

No. 705,114.

Patented July 22, 1902.

J. A. MOSHER.
GAS STORAGE TANK.

(Application filed Oct. 25, 1901.)

(No Model.)

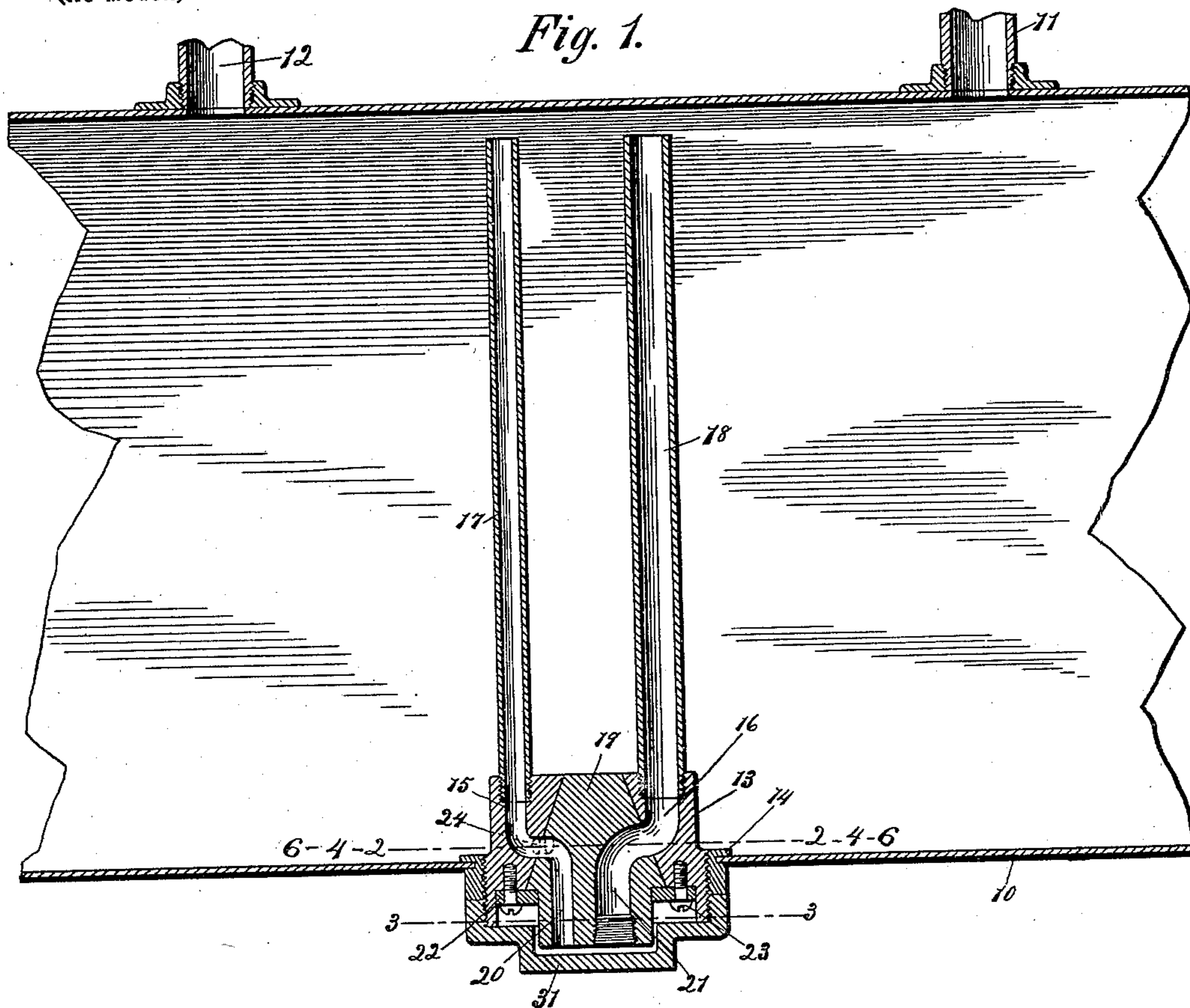


Fig. 2.

