March 25, 1930. C. J. MANUEL 1,751,867

POP GAUGE

Filed April 2, 1929

Fig. 1.

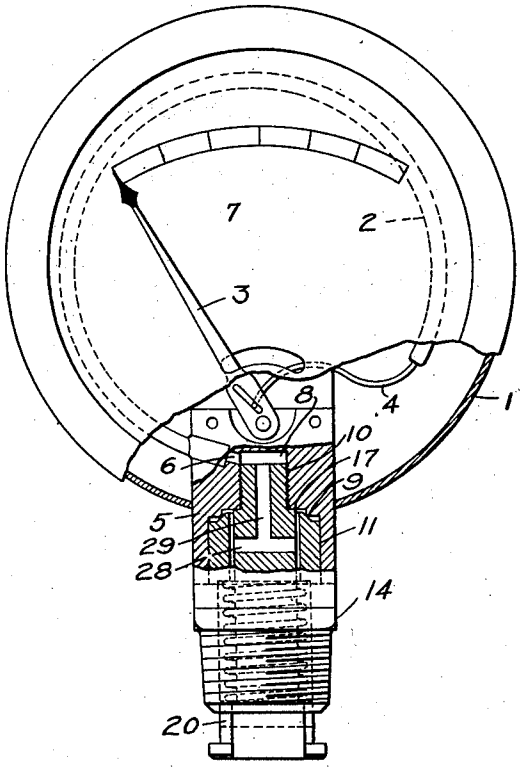
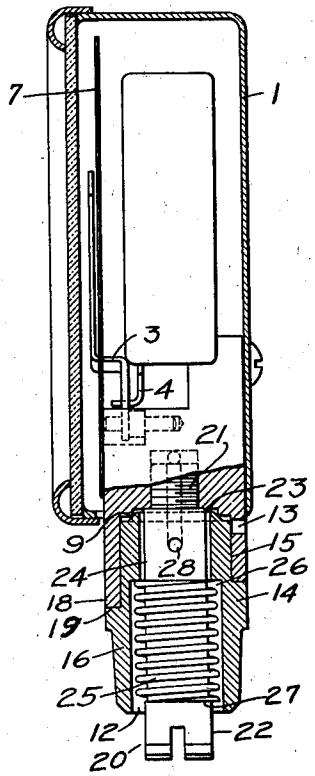


Fig. 2.



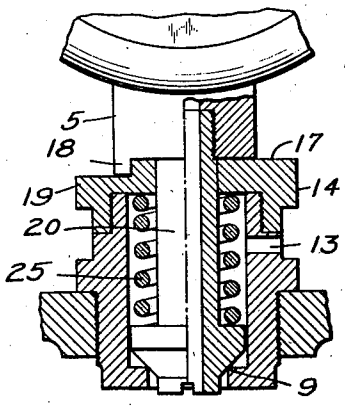


Fig. 4.

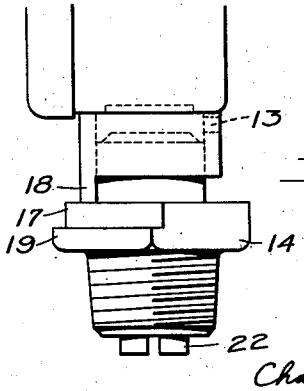


Fig. 3.

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1,751,867

UNITED STATES PATENT OFFICE

CHARLES J. MANUEL, OF LA CROSSE, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MOTO METER GAUGE & EQUIPMENT CORPORATION, OF LONG ISLAND CITY, NEW YORK, A CORPORATION OF DELAWARE

POP GAUGE

Application filed April 2, 1929. Serial No. 351,915.

This invention relates to an improvement in relief valves for pressure gauges, particularly that type of pressure gauge which is employed in connection with pressure cookers and similar appliances. A main object is to dispense with complicated parts and to combine in one instrument an automatic and a manually operated relief valve, of such character that the parts can be readily disassembled and thereafter readily cleaned and re-assembled. To this end there is disclosed a compact gauge having a combined automatic relief and manual valve, comprising a minimum number of parts all of which can be readily assembled and likewise be disassembled and cleaned. Moreover, the entire arrangement of parts is such as to present the advantages of simplicity, minimum of parts, accuracy of movement, accessibility of parts, prevention of condensation of vapors on the dial glass and permanent calibration thereby dispensing with re-calibration when parts are re-assembled. By reason of the vapors caused by the cookers entering the relief valve chamber it has been desirable to protect the valve mechanism from the action of these vapors and that is acomplished by properly positioning the valve.

In general, the arrangement is such that the blow-off hole is advantageously positioned, being permanently located in the socket proper in the stationary rear wall at the back of the gauge. The valve is also preferably positioned so as to be protected from the deleterious effects from the fumes and vapors passing from the cooker into the valve chamber and the valve is preferably formed in two parts such that they can be readily taken apart and readily re-assembled. The valve is operated automatically by an excessive pressure and can also be manually operated and held in its predetermined open position with little or no danger of the valve being locked by the vapor pressure, and in addition the valve is calibrated for proper working position in such manner that in re-assembling the parts the artisan will not have to re-calibrate the instrument.

Other objects and advantages will be in part indicated in the following description and in part rendered apparent therefrom in connection with the annexed drawings.

To enable others skilled in the art fully to apprehend the underlying features hereof that they may embody the same in the various ways contemplated by this invention, drawings depicting a preferred typical construction have been annexed as a part of this disclosure and, in such drawings, like characters of reference denote corresponding parts throughout all the views, of which in the drawings Fig. 1 is an elevational view showing parts in section; Fig. 2 is a sectional view and Fig. 3 a detail view showing the position of the parts after a manual manipulation of the valve. Fig. 4 is a sectional view of a modification wherein the valve is at the bottom of the socket.

