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METHOD OF CONTROLLING COMBUSTION IN FURNACES.

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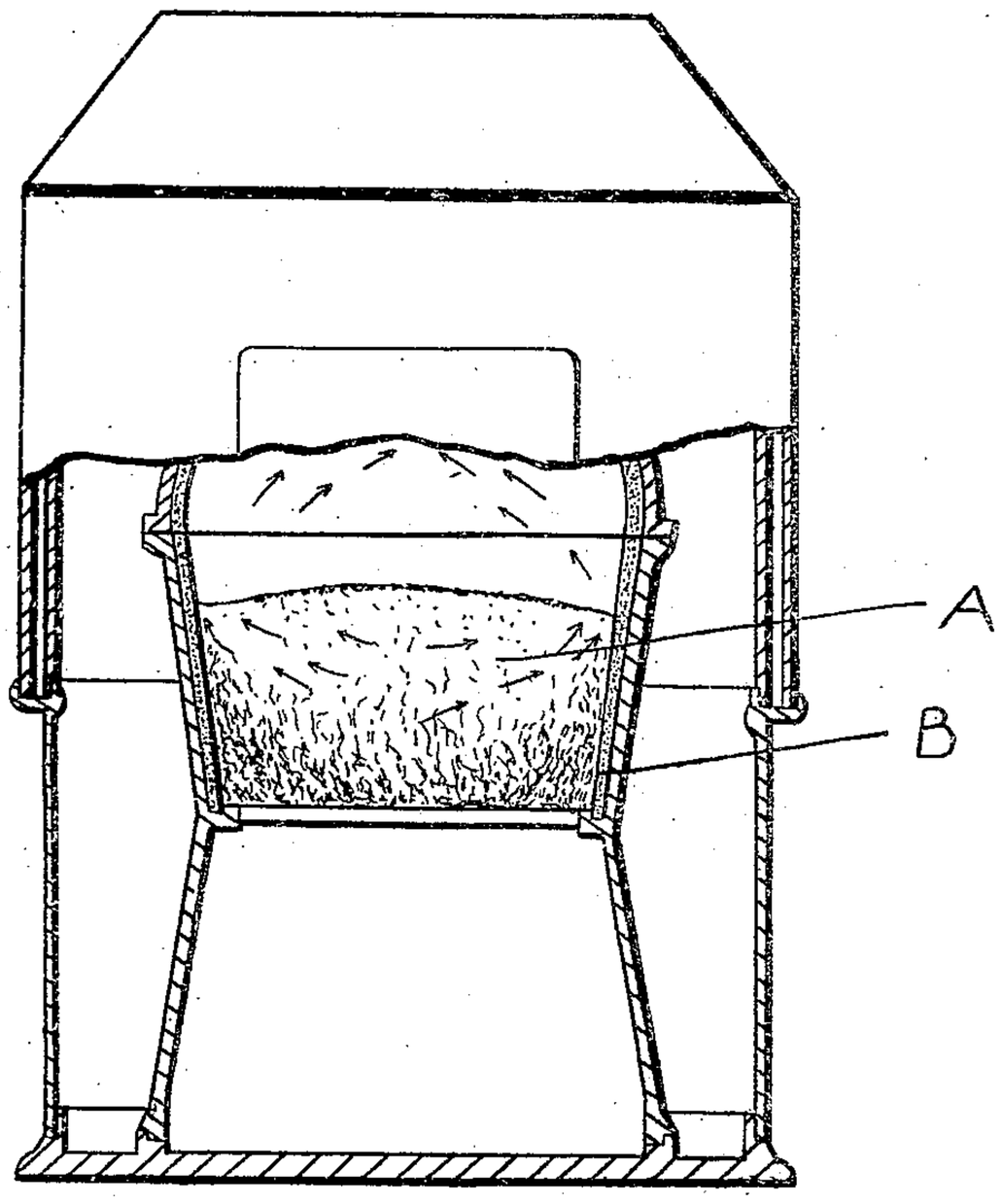


WITNESSES:
L. Wheeler.
L. E. Boyce

INVENTOR:
G. Bruce;
By Fred. B. Fitherstonhaugh.
Atty.

# UNITED STATES PATENT OFFICE.

GEORGE BRUCE, OF TORONTO, ONTARIO, CANADA.