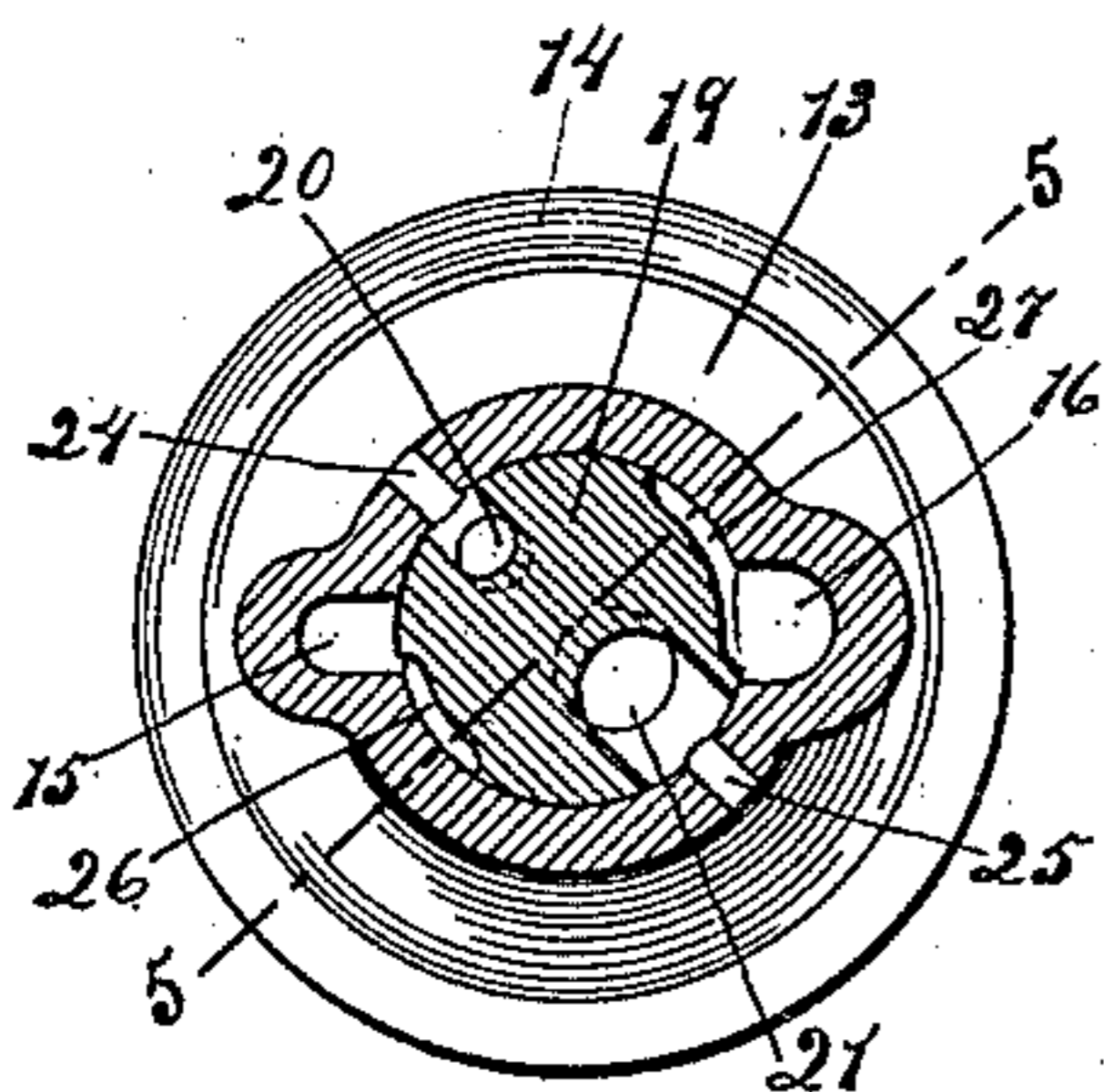


Fig. 3.

