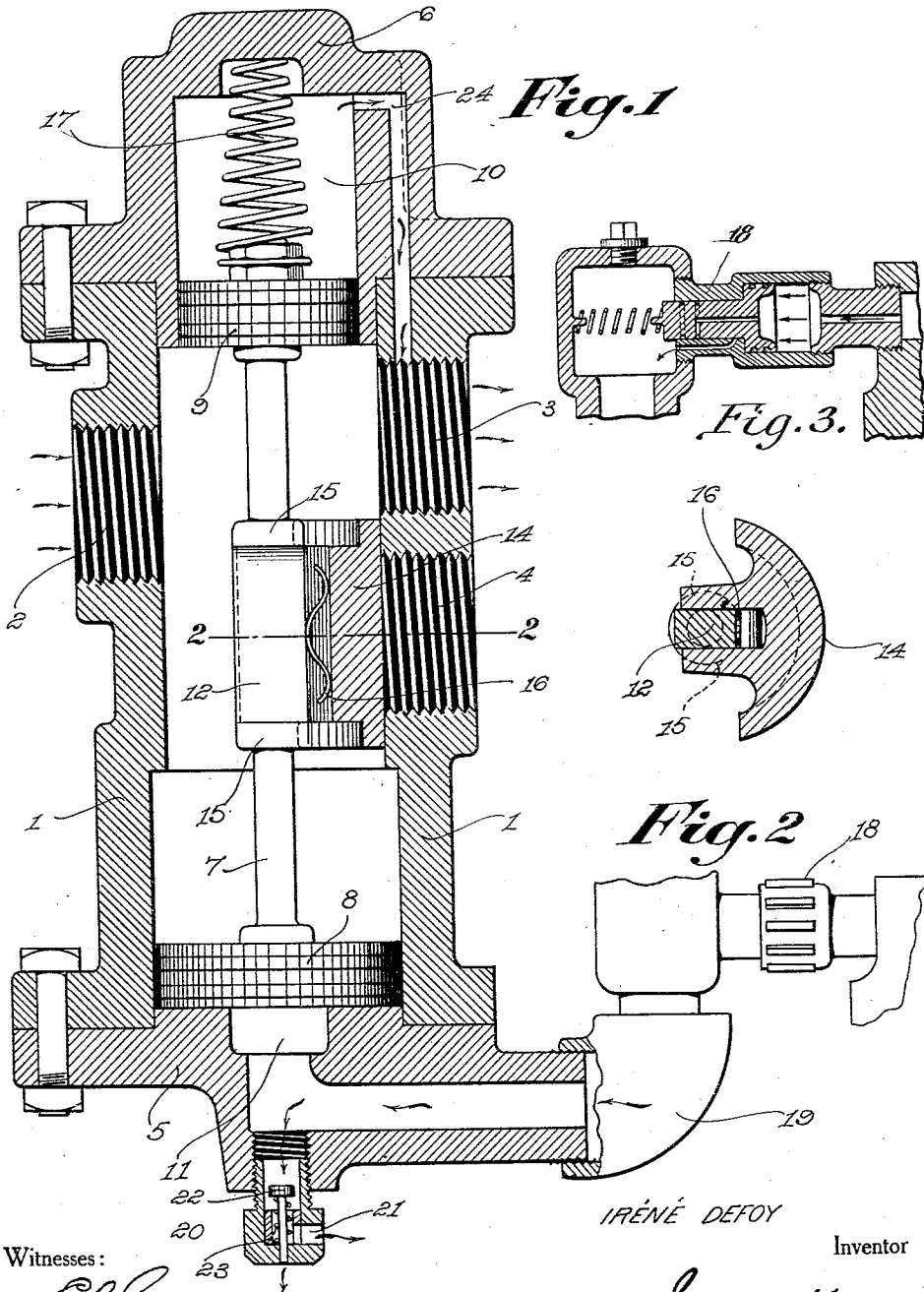


I. DEFOY.
 AUTOMATIC REGULATING VALVE.
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1,060,067.

Patented Apr. 29, 1913.



Witnesses:

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IRÉNÉ DEFOY, OF QUEBEC, QUEBEC, CANADA.

AUTOMATIC REGULATING-VALVE.

1,060,067.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed March 7, 1912. Serial No. 682,288.

To all whom it may concern:

Be it known that I, IRÉNÉ DEFOY, a subject of the King of Great Britain, residing at Quebec, Province of Quebec, Canada, have invented certain new and useful Improvements in Automatic Regulating-Valves; and I do hereby declare that the following is 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.

The invention to be hereinafter described relates to automatic regulating valves.

In order to more clearly disclose the construction, operation, and use of the invention, reference should be had to the accompanying drawings forming part of the present application.

Throughout the several figures of the drawings like reference characters designate the same parts.

In the drawings: Figure 1 is a central, vertical, cross section through the invention; Fig. 2 is a lateral cross section through the slide valve; and Fig. 3 is a central, vertical, longitudinal, cross section through the check valve 18.

The main objects of the invention are to provide a simple, efficient, economical, durable, and compact automatic regulating valve for heating systems.

