

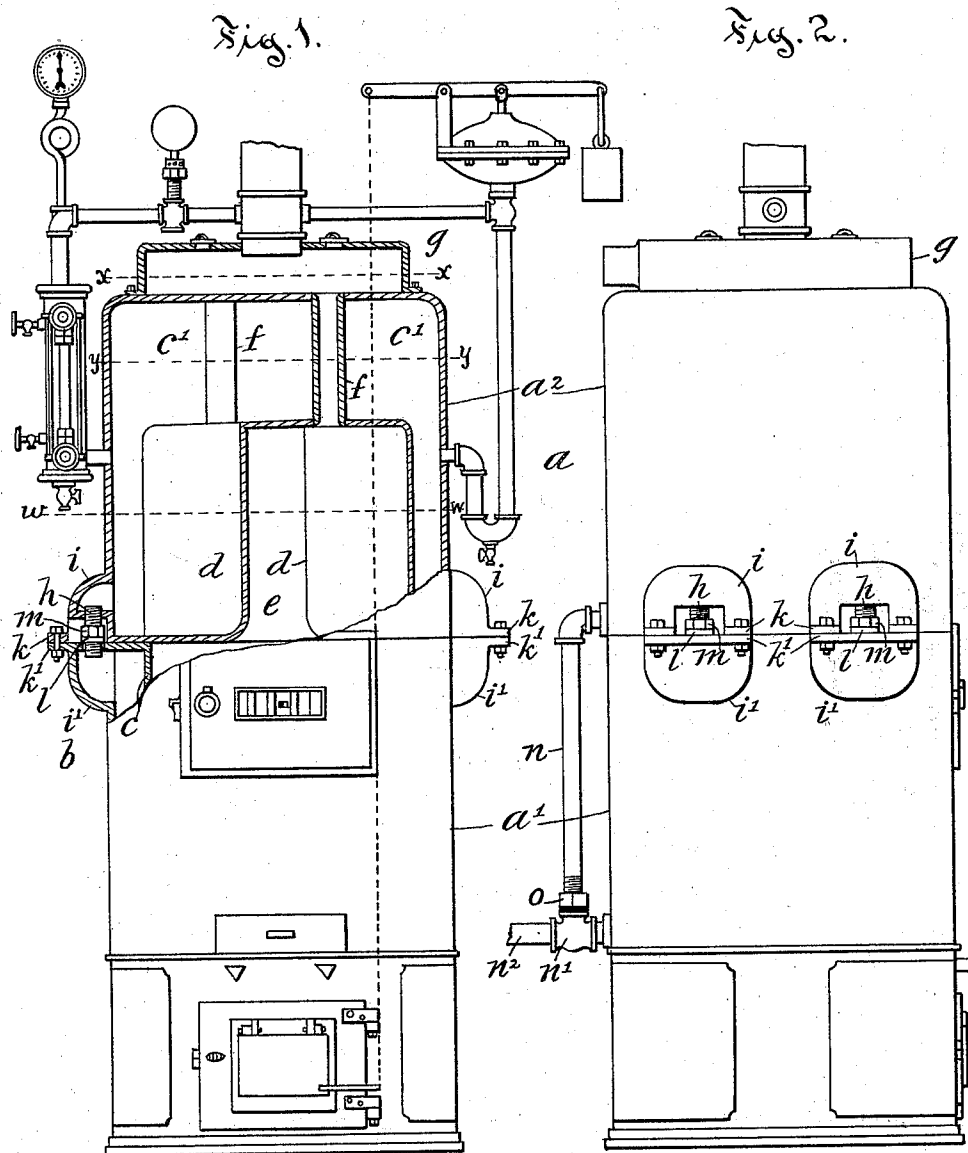
(No Model.)

2 Sheets—Sheet 1.

W. VANDERMAN.
STEAM OR HOT WATER HEATER.

No. 550,734.

Patented Dec. 3, 1895.



Witnesses:

J. A. Cantin.

Arthur B. Jenkins.

Inventor:

