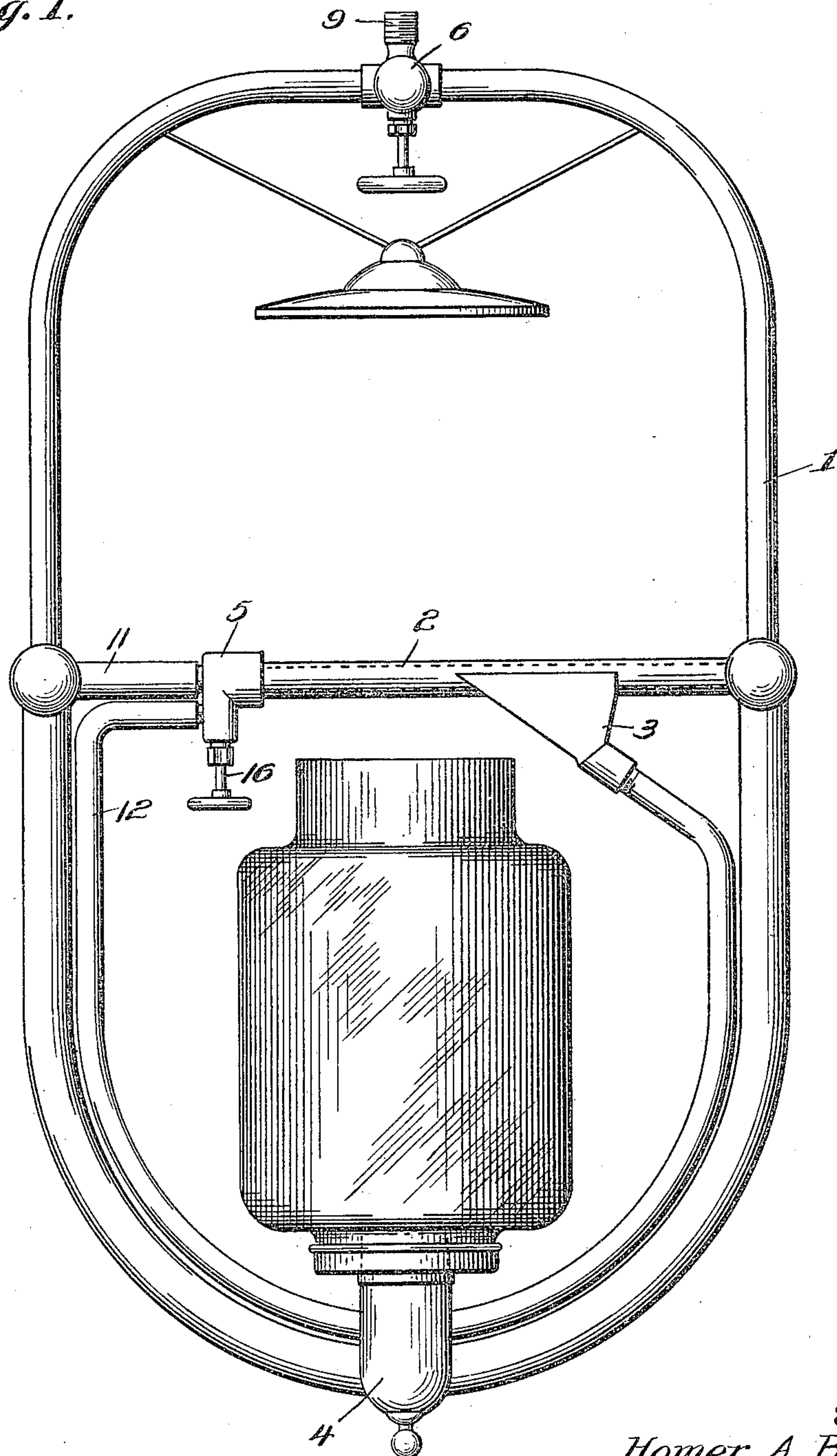


H. A. BARR.
VAPOR BURNING LAMP.
APPLICATION FILED FEB. 19, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



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962,296.

Patented June 21, 1910.

4 SHEETS—SHEET 2.

Fig. 2.

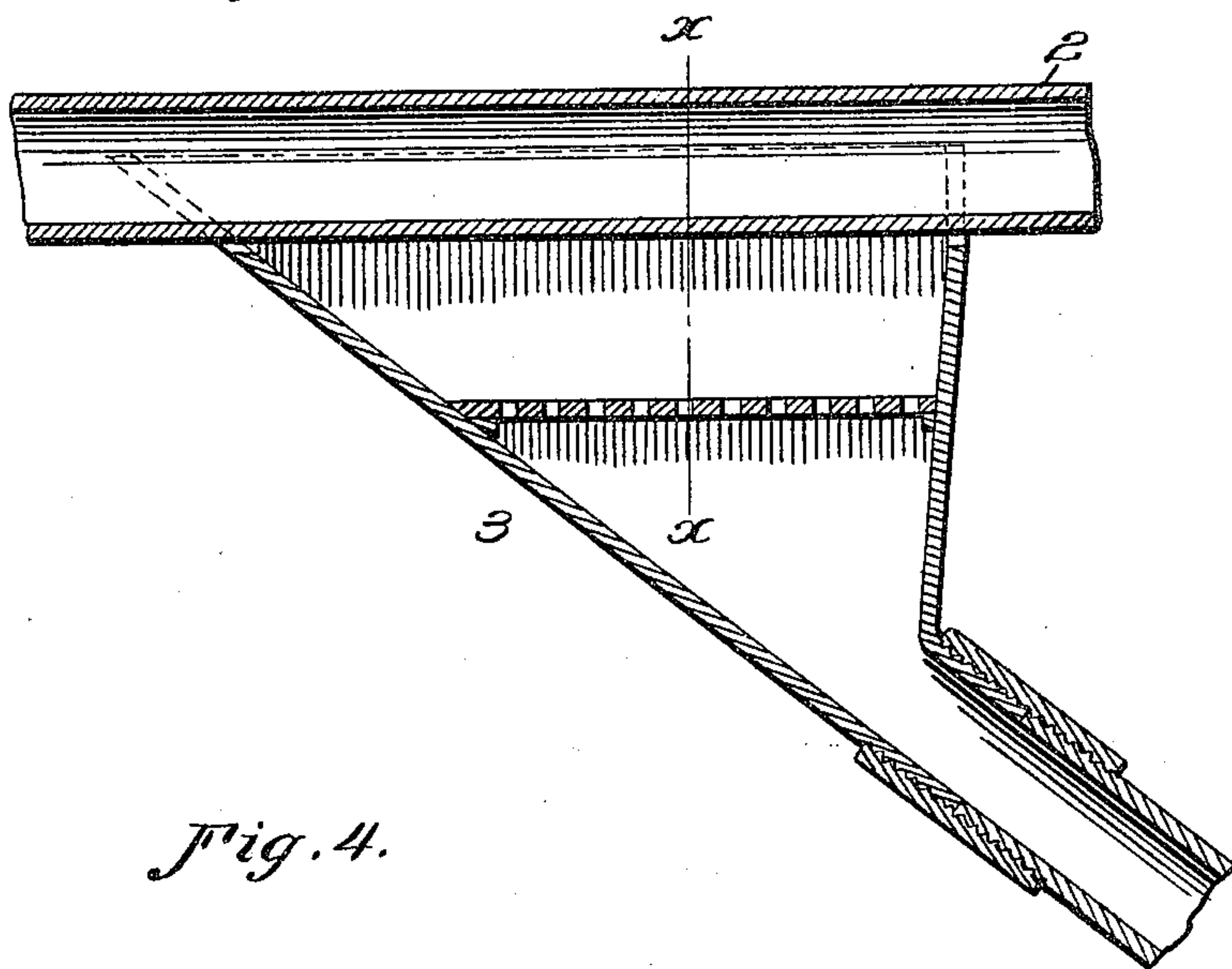


Fig. 3.

