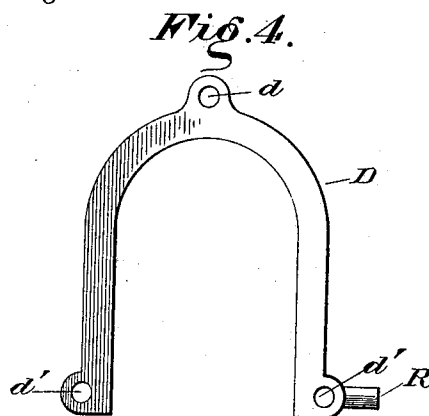
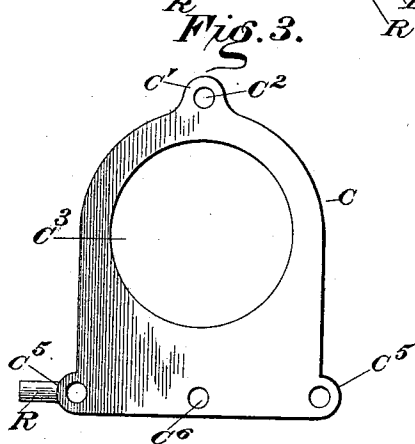
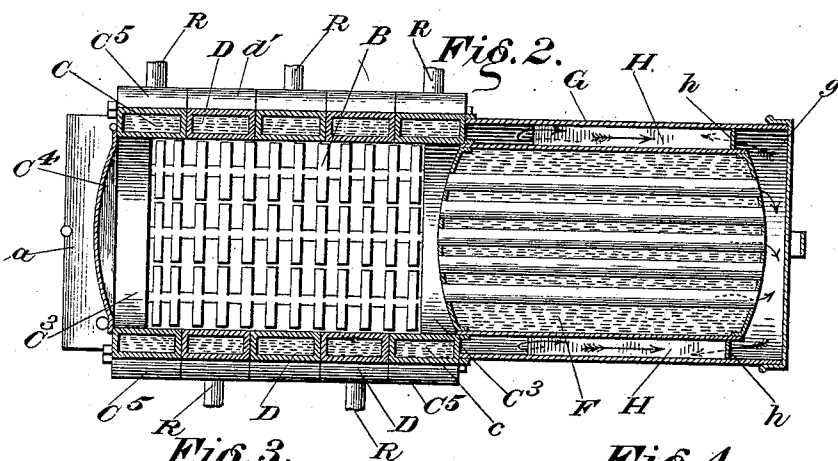
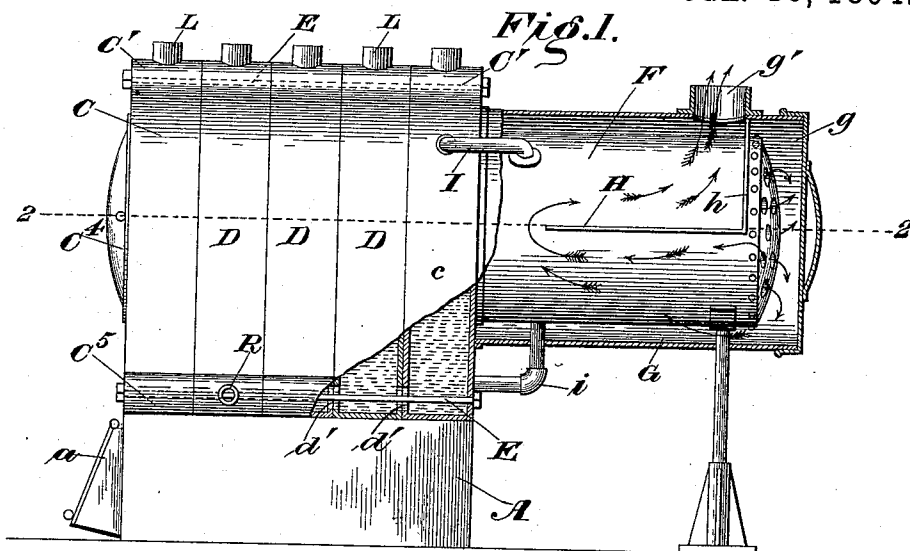


(No Model.)

G. H. HERSEY.
TUBULAR AND SECTIONAL BOILER.

No. 513,045.

Patented Jan. 16, 1894.



Witnesses

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE H. HERSEY, OF CLIFTON, NEW JERSEY.

TUBULAR AND SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 513,045, dated January 16, 1894.

Application filed August 2, 1893. Serial No. 482,185. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HERSEY, of Clifton, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Tubular and Sectional Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention is an improved combined sectional and tubular boiler especially designed for use in heating buildings.

Its objects are, first, to provide water legs of simple and improved construction, any desired number of which may be employed together according to the desired capacity of the boiler, and second to combine therewith a tubular boiler whereby the heat of the products of combustion may be more thoroughly utilized.