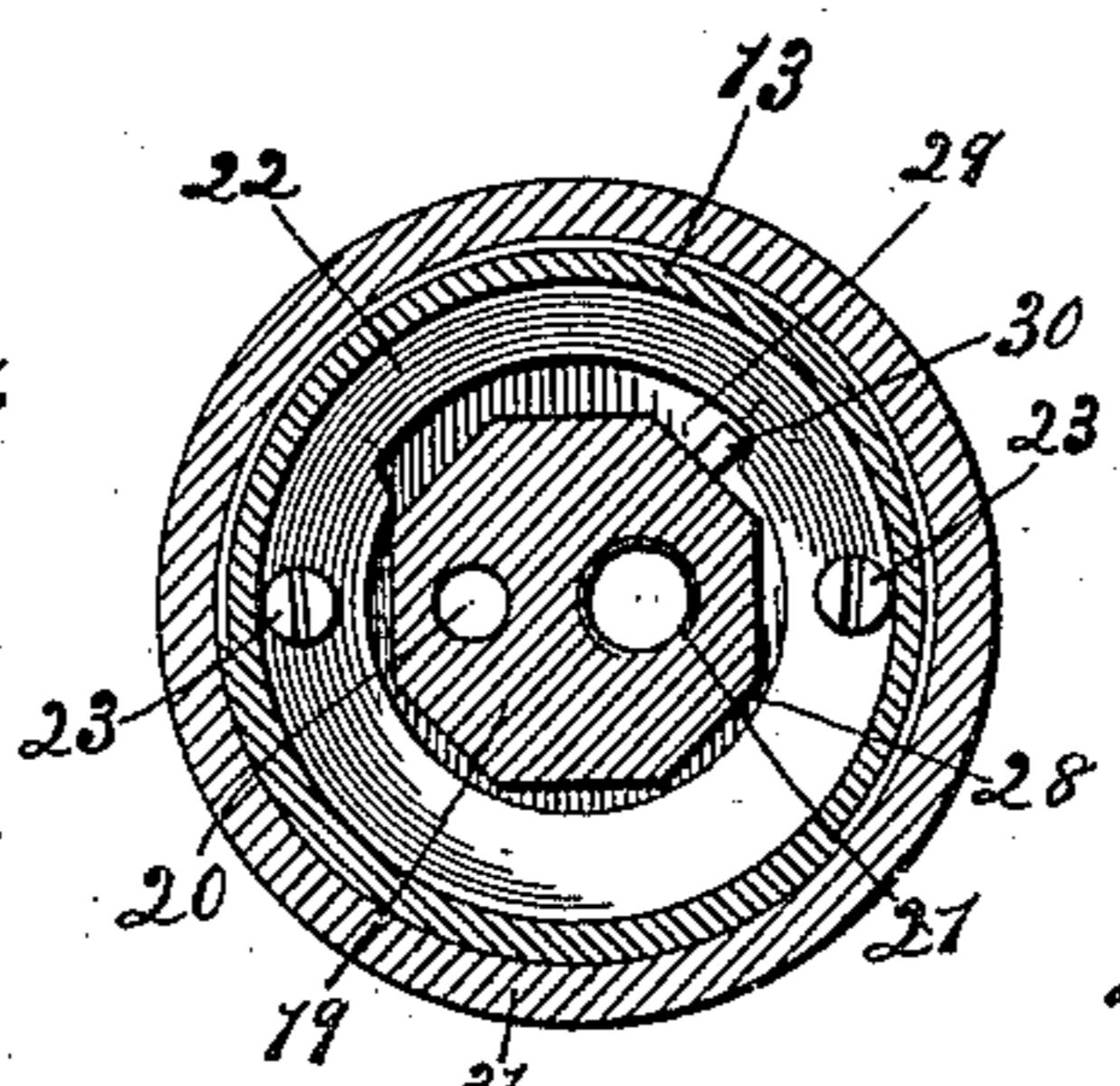


Fig. 4.

