

No. 702,466.

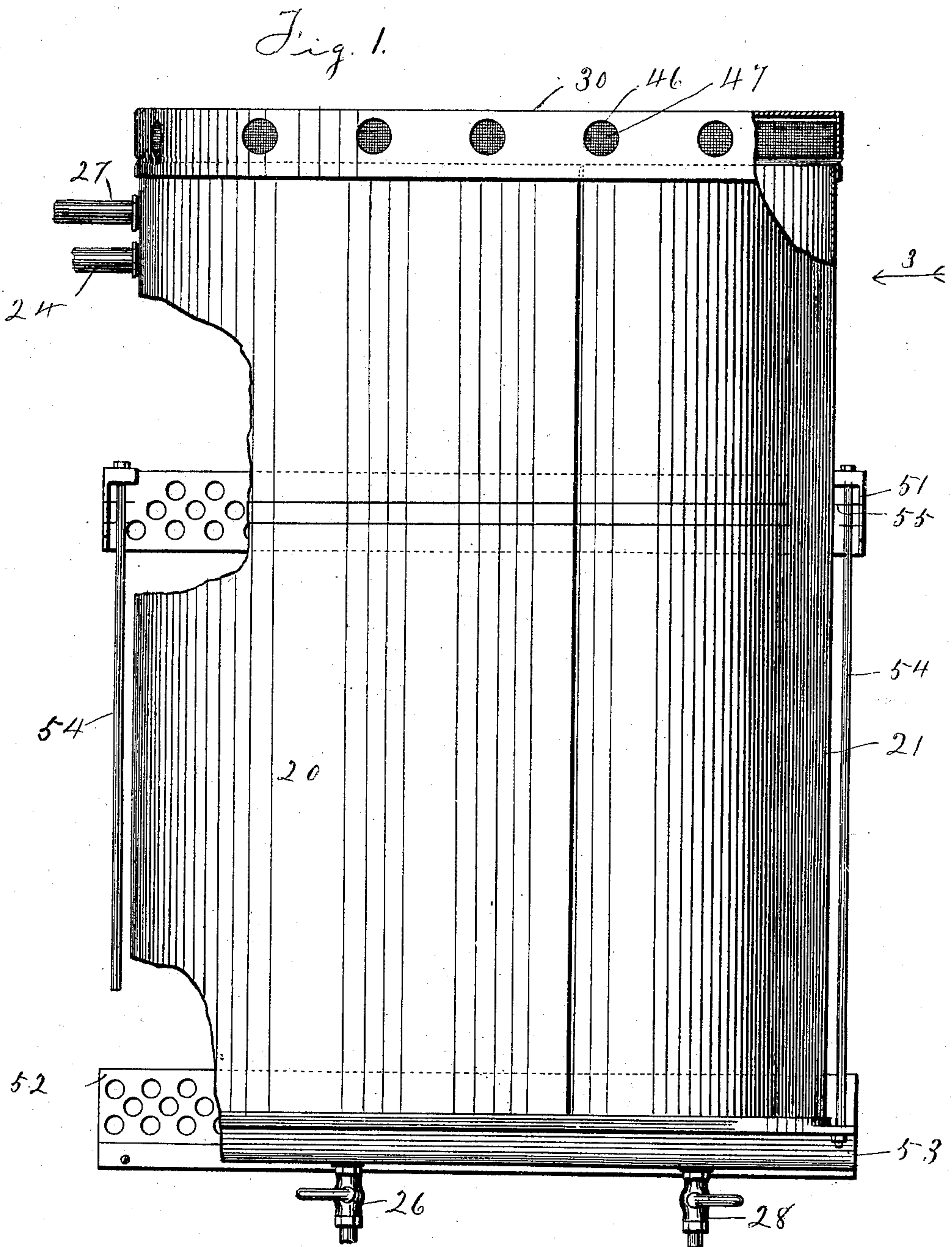
Patented June 17, 1902.

V. OSTER.
FILTER.

(Application filed Oct. 28, 1901.)