## METHOD OF CONTROLLING COMBUSTION IN FURNACES.

945,443. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed June 9, 1909. Serial No. 501,000.

*To all whom it may concern:*

Be it known that I, GEORGE BRUCE, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, clergyman, have invented certain new and useful Improvements in the Method of Controlling Combustion in Furnaces, of which the following is the specification.

My invention relates to improvements in the method of controlling combustion in furnaces, and the object of the invention is to devise a simple method, whereby the consumption of coal may be controlled by stimulating, directing and conserving the products of combustion including smoke, gases and calorific values, and utilizing them to the greatest advantage in the fire chamber or pot where most required, and thus not only effect a great saving of fuel, but also always conserve and keep the fire clear.

A further object is to eliminate the production of cinders, or in other words insure of the spent coal being reduced to ashes.

A still further object is to reduce to a minimum the amount of attention necessary to any one looking after the furnace.

My invention consists of producing a deflecting blanket on the top of the fire bed, so as to leave an annular space around the fire at a slight distance from the wall thereof as hereinafter more particularly explained.

The drawing represents a sectional view of a furnace illustrating my method.

My method consists in mixing muriate of potash or other combustible chemical capable of leaving an ash, with water in the proportion of about a good handful of the chemical to an ordinary pail of water, and pouring this on anthracite screenings, which are sufficient in quantity, so that the screenings are converted into a damp mass. This is shoveled on to the top of the fire bed from the central portion of the fire bed A to a point within a distance from the wall B of the fire pot, leaving a substantially annular space around next the wall B over which the mixture does not extend. The depth of the mixture is preferably made about one inch or thereabout. This covering of the mixture forms a thin coat or veil and being of a combustible character is consumed somewhat rapidly owing to the presence of the chemical. As a result an ash held in solution in the chemical is disposed on the central layer of the fuel. This deposit as combustion proceeds forms an ash blanket or veil, which though light is sufficient to discourage, check and deflect the incipient flames from the fuel from their natural course directly upwardly toward the flue or chimney into a laterally extending course underneath the veil and toward the edge of the fire pot. The ash left by the chemical is incombustible once the anthracite screenings are consumed, and such ash veil remains in position as long as the fire or fuel is undisturbed and this control over the course of the flame is continuous and is exerted quietly and effectually, if necessary, for hours.

It will be readily understood that the course indicated of the products of combustion around the open space or annulus surrounding the ash veil is such as will effectually utilize to the greatest advantage the products of combustion, so as to heat the air outside of the wall of the fire pot or water, if there be water, instead of letting such heat go straight up the chimney as is frequently the case by the method in which fuel is now directed and controlled. Formerly the incandescent body of the fuel was in the center of the fire pot and the ash and half consumed coal were next the wall forming a good non-conductor and eliminating to a great extent the calorific value of the fuel, especially as a great deal of the heat would pass from the center of the incandescent bed straight up to the top of the fire pot. In my invention, however, as the ash veil is light and practically incandescent the central body of coal covered by it is not smothered or deadened, but kept intensely hot and at the same time the waste of consumption of fuel by act of combustion is reduced to a minimum. The combustion around the wall of the fire pot being more incandescent is more rapid and the fuel is consequently consumed more quickly than it is at the center under the ash, which is left standing as a cone clear and vital as at the beginning of a new fire. I also find in practice that all cinders are practically eliminated by my method of directing and controlling combustion, the coal being entirely consumed on account of the veil. The importance of the veil can not be over estimated as it will preserve the fire in an incandescent state for many hours, so that the greatest heat possible may be obtained

from the same instead of going up the chimney and this with a minimum amount of attention as compared with that now required.

What I claim as my invention is:

1. The method herein described of controlling fire of furnaces consisting in covering the major portion of the top of the fire bed in such a manner as to leave an uncovered portion next the fire pot, with a layer or veil comprising a combustible base and a chemical in solution having ash producing qualities under combustion, the said ingredients being mixed together to form a moist mass as and for the purpose specified.

2. The method herein described of controlling fires of furnaces consisting in covering the major portion of the top of the fire bed in such a manner as to leave an uncovered portion next the fire pot, with a layer or veil comprising anthracite screenings and a chemical in solution having ash producing qualities under combustion, the said ingredients being mixed together to form a moist mass as and for the purpose specified.

GEORGE BRUCE.

Witnesses:
R. COBAIN,
D. E. CRAIGIE.