

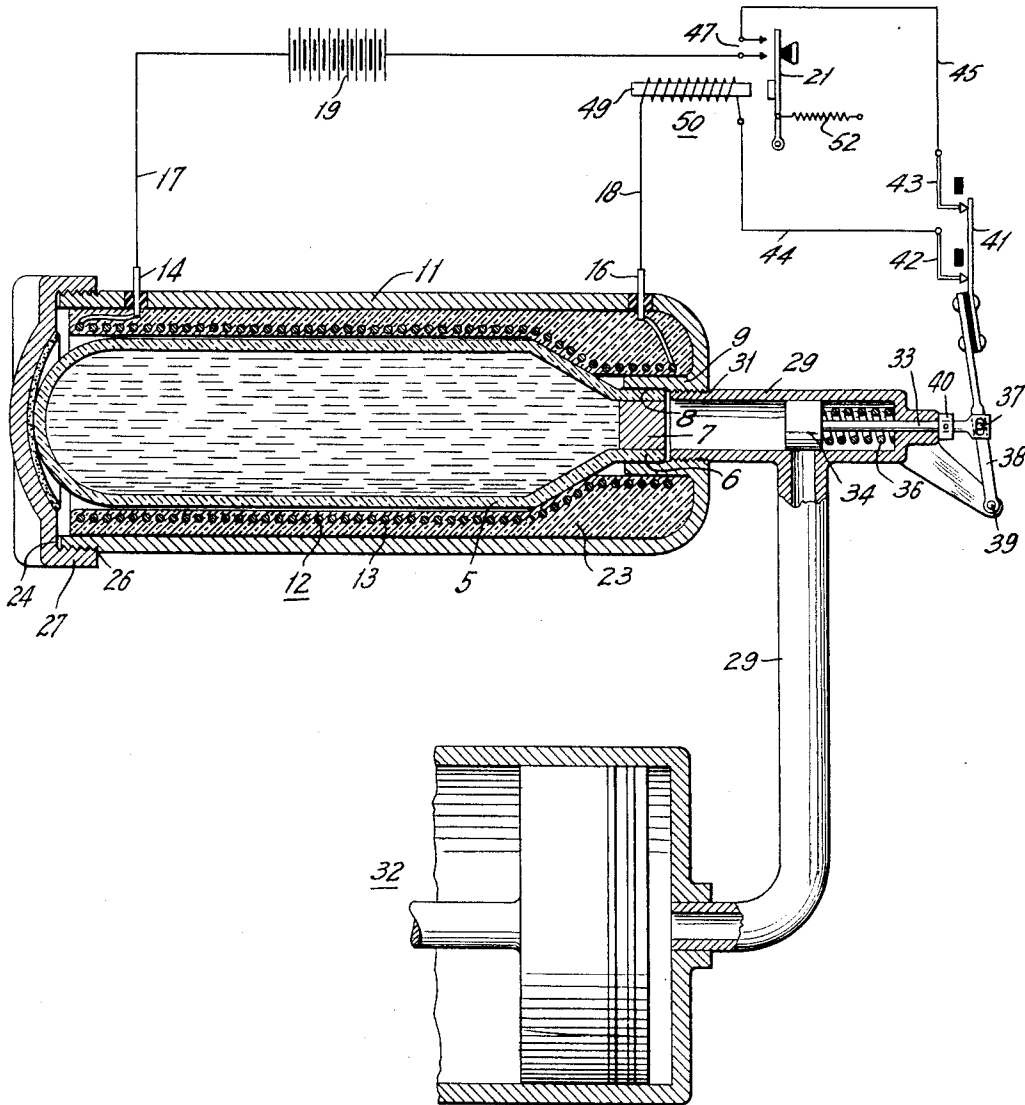
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ELECTRIC CONTROL FOR FLUID CONTAINERS

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ELECTRIC CONTROL FOR FLUID CONTAINERS

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10 Claims. (Cl. 219—38)

This invention relates to an electrical control for fluid containers and it is a general object of the invention to provide an effective and improved device of this general character.

5 The invention involves novel electrical control means suitable for gas or liquid containers and operable in response to current flow to open the container to allow the contents thereof to escape.

10 An object of the present invention is to provide a control device of the character mentioned which is particularly simple and inexpensive of construction and which does not involve mechanical means liable to fail or become inoperative.

15 These and other objects and advantages of the invention will be more apparent from the following detailed description taken in connection with the accompanying drawing, wherein one embodiment of the invention is shown. It is to be expressly understood, however, that the drawing is for the purpose of illustration only, and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

25 In the drawing, the invention is shown embodied in a typical gas container 5 having a neck portion 6 closed by a plug 7 formed of a metal alloy having a low melting point, the neck portion being received in the bore 8 of the inwardly protruding boss 9 of the metallic casing 11 which surrounds the container 5 and encloses an electrical heating element 12 including a coil of current conducting wire 13, the ends of which are brought through the casing to connect with terminal posts 14 and 16 to which are attached suitable conductors 17 and 18 leading to a source of current 19, a switch 21 being provided to control the flow of current to the coil 13. The coil 13 is preferably protected by suitable material 23 which acts as an insulator but does not prevent a high degree of heat transfer to, and along, the inner surface of the container 5. The casing 11 is preferably open at one end, as indicated at 24, and is provided with threads 26 to receive a removable cap 27 facilitating the ready insertion and removal of the container 5. A suitable conduit 29 threadedly attached to the casing, as indicated at 31, serves to connect the container with the servo-motor or other unit 32 which is to be supplied with pressure fluid.

