S. J. SHARP.

WATER HEATER.

APPLICATION FILED DEC. 2, 1915.

1,207,229.

Patented Dec. 5, 1916.

2 SHEETS—SHEET 1.

Fig. 1

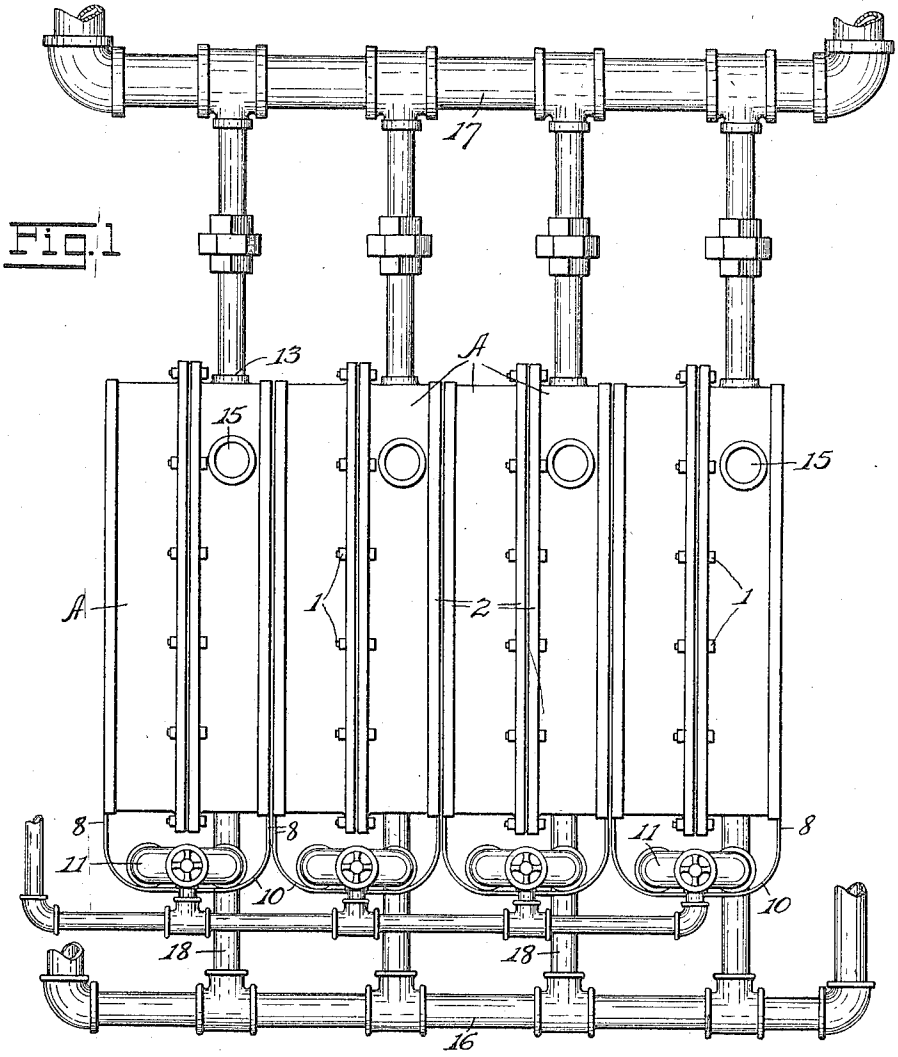
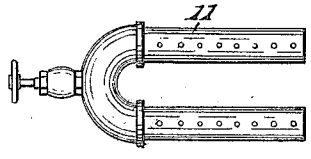


Fig. 5



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2 SHEETS—SHEET 2.