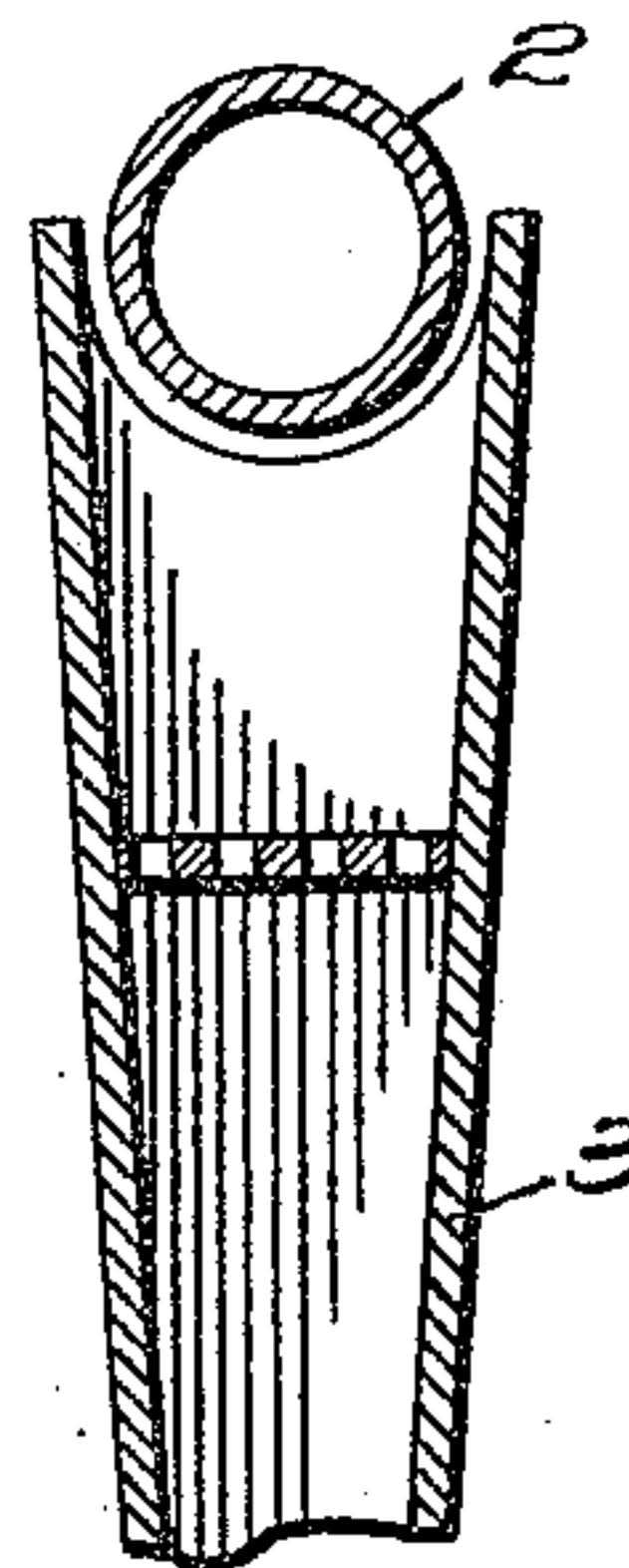


Fig. 4.

