March 17, 1925. 1,530,047

H. HELLAN

REVERSING VALVE

Filed Aug. 29, 1924

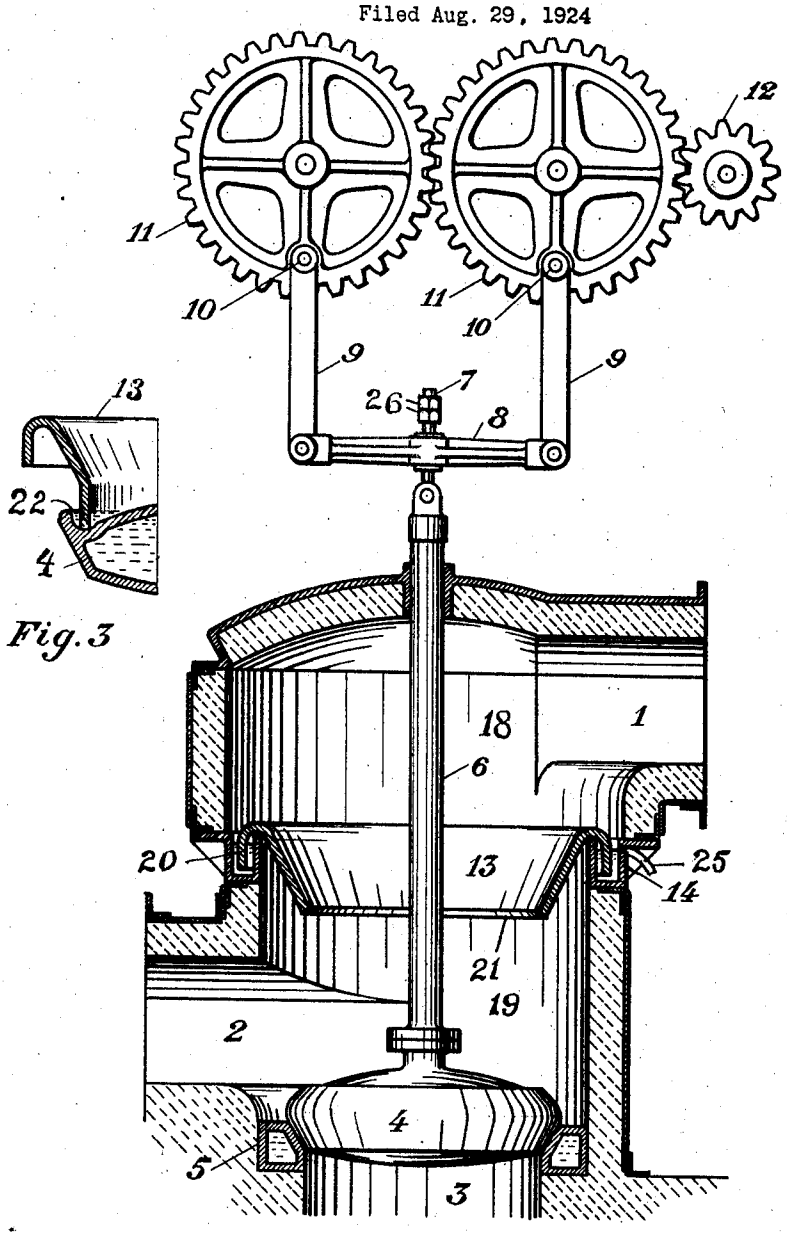


Fig. 1

Fig. 3

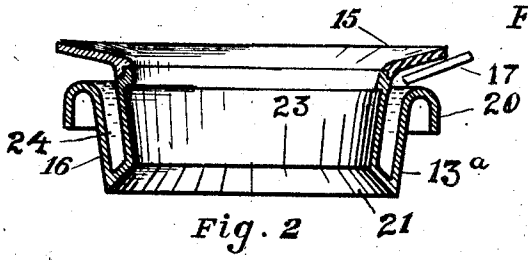


Fig. 2

INVENTOR.
Haakon Hellan
BY
F. N. Barber
ATTORNEY.

Patented Mar. 17, 1925. 1,530,047

UNITED STATES PATENT OFFICE.

HAAKON HELLAN, OF BRENTWOOD, PENNSYLVANIA.

REVERSING VALVE.

Application filed August 29, 1924. Serial No. 734,881.

To all whom it may concern:

Be it known that I, HAAKON HELLAN, a citizen of the United States, residing at Brentwood, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Reversing Valves, of which the following is a specification.

My invention relates to reversing valves of the mushroom type for regenerative furnaces. The principal object of this invention is to provide means for closing the valve against gas or air, and to provide means for a positive stroke of the valve proper.

