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J. KANTOR

PRESSURE SIGNAL

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Fig. 1.

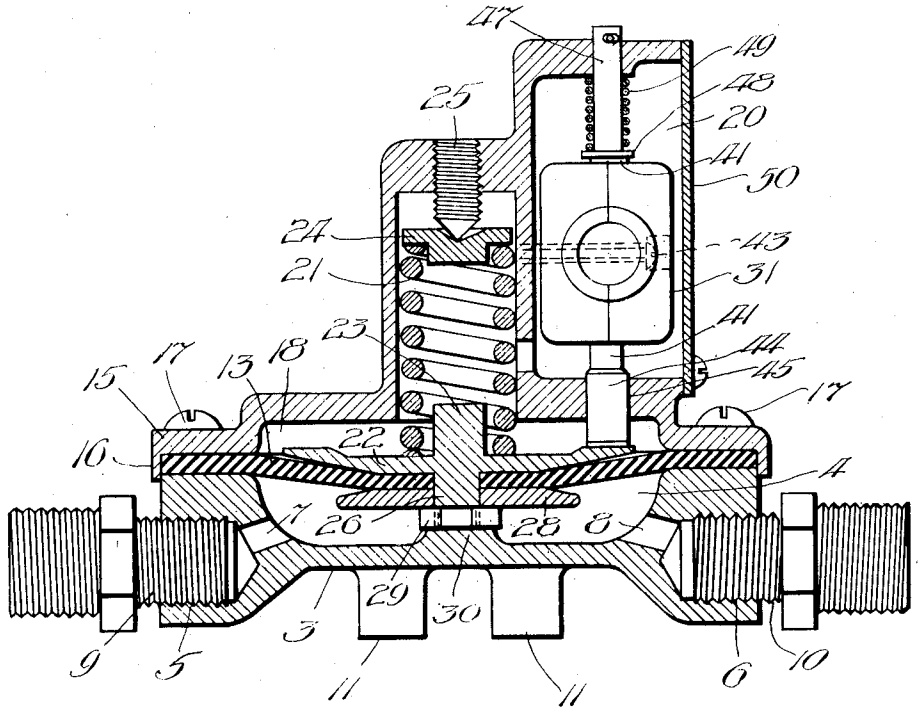
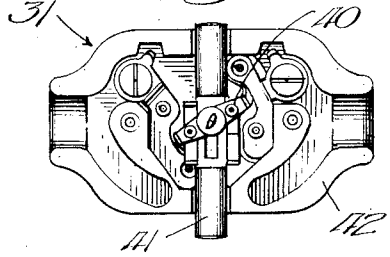


Fig. 2.



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PRESSURE SIGNAL.

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My invention is designed more particularly for use in connection with apparatus for charging water intended for beverages with carbonic acid gas such as is used at soda fountains, but it will be apparent from the following specification that it is also useful in many situations and apparatus involving the use of a gas under pressure where a certain minimum pressure must be maintained. In connection with soda fountains it is common to employ a carbonator in which the soda water is charged with gas on its way to the dispensing apparatus, the gas being supplied from cylinders or containers in which it is under a high pressure or in liquid condition. It is important for the operator to know when the gas in the container approaches the point of exhaustion or the pressure is so lowered therein that insufficient gas remains to properly continue the charging operation so that a new cylinder or container of gas may be substituted for the exhausted one. My invention provides an automatic signal operated directly by the gas pressure when a predetermined low pressure in the container is reached.

A preferred form of the invention is shown in the accompanying drawing. It is to be understood, however, that the specific disclosure is for the purpose of exemplification only and that the scope of the invention is defined in the following claims in which I have endeavored to distinguish it from the prior art while claiming it as broadly as its novelty will permit.

In the drawing, Fig. 1 is a longitudinal vertical section through a preferred form of the invention; and Fig. 2 a side elevation of a detail.

The body of the device comprises a main casting 3, which may be circular in plan, having a central chamber 4 and a pair of threaded sockets 5—6 which communicate with said chamber through openings 7—8. The sockets 5—6 receive the nipples 9—10 of unions to which may be connected pipes (not shown) leading respectively to the carbonator and to a union by which the device may be coupled to a cylinder containing liquefied gas or gas under pressure. The casting is shown provided with feet 11—11 so that it may rest stably upon a flat surface.