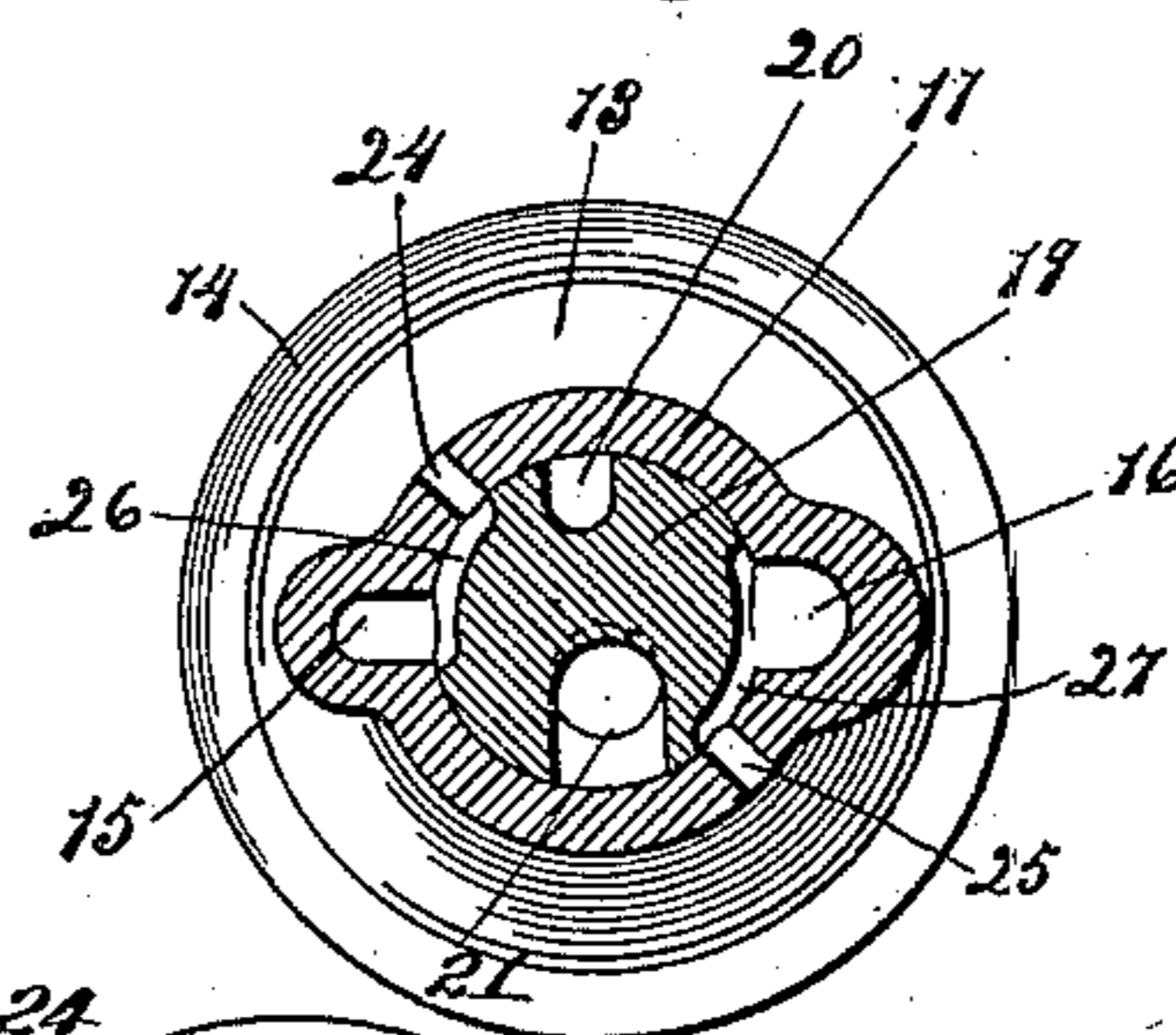


Fig. 5.

