

J. E. ATKINSON.

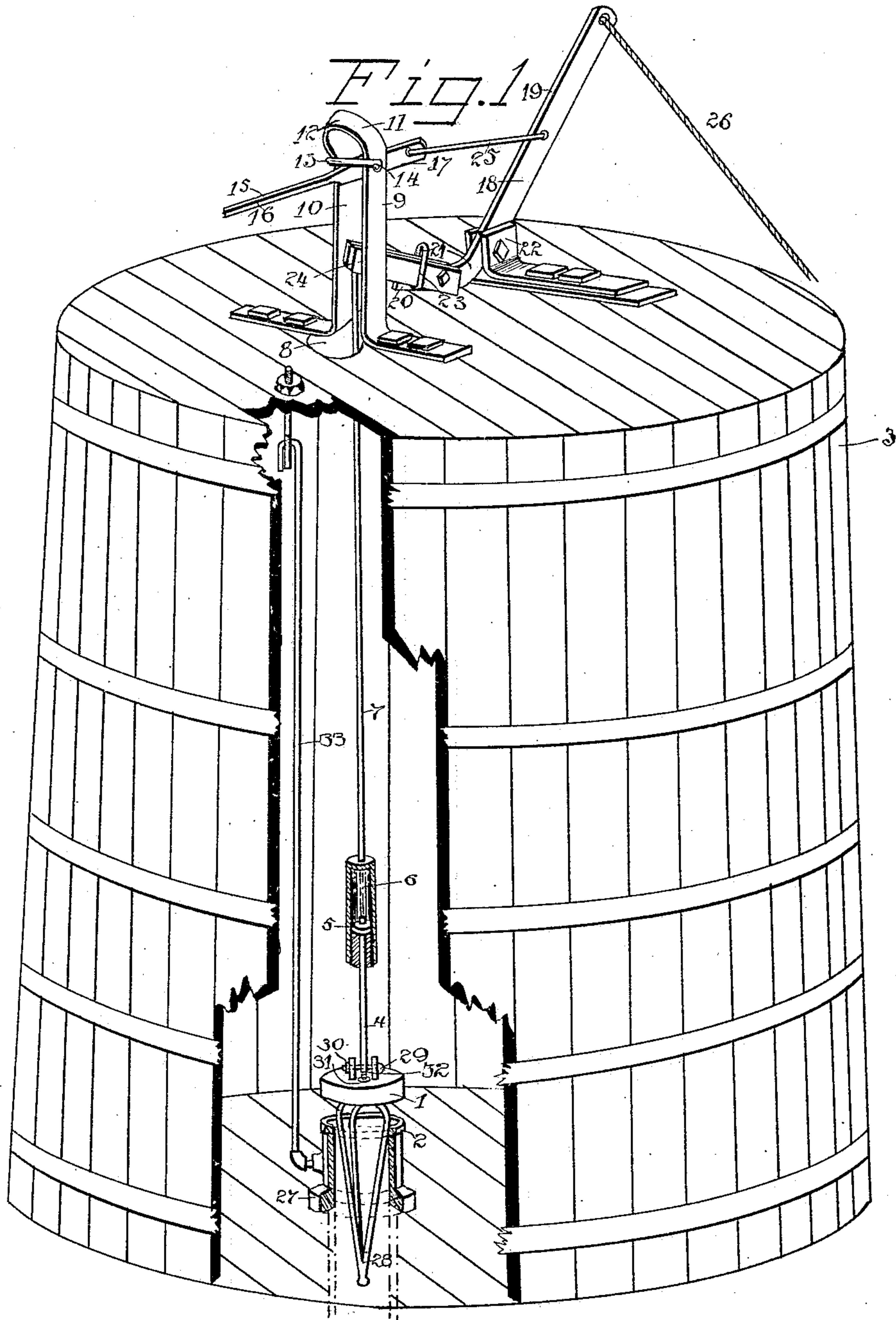
VALVE CONTROL IN LIQUID TANKS.

APPLICATION FILED MAY 13, 1916. RENEWED FEB. 3, 1919.

1,297,985.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 1.



