Aug. 19, 1924. 1,505,217

L. C. POWELL

PRESSURE REGULATOR

Filed Dec. 17, 1923

Fig. 1.

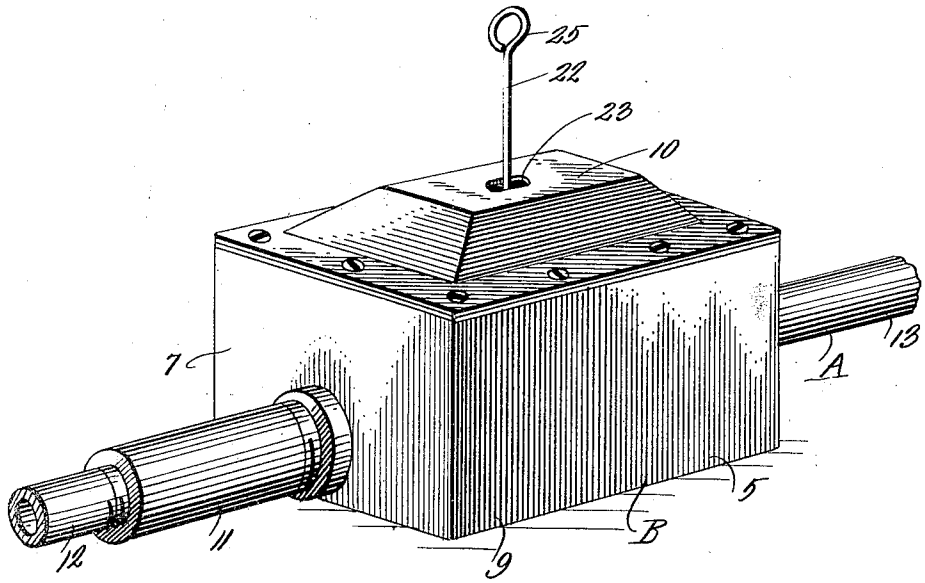
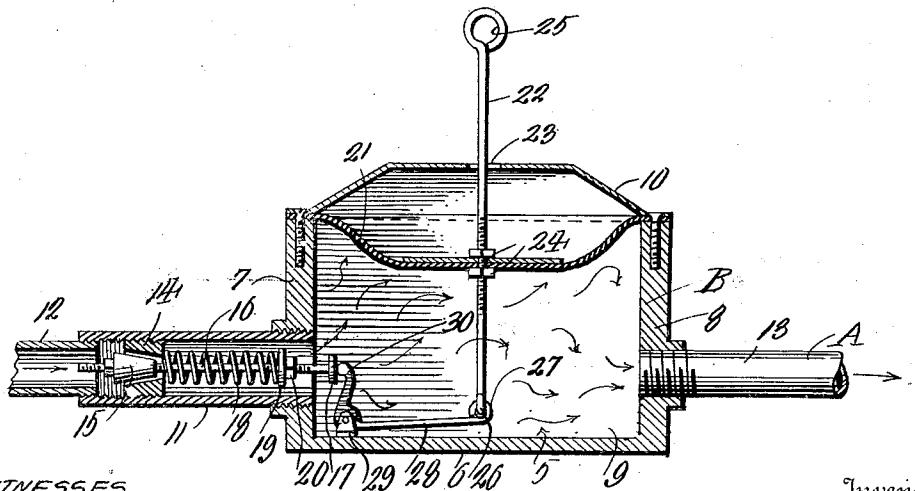


Fig. 2.



WITNESSES

Guy M. Spring

George A. Wright

Inventor

LOYD C. POWELL

By Richard B. Owen

Attorney

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UNITED STATES PATENT OFFICE.

LOYD C. POWELL, OF CUSHING, OKLAHOMA.

PRESSURE REGULATOR.

Application filed December 17, 1923. Serial No. 681,287.

To all whom it may concern:

Be it known that I, LOYD C. POWELL, a citizen of the United States, residing at Cushing, in the county of Payne and State of Oklahoma, have invented certain new and useful Improvements in a Pressure Regulator, of which the following is a specification.

This invention appertains to a novel safety appliance for systems delivering fluid under pressure and the primary object of the invention is to provide an improved automatic cut off valve, which can be effectively used on gas supply pipes, and which is so constructed as to automatically cut off the supply of gas to a gas heater, cooking stove or the like, when the gas falls below a predetermined pressure, thereby effectively preventing the asphyxiation of persons by the rush of gas through the heater or stove, when the normal gas pressure is resumed.

A further object of the invention is the provision of a novel safety appliance or valve incorporated in the feed line pipe of a gas, liquid or other supply system, which embodies resilient means for normally holding a valve closed for preventing the passage of gas or fluid past the same, and a casing in which the gas or fluid is adapted to normally collect during the normal passage of gas or liquid through the system embodying a diaphragm, having operative engagement with the spring pressed valve, against which the gas or liquid is adapted to impinge for normally holding the valve open against said resilient means, the valve being closed by said spring means, when the pressure of the gas or liquid against the diaphragm falls below a predetermined degree.

