No. 710,707. Patented Oct. 7, 1902.

T. MURPHY.

FURNACE.

(Application filed May 2, 1900.)

(No Model.)

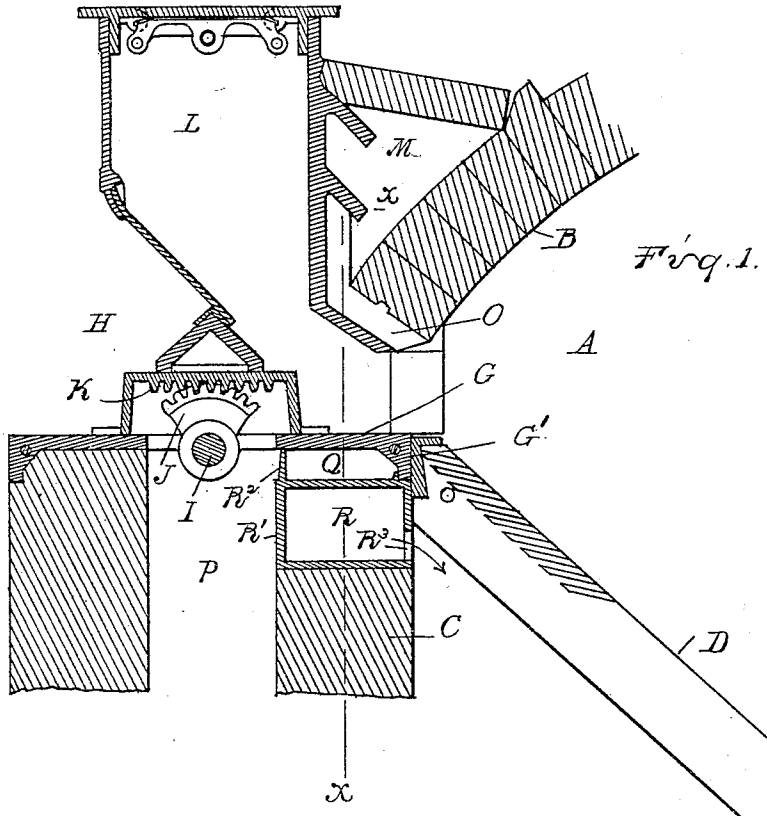


Fig. 1.

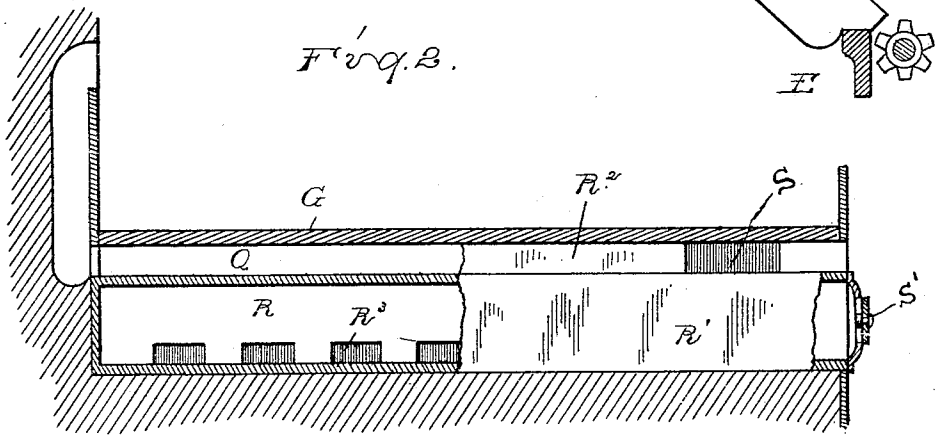


Fig. 2.

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UNITED STATES PATENT OFFICE.

THOMAS MURPHY, OF DETROIT, MICHIGAN.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 710,707, dated October 7, 1902.

Application filed May 2, 1900. Serial No. 15,173. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MURPHY, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to self-feeding furnaces of the type shown and described by me in several prior patents, such as Patents Nos. 316,641 and 316,642, dated April 28, 1885.

In previous constructions I have employed circulating air-currents for preventing the overheating of different portions of the furnace and for also heating the air which is subsequently introduced into the furnace-chamber, and thereby aiding the combustion of the fuel. My present invention has reference to improved construction employed for distributing said air-currents whereby the desired cooling effect is obtained, and at the same time a better regulation and distribution is obtained for the heated air introduced in the furnace.

In the drawings, Figure 1 is a cross-section through a furnace to which my improvements are applied. Fig. 2 is a longitudinal section on line *x x*, Fig. 1.