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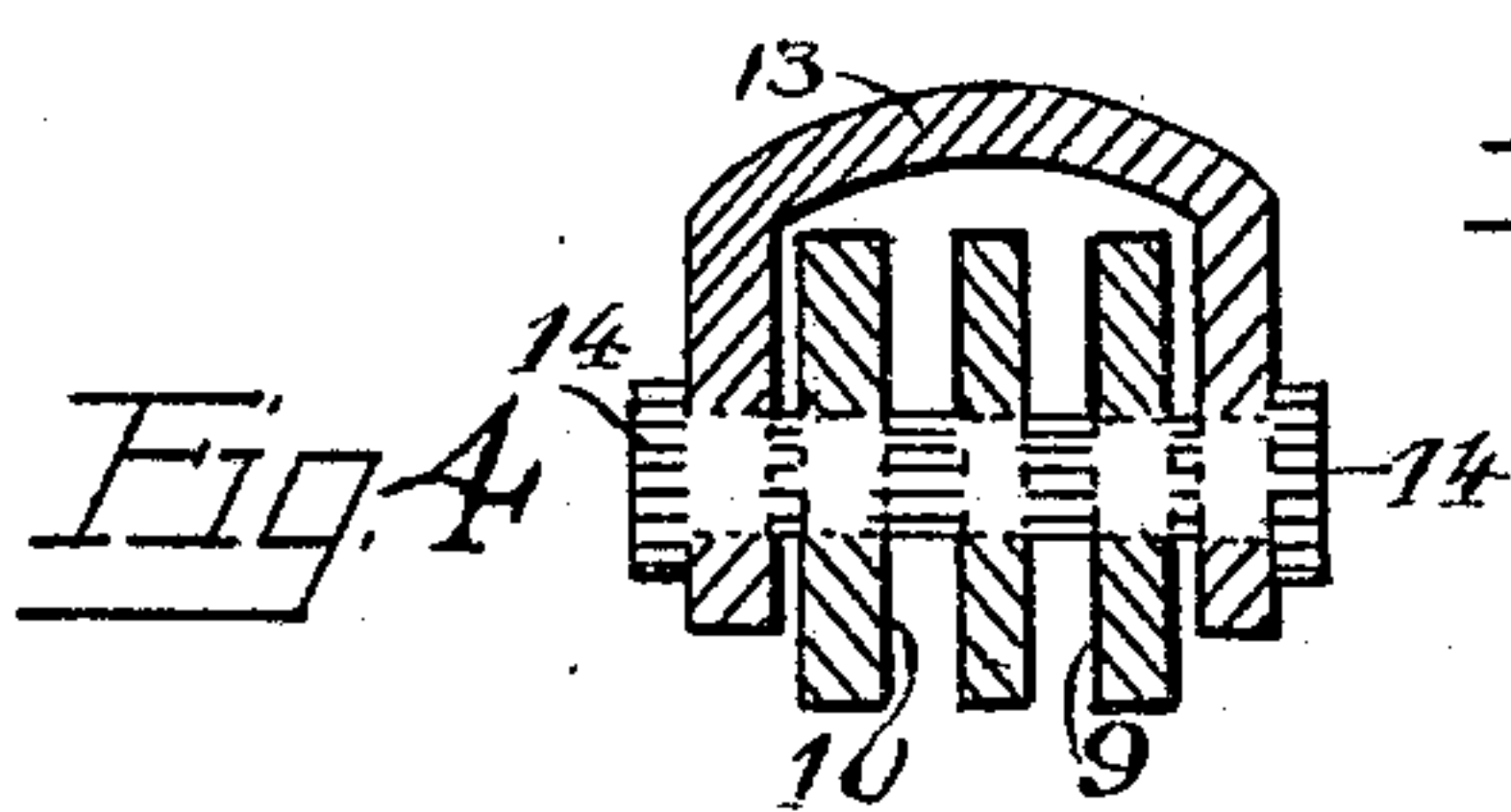
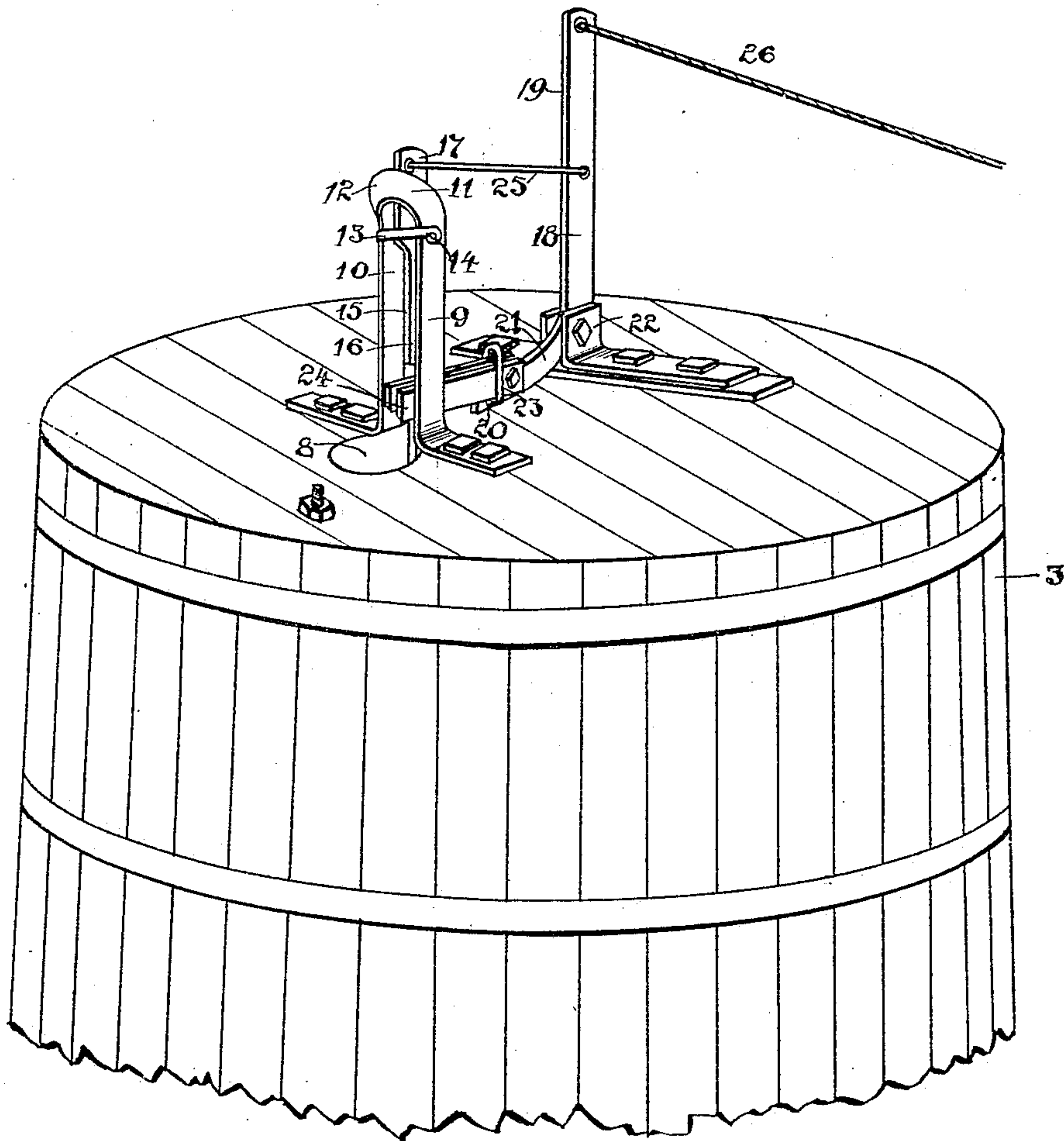


