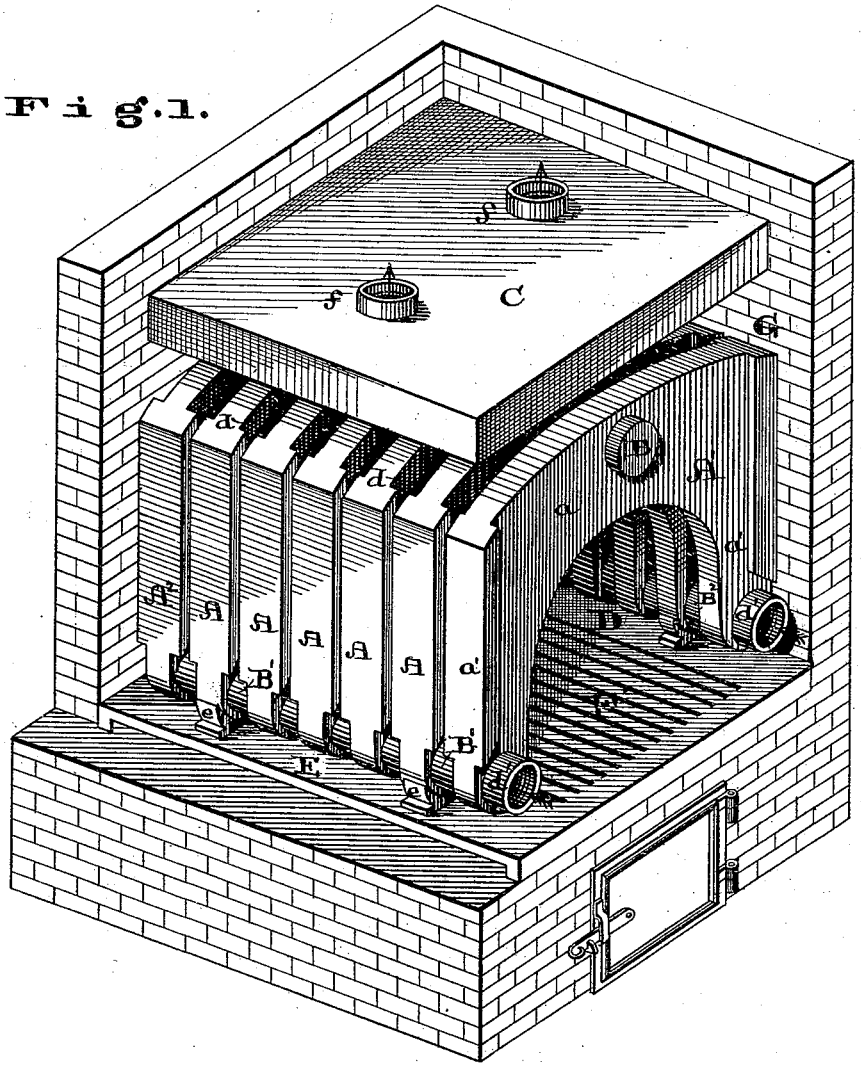
2 Sheets—Sheet 1.

E. W. KEMPIN.

HOT-WATER HEATING APPARATUS.

No. 186,850. Patented Jan. 30, 1877.

Fig. 1.



WITNESSES.

Frank V. Boyd

Paul Bakewell

INVENTOR.

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By Chas. D. Moody

his atty.

2 Sheets—Sheet 2.

E. W. KEMPIN.

HOT-WATER HEATING APPARATUS.

No. 186,850. Patented Jan. 30, 1877.

Fig. 2.

