July 15, 1952 R. B. DICKSON ET AL 2,603,209

SMOKEBOX FOR HEATING APPARATUS

Filed Jan. 5, 1949 2 SHEETS—SHEET 1

Fig. 1.

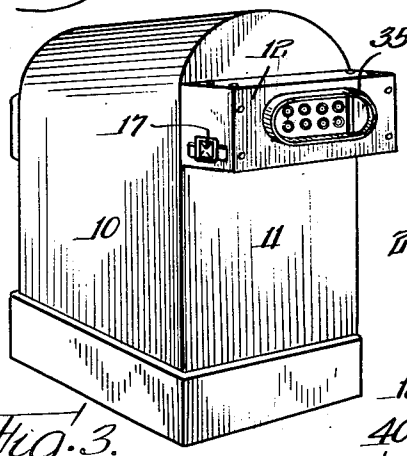


Fig. 2.

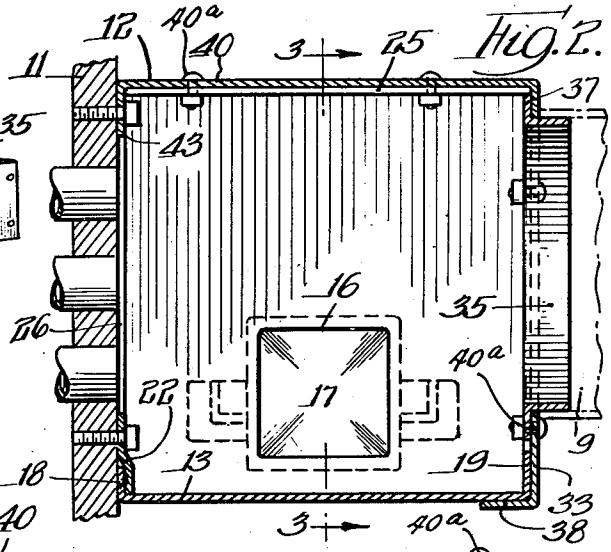


Fig. 3.

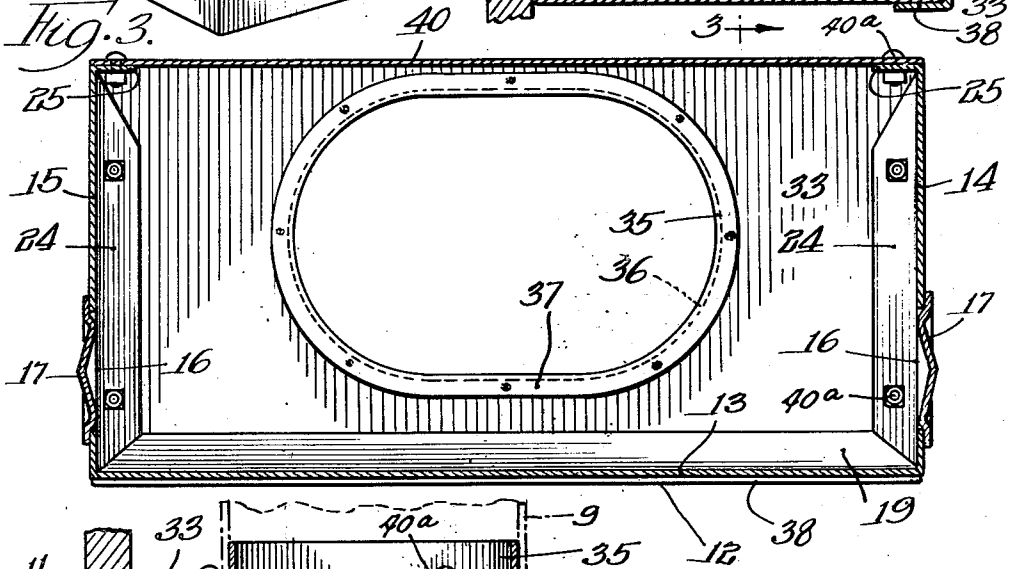
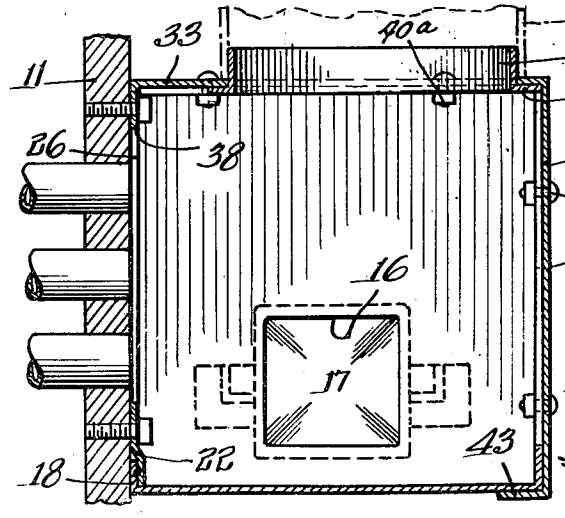


