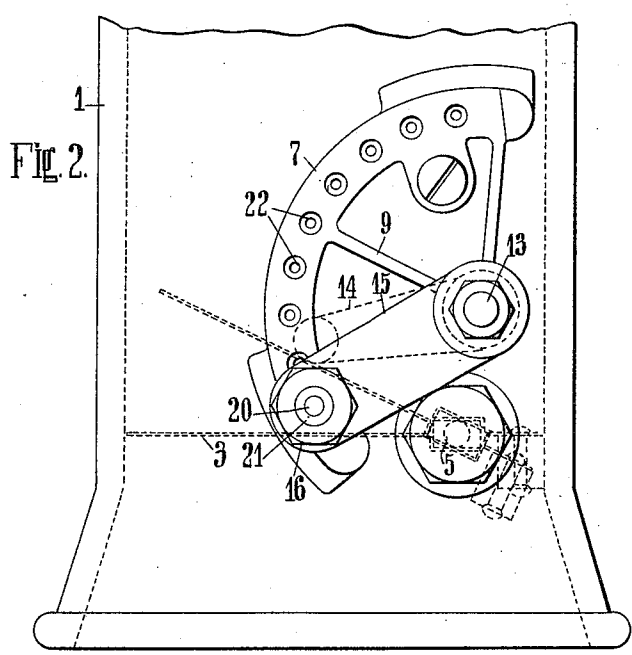
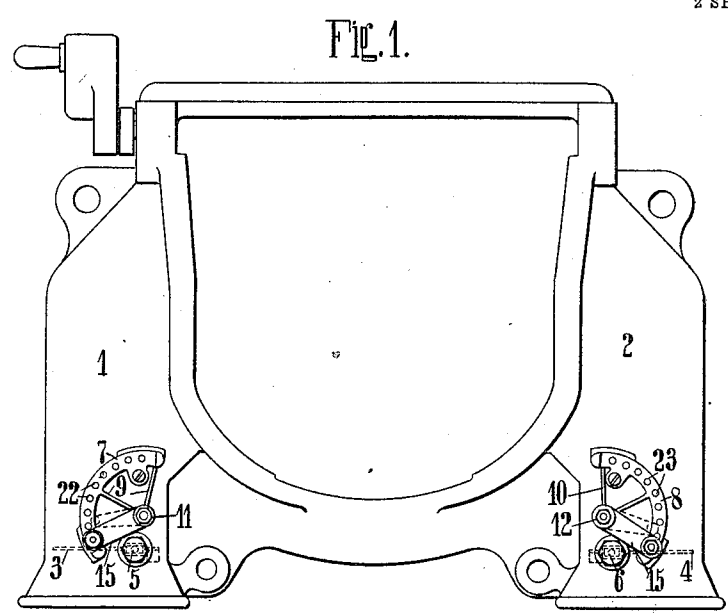


G. DE GRAHL.
BOILER FURNACE.
APPLICATION FILED MAR. 21, 1911.

1,050,940.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.



Witnesses:
M. Schmid
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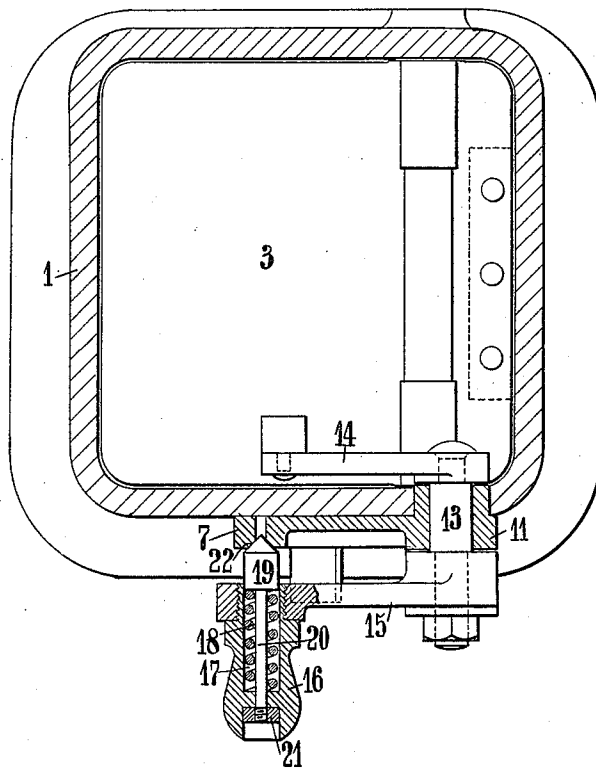
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2 SHEETS-SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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BOILER-FURNACE.

