J. W. GUIMONT.

INJECTOR FOR HOT WATER HEATERS.

APPLICATION FILED MAR. 15, 1909.

935,015.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 1.

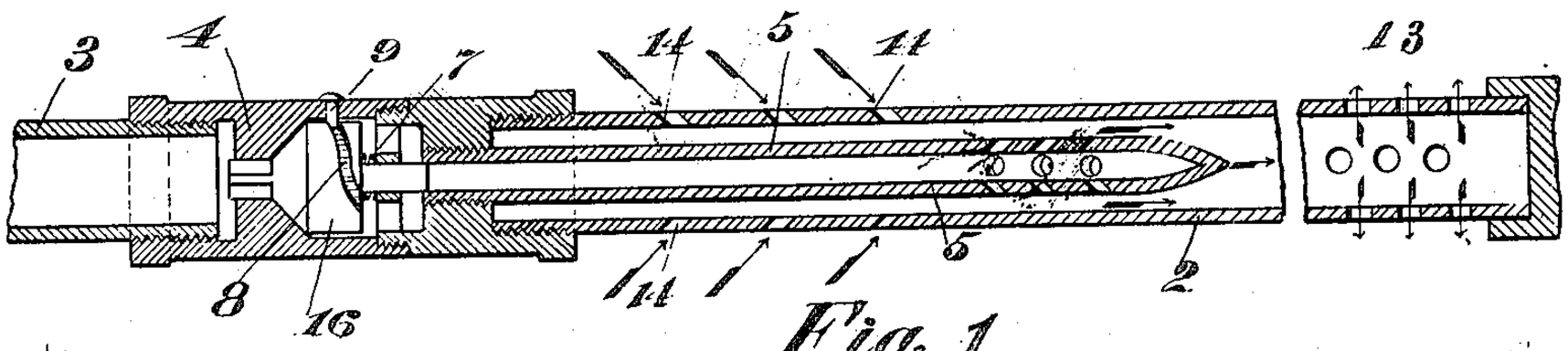


Fig. 1

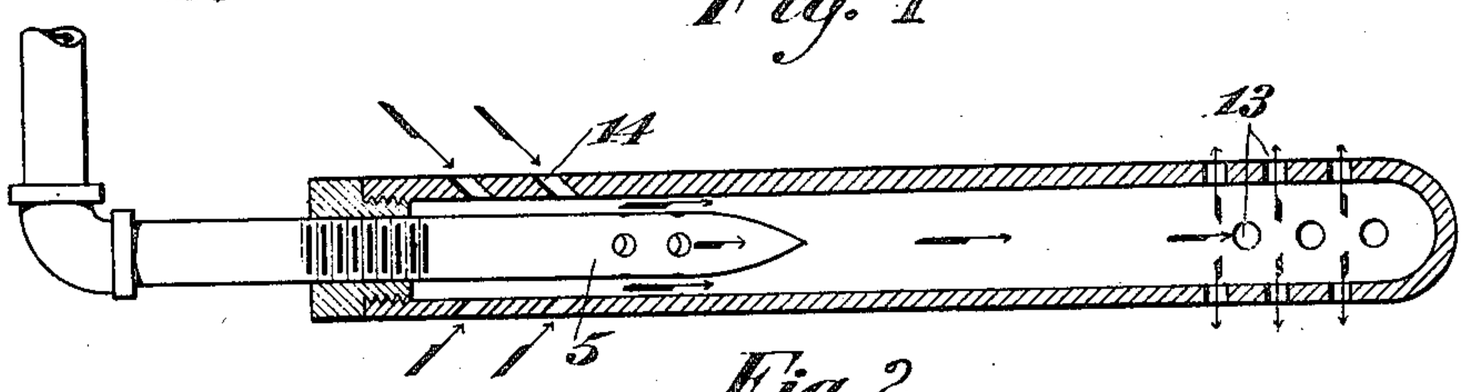


Fig. 2

JOSEPH WILLIAM GUIMONT

Inventor,

Witnesses:

L. A. Gauvin

E. Toupin

By Marion & Marion

Attorneys

J. W. GUIMONT.

INJECTOR FOR HOT WATER HEATERS.