Fig. 4.



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SMOKEBOX FOR HEATING APPARATUS

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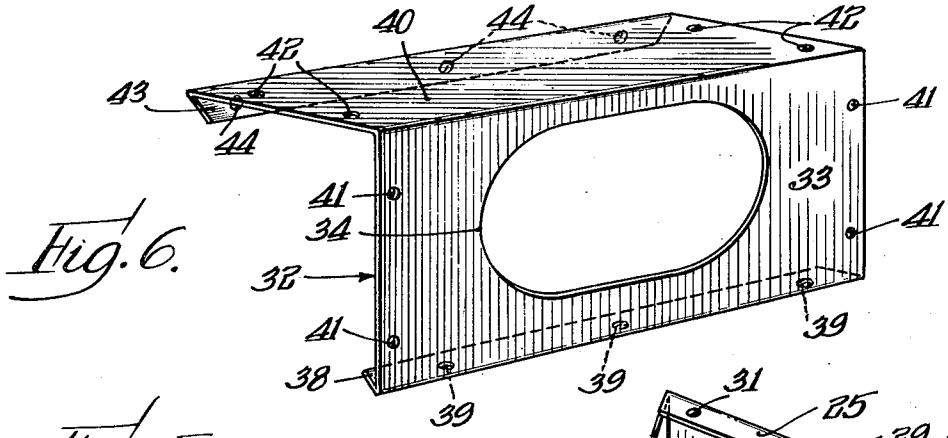


Fig. 6.

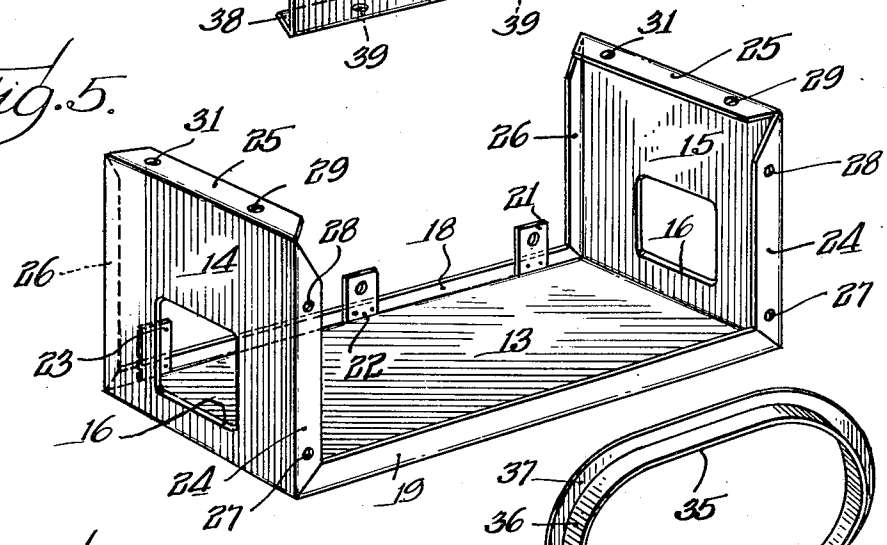


Fig. 5.

Fig. 8.