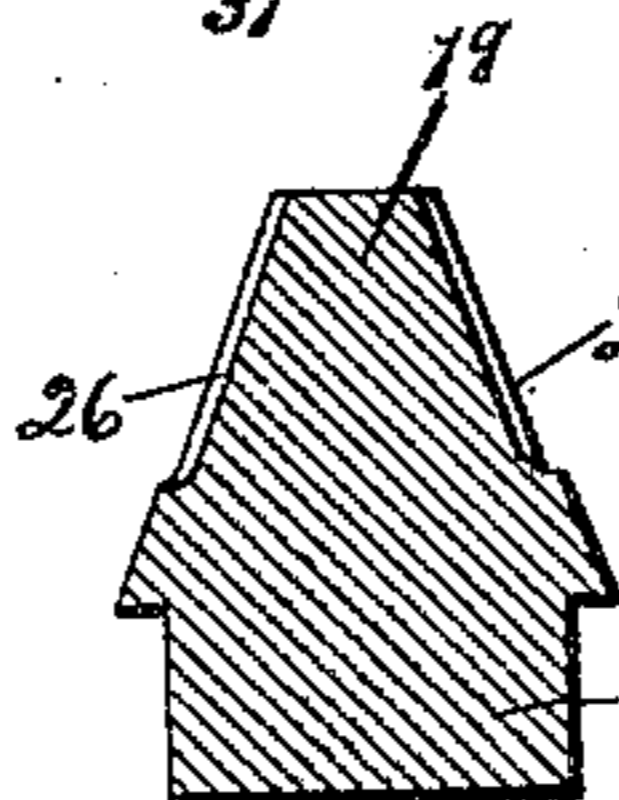
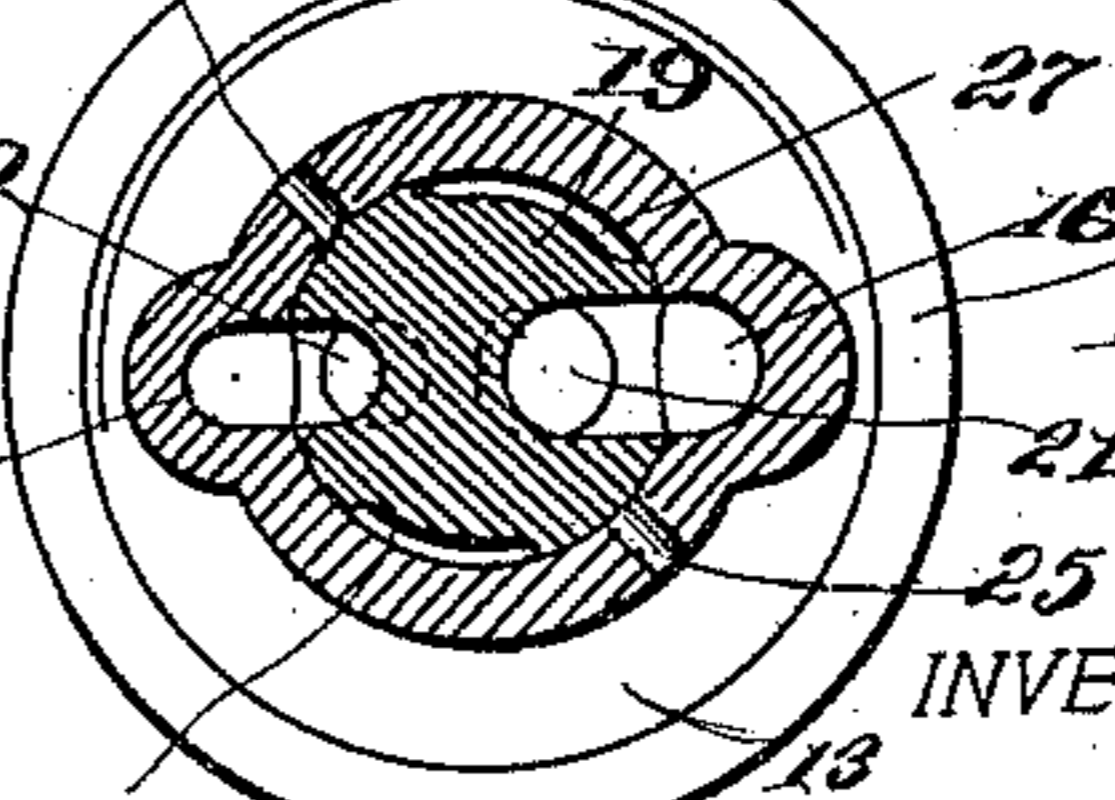


Fig. 6.



