

M. MINTZ.,
RELIEF VALVE.
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1,133,738.

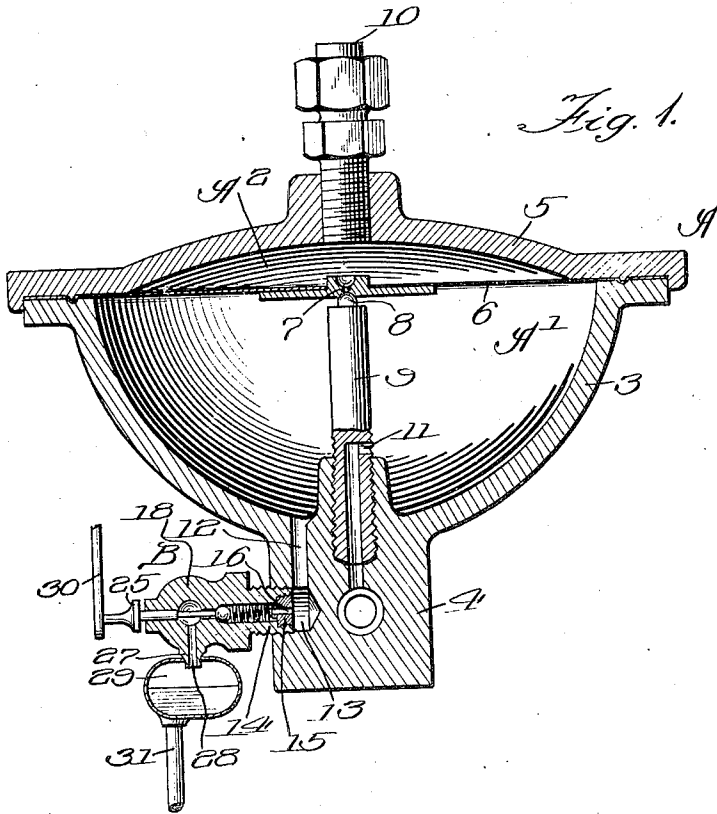
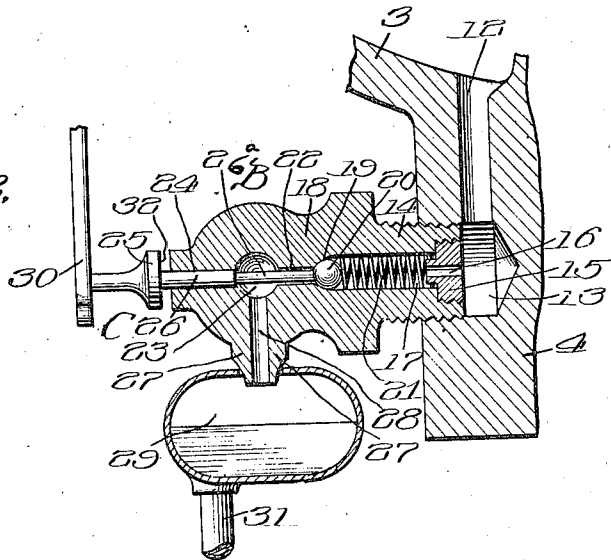


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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RELIEF-VALVE.

1,133,738.

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To all whom it may concern:

Be it known that I, MIKE MINTZ, a citizen of the United States, residing at Rock Island, in the county of Rock Island and State of Illinois, have invented new and useful Improvements in Relief-Valves, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in relief valves and has for its object the production of a valve, by means of which the accumulative oil and oil laden air in the interior of the chamber may be withdrawn or forced therefrom.

A further object is the production of a device, by means of which the pressure below the diaphragm in a diaphragm valve chamber may be quickly reduced to atmospheric.

A further object is the production of a valve of simple and cheap construction, and one that is not liable to get out of order.

These, and such other objects as may hereinafter appear, are attained by my device, an embodiment of which is illustrated in the accompanying drawing, in which—

Figure 1 represents a sectional view of a diaphragm valve casing equipped with my improved valve; Fig. 2 represents an enlarged view of a portion of Fig. 1.

Like numerals of reference indicate like parts in the several figures of the drawing.

Referring now to the drawing, A represents a diaphragm valve casing interposed between a compressor and a storage reservoir, and comprises a lower shell or member having a base 4, and an upper shell or member 5 adapted to be secured in any desired manner to the lower shell, and having a diaphragm 6 interposed therebetween, dividing the interior of the chamber into a lower chamber A' and an upper chamber A².