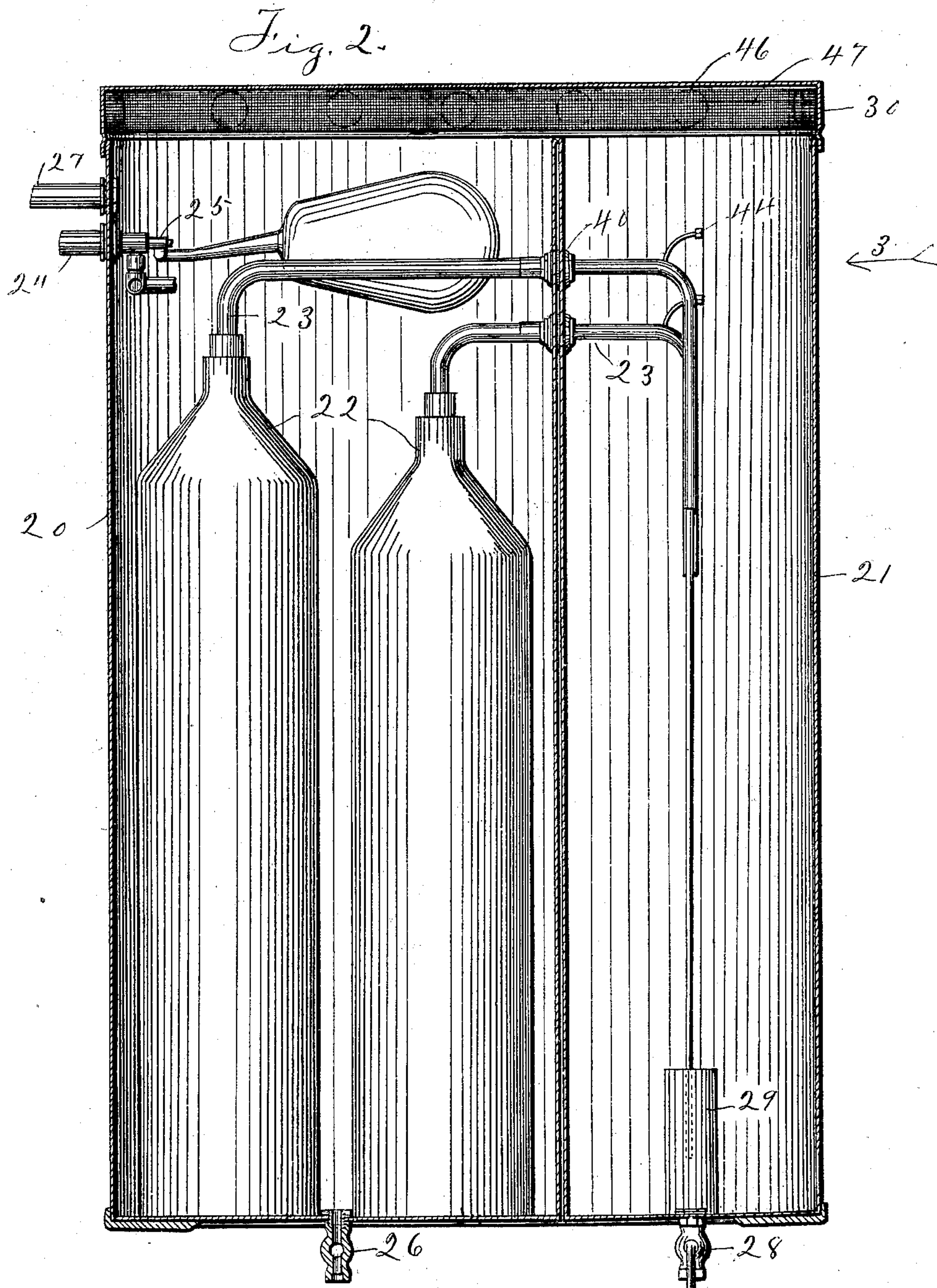
(No Model.)

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Witnesses
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By *his* Attorney,
Samuel G. Wells



Witnesses
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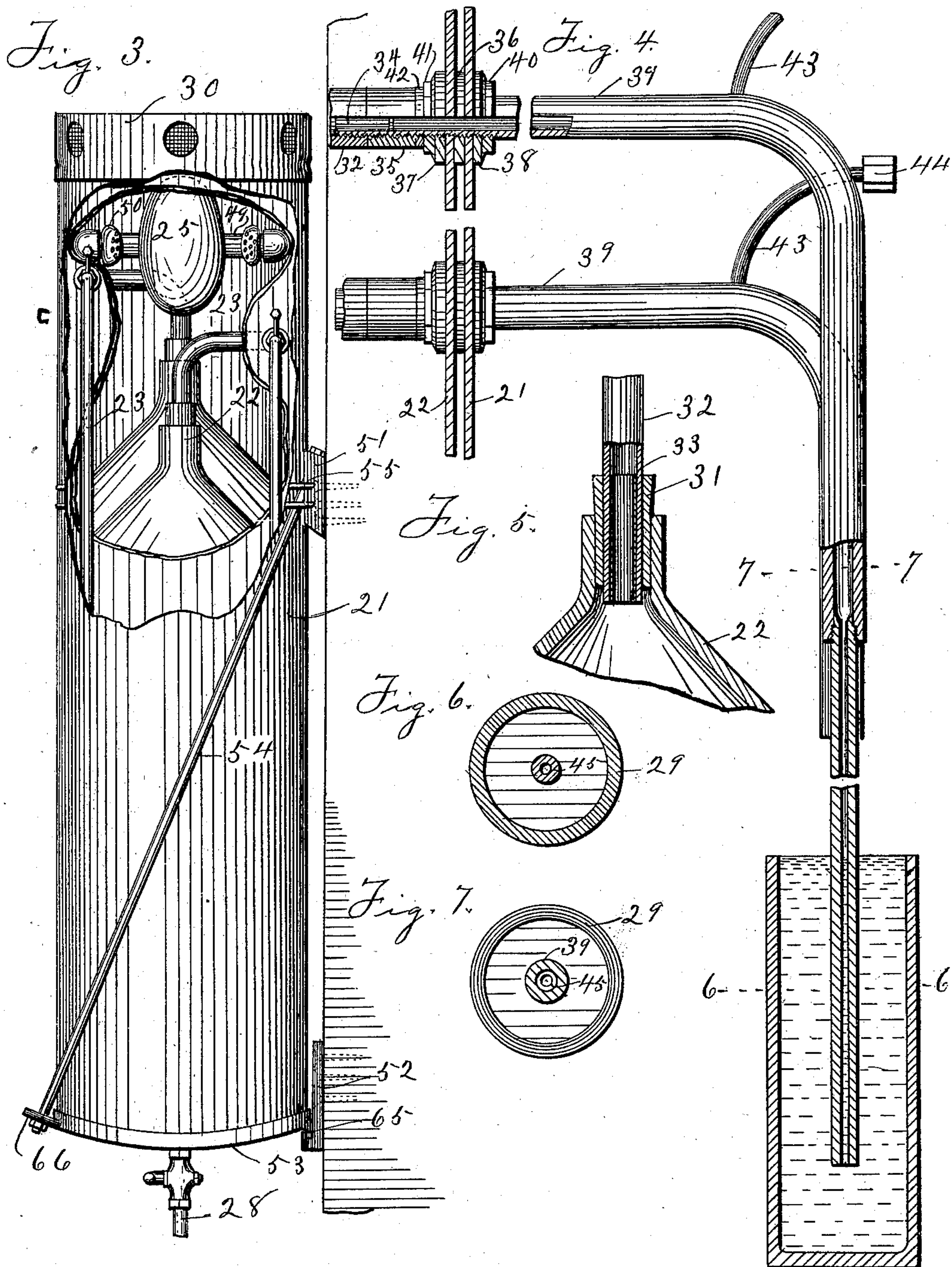
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Fig. 8.

