I. M. REED.

REGULATOR.

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1,433,416. Patented Oct. 24, 1922.

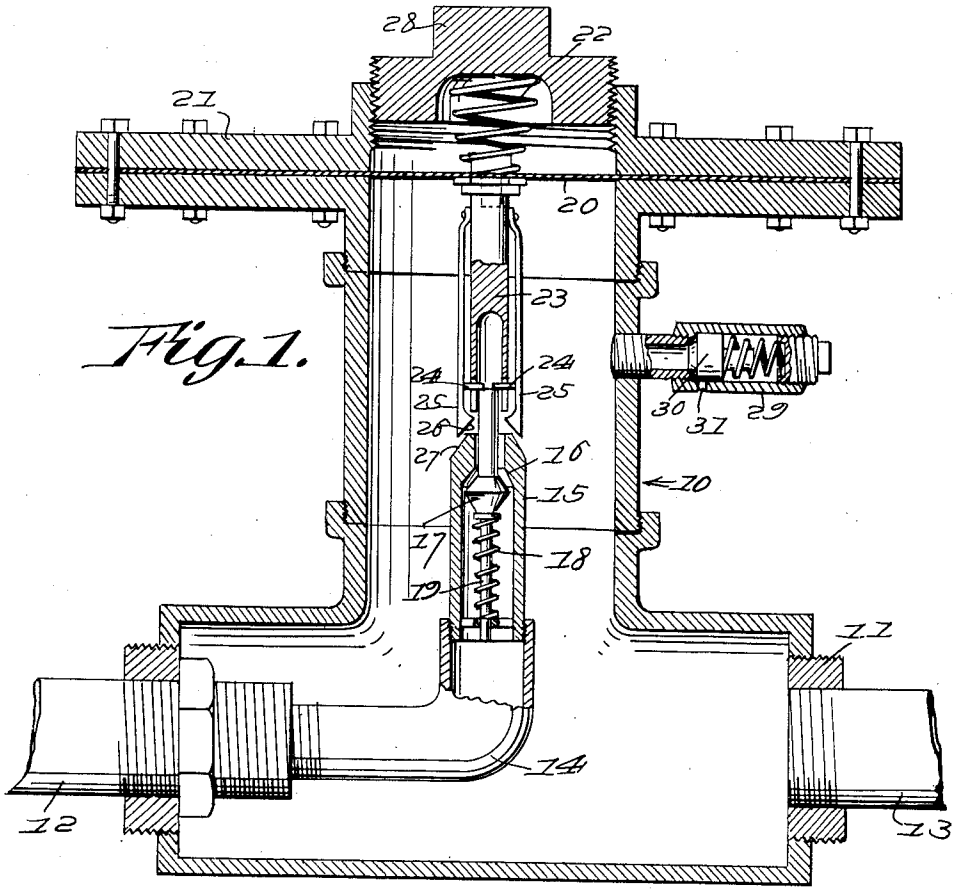


Fig. 1.

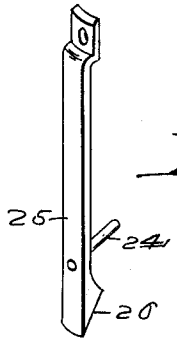


Fig. 2.

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UNITED STATES PATENT OFFICE.

IRA M. REED, OF WILLIAMSTOWN, WEST VIRGINIA, ASSIGNOR OF ONE-THIRD TO WILLIAM B. SCOTT, OF WILLIAMSTOWN, WEST VIRGINIA.

REGULATOR.

Application filed March 14, 1921. Serial No. 451,974.

To all whom it may concern:

Be it known that I, IRA M. REED, a citizen of the United States of America, residing at Williamstown, in the county of Wood and State of West Virginia, have invented new and useful Improvements in Regulators, of which the following is a specification.

The object of the invention is to provide a pressure regulating apparatus for gas supply or feed mains or conductors designed to maintain a substantially uniform pressure in the service pipes regardless of fluctuations of pressure in the supply main, and also designed to cut off communication between the supply main and the service pipe or system in the event of an interruption or cessation of pressure in the supply main due for example to freezing or any like contingency; and with this object in view the invention consists in a construction and combination of parts of which a preferred embodiment is shown in the accompanying drawing, wherein:

Figure 1 is a sectional view of a pressure regulating valve mechanism embodying the invention.

