W. C. BEAM.

REGULATOR.

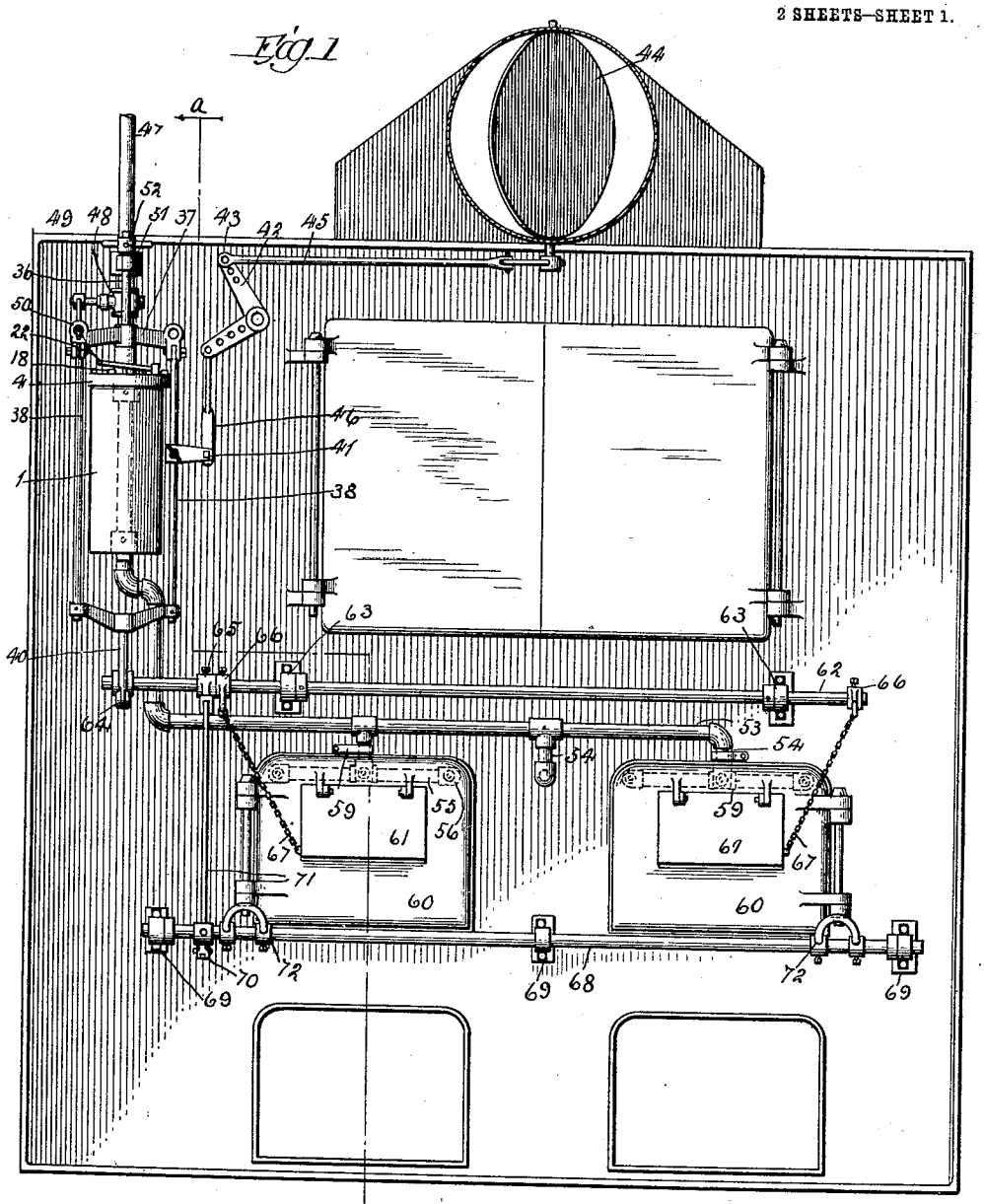
APPLICATION FILED APR. 8, 1912.

