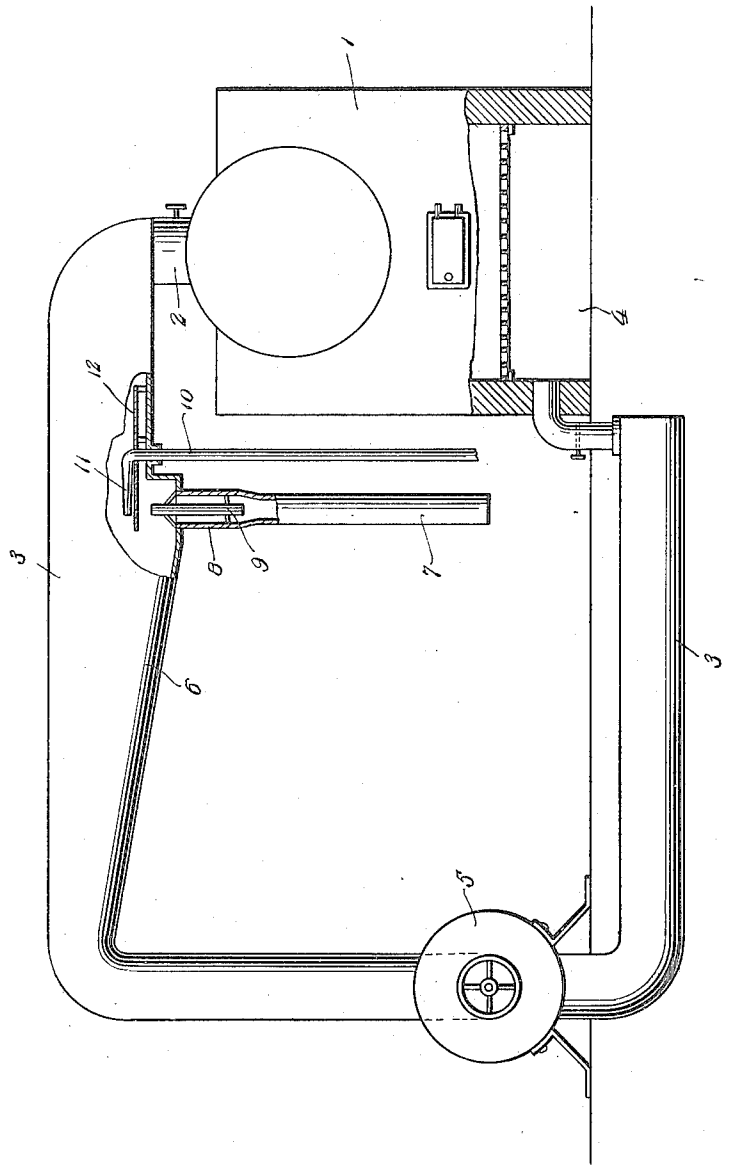
J. M. NYE.

SMOKE AND GAS RETURNING MEANS.

APPLICATION FILED JUNE 2, 1914.

1,135,913. Patented Apr. 13, 1915.



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UNITED STATES PATENT OFFICE.

JAMES MONTFORD NYE, OF KANSAS CITY, KANSAS.

SMOKE AND GAS RETURNING MEANS.

1,135,913. Specification of Letters Patent. Patented Apr. 13, 1915.

Application filed June 2, 1914. Serial No. 842,429.

To all whom it may concern:

Be it known that I, JAMES M. NYE, a citizen of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented new and useful Improvements in Smoke and Gas Returning Means, of which the following is a specification.

The present invention has relation to furnaces which are designed for generating steam for operating engines and has for its object to obtain a maximum percentage of heat units from a given amount of fuel and also to prevent the giving off of free carbon in the shape of dense smoke which is objectionable for many reasons, besides representing a loss of fuel.

The invention utilizes the smoke and gases emanating from a furnace and generally going to waste, such smoke and gases being returned to the furnace to be consumed and in the travel from the stack to the furnace the smoke and gases are subjected to a separating process by means of which carbon dioxid is eliminated and carried off to a point of discharge.

The invention consists of a flue whereby communication is established between the stack and the ash pit of the furnace, means for creating a positive draft through such flue whereby the smoke and gases are caused to positively travel therethrough, means for introducing a spray into the flue, a trap for collecting the water and other residue including carbon dioxid and means connected with the trap for carrying off the waste accumulation, such means consisting of a vacuum device, which is actuated by the water collecting in the trap.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth as shown in the accompanying drawing, which is a diagrammatic view of a furnace provided with means for returning the smoke and gases for consumption, such means illustrating an embodiment of the invention.

The numeral 1 designates a furnace which may be of any construction or design and 2 is the stack connected therewith for receiving the smoke, gases and other products of combustion. A flue 3 connects with the stack 2 and with the ash pit 4 of the furnace, the receiving end of the flue being large and the delivery end contracted. A device is located in the length of the flue 3 for creating a positive draft therethrough, whereby the smoke and products of combustion are drawn from the stack 2 and delivered to the ash pit 4. For this purpose a fan blower 5 is illustrated. A portion of the flue is depressed as indicated at 6 to form a trap. The depressed portion 6 is inclined to the horizontal and as a result the matter accumulating in such trap tends toward the deepest point at which is located a vacuum device for carrying off the waste products which are unsuitable to be returned to the furnace for consumption. A pipe 7 connects with the lowest point of the depression or trap 6 and carries off the waste products to a suitable point of discharge. The upper portion of the pipe is enlarged as indicated at 8 and within this enlarged portion is located a tube 9 which projects above the pipe 7 so as to receive the carbon dioxid which forms the lowermost strata of the smoke and gaseous products passing through the flue 3. A pipe 10 terminates in a nozzle 11 and connects with a pump or other means for supplying water under a pressure of about fifteen to twenty pounds. The water is delivered into the flue 3 in a spray and serves to purify the smoke and products of combustion and the water accumulating in the trap 6 passes off through the pipe 7 and creates a suction in the tube 9 whereby the carbon dioxid is separated from the gases and caused to pass off with the waste water to the point of discharge, the smoke and other gases passing through the flue 3 into the ash pit 4, thence through the bed of fuel to be consumed.

A plate 12 is arranged in the receiving end portion of the flue 3 and is located in a plane above the trap formed by the depression 6, such plate having its rear portion overhanging the trap. The plate 12 is spaced from the bottom of the flue 3 so as to provide a passage for the carbon dioxid which separates from the products of combustion. The plate 12 may be properly designated as a separator, since it divides the lighter products from the heavier.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the

invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the invention as claimed.

Having thus described the invention, what is claimed as new is:—

The combination with a furnace embodying a combustion chamber, stack, and ash pit, of means for returning smoke and other products of combustion to the furnace, comprising a flue having a portion thereof depressed to form a trap, means in the length of the flue for creating a positive draft therethrough, a spray pipe for injecting water into the flue, a downwardly extending water outlet pipe connected with the lowest part of the trap, a tube located in the upper part of said pipe and extending vertically upward above the top of said pipe to receive the carbon dioxid which is carried off with the water through said pipe, and a horizontal separator plate arranged within the flue and having a portion thereof overhanging the trap and interposed between the discharge end of the spray pipe and the receiving ends of said tube and water outlet pipe for dividing the carbon dioxid from the lighter products.

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

JAMES MONTFORD NYE.

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