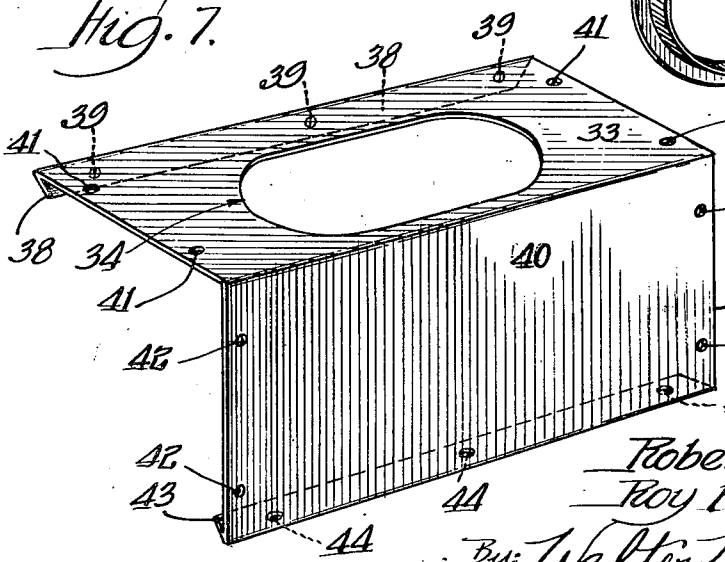


Fig. 7.

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SMOKEBOX FOR HEATING APPARATUS

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9 Claims. (Cl. 126—307)

1

A boiler smokebox, as its name indicates, is a box-like steel or comparable enclosure or housing attached to the boiler proper for the purpose of collecting or assembling smoke and gases from the boiler, and directing them, by means of a suitable sheet-metal or other appropriate conduit or flue, generally referred to as a breeching, to a stack or chimney for the discharge or delivery therefrom to the atmosphere. Such breeching may be attached or connected to the smokebox in either a horizontal or a vertical position depending on the requirements of the particular installation, and since these demands or needs vary greatly it becomes of substantial importance that the smokebox have provision for readily making either a horizontal or a vertical connection therewith without necessity for the use of special tools or particular training.

The present invention efficiently meets such requirement in that by the innovatory structure and mode of operation of the smokebox incorporating the instant invention, the specified problem was adequately solved.

The new box is relatively simple in construction, is comparatively inexpensive to build, is unlikely to become damaged or injured in assembling its parts together, is of long life, is reasonably safe from injury or damage during ordinary service, etc.

The assembled box is preferably made up of three parts aside from means fastening such elements or members together.

One of these members or parts constitutes the bottom and the two opposite end-walls of the smokebox, another or companion member constitutes the top and back of the box, such companion member having an opening therethrugh which receives the third member or part which is flanged and known as a smoke neck. It is to such neck that the breeching is actually applied, such smoke neck being of such size and shape that the flattened end of a stock piece of smoke pipe or breeching will readily slip over its flange.

In order that those acquainted with this art may readily understand the present invention, and its structural and functional advantages, a present preferred embodiment of such invention has been illustrated in the accompanying drawings, forming a part of this specification, and described below in detail whereby any one having a knowledge of this art will readily appreciate the advantages of its novel structure.

In such drawings:

Figure 1 presents a perspective view of a boiler whose rear wall has one of the new smokeboxes mounted thereon, the breeching connection of such smokebox to the stack or chimney not being shown;

2

Figure 2 illustrates a vertical cross-section through the smokebox portraying the manner of mounting it on the boiler;

Figure 3 is a vertical section through such box on line 3—3 of Figure 2 as viewed in the direction indicated by the arrows;

Figure 4 is a fragmentary vertical section of the boiler and through the smokebox similar to Fig. 2, but with the outlet construction at the top of the box instead of the back thereof;

Figure 5 depicts the sheet-metal member of the smokebox constituting its internal bottom and opposite end walls;

Figure 6 portrays the other member of the box comprising its top and back perforated wall;

Figure 7 illustrates the same sheet-metal member as shown in Figure 6 presented as used to have the smokebox top as discharging the smoke and gases through it; and

Figure 8 presents in perspective the smoke-neck which is to be mounted in the discharge opening which occupies one of the two walls illustrated.

Referring to Figure 1 of the drawings, the boiler 10 has the novel smokebox 12 embodying the current invention suitably mounted on its rear-wall 11 in position to receive through its front the smoke and gases from the interior of the boiler, and to discharge them from the interior of the smokebox through the opening in its back-wall.

