

E. H. CALLAWAY.

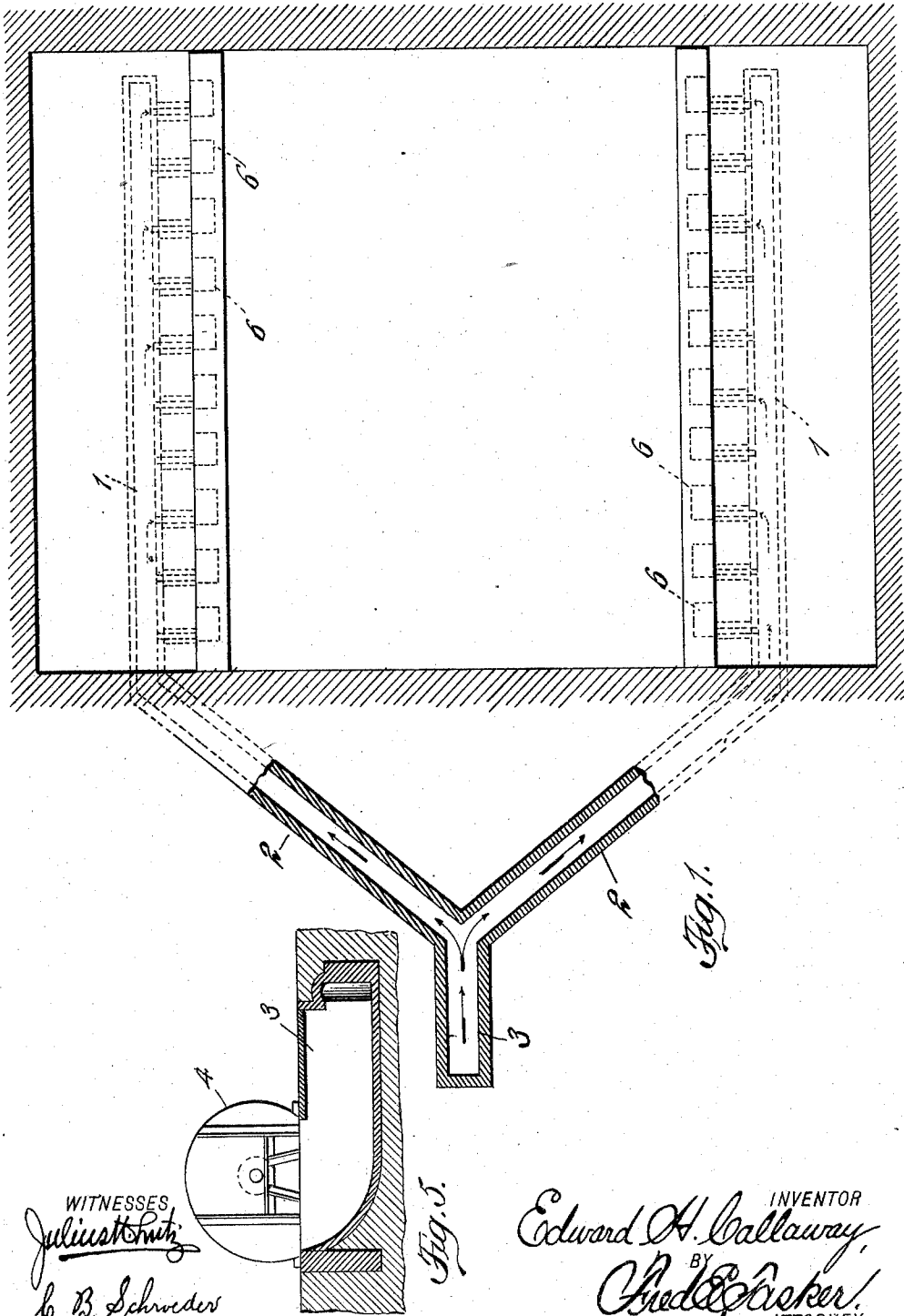
BRICK KILN.

APPLICATION FILED DEC. 17, 1907.

967,608.

Patented Aug. 16, 1910.