The chamber 4 is open at its upper side, the opening preferably being circular and surrounded by a flat margin which forms a seat for the edge of the circular diaphragm 13. The diaphragm may be of rubber or other suitable impervious, flexible material and is clamped upon the seat by the circular base 15 of the cap casting. The base 15 is surrounded by the depending skirt or flange 16 and is secured to the main casting by screws 17 so that the diaphragm is firmly clamped between the two castings. The diaphragm at its center is clamped between a pair of disks 22—28, disk 22 being formed on its under face with a post 26 reduced and threaded at its lower end to receive a nut 29. The post extends through the diaphragm and the lower disk and when the nut 29 is in place the disks are firmly clamped on opposite sides of the central portion of the diaphragm. It will be noted that the base plate 15 of the upper casting is recessed or rabbeted at 18 and that the disks 22 and 28 are chamfered on their adjacent edges to permit a limited vertical movement of the diaphragm. The lower casting is formed with a central boss 30 which forms a stop for the post 26.

The diaphragm is pressed downward by a spring 21, the lower end of which surrounds the upwardly extending post 23 on disk 22 and presses against the upper face of said disk, said spring extending upwardly into the chamber 19 formed in the upper casting. The upper end of the spring bears against a button 24, the position of which in the casting may be adjusted by means of the adjusting screw 25 which bears upon the upper face of said button. Obviously, the spring may be so adjusted as to offset any desired pressure within the chamber 4.

The diaphragm is designed to permit the operation of the signal when the pressure in the chamber 4 falls to such a point as to be overcome by the action of the spring. In the preferred construction shown in the drawing, the signal is electrical and the fall of the diaphragm causes the operation of a switch in the circuit of the signal. The signal may be of any known or approved type such for example as an electric bell. In the drawing, I have shown a well known type of switch which is suitable for the purpose. The switch 31 as it is found upon the market is bodily incorporated in the apparatus being enclosed in a chamber 20 provided in the top casting for this purpose as seen in Fig. 2, which is a side elevation of

the switch with one-half of the casing removed. The switch comprises a swinging contact member 40 which is caused to swing from open to closed position by a reciprocating member 41, the ends of which project beyond the housing 42 and, as the switch is ordinarily used, are pressed by the fingers respectively accordingly as the circuits are to be opened or closed. As seen in Fig. 1, the casing of the switch is secured to the wall of the chamber 20 by screws 43 with the actuating bar 41 in vertical position. The lower end of the actuated bar is adapted to be engaged by the plunger 44 extending through an opening 45 in the lower wall of chamber 30 and in position to rest upon the disk 22 at 46. The switch is so arranged that by the upward movement of the actuating bar, it is opened and by the downward movement of said bar closed. The upper end of bar 41 is engaged by a plunger 47, the lower end of which is provided with a plate or flange 48 between which and the upper wall of the chamber 20 a spring 49 is compressed. The open side of the chamber 20 is closed by the removable plate 50.

It will now be understood that when the pressure of gas within the chamber 4 is sufficient to maintain the diaphragm and its connected parts in its upper position the switch is maintained closed against the pressure of spring 49 by the engagement of the plunger 44 with the lower end of the actuating bar. When, however, the pressure in the chamber 4 falls to such a point that it is overcome by the spring and the diaphragm drops the pressure of the plunger 44 on the actuating bar of the switch is overcome by the spring 49 and the bar is shifted to close the switch and the electric signal is thereby operated.

The construction is relatively easy to install and reliable in operation.

I claim:

1. In a device of the class described a housing having a gas chamber, means for connecting the housing to a gas container, a diaphragm closing one part of the chamber, a disk on said diaphragm, a spring bearing upon the diaphragm at one end and opposing the pressure in the gas chamber, an adjustable abutment against which the spring bears at its other end, an electric switch comprising a shell, stationary and movable contact and a reciprocating actuator, a plunger bearing upon said actuator and on the disk, a spring pressed plunger also bearing upon the actuator and opposing the pressure of the diaphragm thereon, and a casting having a flange between which and said housing the edge of the diaphragm is secured, said casting also having chambers in which the first said spring and said switch are respectively housed.

2. In a device of the class described, a main body having a chamber therein and means for putting said chamber in communication with a source of gas under pressure, a flexible diaphragm closing one side of said chamber, a top casting having a flange between which and said body the edge of the diaphragm is clamped, said top casting having a spring housing chamber and a switch receiving chamber, a disc mounted on the diaphragm, a spring in said spring housing bearing on the disc, an electric switch mounted in the switch chamber and comprising a reciprocating actuating plunger, said plunger being guided at one end in the wall of said chamber, and a second plunger guided in said casting and bearing at one end upon said disc and at the other upon the first named plunger.

3. In a device of the class described, a main body having a chamber and means for putting said chamber into communication with a source of gas under pressure, a flexible diaphragm closing one side of said chamber, a housing comprising a disk portion between which and the main body the edge of the diaphragm is clamped, a disk secured to the central portion of the diaphragm, a spring in said housing bearing upon said disk, means for adjusting the pressure of said spring, an electric switch enclosed in said housing and comprising an actuating bar, a spring pressed plunger engaging said actuating bar to close the switch and a second plunger engaging said actuating bar and operated by the diaphragm to open said switch.

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