Referring to the accompanying drawing, Fig. 1 is a vertical section, parts being in elevation, showing one embodiment of my invention; Fig. 2, a vertical section showing a modified form of the ring; and Fig. 3, a fragmentary view showing the valve proper and the said ring.

On the drawing, I show a single gas-controlling structure having the upper or inlet box 18 and the lower or outlet box 19 separated by the annular open topped water trough 14, on the inner wall of which is hung the metal ring 13, having an outer annular downwardly-extending flange 20, projecting into the trough to form a seal. The ring 13 has its inner portion tapered downwardly, its lower end forming a seat 21 for the upper portion of the valve body 4 when the latter is drawn upwardly by its stem 6 sufficiently.

2 is a port leading from the box 19 toward a suitable furnace chamber, not shown, and 3 is a passage leading exhaust gases from the box 19 toward the stack, not shown. The top of the passage 3 is provided with an annular water-cooled seat 5 adapted to be closed by the valve-body 4 when in its lowest position, as shown in Fig. 1. When the valve-body 4 is on its seat 21 the waste gases from the furnace pass through the port 2, the seat 5 and the passage 3.

The upper face of the valve-body may have an annular depression or trough 22 to receive the lower end of the ring 13. Tar condensed from the gases contacting with the valve-body and its stem, preferably constructed as shown in my Patent No. 1,499,017, granted June 24, 1924, gathers in the trough 22 and forms a seal between the ring and the valve-body.

In Fig. 2, I show a modified form of ring. It has the flange 20 as the ring 13 has. It has a valve seat 21^a similar to the seat 21. From the inner edge of the seat 21^a, the ring has the ascending annular wall 23 spaced from the outer wall 16 to form an annular water trough 24. The wall 23 is continued up above the top of the trough and flares out over the same to form a cover or shield 15 for the water in the trough. This shield is preferably separable from the rest of the ring. Water is admitted to the trough 24 by the pipe 17, the overflow from the trough dropping into the trough 14, whence it escapes through the pipe 25. In the construction shown in Fig. 1 water may be constantly supplied by any suitable well-known means.

In order to cause the stem 6 to move in a straight line, I provide two intermeshing spur-gears 11 driven by the pinion 12. Each gear has a crank-pin 10, each directly below the center of its gear when the valve-body 4 is on its seat 5. Each crank-pin has a link 9 of equal length whose lower ends are pivotally attached respectively to the ends of the equalizer-bar 8, loosely connected to the pin 7 pivotally connected to the upper end of the stem 6. The pin 7 has the nuts 26 above the bar 8 which engages the lower nut for the purpose of lifting the valve stem and body. The gears 11 rotate in opposite directions and cause the links to move laterally in opposite directions whereby the tendency of one link to move the stem laterally is balanced by the contrary tendency of the other link. This prevents wear between the stem and the opening through which it reciprocates in the top of the box 18, and prevents the valve-body from sitting skewed on its seat. There is a slight lost motion of the bar 8 on the pin 7 to insure that the stem will not be supported by the bar at the times when the valve-body should be on its seat 5. The upward travel of the bar causes the valve-body to engage the seat 21. In case the valve body has overtraveled upwardly beyond the distance required to seat the valve body properly against its seat 21, the valve body will lift the ring, but the seal will not be broken because the flange 20 and the trough 14 have sufficient depth to allow the flange to move upwardly reasonable distances without lifting the flange out of the water in the trough.

The crank-pins 10 may be described as

being arranged so that they shall both be in alinement with the centers of both gears 11 when the crank-pins are ninety degrees from their positions shown in Fig. 1, both pins being either between the gears or beyond the same.

I claim—

1. In a valve structure, a gas-inlet box, a gas-outlet box, an annular liquid-holding trough between the boxes, a valve seat loosely hung on the trough and having an annular flange in the trough, and a valve body movable upwardly into engagement with the seat.

2. In a valve structure, a gas-inlet box, a gas-outlet box, an annular liquid-holding trough between the boxes, a loosely suspended valve seat and having an annular flange in the trough, and a valve body movable upwardly into engagement with the seat.

3. An annular valve seat for furnaces having an outer annular sealing flange, and an interior downwardly extending portion comprising an upwardly open trough with a valve seat at its lower end and a removable cover over the trough.

4. An annular valve seat for furnaces having an outer annular sealing flange, and an interior downwardly extending portion comprising an upwardly open trough with a valve seat at its lower end and a cover over the trough.

5. In a valve structure, a reciprocable valve stem, a pair of intermeshed equal gears, means for driving them, crank-pins, one for each gear, arranged to be, at certain positions of the gears, in alinement with the centers of both gears and between the same, an equalizer bar pivotally connected to the links, and means connecting the valve stem to the bar.

In testimony whereof I hereunto affix my signature this 28th day of August, 1924.

HAAKON HELLAN.