Another prime object of the invention is to provide means for permitting the manual opening of the valve after the valve has been closed due to the fall of pressure acting against the diaphragm, the manual means permitting the holding of the valve open until the pressure of the gas or fluid is sufficient to act against the diaphragm for normally holding the valve open.

A still further object of the invention is to provide an improved automatic cut off valve of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture and one which can be placed upon the market at a small cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a perspective view of the improved safety appliance, and

Figure 2 is a longitudinal section through the same.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A indicates a supply or line pipe for gas, liquid or the like under pressure and B the improved safety appliance, which is incorporated in the length thereof.

The improved safety appliance B includes a casing 5 provided with a bottom wall 6, end walls 7 and 8 and side walls 9. One end of the casing 5 is left open and is adapted to be normally closed by a cap or cover 10. The end wall 7 supports a valve sleeve or casing 11 which has communicating therewith the inlet end 12 of the supply line. The opposite end wall 8 of the casing has communicating therewith the outlet end 13 of the supply line A. The valve sleeve or casing 11 supports a valve seat 14 on which is adapted to fit a valve 15. This valve 15 can be adjustably mounted on a valve rod 16 which extends longitudinally through the valve sleeve or casing 11 and into the casing 5. The inner end of the valve rod 16 is provided with a bearing head 17, the purpose of which, will be hereinafter more fully described. The valve 15 is normally held on its seat 14 by means of an expansion spring 18 which is coiled about the valve rod 16. One end of the spring 18 bears against the valve seat 14, while its opposite end bears against a washer 19 which is adjustably held on the valve rod 16 through the medium of an adjustable nut 20 or the like.

A flexible diaphragm 21 formed of rubber or the like is placed across the casing 5 and held in position in the casing by the medium of corner plate 10, which clamps the diaphragm in place between the same and the walls of the casing. The diaphragm 21 at the central portion thereof supports an operating rod 22 which extends through

a slot 23 formed in the cover plate 10. This operating rod 22 is connected to the diaphragm 21 through the medium of clamping nuts 24 which are threaded on the operating rod in tight engagement with the diaphragm. The extreme upper end of the rod 22 can be provided with an operating handle 25. The lower end of the operating rod 22 is provided with an eye 26 which engages an eye 27 formed on the operating bell crank 28 which is pivoted at its angle to a supporting bracket 29 rigidly fastened to the walls 6 of the casing. The short arm of the bell crank 28 is provided with a bearing head 30 which is adapted to engage against the bearing disk 17 formed on or secured to the valve rod 16.

In use of the improved safety appliance, it can be seen that when the gas or liquid is being forced through the line pipe A under normal pressure that the same flowing into the casing 5 through the inlet end 12 thereof will exert pressure against the diaphragm 21 which will raise the operating rod 22 and thus rock the bell crank 28 moving the operating head 30 thereof against the operating disk 17 of the valve rod 16. This moves the valve 15 off of the seat 14 against the tension of the coil spring 16. If the pressure of the gas or liquid should fall below a predetermined degree, the tension of the spring 18 will close the valve or move the valve body 15 on its seat 14, thus preventing further entrance of the gas or liquid into the casing 5. This effectively prevents loss of gas or liquid and the dangers incident thereto should the pressure of the gas or liquid fall below a predetermined degree when the gas valves or the like are left open. When the pressure of the gas or liquid is resumed, it is merely necessary to manually lift up the rod 22 which will move the valve 15 off of its seat 14 and thus allow the reentrance of the gas or liquid into the casing 5, and if the pressure of the same is sufficient to normally hold the valve 15 off of its seat by acting against the diaphragm 21, the system can be left to operate automatically.

Changes in details may be made without departing from the spirit or the scope of this invention.

What I claim as new is:

1. A device of the class described, a casing having a diaphragm in the same, a valve sleeve communicating with one end of the casing, an inlet pipe communicating with the outer end of the valve sleeve, an outlet pipe communicating with the opposite end of the casing, a valve seat in the valve sleeve, a valve adapted to fit upon the seat, a valve rod extending through the sleeve and into the casing attached to said valve, spring means coiled about said rod for normally holding the valve on its seat, a disk head carried by the inner end of the rod, a bell crank pivoted at its angle in the casing having an operating head formed on one end thereof for engaging the disk head of the valve rod, and an operating rod connected with said diaphragm and with the opposite end of the bell crank.

2. A device of the class described, a casing having a diaphragm in the same, a valve sleeve communicating with one end of the casing, an inlet pipe communicating with the outer end of the valve sleeve, an outlet pipe communicating with the opposite end of the casing, a valve seat in the valve sleeve, a valve adapted to fit upon the seat, a valve rod extending through the sleeve and into the casing attached to said valve, spring means coiled about said rod for normally holding the valve on its seat, a disk head carried by the inner end of the rod, a bell crank pivoted at its angle in the casing having an operating head formed on one end thereof for engaging the disk head of the valve rod, an operating rod connected with said diaphragm and with the opposite end of the bell crank, and a handle formed on the operating rod arranged to extend outward of the casing for permitting the manual operation of said bell crank.

In testimony whereof I affix my signature in presence of two witnesses.

LOYD C. POWELL.

Witnesses:

R. G. BOATRIGHT,

MABLE TREESE.