April 26, 1938. B. D. BRUNO 2,115,614

BOILER CONSTRUCTION

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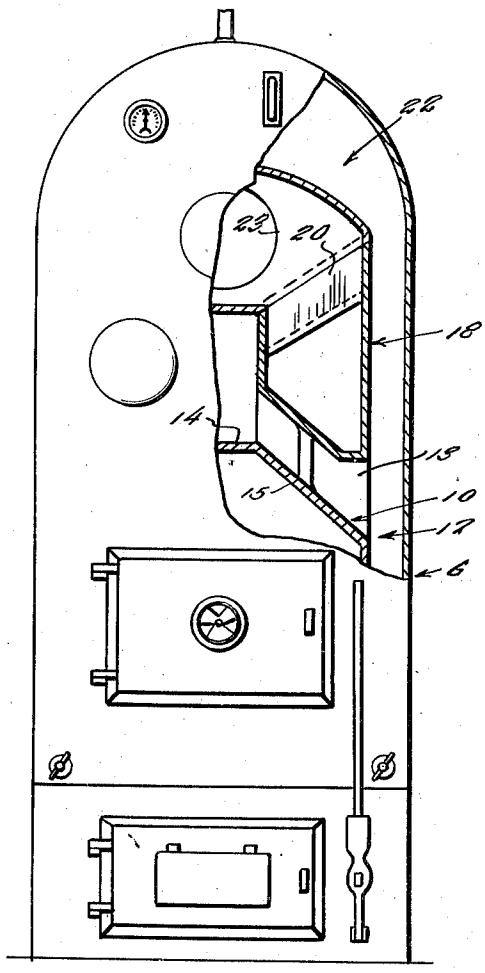


Fig. 1.

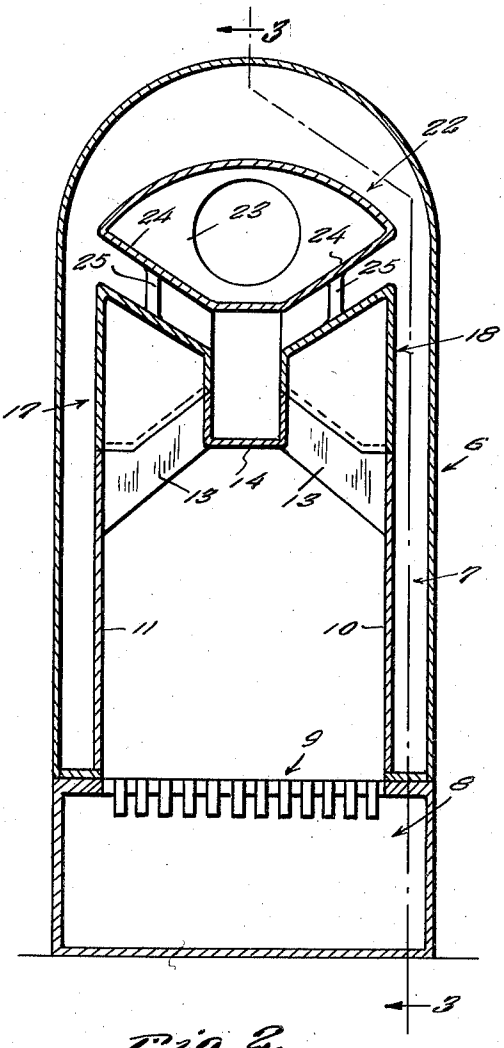


Fig. 2.