3 SHEETS—SHEET 1.



WITNESSES
Julius A. Smith
C. B. Schneider

INVENTOR
Edward H. Callaway
BY
Fred E. Coker
ATTORNEY

E. H. CALLAWAY.

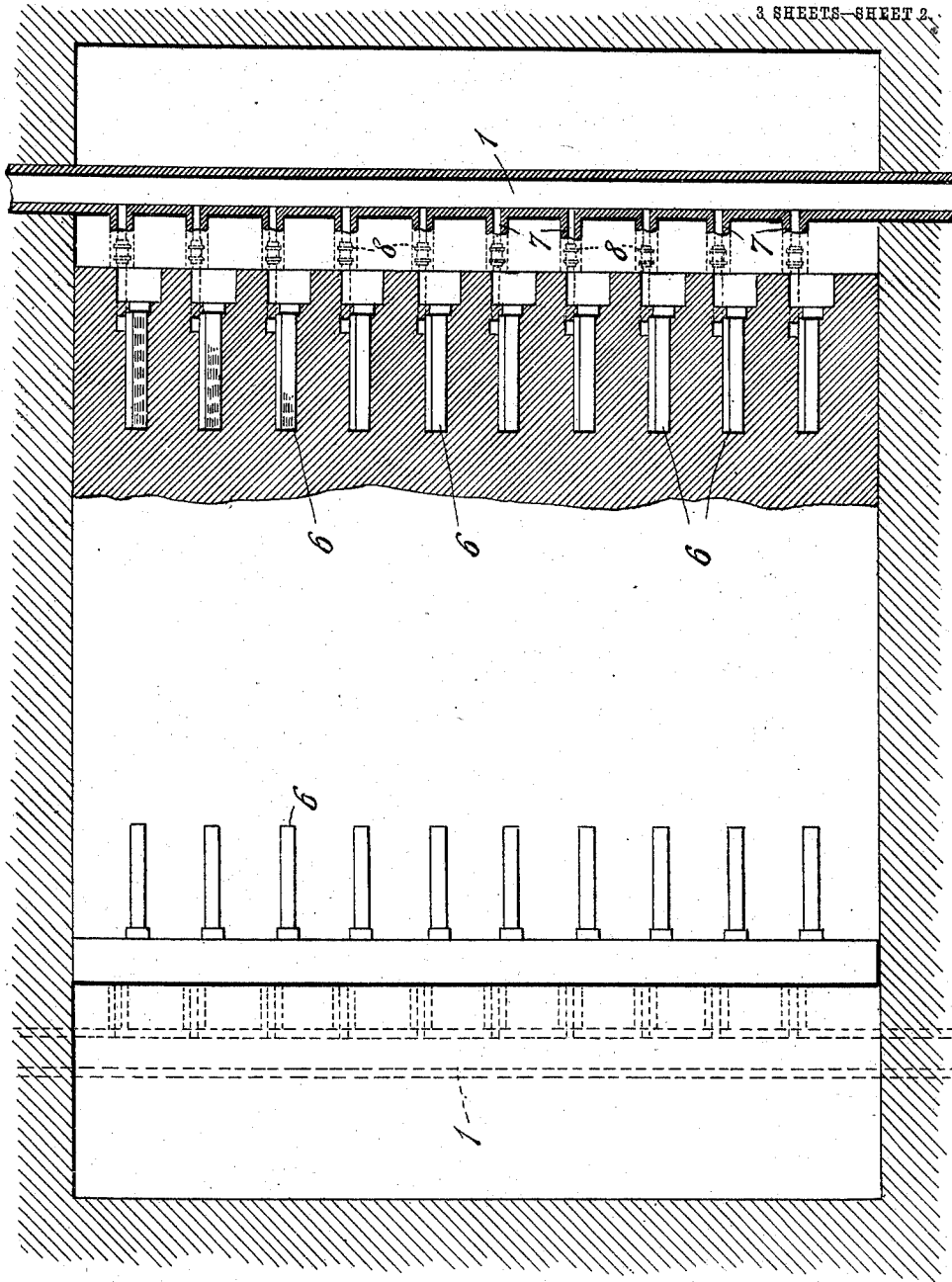
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3 SHEETS-SHEET 2.



WITNESSES
Julius H. Smith
W. B. Schneider

Fig. 2.