Figure 2 is a detail view in perspective of one of the trip arms detached.

The valve casing 10 is shown in communication by means of suitable reducers 11 with the gas main 12 and service pipe 13, the former being provided with a nozzle 14 with which is connected a valve tube 15 having a seat 16 for the reception of a cut-off valve 17. This cut-off valve is yieldingly impelled toward its seat by means of a spring 18 coiled as shown in the construction illustrated upon the stem 19 of the valve.

Arranged in the casing in exposed relation to the external pressure thereof is a diaphragm 20 secured as shown between suitable disks 21 forming elements of the casing and supplemented by a pressure spring 22, said diaphragm carrying a plunger 23 designed to control the position of the cut-off valve to the extent of maintaining the latter in an open or unseated position when there is a normal pressure in the casing and to permit of the closing movement of said valve and hence the throttling of the flow of gas to the casing when the pressure increases and causes a repression of the diaphragm in opposition to the tension of the spring 22.

The means by which the plunger communicates unseating movement to the cut-off valve consists of pins 24 adapted for engagement with the stem of the cut-off valve and carried by yielding trip arms 25 which are secured to and carried by the plunger and which under normal conditions maintain said pins in condition for engagement with the end of the cut-off valve stem as indicated in Figure 1. At their lower extremities these trip arms are provided with bevelled faces 26 for engagement with a conical surface 27 at the end of the valve tube 15, and in the event that there should be an entire cessation of pressure in the casing or an abrupt and considerable reduction of pressure permitting the inward or downward movement of the diaphragm under the influence of the pressure spring 22, the bevelled surfaces of the trip arms will be brought into engaging relation with the conical surface of the valve tube to spread the trip arms and thus withdraw the valve actuating pins 24 out of engagement with the stem of the cut-off valve, so that the latter is released for seating movement by its actuating spring 18 to thereby completely cut off communication between the supply main and the casing and hence the service system.

In other words the conical terminal of the valve tubes acts as a spreader or cam to disengage the valve actuating pins and hence the plunger from the valve stem to permit of the automatic seating of the cut-off valve in the event of a radical reduction of pressure in the regulator, and therefore when the pressure is subsequently restored it is prevented from being communicated to the casing and therefore to the service system until after a readjustment of the parts by the retraction of the plunger sufficiently to arrange the pins beyond the extremity of the cut-off valve stem. This readjustment can be effected only by removing the plug 28 in the outer end of the casing.

Also in connection with the mechanism there is preferably a safety valve 29 designed to relieve excessive pressure accumulating in the casing, said device consisting of a spring pressed valve 30 controlling a suitable vent 31.

Having described the invention, what is claimed as new and useful is:—

1. A pressure regulator having a cut-off valve seatable in the direction of supply

pressure, a plunger carried by a pressure actuated diaphragm, means actuated by the plunger for normally retaining the cut-off valve in an unseated position, and trip mechanism actuable by valve unseating movement of the plunger for releasing the cut-off valve.

2. A pressure regulator having a cut-off valve yieldingly impelled toward its seat, a valve unseating plunger, a pressure actuated diaphragm for controlling the position of the plunger, said plunger having movable means for engaging the valve stem, and trip mechanism actuable by valve unseating movement of the plunger for releasing the valve therefrom.

3. A pressure regulator having a cut-off valve yieldingly impelled toward its seat, a diaphragm carried plunger movable by variations of pressure, movable pins carried by the plunger for communicating unseating movement to the valve, and trip mechanism consisting of pin carrying arms and a spreader arranged in the path of plunger controlled movement of said arms.

4. A pressure regulator having a cut-off valve yieldingly impelled toward its seat, a plunger, a plunger carrying diaphragm exposed to variations of pressure and having a supplementing pressure spring, yielding trip arms carried by the plunger, pins actuable by said arms and movable by the plunger to effect the unseating of the cut-off valve, and a spreader arranged in the path of plunger controlled movement of said trip arms for disengaging said pins from the valve upon excessive valve unseating movement of the plunger.

In testimony whereof he affixes his signature.

IRA M. REED.