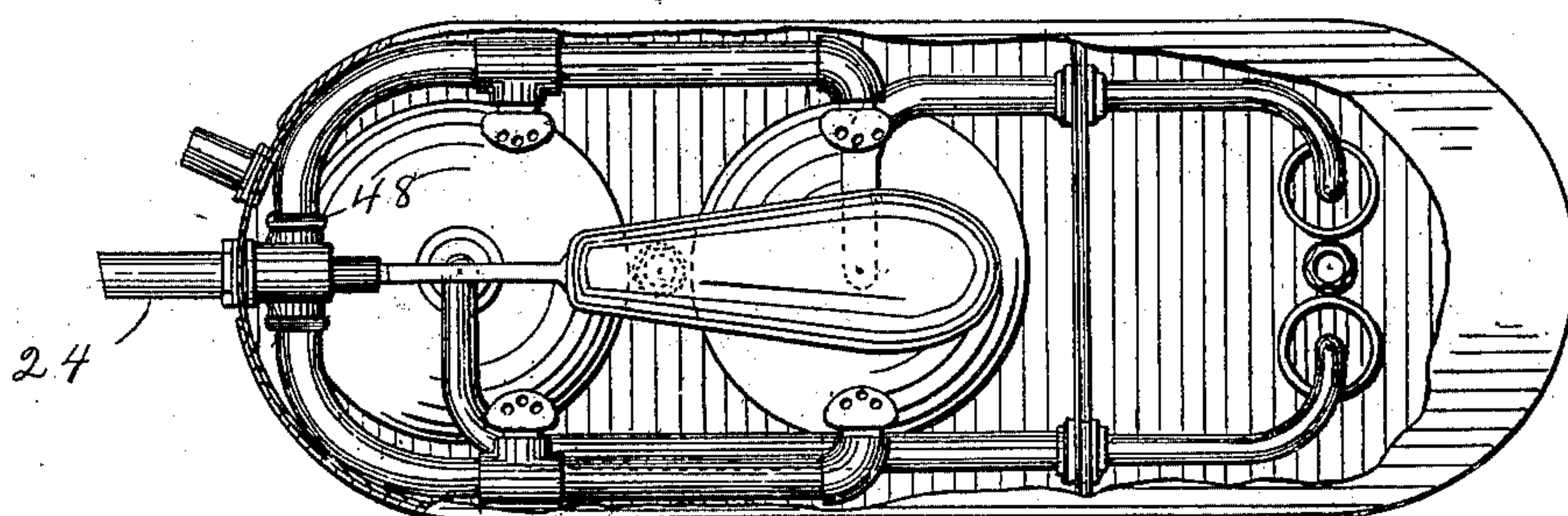
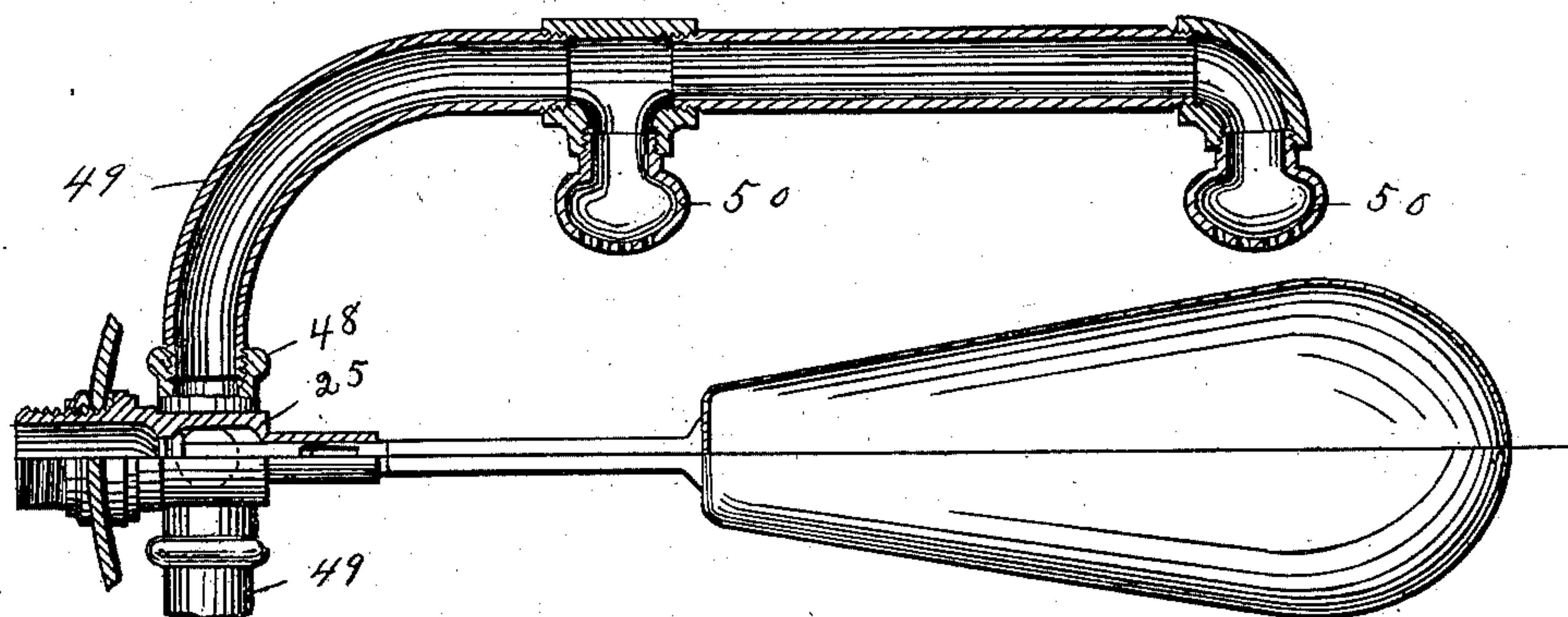