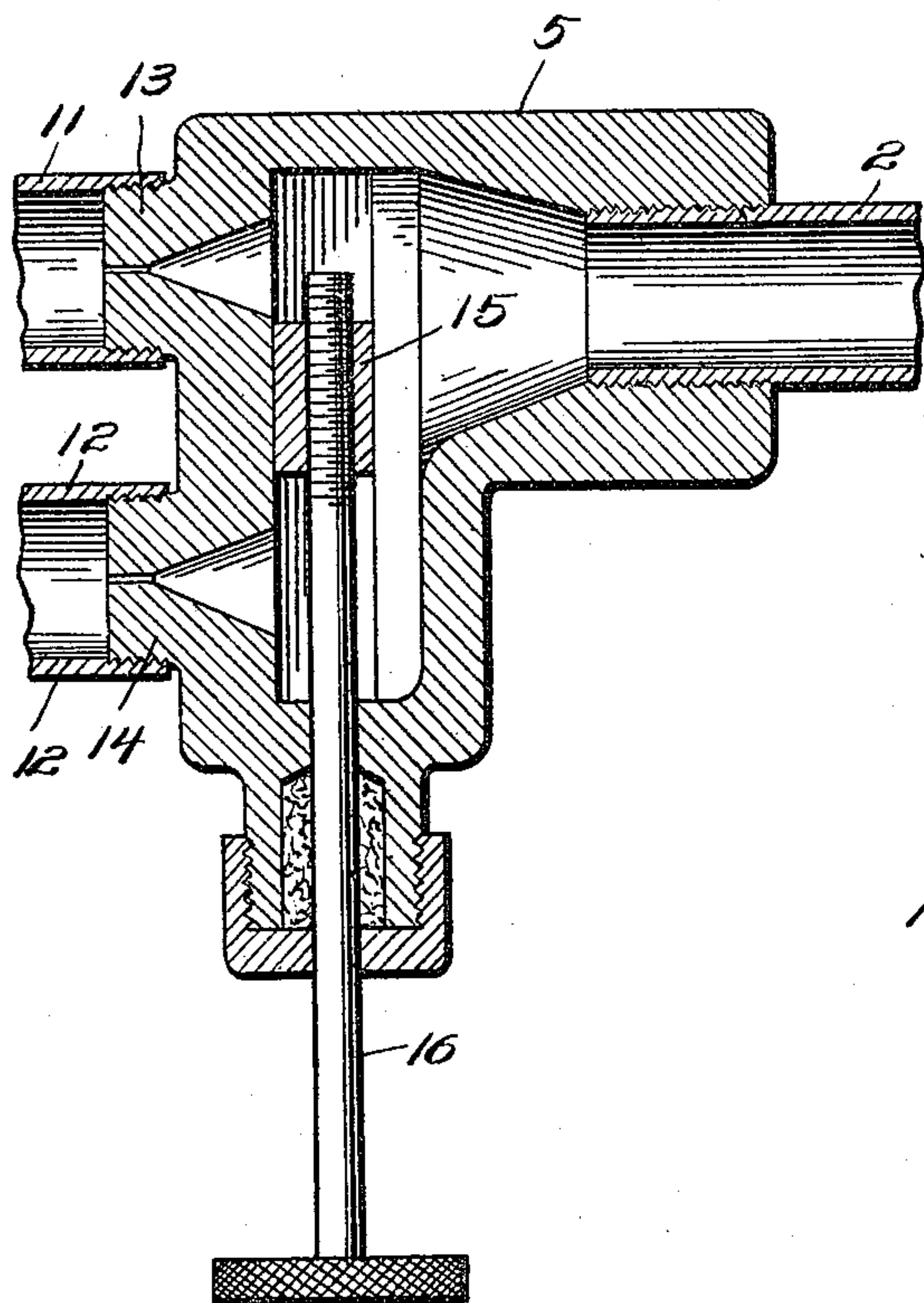
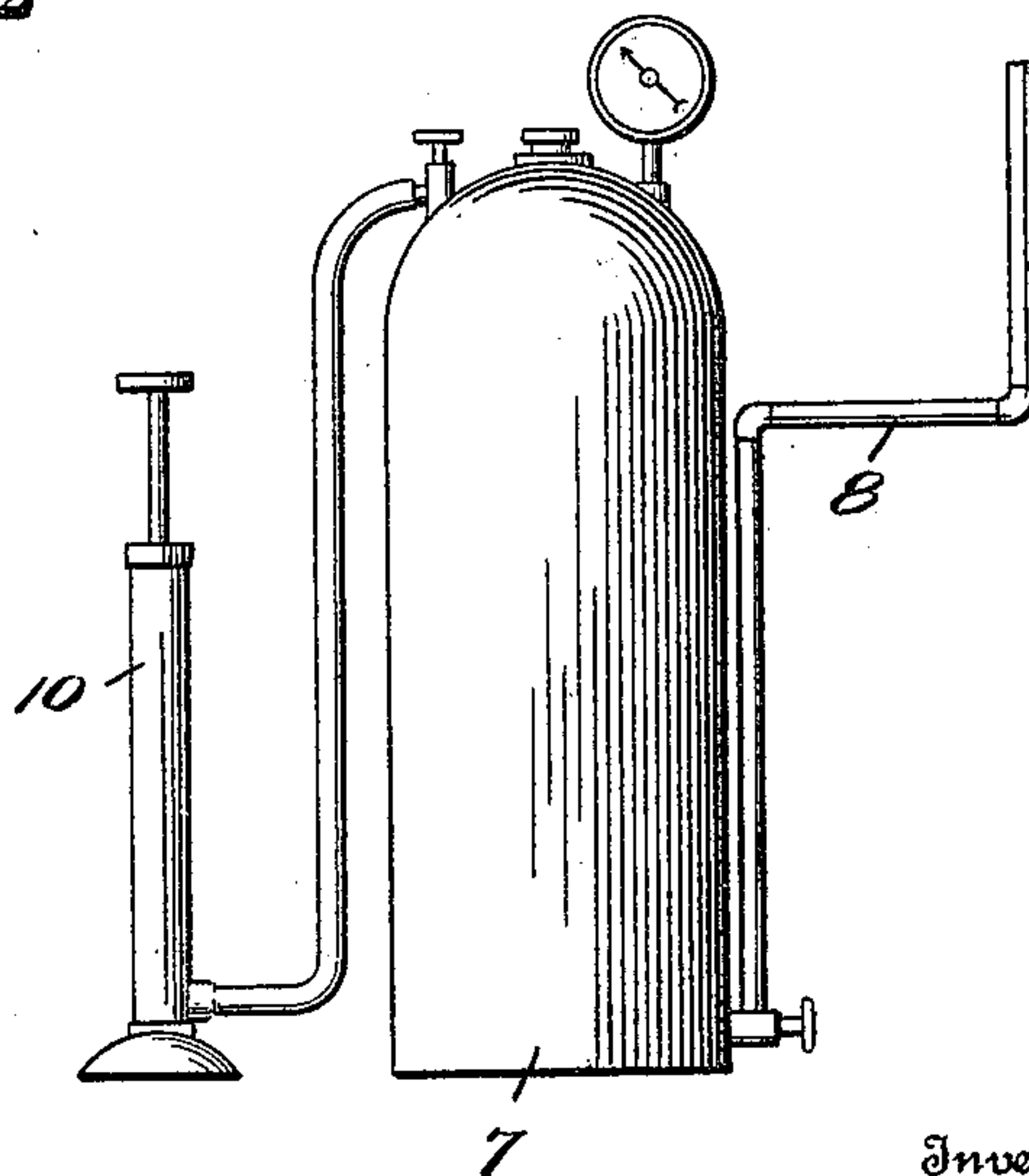


Fig. 5.