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GAS-STORAGE TANK.

SPECIFICATION forming part of Letters Patent No. 705,114, dated July 22, 1902.

Application filed October 25, 1901. Serial No. 79,958. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MOSHER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Gas-Storage Tanks, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

10 This invention relates to improvements in gas-storage tanks.

In the generation and utilization of acetylene and other gases of a similar nature the gas is usually stored for consumption in a tank or receptacle located in some convenient place in the system, and ordinarily this tank is charged with gas in a pure state and not of an explosive character. When, however, the tank after having once been filled is to be removed from the system, either for repairs or other purpose, it is necessary that the gas therein be discharged, and in order that no air may ever be present in the tank, as thereby an explosive mixture would be formed, means must be provided for permitting the expulsion of the gas from the tank and at the same time preventing the admission of air thereto. To this end the tank is filled with water to expel the vapor, and in turn the water is expelled by the incoming gas. This is accomplished by the invention hereinafter described and which comprises, essentially, a tank having a gas-inlet port and a valve-casing having a pair of ports, a valve-plug in the casing having a pair of ports adapted to communicate with the ports in the valve-casing when the valve is in one position, and means for draining the tank when the valve is in a second position.

40 The invention further consists of a valve of the character referred to having means for draining back into the tank when the valve is closed any of the water or other fluid that may have accumulated in the valve-casing or its connections.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a detail longitudinal vertical section of a tank, showing the valve applied thereto. Fig. 2 is a section on the line 2 2 of Fig. 1, the valve being in position for draining the tank. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a section similar to

Fig. 2, except that the valve is shown in position for draining the valve-casing and the tubes in the tank. Fig. 5 is a section of the valve-plug on the line 5 5 of Fig. 2; and Fig. 6 is a section on the line 6 6 of Fig. 1, showing the extreme position of the valve-plug when the ports are in position for filling the tank with water to discharge the gas.

Referring to the drawings, a tank for storing acetylene or other gas is shown at 10 and is provided with a gas-inlet pipe 11 and an outlet-pipe 12.

Located in the bottom of the tank 10 is a valve-casing 13, which may be secured in any suitable manner, as by screwing it into an internally-threaded collar 14, fixed to the tank, and is provided with two ports 15 16, communicating with the interior of the tank. From each of the ports 15 16 there leads a tube 17 18 to the top of the tank, but opening within the same in order that water may enter through one of the said tubes while the gas is being expelled through the other. The casing 13 has a preferably tapering seat to provide space for the ports 15 and 16, from which the tubes 17 and 18 lead, and to insure a snug fit of the rotary oscillating valve-plug 19, seated therein, which is provided with ports 20 21, leading through the outer end thereof, and the former of which communicates with the port 15 in the casing 13 and the latter with the port 16 when the valve is in the position for filling the tank with water and expelling the gas, as illustrated in Fig. 1. The valve-plug is held to its seat by a retaining and adjusting ring 22, overlapping a flange thereof and secured by screws 23 to the valve-casing 13. Located intermediate of the ports 15 16 there is one or preferably, as shown, there are two ports 24 25 in the wall of the casing 13, which have the same angular relation as the ports 20 21 in the valve-plug, so that they may be brought into communication with the latter ports for the purpose of draining the tank, and in order to secure practically complete drainage through these ports 24 25 they are so placed as to open close to the tank-wall. The valve-plug 19 has cavities 26 27 on opposite faces thereof of a width sufficient to overlap the ports 15 and 24 and the ports 16 and 25, respectively, to drain the tubes 17 18 when the valve is closed, or in the position illustrated in Fig. 4. The outer end of the

valve-plug is shaped, as at 28, to receive a wrench or other tool for moving the same, and the outer end of the port 21 is threaded for connection with a hose or pipe through which the liquid is forced to the tank. The ring 22 is provided with an internal recess 29, into which a pin 30, projecting from the valve-plug 19, plays to limit the movement thereof, and a scale may be provided, if desired, to indicate the positions at which the valve-plug is to be left at rest, as for filling the tank with water, draining the tank, and closing the valve. A screw-cap 31 is provided for the casing, which will prevent tampering with the valve.