Fig. 9.



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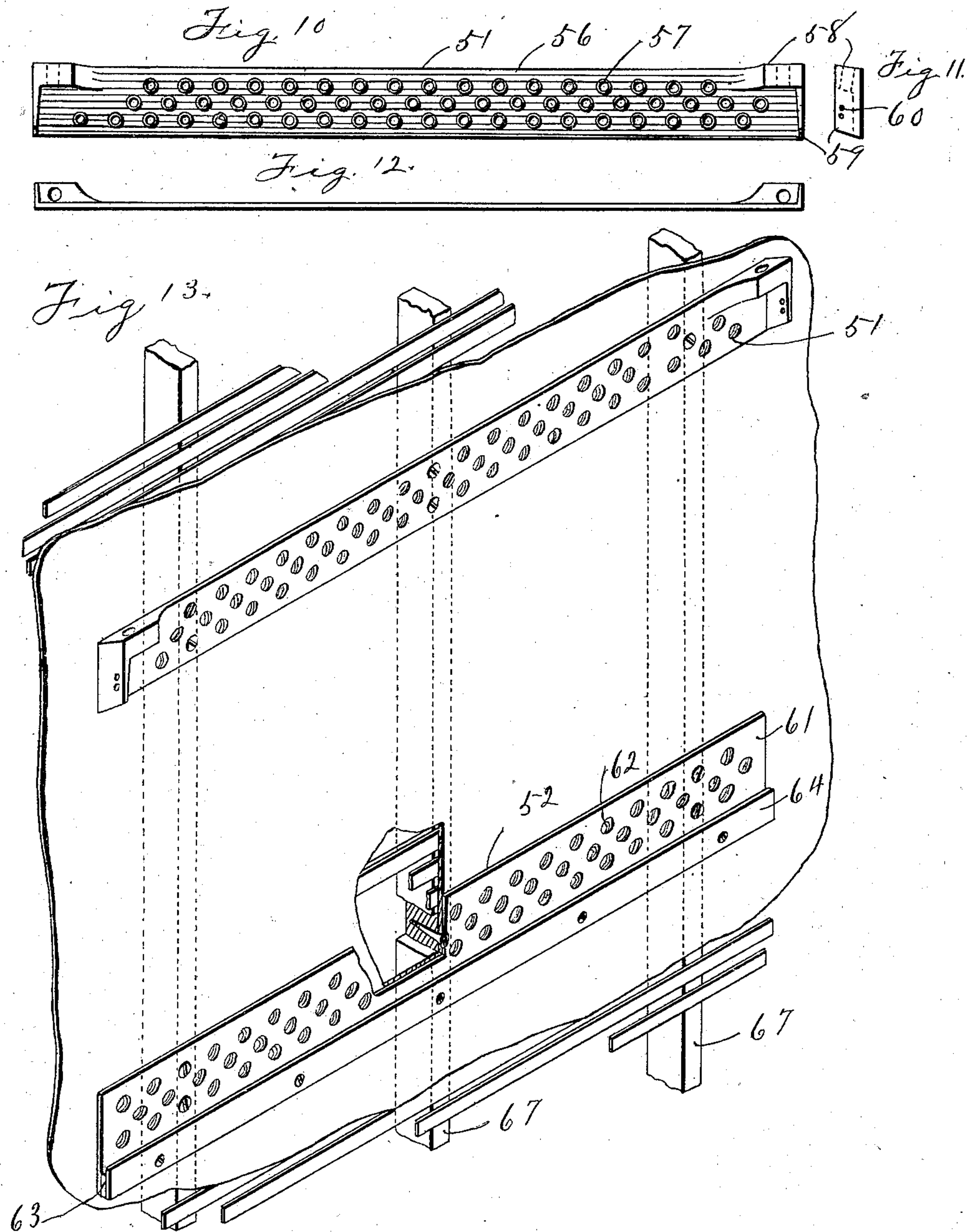
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No. 702,466

