(No Model.)

L. HALLBAUER.

SMOKE CONSUMING APPARATUS.

No. 523,035. Patented July 17, 1894.

Fig. 1.

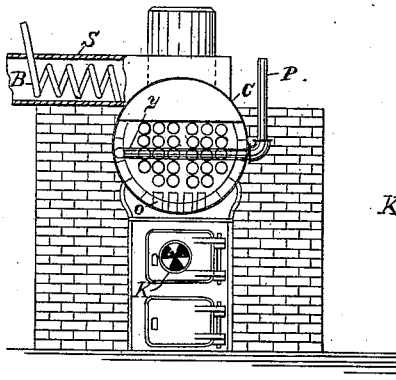
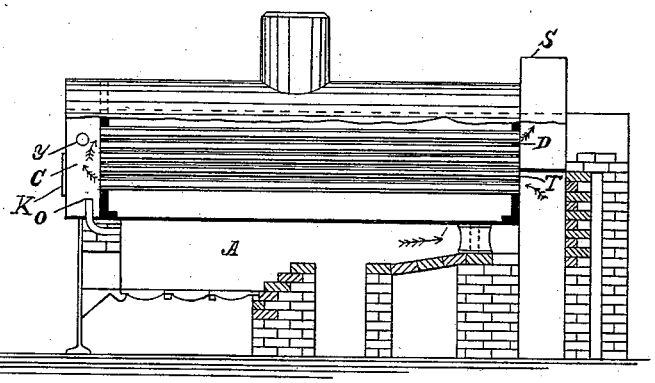


Fig. 2.



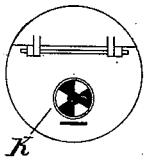
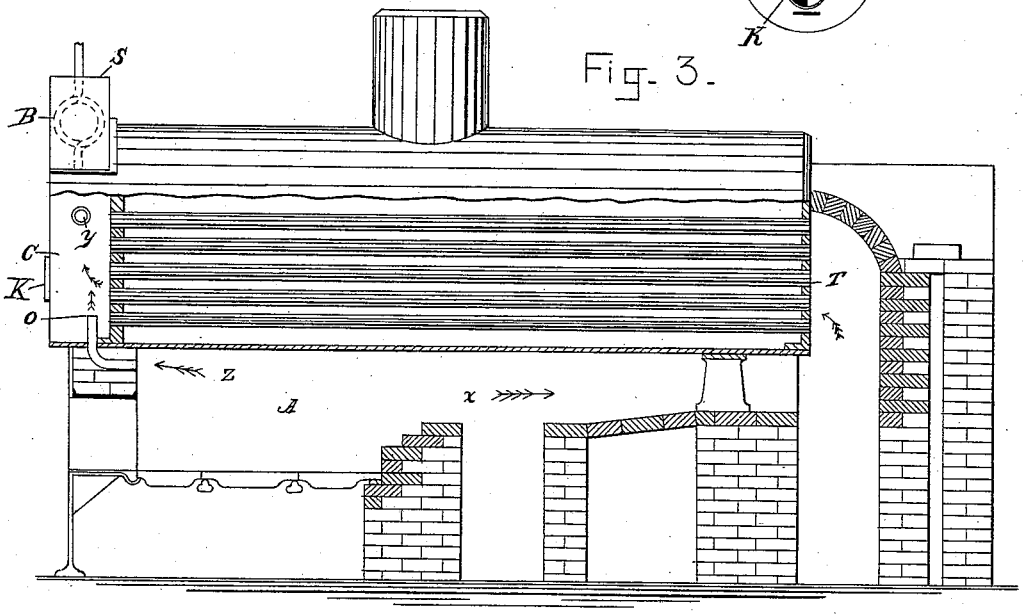


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

LOUIS HALLBAUER, OF MERIDEN, CONNECTICUT.

SMOKE-CONSUMING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 523,035, dated July 17, 1894.

Application filed September 29, 1893. Serial No. 486,762. (No model.)

To all whom it may concern:

Be it known that I, LOUIS HALLBAUER, a citizen of the United States, and a resident of Meriden, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Apparatus for Consuming Smoke and Combustible Gases, of which the following is a specification.

My invention relates, generally, to apparatus of the above class, and more particularly to those forms thereof used in connection with steam boiler furnaces.

My invention consists of an auxiliary combustion chamber, receiving the gaseous products of combustion from the flues which supply draft to the original combustion chamber; a device for igniting the inflammable portion of said products in said auxiliary chamber, and a device for admitting air thereto, to support combustion therein.

My invention further consists of the devices, and combinations of devices, hereinafter more specifically set forth and claimed.

The object of my invention is to provide a device that will consume a larger portion of the heretofore unconsumed parts of the fuel, and will utilize heat generated during such consumption, for useful purposes.

The accompanying drawings illustrate a device, embodying my invention as applied to two forms of steam boiler, viz: to a boiler with double return drafts and a boiler with triple return drafts.

Figure 1 is a front view of boiler furnace, double return drafts, with sections cut out to show application of my invention thereto. Fig. 2 is a side view of boiler furnace, triple return drafts, with sections cut away for the same purpose. Fig. 3 is a side view of boiler furnace, double return drafts, with sections cut away for same purpose. Fig. 4 is a detached view of front of boiler, showing device for admission of air.

