

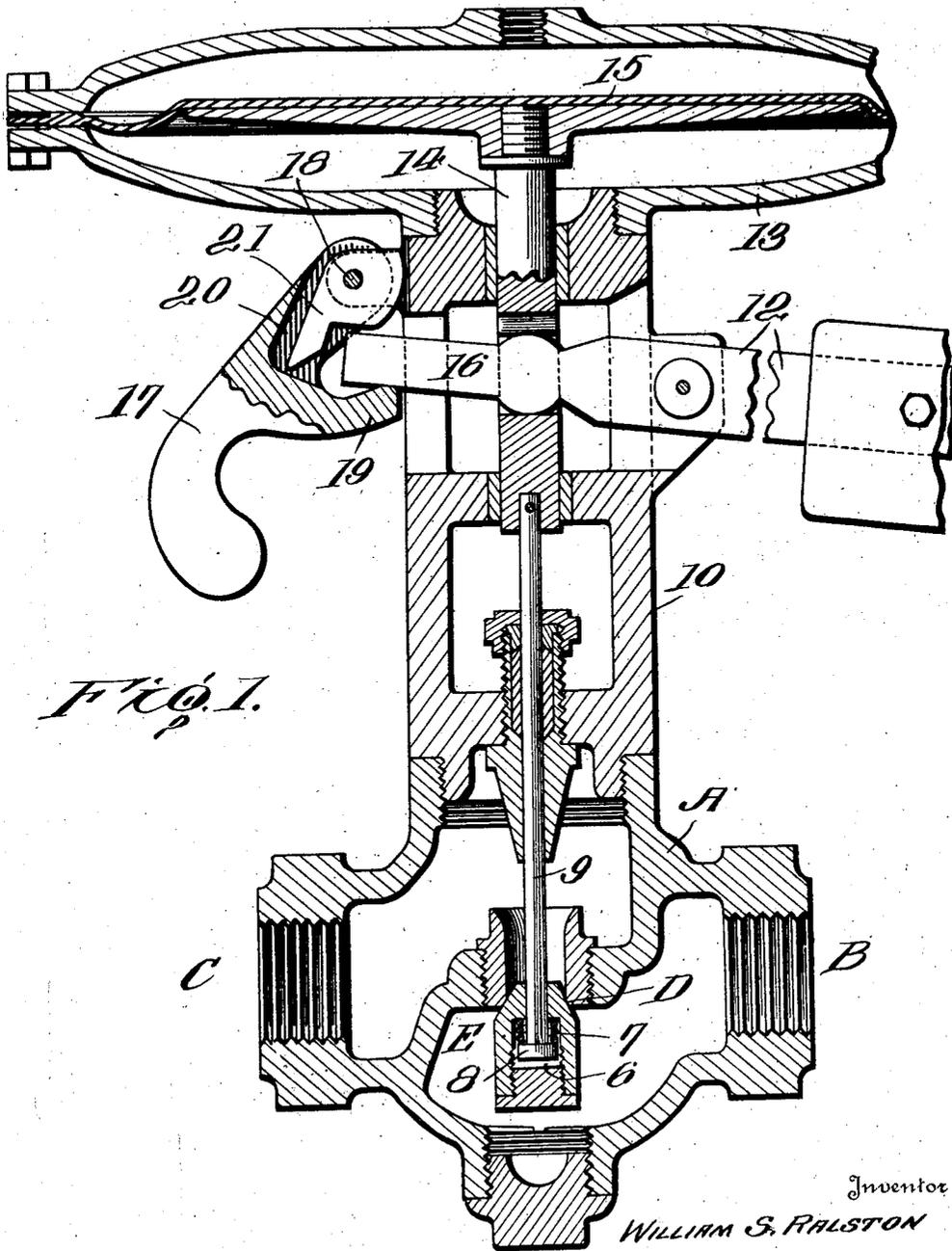
Mar. 3, 1925.