William Vanderman

By Chas. L. Burdett,
attorney

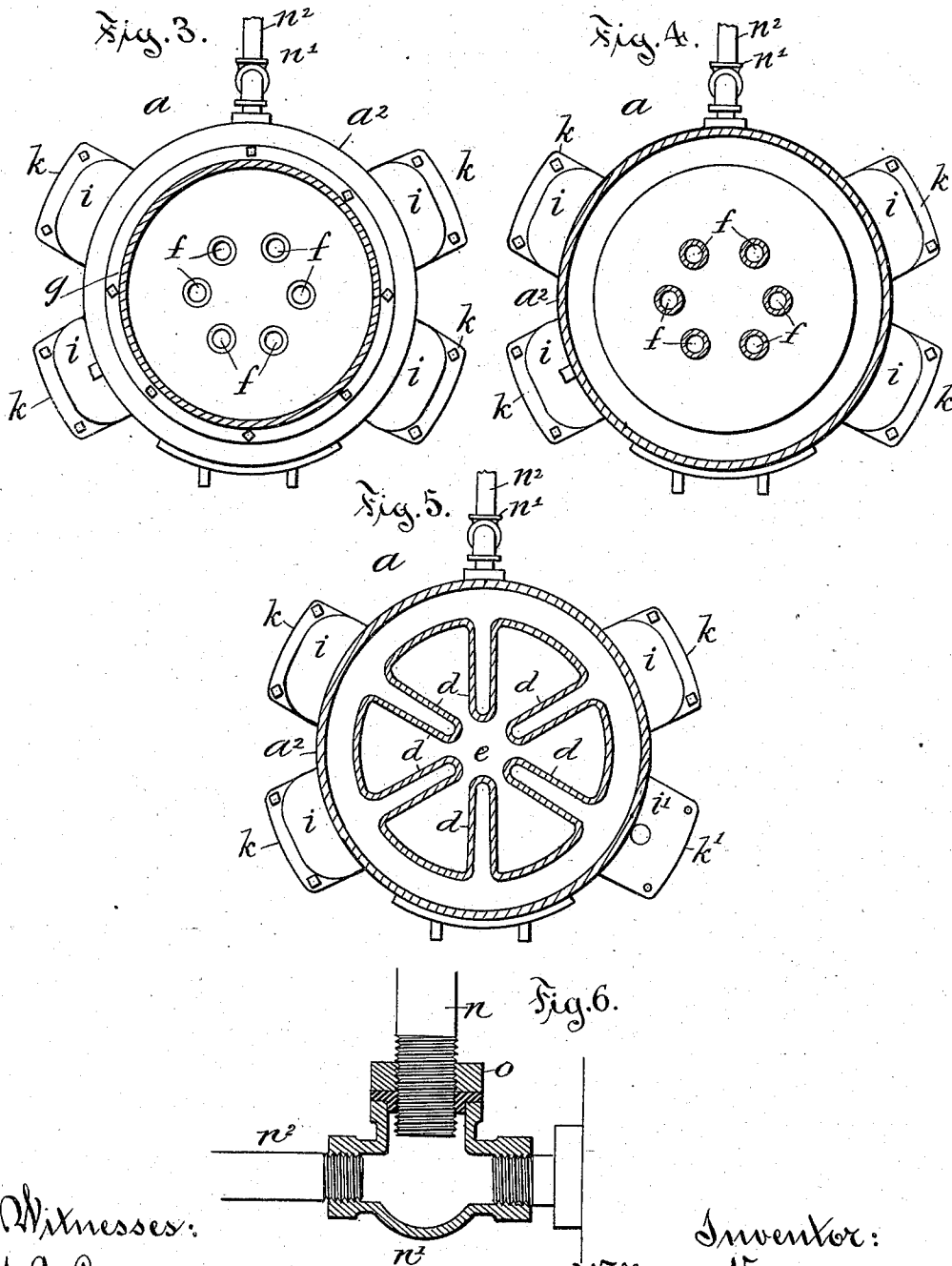
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UNITED STATES PATENT OFFICE.

WILLIAM VANDERMAN, OF WILLIMANTIC, CONNECTICUT.

STEAM OR HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 550,734, dated December 3, 1895.

Application filed May 19, 1894. Serial No. 511,759. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM VANDERMAN, a citizen of the United States, and a resident of Willimantic, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Steam or Hot-Water Heaters, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide an apparatus for heating buildings by the generation of steam or the heating of water, the circulation of such heated fluid throughout a system of piping, and of radiators or coils connected up to the heater, such apparatus embodying features of construction which enable a greater economy in consumption of coal and the construction of the apparatus to be observed.

To this end my invention consists in the details of the several parts making up the boiler or heater and in the combination of such parts, as more particularly hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a view in front elevation of my improved boiler with parts cut away to show construction. Fig. 2 is a detail view in side elevation of the structure with parts cut away in section. Fig. 3 is a detail view in cross-section on plane denoted by the dotted line $x x$ in Fig. 1. Fig. 4 is a detail view in cross-section on plane $y y$ of Fig. 1. Fig. 5 is a detail view in cross-section on plane denoted by the dotted lines $w w$ in Fig. 1. Fig. 6 is a detail view on enlarged scale of the pipe connection and packing.

In the accompanying drawings the letter a denotes a boiler, preferably cylindrical and of the water-leg type, the two shells $b c$ forming an annular space at the lower part of the boiler, which is made in several sections $a' a^2$, secured together by devices and means, as hereinafter described. The upper section a^2 has a dome c' the space being a continuation of the annular space below, and wings d extend inward from the inner wall of the boiler in that part above the fire-pot which may be called the "combustion-chamber" e . These wings d are intumed extensions of the inner wall of the boiler, the narrow space or cham-

ber in the hollow wings opening along the side and top into the water and steam space between the walls and through the crown-sheet into the dome. This construction of the inner wall exposes a large extent of boiler-surface to the action of the heated products of combustion, and as the hollow space within the wings is thin the heat acts rapidly to generate steam or to raise the water to a temperature sufficient for the purpose of securing efficient circulation for heating purposes.

