

No. 775,563.

PATENTED NOV. 22, 1904.

S. M. GUSS.
REVERSING VALVE FOR FURNACES.

APPLICATION FILED JULY 7, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 2--

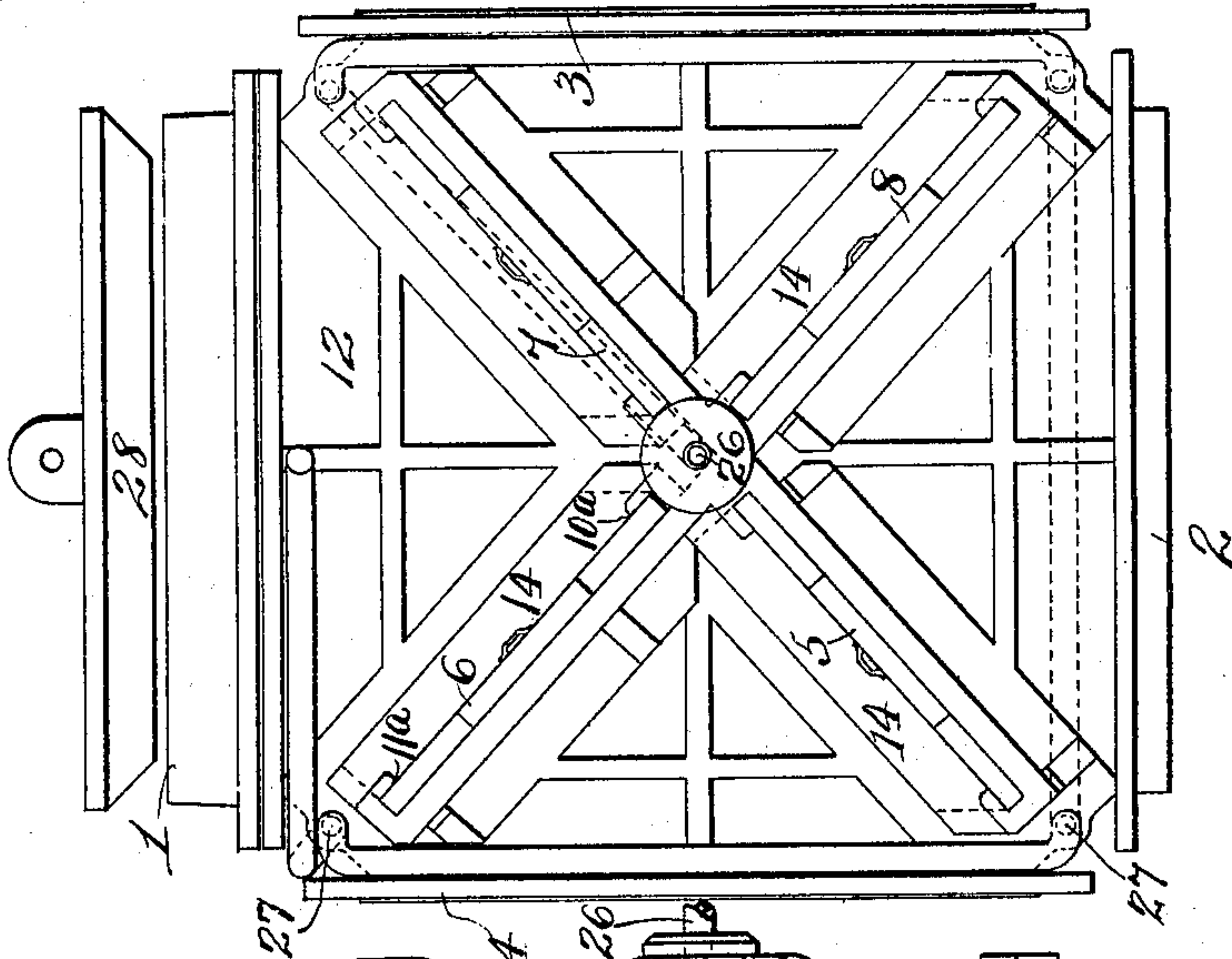
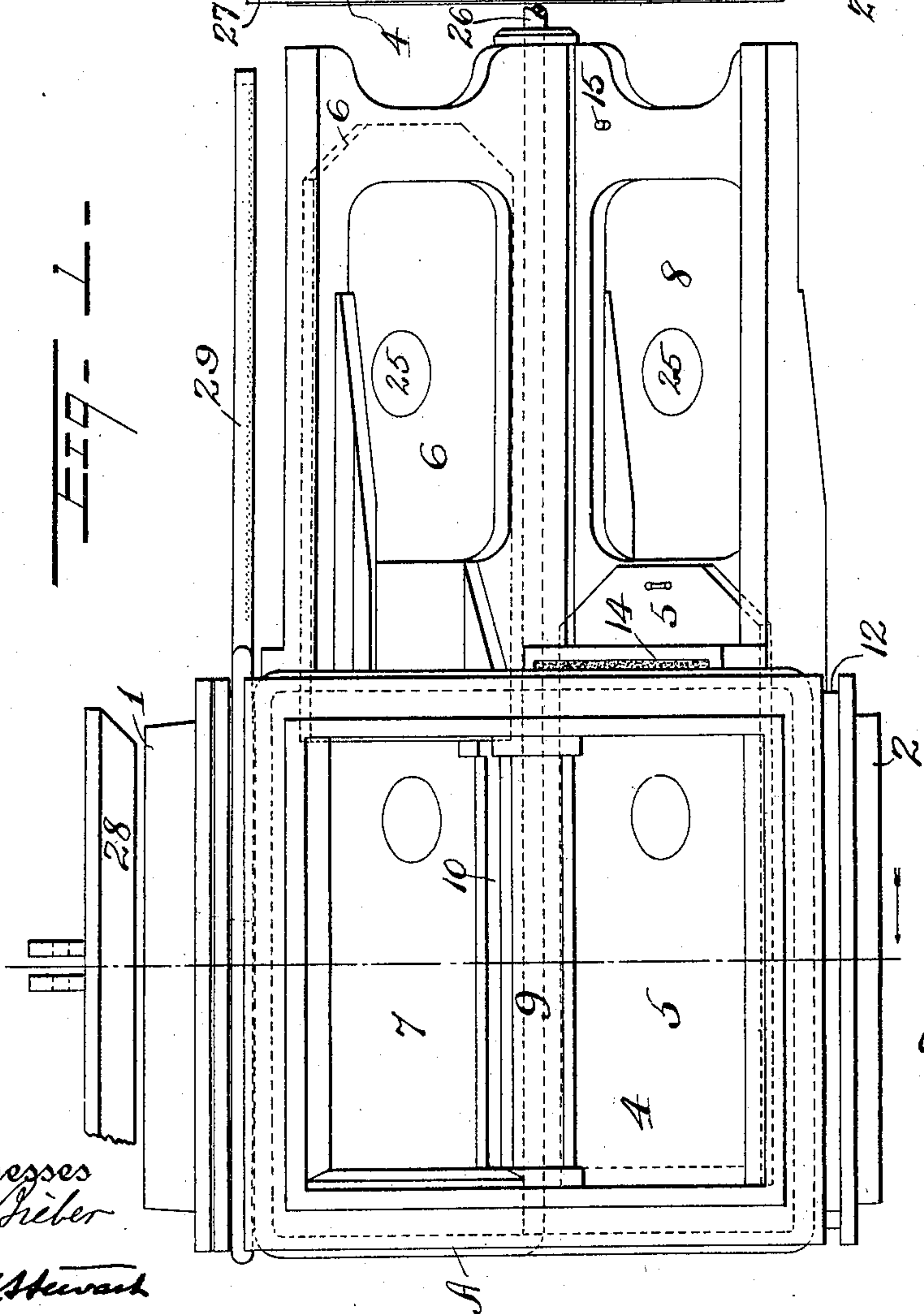


FIG. 1--



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2 SHEETS—SHEET 2.