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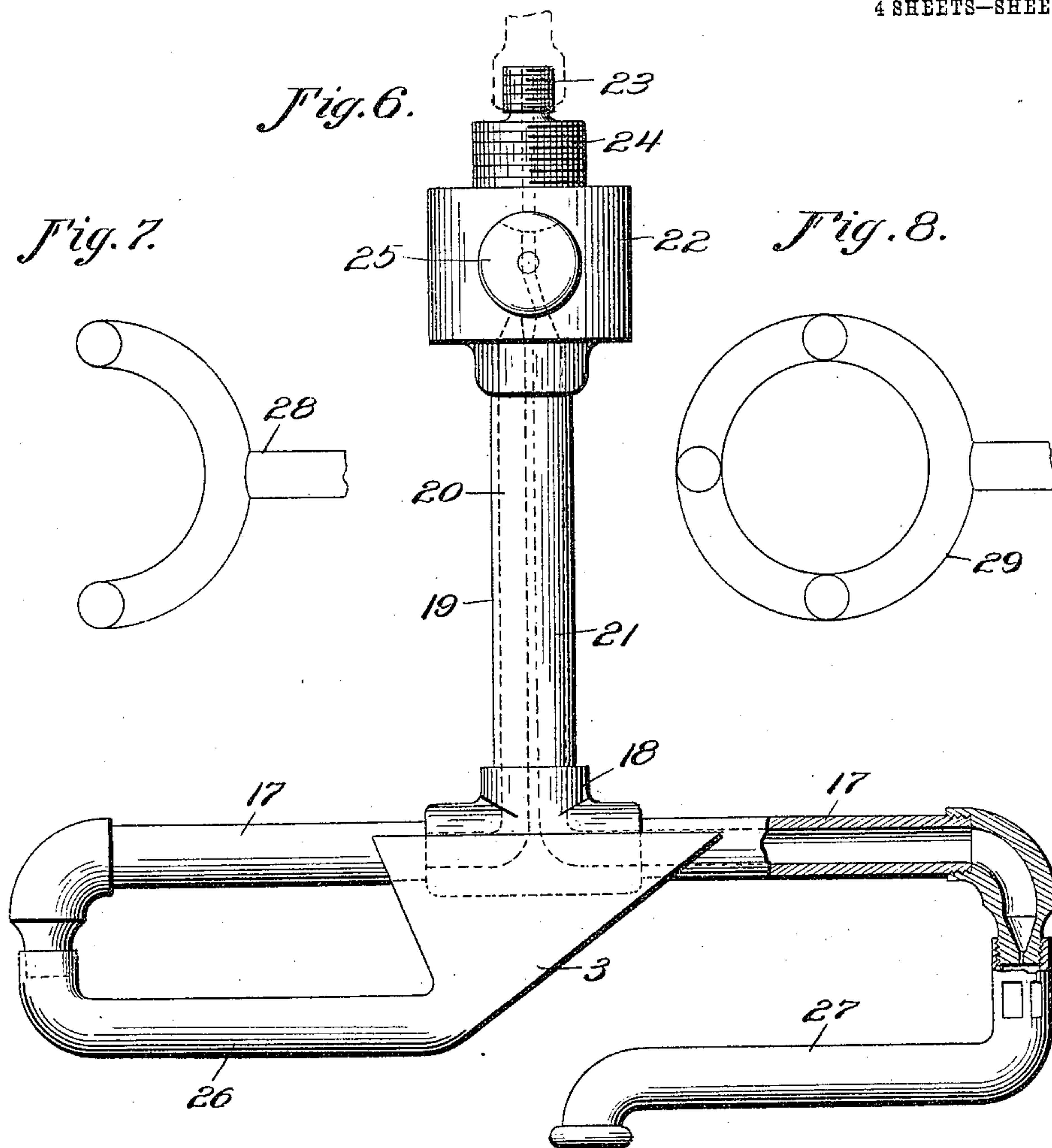
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4 SHEETS—SHEET 3.