Fig. 2

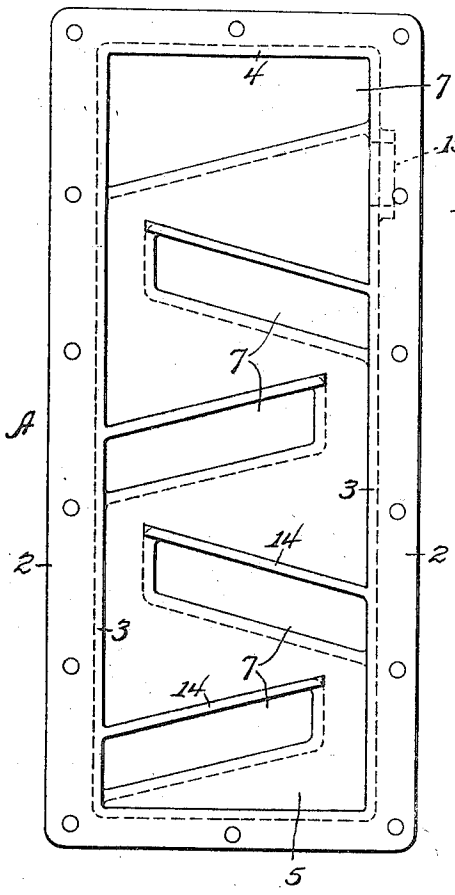


Fig. 3

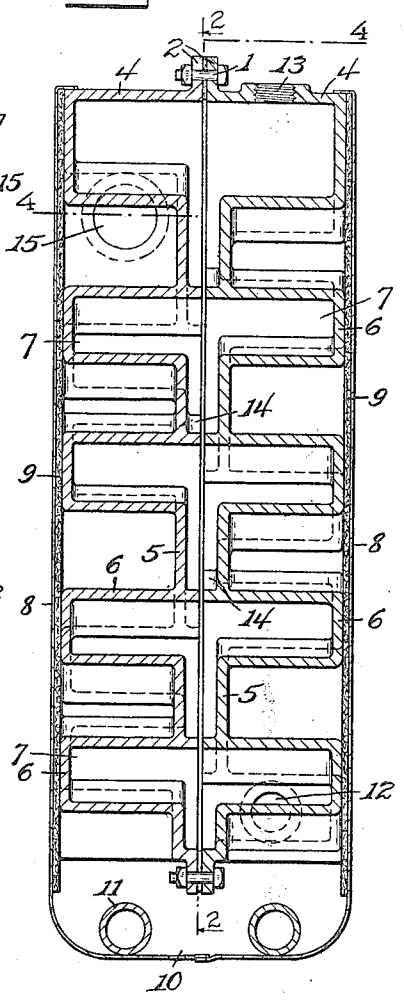
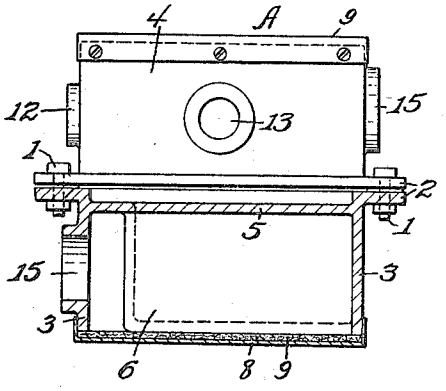


Fig. 4



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UNITED STATES PATENT OFFICE.

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WATER-HEATER.

1,207,229. Specification of Letters Patent. Patented Dec. 5, 1916.

Application filed December 2, 1915. Serial No. 64,694.

To all whom it may concern:

Be it known that I, SAMUEL J. SHARP, a citizen of the United States of America, and resident of Wheeling, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

This invention relates broadly to heating apparatus, and more particularly to a water heater.

The chief object of the invention is to provide a water heater, designed primarily for use in hot water heating systems for buildings, which is composed of units of simple and compact construction, said units being adapted to be employed singly or in batteries according to the capacity required.

A further object is to provide a heater unit composed of a pair of identical connected sections and having a form which permits of additional units being closely associated therewith in relatively small compass as the demand for an increased heating capacity may require. And a still further object of the invention is to provide a heating system in which a plurality of heater units are employed any number of which may be cut off or rendered inoperative as the demand for heat decreases.

Other objects within the contemplation of the invention are, to provide a heater of the character mentioned which is structurally simple, inexpensive and durable, which accomplishes its heating function with a minimum of applied heat and, consequently, with a minimum of fuel consumption, and which has the water passages thereof so located that they are readily accessible for the removal of accumulated sediment.