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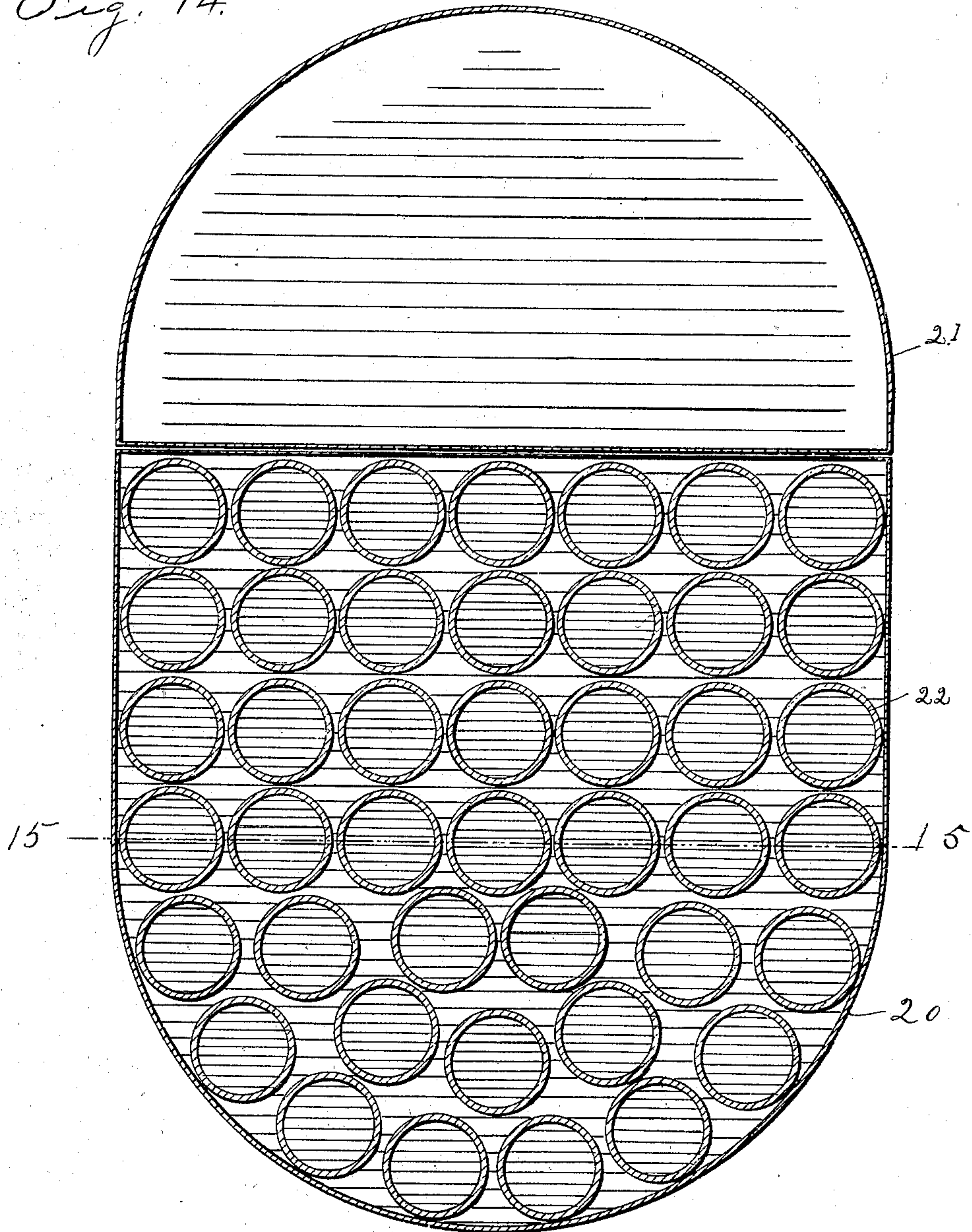
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(Application filed Oct. 28, 1901.)

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Fig. 14.



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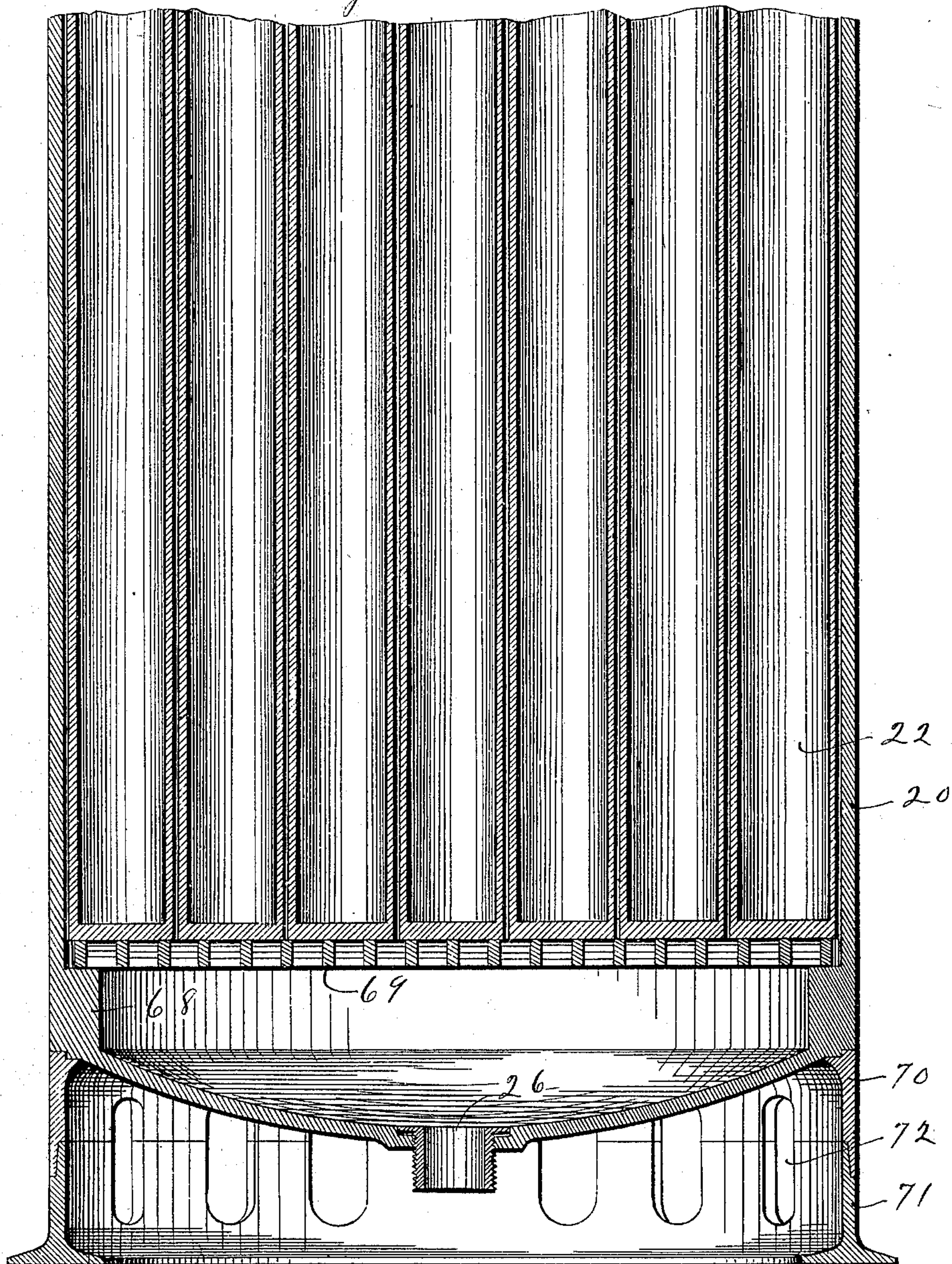
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(No Model.)