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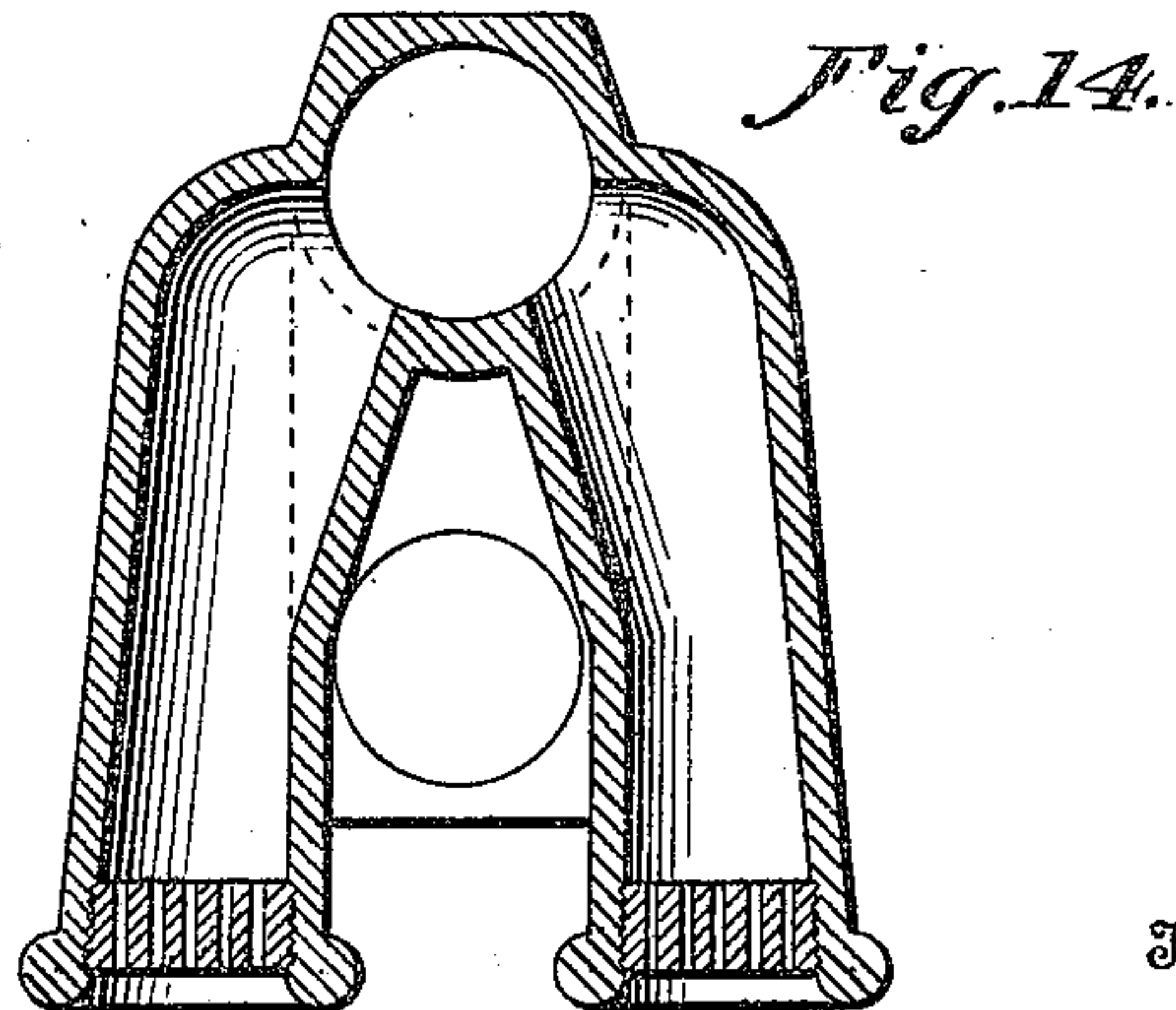
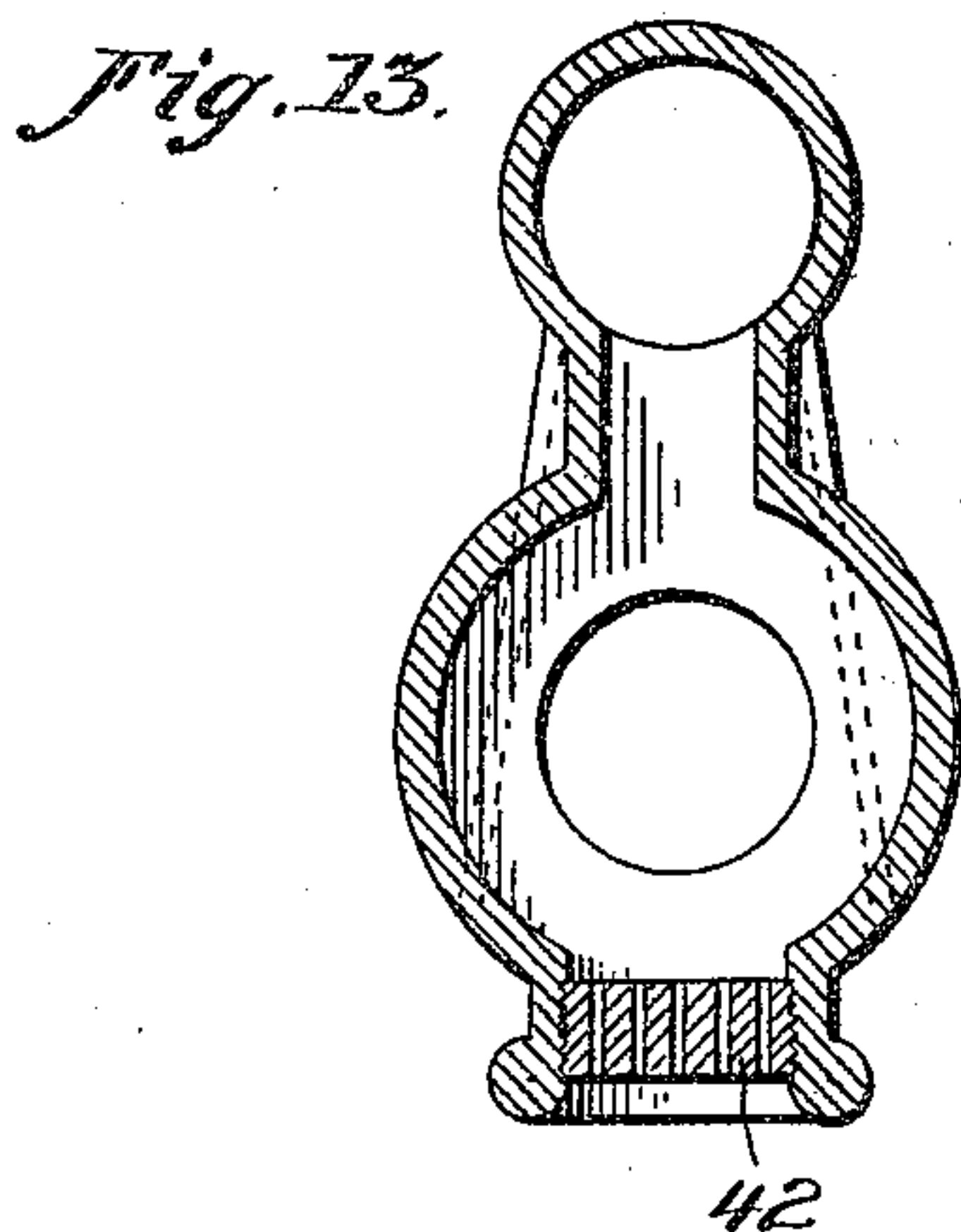
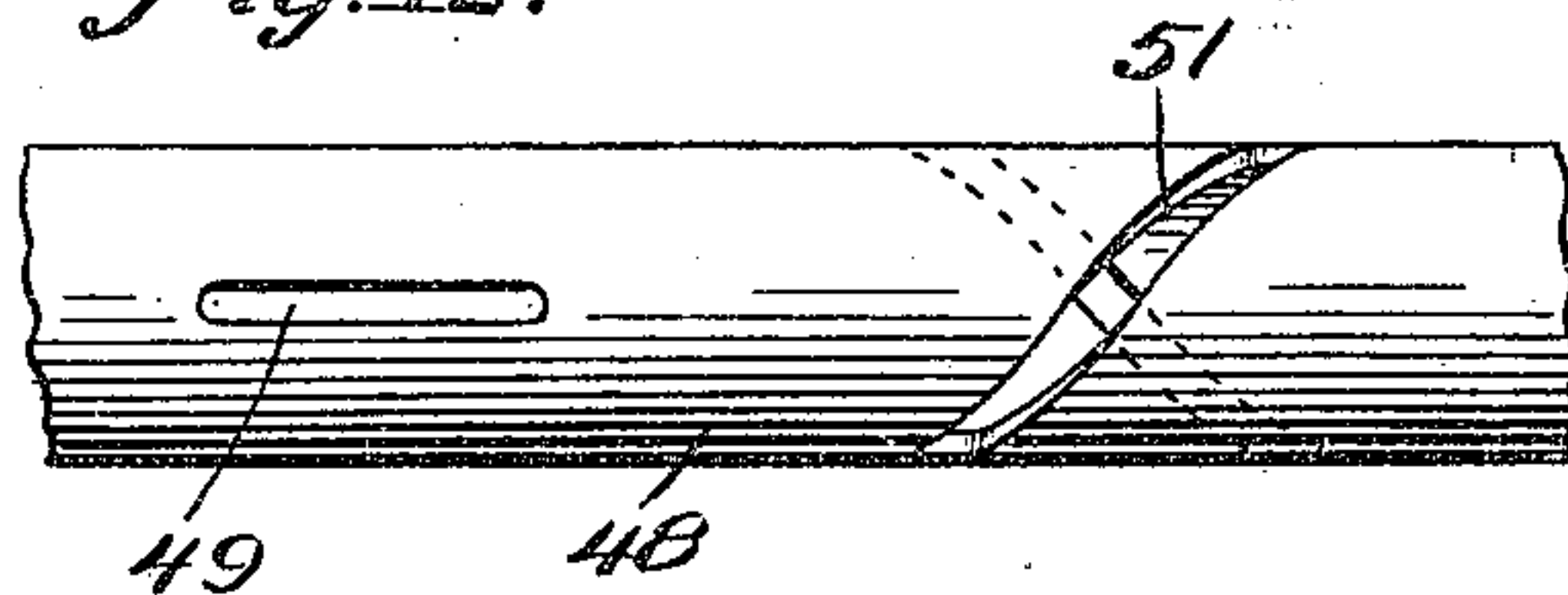
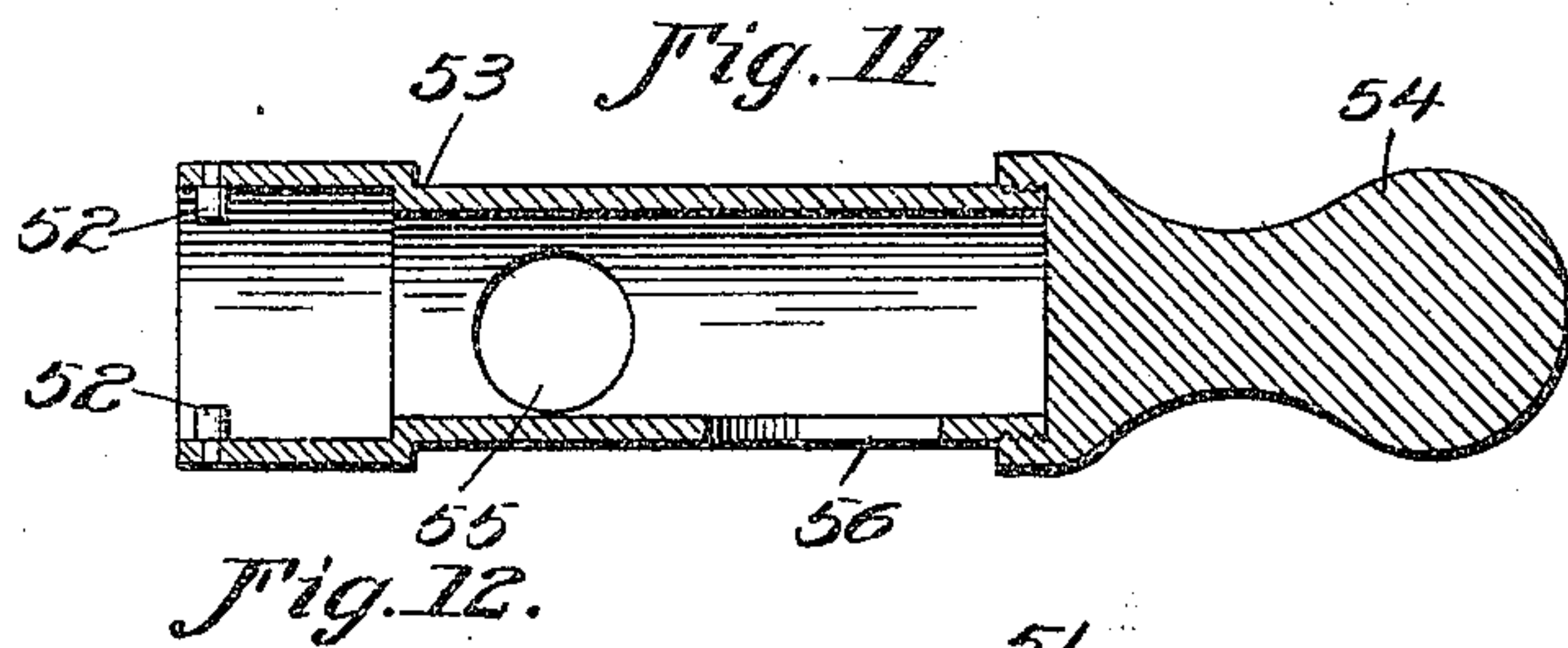
