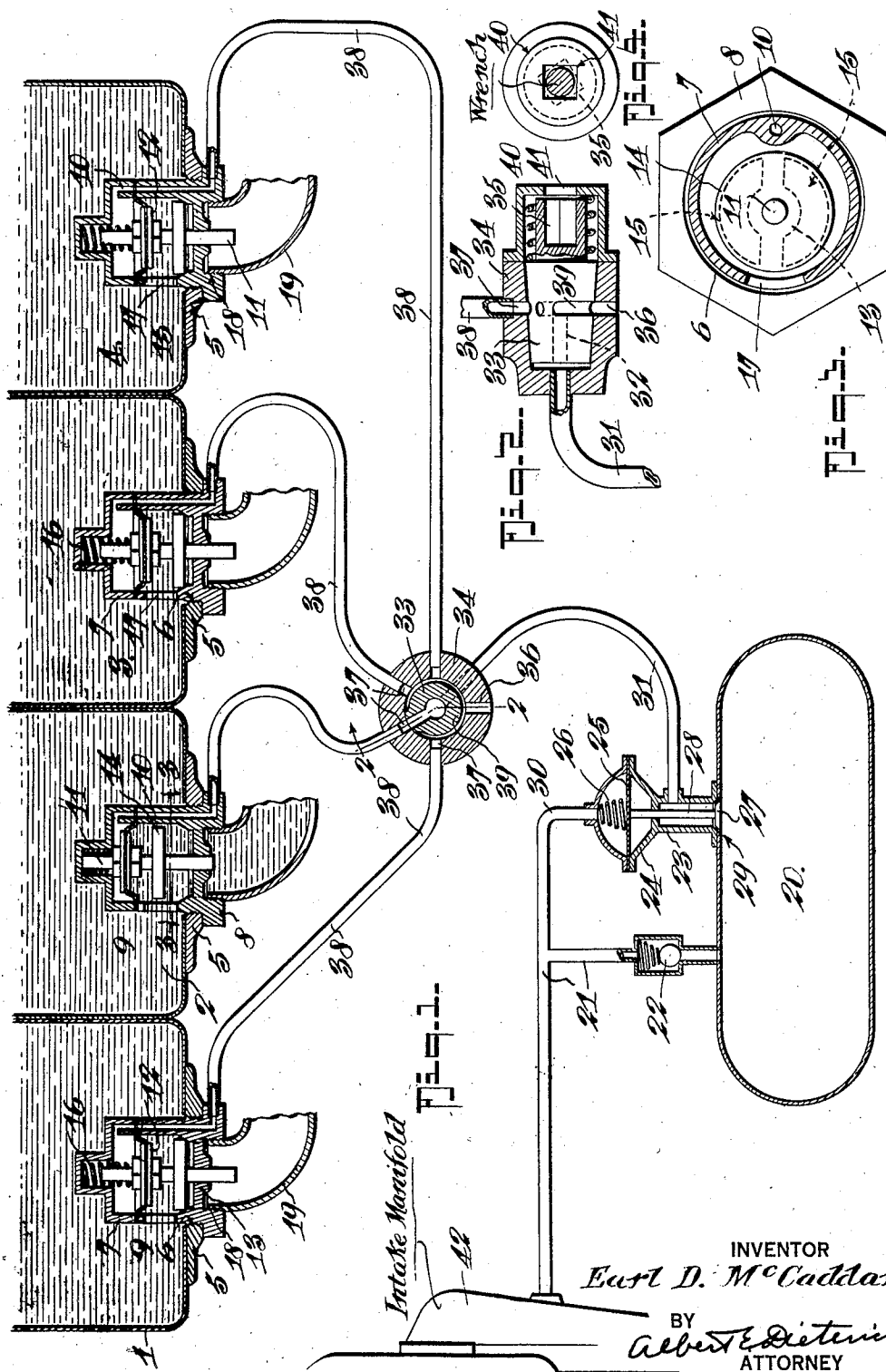


Dec. 3, 1929.

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1,737,933

SAFETY DISCHARGE VALVE FOR MOTOR OPERATED TRANSPORTING
TANKS AND MEANS TO SELECTIVELY ACTUATE THE VALVE
Filed Oct. 20, 1928



UNITED STATES PATENT OFFICE

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SAFETY DISCHARGE VALVE FOR MOTOR-OPERATED TRANSPORTING TANKS AND
MEANS TO SELECTIVELY ACTUATE THE VALVE

Application filed October 20, 1928. Serial No. 313,781.