Similar letters of reference refer to similar parts throughout the several views.

The accompanying drawings are given as convenient illustrations only, as my invention can be used with other forms of boiler, and in other kinds of furnace, having analogous devices for producing and disposing of products of combustion.

Reference being had to the drawings, A represents the chamber in which the original combustion of the fuel occurs, or is continued, including, in constructions shown, the chamber or chambers back of the bridge wall commonly called combustion chambers, whose function is to promote the more complete combustion of gases ignited in the fire box or chamber in which fuel is placed. The term original combustion chamber, as herein used, may be said, generally, to include, in other forms of furnace, those chambers or parts whose function is similar.

T represents the tubes or flues which supply draft to the original combustion chamber, and carry the heated products of combustion through the boiler, which, in forms of boiler with triple return drafts (Fig. 2), are returned through the boiler by a series of flues or tubes D.

C represents the auxiliary combustion chamber, the function of which is hereinafter set forth, and which is placed in the position shown in the drawings, for convenience in utilizing the heat generated therein, but which, with slight modifications, can be placed in other positions, and substantially the same results secured. The chamber C is connected with chamber A through the flues T.

O represents a series of shorter tubes or flues, running as directly as practical from the chamber C to the chamber A, for the purpose hereinafter set forth.

At *y*, is shown a gas jet or series of jets, supplied by the pipe P from any convenient source.

K is a device for the admission of air to the chamber C, which, as shown, is the common form of rotary damper, for which it is evident that any other suitable device may be substituted, the form or arrangement of same forming no essential feature of my invention.

The reference letter B represents a feed water heating device, placed in the smoke stack S, which may consist of a coiled pipe, as shown, or other convenient device, by which a similar result may be secured.

The functions of the several parts above described, may be conveniently explained by describing the operation of my invention, which is as follows: The smoke and gaseous products of combustion, generated in the original combustion chamber A, are carried by

the draft in the direction of the arrow heads *x* into the tubes or flues T, in which the combustion thereof ceases, and a quantity of smoke and combustible gas passes unignited into the auxiliary combustion chamber C. The smoke and gas thus reaching the chamber C, are ignited either by the gas jets *y* (or other convenient device for introducing ignited or highly heated substance into chamber C), or by highly heated products of combustion drawn from chamber A through flues O, as indicated by arrow heads *z*. As hereinbefore stated, the flues O lead as directly as practical from chamber C to A, and the products of combustion drawn through the same from chamber A, upon entering chamber C, are still sufficiently heated to ignite therein the smoke and gas entering same from the flues or tubes T. Air sufficient to support combustion, is admitted to the chamber C by means of the device K, which as hereinbefore stated, may be any convenient device by which such result is accomplished. The heat generated in chamber C may be conveniently utilized directly in the boiler, or in heating the feed water which supplies the boiler.

In a boiler with triple return drafts, the heated products of combustion generated in chamber C, are returned through the boiler by the tubes D, and the heat thereof utilized to a great extent in boiler, though a feed water heating device may be used with good results.

In regard to a feed water heating device, the general operation of such device being well known in the art, it is simply necessary to add that it is placed in a convenient position to receive heat from chamber C.

The combustion of the smoke and gas in chamber C, produces another result, to wit, an increase in the draft.

If the amount of air admitted through K is properly regulated, the combustion occurring in chamber C causes a partial vacuum therein, and the rush of air and gas from chamber A, tending to destroy the same, greatly increases the draft through tubes or flues T.

Having thus described my invention and its operation, I will further add that I am aware of the state of the art as shown in the following Letters Patent, and claim nothing shown therein: English patent, No. 1,328, of 1873; Myers, No. 60,229, December 4, 1866; Coryell, No. 326,631, September 22, 1885; English patent, No. 11,260, of 1846; Simonin, No. 205,979, July 16, 1878.

I claim, however, as novel and desire to secure by Letters Patent—

1. The combination with a steam boiler, original combustion chamber, and flues for supplying draft to same, of an auxiliary combustion chamber, connected through said flues with the original combustion chamber, a device for admitting air to said auxiliary chamber, and shorter flues connecting said chambers; substantially as described, and for the purposes specified.

2. The combination with a steam boiler, having the flues T and D, and the original combustion chamber A, of the auxiliary combustion chamber C, adapted to receive the smoke and gases from chamber A, after the same have passed into the flues T, and before the same have entered flues D; a device for admission of air to chamber C, to support combustion therein, and a device for igniting in said chamber C said smoke and combustible gases; all substantially as set forth, and for the purposes specified.

3. The combination with a steam boiler, having the flues T, a feed water heating device B, and an original combustion chamber A, of the auxiliary combustion chamber C, adapted to receive smoke and combustible gases from chamber A after the same have entered flues T and in which the feed water heater is located, and a device for igniting, in said chamber C, said smoke and combustible gases; substantially as described, and for the purposes specified.

In witness whereof I have hereunto set my hand, in the presence of two subscribing witnesses, this 28th day of August, 1893.

LOUIS HALLBAUER.

Witnesses:
FRANK. J. O'NEIL,
RICHARD GLEESON.