1,067,394.

Patented July 15, 1913.

2 SHEETS—SHEET 1.

Fig. 1



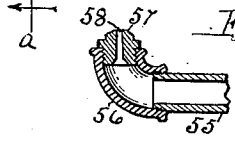


Fig. 6

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2 SHEETS—SHEET 2.

Fig. 2

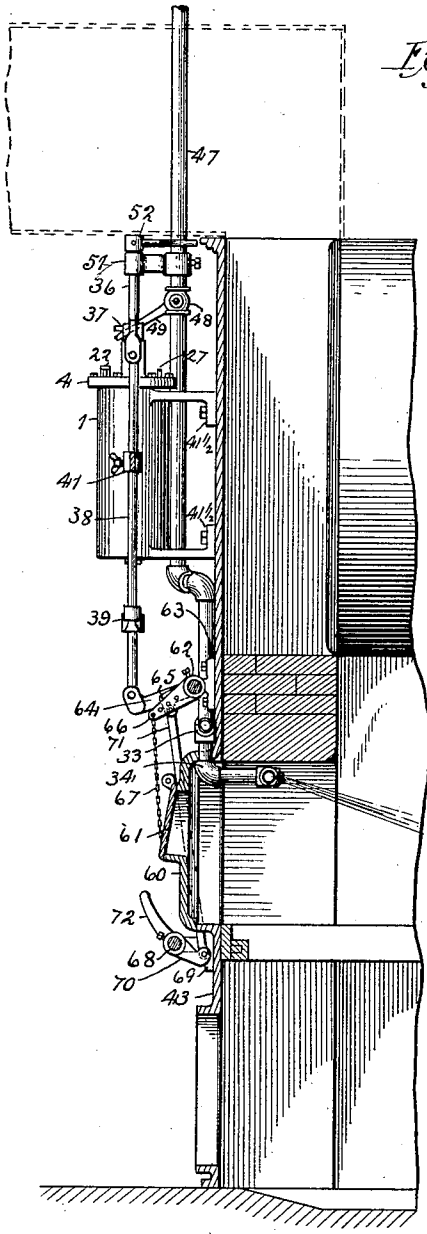


Fig. 3

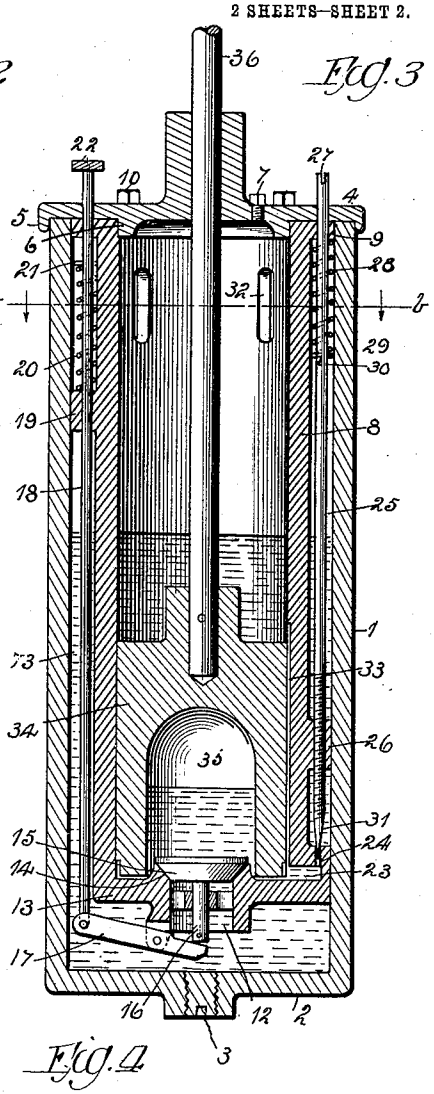


Fig. 4

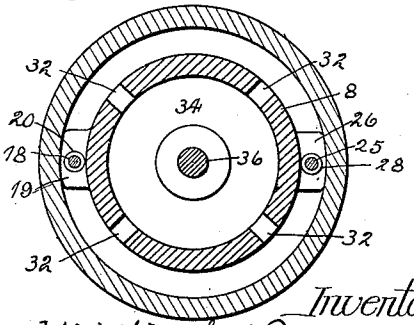
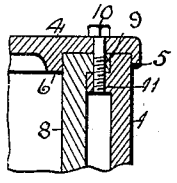


Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIE C. BEAM, OF ROCKFORD, ILLINOIS, ASSIGNOR OF ONE-HALF TO THOMAS D. REBER, OF ROCKFORD, ILLINOIS.

REGULATOR.

1,067,394. Specification of Letters Patent. Patented July 15, 1913.

Application filed April 8, 1912. Serial No. 689,404.

To all whom it may concern:

Be it known that I, WILLIE C. BEAM, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Regulators, of which the following is a specification.

The object of this invention is to construct a regulator adapted for use in operating the dampers of a heater and also operating a valve for admitting steam over the fire at the time new fuel is fed to the heater.

In the accompanying drawings, Figure 1 is a face representation of a heater front to which I have applied my improvements. Fig. 2 is a vertical section on line *a a* Fig. 1. Fig. 3 is a vertical section through the regulator. Fig. 4 is a section on line *b b* Fig. 3. Fig. 5 is a section showing the connection between the shell and cap thereof. Fig. 6 is a section through one of the steam outlet openings.

The regulator comprises an outer shell 1 having a closed bottom 2 provided with a removable plug 3. A cap 4 is formed with a depending outer edge 5 and with a depending inner rim 6. A filling opening through the cap is closed by a plug 7, Fig. 3. An inner shell 8 is located within the outer shell and has a flange 9, through which screws 10 pass into ears 11 extending from the inner face of the outer shell, Fig. 5, which serve to connect the inner shell, cap and outer shell. The inner shell is formed with an opening 12 in the bottom 13 thereof which is formed with a valve seat 14. A valve 15 is located on the seat 14 and is provided with a depending stem 16. A rocking lever 17 is pivotally supported by the lower end of the inner shell, one end of which contacts with the lower end of the stem 16. A rod 18 is guided in openings through the cap 4 and flange 9, also through a projection extending from the outer face of the inner shell. The lower end of this rod is pivoted to the rocking bar 17. A spring 20 surrounds the rod 18, one end resting against the projection 19, and its other end resting against a pin 21 extending through the rod 18. The action of this spring is to hold the rod 18 elevated and the rocking bar in a position to allow of the seating of the valve 15. A lever 22 is pivotally connected with the cap and rests on the upper end of the rod 18.

The inner shell is formed with a side pocket 23 near its lower end, and is formed with a vertical opening 24. A screw threaded rod 25 is screw threaded in connection with a projection 26 extending from the outer face of the inner shell. The upper end of this rod 25 is guided in openings through the flange 9, and cap 4, Fig. 3, and is formed with a transverse slot 27 for the reception of a screw-driver. A spring 28 surrounds the rod 25, one end resting against the flange 9, and its other end resting on a washer 29 held in connection with the rod by a pin 30. The action of this spring is to hold the rod from turning freely. The lower end of the rod 25 is tapered as at 31, and located in the opening 24.

The upper portion of the inner shell is provided with openings 32, and in the lower portion of the inner shell, in its inner face, is formed a groove 33 extending in the lengthwise direction of the shell. A piston 34 is located in the inner shell and has a central cavity 35 to receive the valve 15. A rod 36 is connected to the piston and extends upwardly through the cap 4. A cross head 37 is fixedly connected to the rod 36 and to its ends are pivotally connected rods 38, and the lower ends of these rods are connected by a cross-bar 39. A rod 40 is connected to the cross-bar 39. To one of the rods 38 is adjustably connected an arm 41 by a thumb screw. The outer shell is connected to the heater front by the brackets 41½.

