(No Model.)

R. BIGLEY.

SECTIONAL WATER HEATER.

No. 395,688. Patented Jan. 8, 1889.

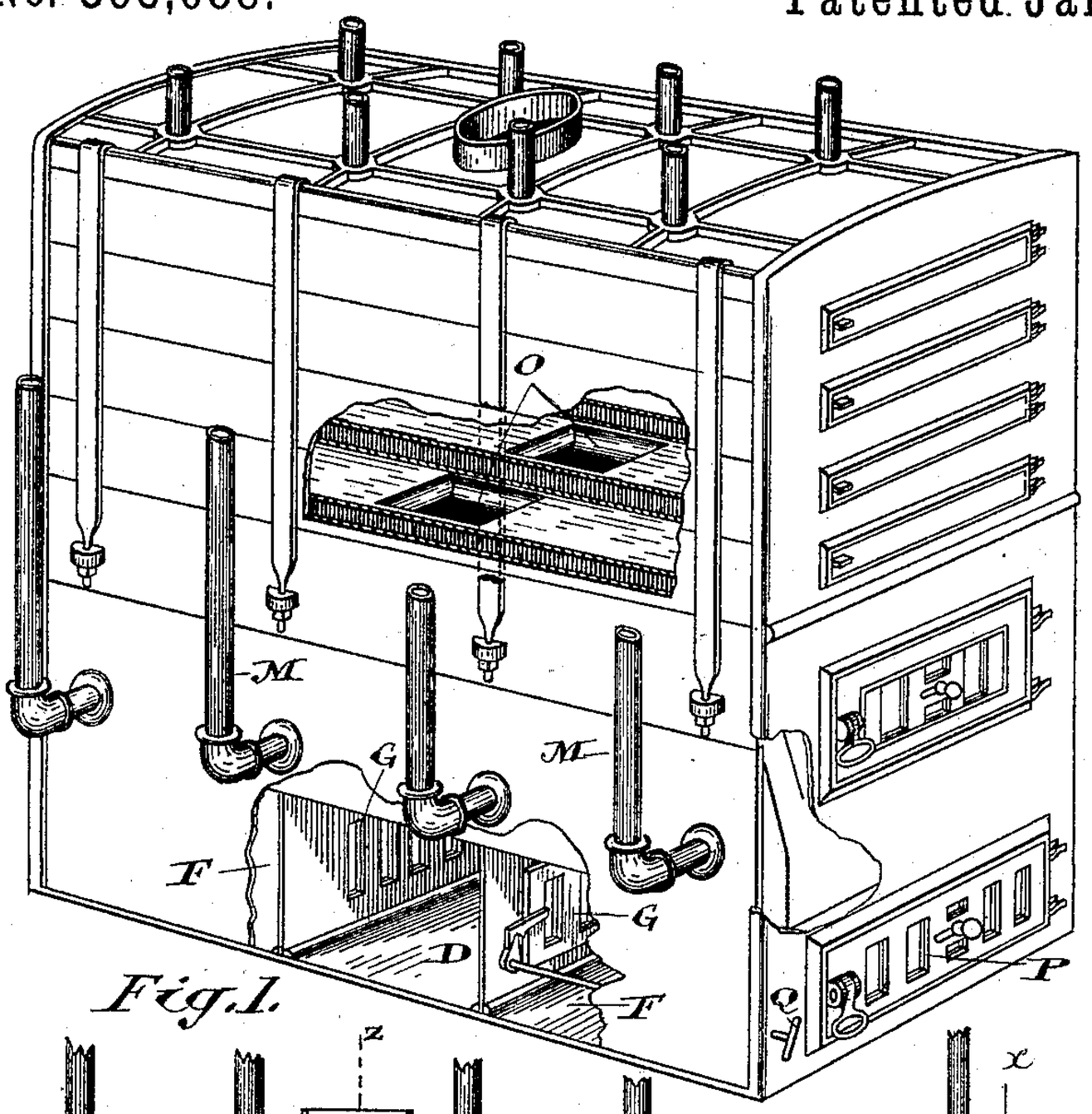

Fig. 1.

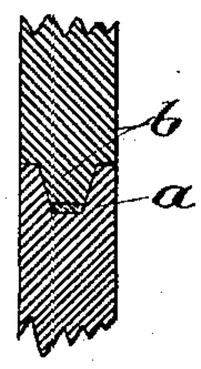

Fig. 4.