INVENTOR
Edward H. Callaway
BY
Frederick C. Foster
ATTORNEY

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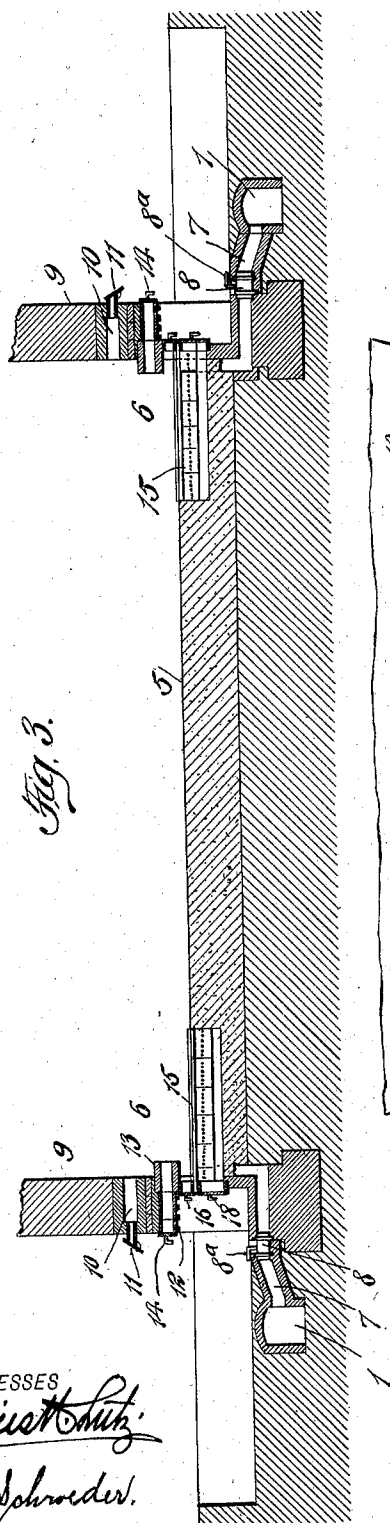


Fig. 3.

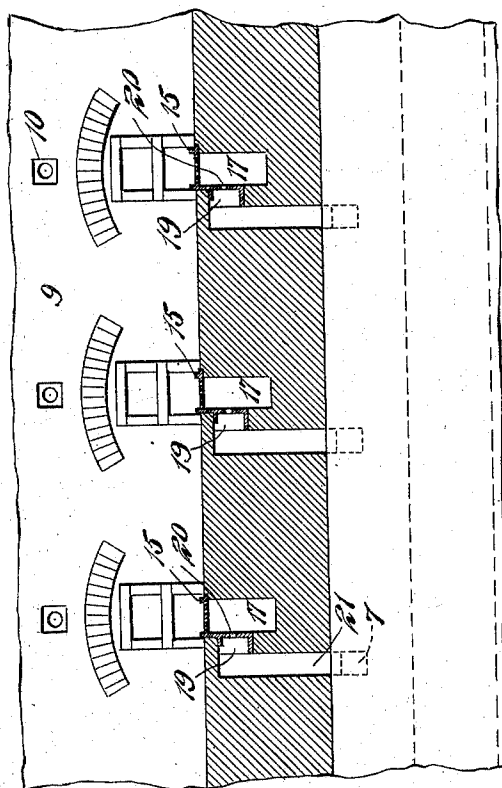


Fig. 4.

WITNESSES
Julius H. Smith
L. B. Schroeder

INVENTOR
Edward H. Callaway
BY
Frederick A. Cooper
ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD H. CALLAWAY, OF WESTFIELD, NEW JERSEY, ASSIGNOR TO THE AMERICAN CLAY MACHINERY COMPANY, OF BUCYRUS, OHIO, A CORPORATION OF OHIO.

BRICK-KILN.

967,608.

Specification of Letters Patent.

Patented Aug. 16, 1910.

Application filed December 17, 1907. Serial No. 406,932.

To all whom it may concern:

Be it known that I, EDWARD H. CALLAWAY, a citizen of the United States of America, and a resident of Westfield, Union county, State of New Jersey, have invented certain new and useful Improvements in Brick-Kilns, of which the following is a specification.

My present invention relates to a brick-kiln having a series of furnaces provided with a forced air blast which is entirely under control and can be supplied to, or cut off from, any one or more of the furnaces, so that the heat in every portion of the kiln may be regulated and the burning of the bricks or other articles made regular and even everywhere at all times.

The object of my improved brick-kiln is to provide a forced air draft for the combustion throughout the different furnaces of the kiln, when the latter consists of a plurality of furnaces, said forced draft being arranged so that the air may be easily and readily cut off at any time from any one or more of the separate furnaces.

The invention, therefore, consists essentially, in a brick-kiln, in means for enabling a supply of air from a fan or other source of draft to be furnished to the furnace and to its various constituent members, the furnace usually consisting of a plurality of similar grates and their appurtenances arranged in one or more series; and the invention also consists in means for absolutely controlling and regulating this air supply and directing it toward or withdrawing it from any desired number of furnaces simultaneously, that is to say, the means enabling one or more of the furnaces to be deprived of the air draft at any time, and thus cut out of the series; and the invention also consists in various details and peculiarities in the construction, combination and arrangement of the various parts, substantially as will be hereinafter described and claimed.

