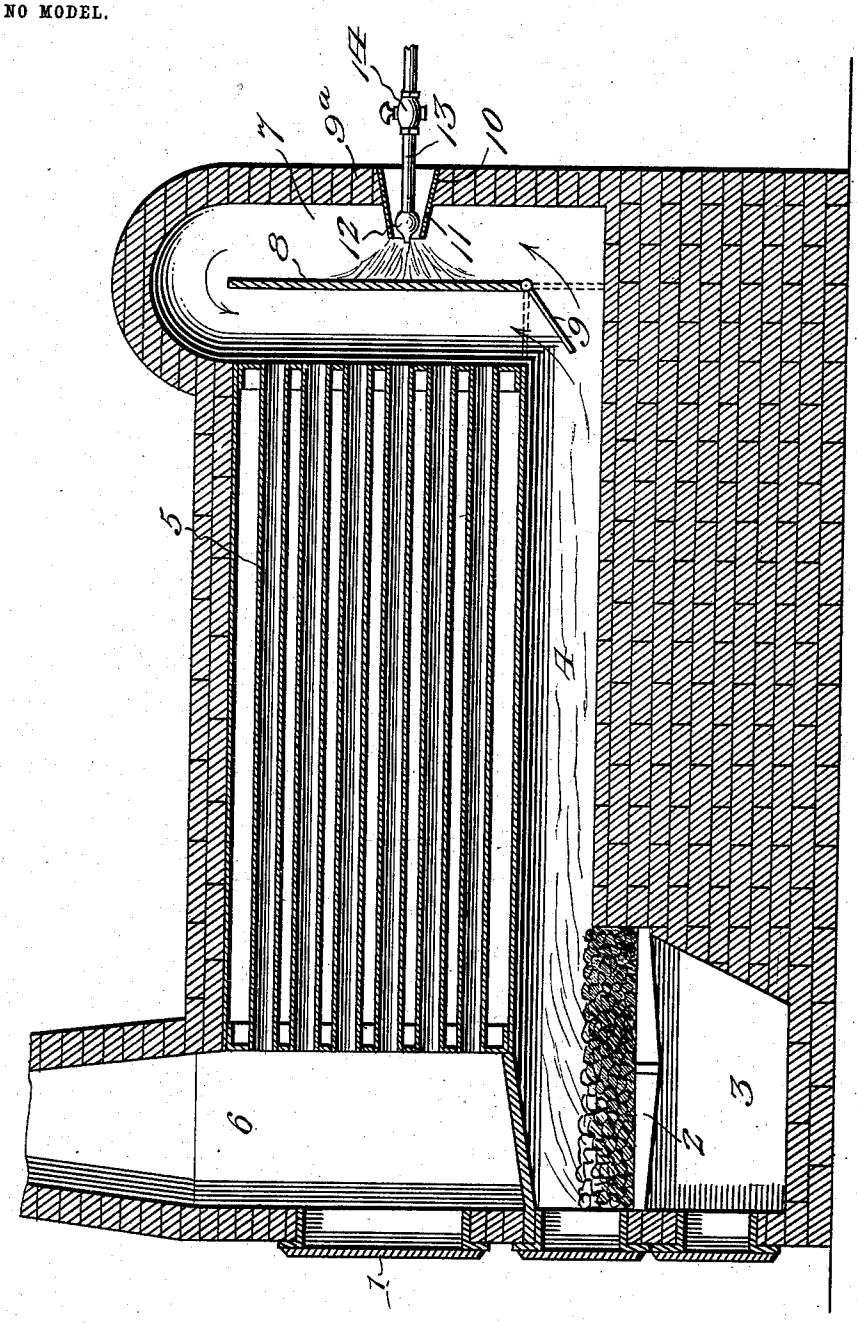
No. 749,586. PATENTED JAN. 12, 1904.

R. SIMMS.

SMOKE CONSUMING MEANS.

APPLICATION FILED MAY 23, 1903.

NO MODEL.



WITNESSES:

Edwin F. McKee

Chas. S. Hoyer.

INVENTOR

Rudolph Simms

BY

Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 749,586. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

RUDOLPH SIMMS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO BERNHARD F. SCHUBERT, OF WASHINGTON, DISTRICT OF COLUMBIA.

SMOKE-CONSUMING MEANS.

SPECIFICATION forming part of Letters Patent No. 749,586, dated January 12, 1904.

Application filed May 23, 1903. Serial No. 158,518. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH SIMMS, a citizen of the United States, residing at Washington, District of Columbia, have invented new and useful Improvements in Smoke-Consuming Means, of which the following is a specification.

This invention relates to a smoke-consuming means for use in connection with furnaces employed in operative relation to steam-boilers coöperating in conjunction with engines of locomotive, stationary, or marine types. The improved smoke-consuming means is located in such position in the furnace that the unconsumed gas escaping from the fuel of the main furnace will be completely consumed and economize in the use of fuel, as well as prevent the formation of smoke, and create a more perfect rate of combustion to increase the heating efficiency of the furnace.

The improved smoke-consuming means is comparatively inexpensive in its structure and application and can be readily applied to furnaces now in use with comparatively little reorganization of the parts of the same and operates to perform its intended function in connection with soft coal, tar, pitch, resin or any other kind of fuel.

The invention, broadly stated, consists of an auxiliary combustion-chamber located adjacent one set of terminals of the flues, but at a distance therefrom, and a crude-oil or other burner projected in a plane at an angle into said chamber in relation to a vertically-disposed guard or baffle, with a damper movably attached to its lower extremity to control the course of the smoke and products of combustion from the main furnace.

The invention further consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

The drawing illustrates a vertical longitudinal section of a furnace, showing smoke-consuming means disposed therein and embodying the features of the invention.