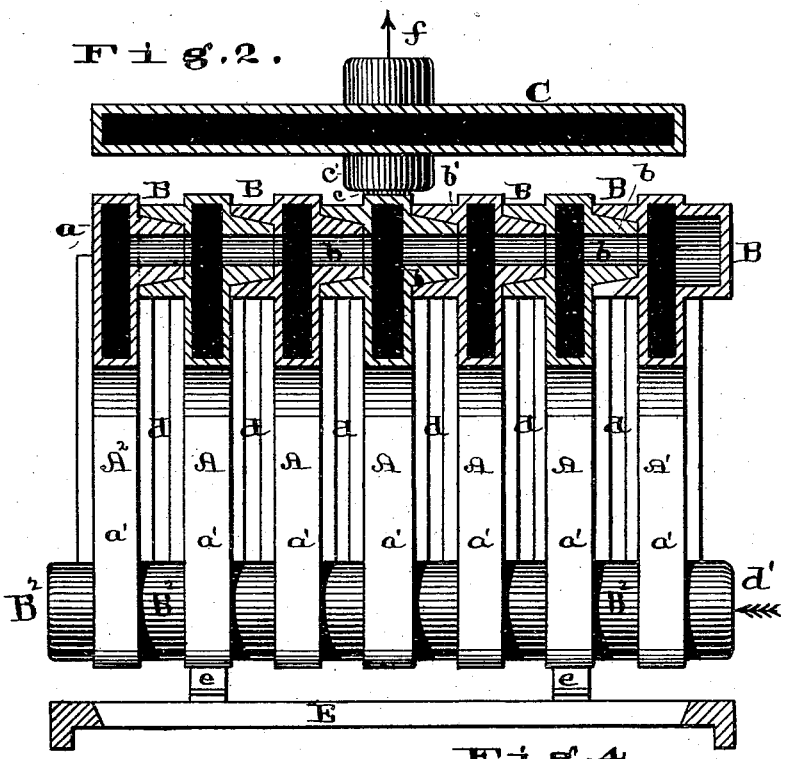


Fig. 3.

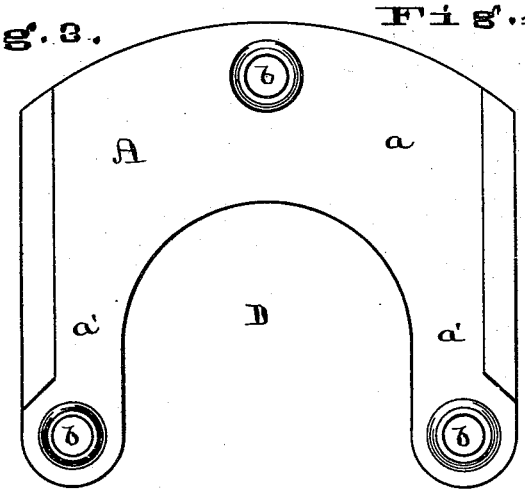
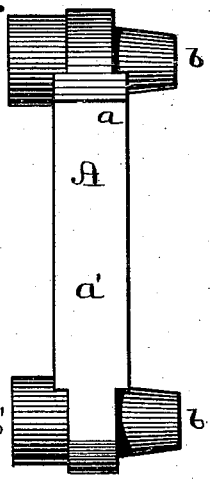


Fig. 4.



WITNESSES.

Saml. S. Boyd

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UNITED STATES PATENT OFFICE.

EDWIN W. KEMPIN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO JOSEPH W. BRANCH, OF SAME PLACE.

IMPROVEMENT IN HOT-WATER HEATING APPARATUS.

Specification forming part of Letters Patent No. **186,850**, dated January 30, 1877; application filed December 2, 1876.

To all whom it may concern:

Be it known that I, EDWIN W. KEMPIN, a resident of St. Louis, Missouri, have made a new and useful Improvement in Hot-Water Heating Apparatus, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making a part of this specification, in which—

Figure 1 is a perspective, showing the invention in position; Fig. 2, a central sectional elevation; and Figs. 3 and 4, respectively, a side and an edge view of one of the sections of the apparatus.

Similar letters refer to similar parts.

The present invention affords several advantages. A large amount of heating-surface is arranged favorably with reference to the course of the heat-currents. The apparatus is simple, durable, easily made, transported, and erected. All parts of it liable to be coated with soot can be easily reached to be cleaned. It provides for an easy circulation of the water. It is chiefly composed of similar sections similarly connected, enabling the capacity of the apparatus to be increased at will by adding more of the sections. The sections are, also, so shaped and combined as to inclose a fire chamber and flue, which are enlarged and extended as the sections are added, providing additional fire room with the additional surface to be heated. Further, the arrangement of the sections enables each one of them, if desired, to be supported independently, making the structure more durable under the action of the heat. Any one of the sections, also, can be more easily reached for repair than if the sections were arranged one above another.