When the valve is in the position shown in Fig. 4, its normal position when the tank is in service, communication of the ports 20 21 with the ports 15 16 is closed, and the cavities 26 27 connect the ports 15 16 with the ports 24 25, opening into the tank, to drain the pipes 17 18 of any water that may have accumulated in the latter to prevent freezing thereof during cold weather if the tank be located on the exterior of a car. To expel the gas in the tank, the valve-plug is turned—as, for instance, looking at Fig. 3, to the limit of its movement to the right—thereby throwing the ports thereof into communication with the ports 15 16 of the casing, as illustrated in Figs. 1 and 6. A hose or pipe having been coupled to the valve water is forced through the tube 18 until the tank is filled, the gas therein being expelled through the tube 17 and the ports 15 and 20. The water-pipe may be detached before the valve-plug is turned, the pipe 18 preventing any loss of liquid. The tank may now be removed. When it is again restored to its place in the system, the valve-plug is returned to its intermediate position, or that illustrated in Fig. 2, the ports 24 25 being in communication with the ports 20 21, and as the gas enters the tank through the pipe 11 the water is expelled through both ports. As soon as the water is entirely drained away the valve is again closed, taking the position shown in Fig. 4. Prior to the original and each subsequent installation the tank should be filled with water in order that when gas is admitted no air may be present in the tank, and such water is expelled, in the manner hereinbefore described, as the gas enters.

Various modifications may be made without departing from the spirit of my invention, and I do not limit myself to the precise construction shown. For example, it is not essential that a tube be applied to the port 16 or that drainage be provided for through both ports 20 21.

I claim as my invention—

1. In a valve, in combination, a valve-casing having a pair of ports, a valve-plug having a pair of ports so placed as to simultaneously communicate with the ports in the casing, a third port in the casing and which registers with one of the ports in the valve-plug

when the latter port is out of communication with one of the pair of ports in the casing, and a cavity in the valve-plug designed to bring one of the pair of ports in the casing into communication with the said third port.

2. In a valve, in combination, a valve-casing having a pair of ports, a valve-plug having a pair of ports so placed as to simultaneously communicate with the ports in the valve-casing, and a third port in the casing so located as to register with one of the ports in the valve-plug when the latter is out of communication with one of the pair of ports in the casing.

3. In combination, a gas-tank having an induction-port, a valve-casing in the bottom of the tank and having a pair of ports leading to the top thereof and a second pair of ports opening at the bottom of and within the tank, and a rotatable valve-plug in the casing and having a pair of externally-opening ports so placed that their inner ends will register with either of said pairs of casing-ports.

4. In combination, a gas-tank having an induction-port, a valve-casing in the bottom of the tank and having a pair of ports leading to the top thereof and a second pair of ports opening at the bottom of and within the tank, and a rotatable valve-plug in the casing and having a pair of externally-opening ports so placed that their inner ends will register with either of said pairs of casing-ports, the valve-plug also having a pair of ports connecting adjacent casing-ports when the first-mentioned valve-plug ports are not in register therewith.

5. In combination, a gas-tank having an induction-port, a valve-casing in the bottom of the tank and having a pair of ports leading to the top thereof and a lateral port opening at the bottom of and within the tank, and a rotatable valve-plug in the casing and having a pair of externally-opening ports so placed that their inner ends will register with the pair of casing-ports or one of the valve-plug ports will register with the lateral casing-port.

6. In combination, a tank having an inlet-port 11, a valve-casing fixed in the bottom of the tank and having a pair of ports leading from the valve-seat through its inner end, a duct leading from one of such ports to the top of and opening within the tank, a second pair of ports located intermediate of the first pair and opening laterally through the walls of the valve-casing to the interior of the tank, an oscillating valve-plug seated within the casing and having a pair of ports opening through its outer end and through its side walls in line with the valve-plug ports, and segmental cavities of sufficient length to overlap adjacent casing-ports.

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Witnesses:

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