The invention therefore consists in the novel construction of the water legs or sections, and in the novel combination of parts, and details hereinafter specifically explained, and illustrated in the drawings, in which—

Figure 1 is a side elevation of the improved boiler, parts being removed or broken away to more clearly show up the construction thereof. Fig. 2 is a longitudinal horizontal sectional view through the same on line 2—2 Fig. 1. Fig. 3 is a detail face view of a front or rear section detached, and Fig. 4 is a detail view of an intermediate section detached.

A designates the base section of the boiler which is of any desired construction and in it is mounted the grate B also of any desired construction, a door *a* in the front end of the base permitting access to the ash pit. Upon this base are mounted the water leg sections C, D, *c*, of the boiler.

C is the front section wide enough to rest upon the sides of the base, arched at top and having a top protuberance C' in the sides of which are openings C² for the passage of water and of the section tie-rods E. This section also has a large opening C³ through it which has no communication with the waterspace therein, however, but through which access is had to the fire chamber. This opening is closed

by a suitable door C⁴. At the lower corners of the sections are slight off sets C⁵ in the sides of which are openings for the passage of water and of the tie rods as indicated. The section may also have a drain or cleaning out opening C⁶ in its lower portion. Section *c* is the rear section and is constructed like section C, like parts of these sections being similarly lettered. The sections D, D, are arranged intermediate sections C, *c*, and are simply U-shaped water legs corresponding in external contour to sections C, *c*, and having water passages *d* at top, and *d'* at bottom on each side.

In building the boiler the sections D, D, are set one beside the other and sections C, *c*, at opposite ends of the group of sections D, D. Tie rods E are then passed through the coinciding openings C², *d*, and C⁵, *d'* of the several sections and secured by nuts as usual, binding the sections firmly together. Any suitable packing may be interposed between the sections; this however not forming any part of my present invention, I do not show in the drawings. When so arranged it will be apparent that water can circulate between the several sections through the adjoining openings C², C⁵, *d*, *d'* therein and thus an equal dispersion of heat through the water is attained.

The sections D, D, constitute the roof and sides of the fire chamber, and sections C, *c*, the front and rear walls thereof respectively.

F designates a tubular boiler of any suitable construction of a diameter however corresponding to the opening C³ in section *c*, into which opening one end of the tubular boiler is fitted. This boiler is inclosed by a shell G of any suitable construction, of such interior diameter as to leave an air space or chamber around the boiler F as shown.

An opening *g* closed by a suitable door is made in the rear end of casing G so that access can be had to the boiler flues. The rear end of casing and boiler may be supported in any suitable manner. The smoke exit *g'* is in top of casing G and in order to cause the products of combustion to traverse the space between the boiler and casing I employ the horizontal side partitions H, H, which extend from the rear end of boiler F nearly to the

section *c*, and a saddle-partition *h* which is interposed between the exit *g'* and the rear end of boiler *F* straddling over the latter and connected to the rear ends of partitions *H*.

5 By this arrangement the products of combustion after passing through the boiler flues are compelled to move backward around the outside of the boiler, below partitions *H*, and then up again to the exit as indicated by the
10 arrows in Figs. 1 and 2.

The upper part of the water or steam space of the boiler *F* communicates with the upper part of section *c*, or sections, by a pipe *I* or in other suitable manner, and the lower
15 part of the water space in boiler *F* communicates with the lower part of the sections by a pipe *i*. By this means a circulation of water through the several sections and boiler is procured, and much heat saved that would
20 otherwise escape with the products of combustion from the fire chamber. It will be obvious that by increasing or diminishing the number of intermediate sections *D*, the capacity of the boiler will be correspondingly
25 increased or diminished.

The feed pipes *L* leading to the radiators may be connected directly to the tops of the sections, and the return pipes *R*, directly to the lower ends thereof as indicated in the
30 drawings.

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

1. The combination of the sectional boiler, with a tubular boiler having one end fitted 35 into an opening in the rear section of the sectional boiler, communications between the water spaces of said boilers, and a casing enclosing the tubular boiler, and partitions between said casing and boiler whereby the pro- 40 ducts of combustion after passing through the sectional boiler and tubes are caused to pass around the outside of the tubular boiler, substantially as specified.

2. The combination of the front and rear 45 water holding sections *C*, *c*, and the intermediate series of U-shaped water holding sections *D*, *D*, with a tubular boiler connected to the rear section, its flues communicating with the fire space, and connections between 50 the water spaces of the tubular boiler and the sections all constructed substantially as and for the purpose described.

3. In a water heater the combination of the base, the water holding sections *C*, *D*, *D*, *c*, 55 mounted thereon, the tubular boiler *F*, the casing surrounding the same, and the partitions *H*, *h*, and pipes *I*, *i*, all constructed substantially as and for the purpose set forth.

In testimony that I claim the foregoing as 60 my own I affix my signature in presence of two witnesses.

GEORGE H. HERSEY.

Witnesses:

WILLIAM J. BRIODY,
JOHN HOPPER.