The bent, sheet-metal, integral member or first unit, designated as a whole 13, of the smokebox illustrated in Figure 5, by itself alone, is made from a flat blank and then bent to form a plane rectangular bottom and flat, vertical, substantially square end-walls 14, 15, of like size with cleanout openings 16, 16 normally closed by manually removable covers 17, 17 (Figure 3).

The bottom of such first unit is equipped with full length front and rear upstanding flanges 18 and 19, respectively, the front narrow flange 18 having welded thereto three apertured mounting clips 21, 22, 23, employed to accommodate stud-bolts extending through the holes of such clips and registering holes in the wall of the boiler to fasten the box thereto.

Each end-wall 14 and 15 has three inturned, bevelled-end, integral flanges, these comprising a back flange 24 with two spaced apertures 27 and 28 therethrough, a top flange 25 with like separated apertures 29 and 31 and a somewhat

narrower unapertured flange 26. The flanges 26, 26 and 18 are in the same vertical front plane and flanges 24, 24 and 19 are in the same vertical back plane. The other or companion or complementary main sheet-metal member or second unit 32 of the smokebox is of angle form, shown separate from the other parts in Figures 6 and 7, and has an apertured rectangular wall 33 with an oval opening or perforation 34 therethrough of the shape depicted in said Figures 6 and 7. In the opening 34 is snugly fitted the third part or member which is the smokebox-neck designated as a whole 35 (Figure 8) having a neck part 36 of the same shape and external size as the opening 34 and having a flange 37 extending from the part 36 and bearing against the inner face of wall 33 and spot-welded thereto. The neck part 36 projects sufficiently beyond the wall 33 for the easy application thereto of an outlet flue or breeching connection 9, as shown in dotted lines in Figures 2 and 4. The margin of the wall 33 parallel to the angle edge has an inturned bevelled-end flange 38 fitted with three apertures 39 (Figures 2, 6 and 7), whereas each of the two end portions of wall 33 and fitted with a pair of apertures 41, 41, each pair being spaced apart the same distance as apertures 27 from 28, and 29 from 31.

The wall 40 integral with the wall 33 and of the same rectangular size as wall 33, and which is at a right-angle to such wall 33, has at each of its two ends a pair of apertures 42, 42 therethrough, each pair being spaced apart the same distance as the apertures 27 from 28, and 29 from 31. The longitudinal edge of wall 40 parallel its angle edge has an inturned flange 43 (Fig. 6) at right-angles to the sheet 40 and provided with bevelled-ends, such flange having three apertures 44 spaced like those, 39, of the other flange 38.

Assuming that the smoke and gases are to be delivered horizontally from the smokebox, the second unit member 32 (Figure 6) is applied to the first unit member 13 (Figure 5) with the smokebox-neck aperture positioned as shown in Figure 6, and the two parts or members are held together by eight bolts 40*a* extended through the sixteen apertures 27, 28, 29, 31, 41 and 42 with the flange 38 below the bottom of member 13, as depicted in Figure 2.

When the two elements 32 and 13 are thus fastened together, the smokebox which previously had the smokebox-neck fastened in place in the aperture 34 is mounted on the back of the boiler by bolts through the apertures of clips 21, 22 and 23 and through the apertures 44 of flange 43, as presented in Figure 2.

Of course, to complete the contruction the breeching is thereafter applied to the neck 35.

In case the breeching is to be connected vertically to the smokebox then the element 32 is joined to the member 13 in a different manner, namely, in the position shown in Fig. 7, with the apertured wall 33 of the second unit 32 at the top and with the unapertured wall 40 at the back, and in that case the bolts occupying holes 27 and 28 also occupy the four holes 42, of wall 40 which is then disposed vertically instead of horizontally, and those bolts filling holes 29 and 31 also occupy the four holes 41, and the finished appliance in section assumes the appearance portrayed in Figure 4.

Under these circumstances, the apertured clips 21, 22 and 23 and the three holes 39 of flange 38 are employed by means of bolts to fasten the

smokebox to the boiler, the smokebox-neck 35 having at any suitable time previously been fitted and secured in aperture 34.