Fig. 2

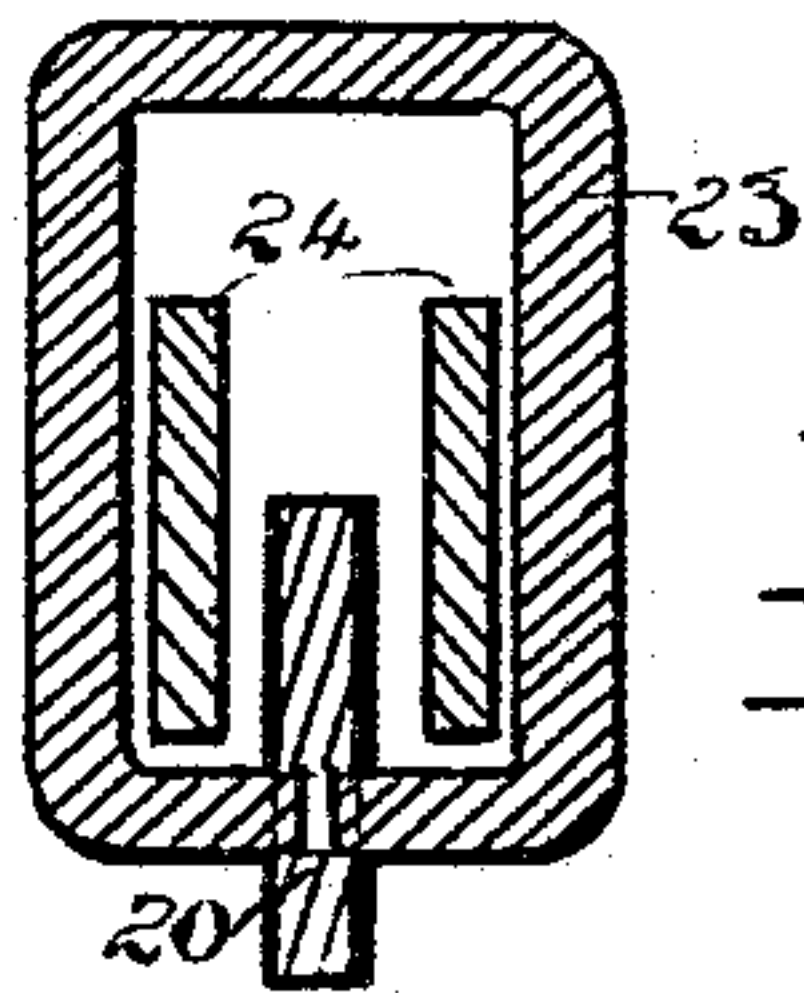


Fig. 3

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UNITED STATES PATENT OFFICE.

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VALVE CONTROL IN LIQUID-TANKS.

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Specification of Letters Patent.

Patented Mar. 25, 1919.

Application filed May 13, 1916, Serial No. 97,409. Renewed February 3, 1919. Serial No. 274,804.

To all whom it may concern:

Be it known that I, JAMES EDWIN ATKINSON, subject of the King of Great Britain, and resident in the village of Landis, in the Province of Saskatchewan, in the Dominion of Canada, have invented certain new and useful Improvements in Valve Controls in Liquid-Tanks, of which the following is the specification.

The invention relates to improvements in valve control for liquid tanks as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel construction and arrangement of parts, whereby the valve is automatically kept on its seat except when manually removed and held therefrom.

The objects of the invention are to devise a reliable operating gear for railway and other exposed tanks, that will be comparatively free from damage or interruption by contact with the elements, to insure simple and efficient operation in filling and discharging, to facilitate the use of the tank by railway employees and effect a quick closure after discharge and generally to provide a cheap, serviceable and durable tank equipment.

In the drawings, Figure 1 is a perspective view of a tank showing the valve gear mounted thereon and the casing broken away to disclose the valve in its open position.

Fig. 2 is a perspective view, showing the valve closed and the gear in corresponding position.

Fig. 3 is an enlarged cross sectional view, showing the crank lever, the pivoted valve gear links and the anchoring yoke.

Fig. 4 is an enlarged cross sectional view of the closing arm standards showing the stop for said arm.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, the valve 1 normally rests on the seat 2 in the bottom of the tank 3 and controls the passage for the fluid to and from said tank.

The rod 4 extends upwardly from the valve 1 and is connected at its upper end to the piston or plunger 5 operating in the cylinder 6.

The cylinder 6 is supported from its upper

end by the gear rod 7, the latter extending upwardly through the rod hole 8 in the top of said tank.

On the exterior of the top wall of the tank 3 the standards 9 and 10 are supported being secured to said top wall at each side of the rod hole 8, the latter being approximately between said standards. The standards 9 and 10 are joined at their upper offset ends 11, the offset at the joining forming a stop 12.

A short distance below said offset ends 11, the strap 13 passes in front of the two standards 9 and 10 and is secured at its ends to the pivot pin 14.

The arm 15 formed of a bar preferably twisted centrally to present right angular faces 16 and 17, respectively, is pivoted toward one end on the pin 14, so that the longer and heavier end falls by gravity between the standards 9 and 10 the lower faces 16 extending across and occupying the space separating said standards, while the upper faces 17 through which the pivot 14 extends are parallel with the said standards and therefore leave considerable space on each side between themselves and the standards for the free working of the arm on its pivot, thus the space between the standards cannot become choked, as every operation of the arm 15 keeps its path clear.

The arm 15 at the front is limited in its upward movement by the stop 13 and in its downward movement by the stop 12.

