

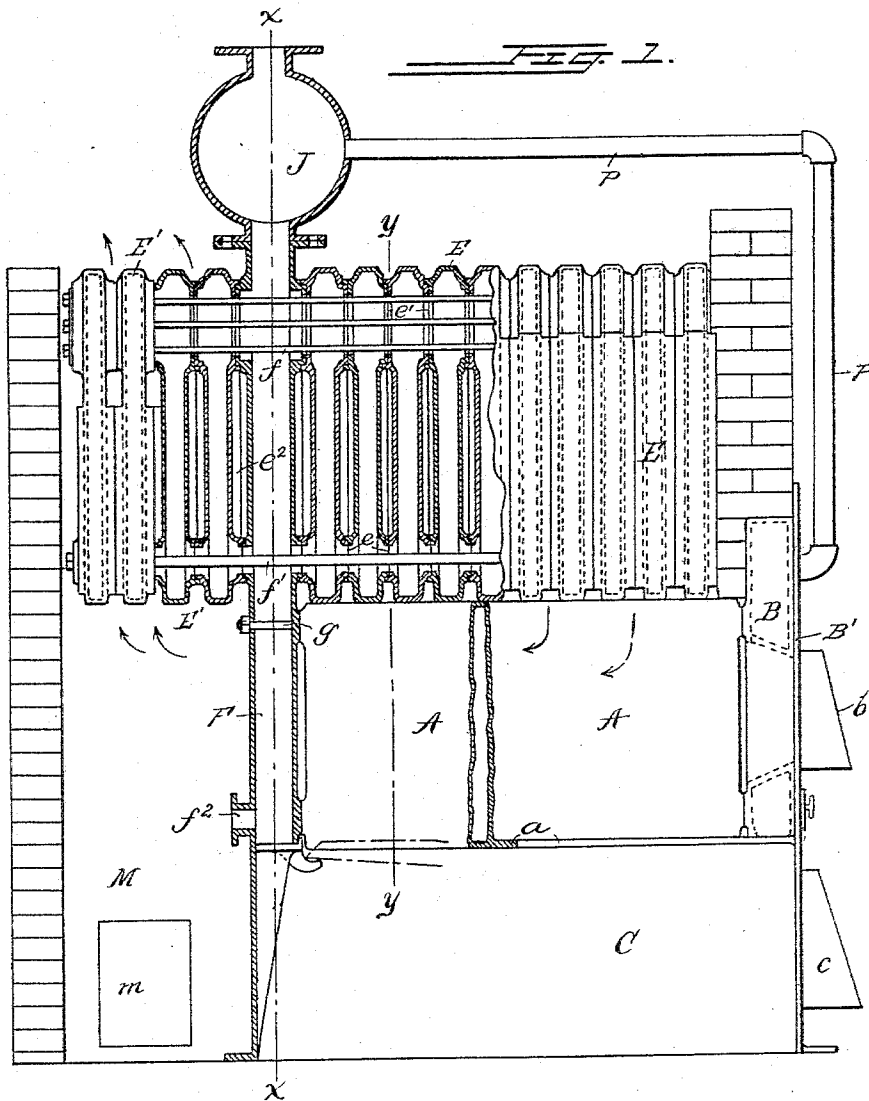
(No Model.)

2 Sheets—Sheet 1.

D. L. ADAMS.
STEAM OR HOT WATER HEATER.

No. 532,014.

Patented Jan. 8, 1895.



