(No Model.)

W. H. PAGE.

SECTIONAL BOILER.

No. 541,052. Patented June 11, 1895.

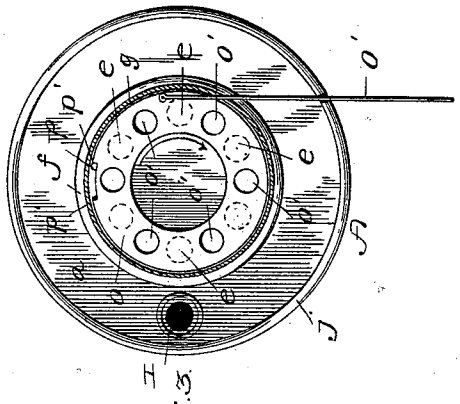

Fig. 3.

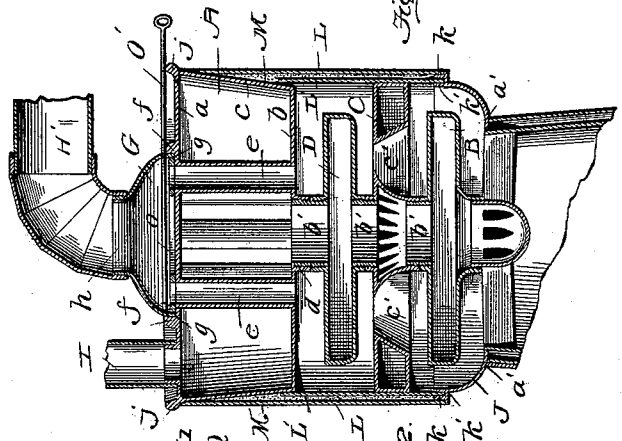

Fig. 2.

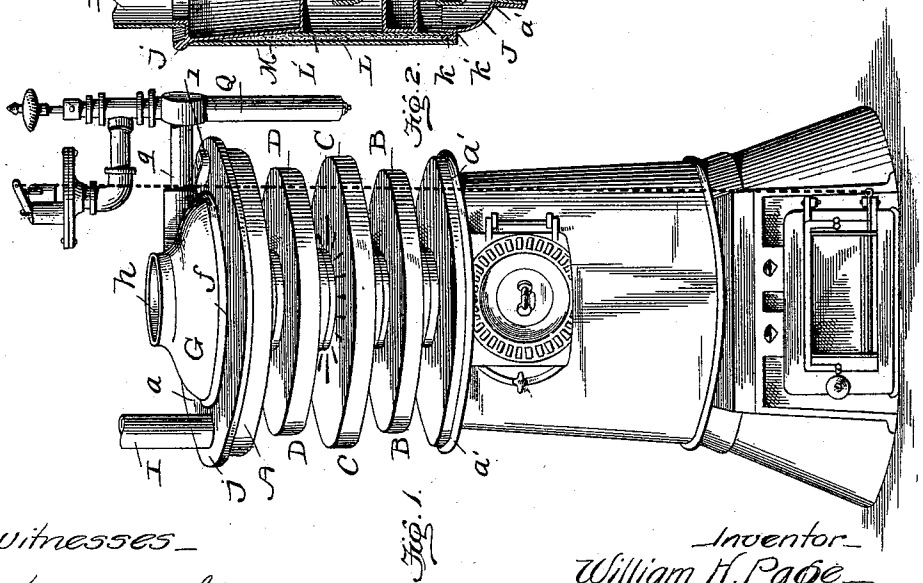

Fig. 1.

Witnesses
Wm. O. Dashiell
H. J. Bernhard

Inventor
William H. Page
By Edson Bros
Atty's

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

UNITED STATES PATENT OFFICE.

WILLIAM H. PAGE, OF NORWICH, CONNECTICUT, ASSIGNOR TO THE WILLIAM H. PAGE BOILER COMPANY, OF SAME PLACE.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 541,052, dated June 11, 1895.