With these and other objects in view, the invention resides in the features of construction, arrangement of parts and combinations of elements which will hereinafter be fully described, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front elevation of a portion of a water heating system embodying a plurality of units constructed in accordance with my invention; Fig. 2 is an inner face view of one of the sections of a unit; Fig. 3 is a vertical sectional view of a unit; Fig. 4 is a partial top plan view and a partial horizontal section on the line 4—4, Fig. 3; and Fig. 5 is a top plan view of the burner, detached.

In said drawings, like designating characters distinguish like parts throughout the several views.

The invention embodies one or more heater units, each comprising a pair of substantially identical sections A secured together, face to face, in any suitable manner, as by bolts or rivets 1 directed through encircling integral flanges 2 formed on said sections. Each section comprises a cast iron body in one piece and having a substantially rectangular form, consisting of opposite side-walls 3, an upper end-wall 4, and a flat division wall 5, the latter being located on a plane slightly to the rear of the plane of the flange 2 and extending from one of said side-walls to the other.

Formed on the rear face of the division wall 5 is a plurality of substantially rectangular box-like receptacles 6, open in front, the interiors of which constitute water-receiving pockets 7. Said receptacles are preferably inclined and disposed in staggered relation, alternate receptacles being extended laterally from the opposite side-walls 3. Each receptacle terminates at a distance from the side-wall opposite that from which it is projected, there being thus constituted between said receptacles at the rear of the division wall 5 a tortuous passage for the products of combustion.

A back or cover 8, preferably of sheet-metal, is suitably attached to the rear face of the body, as is clearly shown in Fig. 3, an asbestos board 9 being preferably interposed between said cover and the passages inclosed thereby for the products of combustion. Said cover is extended at its lower end in curved form to provide a partial inclosure 10 for a gas burner 11 which may be of any suitable form or type, the double burner disclosed in Figs. 1 and 5 being merely illustrative of a form which is well adapted for heating the connected sections composing a heater unit. The lower curved ends of the covers 8 of the oppositely disposed sections of a heater unit meet, as shown in Figs. 1 and 3.

When the two sections A are secured together, a central passage for water is formed between the opposing division walls of said sections. Water is admitted to the lowermost pocket 7 of one of said sections

through an inlet opening 12, and thence passes outward into the passage between said opposing division walls, whence it follows a tortuous course to a discharge opening 13 located in the upper end-wall 4, being deflected back and forth across said passage and into the various pockets of said sections by means of ribs 14 disposed along the upper edges of said pockets and having their outer edges in the plane of the outer edges of the side and end walls.

As is obvious, heat emanating from the burning gas ascends between the covers 8 and the division walls 5 to suitably located discharge vents or passages 15 through the tortuous passages afforded between the receptacles 6, being deflected back and forth by said receptacles. The walls of said receptacles and the division walls present a relatively large area for receiving heat. Further, both the heat and the water are so retarded that practically all of the former is absorbed by the latter in its passage through the heater.

Due to the fact that plain flat exterior faces are presented by the heater unit, a plurality of units may be closely associated in a battery, as shown in Fig. 1, all receiving their water supply from a common source, as the supply pipe 16, and each being separately connected with an element, as the pipe 17, of a hot-water circulating system. It will be noted that additional units may be added to the battery as required for supplying additional heat; also, that by providing appropriate valves in the pipes 18 connecting the various units to the supply pipe 16 any number of said units may be cut out, as when less heat is desired in the heating system. When the water passages become clogged with sediment or accumulations of lime, access may be readily had to the same by disconnecting the unit sections, whereupon such accumulations may be removed by means of a chisel or other suitable tool.

What is claimed is—

1. A water heating unit comprising a pair of similar sections; each section consisting of side walls, a division wall extending from one side wall to the other and located adjacent to the front edges of said side walls, an inclosing cover fixed over the rear edges of said side walls, and a plurality of receptacles extending rearward from said division wall and opening outward through the latter to constitute pockets; said division wall, cover and receptacles being relatively disposed to form a tortuous passage for heat, and said sections being connected face to face to form a central passage for water defined by the opposing division walls and pockets.