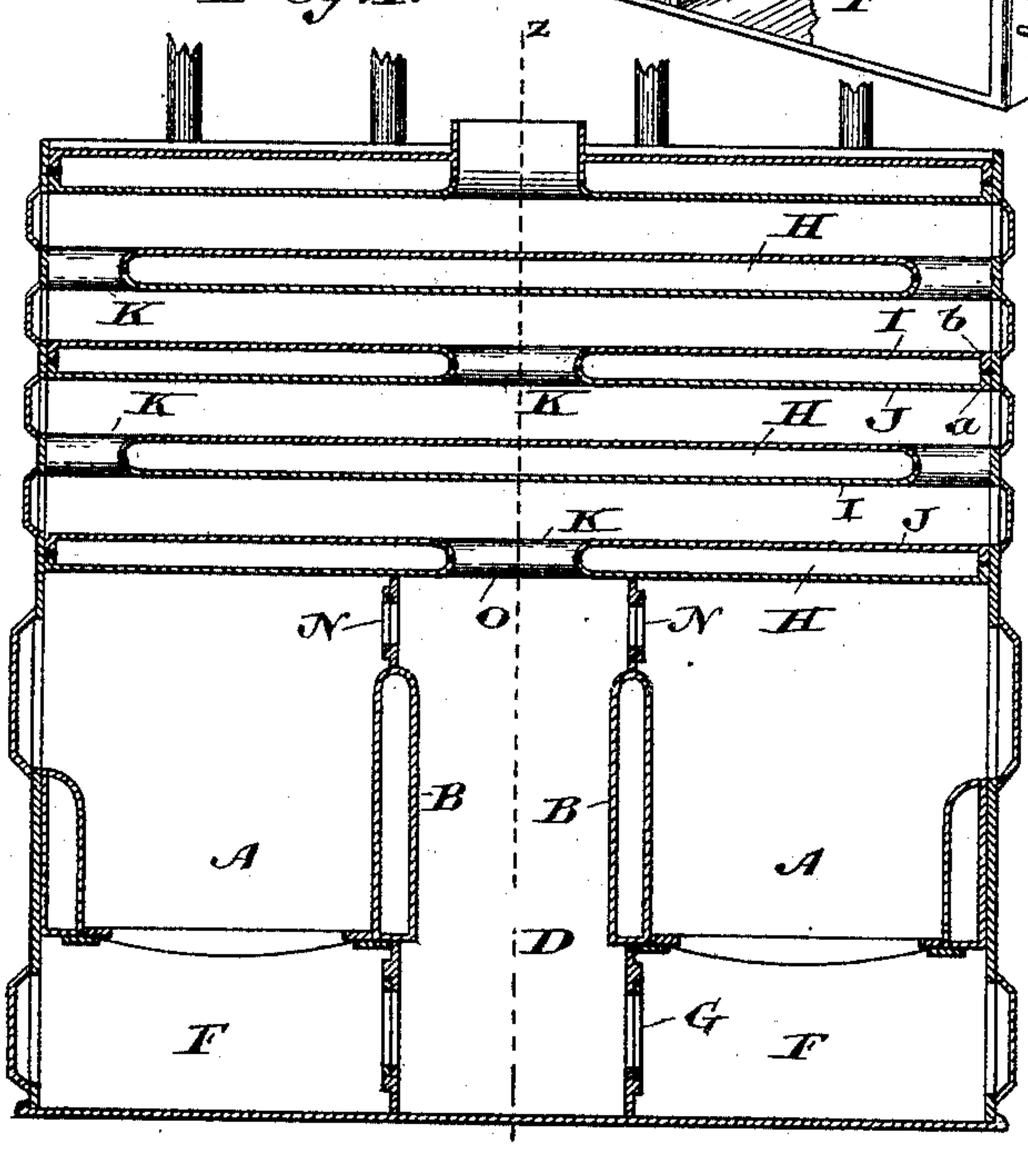

Fig. 2.