1,050,940.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed March 21, 1911. Serial No. 615,965.

To all whom it may concern:

Be it known that I, GUSTAV DE GRAHL, a subject of the German Emperor, and residing at Zehlendorf, near Berlin, Germany, have invented certain new and useful Improvements in Boiler-Furnaces, of which the following is a specification.

My invention relates to boiler furnaces having lateral air conduits in the door-frame in which flap-valves adapted to open automatically under the influence of the vacuum are pivoted. If in these boiler-furnaces one side of the grate is highly charged with coal and in consequence thereof the air cannot or not sufficiently pass between the grate-bars, the additional air, which is introduced through the corresponding air-conduit cools the coal on this side of the grate, so that black or so-called dead spots are formed thereon. To meet this disadvantage, I provide stops above the flap-valves adjustable independently from each other for coacting with the valves in order to limit the opening of the same. Herewith the advantage is obtained that in fact by every one of the two air-conduits additional air can be admitted to the fire-box under the influence of the vacuum therein, but the maximum amount of the opening of the valves may be different in each air-conduit according to the adjustment of the stops. If now at one side of the grate black or dead spots appear this stop in the corresponding air-conduit is to be adjusted in such a manner that it allows but a very small opening of the valves. The consequence of this is, that a smaller amount of air is sucked into the fire-box through the lateral air-conduit but a greater amount through the grate-bars and herewith the burning of the coal on the grate is favored. If the stoker intends to release one side of the grate from the slags the opening of the valves and in consequence the amount of the air entering through the corresponding lateral air-conduit is to be reduced to such an amount, as is just sufficient for cooling the walls of the air-conduit and preventing the burning of the same, while through the air-conduit at the other side of

the grate which is not to be released from 50 slags a far greater amount of air may be introduced according to the adjustment of the stop.

One illustrative embodiment of my invention is represented by way of example in 55 the accompanying drawings, wherein:—

Figure 1 is a front elevation of the door-frame and the fire-door, and Figs. 2 and 3 are front elevation and horizontal section, respectively, enlarged, showing one of the 60 two lateral air-conduits.

Referring to the drawings, the numerals 1 and 2 designate the two known lateral air-conduits in the door-frame, in which the flap valves 3, 4 are respectively arranged to rock about the pivots 5, 6, respectively. On the wall of each of the lateral air-conduits 1, 2 I attach a curved plate 7, 8, respectively, connected by spokes 9, 10 with a sleeve 11, 12, respectively. The latter are located 70 above the valves, extend through the walls of the latter air-conduits 1 and 2 and each contains a pivot 13, whose one end projecting into the lateral air-conduit carries a lever 14 acting as a stop for limiting the 75 motion of the valve and whose other end carries a lever 15. Each lever 15 carries a handle 16 containing a chamber 17. The spring 18 in the chamber 17 presses against the pointed head 19 on one end of the shank 80 20. The latter is mounted axially displaceable in the handle and at its other end carries a nut 21. Each curved plate 7, 8 possesses a number of recesses or holes 22 and 23, respectively, for receiving the pointed 85 end of the head 19. The position of the lever 14 relatively to the valves 3, 4 is such that as soon as the heads 19 rest in the lowest of the holes 22 and 23, the lever 14 which limits the movement of the valves 3, 90 4 allows the valves to be open a minimum amount which is just sufficient for admitting sufficient air for cooling the furnace front and preventing the burning of the same. 95

According in each instance to the kind of coal which is burned and to the size of the grate the valve can be opened a minimum

amount by actuating the lever 15, whereby the furnace front is effectively prevented from becoming overheated.

I claim:—

- 5 A combination with the fire-door frame, having lateral air-conduits 1, 2, flap-valves 3, 4, adapted to open automatically under the influence of the vacuum in the fire-box therein, levers 14 journaled in the walls of
10 the conduits and adapted to stop the valve

after it has lifted itself, and means for locking the levers 14 independently from each other in various positions.

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

GUSTAV DE GRAHL.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.

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