Aug. 5, 1924. 1,503,465

W. O. AMSLER

REVERSING VALVE FOR REGENERATIVE FURNACES

Filed May 21, 1920 2 Sheets-Sheet 1

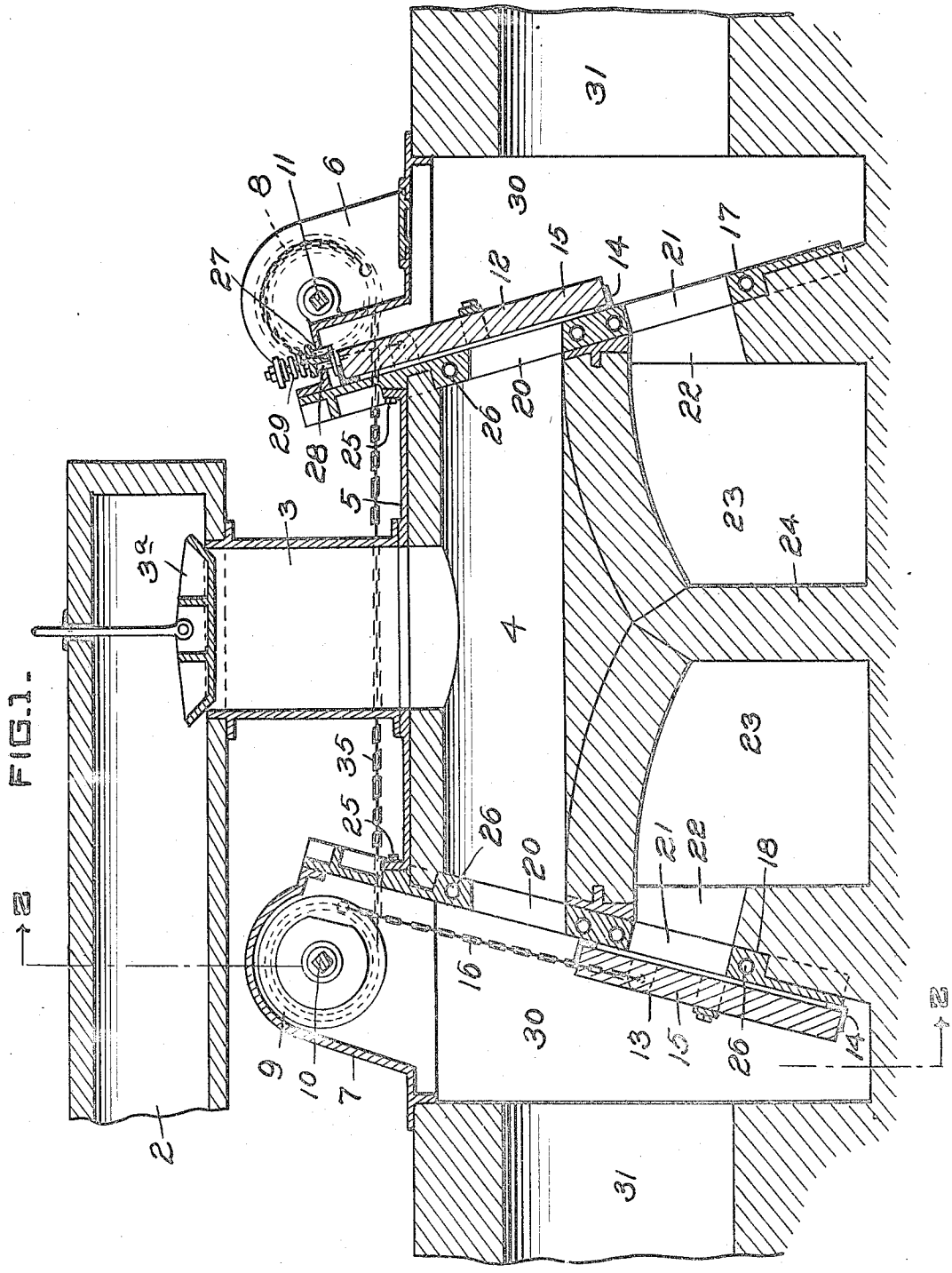

FIG. 1.

WITNESSES

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FIG. 1.