In the form of the improvement illustrated smoke-flues f are formed through the dome, and they are arranged with reference to the wings so as to cause the gases and heated products of combustion to circulate freely along the sides of the wings and disperse away from the vertical center of the combustion-chambers. A smoke-box g crowns the dome, and the flues f all communicate with that, and from it the smoke passes out through a central flue or flues.

The two or more sections into which the boiler is divided are united by means of clamping-bolts, which extend through holes in lugs on the respective parts, which register with each other, while the water-spaces are united by a tubular connection h of peculiar construction. Each section $a' a^2$ of the boiler is complete as to the chamber between the shells and has what may termed "end walls," those adjacent to each other forming the contact-surfaces, the several sections being of substantially the same internal and external diameter; but projections $i i'$ are formed on the several sections. These projections include flanges $k k'$, having registering openings through which bolts pass and serve by means of nuts to secure the boiler-sections together. Provision must be made for the free circulation of water or steam between the several sections, and this is afforded by the chamber in the projections having registering openings through the bottom wall of one section and the top wall of the opposite section. Each tubular connection h is secured to one of the boiler-sections in such opening, as described, either by screwing it into the threaded socket in the wall, or the projection may be cast integral with the wall; but it is preferred to use a threaded tube and secure the parts by screwing the tube into the socket, as

stated. The opening in the opposing wall is larger in diameter than the tube, so as to enable the adjacent boiler-sections to be fitted together without requiring absolute accuracy or nicety of fit to bring the parts into alignment, such as is required in prior constructions, where both sockets are threaded and the tubular connection is screwed into both such sockets.

10 The connection h extends into what may be called a "free socket," an annular packing l having been slipped upon the section under a packing-nut m , and the latter is screwed down, so as to force the packing onto the end wall of the boiler-section and securely close the joint, making it steam and water tight. The boiler-sections are held together by the bolts and nuts described, which extend through the flanges, so that the tendency of this packing device to force the boiler-sections apart is resisted.

The several separate boiler-sections (in this case the two parts a' a'') are provided with a tubular connection n , which is a pipe long enough to extend from the bottom of one section to the bottom of the other and unites the water-ways in the sections. The pipe n is preferably connected by a nipple and elbow to one section at one side of the boiler and at its other end extends to an opening in a T n' , larger in diameter than the threaded lower end of the pipe, the T being in the return-pipe n'' in this case, which is connected to the lower section. A nut o on the threaded end of the pipe, which projects into the unthreaded socket, is used to press upon the packing, so as to form a screw-joint. The object of this construction of parts is found in the convenience with which the boiler parts are assembled, either in setting up the furnace or in making repairs. When the boiler-sections are placed in position, the end of the pipe n , bearing the packing-nut, is thrust into the unthreaded socket. The pipe is then swung into line and inserted in the threaded opening, (as in the elbow,) and then the nut o is screwed onto the packing to close the small annular opening about what may be termed the "free" end of the pipe. A main advantage of this feature of construction is that the several sections of such a boiler may be securely fitted together and perfect joints made by the exercise of less skill in construction of the sections and the connecting-pipes, and also less skill in setting up the apparatus.

The boiler is fitted with the usual appliances, as water-gage and damper-controller, and provision is made for connecting with the boiler the usual risers and returns of the heating system.

I claim as my invention—

1. In combination in a boiler having an an-

nular water chamber between the inner and outer shells, a comparatively small central smoke flue located within the dome section of the boiler, smoke flues extending radially from said central opening to the wall of the annular water chamber, a communicating passage between the smoke flues and smoke box, and the smoke box, all substantially as described.

2. In combination in a boiler having an annular water chamber between the inner and outer shells, a comparatively small central smoke flue located in the dome section of the boiler, smoke flues extending radially from the central flue to the wall of the annular water chamber, smoke flues extending from the lateral flues to the smoke box, and the smoke box, all substantially as described.

3. In combination in a sectional boiler having an inner and outer shell and a dome section together, tubular connections between the sections each such tubular section being fixed in the wall of one section and having a thread extending into an opening in the wall of the opposite section larger in diameter than the exterior of the tube, a packing nut borne on the threaded tubular connection, and the wings extending radially from the inner shell of the boiler into the combustion chamber and forming narrow water chambers communicating with the annular chamber and the dome of the boiler, and the hot air and smoke flues extending between the wings and through the dome, all substantially as described.

4. In combination a sectional boiler having an annular water chamber formed between the inner and outer shell of each section, a chambered projection from the outer shell of each section, means for securing the boiler sections together, and a tubular connection fastened in the wall of one section and fitting loosely in a socket in the opposite wall of the adjacent section, a packing, and a packing nut fitting the threaded connection, all substantially as described.

5. In combination in a sectional boiler, the several boiler sections having water ways and tubular connections between the sections, a tubular connection having one end fast to one section and the other provided with a threaded end projecting into a larger and unthreaded opening in the other section, and a packing nut borne on the threaded free end of the connection, all substantially as described.

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Witnesses:

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