W. O. AMSLER.

REVERSING VALVE FOR REGENERATIVE FURNACES.

APPLICATION FILED FEB. 17, 1906.

1,009,822. Patented Nov. 28, 1911.

2 SHEETS—SHEET 1.

FIG. 1.

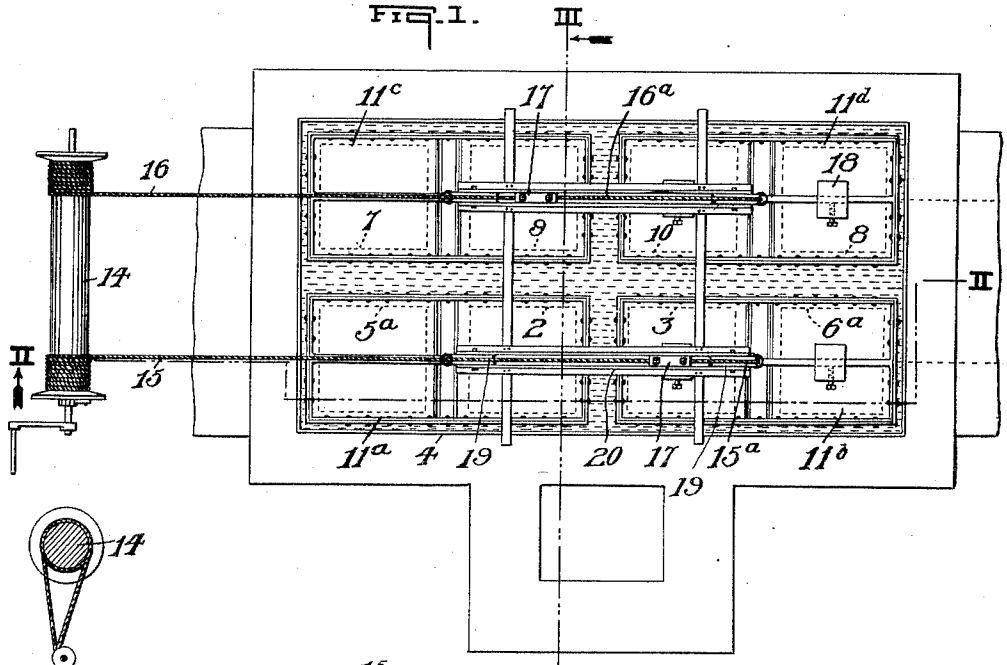


FIG. 2.

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2 SHEETS—SHEET 2.

FIG. 3.

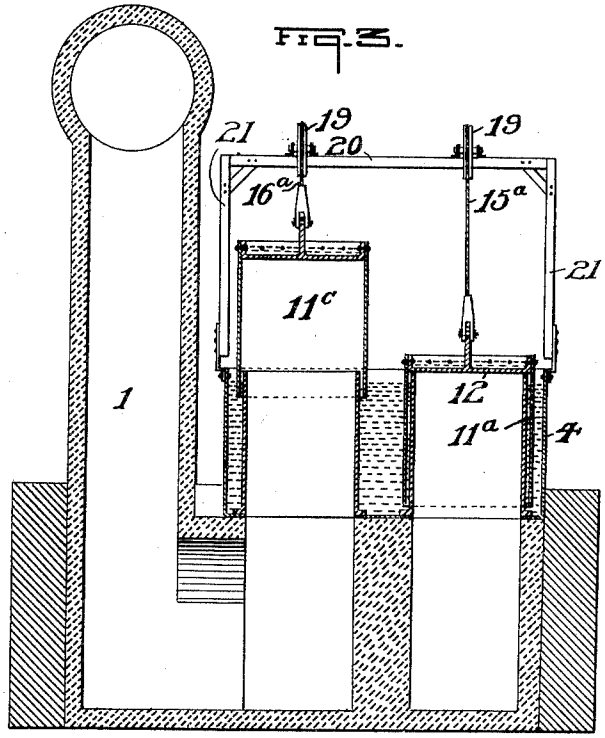
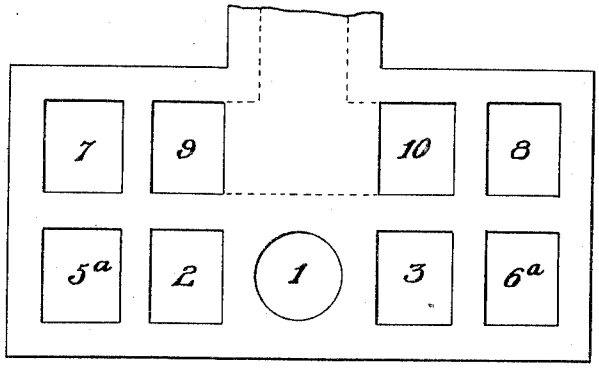


