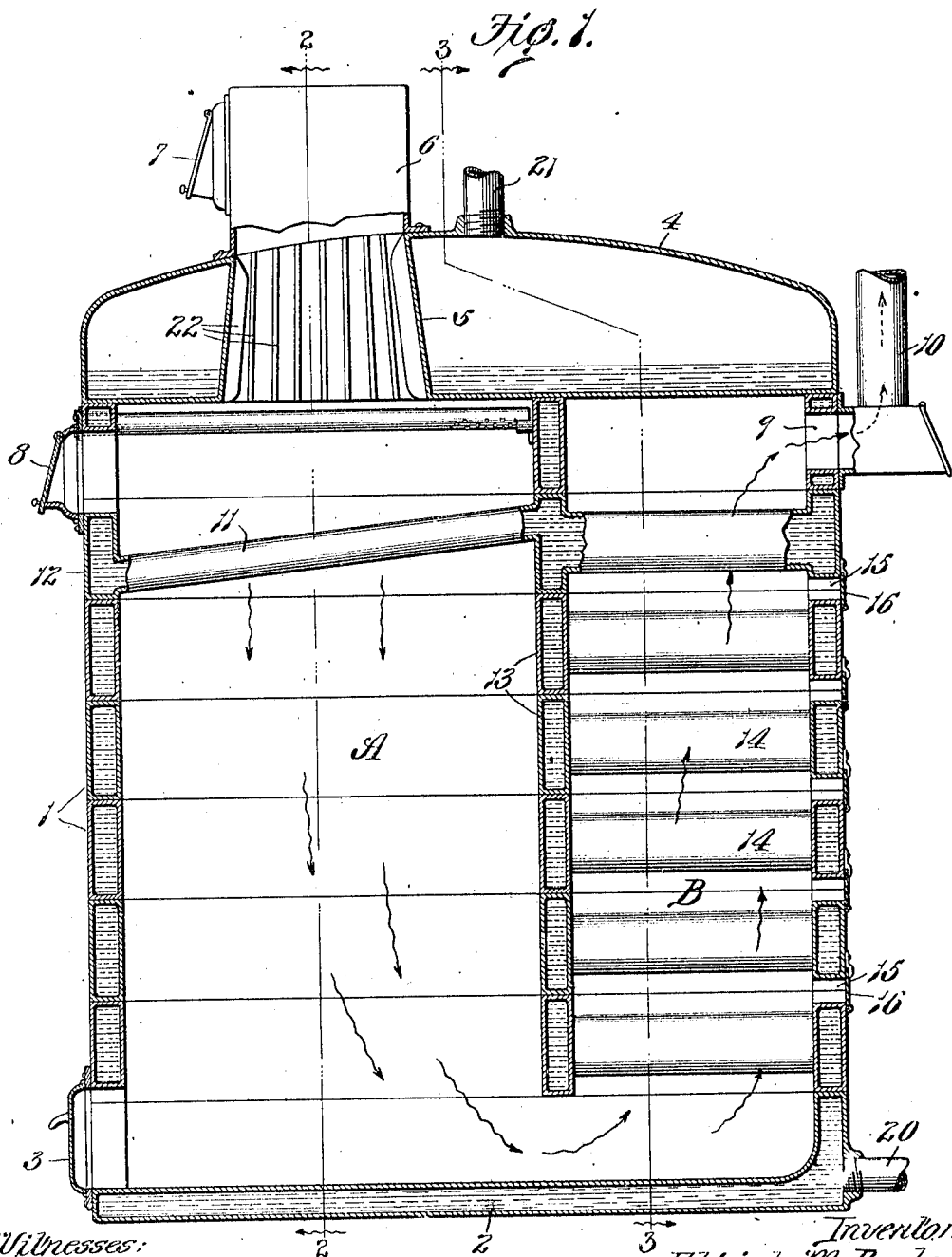


E. M. BOSLEY.
 DOWNDRAFT SECTIONAL BOILER.
 APPLICATION FILED MAY 17, 1909.

954,417.