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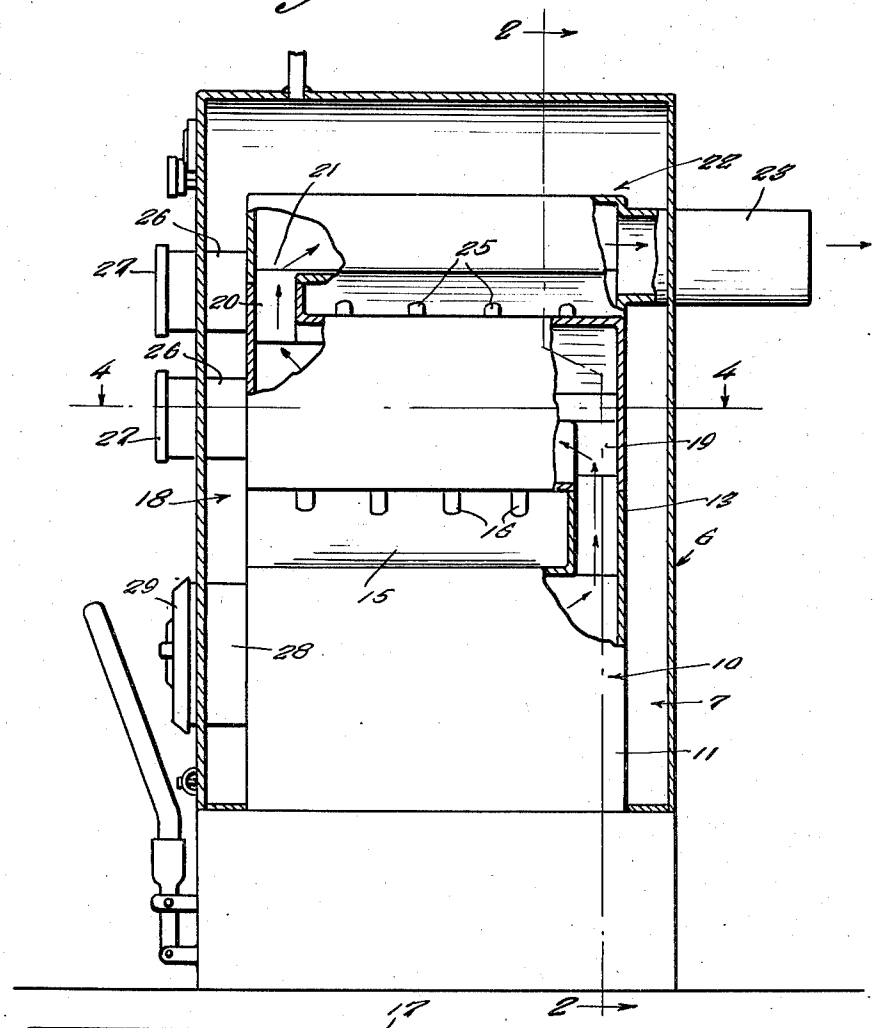
Attorneys

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BOILER CONSTRUCTION

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Fig. 3.



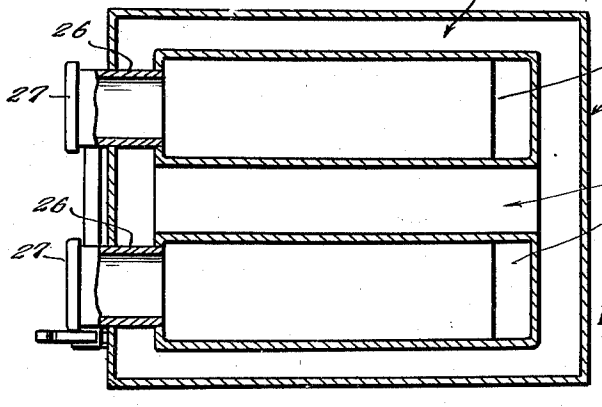


Fig. 4.