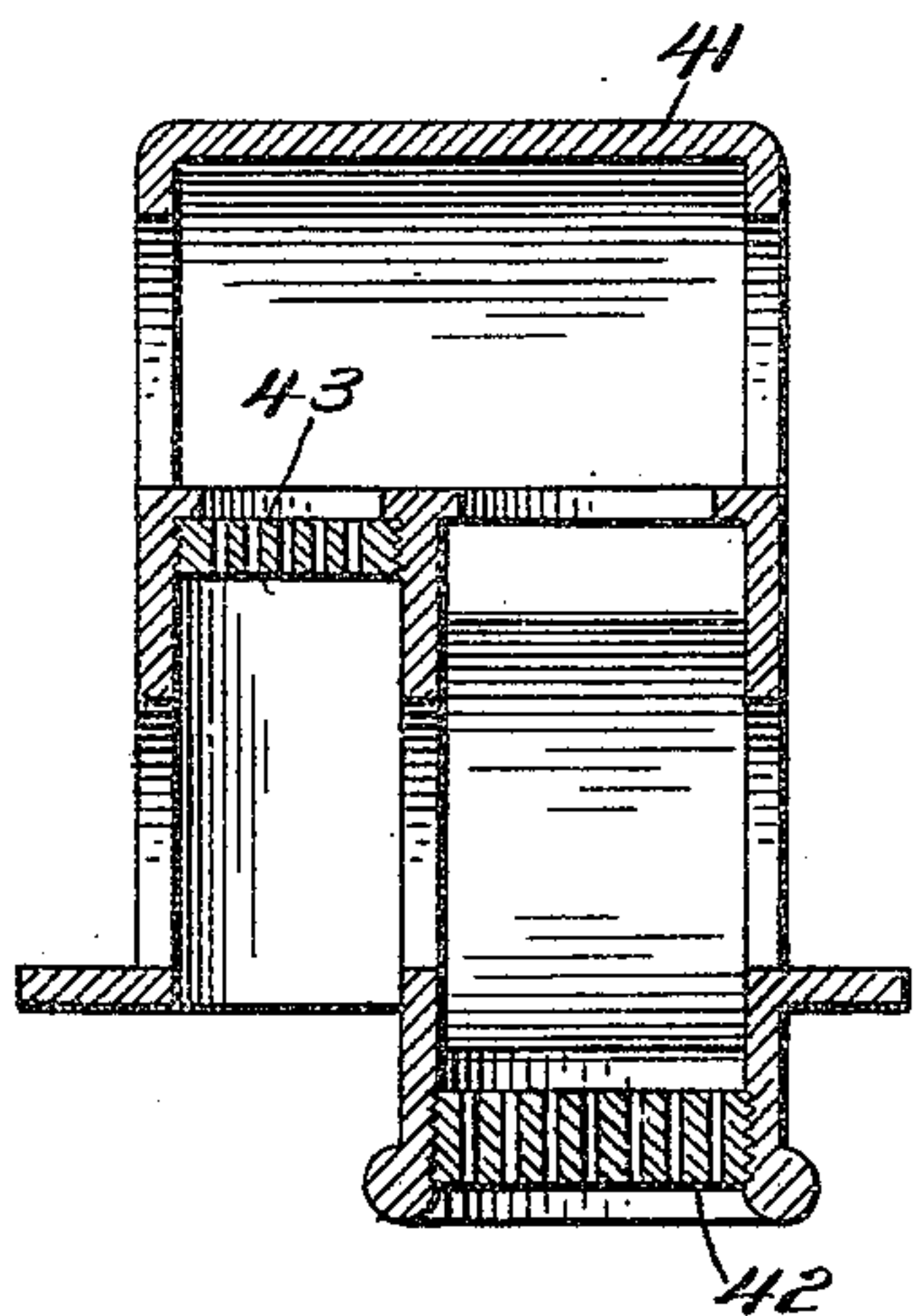
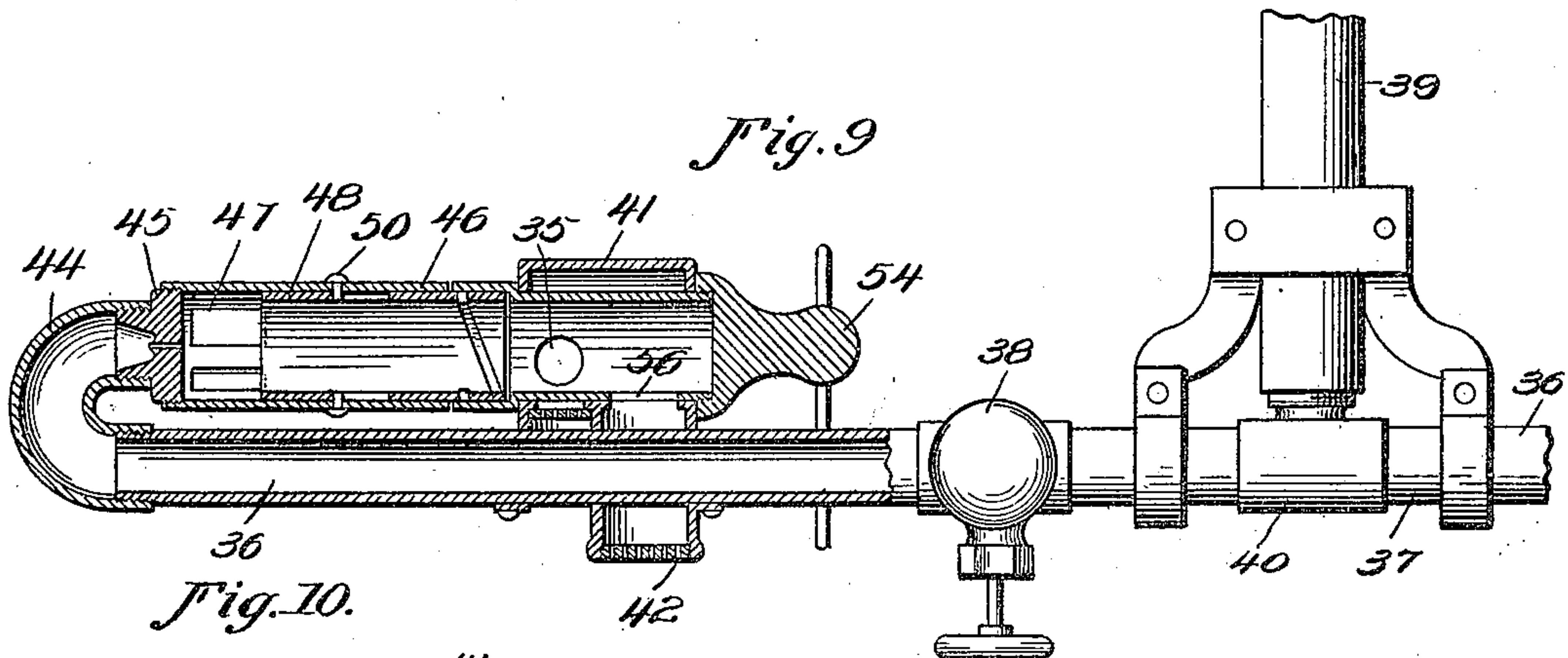
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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VAPOR-BURNING LAMP.