Patented Apr. 12, 1910.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 2.

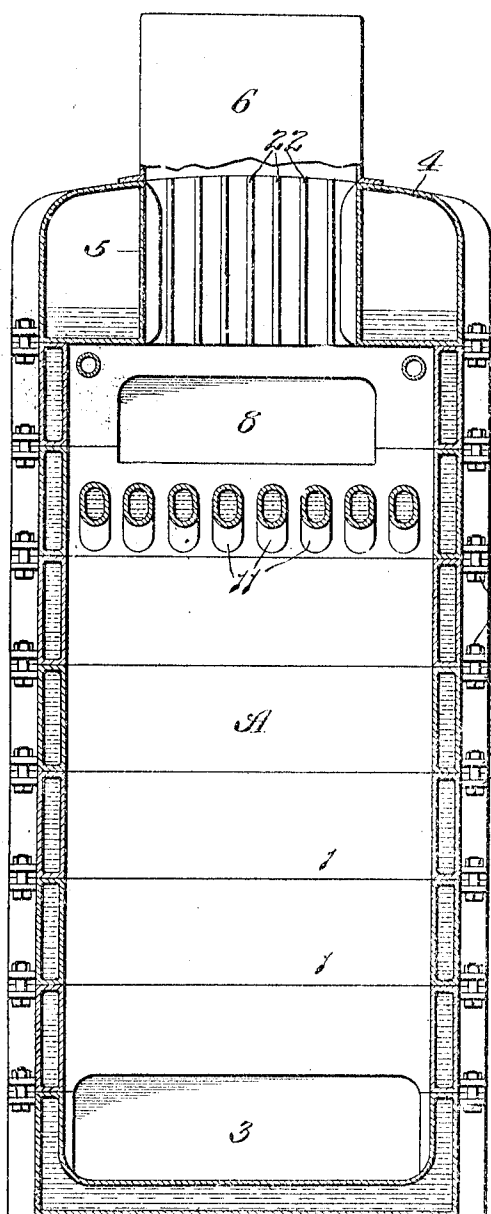
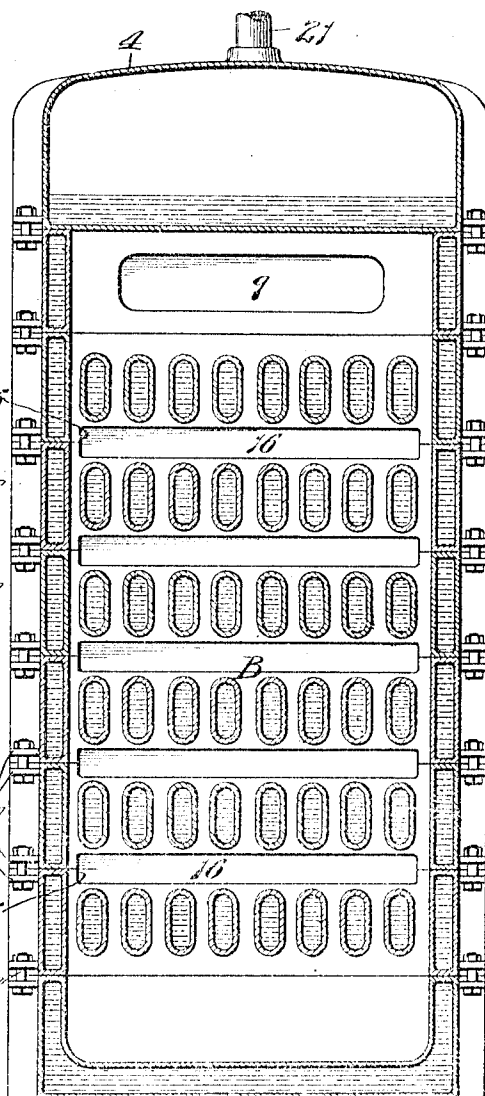


Fig. 3.