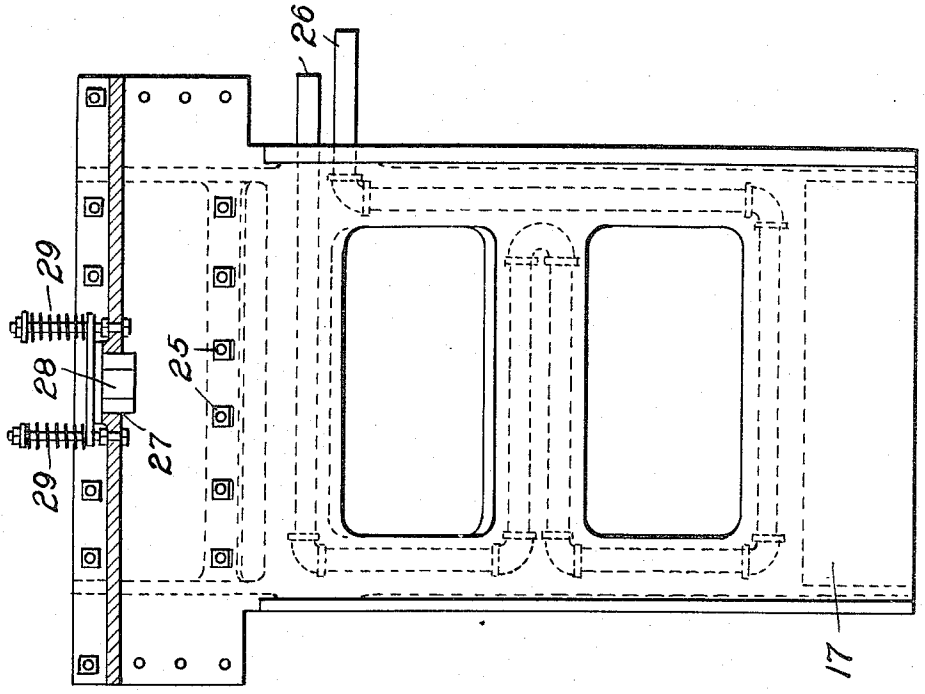
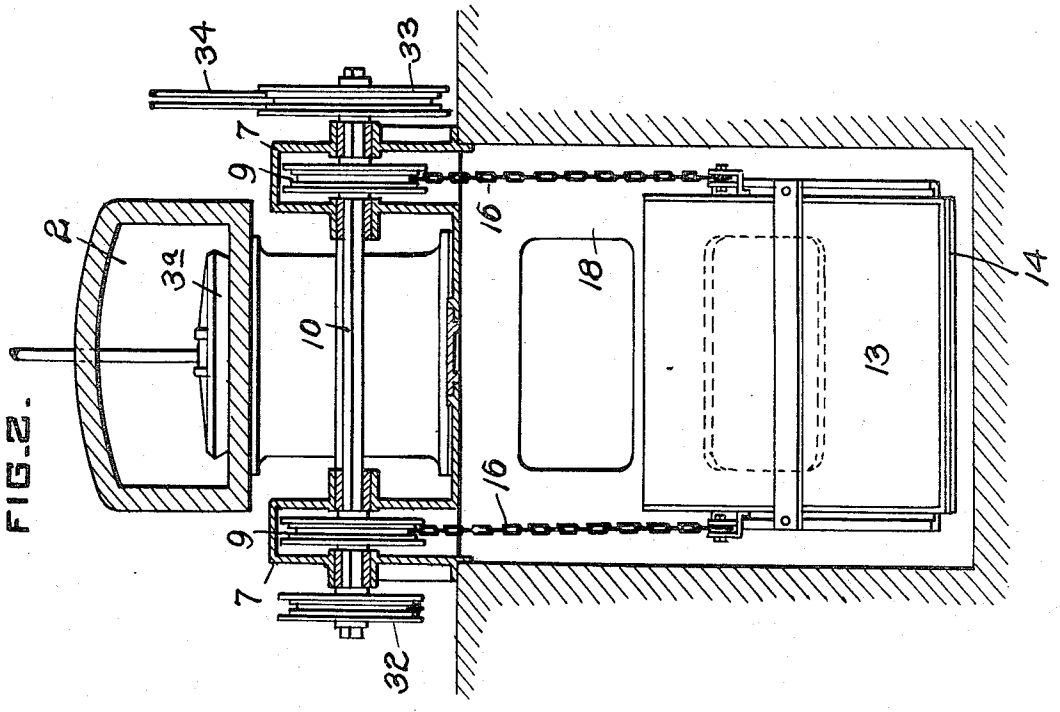


FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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REVERSING VALVE FOR REGENERATIVE FURNACES.

Application filed May 21, 1920. Serial No. 383,255.

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 certain new and useful Improvements in Reversing Valves for Regenerative Furnaces, of which the following is a specification.

The prime object of my invention is to provide a new and improved reversing valve for regenerative and like furnaces, and more particularly an improved gas reversing valve structure including a plurality of slide valves.

A further object of the present invention is to provide a reversing valve disposed and operable within the brick-work or masonry containing the chimney and regenerative flues.

Other objects of my invention are, to provide a simple and efficient reversing valve structure in which the usual liquid seals are dispensed with, thereby greatly reducing the initial cost of the structure as well as the cost of operations; and a reversing valve structure of such a character as to eliminate the abrupt bends and curved passages so frequently found in gas reversing valves.

In the accompanying drawings, which illustrate an application of my invention,

Fig. 1 is a vertical longitudinal sectional view of my gas reversing valve shown in connection with a gas box and the chimney and regenerative flues;

Fig. 2, a vertical sectional view taken on line 2—2 of Fig. 1; and

Fig. 3, an elevational view particularly showing the water cooled valve seat and a portion of the casing.