The diaphragm has a centrally located valve opening 7 controlled by a spherical ball valve stem 8 mounted on a post 9 screwed into the base 4. From the upper chamber a pipe 10 communicates with the storage tank (not shown), and the upper chamber is also in communication with an automatic switch, and the lower chamber in communication with the motor and compressor system, which parts are not shown

but which are fully illustrated and described in companion applications filed on even date herewith. The air passing into the lower chamber always carries with it a great deal of oil in suspension, having taken it up from the pump cylinders, and it becomes a serious problem to remove the oil and prevent it from clogging up parts of the machine.

It will be noted that the opening 11, through which the air and gas is forced into the lower chamber A', is larger than the valve opening 7, through which it is forced out. Consequently the air and gas laden with a certain amount of oil is thrown violently about the chamber A' and necessarily gives up the greater part of the oil which collects on the under side of the diaphragm 6 and the inner walls of the casing and gravitates to the bottom of the chamber. While I have shown the opening into the lower chamber as coming in from the center, I can, if I prefer, have it enter tangentially and thus give the entering air and gas a whirling effect in order to more quickly relieve it of its oil.

Communicating with the extreme bottom of the chamber is a passage 12 opening into a chamber 13 in the base, this chamber opening through the walls of the base 4. I provide a valve B, the screw threaded end 14 of which is screwed into the chamber 13. A threaded bushing 15 is screwed into the end 14 and provided with a small passage 16 communicating with a passage 17 within the valve casing 18. The inner end of the passage 17 is formed with a seat 19 for a ball valve 20 of less diameter than the passage 17, and held in place against the seat by means of a spring 21 resting against the ball and the end of the bushing. A smaller passage 22 extends from the end of the passage 17 into an expansion chamber 23 and passage 24 extends from the chamber 23 through the casing in line with the passages 17 and 22.

A plunger fits within the passages 22—24, passing through the chamber 23. This plunger is provided with a head 25, a comparatively large portion 26 adapted to slide snugly within the passage 24, and a smaller end 26^a adapted to slide within the passage 22 and being much smaller than the passage itself. The end of the plunger rests against

the ball valve 20 which is considerably smaller than the cross-section area of the passage 17.

The nozzle 27 is provided with a downwardly extending passage 28 communicating with the chamber 23 and opening into an oil receptacle or second expansion chamber 29. The valve is preferably operated by means of a lever 30 connected with an automatic switch (not shown), the operation of which is fully described in a companion application filed on even date herewith, but any other means may be employed, or the valve operated by hand, if desired.

When the valve is closed, the oil accumulates within the chamber 13 and passage 12 and in the passage 17 back of the valve. As soon as the valve is opened, the valve 7 being closed, the pressure within the diaphragm chamber A' forces the oil and air between the sides of the ball and the wall of the passage 17 into the passage 22 and the chamber 23. It is understood, of course, that the oil, as it is forced through the valve, becomes mixed with air or gas, and the resulting mixture has an opportunity to expand in the chamber 23 and passage 28 and then expand still further in the second expansion chamber or oil receptacle 29, where the oil will be collected and returned to its original source through the passage 31, as explained in the companion application heretofore referred to.

It will be noted that when the valve is open, the face 32 of the head 25 rests tightly against the valve casing, and the enlarged

portion 26 of the plunger fits snugly within the opening 24, thus preventing any escape of oil or oil laden air or gas, except through the discharge nozzle 27 into the oil receptacle 29. By inclining the valve at an angle, I might omit the spring and let the ball be held in place by gravity, but I prefer the construction illustrated in the drawing.

I have thus produced a simple yet efficient device that will serve to keep the system free from oil, and also relieve the pressure beneath the diaphragm.

I claim:

A device of the class described, comprising a casing having a passage extending therethrough and a central expansion chamber intermediate the ends of said passage, a second expansion chamber and a discharge passage opening from said first chamber and communicating with the second expansion chamber, a threaded bushing fitting within one end of said first named passage, and a plunger fitting within the other end, the passage beyond the end of said plunger being enlarged, a ball valve seat within said enlargement, a ball, and a spring mounted back of said ball and normally holding said ball against the valve seat.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

MIKE MINTZ.

Witnesses:

BENJ. F. SCHRIVER,
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