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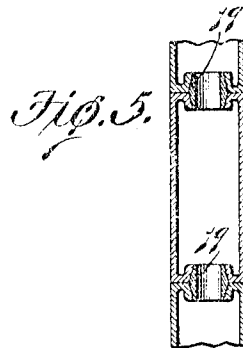
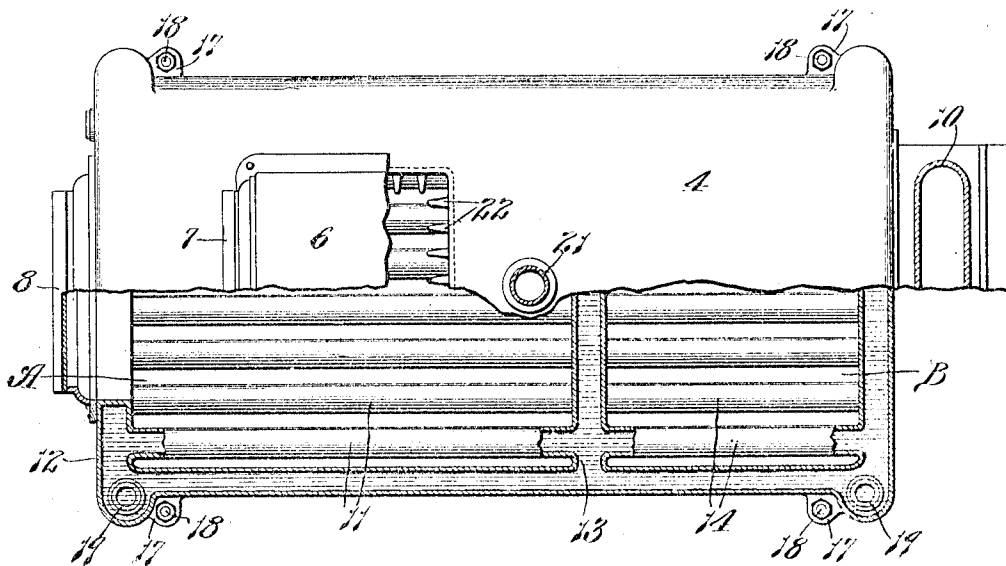
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3 SHEETS—SHEET 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ELIJAH M. BOSLEY, OF ST. LOUIS, MISSOURI.

DOWNDRAFT SECTIONAL BOILER.

954,417.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed May 17, 1909. Serial No. 496,590.

To all whom it may concern:

Be it known that I, ELIJAH M. BOSLEY, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Downdraft Sectional Boilers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to boilers, and particularly to down-draft sectional boilers of the type described in my pending application Serial No. 438,582, filed June 15, 1908.

One object of my present invention is to provide a down-draft boiler composed of horizontally arranged sections and having a comparatively large unobstructed combustion chamber that communicates with a vertical flue located adjacent the rear end of the boiler.

Another object of my invention is to provide a down-draft boiler having a fuel hopper arranged above the grate, and means for holding the fuel away from the side walls of said hopper so that a draft will be created down through the hopper, and also to prevent the fuel sticking to the side walls of the hopper. Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a vertical longitudinal sectional view of a boiler constructed in accordance with my invention; Fig. 2 is a vertical transverse sectional view taken approximately on the line 2—2 of Fig. 1, looking in the direction of the arrow; Fig. 3 is a vertical transverse sectional view taken on approximately the line 3—3 of Fig. 1, looking in the direction indicated by the arrow; Fig. 4 is a top plan view partly broken away to more clearly illustrate the construction of the boiler; and Fig. 5 is a detail sectional view showing the means for establishing communication between the various sections of the boiler.