FIG. 4.



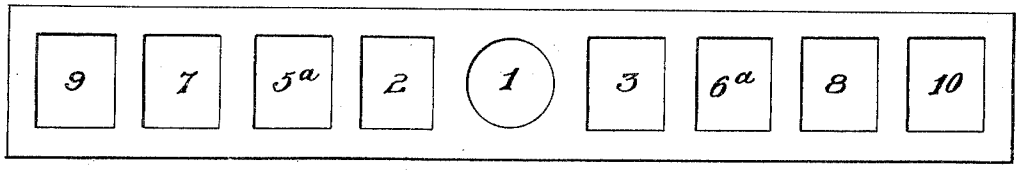


FIG. 5.

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REVERSING-VALVE FOR REGENERATIVE FURNACES.

1,009,822. Specification of Letters Patent. **Patented Nov. 28, 1911.**

Application filed February 17, 1906. Serial No. 301,588.

To all whom it may concern:

Be it known that I, WALTER O. AMSLER, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Reversing-Valves for Regenerative Furnaces, of which the following is a specification.

My invention relates to reversing-valves for regenerative furnaces, and the primary object of the present invention is to provide a new and improved water-sealed reversing valve.

To this end my invention consists of a water-sealed reversing-valve, in the novel features of construction and in the combination of parts, all as fully hereinafter described and claimed.

In the accompanying drawings, which illustrate applications of my invention, Figure 1 is a plan view; Fig. 2, a vertical longitudinal sectional view, taken on line II—II of Fig. 1; Fig. 3, a vertical sectional view taken on line III—III of Fig. 1; and Figs. 4 and 5 diagrammatic plans, showing different arrangements of the flues.

Referring to the drawings, 1 represents a gas-supply passage in communication with two gas-ports 2 and 3. Gas-ports 2 and 3 extend upwardly into a water-tank 4. Formed in the masonry are flues 5 and 6 leading to the regenerators and these flues communicate with ports 5^a and 6^a which latter extend upwardly into the water-tank 4 in a similar manner to the gas-ports 2 and 3. In addition to the ports 2, 3, 5^a and 6^a, I employ ports 7 and 8 respectively communicating with flues leading from the regenerators and ports 9 and 10 in communication with the chimney-flue. These latter ports 7, 8, 9 and 10 are arranged in the water-tank similar to the ports heretofore described.

11^a, 11^b, 11^c and 11^d designate the valves proper and, as illustrated, I have shown these valves in the form of hoods and each hood or valve arranged to cover two ports. In the forms shown, I employ four valves, valve 11^a located over and controlling the ports 2 and 5^a, valve 11^b controlling ports 3 and 6^a; valve 11^c the ports 7 and 9, and valve 11^d ports 8 and 10. The valves are arranged to move vertically into and out of the water-seal of tank 4, and are each formed with a top or closing-member 12 having a centrally disposed trough 13 adapted to contain a cooling fluid. It will be noted that a water-seal surrounds all the ports and between each port, as particularly shown by Fig. 2, there is a space separating each port of a pair. When the valves are seated to close their respective ports, the trough 13 extends down into the space between the ports and forms a seal between the ports controlled by a valve, thus, in Fig. 2, valve 11^b is seated, and while thus seated, the downwardly extending trough 13 forms a seal between the port 3 and port 6^a.