2. A water heating unit comprising a pair of similar sections; each section consisting of side walls, a division wall extending from one side wall to the other and located adjacent to the front edges of said side walls, an inclosing cover fixed over the rear edges of said side walls, and a plurality of receptacles extending rearward from said division wall and opening outward through the latter to constitute pockets; said receptacles being directed laterally from opposite side walls and being of less length than the distance between the latter; said division wall, cover and receptacles being relatively disposed to form a tortuous passage for heat, and said sections being connected face to face to form a central passage for water defined by the opposing division walls and pockets.

3. A water heating unit comprising a pair of similar sections; each section consisting of side walls, a division wall extending from one side wall to the other and located adjacent to the front edges of said side walls, an inclosing cover fixed over the rear edges of said side walls, and a plurality of recptacles extending rearward from said division wall and opening outward through the latter to constitute pockets, said receptacles being directed laterally from opposite side walls and being of less length than the distance between the latter; said division wall, cover and receptacles being relatively disposed to form a tortuous passage for heat, said sections being connected face to face to form a central passage for water defined by the opposing division walls and pockets, and deflecting ribs formed on the front faces of the division walls whereby said water passage is rendered tortuous.

4. A water heating unit comprising a pair of similar sections; each section consisting of side walls, a division wall extending from one side wall to the other and located adjacent to the front edges of said side walls, an inclosing cover fixed over the rear edges of said side walls, and a plurality of receptacles extending rearward from said division wall and opening outward through the latter to constitute pockets, said pockets being disposed in staggered relation; said division wall, cover and receptacles being relatively disposed to form a tortuous passage for heat, and said sections being connected face to face to form a central passage for water defined by the opposing division walls and pockets.

5. A water heating unit comprising a pair of similar sections; each section consisting of side walls, a division wall extending from one side wall to the other and located adjacent to the front edges of said side walls, an inclosing cover fixed over the rear edges of said side walls, and a plurality of receptacles extending rearward from said division wall and opening outward through the latter to constitute pockets, said pockets being disposed in staggered relation and

having an inclined disposition; said division wall, cover and receptacles being relatively disposed to form a tortuous passage for heat, and said sections being connected face to face to form a central passage for water defined by the opposing division walls and pockets.

6. A water heating unit comprising a pair of similar sections; each section consisting of side walls, a division wall extending from one side wall to the other and located adjacent to the front edges of said side walls, an inclosing cover fixed over the rear edges of said side walls, and a plurality of receptacles extending rearward from said division wall and opening outward through the latter to constitute pockets, said pockets being disposed in staggered relation and having an inclined disposition; said division wall, cover and receptacles being relatively disposed to form a tortuous passage for heat, said sections being connected face to face to form a central passage for water defined by the opposing division walls and pockets, and deflecting ribs formed on the front faces of the division walls whereby said water passage is rendered tortuous.

7. A water heating unit consisting of a cast iron body composed of two similar sections and a cover fixed on the rear face of each section, each section comprising a division wall located a suitable distance in front of said back, said division wall and cover constituting walls of a passage for heat; said section being connected face to face to form a passage for water between the opposite division walls, and each of said division walls having rearwardly extending pockets formed therein which open into said water passage; the walls of said pockets rendering the heat passage tortuous.

8. A water heating unit consisting of a cast iron body composed of two similar sections and a cover fixed on the rear face of each section, each section comprising a division wall located a suitable distance in front of said back, said division wall and cover constituting walls of a passage for heat; said sections being connected face to face to form a passage for water between the opposite division walls, and each of said division walls having rearwardly extending pockets formed therein which open into said water passage; the walls of said pockets rendering the heat passage tortuous, and means rendering said water passage tortuous.

9. In a water heating system, a plurality of heater units disposed in a battery and having separate connections with a common source of water supply and separate connections with a water circulating system, each unit consisting of two face-to-face attached sections having two separate flues and an intermediate tortuous water passage.

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

SAMUEL J. SHARP.

Witnesses:
W. J. LEMLEY,
H. E. DUNLAP.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."