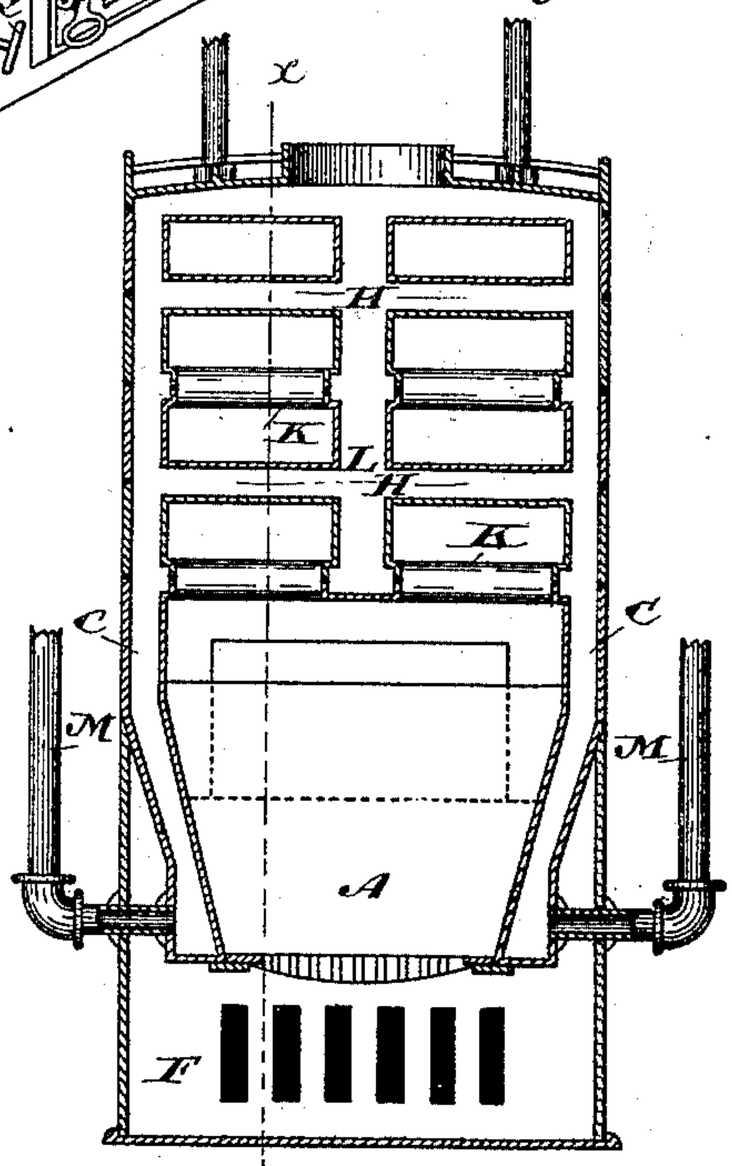

Fig. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

RICHARD BIGLEY, OF TORONTO, ONTARIO, CANADA.

SECTIONAL WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 395,688, dated January 8, 1889.

Application filed July 7, 1888. Serial No. 279,240. (No model.)

To all whom it may concern:

Be it known that I, RICHARD BIGLEY, manufacturer, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and useful Improvement in Sectional Hot-Water Heaters, of which the following is a specification.

The object of the invention is to design a sectional hot-water heater with a large heating-surface easily constructed, and in which the fire-surface may be increased or decreased, as desired, and have its draft regulated without affecting the circulation of warm air between the compartments; and it consists, essentially, of a series of sections, preferably rectangular in shape, and having longitudinal smoke-flues formed between the plates of each section, and a water-space formed between each section, the said water-spaces being connected together by suitable vertical passage-ways arranged as herein described, and extending from a point near the grate to the crown of the furnace, the whole being otherwise constructed and arranged substantially as hereinafter more particularly explained.

Figure 1 is a perspective elevation, partially in section, of my improved sectional hot-water heater. Fig. 2 is a longitudinal sectional elevation through *x y*. Fig. 3 is a cross-section through *z w*. Fig. 4 is an enlarged detail showing the style of joint between the sections.