The invention generally relates to motor operated liquid fuel transporting tanks having a plurality of separate compartments for containing various grades of liquid fuel, and primarily has for its object to provide a discharge valve for each compartment and means adapted for selectively operating the valves only when the transporting motor is not running.

10 In its more detailed nature, the invention seeks to provide, in combination with the individual tank compartments and the transporting motor, an individual discharge valve for each compartment which is spring-held to the normal closed position and adapted to be suction-actuated to be shifted to the open or discharging position, a vacuum tank in which a vacuum is maintained by connection with the intake manifold of the motor, a vacuum distributor or tank selector to selectively communicate between the vacuum tank and the valves, and a valve normally held closed by motor suction to close off vacuum communication between the vacuum tank and the distributor and which is adapted to automatically open such vacuum communication when the motor ceases to operate.

Other objects will in part be obvious and in part be pointed out hereinafter.

30 To the attainment of the aforesaid objects and ends, the invention further resides in the novel details of construction, combination and arrangement of parts, all of which will be first described in the following detailed description, then be particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which:—

Figure 1 is a diagrammatic sectional view illustrating the invention, parts being shown in elevation.

Figure 2 is a vertical cross section taken on the line 2—2 on Figure 1.

Figure 3 is a horizontal section of one of the discharge valves taken on the line 3—3 on Figure 1.

Figure 4 is a detail end view of the valve spring keeper.

It is customary in tank wagons for transporting liquid fuel to divide the tank body into a plurality of individual compartments

for containing fuel of different grades. In Figure 1 of the drawing I have diagrammatically indicated four such individual liquid fuel compartments or tanks, the discharge of liquid fuel from each being controlled by an individual valve, and a single distributor for selectively operating the valves, it being understood, however, that this illustration is simply diagrammatic and the number of compartments and valves may be varied at will. The four compartments shown are designated 1, 2, 3 and 4, respectively.

Each of the liquid fuel tanks or compartments is provided with a discharge opening surrounded by an internally threaded flange 5 to receive the internally threaded portion 6 with which each valve casing 7 is provided. To facilitate the mounting and removal of the valve bodies they may be provided with turning head portions 8, see Figures 1 and 3.

The valve casings are preferably formed in two halves between which a diaphragm 9 of leather, or other suitable material, is securely clamped. A suction duct 10 is formed in the valve casing and communicates into the upper portion thereof above the diaphragm 9 for a purpose later to be described.

A valve stem 11 is securely clamped as at 12 to the diaphragm and is vertically guided in a cross web 13 formed in the lower part of the valve casing. Each stem 11 carries a valve head 14 to normally seat over and close the discharge opening 15 through the lower portion of the valve casing. The diaphragm and valve head are normally held to the lowered valve-closed position by a spring 16 which encircles the valve stem above the said diaphragm. Each valve casing is provided with a communicating passage 17 communicating between the interior of the respective tank and the lower portion of the valve casing beneath the diaphragm thereof. Each diaphragm 9 divides the respective valve body into a lower liquid fuel discharge chamber and an upper suction chamber.

Each valve casing is provided with an internally threaded bore 18 to receive the discharge elbow 19 through which the liquid fuel is delivered from the tank when the valve is unseated, as shown in tank 2 of Figure 1.

A vacuum storage tank 20 is provided and is in communication with a source of suction, such as the intake manifold of the engine or motor by which the tank wagon is transported, through the medium of the suction line 21 in which a back check valve 22 is provided to retain the vacuum in the tank created by the said motor and through the suction line mentioned.

A control valve body 23 is mounted on the tank 20 and is preferably formed with a two-part head enlargement 24 between the parts of which a diaphragm 25 is clamped. A spring 26 is mounted in the head above the diaphragm and tends to force the diaphragm downwardly and unseat the valve 27, which is secured to the diaphragm by its stem 28, from off the seat 29 provided therefor in the valve body 23.

A suction duct 30 enters the valve body enlargement above the diaphragm and communicates through the suction line 21 with the intake manifold of the engine. A suction line 31 communicates with the interior of the valve body beneath the diaphragm 25 and above the valve 27 and communicates with a control passage 32 formed in the tapered distributor valve 33 which is rotatable in the distributor casing or body 34. The valve 33 is provided with a wrench socket 35 to receive a wrench by which the valve may be conveniently turned to its various adjusted positions. The distributor body 34 is provided with an air vent 36 and selective suction ducts 37 each of the latter of which is connected by a suction line 38 to the suction duct 10 of one of the valve bodies 7. An annular groove 39 is provided in the valve 33 and serves to open communication between all except a selected one of the ducts 37 and the air vent 36 so that one only of the suction lines 31 and 38 communicating with the interior of the vacuum chamber can be effective at a time.