962,296.

Specification of Letters Patent. Patented June 21, 1910.

Application filed February 19, 1909. Serial No. 478,919.

To all whom it may concern:

Be it known that I, HOMER A. BARR, a citizen of the United States, residing at Ashland, in the county of Schuylkill and State of Pennsylvania, have invented new and useful Improvements in Vapor-Burning Lamps, of which the following is a specification.

This invention has relation to hydro-carbon lamps or burners whether designed for illuminating, heating, or cooking purposes.

The invention is of special significance in connection with lamps, utilizing a volatile liquid for generating a burning vapor or fluid, since it involves the burner to be lighted in much the same manner as an electric light it only being necessary to turn on the gas. This result is brought about by means of an auxiliary burner which vaporizes a certain proportion of the hydro-carbon or volatile liquid thereby keeping the lamp or burner primed at all times, said auxiliary burner being so disposed with reference to the main burner that when the valve is open, the main burner instantly ignites, the parts being of such formation that the auxiliary burner may remain lighted in conjunction with the main burner or become extinguished the instant the main burner is lighted.

In systems of out-door illumination in districts or localities lighted by vapor, or hydro-carbon burners, it is generally necessary to start the burners by the application of a naphtha burner to the generator thereby entailing a considerable loss of time which in the aggregate is of consequence when a number of such lamps are to be lighted on given route or system. The present invention obviates the use of matches or like igniting means for lighting the lamps, it being necessary only to operate the valve so as to admit the vapor or gas to the burner when the same automatically lights.

For a full understanding of the invention and the merits thereof, reference is to be had to the accompanying drawings and the following description.

In the drawings:—Figure 1 is a view in elevation of a vapor burner lamp embodying the invention. Fig. 2 is a sectional view of a portion of the generator and the auxiliary burner cooperating therewith. Fig. 3 is a transverse section on the line $x-x$ of Fig. 2. Fig. 4 is a sectional view

of the valve for controlling the vapor or gaseous mixture to both the main and auxiliary burners. Fig. 5 is a detail view of the reservoir or tank for containing the gasolene or other volatile liquid in quantity and having an air pump in connection therewith to force the liquid from the tank to the several burners. Fig. 6 is a view in elevation of a modification in which the fluid is controlled in its passage to the main or the auxiliary burners. Fig. 7 is a detail view of a duplex burner and mixing chamber. Fig. 8 is a detail view of a cluster burner having a mixing chamber of annular form. Fig. 9 is a detail view partly in section and partly in full lines of a further modification. Fig. 10 is a sectional view of the style of generator illustrated in the modification shown in Fig. 9. Fig. 11 is a longitudinal section of the rotary sleeve valve and cut off controller. Fig. 12 is a side view of the slidable cut off for controlling the admission of air to combine with the vapor or gaseous fluid. Fig. 13 is a sectional view of a modified form of burner and of generator. Fig. 14 is a view similar to Fig. 13 of a duplex burner and single generator.

Corresponding and like parts are referred to in the following description indicated in all the views of the drawings by the same characters of reference.

The invention may be applied to a lamp of any design, construction or make, utilizing gasolene, naphtha or other volatile hydro-carbon as the gas producing agent. The style of lamp is immaterial whether intended for illuminating, heating, or cooking purposes so long as it embodies a generator in which the volatile liquid is converted by heat into vapor or fluid which is subsequently mixed with a proportionate amount of air and consumed either to produce illumination or caloric for industrial purposes. The lamp illustrated in Fig. 1 comprises a frame 1, a generator 2, an auxiliary burner 3, and the main burner 4 and a valve 5. A portion of the frame 1 is tubular and utilized for conveying the volatile liquid or gasolene to the generator and subsequently conveying the gaseous mixture to the main burner. A valve 6 is illustrated at the upper end of the frame and is adapted to shut off the supply of gasolene or light gas producing agent to the generator. This valve may

be of any construction. It is to be understood that the lamp may be supplied with hydro-carbon from any source such as a reservoir or tank 7, a pipe 8 leading from
 5 said reservoir and adapted to make connection with the lamp at 9. The tank or reservoir 7 may be conveniently located and may be of usual construction and supplied with a pressure gage, filling opening and air
 10 pump 10 for forcibly displacing the hydro-carbon and causing the same to be properly supplied to the lamps.