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Fig. 15.



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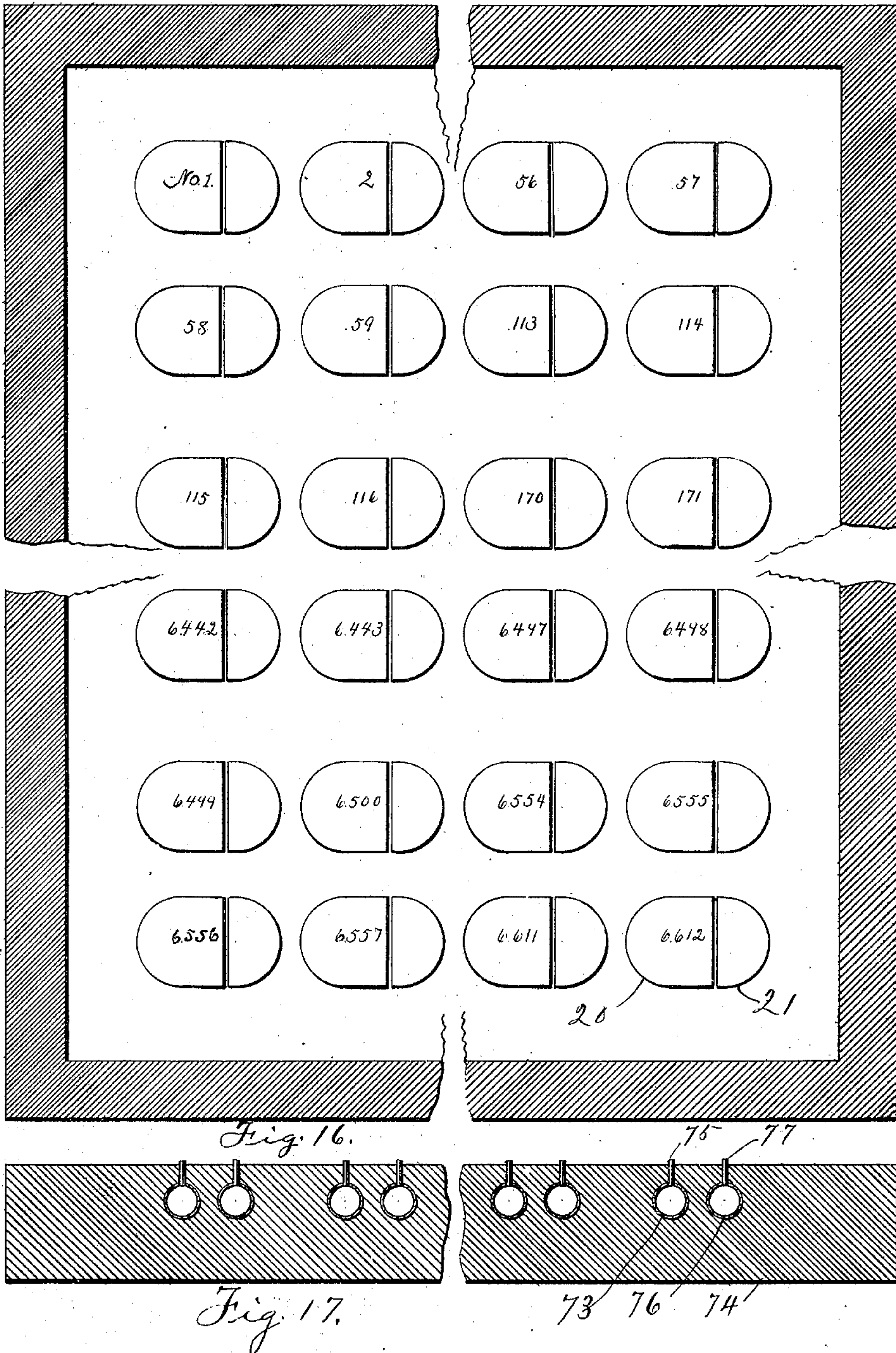
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(Application filed Oct. 28, 1901.)

