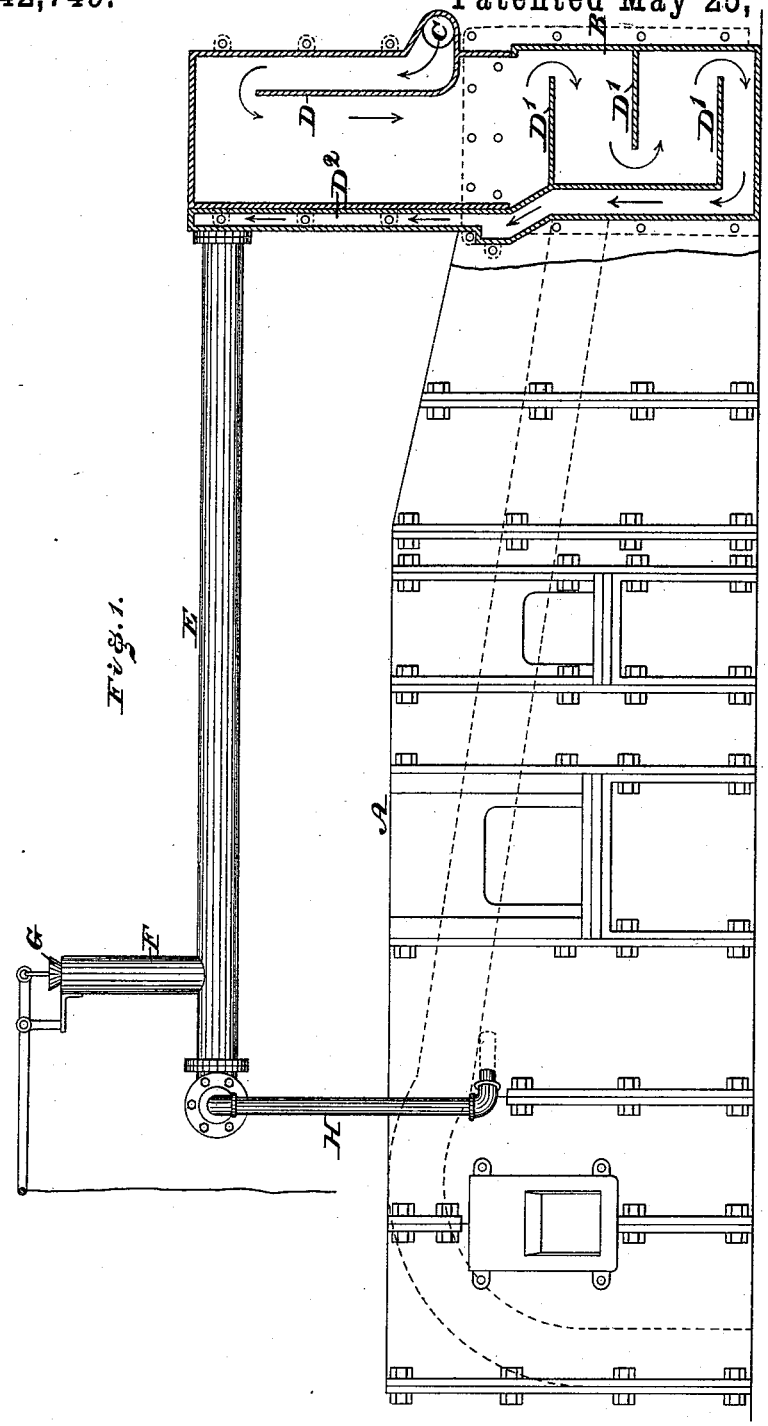
(No Model.) 2 Sheets—Sheet 1.

J. O. HUGHES & J. EYNON.

HEATING AND PUDDLING FURNACE.

No. 342,749. Patented May 25, 1886.



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(No Model.) 2 Sheets—Sheet 2.

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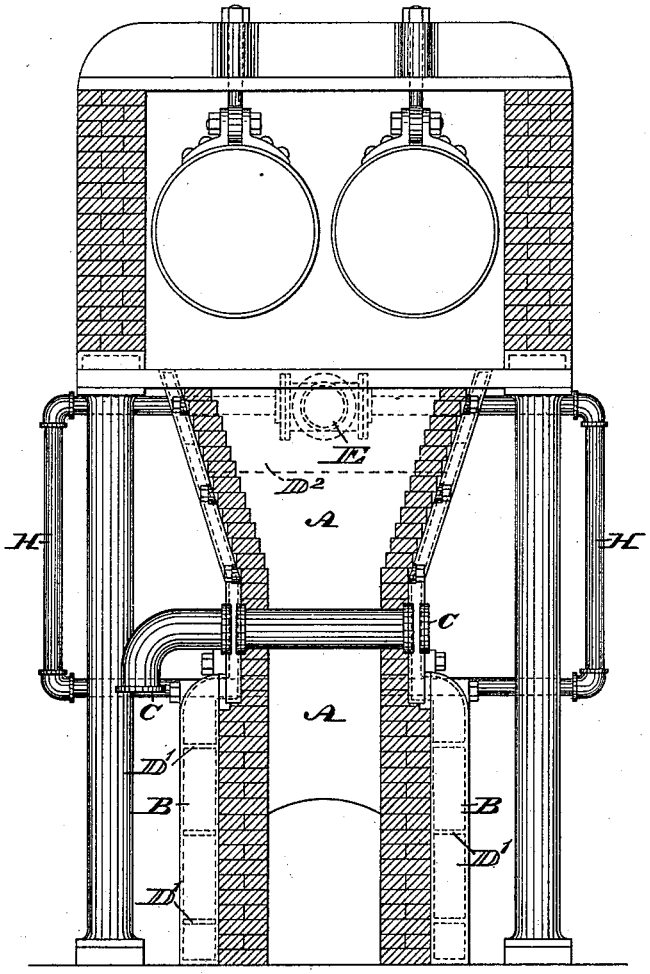
Fig. 2.