With the view of having as large a fire-surface as possible, and which surface may be easily reduced, if required, I form at each end of the heater a fire-box, A, having a hollow back, B, which connects with the vertical water-spaces C on the sides of the heater. An air-space, D, is left between the two backs B and extends down to a point level with the bottom of the ash-pits F, from which it is separated by the adjustable dampers G. The vertical hollow water-spaces B and C communicate with the horizontal water-spaces H, formed between each section of the boiler, all of which sections above the fire-box A are composed of a top plate, I, and a bottom plate, J, having flanges *a* formed around them, the flange around the bottom plate, J, being recessed, as indicated in Fig. 4, to receive the tongue *b*, formed on the flange surrounding the top plate, I. The joint thus formed between each section must of course be made water-tight. Horizontal smoke-flues K are formed in each section, vertical walls being formed in each section to surround the vertical water-spaces, C, which pass through each section and communicate with the horizontal water-spaces H, as shown.

A central vertical water-space, L, is formed between the two rows of smoke-flues K. This central vertical water-space, L, communicates with the horizontal water-space H; consequently the water which enters through the feed-pipes M into the vertical water-space C circulates through the hollow backs B, horizontal water-spaces H, and central water-space, L, so that it will come in contact with the entire heating-surface of the boiler before escaping from the boiler.

It will be noticed that above the water-back B of each fire-box A, I place a damper, N, so that either of the fire-boxes may be cut off without interfering with the satisfactory working of the other fire-box. If both fire-boxes are in use, both the dampers N will be opened and the smoke and other heated gases from the two fire-boxes will intermingle and pass up through the opening O, and thence around through the smoke-flues, as indicated by arrows. If a smaller fire is sufficient, only one of the fire-boxes need be used, in which case the damper N belonging to the fire-box not in use will be closed, and the smoke and heated gases will pass through the furnace in the same manner.

B is an ordinary outside damper for regulating the openings leading into the ash-pits F. By closing the damper G and opening the damper P belonging to the fire-box which may at the time be in use all the air admitted into the ash-pits will pass up through the grate of the said fire-box. Should it be necessary to check the fire in its particular fire-box, its damper G is opened, in which case the major portion of the air admitted into the said ash-pit through the damper N will pass out of the ash-pit through the damper G into the air-space D and thence through the smoke-flues K. Each damper G is provided with a suitable crank-rod, Q, as indicated in Fig. 1, by which the said damper may be opened or closed, as desired.

As the smoke-flues are made in each section and the water-spaces formed between the sections, no smoke-joints are required, the only joint in the furnace being formed around the water-spaces and on the outside of the furnace; consequently any leak will be immediately discovered and cannot occur inside of the heater.

What I claim as my invention is—

1. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed between the plates of the sections, and a water-space between each section, the said water-spaces being connected together by vertical passage-ways arranged substantially as and for the purpose specified.

2. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having longitudinal smoke-flues formed between the plates of the sections, and a water-space formed between each section, the said water-spaces being connected together by suitable passage-ways arranged as herein described and extending from a point near the grate to the crown of the said heater, substantially as and for the purpose specified.

3. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed between the plates of the sections, and a water-space between each section, connected together by suitable vertical passage-ways, in combination with a fire-box located at each end of the heater and connected with the smoke-flues passing through the sections, substantially as and for the purpose specified.

4. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed between the plates of the sections, and a water-space formed between each section, the said water-spaces being connected together by suitable vertical passage-ways, in combination with two fire-boxes located at each end of the heater, the said fire-boxes being separated by an air-space through which the smoke and heated gases pass from the fire-boxes on their way to the smoke-flues, arranged, as described, in the sections of the heater.

5. A hot-water heater having two fire-boxes separated by an air-space extending to a point where the smoke and heated gases pass into the flues arranged in the heater, combined with the adjustable dampers arranged above the water-backs of each fire-box, substantially as and for the purpose specified.

6. A hot-water heater composed of a series of sections, preferably rectangular in shape, and having smoke-flues formed between the plates of the sections, and a water-space formed between each section, the said water-spaces being connected together by suitable vertical passage-ways extending from a point near the grate to the crown of the fire-box, in combination with two fire-boxes separated by an air-space extending upwardly from the bottom of the ash-pit, from which it is separated by adjustable dampers arranged substantially as and for the purpose specified.

7. A hot-water heater composed of a series of sections having smoke-flues formed in each section and connecting with each other, the said sections being jointed together, so as to form the water-space between each section, substantially as and for the purpose specified.

Toronto, June 14, 1888.

RICHARD BIGLEY.

In presence of—
CHARLES C. BALDWIN,
J. M. JACKSON.