Witnesses

E. A. Kelly
David L. Swan

DANIEL L. ADAMS

Inventor

By Attorney

J. H. Hunt

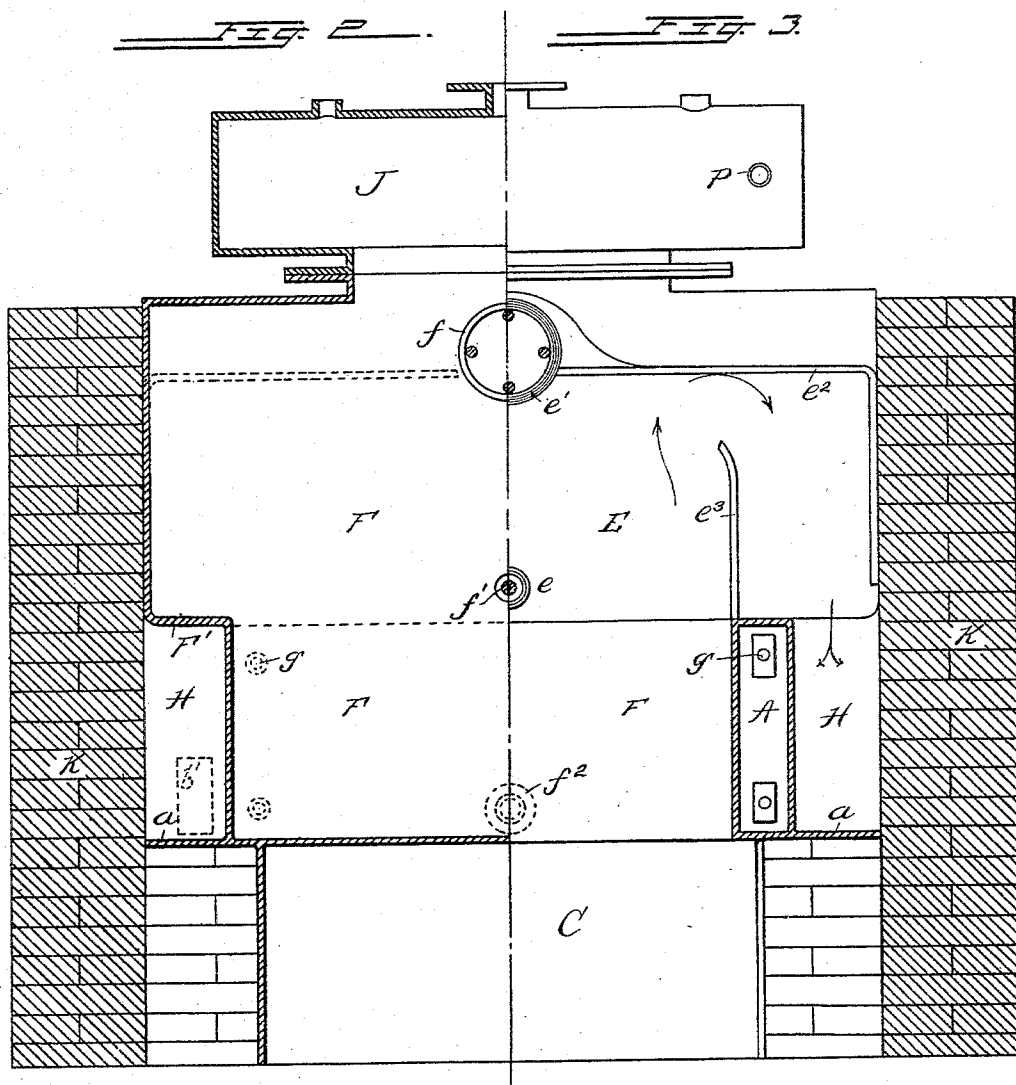
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UNITED STATES PATENT OFFICE.

DANIEL L. ADAMS, OF READING, PENNSYLVANIA.

STEAM OR HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 532,014, dated January 8, 1895.

Application filed April 27, 1894. Serial No. 509,215. (No model.)

To all whom it may concern:

Be it known that I, DANIEL L. ADAMS, a citizen of the United States, residing at Reading, county of Berks, State of Pennsylvania, have invented certain Improvements in Steam or Hot-Water Heaters, of which the following is a specification.

This invention relates particularly to that class of heaters which are designed to generate either steam or hot water to be circulated through a system of piping.

The main object of the invention is to provide a sectional heater of this class in which the products of combustion will be brought in contact with a large amount of water surface so as to abstract the greatest practicable amount of heat therefrom.

Further objects are to provide for easily keeping the heater clean and in general to make the construction simple and not apt to get out of repair, and the operation easy, satisfactory and economical.

The invention is fully described in connection with the accompanying drawings and is specifically pointed out in the claims.

Figure 1 is a side elevation of my improved heater with the brick setting removed, and showing some of the parts in section. Fig. 2 is a half cross-section on line X X of Fig. 1. Fig. 3 is a half cross-section on line Y Y of Fig. 1.

The fire-box is formed by side-wall water sections A A, a front wall section B and a rear wall section F, each of which sections are separate castings and all of which are held together by means of suitable rods or bolts *g* so as to form communicating water chambers.

Supported upon the top edges of the side wall sections A A are a series of cast iron water sections E extending transversely and connected together by means of rods or bolts *f f'* and suitable joints so as to likewise form communicating water chambers directly over the fire. These roof sections extend sidewise beyond the side walls A A of the fire box, the overhanging portions forming the roof of side chambers or passage-ways H H, and they are provided with partition ribs *e² e³* on their meeting faces which are brought nearly or quite in contact with each other when the joints at *e e'* are drawn together.