The crank lever 18 is formed of the vertical section 19 extending upwardly from the short section 20 projecting from said vertical section obtusely at the angle 21. The crank lever 18 is pivotally supported on the top wall of the tank 3 in the bracket 22 and centrally in alinement with the standards 9 and 10. The section 20 of the lever 18 may be recessed in the top wall or ceiling of the tank and at or near its extremity has the yoke or strap 23 pivotally secured thereto and projecting upwardly.

The parallel bar links 24 are pivotally secured to the section 20 near the angle 21, one on each side, and extend beyond said section through the yoke 23 and near their extremity the gear rod 7 is pivotally secured therebetween.

The arm 15 at its upper end is pivotally connected to the vertical section 19 by the

rod 25, said connection being in the upper part of said vertical section, so that any pull on the section 19 by means of the rope or cable 26 will immediately affect the said arm 15, but on the other hand the arm 15 in dropping by gravity will at once affect the said crank lever, when the pull on the rope 26 is over.

The valve seat 2 is at the upper end of the inlet and discharge pipe 27 and the valve is directed to its seat by the long tapering guide 28 in skeleton cone form and preferably made of wire. The rod 4 is secured to the valve 1 by means of the pin 29 extending through the lugs 30 from the top of said valve, and the guide 28 is secured to said valve by the bolt 31 extending upwardly through said valve between the lugs 30 and to be held by the nut 32.

The air pipe 33 communicates with the feed and discharge pipe 27 within the tank and below the valve 1 and extends upwardly terminating in a downwardly turned upper end 34, which is normally above the water level in the tank, thus permitting the passage of air at all times to the said feed and discharge pipe and avoiding a vacuum in said pipe and its consequences.

Briefly the operation of the invention is as follows:—

The valve 1 normally rests on its seat 2 and the pipe therebelow is empty, so it cannot freeze up, as happens with exposed tanks frequently.

It will readily be understood that in filling the tank, the valve gear as described will permit the inflow of water without affecting the lifting arms to any appreciable extent and will automatically drop to its seat at once on the release of the pressure.

The cylinder having the plunger operating therein accounts for an upward movement of the valve without affecting the crank lever used in discharging. This is further provided for in the yoke 23 as the parallel links 24 may lift slightly without drawing up the short section of the crank lever, further any disturbance by ice forming around the gear rod and the customary changes level of the water will also be accounted for in the present arrangement.

It will be noticed that with the flexibility permitted by the link and yoke connection to the crank lever a comparatively stiff connecting rod may be used between the valve and the roof gear, thereby avoiding links in the connection which are almost certain to bring trouble in winter time by the inadvertent raising of the valve from clinging ice.

In discharging the water the rope is pulled and held and this has the effect of tilting the crank lever on its pivot, consequently the

short section of said lever is raised and in turn the links and gear rod and valve.

Meanwhile the arm 15 has been also raised until stopped by the front stop. Immediately the rope is released the arm 15 drops to its vertical position and this returns the crank lever, links and valve rod and consequently the valve, which shuts off the discharge.

The simplicity of the mechanism is particularly efficacious in such plants, where exposure to weather conditions is liable to interfere with a more complicated device and in addition it may be mentioned that the parts can be of substantial make thus doing away with breakages.

What I claim is:—

1. In a device of the class described, the combination with a tank having a feed and discharge leading thereinto and forming a seat at its upper end and a valve on said seat, of a cylinder and plunger operating therein, a rod secured to said plunger at one end and to said valve at the other, valve operating means mounted on said tank, a rod connecting said cylinder with said operating means and a conical guide depending from said valve into said pipe and centralizing the valve on its seat.

2. In a valve control for fluid tanks, the combination with a tank having a fluid opening, a valve closing said opening and a vertical rod projecting through the top of said tank from said valve, of a structure mounted on said tank supporting a pivot bearing a crank lever pivotally secured adjacent to said structure and having one section thereof connected to said valve, an arm pivotally supported by said structure and pivotally connected with said crank lever and having a longer and weightier section normally maintaining said valve closed and said crank lever in the corresponding position.

3. In a valve control for fluid tanks, the combination with a tank having a fluid opening and a valve closing said opening, of a crank lever pivotally mounted on said tank, a pair of standards on said tank joined at the upper end, a stop intermediate of the height of said standards, an arm pivotally secured between said standards and normally dropping therebetween, a connecting rod joining said crank lever and said arm, a link connection from said crank lever and a valve rod joined to said link connection.

Signed at Landis, Saskatchewan, this twenty first day of March 1916.

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