The generator 2 is horizontally disposed above the main and auxiliary burners within
 15 the heating zone thereon. One end of the generator makes direct connection with the frame 1 of the burner so as to receive the supply of hydro-carbon therefrom. The other end of the generator connects with the
 20 valve 5 and the latter in turn is connected to pipes 11 and 12, the former having connection with the main burner 4 and the latter with the auxiliary burner 3.

The valve 5 is formed with the two nozzles 13 and 14 cooperating with pipes 11 and 12, respectively. A slide valve 15 located within the casing or body of the valve 5 is adapted to control or close either of the
 25 nozzles 13 or 14 and is adapted to be moved by means of a stem 16 which operates in a stuffing box formed at one end of the valve body 5 and has a hand piece at its outer end. By proper manipulation of the slide valve
 30 15 either of the nozzles 13 or 14 may be closed or said valve may be moved to a position as indicated in Fig. 4 to admit of hydro-carbon vapor passing through each of the nozzles into the pipes 11 and 12 to supply both the main and auxiliary burners.

The main and auxiliary burners are so positioned that the flame may be transferred from one to the other. After the lamp has been started it is kept in readiness for lighting when required by means of the auxiliary burner and when the valve 5 is operated to divert the gas from the generator into the pipe 11 to supply the main burner, the gas issuing from the main burner is ignited by the flame of the auxiliary burner.
 45 When operating the valve 5 to turn off the gas from the main burner, the auxiliary burner is lighted from the main burner. It will thus be understood that it is not necessary to ignite either burner after the lamp
 50 has been started and is in working position and hydro-carbon is supplied thereto. The main and auxiliary burners may operate independently or in unison this being readily understood on reference to Fig. 4 in connection with the foregoing description.

The main burner may be of any type, variety or design and may consist of a single element or two or more as required. The auxiliary burner 3 is elongated in the direction of the generator and comparatively narrow

as will be apparent on reference to Figs. 2 and 3. This formation of burner concentrates the heat and supplies the same throughout the length of the generator. The upper portion of the auxiliary burner is depressed so as to receive the generator as indicated most clearly in Fig. 3.

In the modification shown in Fig. 6, the generator 17 is formed of two sections which are coupled at their ends to a tee fitting 18. The pipe 19 is attached at one end to the tee fitting 18 and is provided with two passages 20 and 21, the latter in communication with one branch or section of the generator and the former in communication with the other section of the generator. A valve 22 is attached to the opposite end of the pipe 19 and is formed with a coupling end having stepped portions 23 and 23. The pipe for supplying hydro-carbon to the burner is adapted to be connected to the reduced end 23 of the coupling and the threaded portion 24 of said coupling serves to attach the burner to an overhead socket or other supporting fixture, (not shown.) A plug valve 25 is rotatably mounted within the body or casing of the valve 22 and is formed with an opening adapted to register with either one of the passages 20 and 21. The upper end of the opening in the plug valve 25 is enlarged so as to register with the passage in the coupling end in either position of the valve. A pipe 26 connects one end of the generator with the auxiliary burner 3. A pipe 27 is connected to the opposite end of the generator and is designed to receive any form of burner whether single, duplex or multiple type.

The burner 28 shown in Fig. 7 is of the duplex type, whereas the burner 29 illustrated in Fig. 8 is of the multiple or cluster type. Either of these burners is adapted to be coupled to the pipe 27.

The burner outlined in Fig. 9 comprises a generator 36 which is coupled at one end to a pipe 37 having a valve 38 in its length. A vertical pipe 39 is coupled at its lower end to a tee fitting 40 interposed between oppositely arranged burners. A mixing chamber 41, shown most clearly in Fig. 10 is mounted upon the generator 36 and is provided with a main burner 42 and an auxiliary or supplemental burner 43. A return fitting 44 is coupled to the outer end of the generator 36 and is provided with a nozzle 45. A cylindrical casing 46 is coupled to the end of the return fitting 44 provided with the nozzle 45 and is formed in the end adjacent to said nozzle with a series of openings 47 for the admission of air to mix with the vapor or gas produced by vaporizing the hydro-carbon. A cylindrical cut off 48 is arranged within the casing 46 and is slidably mounted therein. The cut off 48 has longitudinal slots 49 at opposite points to

receive inner ends of studs 50 let into the sides of the casing 46, thereby preventing rotation of the cut off 48 and directing the same in its reciprocating movements. Spiral slots or guide-ways 51 are provided in opposite sides of the cut off 48 and cooperating with studs 52 extended inward from a rotary sleeve valve 53 which is mounted in the upper portion of the mixing chamber 41 and provided at one end with a hand piece 54. The rotary sleeve valve 53 is formed with two openings 55 and 56 the latter adapted to register with the burner 42 and the former with the burner 43. The openings 55 and 56 are of different sizes, the latter being the larger. When the valve 53 is turned to bring the opening 56 in register with the burner 42, the opening 55 is thrown out of register with the burner 43 and vice versa. The rotary valve 53 is prevented from longitudinal movement in the mixing chamber 41 and by reason of the inner studs 52 entering and cooperating with the spiral slots or guide-ways 51, the cut off 48 is moved longitudinally simultaneously with the rotary movement of the valve 53. It is to be remembered that the auxiliary or supplemental burner 43 is smaller than the main burner 42, hence, less gas is required to supply the same. When the valve 53 is turned to bring the smaller opening 55 in register with the burner 43, the cut off 48 is moved inward within the casing to reduce the effective side of the openings 47, hence, a less amount of air is admitted to the mixing chamber. When the opening 56 of the valve is in register with the burner 42 the cut off 48 is moved outward and the openings 47 uncovered thereby admitting a maxi-

mum amount of air to form a proper gaseous mixture. 40

In Fig. 13 is shown a type of mixing chamber designed for a single burner, whereas Fig. 14 illustrates a mixing chamber designed for two or more burners. The mixing chambers shown in Figs. 13 and 14 are adapted to be applied to the form of burner and arrangement of parts shown in Fig. 9. 45

I claim:— 50

1. In a vapor burner, the combination of a generator, a mixing chamber, a cylindrical casing connected with the generator and having openings, a cylindrical cut off mounted within said casing and having spiral guide-ways, and a rotary valve for the mixing chamber having portions extended into the spiral guide-way of the cut off to effect a reciprocating movement thereof. 55 60

2. In combination, a generator, a mixing chamber mounted upon said generator and comprising a main and an auxiliary burner, a valve rotatably mounted in the mixing chamber and provided with two openings to register with the respective burners, a cut off slidably mounted with respect to the casing in controlling the openings thereof, and having a spiral guide, and an interlocking connection between the rotary valve and said cut off. 65 70

In testimony whereof I affix my signature in presence of two witnesses.

HOMER A. BARR.

Witnesses:

HERBERT RAYMOND WOLFGANG,
JAMES MCFADDEN.