(No Model.)

8 Sheets—Sheet 8.



Witnesses
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UNITED STATES PATENT OFFICE.

VALENTINE OSTER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
OTTO F. KEISKER, OF ST. LOUIS, MISSOURI.

FILTER.

SPECIFICATION forming part of Letters Patent No. 702,466, dated June 17, 1902.

Application filed October 28, 1901. Serial No. 80,373. (No model.)

To all whom it may concern:

Be it known that I, VALENTINE OSTER, a citizen of the United States, residing at St. Louis, Missouri, have invented a new and useful Improvement in Filters, of which the following is a specification.

My invention relates to filters; and it consists of the novel features herein shown, described, and claimed.

10 Figure 1 is a view in elevation of a filter for domestic use embodying the principles of my invention, parts being broken away to illustrate the construction. Fig. 2 is a sectional elevation of the filter on a plane parallel with
15 Fig. 1. Fig. 3 is a side elevation looking in the direction indicated by the arrows 3 in Figs. 1 and 2, parts being broken away to show the construction. Fig. 4 is an enlarged detail of the siphon and trap. Fig. 5 is a sectional detail showing the connection between
20 the siphon and the strainer. Fig. 6 is a sectional detail on the line 6 6 of Fig. 4. Fig. 7 is a sectional detail on the line 7 7 of Fig. 4. Fig. 8 is a top plan view of the filter, the cover being broken away to show the interior.
25 Fig. 9 is a horizontal section on the parts shown in Fig. 8. Fig. 10 is a view in elevation of the top hanger. Fig. 11 is an end view of the hanger. Fig. 12 is a bottom plan view of the hanger. Fig. 13 is a perspective
30 showing the upper and lower hangers attached to the wall. Fig. 14 is a horizontal section showing how a large number of strainers may be assembled in one tank. Fig. 15 is a vertical section on the line 15 15 of Fig. 14.
35 Fig. 16 is a plan showing how a large number of filters may be assembled as required for use in a city waterworks. Fig. 17 is a section of the floor shown in Fig. 15 and illustrating
40 the muddy-water pipes and the clear-water pipes.

Referring to the drawings in detail, the muddy-water tank 20 and the clear-water tank 21 are mounted side by side and upon
45 the same level. A single tank may be used with a partition to separate the muddy-water compartment from the clear-water compartment; but as a matter of economy in the construction I prefer to use two separately-constructed tanks. The strainers 22 are placed
50 in the muddy-water tank and are in the form

of bottles or jugs. The siphons 23 are attached to the upper ends of the strainer and lead upwardly through the walls of the tanks and downwardly to points near the bottom of
55 the clear-water tank. The intake-pipe 24 discharges into the upper end of the muddy-water tank, and the float-valve 25 controls the passage through the intake-pipe. The outlet-pipe 26 leads from the bottom of the
60 muddy-water tank, and the overflow-pipe 27 leads from the top of the muddy-water tank, and the outlet-pipe 28 leads from the bottom of the clear-water tank, and the traps 29, placed in the bottom of the clear-water tank, 65
serve to keep air out of the siphons. The cover 30 closes the upper ends of both of the tanks to keep the dust out of the tanks. In the construction of the strainer 22 I take
70 two thousand pounds of ordinary yellow or red brick clay, five hundred pounds of potter's clay, and five hundred pounds of hard-wood charcoal. The clay is first carefully washed to eliminate all the particles of silica, then
75 dried, ground, and bolted through not coarser than No. 50 bolting-cloth. The charcoal is ground as fine as possible and bolted through No. 90 bolting-cloth. The materials are then
80 thoroughly mixed in their dry state and placed in a water-tight box and saturated with water. Care must be taken to avoid the use of lime-water. The materials are mixed with water
85 until they are very thin, or in the condition known as "lobally," because in this state or condition a more thorough mixture and mingling are secured. Then the mixture is
90 left to dry until it is thick enough to work, when it is worked into tubes, pipes, bottles, jugs, plates, or any desired shape, in which it may be used as a filtering medium. Then
95 it is burned in a potter's unglazed-ware kiln. The amount of heat used is about the same as that used in producing front cherry-red brick.

The siphons are attached to the strainer 95 22, as shown in detail in Fig. 5. The corks are formed to fit the necks of the strainers and are bored to receive the flexible tubes 32, and the metallic collars 33 are placed tightly in the ends of the tubes 32 to hold
100 said tubes tightly in the corks 31, and the corks 31 are tapered and pushed tightly into

the necks of the strainers. The exteriorly-screw-threaded nipple 34 is inserted in the opposite end of the tube 32 and the nipple is in turn inserted into the union 35. The washer 36 is placed between the walls of the tanks 20 and 21. A similar washer 37 is placed inside of the wall of the tank 20. Another similar washer 38 is placed inside of the wall of the tank 21. The tube 39 is screw-threaded and inserted through the walls of the tank 20 and 21 and through the washers 36 37 38, and the nut 40 is placed upon the tube 39 against the inner face of the washer 38, and a similar nut 41 is placed upon the tube 39 against the inner face of the washer 37. The nuts should be screwed to form a water-tight joint at the opening where the siphon passes from the muddy-water tank to the clear-water tank. The tube 39 extends some distance from the nut 41 into the union 35, and the washer 42 is placed between the union 35 and the nut 41 to make a water-tight joint. The small pipes 43 are tapped into the tubes 39 and extend upwardly, and are closed by the removable caps 44, said pipes 43 serving as vents to let air in or out of the siphon as desired.