Whereas various details of construction have been presented in the drawings and set forth in the above description, it is to be understood that various modifications may be resorted to without departure from the heart and essence of the invention as presented in the following claims and without the loss or sacrifice of any of its material or substantial benefits and advantages.

We claim:

1. A sheet-metal smokebox having an open front adapted to be mounted at the outlet of a heating apparatus combustion chamber to receive its smoke and gases, said smokebox including the combination of an integral, bent sheet-metal first unit with a flat rectangular bottom-wall with opposite, upright, substantially square, aligned, end-walls of the same size each with integral, inwardly directed, marginal, top and back apertured flanges, a second, companion, integral, bent sheet-metal unit with one flat wall perforated for the discharge of smoke and gases therethrough, said perforated wall being of substantially the same length as said first unit bottom-wall and of substantially the same height as said first unit end walls, a flat second wall integral with and folded longitudinally of and at a right-angle to said second unit perforated wall and of substantially the same dimensions as those of said perforated wall, the opposite edges of said second unit two walls having like apertured flanges bent inwardly at right-angles to their longitudinal walls, the apertures of said second unit flanges being adapted to accommodate stud-bolts to fasten either one of such flanges to the heating apparatus, the opposite end portions of each of the two walls of said second unit being apertured for the reception of bolts extended through either one of such two walls and the apertures of the back or top flanges of the first unit to fasten them together with the perforated wall being adapted to be at the back of the smokebox or on its top for the proper application of a breeching connection thereto.

2. The smokebox construction presented in claim 1, in which the perforation of the one wall of the second unit accommodates a smokebox neck occupying said perforation and having a flange spot-welded to the inner side of the perforated wall of said second unit, and with the smokebox neck protruding out of said perforation for the application of a breeching connection therewith for the discharge of the smokebox gases therefrom.

3. The smokebox construction presented in claim 1, including in addition unperforated upturned longitudinal flanges along the opposite edges of the bottom of the first unit.

4. The smokebox construction presented in claim 1, in which the front margins of the two upstanding ends of the first unit have unperforated flanges projecting inwardly in the same plane.

5. The smokebox construction set forth in claim 1 in which, when the perforated wall of the second unit is fastened in place on the first unit as the back vertical wall of the box, its longitudinal flange is located directly below the bottom wall of the first unit.

6. A smokebox consisting of two main bent sheet-metal units fastened together, the first such unit having a bottom wall and two opposite upstanding end walls integral therewith,

the second companion sheet-metal unit having two integral walls of the same size at a right-angle to one another, one of said two walls being perforated for the discharge of smoke and gases, a smokebox neck occupying such perforation for the application of a breeching connection thereto for the discharge of the smoke and gases from the smokebox, and means to fasten said second unit with its two walls as the back and top walls of said first unit.

7. A smokebox comprising complementary members adapted to be fastened together, one of said members having a bottom wall and end walls at substantially right angles to said bottom wall, the other of said members having at least two walls at right angles to each other to provide side and top walls, means securing said members to each other to form a chamber, one of said two walls having an aperture therethrough for discharge of gases from said chamber, and said other of said members being so constructed that either of said two walls can be positioned to form the chamber top wall.

8. A smokebox comprising complementary members adapted to be fastened together, said members having walls extending at substantially right angles to each other to form a chamber, one of said members having at least two of said walls, one of said two walls having an aperture therethrough for the discharge of combustion gases, said one of said members being so constructed that either one of said two walls can be positioned to form the chamber top wall and the other a chamber side wall, a neck member

projecting exteriorly of said chamber from the periphery of said aperture for the application of a breeching connection thereto, and means rigidly securing said members together.

9. A smokebox comprising two complementary members adapted to be fastened together to form a chamber having an inlet for combustion gases and having a bottom wall and end walls, one of said members including said chamber bottom wall, the other of said members having two walls at an angle to each other to form side and top walls of substantially equal dimensions so that either one of said two walls can be positioned to form the chamber top wall and the other a chamber side wall, one of said two walls having an aperture therethrough for the discharge of combustion gases, and means rigidly securing said members together.

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ROY H. SOMERS.

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