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BOILER CONSTRUCTION

Filed March 13, 1937 3 Sheets-Sheet 3

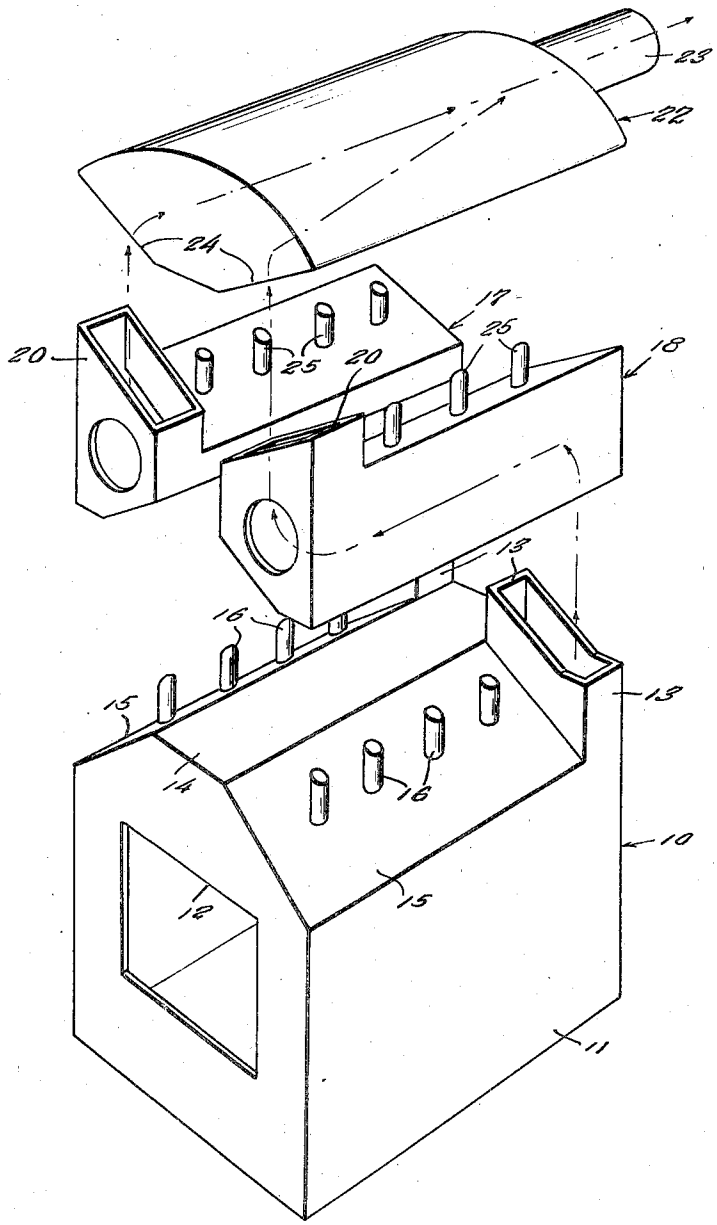


Fig. 5.

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UNITED STATES PATENT OFFICE

2,115,614

BOILER CONSTRUCTION

Basilio D. Bruno, La Salle, Ill.

Application March 13, 1937, Serial No. 130,764

3 Claims. (Cl. 122—135)

This invention relates to an improved stationary domestic-type boiler construction, and the general object of the invention is to so form the parts through which the products of combustion pass that practically all gases are burned before reaching the stack which prevents black smoke from pouring from the stack and the maximum amount of heat of the products of combustion will be used in heating the water of the boiler and the arrangement enables the conduit to be easily cleaned though very little cleaning is necessary.

Other features and advantages will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a front view of a boiler equipped with the internal means constructed in accordance with the principles of my invention, the front of the boiler being broken away and shown in section to disclose a part of the internal structure.

Figure 2 is a vertical section taken on the plane of the irregular line 2—2 of Figure 3.

Figure 3 is a section on the irregular line 3—3 of Figure 2.

Figure 4 is a horizontal section on the line 4—4 of Figure 3.

Figure 5 is an assembly "exploded" perspective view of the four sections which go to make up the internal structure of the boiler.

In the drawings the outer shell or casing of the boiler is denoted by the numeral 6 and may be of any appropriate construction so as to properly house the improved internal structure which is contained or housed within the shell and spaced therefrom so as to define a water space 7. The ash box is indicated at 8 and the grate is indicated by the numeral 9.