A small tube 45 is screwed into the lower ends of the tubes 39, thus making the lower or discharge end of the siphon smaller than the upper or intake end. Attention is called to the fact that the flexible tubes 32 are larger than the tubes 39 and that the tubes 39 are larger than the tubes 45, thus making a funnel-shaped siphon. The traps 29 are simply cups placed in the bottom of the clear-water tank, and the siphon extends downwardly to near the bottom of the cup. It is obvious that the cup will remain filled with water when the outlet-valve 28 is open and the balance of the water runs out of the clear-water tank, and said cups will thus form traps to keep air out of the siphon. The cover 30 has perforations 46 for the purpose of letting air into the tank, and the said perforations are covered with wire-cloth 47 to keep the dust out of the tanks. The T 48 extends downwardly from the float-valve 25, and the pipes 49 lead in opposite directions from the T. The sprinklers 50 are connected to the pipes 49 and mounted directly over the strainers 22, and when the float-valve opens to admit water from the intake-pipe the water passes through the pipes 49, through the sprinklers 50, and falls upon the strainers 22 to wash and clean the strainers. The upper hanger 51 and the lower hanger 52 are attached to the wall. The platform 53 is connected to the lower hanger at its rear edge, and the tie-rods 54 connect the forward edge of the said platform to hanger 51, and the tanks 20 and 21 are mounted upon the platform 53, and wires 55 are attached to the upper ends of the upper hanger and extend along in front of the tanks and hold the tanks from tipping off the platform. The hanger 51 consists of the plate 56, having a large number of screw-holes 57 formed in its

intermediate portion and having ears 58 formed on its ends, the webs 59, connecting the ears 58 to the ends of the plate. The holes 60 are formed through the webs 59 to receive the ends of the wires 55. The hanger 52 consists of the plate 61, having a large number of screw-holes 62 and a bead 63 extending forwardly from the lower edge of the plate 61 and the lip or flange 64 attached to the bead 63 and extending upwardly to form a hook, the platform 53 having a flange 65 interlocking with the hook 64 and the ears 66 to receive the tie-rods 54. When it is desired to mount a filter, on a plaster wall, for instance, the location may be selected without regard to the position of the studs 67 of the wall. Then the hangers 51 and 52 may be placed in position upon the wall and the screws may be inserted through any of the holes which will strike the studs 67. This feature is of great importance when the filter is to be mounted, as illustrated in Fig. 13. The hangers 51 and 52 make it possible to mount the filter in any desired position and at the same time connect it securely to the studs.

In Figs. 14 and 15 I have shown how a large number of strainers may be assembled in a single muddy-water tank. The ledge 68 is formed in the bottom of the muddy-tank, and the grate 69 sets upon the ledge and the strainer 22 rests upon the grate 69. The outlet 26 is attached to the center of the bottom of the tank and the tank is elevated upon the foundation by means of the wall 70 and a sub-wall 71. Openings 72 are formed through the subwalls and allow access to the outlet-pipe.

In Figs. 16 and 17 I have shown how a large number of filters may be assembled as required for a city waterworks. The muddy-water pipes 73 are embodied in the foundation 74 and connected to the muddy-water tanks by pipes 75, and the clear-water pipes 76 are placed beside the muddy-water pipes and connected to the clear-water tanks by pipes 77.

When water is admitted to the muddy water-tank through the float-valve and the tank is filled, the float rises and shuts off the water, the strainers are submerged and filled with water, and the siphons are submerged, and the water passes from the siphon into the clear-water tank. As fast as the water passes out of the muddy-water tank into the clear-water tank the float is lowered and admits more water. The strength and action of the siphon depend upon the height of the water in the clear-water tank. When the water is low in the clear-water tank, the suction of the siphon is strongest, and the filters will furnish water at the rate of four gallons an hour to the superficial foot. When the clear-water tank is filled, an equilibrium is established and the suction-pressure of the siphon ceases. Then the mud and impurities which are collected on the outer surface are released and allowed to fall into the bottom of the muddy-water tank. When the outlet

from the bottom of the muddy-water tank is open, the mud and water will pass out, the float will be lowered, fresh water admitted to the tank, and this water will pass through the sprinklers and fall upon the strainers and assist in cleaning the strainers. If the muddy water is drained at the time there is clear water in the clear-water tank, the action of the siphon will be reversed, and this will assist in the cleaning process. Since the grain of the strainer is so fine that no impurities could enter, the strainers are kept clean by simply washing the muddy water off the outer surface.

15 I claim—

1. In a water-filter, a muddy-water tank; a clear-water tank mounted on the same level and beside the muddy-water tank; a strainer in a muddy-water tank, and a siphon connection between the strainer in the muddy-water tank and the clear-water tank; said siphon connection consisting of the flexible tube 32; the nipple 34 connected to the flexible tube; the union 35 connected to the nipple; the washer

36 placed between the walls of the tanks; the washer 37 placed inside of the muddy-water tank; the washer 38 inside of the clear-water tank; the tube 39 inserted through the walls of the tanks and through said washers; the nut 40 placed upon said tube against the inner face of the washer 38; the nut 41 placed upon said tube against the inner face of the washer 37.

2. In a filter, a muddy-water tank; a supply-pipe leading to said tank; a valve controlling the supply-pipe; a float controlling the valve pipes leading from the valve strainers mounted under the pipes; sprinklers attached to the pipes in position to wash the strainers so that when the float opens the valve to admit water, the water will pass through the sprinklers as required to wash and clean the strainers substantially as specified.

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