50 From the foregoing it will be apparent that upon closure of the switch 21, current will be caused to flow from the source 19 through the windings of the coil 13, and the heat thus generated will pass, by conduction and radiation,

to and through the surface of the container 5 and along the walls of the container to the plug 7. When the heat thus transferred to the plug 7 becomes sufficient to melt the latter, the gas within container 5 will have reached a correspondingly increased temperature and pressure; the composition of the alloy in the plug 7 being chosen to insure a predetermined pressure rise in the container 5 prior to the escape of the gas. The gas may then be allowed to pass directly into the operating chamber of the unit 32 or, if preferred, a suitable valve mechanism may be interposed in the conduit 29 to regulate such flow, and for the additional purpose of providing means for automatically interrupting the circuit to the heating coil 13 in response to the discharge of pressure fluid.

In the form shown, such combined valve and circuit controlling mechanism comprises a slidable rod or valve stem 33 having a piston or head 34 at its inner end normally urged by the pressure of a spring 36 into position to cut off communication between the two portions of the conduit 29. At its outer end the stem 33 is slotted to receive a pin 37 located in a rocking lever 38 adapted to pivot about a fixed anchorage 39 and having at its opposite end a current conducting plate 41 insulated from the main portion of the arm 38 and normally bridging a pair of flexible contacts 42 and 43 interposed between the leads 44 and 45, the latter being connected to one of a pair of contacts 47 adapted to be bridged by the normally open switch member 21 when the latter is manually closed to initiate the operation.

90 Preferably the switch 21 is in the form of an armature associated with the core 49 of a relay 50 in such a manner that the latter acts to hold the switch 21 closed independently of manual pressure, after its initial closure by manual operation. Thus it will be seen that the circuit to the heating element 13 is a self-holding circuit and is broken when the escape of the gas drives the valve head 34 to the right and thereby breaks the circuit at a point 42 and 43. This break, even though only temporary, acts to interrupt current flowing through the winding of the relay 50, whereupon the spring 52 becomes effective to open the switch 21 and hold it open until the next cycle of operation is initiated manually, it being understood that the valve 34 returns to the closed position (the returning pressure being adjustable by movement of collar 40) as soon as the pressure of the escaping gas passing through the conduit 29 drops suffi- 110

ciently to permit the spring 36 to return to its normal position, thereby cutting off communication between the container and the servo-motor, placing the circuit in condition for re-energization of the heating coil in response to the single manual operation of reclosing the switch 21.

While the form of the invention herein disclosed possesses the merit of simplicity and durability as well as ready removal of the container, it is to be understood that changes may be made in the construction, arrangement of the parts and the uses to which they are applied, without departing from the spirit of the invention or the scope of the appended claims.

15 What is claimed is:

1. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion including a sealing plug extending across the bore thereof, a current conducting coil surrounding said container, and means for energizing said coil for a sufficient interval to melt said plug.

2. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion including a sealing plug extending across the bore thereof, a current conducting coil surrounding said container, means for energizing said coil for a sufficient interval to melt said plug, and means for automatically de-energizing said coil in response to the escape of the pressure fluid from said container.

3. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion, a current conducting coil wound about said container, means for passing current through said coil to raise the temperature and pressure of the fluid within said container, and means responsive to the predetermined temperature rise to destroy the effectiveness of said closure means.

4. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion, a current conducting coil wound about said container, means for passing current through said coil to raise the temperature and pressure of the fluid within said container, and supporting means for said coil, said supporting means also serving to direct the flow of heat from said coil toward and along the surface of said container.

5. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion including a sealing plug extending across the bore thereof, a casing surrounding said container, a current conducting coil supported in said casing, means for energizing said coil for a sufficient interval to melt said plug, said container being removable from said casing independently of said coil.

6. A container for fluid under pressure comprising a body portion and a discharge portion,

closure means for said discharge portion, a current conducting coil wound about said container, means for passing current through said coil to raise the temperature and pressure of the fluid within said container, and means responsive to the predetermined temperature rise to destroy the effectiveness of said closure means, said container being removable from said casing independently of said coil.

7. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion, a current conducting coil wound about said container, means for passing current through said coil to raise the temperature and pressure of the fluid within said container, and supporting means for said coil, said supporting means also serving to direct the flow of heat from said coil toward and along the surface of said container, said container being removable from said casing independently of said coil.

8. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion, a current conducting coil wound about said container, means for passing current through said coil to raise the temperature and pressure of the fluid within said container, means responsive to the predetermined temperature rise to destroy the effectiveness of said closure means, and means for interrupting the flow of current to said coil upon the escape of the pressure fluid from said container.

9. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion, a current conducting coil wound about said container, means for passing current through said coil to raise the temperature and pressure of the fluid within said container, and supporting means for said coil, said supporting means also serving to direct the flow of heat from said coil toward and along the surface of said container, and means for interrupting the flow of current to said coil upon the escape of pressure fluid from said container.

10. A container for fluid under pressure comprising a body portion and a discharge portion, closure means for said discharge portion including a sealing plug extending across the bore thereof, a casing surrounding said container, a current conducting coil supported in said casing, means for energizing said coil for a sufficient interval to melt said plug, means for automatically de-energizing said coil in response to the escape of the pressure fluid from said container, said last named means including a combined current controlling switch and valve, and means for returning said switch and valve to their initial positions upon a reduction in the pressure of the fluid remaining in said container.

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