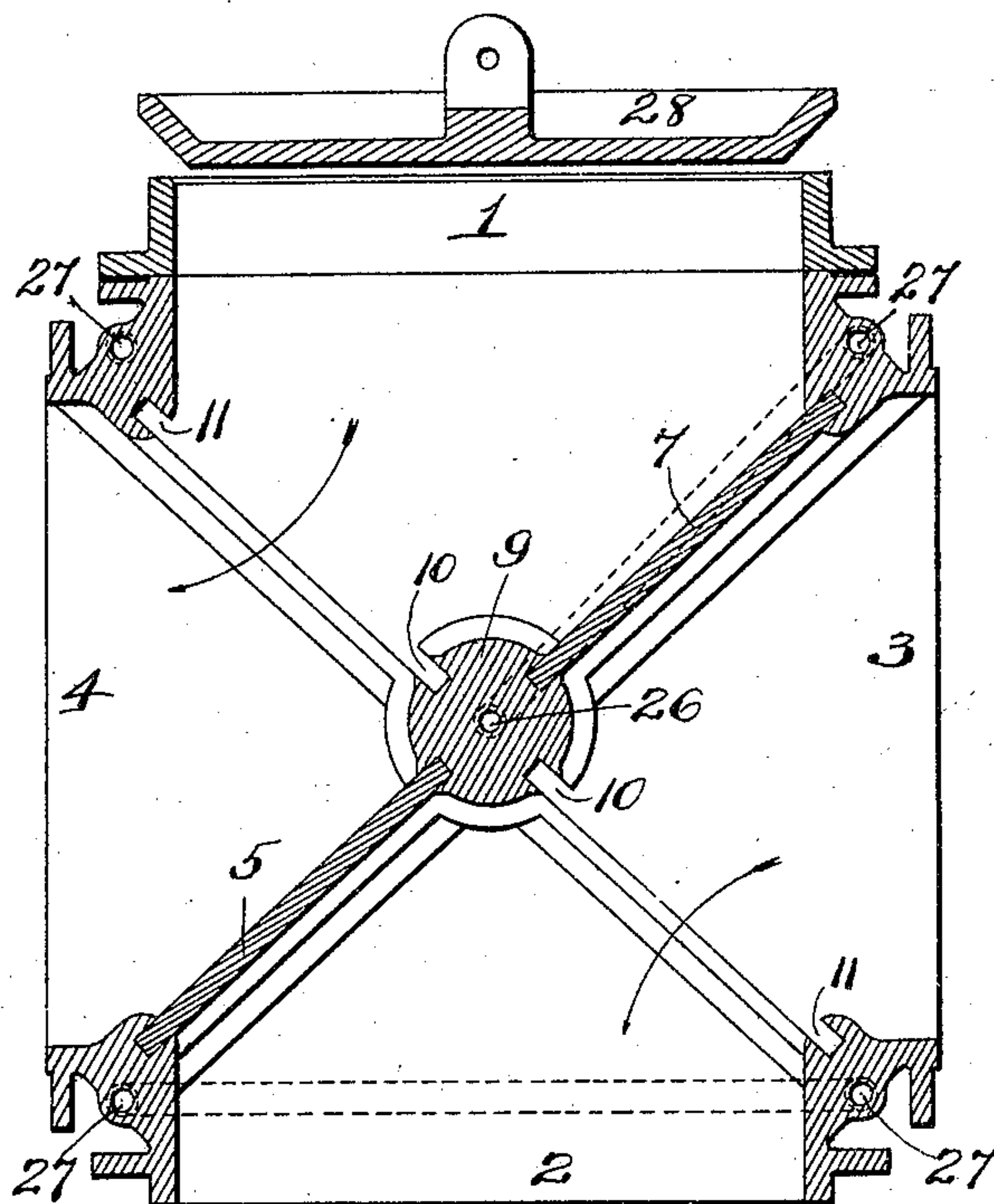
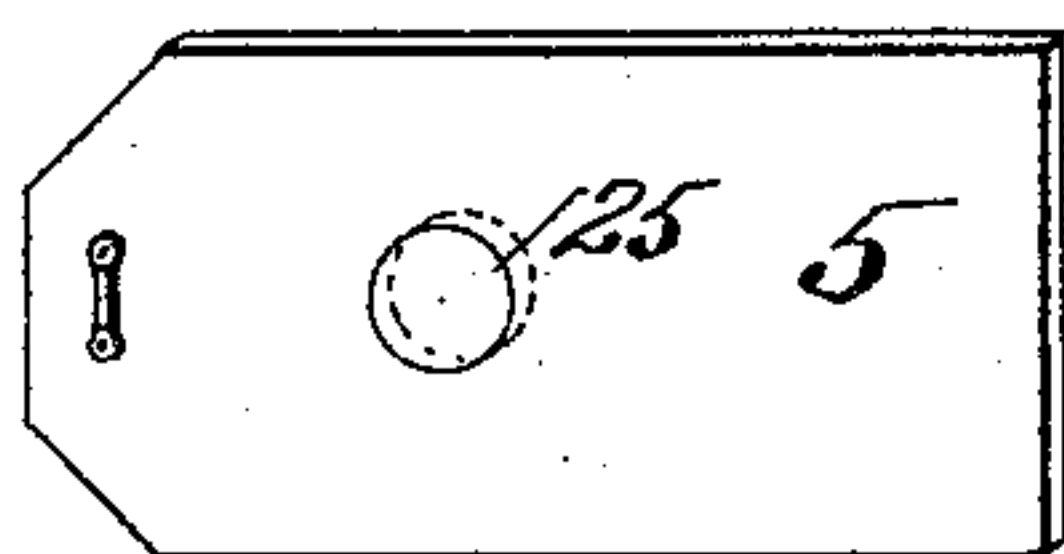



Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL M. GUSS, OF READING, PENNSYLVANIA.

REVERSING-VALVE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 775,563, dated November 22, 1904.

Application filed July 7, 1904. Serial No. 215,663. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. GUSS, a citizen of the United States, residing in the city of Reading, county of Berks, State of Pennsylvania, have invented certain new and useful Improvements in Reversing-Valves for Furnaces, of which the following is a specification.

My invention relates to reversing-valves for regenerative furnaces; and my object is to provide a simple and durable valve mechanism for this purpose which will at all times satisfactorily control communication between the several flues as desired.

The invention is fully described in connection with the accompanying drawings, showing a preferred embodiment thereof, and the novel features are specifically pointed out in the claims.

Figure 1 is a side elevation of a valve mechanism embodying my improvements. Fig. 2 is an end view of the same. Fig. 3 is a cross-sectional view looking in the direction of the arrow, Fig. 1. Fig. 4 is a separate view of one of the slide-plates.

A represents a valve-box of rectangular form having four of its walls provided with ports, marked, respectively, 1, 2, 3, and 4, communicating with the several flues as follows: port 1 with the usual gas-inlet flue; port 2, opposite port 1, with the flue leading to the stack, and side ports 3 and 4 with the respective furnace-chambers. To control communication between these ports, I employ sliding valves or partition-plates 5, 6, 7, and 8, arranged to be moved into diagonal position within the box or to be withdrawn from the box, as desired. To effect this, I provide the box with a central bar 9, having suitable longitudinal slideways 10 for engaging the inner edges of the several slide-plates employed, and at the several interior corners of the box I provide similar slideways 11 for engaging the outer edges of said plates. These central and corner slideways are extended outward beyond the wall 12 of the box, as indicated at 10^a and 11^a, the slide-plates being moved in said ways into and out of operative position in the box through slotted openings in said wall 12. These openings are guarded by suitable packing-boxes 14 to prevent leakage, and

equivalent provision may be made to insure tight closure of the edges of the pushed-in plates in the interior slideways 10 and 11 of the box.