The numeral 1 designates a furnace of any preferred type having the usual grate 2, ash-pit 3, and combustion-chamber 4, which serves also as a means of conveying the smoke in the present instance to the rear of the furnace for return through flue-tubes 5 and communicating at their forward ends with a stack 6. The furnace may also be provided with such other appurtenances as are ordinarily employed in furnace construction, and it will be understood that the form of furnace shown is not at all essential to the practical operation of the smoke-consuming means, which will be more fully described hereinafter. It is proposed to apply the smoke-consuming means forming the gist of this invention to any furnace to which they may be applicable, and for the purpose of practical demonstration a furnace is illustrated having the smoke-stack located at the front end thereof, directly over the grate.

In the rear part of the furnace, as shown, an auxiliary combustion-chamber 7 is constructed and extends vertically, the lower end of said chamber being adapted to communicate with the chamber 4. Centrally disposed within the chamber 7 is a guard or baffle plate 8, which is located at a distance from the rear ends of the flues 5, and to the lower end thereof a damper 9 is pivotally attached and is of such length as to contact with the lower wall of the chamber 7 and the chamber 4 communicating therewith or the rear flue-tube sheet, to thereby permit the smoke or products of combustion and draft to be established between the guard or baffle plate 8 and the rear end of the flue-tubes or cause said products of combustion to pass between the guard or baffle plate and the rear wall of the chamber 7. In the rear wall 9^a of the chamber 7 an opening 10 of inwardly-contracting contour is formed, and therein a conical thimble or shield 11 is mounted and has its reduced extremity projected into said chamber 7. Centrally located in the reduced extremity of this thimble or shield 11 is a crude-oil burner 12 of any preferred form, to which a feed-pipe 13 is secured and runs to any suitable source of supply, and to regulate the flow of oil therethrough a valve 14 is interposed in the said pipe. The reduced end of the burner 12 projects in-

wardly beyond the inner terminal of the thimble or shield 11, and the latter is large enough to permit the insertion of an igniting device, or in some instances the oil will be ignited by the flame that may pass rearwardly into the chamber 7 from the main furnace or bed of burning fuel on the grate 2.

In the operation of the smoke-consuming means the oil is permitted to pass through the pipe 13 to the burner, the damper 9 having first been turned into horizontal position, as shown in dotted lines. The oil flowing from the burner 12 becomes ignited or is manually ignited from the rear of the furnace, and the flame shoots over against the guard or baffle 8. The products of combustion and unconsumed gases entering the chamber 7 behind the guard or baffle 8 come into contact with the flame and are consumed, and what residuum may escape over the upper edge of the guard or baffle 8 and pass through the flue-tubes 5 into the stack 6 will be colorless. Practical use of the smoke-consuming means has demonstrated that the consumption of the gases in rear of the guard or baffle 8 is absolute and that only heat currents pass out through the flue-tubes 5 into the smoke-stack 6, thereby materially increasing the heating capacity of the furnace and economizing in the use of fuel. The draft of the furnace is not in the least impaired by the application of the smoke-consuming means set forth, and at times when it may be undesirable under certain conditions to use the smoke-consuming means the damper 9 will be disposed in vertical position, so that the products of combustion of the main furnace will pass directly through the flue-tubes into the stack.

It is proposed to form the guard or baffle 8 of some suitable refractory or hard material, and in connection with the burner 12 any of the well-known forms of blast means or injectors may be used. It is also proposed to vary the proportions, dimensions, and minor details of the several parts to accommodate different applications of the smoke-consuming means without departing from the spirit of the invention.

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

1. A furnace having a grate, combustion-chamber, flue-tubes, and a stack, combined with an auxiliary combustion-chamber arranged adjacent one set of terminals of the flue-tubes, a baffle vertically disposed in the said auxiliary combustion-chamber, and a burner arranged to direct its flame against the baffle to consume the gases passing into the auxiliary combustion-chamber.

2. The combination with a furnace having flue-tubes and escape-stack, of an auxiliary combustion-chamber communicating with the main combustion-chamber, a baffle disposed in said auxiliary combustion-chamber adjacent to one set of terminals of the flue-tube and at a distance from the latter, and a flame, means coöperating with the said baffle in the auxiliary chamber to consume the gases passing into the latter.

3. The combination with a furnace having flue-tubes and an escape-passage, of an auxiliary chamber communicating with the main combustion-chamber, a baffle disposed in said auxiliary chamber and having a damper movably attached to one end thereof to create two passages in relation to the flue-tubes, and a flame-producing means projecting into the auxiliary chamber and coöperating with the baffle.

4. The combination with a furnace, of an auxiliary combustion-chamber having a baffle extending lengthwise thereof and forming two passages therein, a damper hinged to one end of the baffle to control the open or closed condition of either of said passages, and a flame-producing means projecting in a plane at an angle in relation to and coöperating with the said baffle.

5. The combination with a furnace having flue-tubes and an escape, of an auxiliary combustion-chamber with which one set of terminals of the flue-tubes communicates, a baffle extending partially through the said auxiliary chamber at a distance from the terminals of the flue-tubes and forming two passages, and a flame-producing means projecting into one of the passages and coöperating with the baffle.

6. The combination with a furnace having flue-tubes and an escape, of an auxiliary combustion-chamber with which one set of the terminals of the flue-tubes communicates, a baffle extending partially through the auxiliary chamber and forming two passages in the latter, means at one end of the baffle for controlling communication of either of the passages with the main combustion-chamber of the furnace, a conical shield extending through the wall of the furnace into one of the passages and having its reduced extremity projected toward the baffle, and a burner located in said shield and provided with fuel-supply means.

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

RUDOLPH SIMMS.

Witnesses:
B. F. SCHUBERT,
IDA S. KURTZ.