Referring to the drawings which illustrate the preferred form of my invention, 1 designates the intermediate horizontally arranged sections of my improved boiler, said sections being arranged one above the other. The base section 2, which preferably forms the ashpit of the boiler, is provided with a clean-out opening that is covered by a door 3, and the top section 4 of the boiler is provided with a magazine or hopper 5 in which the fuel is placed. I prefer to

arrange an auxiliary hopper 6 above the hopper 5, as shown in Fig. 1, and provide said auxiliary hopper with a door 7 that can be controlled by some suitable automatic draft-regulating mechanism, not shown. The section which is arranged immediately under the top section 4, is provided at its front end with a stoking door 8 that covers an opening through which the fuel can be introduced onto the grate; and the rear wall of said section is provided with an opening 9 through which the products of combustion pass to a smoke-pipe 10.

The fuel grate is arranged adjacent the upper end of the boiler and is composed of a number of hollow grate-bars 11 that communicate with the hollow chambers of the section 12 through which the heating medium associates. I have herein shown the grate-bars 11 formed integral with the section 12 but I do not wish it to be understood that my broad idea is limited to this exact construction for, if desired, the grate could consist of a removable hollow member or a plurality of removable hollow members detachably connected to the section 12. Each section of the boiler, with the exception of the top section, is provided with hollow side walls and hollow front and rear walls, and the sections that are arranged between the base section and the top section are provided with hollow transversely extending portions 13 arranged in vertical alinement with each other so as to divide the inner space of the boiler into a combustion chamber A arranged under the fuel grate and a vertical flue B which establishes communication between said combustion chamber and the smoke-pipe, the hot gases of combustion traveling downwardly through said combustion chamber, and thence under the lower edge of this dividing wall into the vertical flue B, as indicated by the arrows in Fig. 1. The vertical flue B is located adjacent the rear end of the boiler, and the intermediate sections and also the grate-carrying section are provided with hollow members 14 that connect with the rear wall and the transversely extending dividing wall 13 so as to permit the heating medium to circulate therethrough and thus provide a large heating area, these hollow members 14 being arranged inside of the vertical flue B so that they will be in the path of travel of the hot gases of combustion. By arranging these hollow members 14 inside of a large vertical

flue that is separate and distinct from the combustion chamber, I obtain a boiler that has a comparatively large and unobstructed combustion chamber under the fuel grate.

5 The rear wall of the boiler is provided with openings 15 through which a device can be inserted to clean off the outer surfaces of the hollow members 14, said openings being closed by movable caps 16. The various
10 sections of the boiler are provided with laterally projecting lugs 17 through which suitable fastening devices 18 pass to connect the sections together, and communication between the hollow chambers of the various
15 sections is established by means of slip nipples 19, as shown in Fig. 5. The base section is preferably provided with a hollow bottom, as shown in Fig. 1, through which the heating medium circulates, and the intake pipe 20 is tapped into the rear end of said base section, the eduction pipe 21 leading from the top section. The top section is so shaped that its lower wall forms the top of the vertical flue B, and the walls of the
20 hopper 5 are preferably cast integral with said top section.

As previously stated, one of the objects of my present invention is to provide means for holding fuel away from the side walls of the
30 fuel hopper so as to prevent the fuel from sticking to the hopper and also to enable a draft to be created down through the hopper, and in the embodiment of my invention herein shown, the means for accomplishing
35 this consists of a plurality of inwardly projecting ribs 22 on the inside of the hopper 5, said ribs operating to hold the fuel away from the walls of the hopper and thus permit air to travel downwardly through said hopper to the fuel on the grate. These ribs
40 22 are preferably arranged vertically, as shown in Fig. 1, and as they are comparatively narrow and extend some distance inwardly from the walls of the hopper they prevent the fuel from sticking to the hopper. Either the door 8 above the fuel grate or the door 7 in the auxiliary hopper 6 can be used for regulating the draft but I prefer to regulate the draft by means of the door 7. A
50 boiler of this construction is compact and has a large heating area, and as the hot gases of combustion travel downwardly through the grate the fuel will not become coked in the hopper. The ribs 22 inside of the hopper insure a free draft to the fire and also reduce the liability of the fuel sticking to the hopper, and the arrangement of the hollow members 14 in the manner herein shown produces a very efficient boiler having a combustion chamber of such dimensions that the
60 gases can explode freely.