In the accompanying drawing illustrating my invention, Figure 1 is a sectional plan view of my improved brick-kiln, showing two series of furnaces in dotted indications merely, and showing the air supply pipe which carries the air to these furnaces. Fig. 2 is a top plan view of my improved brick-kiln, showing certain parts in section, these relating more particularly to one of the air supplying conduits and the means for de-

livering the air therefrom to the individual furnaces. Fig. 3 is a vertical cross section of my improved brick-kiln. Fig. 4 is a side elevation with the air passages below the grate, shown in section. Fig. 5 is a sectional detail of the end of the air conduit, and shows the arrangement of the fan or blower for generating the air blast at that point.

Similar characters of reference designate corresponding parts throughout the different figures of the drawing.

The type of brick-kiln with which my present invention is concerned is preferably, although not necessarily, the same as that described and claimed in my co-pending application for patent on improvements in brick-kiln furnace, filed May 8, 1907, Serial No. 372,527, since the furnace is built for attaining the best possible results in the way of the production of heat, the controlling of such combustion, economy and ease of supervision, etc. While this is the preferable and most convenient type of furnace, yet it will be understood that I am not rigidly restricted thereto, but am privileged to modify the same if desired.

In carrying my present invention, which consists principally of means for regulating and controlling the air supply to the different furnaces into practical execution, I ordinarily arrange, in conjunction with the kiln structure, two series of furnaces, as 6, said two series being shown in dotted lines and partly in full lines in Figs. 1 and 2, and between these two series is a flooring, or the ground, 5, on which the green bricks to be burned are supported.

Before proceeding to describe the air conduits and the means for generating the supply and controlling its distribution to the different furnaces, I will first briefly describe one of the furnaces, referring to Fig. 3. 9 denotes the permanent wall of the kiln structure on one side, there being a similar wall at the other side, and these walls are of brick, concrete, stone masonry, or other material. Said walls rise to the desired height and are provided with any desired superstructure, which will be of a common form, and need not be set forth in detail here. Arranged in each of these walls is a series of furnaces, designated generally by 6, and in order to secure the best results it is usual to place the furnaces of the one series which are

in one wall opposite to the individual furnaces of the other series located in the other wall, as indicated in Fig. 3, there being between the members on the one side and those on the other side a suitable ground space or flooring, as 5, on which the green brick or other articles to be burned are piled. Above each furnace is a peep hole 10, having a cover 11. In the upper part of the furnace structure is a superheater, consisting of a horizontal fuel box 12, which is suitably supported, and coinciding with this fuel box and projecting a short distance into the kiln, and consequently coming nearer to the green brick which are being burned, is a box of tiling 13. The fuel box 12 has an outside door 14 suitably hinged, through which fuel is introduced into the fuel box 12 and passed through it into the tiling 13, and thence to the grate. I designate this arrangement the superheater, because thereby the fuel is held in such a position relatively to the grate and the fire that the latter will heat the fuel to a high degree, and cause it to become disintegrated and incandescent and ready for instant ignition and combustion the moment it is passed over to the grate. The superheater will be kept filled all the time with fuel, which usually is coal of the proper kind and size. At a proper point inside of the wall 9 on a level with the floor 5 is situated the grate 15, to which access is had through a door 16. Below the grate 15 is the ash pit 17, to which access is had through the door 18 supported immediately below the grate door 16. It will be noted that in the wall 9 below the superheater and in front of the doors 16 and 18 is a recess, the object of which is to enable access to be had more quickly and with greater ease to the surface of the grate and to the ash pit, than would be possible if these doors were placed below door 14 on the outer surface of the wall 9. The grate may consist of a single casting 15, or a plurality of them. Commonly, it consists of several placed together as sections of a complete grate which extends inwardly from the wall 9 toward the furnaces on the other side.

Alongside of the grate is an air duct 19 formed by means of masonry of any suitable kind, or some substantial brick-work, and from this duct air may be easily introduced through the openings 20 to the grate 15 for the purpose of promoting combustion. As I have already said, the ash pit 17 is located below the grate. By referring to Fig. 4, it will be noticed that the ash pit 17 drops to some distance below the air duct 19, thus allowing the discharge of the air from the duct 19 to take place against the fire through the upper part of the space occupied by the ash pit, so that the ashes in falling pass down below the air draft, and hence there is no interference with said

draft when the door 18 is opened for the purpose of removing ashes.

