water-pressure in the filter-casing, so that leakage is practically completely avoided. The partitions of the channel are so arranged that one partition will preferably be located across the middle of the inlet-opening, so that the

inlet-water will be divided and pass around on opposite sides of the filtering-body through the channels upon the latter. For the purpose of providing a full flow of water through the channels on opposite sides of the filtering-body the inlet-opening is of a cross-sectional area at least equal to the cross-sectional area of two of the channels. This will insure a full flow of water through the channels and will insure a sufficient scouring action of the water in the channel when the waste-outlet is opened, as a full flow of water under full pressure will be forced through the channel. A collar 18, having an internal screw-thread, fits upon the outlet-nipple and has a bead at its lower end, over which bead the upper edge of a sheet-metal cage 19 is spun. Said cage is formed from a cup-shaped piece of sheet metal cut out to form large lateral openings and a central opening and is spun or otherwise shaped to have its upper portion bear tightly against the end of the collar and around the bead of the same. A ball 20 is supported in the cage and may be drawn upward against the end of the waste-outlet to close the same by screwing the collar upward on the outlet-nipple. A nozzle 21 is formed from sheet metal with a slightly-contracted lower end, and said nozzle has its upper end spun or otherwise forced around the bead of the collar and the beaded edge of the cage, and said beaded upper portion of the nozzle is suitably knurled or roughened to form a hold in rotating the nozzle and collar. When the nozzle is screwed upward on the outlet-nipple, the valve-ball is seated against the end of the waste-outlet, closing the same, and when the nozzle is unscrewed the valve-ball uncovers the outlet and the unfiltered water may flow out around the ball through the openings in the cage and out through the nozzle.

When the filter is attached to an ordinary water-faucet or bib-cock and the water is turned on, the water will pass around the filtering-body on both sides of the same through the tortuous channel and will be forced through the filtering-body into the central chamber in the latter, from which chamber it will run out through the filtered-water outlet in the head of the casing. When it is desired to draw unfiltered water or to cleanse the filtering-body from accumulated impurities, the waste-valve is opened, as above described, and the water will pass through the tortuous channel, scouring off the impurities by its friction against the surface of the body and carrying them off through the waste-outlet. As the cross-sectional area of the water-inlet is greater than the cross-sectional area of the channels passing to and around both sides of the filtering-body, the resistance in said channels to the passage of the water will cause the water to have a scrubbing action against the surface of the filtering-body when the waste-outlet is open. This same action in the channels will also force the water

through the sides of the filtering-body when the waste-outlet is closed and the filtering action takes place within the filter.

When greater capacity is required than the capacity of one filter unit, two or more filter units are arranged in series, as illustrated in Figs. I and II, by screwing the inlet-nipple of another filter unit to the waste-nipple of the first filter unit, the waste-valve nozzle and collar being first removed, &c., adding as many units as may be required. For the purpose of providing one common filtered-water outlet from the series or battery of filter units, the head or heads of the added units is or are formed with an opening 22, registering with and connected to the filtered-water outlet of the preceding unit, so that all of the filtered-water outlets discharge in series and out through the outlet of the last unit in the series. In this manner increased capacity is attained, according to the demand, with a filter unit of one size.

The construction of each filter unit insures simplicity and strength. The body of the filter-casing may be made from comparatively-light metal tubing, and the portion of the casing on which transverse strain may come is formed by the central ring, having the nipples formed integral with it and sweated upon the tubing. The endwise strain upon the tubing from the heads and stay-bolt is easily borne and the internal strain of the water-pressure comes against the round sides of the tubing and filtering-body. The only portion exposed to strain from the water-pressure at the ends of the casing is the thin edge of the gasket filling the thin annular slit between the casing and the shoulder of the filtering-body, and such surface is so slight that even considerable strain will not affect it. The filter is easily assembled or taken apart, so that it may be easily constructed and repaired. The ball-valve provided for the outlet will always present a tight fit, as the ball will be rotated more or less during closing or opening and by the escaping water, so as to present new surfaces to seat against the end of the outlet-nipple. Said ball is preferably made from rubber or similar more or less yielding material.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth respectively in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. A filter composed of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same and closed at the ends, partitions in said space forming a winding channel around said body and in said space, and a water-inlet through the casing into such

channel and having a greater cross-sectional area than said channel, substantially as set forth.