Referring to the annexed drawing, A A A A A A A A represent my improved apparatus, it being composed of a horizontal series of similar hollow sections, arranged vertically, as shown, and similarly connected at B B^1 B^2, and a hollow deflector, C, arranged horizontally above the sections. The shape of a section, as seen more plainly in Figs. 3 and 4, may, in this general outline, be described as of a horseshoe form. The top *a* of the section is considerably larger in cross-section than the legs *a' a'*. The sections are connected at the top at B, and also at the bottom of each leg at B^1 B^2. One of the last-named connections would render the invention operative, but the two connections are preferable. The desirable method of connecting the sections is the one shown, viz., a tubular projection, *b*, engaging in a tubular socket, *b'*, each section being provided on one side with a series of sockets, and on the other side with a series of projections. These joints are suitably calked. I do not desire to be confined to this kind of connection.

When the various sections are united and in position, their combined shape is such as to nearly inclose a fire-place, D, the sections being separated slightly from each other, to provide flues *d d d*, through which the heat-currents pass both laterally and vertically, and respectively beyond the sides and top of the sections. The latter, at the outer side of each leg, are preferably enlarged, so as to nearly bring the sections together at that point. The structure is supported on a bed-plate, E, Fig. 1, being preferably raised therefrom by means of legs *e e*. If desired, the legs may be inserted under each section.

The hollow deflector C is large enough, and of suitable shape, to extend over the sections. It is raised a short distance above them, as shown. Connections *c c'*, similar to the connections *b b'*, serve to unite the interior of the sections with the interior of the deflector. F represents the fire-grate.

The water flows into the apparatus at *d' d'*, and the outflow is at *f f*. One only of these openings *d* and *f* is sufficient to render the invention operative. The heat-currents radiate from the fire-place D laterally underneath and between the sections, into the usual flue-space surrounding the apparatus and inside the inclosing-wall G; but the larger portion strikes upward against and between the tops *a a* of the sections, and thence upward, encountering the deflector C, which operates to throw the heat down again onto the sections. This enables the heat to be utilized to great advantage, the deflector both supplying additional heating-surface and aiding in directing the heat onto the lower portion of the apparatus.

In a heating apparatus, a part such as this deflector must be heated evenly, to avoid breaking it. I accomplish this by means of the series of flues *d d d d d d*. The heat, ascending equally through all of them, warms all parts of the deflector simultaneously and alike, and its durability is thus insured.

By reason of the shape of the sections, the water flows easily and rapidly upward through them into the deflector, causing a brisk circulation.

In practice, I preferably make the connections B B^1 B^2 on the end sections slightly unlike those on the intermediate sections. On the front end section A^1 the connections B B^1 B^2 are made large enough to enable the next set of joints to be readily reached for calking, and when all the sections are put together the upper opening B is suitably closed, as shown in Fig. 1, and on the rear side of the rear section A^2, there is no opening at the top of the section. Therefore, when more sections are added to the apparatus, I remove the front section A^1 and insert the additional sections between it and the remaining ones of the apparatus, and then replace the section A^1.

I am aware, in hot-water heating devices, that a single casting, having a horizontal upper portion, and a series of vertical portions attached to, and depending from, the horizontal portion, has been designed, and also that a series of sections have been placed closely against each other without any flues between them; but, in the first-named construction, the heat-currents cannot pass directly upward between and above the vertical portions, nor can the device be enlarged, and if any portion of the device is injured, the entire structure is rendered useless, and in the last-named device there is no provision for the heat-currents to pass between the sections, nor is there any deflector above.

What I claim is—

1. A sectional hot-water heating apparatus, consisting of the sections A A A A A A A A, and the flues *d d d d d d*, constructed, arranged, and operating substantially as described.

2. The combination of the sections A A A A A A A A, the flues *d d d d d d*, and the deflector C, arranged above the sections, substantially as described

3. The combination of the fire-place D, the series of flues *d d d d d d*, and the detached deflector C, substantially as described.

EDWIN W. KEMPIN.

Witnesses:

CHRISTOPHER BRANCH,

SAML. S. BOYD.