Application filed April 4, 1895. Serial No. 544,468. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PAGE, a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Sectional Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in sectional boilers of that type which employ horizontally arranged sections which are coupled together to provide for the circulation of water through the sections, and are also disposed and constructed as to enable the heat and products of combustion to circulate around and through the sections.

One of the objects of my invention is to so construct the upper part of the boiler as to expose the top section or dome section in order to dispense with a cover or top plate and to enable the circulating pipes to be readily coupled to the top or dome section without passing the pipes through a top cover or plate, and also to provide means carrying off the smoke and products of combustion which pass through the dome or top section without interfering with the attachment of the circulating pipes to such top or dome section.

A further object of my invention is to provide an improved vertical casing for the water circulating sections of a sectional boiler, which casing is held in place around the sections of the boiler and is preferably lined or filled with a heat resisting medium to reduce to a minimum the radiation and loss of heat from the boiler.

A further object of the invention is to provide an improved regulator damper for the top or dome section which may be easily operated or adjusted to enable the free passage of the products of combustion through the top section or which may be adjusted to partially (or wholly) close the smoke flues through said dome section.

With these and such other ends in view, the first part of my invention consists in a top section provided with a seat forming a ring or flange in the top thereof and extending around a series of smoke flues which run vertically through the section, in combination with a smoke plate or cover which is fitted to the seat formed by the ring or flange, with its edges resting upon the top or dome section, outside of the line of the smoke flues therein, and producing a smoke chamber into which is discharged the products of combustion that pass through the smoke flues, and an exit pipe connected to the smoke plate or cover, whereby the plate or cover only fits upon the top or dome section to inclose the smoke flues therein and the remaining surface of the dome or top section is exposed to enable the circulating pipes to be connected thereto.

The second part of my invention relates to the combination with a vertically tapered dome section and a flange on a lower or fire pot section of the boiler, of an inner casing fitted to the lower part of the vertically tapered dome-section and to the flange on said lower or fire pot section, and an outer casing concentric with the inner casing and having its upper edge fitted against a flange on the dome or top section and with its lower edge resting upon the flange on the lower or fire pot section of the boiler. If desired, a sheet of asbestos, or any other suitable non-conducting material, may be supplied between the inner and outer casings of the boiler.

My invention further consists in the combination with a dome or top section having vertical smoke flues, and a smoke plate or cover which incloses the flues, of a damper fitted to the dome or top section to lie over the smoke flues therein and said damper provided with openings spaced or arranged to register with the smoke flues, an operating rod connected to the damper and extending through the smoke cover or plate, and stops to limit the movement of the damper when its openings are in line with the smoke flues or when the damper is adjusted to close (either partially or wholly) the smoke flues.

My invention further consists in the combination with a top section and a smoke cover or plate, of a regulator having one branch or member thereof connected, by a pipe, which extends through the side of the smoke cover or plate, to the top section; and the invention further consists in the combination and construction of parts which will be hereinafter fully described and claimed.

To enable others to understand my inven-

tion, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of my improved hot-water boiler with the casings omitted. Fig. 2 is a vertical sectional view taken centrally through my improved steam-boiler. Fig. 3 is a plan view of the top or dome section, with the smoke cover and regulator omitted to show the damper.

Like letters of reference denote corresponding parts in all the figures of the drawings.

A denotes the top or dome section of the boiler.

B, C, D, are the intermediate sections; and E, is the fire pot section.