2. A filter composed of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same and closed at the ends, partitions in said space forming winding channels around said body and in said space and passing around opposite sides, and a water-inlet through the casing into the channels and having a greater cross-sectional area than the joint cross-sectional areas of said channels, substantially as set forth.

3. A filter composed of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same and closed at the ends, partitions in said space forming a winding channel around said body and in said space, a water-inlet through the casing into such channel and having a greater cross-sectional area than said channel, and a valve-controlled waste-water outlet at the opposite side of the casing to the inlet, substantially as set forth.

4. A filter composed of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same and closed at the ends, partitions in said space forming winding channels around said body and in said space and passing around opposite sides, a water-inlet through the casing into the channels and having a greater cross-sectional area than the joint cross-sectional areas of said channels, and a valve-controlled waste-water outlet opposed to said inlet, substantially as set forth.

5. A filter composed of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same and closed at the ends, partitions in said space extending longitudinally in the same and alternately projecting from opposite ends to form a longitudinally-winding channel in the space around the body and on both sides of the same, and a water-inlet through the casing into two branches of said winding channel and having a greater cross-sectional area than the joint cross-sectional area of said branches, substantially as set forth.

6. A filter composed of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same and closed at the ends, partitions in said space extending longitudinally in the same and alternately projecting from opposite ends to form a longitudinally-winding channel in the space around the body and on both sides of the same, a water-inlet through the casing into two branches of said winding channel and having a greater cross-sectional

area than the joint cross-sectional area of said branches, and a valve-controlled waste-water outlet opposed to said inlet, substantially as set forth.

7. In a filter, the combination of a hollow cylindrical filtering-body having a filtered-water outlet from its interior chamber, a cylindrical casing surrounding said body to form a space around the same closed at the ends and provided with a water-inlet at one side, and partitions in said space extending longitudinally in the same and alternately projecting from opposite ends to form a longitudinally-winding channel in the space around the body and on both sides of the same from the inlet and having the alternating ends of the partitions connected to form curved ends for the longitudinally-winding ends of the channel, substantially as set forth.

8. A filter having a casing provided with a water-inlet nipple, a filtered-water outlet, and a waste-water-outlet nipple, said inlet-nipple and outlet-nipple being so constructed that the inlet-nipple of one filter unit may be connected to the outlet-nipple of another filter unit to form a series of two or more connected filter units, substantially as set forth.

9. The combination of a filter having a cylindrical casing formed with an inlet-nipple on one side and an opposed waste-outlet nipple and with a filtered-water outlet upon one head, and a filter having a cylindrical casing formed with an inlet-nipple on one side adapted to be coupled to the waste-outlet of the former filter and an opposed waste-outlet and having a nipple upon one head adapted to couple with the filtered-water outlet of the former filter and with a filtered-water outlet in one head, substantially as set forth.

10. In a filter, the combination with a cylindrical casing formed from metal tubing, of a ring sweated or similarly secured upon said casing and formed with integral inlet and outlet nipples communicating with the interior of the casing through the walls of the same, substantially as set forth.

11. In a filter, the combination with a cylindrical casing formed from metal tubing, of a cast-metal ring sweated or similarly secured upon said casing and having an internally-screw-threaded inlet-nipple and an externally-screw-threaded waste-outlet nipple formed upon it, the bores of said nipples communicating through the walls of the casing with the interior of the same, substantially as set forth.

12. In a filter, the combination with a waste-outlet nipple, of a nozzle longitudinally movable upon said nipple and provided with an open cage within it, and a valve-ball supported in said cage to be moved to and from a seat against the end of the nipple by the movement of the cage and nozzle, substantially as set forth.

13. In a filter, the combination with a waste-outlet nipple, of an open cage supported longitudinally movable upon said nipple, and a

valve-ball supported in said cage to be moved to and from a seat against the end of the nipple by the movement of the cage toward and from the end of the nipple, substantially as set forth.

14. In a filter, the combination of an externally-screw-threaded waste-outlet nipple, an internally-threaded collar upon the nipple, an open cage having its upper end beaded upon said collar, a valve-ball supported in

said cage, and a nozzle having its upper end beaded upon the bead of the cage and the collar, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 23d day of October, A. D. 1899.

WILLIAM JANDUS.

Witnesses:

WM. SECHER,

K. F. WINDING.