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

65 1. A down-draft boiler composed of a

number of horizontally disposed superimposed sections having hollow front, rear and side walls through which a heating medium circulates, a transverse vertical wall that divides the inner space of said boiler into
70 a combustion chamber and a vertical flue that establishes communication between the lower end of said combustion chamber and a smoke-pipe, said wall being formed by integral portions of some of said sections arranged in vertical alinement with each other,
75 and a fuel grate arranged above said combustion chamber and adjacent the top of the boiler.

2. A down-draft boiler composed of, a
80 number of horizontally arranged superimposed sections having hollow side, front and rear walls, some of the intermediate sections having transversely extending integral hollow portions that form a vertical dividing
85 wall between the combustion chamber and a vertical flue which leads from the lower end of said combustion chamber, a fuel grate, means for creating a draft down through said fuel grate, and a smoke-pipe leading
90 from the upper end of said flue.

3. A down-draft boiler composed of a number of horizontally arranged sections having hollow front, side and rear walls through which the heating medium circulates, some of said sections having transversely extending hollow members arranged in vertical alinement with each other to form a vertical wall which divides the inner space of the boiler into a combustion chamber and
100 a vertical flue that communicates with the lower end of said combustion chamber, a fuel grate arranged above said combustion chamber, and hollow members arranged in said vertical flue and communicating with
105 the hollow spaces of said sections through which the heating medium circulates.

4. A down-draft boiler composed of a top section, a base section, and a plurality of horizontally arranged sections mounted one
110 upon the other intermediate said base section and top section, said intermediate sections having hollow front, rear and side walls and also hollow transversely extending portions that form a vertical division wall
115 which separates a combustion chamber from a vertical flue, a hollow grate arranged above the combustion chamber and communicating with the spaces of said sections through which the heating medium circulates, hollow
120 members arranged in the vertical flue and communicating with the space of some of said sections through which the heating medium circulates, and means for creating a draft down through the fuel grate.
125

5. A down-draft boiler having a hollow outer shell through which the heating medium circulates and composed of a plurality of horizontally arranged superimposed sections, a vertical division wall that divides
130

the inner space of said shell into a combustion chamber and a vertical flue that leads from the lower end of said combustion chamber to a smoke-pipe, said wall being formed
 5 by transversely extending portions of said sections which are arranged in alinement with each other, a hollow fuel grate arranged above said combustion chamber and communicating with said division wall and
 10 the front wall of the boiler, a top section having a fuel hopper, and means for preventing the fuel from choking or clogging said hopper.

6. A down-draft boiler composed of horizontally arranged superimposed sections having hollow walls through which the heating medium circulates and transversely extending portions which form a vertical division wall that divides the inner space of the boiler
 20 into a combustion chamber and a vertical flue that leads from the lower end of said combustion chamber to a smoke-pipe, a hollow fuel grate arranged above said combustion chamber and communicating with said
 25 division wall and the front wall of the boiler, a top section having a fuel hopper, means

for preventing the fuel from choking or clogging said hopper, and means for admitting air into the upper end of said hopper so that a draft will be created down through
 30 same.

7. A down-draft boiler composed of a number of horizontally arranged superimposed sections having hollow front, rear and side walls and also transversely extending
 35 hollow members arranged in vertical alinement with each other to form a division wall between a combustion chamber and a vertical flue, hollow members in said flue through which the heating medium circulates, openings in one wall of said boiler through which a device can be inserted to clean off the material that collects on said hollow members, and closures for said openings.
 40
 45

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this fifteenth day of May 1909.

ELIJAH M. BOSLEY.

Witnesses:

WELLS L. CHURCH,
 GEORGE BAKEWELL.