The extent of withdrawal of the slide-plates is ordinarily limited by suitably-placed stops 15; but their entire removal for any purpose or the insertion of new ones is readily effected by merely removing such stop temporarily from their path.

Ordinarily the plates are arranged to be operated in pairs, 5 and 7 being so connected as to be moved inward together to direct the flow of incoming gas through furnace-port 4, while 6 and 8 are withdrawn to open communication between furnace-port 3 and the stack and, vice versa, to reverse the flow. Thus each pair of plates is ordinarily withdrawn from the box during the periods of time when the other pair is in service, so that opportunity for cooling the pairs alternately between reversals is provided.

The warping tendency of any valve-plate within the box, owing to excessive heat to which they are subjected, is a great source of loss and trouble, and various more or less complicated mechanisms have been devised for the purpose of overcoming the disadvantages incident to such warping. In my improved construction shown in addition to providing for subjecting the plates to the heating action for only comparatively brief periods of time, as desired, I so construct said plates as to minimize the warping tendency and at the same time provide in connection therewith special means for cooling the box and plates. The most refractory material practicable (as Bessemer iron) is employed in the plates, and the metal at the "neutral axis" is preferably cut away and replaced by a separate plug-piece 25, thus avoiding in a considerable degree the warping action. The cooling means comprise a water-conduit 26 in the central bar 9 and parallel conduits 27 in the corners of the box, all arranged in circuit, so that a stream of water admitted at the center is circulated throughout, the discharge through a projecting drip-pipe 29 being finally utilized, as indicated, in cooling the withdrawn plates, upon which it is arranged to fall through per-

forations provided in said pipe to effectively distribute the stream.

It will be readily seen that with my improved construction of valve I am able to advantageously control the communication between the ports both from the normal operation of the furnace or for retaining the heat in the furnace or cooling it off during a shut-down. In reversing the first step is to momentarily close in the unused sliding plates, so as to cut off all loss of gas to the stack, the previously-used plates being then simultaneously withdrawn to reverse the flow. In closing up the furnaces over a holiday all the valve-plates may be tight-closed, in addition to the usual gas-regulating mushroom-valve 28, so as to retain the heat therein by cutting off all communication with the stack, thereby saving considerable time and fuel in starting up again, or the furnace may be readily cooled off, if desired, the valve-plates being all or any of them withdrawn, as may be desired. If the plates require renewal, it may be readily done without cooling the furnace or practical interference with its operation.

The construction and operation of my improved mechanism are simple and satisfactory, only a small amount of room is required, and the operative parts are so accessible as to greatly facilitate maintenance. Various modifications in the specifically-described construction may obviously be made without departing from my invention.

What I claim is—

35 1. A reversing-valve for regenerative furnaces comprising a valve-box having four ported walls and a central bar, and four slide-plates arranged between said central bar and

the corners of the box and adapted to be moved into and out of the box to control communication between the ports. 40

2. A reversing-valve for regenerative furnaces comprising a valve-box having four ported walls and a central bar, valve-slideways extending beyond the box, and diagonally-arranged plates sliding into and out of the box in said ways to control communication between the ports. 45

3. A reversing-valve for regenerative furnaces comprising a valve-box having ported walls for the passage of gases, slide-plates arranged to be moved into and out of the box to control communication between the ports, and water-conduits arranged for cooling the box and discharging upon the withdrawn plates. 50 55

4. A reversing-valve for regenerative furnaces comprising a valve-box having four ported walls and a central bar, and four slide-plates arranged between said central bar and the corners of the box and moved into and out of the box in pairs to control communication between the ports. 60

5. A reversing-valve for regenerative furnaces comprising a valve-box having four ported walls, a hollow central bar forming a water-conduit and parallel water-conduits in the corners of the box arranged in circuit with said central conduit, and slide-plates to control communication between the ports. 65

In testimony whereof I affix my signature in the presence of two witnesses. 70

SAMUEL M. GUSS.

Witnesses:

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W. G. STEWART.