A spring keeper 40 is mounted on the valve body 34 in which a spring is mounted serving to hold the valve body 33 tight on its seat and the said keeper is provided with a squared opening 41 which will register with the socket 35 of the valve only when the valve is shifted to a position for closing off communication with all of the ducts 37. Thus the valve operating wrench can be applied to and removed from the socket 35 at one position of the valve only assuring an off-position of the valve 32 whenever the wrench is removed.

The transporting motor is diagrammatically indicated at 42.

In operation, assuming all of the valves to be positioned as indicated in tanks, 1, 3 and 4 in Figure 1 and the valve 33 to be shifted to the off-position out of communication with all of the suction ducts 37, and the tank being transported over the roadway by the power of the motor 42, the suction set up in the intake manifold of the motor, act-

ing through the line 21, will create a partial vacuum in the tank 20 which will be held against loss by the back check valve 22. This same suction, acting through the duct 30 and on top of the diaphragm 25, will hold the valve 27 tight on its seat and close vacuum communication through the duct or suction line 31.

When it is desired to discharge liquid fuel from one of the tanks the motor must, of course, be stopped when the suction in the line or duct 30 will be broken and the spring 26 will act to unseat the valve 27 and a suction in the line 31 will be created by reason of the vacuum in the tank 20. The valve 33 is now shifted to cause its communicating duct 32 to communicate with a selected suction duct 37, see tank 2 in Figure 1, causing the suction to act through the line 38 and duct 10 of that particular valve to raise the diaphragm 9 and unseat the valve 14, thus permitting liquid fuel to flow out of the discharge elbow 19.

By reason of the fact that the annular groove 39 communicates between atmosphere and all of the suction ducts 37 not in communication with the valve duct 32, the chambers of the valve bodies above the diaphragm 9 will all be open to atmosphere and the springs 16 will serve to hold the valves 14 tight on their seats and prevent outflow of liquid fuel.

From the foregoing description, taken in connection with the accompanying drawing, it is thought the novel details of construction, manner of use and the advantages of the invention will be readily understood by those skilled in the art to which the invention relates.

What I claim is:

1. The combination with the individual compartments of a liquid fuel tank, of a source of suction, a normally closed suction actuatable discharge valve for each compartment, and a selector valve to open communication between a selected valve and the suction source to open that valve and permit discharge of liquid fuel from the associated compartment.

2. The combination with the individual compartments of a liquid fuel tank, of a source of suction, a normally closed suction actuatable discharge valve for each compartment, a selector valve to open communication between a selected valve and the suction source to open that valve and permit discharge of liquid fuel from the associated compartment, a suction producer, and a suction cutoff valve normally held closed by the action of said producer to close communication between the source of suction and the selector valve but adapted to open when the suction producer is inactive.

3. In compartment tanks having a separate discharge outlet for each compartment, and a valve for controlling each outlet; vacuum

actuated means to control said valves, a single vacuum producing source, connections between said source and each of said valves, and a single selector device in said connections for selectively bringing either of said valves into register with said source.

4. In compartment tanks having a separate discharge outlet for each compartment, and a valve for controlling each outlet; vacuum actuated means to control said valves, a single vacuum producing source, connections between said source and each of said valves, and a single selector device in said connections for selectively bringing either of said valves into register with said source, said selector device having provisions to relieve the valves not selected for purposes described.

5. In compartment tanks having individual discharge outlets and valves controlling said outlets, the combination with said valves of a single valve operating means associated with each of said valves and a manually controlled selector device associated with said operating means to cause said operating means to function on any selected valve desired, said manually controlled selector device including a stationary element and a movable element having operating wrench receiving openings that will register at one position only for the purpose described.

6. The combination with a plurality of vacuum operated outlet valves, a selector valve, connections between said selector valve and each of said outlet valves, a vacuum tank, a connection between said tank and said selector valve, a suction producer connected to said tank to evacuate same, and a safety valve connected in said connection between said vacuum tank and said selector valve, said safety valve including an operating instrumentality connected with said suction producer and functioning to close the safety valve when the vacuum producer is operating.

7. The combination with a travelling tank and a motor, of a discharge valve for the tank, means normally holding said valve closed, pneumatic means for opening said valve, and means operated by the engine when running normally for rendering said opening means inoperative.

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