A bell crank 42 is pivotally supported by the heater front 43, having one arm connected to a check draft damper 44 by the rod 45, and its other arm is connected to the arm 41 by the rod 46.

A steam supply pipe 47 is provided with a valve 48 which is opened and closed by the lever 49. This lever 49 is located in an eye 50 in the cross head 37. An arm 51 is adjustably connected to the steam supply pipe 47, and is formed with an opening through which the rod 36 passes and is guided. To the rod 36 is fixedly connected an arm 52 which is formed with an eye which receives the steam pipe 47. This arm prevents the turning of the rod 36 but allows it to reciprocate. This steam supply pipe 47 has a horizontal extension 53, and in this instance three depending sections 54 are connected with the horizontal extension, and each section 54 is provided with lateral branches 55 formed with elbows 56 in which

plugs 57 are supported, and the plugs are formed with steam outlet openings 58, Fig. 6. This horizontal extension 53 is supported by the clips 59.

The heater front 43 is provided with hinged feed doors 60, and just inside of the doors, the lateral branches 55 are located. Each of the doors 60 is provided with an air supply opening above the fire which is closed by a door 61.

A rock shaft 62 is supported by the brackets 63 connected to the heater front, and to this rock shaft are connected arms 64, 65 and 66. The arm 64 is connected with the rod 40. The arms 66 are connected with doors 61 by the chains 67.

A rock shaft 68 is supported by brackets 69 connected to the heater front, and to it is connected an arm 70 which is connected with the arm 65 by the rod 71. This rock shaft 68 supports two upwardly extending projections 72.

With the parts in the positions shown in the drawings, and the piston in its lowest position, upon opening either of the doors 60 to place fuel on the fire, the door will contact with the projection 72, which will rock the shaft 68, and through the rod 71 will rock the shaft 62, which will open the doors 61. The turning of the rock shaft 62 will raise the piston through the connections with the cross head 37. The raising of the piston and piston rod will move the lever 49 and open the valve 48 and allow steam to escape through the openings 58 over the fire. The raising of the piston will move the bell crank 42 and open the check damper 44. In opening the door 60 the piston 34 will be raised which will draw in oil 73 from between the walls of the inner and outer shells 8 and 1, and the check valve 15 will rise and the oil above the piston will overflow through the openings 32 into the oil space. After the new fuel has been placed on the fire, the doors 60 are closed and the doors 61 will be held open by the oil beneath the piston preventing the descent of the piston. The valve 48 will be held open and the check draft 44 will be held open. By raising the needle valve 25 the oil beneath the piston will be gradually forced into the oil space thereby allowing the piston to descend which will close the doors 61, close the valve 58, and close the check valve 44. The weight of the piston and the force exerted by the doors 61 will be sufficient to return the parts to their normal positions. The rapidity with which the piston descends may be regulated by the needle valve 25. By depressing on the lever 22, the rod 18 will be depressed, which will operate the bar 17, and raise the check valve 15, thereby permitting the quick descent of the piston consequently returning the parts to their normal positions.

The object in admitting air through the doors 61 and forcing steam into the air over the new fuel added to the fire, is to settle the heavy smoke particles until the fresh gases are burned, and the length of time air and steam is supplied can be regulated by the needle valve 25.

The by-pass 33 will allow the piston to descend quickly just before it reaches the bottom of its movement.

I claim as my invention—

A regulator, comprising an outer shell, an inner shell supported within the same and spaced therefrom to form an internal liquid-holding chamber, said inner shell having an inlet port communicating with the lower portion of the chamber, an inwardly opening check valve controlling the lower port, an actuating rod for the check valve extending longitudinally in the chamber between the shells, said rod extending through the outer casing above the level of the liquid in the chamber, said inner shell having an outlet port in its lower portion communicating with the chamber, an adjustable valve controlling the latter port, an actuating device therefor extending longitudinally in the internal chamber and projecting from the therefor extending longitudinally in the in- the chamber, a reciprocatory piston in the inner shell, and means for connecting the piston to the controlling apparatus of a furnace.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIE C. BEAM.

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