The gauge is of the type having a casing 1, Bourdon tube 2, pointer 3 and connecting link 4, one end of the tube being anchored in the usual way to the socket 5, with the tube passage 6 extending from the interior of the socket to the tube 2. The dial plate 7 may be graduated to indicate both pounds pressure and degrees temperature with such range of pressures and temperatures as is desired and it may also be arranged to indicate when the pressure or temperature has reached such a point that the relief valve should be manually operated.

The socket 5 is formed with a lateral vapor or air passage 8 connecting with the tube passage 6 (Fig. 1) and is also formed with a valve seat 9. The bore of the socket is reduced at 10 and has an enlarged portion 11 connecting with said reduced portion to form a chamber for the reception of the two part valve hereinafter described. The socket 5 is also formed with a blow-off passage 13,

which is positioned in the rear wall of the socket (Fig. 2) and is adjacent said valve seat 9 formed in the wall of the socket 5.

The valve consists of three parts (1) an enlarged portion 16, (2) a reduced portion 15, and (3) an inner regulating member. The reduced portion 15 fits within the socket 5, its inner end contacting against the valve seat 9 formed on the walls of the socket 5. In Fig. 2 the valve is shown in its normally closed position and in this position the shoulder 17 formed by the enlarged and reduced portions rests upon the outer edge of the socket. The socket member has a projecting ledge 18 (Fig. 3) which normally contacts against the flange 19 which projects laterally from the portion 14, being formed by cutting away a portion of said part 14. In this normal position of the parts the blow off passage 13 will be cut off from the passage 12, the normal connection to the gauge being from passage or inlet 12 to the passages 8 and 6. Whenever, it is desired to open manually the blow off passage 13, it is only necessary to raise the socket 5 until the gauge 1 can be turned and then by turning that gauge 1 the ledge 18 can be brought to rest upon the shoulder 17, thereby locking the parts in a released position such that the blow off passage will remain in communication with inlet passage 12.

There is shown an inner regulating member for the valve which is marked 20 and this is preferably of elongated shape having an inner screw threaded end 21 and an outer notched end 22 (Fig. 2). A shoulder 23 is intermediate the reduced screw threaded end 21 and the enlarged portion 24 of said member and this shoulder forms a fixed stop which constitutes means for the calibration of the instrument, as hereinafter explained. The parts 14 and 20 constitute when assembled a three part valve structure. The outer notched end 22 is adapted to be manipulated by any ordinary tool for screwing the elongated member 20 to its proper calibrated position. The coil spring 25 encircles the enlarged shank of member 20, the inner spiral bearing against an inner shoulder 26 formed in the bore of valve 14 and the outer spiral contacting against the shoulder 27 of member 20 (Fig. 2). Consequently, the spring can be set at a predetermined pressure for holding the valve against the seat 9 and when that pressure is reached the socket 5 and cooperating member 20 will be lifted against the tension of the spring disengaging the valve from the valve seat and thereby opening up the inlet to the outside air thereby blowing off the excessive pressures. The transverse passage 28 connects with the longitudinal passage 29 (Fig. 1) forming a continuous passage from the inlet 12 to said passage 8. The blow off opening 13 is so related to the other parts that the valve completely opens up this blow off opening before it is manually thrown to open position, which will prevent the valve being automatically locked in open position by the vapor pressure. As heretofore explained, the parts can be so proportioned as to cause the spring to be set at a predetermined pressure when the member 20 is turned to a point where the shoulder 23 will act as a stop to prevent any further turning thereof, and whenever the parts are reassembled this stop 23 will continue to function as a means of calibrating the instrument or re-setting the spring to the proper tension for automatic release.

It is apparent that this combined automatic and manual valved instrument has a minimum of parts, consisting as it does of the socket and three other parts comprising the valve proper 14, the elongated member 20 with the reduced screw threaded end and the coil spring 25, and all of these parts can be readily disassembled and scoured by boiling and thereafter be readily re-assembled without changing the original calibration. In this manner the combined instrument is made compact having its overall length considerably reduced.

Referring to Fig. 4, the parts are so arranged that the danger of the condensed vapors from the cooker clogging and interfering with the operation of the valve is reduced to a minimum. This is due to the valve being positioned so that the vapors cannot enter the valve chamber or passages until the valve is raised from its seat, and when that occurs the pressure will be great enough to relieve the chamber and passages of those vapors which will be forced through the blow off passage 13.

The normal passage is through the valve 20 as indicated near the central portion of said valve, but when the valve is raised from the seat 9 an additional passage is opened through the chamber to passage 13.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can, by applying current knowledge, readily adapt it for various utilizations by retaining one or more of the features that, from the standpoint of the prior art, fairly constitute essential characteristics of either the generic or specific aspects of this invention and, therefore, such adaptations should be, and are intended to be, comprehended within the meaning and range of equivalency of the following claim.

Having thus revealed this invention, I claim as new and desire to secure the following combinations and elements, or equivalents thereof, by Letters Patent of United States:—

A relief valve for a gauge casing, comprising a two part valve structure slidingly mounted with a reduced part projecting within said casing, a valve seat formed within said casing, an inner regulating member adjust-

ably mounted in said casing, a pressure means positioned between said members, a stop on said inner member for determining the amount of pressure exerted by said pressure means upon said outer member, projecting flanges on said casing and said valve for holding said outer member after same has been retracted and turned and a blow off passage capable of being opened by the retraction of said outer member.

In witness whereof, I have hereunto subscribed my name.

CHARLES J. MANUEL.