Referring to the drawings, 2 designates a gas conduit in communication with a gas-box 3 through which gas is introduced to a horizontally extending chamber 4. The passage of gas from the conduit to the gas-box is controlled by a valve 3^a. Gas-box 3 is mounted on a cover-plate 5, and 6 and 7 respectively designate separate housings designed to receive chain sheaves 8 and 9. The chain wheels or sheaves 8 and 9 are arranged in pairs, the wheels 9 constituting one pair are particularly shown by Fig. 2; the other pair of wheels 8 are similar to wheels or sheaves 9. Sheaves 9 are mounted on a shaft 10 which latter extends through the housings 7, and sheaves 8 are mounted on a similar shaft 11, the latter having its bearings in housings 6.

As illustrated and as preferred, the valve structure includes two vertically movable slide valves 12 and 13 adapted to be conjointly operated and moved in alternate directions, each valve moving in a plane which is disposed transversely to the axes of the horizontal ports, hereinafter described. Valves 12 and 13 are similar, and include a metallic frame 14 and suitable refractory material 15. Each valve is moved into open and closed positions by means of chains 16, respectively cooperating with the wheels 8 and 9 mounted on shafts 11 and 10. Valve 12 is mounted on a vertically extending inclined and water cooled metallic seat 17, and valve 13 upon a similar seat 18.

Each valve seat 17 and 18 is formed with corresponding horizontally disposed ports 20 and 21, respectively registering with chamber 4 and with ports 22 formed in the brickwork and leading to a divided chimney flue 23. Chimney flue 23 for a portion of its length is divided by a partition and baffle wall 24. One of the objects in providing wall 24 is to prevent the hot gases, during their passage through the structure, from attacking the valves 12 and 13 when the latter are closing the ports 22 in communication with the chimney flue.

The valve seats extend upwardly through the coverplate 5 and are secured to said plate by bolts 25; the seats are also connected with the respective housings 6 and 7. 26 designates a piping system associated with the seats, whereby a cooling fluid may be circulated in the seats.

For the purpose of admitting air to the interior of the housings to cool the valves, said housings are provided with valve controlled openings 27, the valves 28 thereof being adapted to be moved to open positions by the upward movement of the main slide valves 12 and 13, and to be closed by the springs 29.

Valves 12 and 13 are disposed and operated within chambers 30, 30, formed by the brickwork and the housings, and, as will be readily understood, control the passage of gases, etc., from the chamber 4 to the regenerator flues 31, 31, and from the regenerative or furnace flues to the chimney flues.

In addition to the chain wheels 8 and 9

referred to above, each shaft 10 and 11 has mounted thereon a chain wheel or sheave 32, and one of the shafts (as shown, shaft 10) is provided with a drive wheel 33, the latter being adapted to be turned by a drive rope or cable 34 extending from said wheel 23 to a convenient point. Wheels 32 are connected by a chain 35, thus providing a construction effective to alternately raise and lower the respective valves concomitantly.

What I claim is:

1. In a reversing valve structure, the combination with oppositely disposed gas regenerator flues and a chimney flue disposed within the masonry of a furnace, vertically movable slide valves controlling the passage of gases between the regenerator and chimney flue, horizontally disposed ports over which the valves slide, and a baffle wall interposed between said valves.

2. In a reversing valve structure, the combination with oppositely disposed gas regenerator flues and a chimney flue having a partition wall therein all disposed within the masonry of a furnace, a vertically extending ported valve-seat located between a regenerator flue and a chimney flue, the ports therein being horizontally disposed a vertically movable slide valve controlling the passage of the gases through the port of said seat, and means for operating the valve.

3. In a reversing valve structure, the combination with a gas supply chamber, oppositely disposed gas regenerator flues and a chimney flue all disposed within the masonry of the furnace, opposite ports establishing communication with the gas supply chamber and regenerator flues, opposite ports establishing communication with the regenerator flues and chimney flue, a reciprocable valve adapted to move over one port connecting the regenerator flue and gas supply chamber and one port connecting the regenerator flue and chimney flue, said valve operating to close one or the other of said ports at will, a similar valve for the other two ports, operating means for each valve enclosed in a housing and operable from without the housing, and means outside the housings connecting the operating means in such a manner that the two valves may be operated concomitantly to open and close respectively different ports.

4. In a reversing valve structure, the combination with a gas supply chamber and a chimney flue disposed one above the other, a regenerator chamber with which both the gas supply chamber and the chimney flue communicate through horizontally disposed ports, of a valve reciprocable in a vertically extending plane to close one or the other of said ports, and means operated by said valve for admitting cooling air thereto when the valve is closing the port between the gas supply chamber and regenerator chamber.

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

WALTER O. AMSLER.

Witnesses:

J. M. GEOGHEGAN.

LOIS WINEMAN.