1,528,074

W. S. RALSTON  
PRESSURE REGULATOR

Filed Oct. 26, 1922

2 Sheets-Sheet 1



By *Francis J. [Signature]*  
Attorney

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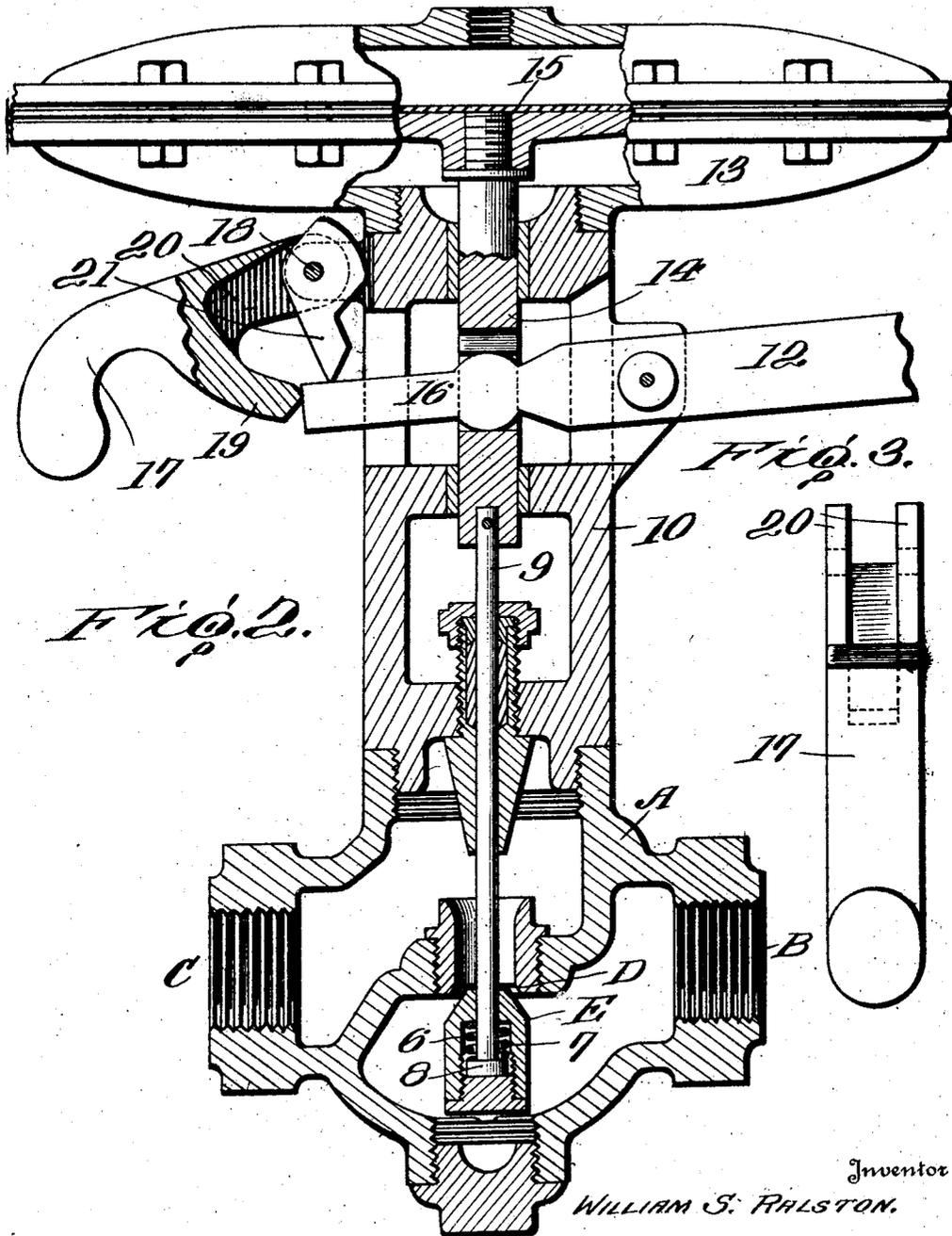
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W. S. RALSTON

PRESSURE REGULATOR

Filed Oct. 26, 1922

2 Sheets-Sheet 2



Inventor

WILLIAM S. RALSTON.

By *Francis Chapman*  
Attorney

# UNITED STATES PATENT OFFICE.

WILLIAM S. RALSTON, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO THE CHAPLIN-FULTON MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## PRESSURE REGULATOR.

Application filed October 26, 1922. Serial No. 597,013.

*To all whom it may concern:*

Be it known that I, WILLIAM S. RALSTON, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Pressure Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to pressure regulators for accurately controlling the supply of air, gas, steam, oil, water or other fluids, and is especially designed for the control of oil supply to furnaces. Regulators employed for this purpose are usually of the diaphragm controlled type and are actuated by air or steam pressure from a suitable source which also furnishes an atomizing supply for the fuel feeding pipe of the furnace in which the regulator is located. Difficulty has heretofore been experienced, particularly in the early morning, by flooding of the furnace with oil where the valve has been opened automatically by an increase of air or steam pressure on the valve-controlling diaphragm before the oil burner has had time to impart sufficient latent heat into the chamber of the furnace or other receptacle to ignite the oil after it has come on a second time. The object of my invention is to provide a simple and highly efficient device which will be positive in automatically shutting off the oil supply to the burners when the air or steam pressure on the diaphragm fails and at the same time locking the valve in such manner that the oil cannot be turned on at the burners without the operator going to the valve and opening it by hand, and I also provide a novel instrumentality which is adapted to cooperate with the valve stem in a manner to block the valve open to permit fluid being available at the burners before the atomizing supply is turned on, such instrumentality being automatically released upon further opening of the valve when the atomizing supply is turned on.

In the drawings, Figure 1 is a vertical sectional view of a back pressure regulator

equipped with my improvements, the valve being shown closed. Figure 2 is a similar view with the valve shown locked in partly opened position. Figure 3 is a detail of the cut-out latch.