The horizontal longitudinal air passage 19, which supplies with air all the sections 15 of each grate, said air passing as already explained through the openings 20, see Fig. 4, connects at one end with a vertical duct 21 which leads downwardly to a point below the ash pit door 18, and at its lower end connects with another horizontal, or substantially horizontal, duct 7, (said duct instead of pursuing a horizontal direction throughout may run through bends or inclinations, as may be desired). This horizontal duct 7 has therein a controlling valve 8, operated by some suitable handle 8^a. Said valve may be constructed in any desired manner. The form shown and described in my co-pending application for Letters Patent, filed April 15, 1907, Serial No. 368,260, is a desirable form, and one which shows great efficiency in practical use; but I do not desire to be restricted to the use of that particular form, inasmuch as my invention is broad enough to include the use of any kind of a valve found workable for the purpose. All the various valve-provided ducts 7, belonging to the furnaces of each series, lead into the main duct 1. One of these main ducts is situated at each side of the kiln, as shown in Figs. 1, 2 and 3. In Fig. 3, one of the ducts 1 is shown in horizontal section, together with the connections therewith of the several furnace ducts 7, and in this figure it is clearly shown where and how the air valves 8 are located for operation in supplying and cutting off air to the furnaces individually. In Fig. 1, I illustrate in a general way the arrangement of the two main ducts at the two sides of the furnace.

At one end of the kiln structure, as shown in Fig. 1, the two lateral main ducts 1, which I have just described, connect with the inclined ducts 2, which are of a similar construction and which run toward each other, and finally connect both with a duct 3 in connection with which is arranged some suitable means for generating an air blast. Fig. 5 illustrates in detail one form of means for this purpose, the same consisting of a fan or blower 4. This is arranged in connection with the duct 3, so that the blast generated thereby will be delivered directly into the duct 3, whence it passes in both directions, as shown by the arrows, into and along the inclined ducts 2, and thence into and along the lateral main ducts 1, the far ends of which are closed so that after the fan has been effectively in operation for a while, there will be a strong air pressure within the ducts, and this pressure can, by means of the valves 8, be supplied at will to as many of the furnaces 6 as may be desired. Thus it will be seen that the combus-

tion of the fuel in each of the furnaces of the kiln is absolutely under the control of the attendant at all times, and he can cut in or cut out any one or more of the furnaces at will. Thus the operation of burning the bricks or other articles in the different furnaces is satisfactorily controlled, in order to bring about the best results.

By having a series of furnaces on each side of the central surface on which the green bricks are placed for burning, and by having all these furnaces supplied with a forced air blast, together with controlling means for letting this blast into or cutting it off from any one or more of the furnaces, the attendant who is called the burner is able to so regulate the temperature throughout the kiln so that it will be even and regular at every point. By looking through the peep holes of the different furnaces, he can witness the operation of burning and see whether it has progressed properly at each point. In case he finds that it is burning too fast at some places, he can diminish or cut off the supply of heat by cutting out the draft at those points; and in case at other places he finds that the burning is not going on fast enough, or is unsatisfactory for any other reason, he may let more draft into the furnaces at that point, and thus increase the combustion. In this way, the temperature throughout the entire kiln can be kept equal and uniform, so that there will be no unevenness about the burning, and more excellent results can be attained than has been possible heretofore. A single attendant by having an apparatus of the kind I have described, controllable at so many different points by means of valves, can oversee the work in all parts of the furnace, and it is unnecessary usually to have a number of attendants, for one man can look after a large number of furnaces.

It will be understood, of course, that in my present invention I have devised a new and efficient way of supplying an air draft to a multiple furnace, in such a manner that the combustion of each furnace may be readily and easily controlled by means which will apply the air pressure to, or divert it from, the furnaces individually, and in so carrying out a broad idea of this kind it will be found in practice that the specific details of construction both in the furnaces and in the air-carrying and air-delivering means, and also in the cut off mechanism, may vary within very wide limits; and I therefore reserve the liberty of re-arranging, modifying and changing the structural features as widely as may be thought desirable in the exigency of actual practice, and I am by no means to be restricted to the precise embodiment herein set forth and described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

A brick-kiln structure having permanent side walls, a series of furnaces with grated ash pits located within said structure, fuel superheaters for the furnaces extending through the side walls and arranged to deliver fuel upon the furnace grates, and doors closing the openings through which access is had to the grates and the ash pits below the grates, the side walls of the structure being recessed below the superheaters and the said openings to the grates and ash pits being through the said recessed parts of the walls.

Signed at New York city, this 2nd day of December, 1907.

EDWARD H. CALLAWAY.

Witnesses:

JOHN H. HAZELTON,
C. B. SCHROEDER.