The rear wall section F of the fire box is

extended upward and the portion above the fire-box corresponds in shape with the roof sections E E to which, as well as to a similar series of sections E' E' at the rear of the section F, it is connected by means of the rods *f f'* thus placing all the water sections in communication.

A drum J is secured to the top of the section F for steam or hot water as the case may be, and this is connected by a circulating pipe P P with the front water section B. Suitable outlets are provided from the drum J and also a return pipe connection *f'* near the bottom of the section F.

The side sections A A are provided with outwardly projecting shelves or brackets *a* which form the bottom of the closed chambers or passage ways H H and the brick setting K is arranged to form the outer walls of the same. These passage ways H thus extend from the front plate B' of the heater backward past the rear-wall section F, the width of the lower portion of which as before stated corresponds with the total width of the fire-box outside of the side sections A A while the upper portion overhangs at F' in the same manner as do the sections E.

The front section B is provided with cleaning doors opening through the plate B' into the passage ways which allow any dirt collecting in the latter to be conveniently pushed backward off the shelf *a* into the rear compartment M from which it may be removed from time to time through a door *m*.

b represents the fire door; *c*, the ash-pit door and C the ash pit.

The partitions *e³* on the meeting faces of the sections E and F guide the products of combustion as they rise from the fire directly upward between the sections to the top partitions *e²* which divert them downward to the right and left as indicated by the arrows into the side passage-ways H H. Here they are brought into direct contact with the outer wall of the side water sections. From these passage-ways they pass to the rear of the section F and then upward through the series of sections E' as indicated by the arrows to the chimney. The sections E' differ from the roof sections E in not being provided with the partitions *e³* and in having the partitions *e²* cut away in whole or in part so as to leave

a sufficient area of outlet between the sections for the passage of the products of combustion to the chimney.

The different sections of my improved heater are cast in convenient shape and are so connected and arranged as to provide for the proper circulation of water through them and at the same time so as to present a very large amount of water surface to direct contact with the products of combustion.

It will be noticed that by causing the roof sections E. to project beyond the side walls of the fire-box and providing passage ways below their overhanging portions for the products of combustion, the amount of heating surface in these sections in relation to the grate area is much increased; also that the rear sections E' serve to utilize a considerable amount of heat which would otherwise escape unused through the chimney. All the sections being arranged vertically effectually prevents the accumulation of dirt upon the water surfaces and provision is made for conveniently removing the dirt from wherever it can collect.

Having thus fully described my invention, I do not desire to limit myself to the exact construction shown, but what I claim is—

1. In a hot water or steam heater a series of connected water sections arranged transversely above the fire-box, said sections projecting beyond the side walls of the fire-box and being provided with partitions whereby the products of combustion are made to pass upward between the sections and then downward between the same to side passage ways outside of the fire walls, the projecting portion of said sections forming the roof of said passage ways and the latter being arranged in communication with the chimney, substantially as set forth.

2. In a hot water or steam heater a series of connected water sections arranged transversely above the fire-box, said sections being provided with partitions whereby the products of combustion are made to pass upward between them and then downward to passage

ways outside of the fire walls, the projecting portions of said sections forming the roof of said passage ways, in combination with a rear wall fire box section and a series of water sections to the rear thereof arranged in communication with said roof sections and between which the products of combustion are made to pass on their way from said side passage-ways to the chimney, substantially as set forth.

3. A hot water or steam heater comprising separately formed water sections for the front, rear and side walls of the fire box and a series of separately formed sections for the roof of the same, said roof sections being arranged to rest upon and project beyond the side walls and the latter being provided with bottom brackets projecting therefrom a distance corresponding with the projection of the roof sections and thereby forming in connection with the casing outer chambers or passage-ways for the products of combustion, substantially as set forth.

4. In a hot water or steam heater the rear wall section F of the fire-box having its lower portion of the same width as the outside of the fire-box and its upper portion of greater width, said upper portion being extended above the roof of the heater and terminating in a steam or hot water drum, substantially as set forth.

5. A hot water or steam heater having a series of water sections arranged above the fire and a similar series back of the rear wall of the fire-box, chambers or passage-ways on either side of the fire-box and opening through said rear wall, and a rear chamber containing said rear water sections and arranged to serve also as a cleaning chamber, and cleaning doors at the front end of said passage-ways, substantially as set forth.

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

DANIEL L. ADAMS.

Witnesses:

ED. A. KELLY,

ADAM L. OTTERBEIN.