A is the furnace-chamber; B, the arch; C, the side wall, and D a series of inclined grate-bars. These bars rest with their lower ends upon a grate-bearer E and at their upper ends are preferably supported by bearing against the side wall of the furnace. In line with the upper end of the bars is arranged a plate G, forming a fuel-shelf, or what is commonly known as the "coking-plate," on which is slidingly secured the reciprocating pusher H, the latter being adapted to be operated by the rock-shaft I and gear-segment J thereon engaging with a rack K on the lower side of the pusher.

L is a fuel-magazine which communicates with the space above the shelf G and is adapted to discharge the fuel thereon, which after being coked is pushed off laterally onto the grate-bars by the action of the reciprocating pushers H.

M is an air-flue formed between the magazine L and the arch B, through which a current of air is circulated, serving to cool the magazine, and which is then introduced into the furnace-chamber through the ports O at the lower end of arch B and directly above the fuel-passage into the furnace-chamber.

The parts thus far described are all old and have been employed by me in previous constructions. In such previous constructions I have usually introduced air into the passage M from a chamber P, formed in the side wall of the furnace beneath the pusher H, which chamber forms a dust-pit. Thus the air passing into the flues M also serves the purpose of reducing the temperature of the pushers H and the mechanism employed for actuating the same before it reaches the flue M. To prevent the overheating of the upper end of the grate-bars, as well as the plate G, an air-flue Q is preferably arranged below said plate G and adjacent to the upper ends of the grate, and this flue is also connected either to the flue M or to some portion of the furnace chamber or stack, so that a current of air constantly passes therethrough and prevents the overheating of the plates. With my present construction I desire to prevent the overheating of the upper ends of the grate-bars by the introduction of a current of cool air into the chamber beneath said bars at substantially the highest point thereof—that is, at the upper angle between said grate and the side wall of the furnace. The air for this purpose might be taken directly from the dust-pit P if the latter were not connected to the air-flue M; but inasmuch as it is so connected and as the draft carried through said flue would be much stronger than that drawn through the grates it would be difficult or impossible to direct any considerable portion of air from the chamber P directly into the space below the grate-bars. I therefore employ the construction shown in the drawings, in which R is an air-flue, preferably formed by a cast-metal box R′, arranged along the wall C. This box is preferably provided with the upwardly-extending flange R^2, upon which the shelf G rests and which forms, in conjunction with a downwardly-extending flange G′ on said shelf, the air-flue Q, hereinbefore referred to. The flange R^2 has a portion cut away to form a connecting-passage S between the flue Q and the dust-pit. The flue R connects at its for-

ward end with a suitable draft-inlet opening controlled by a damper S′, and the box R′ is provided along the side adjacent to the grate-bars with a series of apertures or a slot R^3, through which the air admitted into the flue R may pass into the chamber beneath the grate-bars, as shown by the arrows in Fig. 1.

With the construction described it will be understood that in the operation of the furnace air will be caused to pass through the flue R and will be discharged through the lateral passages R^3 into the upper end of the wedge-shaped chamber beneath the grate. Here it will both serve to cool the grate-bars and will also furnish the required draft for the combustion of the fuel. At the same time air-currents are drawn through the upper flue Q and the dust-pit, which currents are discharged into the flue M or directly into the stack and serve to prevent the overheating of the fuel-shelf G and the feed mechanism.

It is obvious that I might dispense with the flue Q and employ the flue P also for cooling the fuel-shelf G, as well as furnishing the cooling-current introduced beneath the grate. The objection to this arrangement would be that as but a limited amount of air should be admitted below the grates the quantity would not be sufficient to secure the proper cooling of both the fuel feed mechanism and the grate-bars. Thus by arranging the flue Q above the flue R and connecting it with the stack or that portion of the furnace above the grate I obtain the cooling of the shelf and feed mechanism and can then use the air from the flue R solely for cooling the grates. A further advantage of the double flue is that it sometimes happens in the use of the furnaces that the fuel-shelf G becomes cracked by the heat, so that the dust sifting in through said crack will clog the upper flue. In such a case the lower flue will be protected and will save the grate from being burned out. The coking-plate can also be more easily and cheaply repaired by this construction.

What I claim as my invention is—

1. In a furnace, the combination with an inclined grate and a fuel-shelf at the upper end of said grate, of a vertical wall beneath said shelf, an air-conduit extending along the top of said wall having a lateral discharge beneath the grate-flanges between said conduit and fuel-shelf forming a support for the latter and an air-conduit between, for the purpose described.

2. In a furnace, the combination with an inclined grate and a fuel-shelf at the upper end of said grate, of a vertical wall beneath said shelf, an air-conduit extending along the top of said wall having a lateral discharge beneath the grate, a depending flange on said fuel-shelf resting on the inner edge of said conduit, and an upwardly-projecting flange on the opposite side of said conduit having a cut-away portion, substantially as and for the purpose described.

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

THOMAS MURPHY.

Witnesses:

JAMES WHITTEMORE,

H. C. SMITH.