A valve casing A is provided with the usual inlet B and outlet C, valve seat D, and valve E. The valve has a chamber 6 within which is a spring 7, one end of the spring engaging the head 8 of the valve stem 9 and the other the valve, this spring cushion permitting slight relative movement between the stem and valve when the latter is seated. A skeleton frame 10 superposed on the valve casing supports a weighted lever 12 and a diaphragm casing 13. The stem 14 of the diaphragm 15 is connected with the stem 9 of the valve, and such stem 14 is slotted to accommodate the short arm 16 of the lever which extends slightly beyond the frame 10 in a position to cooperate with a latch 17 which is pivoted at one side of the frame as at 18. About midway its length the latch is provided with a finger 19 and its lower end is shaped for convenient gripping. Within a recess 20 of the latch is a detent 21 which is swingingly supported by the pivot 18. This detent is weighted so as to normally hang out of the path of the short arm of the lever.

In the operation of the device herein shown, fluid is made available to the burners before the steam, air or other atomizing supply is turned on by manually lifting the weighted arm 12 and swinging the detent 21 into position where it will engage the short arm 16 of the lever thus offsetting the weight of the latter and holding the valve E partly opened. It is to be understood that the fluid fuel is normally under pressure and will thus flow freely to the burners upon the partial opening of the valve E as described. As soon as the oil enters the furnace it is lighted and allowed to burn a few minutes for the purpose of warming up the furnace preparatory to the turning on of the atomizing supply. When the atomizing supply is turned on, with consequent increase of pressure on the diaphragm, the valve E will be fully opened and the detent 21 will swing

out of the path of the lever arm. Upon failure of pressure on the diaphragm 15, the weighted lever will close the valve, the spring cushion between the head of the valve stem and valve allowing the lever to travel a short distance after the valve is seated before the latch 17 will automatically move to the point where its finger 19 will lie under the end of the short arm of the lever, thus effectively holding the lever against movement with consequent locking of the valve to its seat. So locked, it is manifest, there can be no movement of the valve in the event of increase of pressure upon the diaphragm, it being necessary to manually lift the latch from its locking position before the valve can be again opened.

I claim as my invention:

1. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve for effecting its actuation under pressure on said diaphragm, a latch for engaging said lever to lock it against movement when the valve is in closed position, means for holding said valve in partially opened position against the weight of said lever and whereby said latch will be maintained in ineffective position, such means being automatically moved out of such position when the valve is fully opened to permit said latch to engage the arm of said lever when pressure on the diaphragm fails.

2. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve for effecting its actuation under pressure on said diaphragm, a superstructure on said valve casing supporting said diaphragm and lever, a latch pivoted on said superstructure for engaging said lever to lock it against movement when the valve is in closed position, means for holding said valve in partially opened position against the weight of said lever, such means being automatically moved out of such position when the valve is fully opened to permit said latch to engage the arm of said lever when pressure on the diaphragm fails.

3. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve for effecting its actuation under pressure on said diaphragm, a superstructure on said valve casing supporting said diaphragm and lever, a latch pivoted on said superstructure for engaging said lever to lock it against movement when the valve is in closed position, a detent adapted to be moved into engagement with said lever to hold said valve in partially opened position, and means for automatically moving such detent out of such

position when the valve is fully opened to permit said latch to engage the arm of said lever when pressure on the diaphragm fails.

4. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve for effecting its actuation under pressure on said diaphragm, a superstructure on said valve casing supporting said diaphragm and lever, a latch pivoted on said superstructure for engaging said lever to lock it against movement when the valve is in closed position, a weighted swinging detent adapted to be moved into engagement with said lever to hold said valve in partially opened position, the weight of said detent moving it out of such position when the valve is fully opened to permit such latch to engage the arm of said lever when pressure on the diaphragm fails.

5. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve for effecting its actuation under pressure on said diaphragm, a superstructure on said valve casing supporting said diaphragm and lever, a latch pivoted on said superstructure for engaging said lever to lock it against movement when the valve is in closed position, said latch having a recess, a detent fitting within the recess of said latch and swingingly mounted on the pivot of the latter, said detent being adapted to be moved into engagement with said lever to hold said valve in partially opened position and to swing away from such engagement with the lever when the valve is fully opened to permit said latch to engage the arm of said lever when pressure on the diaphragm fails.

6. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve through its stem for effecting actuation of the valve under pressure on said diaphragm, a resilient connection between said valve and its stem permitting a relative movement between the stem, its diaphragm and lever and the said valve, a latch for engaging said lever when moved relatively to said valve to lock said lever against movement when the valve is in closed position, means for holding said valve in partially opened position against the weight of said lever, such means being automatically moved out of such position when the valve is fully opened to permit said latch to engage the arm of said lever when pressure on the diaphragm fails.

7. A regulator including a valve and its casing, a stem for said valve, a diaphragm and a weighted lever cooperating each with the other and with said valve for effecting its actuation under pressure on said dia-

phragm, a pivotally mounted latch for engaging said lever to lock it against movement when the valve is in closed position, said latch having a recess, a detent fitting within the recess of said latch and swingingly mounted on the pivot of the latter, said detent being adapted to be moved into engagement with said lever to hold said valve in partially opened position and to swing away from such engagement with the lever when the valve is fully opened to permit said latch to engage the arm of said lever when pressure on the diaphragm fails.

In testimony whereof I have signed this specification.

WILLIAM S. RALSTON.