As before implied, the invention itself is composed of four distinct companion sections. The primary or fire box section comprises a box-like hood denoted by the numeral 10. It includes a substantially rectangular inclosure 11 having its bottom open and located above the grate and provided in its front wall with a fuel opening 12 and provided at its rear with upstanding discharge ducts or connections 13 through which the products of combustion escape from the box. It will, of course, be understood that when coal, wood or the like is used as fuel, such fuel is placed on the grate and burns in the box 10 but when oil or the like is used as fuel the grate is removed and a burner for such fuel is placed in the ash pit and flames from the burning fuel will enter the box 10. The crown portion of the box is substantially flat as at 14 and the sides of the roof 15 slant outwardly and downwardly. On these I provide a plurality of upstanding bracing and supporting studs 16, to support the superposed spaced intake manifold units or sections 17 and 18. The manifolds 17 and 18 are disposed in spaced parallelism and are located above the inclined portion 15 of the roof of the box or hood. The rear ends thereof are provided with intake passages or ports 19 registering with the ducts 13. The front ends of the manifolds are provided with upstanding tube-like ducts 20 having matching alignment or registry with intake openings 21 in the front end of the exhaust manifold 22. The exhaust manifold is a single body formation or casting, is longitudinally elongated and substantially segmental in cross-sectional form. At the rear end thereof is the discharge connection 23 which is connected to the smoke stack (not shown). The inclined under surfaces of this segmental unit 22 indicated by the numerals 24 rest on the auxiliary studs or pins 25 carried by the upper walls of the manifolds 17 and 18. The sections or manifolds 17 and 18 are substantially trapezoidal in cross-sectional form, are of the same length as the hood 10, and match in length the overlying exhaust manifold 22. All of the parts are welded or otherwise joined together to provide fluid-tight connections and to allow the water to circulate between the respective features 10, 17, 18, and 22. The numerals 26 designate suitable clean-out pipes with appropriate closing caps 27. A passage forming member 28 leads from the front end of the fire box 10 and communicates with the opening 12 and with an opening in the front of the shell, the front opening being closed by a door 29 so that by opening this door coal, wood or other fuel can be placed in the fire box to rest upon the grate 9.

The invention constitutes an ideal insert for domestic or home heating type boiler. It is an all-steel welded construction and prevents black smoke from pouring into the smoke-stack. It subjects the products of combustion from the fire box to a tortuous circulation such as is needed to bring about the requisite retardation of the products of combustion so that the maximum amount of heat from such products will be imparted to the surrounding water and practically all the gases of an inflammable nature will be consumed before reaching the smoke stack. The arrows in Figure 5 show the path taken by the products of combustion from the fire box to the outlet 23 which is connected with the stack.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

1. In an assemblage of the class described, an open bottom hood having a top including a flat central portion and inclined side portions, a plurality of uprights carried by said inclined portions, said hood being provided at its rear end with upstanding discharge ducts, a pair of spaced parallel individual manifolds connected at their rear ends with said ducts, said manifolds having discharge ducts at their front ends, said manifolds resting on said uprights and themselves being provided with additional supporting uprights, and an exhaust manifold resting on said additional uprights and disposed in parallelism above said intake manifolds, the intake manifolds having their front ducts connected to the front end of said exhaust manifold.

2. A furnace of the class described comprising an outer casing, an ash pit structure on which the casing is seated, a fire box casing located in and spaced from the first casing and having its bottom open and communicating with the ash pit, passage forming means passing through the first casing and communicating with the fire box casing, a door for closing said means, said fire box casing having its top formed with a flat longitudinally extending central portion and sloping portions extending downwardly and outwardly from the central portion, upstanding duct forming members at the rear ends of the sloping portions, a pair of spaced manifolds having their rear ends in communication with the duct forming members, each manifold having an upwardly and inwardly sloping bottom part paralleling and spaced from a sloping part of the fire box casing and each manifold having a top part sloping downwardly and inwardly, upstanding duct forming members at the front ends of said manifolds, an outlet manifold having its front end connected with and in communication with the duct forming members of the manifolds, said outlet manifold having its bottom formed with a central longitudinal extending flat part and upwardly and outwardly sloping parts extending from the flat part, the sloping parts being spaced from and paralleling the sloping upper parts of the two spaced manifolds, the flat part of the bottom of the outlet manifold being located above the flat central portion of the top of the fire box casing, and an outlet pipe connected with the rear end of the outlet manifold and adapted to be connected to a chimney.

3. A furnace of the class described comprising a casing for the fluid to be heated, a firebox in the lower portion of the casing and spaced therefrom, a pair of horizontally arranged manifolds located above and spaced from the firebox and spaced apart, upright duct forming members connecting the ends of the manifolds with the rear end of the top portion of the firebox, an outlet manifold located above and spaced from the manifolds, upright duct forming members connecting the upper portions of the front ends of the first-mentioned manifolds with the front end of the outlet manifold, all of said duct forming members being of much less cross sectional shape than the cross sectional shape of all the manifolds and a discharge conduit forming member connected with the rear end of the outlet manifold.

BASILIO D. BRUNO.