The top or dome section, A, is similar to the construction for which United States Letters Patent, No. 536,041, were granted to me on the 19th day of March, 1895, that is to say, said top or dome section has a crown, *a*, a bottom wall, *b*, an annular wall, *c*, a nipple *d*, and a circular series of smoke flues *e*, all cast in a single piece. These smoke flues are concentric with the nipple, *d*, in the bottom part or the section A, and they open through the crown *a*, within the outer edge thereof. In this crown, *a*, of the top or dome section is formed a ring or flange *f* outside of the circular line of the flues, *e*, said flange or ring constituting the seat for a smoke cover or plate, G, which is cast in a separate piece from the top or dome section. This smoke cover or plate is preferably arched, curved or otherwise formed to make it rise or stand up from the section A, and it is so shaped and proportioned as to fit within the ring or flange *f*, thereby forming a smoke chamber H between the recessed part, *g*, of the crown within the seat or ring, *f* and the plate or cover G, into which space the smoke and products of combustion from the flues *e* are discharged. This smoke plate or cover, G, is fitted snugly or tightly to the recessed crown, to secure a tight joint which obviates leakage of smoke, and said cover or plate gathers and collects the smoke from the flues *e*. At its raised central portion, this cover or plate has a vertical flange *h*, to which is fastened one end of a smoke pipe H′ by which the smoke collected in the chamber, H, is carried to the chimney. The diameter of this smoke cover or plate is much less than the diameter of the top or dome section. In fact, the smoke plate at its largest diameter is equal to the diameter of the ring or flange *f*, whereby when the plate or cover G (which is cast in a separate piece from the top or dome section) is applied to the top or dome section, it only covers the recessed part *g* of the crown and the smoke flues *e* and thus leaves all the remainder of the crown *a* exposed, which is advantageous in that the circulating pipes, I, can be attached to the dome or top section without passing the pipes through a boiler cover or plate. This construction also enables me to dispense with a cover to conceal the top part of the boiler, which effects a saving in the manufacture of the boiler, and provides for the ready attachment of the circulating pipes, as aforesaid.

In a boiler designed to supply steam to the circulating pipes, I prefer to make the top or dome section, A, somewhat deeper than the top section provided for hot water heating boilers.

Fig. 1 of the drawings shows my hot-water boiler, with a top section, the depth of which is about the same as the intermediate sections, but Fig. 2 shows my steam boiler. In this last named figure (2) I show the casings and the lower supporting flange J for the casings, which flange rests on the lower section or fire pot section. In applying the casings to inclose the boiler sections, I make the top or steam dome somewhat tapering in form, so that the diameter thereof at the lower part is less than the diameter at the upper part, and said upper part of the dome or top section has an overhanging flange, *j*, this being true of the top section for both the hot water boiler and the steam boiler. The flange or ring, J, is cast in a separate piece from the lower section or fire pot section of the boiler and this fire pot section is recessed at *a′* to provide an annular seat at its top to receive the inner edge of the flange or ring J. See Fig. 2. The separate ring or flange J is curved or shaped to stand upward from the fire pot section, and at its upper free edge it is flanged at *k*, *k′* to receive the casings L, L′, which are disposed between the dome or top section, A, so as to inclose the sections B, C, D, of the boiler, said casings being seated on the flange or ring J. These casings are concentric, and the inner smaller casing L′ has its top edge fitted to the lower end of the top section A, while its lower edge rests upon the flange, J, and against the inner seat *k′* thereof. The outer casing L is between the flange, *j*, at the upper larger end of the dome or top section, A, and its lower edge rests upon the flange J, against the seat *k*. The space between the casings L, L′, is supplied with an asbestos packing M, although this is not essential, as other materials may be used as non-conductors of heat. The casings are held or confined between the top section of the boiler and the ring or flange J, and they inclose the circulating sections B, C, D, so as to form a chamber for circulation of heat, smoke and products of combustion. The casings only partially inclose the top section or dome A, its crown, *a*, being exposed, except where it is covered by the plate G, for the purpose explained.