As illustrated, the valves are arranged to be operated in pairs that is, two valves 11^a and 11^d are arranged to be simultaneously raised to open the ports 2 and 5^a leading to one regenerator and to open port 8 leading from the other regenerator and the port 10 in communication with the chimney-flue. While these valves 11^a and 11^d are raised from their respective seats, gas from the gas-supply passes through port 2 to port 5^a, and thence to one regenerator, through the furnace, and the waste-gases from the furnace to a second regenerator and from said latter regenerator to the chimney-flue by way of ports 8 and 10. Valves 11^b and 11^c, while valves 11^a and 11^d are raised for the purposes described, are seated. To reverse the direction of the gas, valves 11^b and 11^c are raised and the valves 11^a and 11^d lowered. While the valves 11^a and 11^d are seated and the valves 11^b and 11^c raised, the course of the gas and waste-products is just the reverse of that described.

The valves may be reversed by any suitable mechanism. In the form of my invention, as illustrated, I employ very simple means comprising, a windlass 14 around which and operated thereby are two ropes 15 and 16. These ropes are arranged to be reeled off the windlass from opposite sides. Joined to each of the ropes 15 and 16 by means of clamps 17 are supplemental ropes 15^a and 16^a. Rope 15^a is connected at one end with valve 11^d and at its other end with valve 11^a, while rope 16^a is similarly connected with valves 11^d and 11^c. Each of the valves 11^b and 11^d are preferably provided with weights 18 to assist in the operation of raising and lowering the valves.

19 designates sheaves on which the ropes 15^a and 16^a travel, these sheaves are mounted on cross-pieces 20, the latter being supported on uprights 21.

By the diagrammatic views, Figs. 4 and

5, I show two different ways of arranging the ports. In both of these forms one valve is designed to cover two ports and the operation of the valves is similar to the mode above described.

What I claim is:—

1. A reversing-valve system comprising two pairs of vertical intake ports, two pairs of vertical outlet ports, a water seal surrounding the ports, said ports all located in a common horizontal plane, a series of vertically operative hood-valves each arranged to control one pair of ports only, said valves each having a closed top-member and provided with a depending water-cooled trough adapted to extend below the upper ends of the ports for effecting a seal between the ports constituting a pair when the valve is seated.

2. A reversing-valve system comprising a water-tank, a plurality of vertical ports arranged in intake and outlet pairs extending into the water of the tank and located in a common horizontal plane, a plurality of vertically operative hood-valves each having its top-member closed, one arranged to control a pair of intake ports and one arranged to control a pair of outlet ports, and means for simultaneously raising one valve and lowering the other valve.

3. A reversing-valve system comprising a series of vertical ports arranged in intake and outlet pairs and all located in a common horizontal plane, a water-seal surrounding the ports, a series of vertically operative hood-valves each having a closed top-member and arranged to cover a pair of ports and each having its top-member provided with a trough adapted to extend below the upper ends of a pair of ports for effecting a seal between the ports of one pair when the valve is seated, and means for raising and lowering the hood-valves.

4. A reversing-valve system comprising a water-tank, an upwardly extending gas supply port, a port to a regenerator, said ports extending into the water of the tank, a single vertically operative hood-valve controlling said ports having its top-member closed and provided with means for effecting a seal between the ports when seated, a port from a regenerator, a port leading to a chimney, said latter ports extending into the water of the tank, a vertically operative hood-valve controlling said latter ports having its top-member closed and provided with means for effecting a seal between these ports when the valve is seated, all of said ports being located in a common horizontal plane, and means for simultaneously raising the valves.

5. A reversing valve system comprising a water tank, a series of vertical ports arranged in intake and outlet pairs extending into the water of the tank and all located in a common horizontal plane, a series of vertically operative hood-valves each having a closed top-member and arranged to control a pair of ports, and means for simultaneously raising two valves of the series and lowering two valves.

6. A reversing valve system comprising a water tank, a series of vertical ports arranged in intake and outlet pairs extending into the water of the tank and located in a common horizontal plane, a series of vertically operative hood-valves each having its top-member provided with a depending trough and one arranged to control a pair of intake ports, one arranged to control a pair of outlet ports, and means for simultaneously raising two valves of the series and lowering two valves.

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

WALTER O. AMSLER.

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