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JOHN O. HUGHES AND JAMES EYNON, OF PHILADELPHIA, PENNSYLVANIA.

HEATING AND PUDDLING FURNACE.

SPECIFICATION forming part of Letters Patent No. 342,749, dated May 25, 1886.

Application filed August 13, 1885. Serial No. 174,239. (No model.)

To all whom it may concern:

Be it known that we, JOHN O. HUGHES and JAMES EYNON, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Heating and Puddling Furnaces, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a side elevation of a heating and puddling furnace embodying our invention. Fig. 2 represents a transverse vertical section thereof, showing a battery of boilers located above the furnace.

Similar letters of reference indicate corresponding parts in the two figures.

Our invention consists in the particular construction and combination of parts, hereinafter fully described, for supplying a reverberatory furnace with heated air to aid the combustion, and in utilizing the waste heat of the furnace to elevate the temperature of the air thus supplied.

It further consists in controlling the temperature of the current supplied, as also in the location in the fire-bed of the tuyere or supply-pipe.

It also consists of other details of construction, as will be hereinafter more fully described.

Referring to the drawings, A represents a reverberatory furnace, which, except so far as concerns our invention, is of the well-known construction of puddling and heating furnaces. At the side or end of the furnace, where the waste products of combustion leave the same, or some other suitable part thereof, there is placed on the outer side of the masonry casings, boxes, or air-receivers B, the same being with one of their sides in immediate contact with the masonry or covering thereof, in order to obtain all available heat transmitted through the walls of the furnace. These casings or boxes have an air-inlet, C, and are provided internally with vertical partitions D, horizontal partitions D′, and vertical passages D², the partitions D′ being alternately separated or open at opposite ends of the casing, in order to make the current assume a serpentine or zigzag course through the casing, and thus provide increased heating-surfaces for the air. The vertical partitions D direct the air entering the casing to the top of the same, thus providing an increased heating-surface for the air. The air which has been conducted to the opening or inlet C from a suitable source of supply, either by natural draft or a blast, is directed (see arrows, Fig. 1) to a pipe, E, running longitudinally over the top of the furnace to near the end of the combustion-chamber, said pipe E having a branch, F, on which is a valve, G, opening the pipe to the atmosphere. As the hot air is carried away from the sides or ends of the masonry or covering thereof through the casings B, said masonry is materially cooled and prevented from being rapidly burned out, thus effecting an economy or saving of material for the masonry of the furnace. The pipe E has connected with it at opposite sides the pipes H, which end in tuyeres, and are directed into the furnace preferably between the fuel-opening and first puddling-hole and somewhat nearer the former. It is evident that by these means the furnace is supplied with air at a very high temperature, and thus an immense saving is occasioned in the consumption of fuel.

It will be seen that the temperature of the air in the pipe E may be reduced by opening the valve G, and thereby permitting the discharge of a portion of the heated air therein before it enters the pipe H and the furnaces. In a short time the cold air will also enter the branch F, and by means of the pipe H the furnace.

We are aware that it is not new to use devices in connection with reverberatory furnaces for utilizing the waste heat of the same in heating air fed to the furnace for the purpose of increasing the heat thereof, and such we do not claim.

We are also aware that it is not new to construct a receiver with serpentine passages. Neither is it new to provide the hot-air pipe with a valve, whereby cold air may be let into the tuyeres.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A reverberatory furnace, in combination with the air-receiver B, located substantially as described, and having inlet-pipes C, vertical partitions D, horizontal partitions D′, attached

alternately to opposite sides of the receiver, passage or conduit D^2 in said receiver, leading from the bottom part to the top thereof, the horizontal pipes E, having branch F, with valve G, and pipes H, leading into tuyeres in the furnace, said tuyeres being located between the fuel-opening and the first puddling-opening, all substantially as and for the purpose set forth.

2. A reverberatory furnace, in combination with the air-receiver B, having its side contiguous or adjacent to the furnace, and provided with inlet-pipe C, partition D, the partitions D', attached alternately to opposite sides of the receiver, and vertical passage D^2 in the part of the receiver adjacent to the furnace, and leading from the bottom to the top thereof, substantially as described.

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Witnesses:
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