Within the smoke space or chamber, H, I provide a non-pivoted regulating damper O. This damper is not pivoted to the section A upon which it rests, and it consists of a flat circular ring which is arranged within the recess or seat *g*, of the crown *a*. Said damper is confined within the recess or seat *g*, or within

the cover G, in a manner to permit it to have free turning or oscillating movement, to a certain extent, over the smoke flues, *e*. In this flat ring-like damper, O, (which is compactly arranged in the depressed crown *g*) is formed a series of openings, *o'*, which are spaced or arranged so as to register with the smoke flues, when the damper is in one position, and to close said flues (partially or wholly) when the damper is adjusted to the other position. This movement of the damper is controlled by a stop, *p*, and which plays between shoulders *p'*, *p'*, the stop, *p*, being in the path of the shoulders, *p'*. I prefer to so place the stop that the damper will be arrested, by one shoulder, when it is adjusted to close about three-fourths of the area of the smoke flues, in order that the gases may readily pass from the boiler to the exit pipe, while the other shoulder operates to arrest and limit the play of the damper when its openings, *o'*, coincide with the smoke flues *e*. The damper is operated by the rod or stem, O', which is pivoted thereto and which passes through an opening provided in the arched smoke cover or plate G.

In the hot water boiler shown by Fig. 1, I provide a regulator Q, indicated in Fig. 1. This regulator has one of its branches or members connected to the top section A by means of a pipe, *q*, which passes through one side of the smoke plate or cover G and thence through the section A.

The sections, B, C, D, of my improved boiler may be of any suitable construction, but I prefer to make the middle section C with the smoke flues, *c'*, through it and to extend the middle section to the inner casing L', in order to insure the smoke and products of combustion taking a tortuous course through the boiler. These sections rest one upon the other and they are all provided with central interiorly threaded openings, into which are screwed the externally threaded nipples *b'*. Each nipple has a continuous thread on its outer surface, and one part of the nipple is screwed into one section while the other part of the nipple is screwed into the next section. See Fig. 2.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a top section having a series of smoke flues which open through the crown thereof within its edge, of a smoke cover or plate made separate from the top section and fitted to the crown of said section outside of the line of the smoke flues, leaving a part of the crown exposed for the attachment of the circulation pipes, and an exit pipe connected to the smoke plate or cover, substantially as and for the purposes described.

2. The combination with a top or dome section having a series of smoke flues opening through its crown within the line of a surrounding seat, of a smoke plate or cover fitted to the crown of the dome within the seat, and forming a space for the accumulation of smoke and products of combustion from the smoke flues, a circulating pipe coupled to the exposed part of the top or dome section outside of the seat, and a smoke exit pipe connected to the smoke plate or cover, substantially as and for the purposes described.

3. The combination of a dome or top section having a central recess and a surrounding seat in its crown and a series of smoke flues which open through said recess, within the seat, an arched smoke plate or cover fitted to the recess and seat in the crown of said top section and forming a chamber to receive the smoke and products of combustion from the flues, and an exit pipe connected to the smoke plate or cover, substantially as and for the purposes described.

4. The combination of a top section having a recess and raised seat in the crown thereof and a series of smoke flues which open through said recess within the line of the seat, a smoke plate or cover resting upon the recess and the seat, a damper confined within the recess, having openings adapted to register with the smoke flues in said top section, means for operating the damper, and an exit pipe connected to the smoke cover, substantially as described.

5. The combination with a tapering top or dome section, of a ring or flange supported by a fire pot section, and the concentric casings confined between said ring or flange and the dome section, the inner casing being fitted against the lower smaller portion of the top section and the outer casing fitted to the upper larger part of the top section, substantially as described.

6. The combination of a vertically tapered, flanged top section, a separate ring or flange J fitted in a seat on the fire pot section and provided with spaced seats at their upper edge, and the concentric casings, resting at their lower edges upon the ring or flange J and its seats, substantially as described.

7. The combination of a top section having the smoke flues, a smoke plate or cover, and a regulator, Q, having a pipe, *q*, leading through the side of the smoke plate or cover, substantially as described.

8. The combination of a top or dome section provided with a recess, a surrounding seat, and smoke flues which open through the recess, within the seat, a cover or plate fitted to the seat over the recess, and a non-pivoted damper confined within the recess to be held in place thereby and provided with openings to register with the smoke flues, substantially as described.

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

WILLIAM H. PAGE.

Witnesses:

LUCIUS BROWN,

DONALD G. PERKINS.