Referring to the drawings in detail, 1 indicates a valve casing provided with inlet port 2, exhaust port 3, and delivery port 4. To the ends of this casing are detachably secured heads 5 and 6. Within the casing is slidably mounted a piston rod 7 to the opposite ends of which are secured the piston heads 8 and 9. The head 9 is adapted to slide freely in a bore 10 of the head 6, the bore forming, practically, a reduced extension of the interior of the valve casing 1. The head 8, on the other hand, slides freely in an enlargement of the interior of valve casing 1 and, when in the lowered position of Fig. 1, is seated directly over the upper end of a passage 11 formed in the head 5, for a purpose to be later disclosed. The central part of the rod 7 is flattened as at 12 to fit freely into a corresponding groove 13 in the body of a sliding valve 14. Collars 15 on the rod 7 prevent relative longitudinal movement between the rod and valve, and a spring 16 interposed between the portion 12 and the valve body 14 serves

to keep the valve pressed against the inner face of the valve casing, at all times.

A coil spring 17 in the head 6 acts, normally, to maintain the piston heads 8 and 9 and the valve 14 in the positions shown in Fig. 1. When in the position shown in Fig. 1, a heating fluid entering through inlet port 2 will flow into the valve casing and out through exhaust port 3 to a suitable outlet.

To the delivery port 4 is connected one end of a heating main. To the opposite end of the main, or at any suitable point in the main, is secured a controlling check valve 18 arranged to open and permit passage of heating fluid from the heating system when the pressure in the system has fallen below a predetermined point. The heating fluid passes through valve 18, through a suitable connection 19, and into the passage 11 beneath piston head 8. This causes the piston head 8 and rod 7 to rise, carrying valve 14 with them. As valve 14 rises, it will close the exhaust port 3 and open the delivery port 4. Thus, fluid entering by port 2 will pass through the port 4 and into the main of the heating system, increasing the pressure therein. As the pressure thus increases, the check valve will close and the pressure will be cut off from the under face of the piston head 8. When this happens, the spring 17 will force the rod 7 and piston head 8 back to the initial position of Fig. 1, and the entering fluid will pass out by way of exhaust port 3, as before.

The normal pressure in the system, acting in the direction of the arrows, will keep the check valve forced toward the left of Fig. 3, against the pressure of its spring, so that the passages through its stem will be out of alinement with the entrance to the by pass passage in the shell or casing of the valve 18. But, when the pressure in the system drops below the predetermined point, the spring of the valve will force it in the opposite direction. When it reaches the limit of its travel in this direction, the lateral port in the valve stem will be alined with the entrance to the by pass in the casing. Then the steam or other fluid will flow through the by pass and beneath the head 8, with the resulting operations previously outlined.

The head 5 is provided with a small threaded bore communicating with the passage 11 and adapted to removably receive a

hreaded nipple 20 having a drip passage 1. In this nipple is slidably mounted a spring pressed valve 22 held normally inoperative by a coil spring 23. Thus, when there is very low pressure, or no pressure at all, in the passage 11, the valve 22 will be raised so that the drip passage 21 will be open to permit escape of drip or exhaust of the pressure medium as the spring 17 forces the piston head 8 to its seat.

In order to avoid alternate suction and compression between the head 6 and piston head 9, during operation of the device, a bypass passage 24 is provided in the wall of head 6 and casing 1, and establishes communication between the exhaust port 3 and the upper end of bore 10.

The device is more particularly meant as a means for using the exhaust of engines, etc. which would otherwise be wasted. To this end, the inlet port 2 is usually connected to the exhaust of a steam engine or the like.

It is thought that the operation and use of the invention will be clear from the preceding detailed description.

Changes may be made in the construction, arrangement, and disposition of the several parts of the invention without in any way departing from the field and scope of the same, and it is meant to include all such within this application wherein only a preferred form has been disclosed.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination, a casing provided with an inlet port, an exhaust port, and a delivery port; a rod slidably mounted therein and provided with piston heads on its opposite ends, a valve carried by said rod and adapted to control said exhaust and said delivery ports, a heating system connected to said delivery port, a passage leading beneath one of the aforesaid piston heads, connections between said passage and said heating system, and a check valve interposed in said connections.

2. In combination, a valve casing provided with an inlet port, an exhaust port, 50 and a delivery port; a head secured to one end of said casing and provided with a bore, a head secured to the other end of said casing and provided with a passage, a rod slidably mounted in said casing and provided 55 with piston heads on its opposite ends, one of said heads being slidably mounted within the aforesaid bore and the other being adapted to be seated over the end of said passage, means for keeping said last named 60 head seated over the end of said passage, a valve carried by the aforesaid head and adapted to alternately control the aforesaid exhaust and delivery ports, a heating system connected to said delivery port, connections 65 between said system and the aforesaid passage, and a check valve in said connections.

3. In combination, a valve casing provided with an inlet port, an exhaust port, 70 and a delivery port; a head secured to one end of said casing and provided with a bore, a head secured to the other end of said casing and provided with a passage, a rod slidably mounted in said casing and provided 75 with piston heads on its opposite ends, one of said heads being slidably mounted within the aforesaid bore and the other being adapted to be seated over the end of said passage, means for keeping said last named 80 head seated over the end of said passage, a valve carried by the aforesaid rod and adapted to alternately control the aforesaid exhaust and delivery ports, a heating system connected to said delivery port, connections 85 between said system and the aforesaid passage, a check valve in said connections, a drip passage leading from said passage, and a valve controlling said drip passage.

In witness whereof I have hereunto set 90 my hand in the presence of two witnesses.

IRÉNÉ DEFOY.

Witnesses:

E. LAHOYE,
CHAS. VIZINA.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."