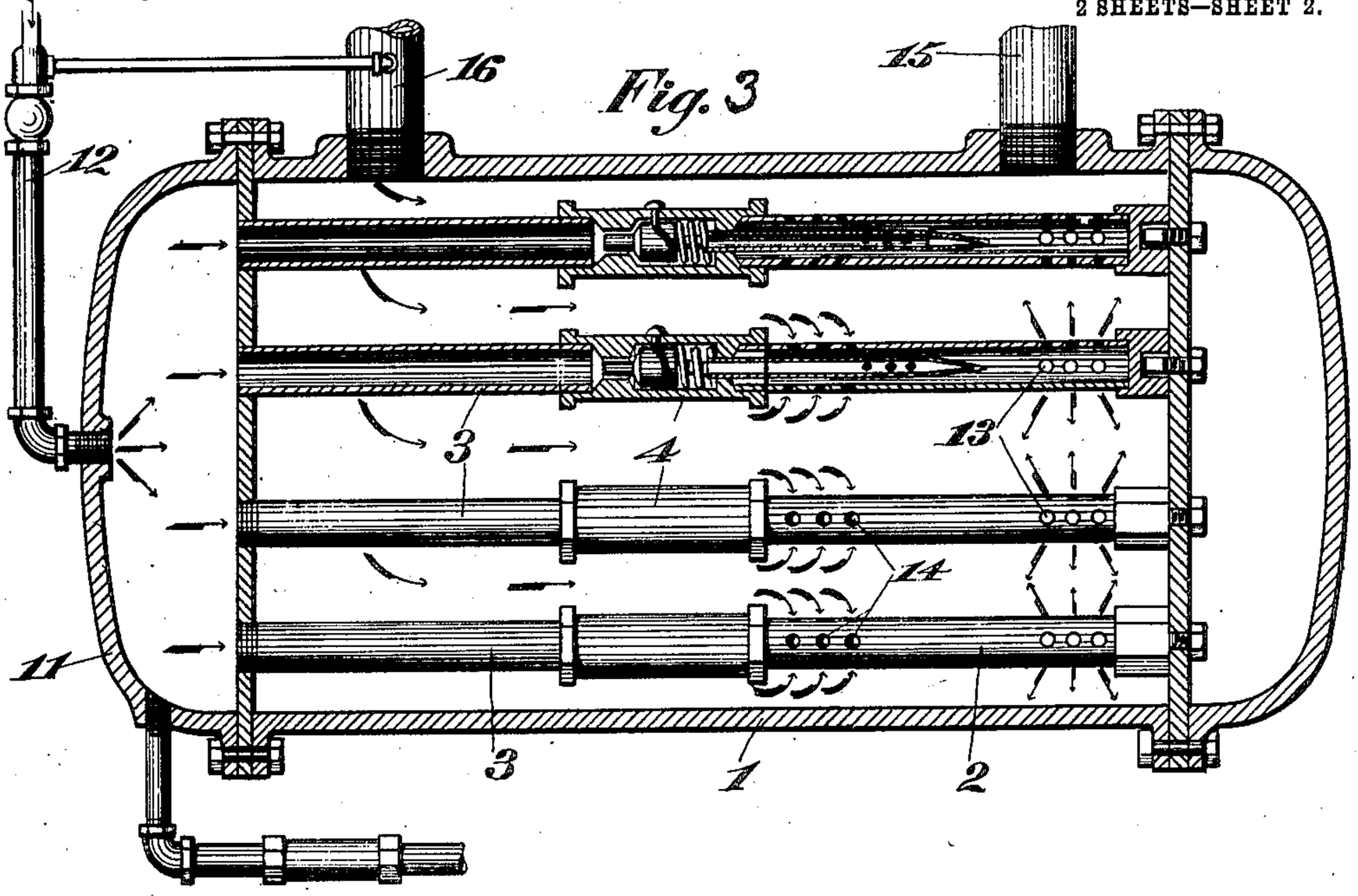
APPLICATION FILED MAR. 15, 1909.

935,015.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 2.

Fig. 3



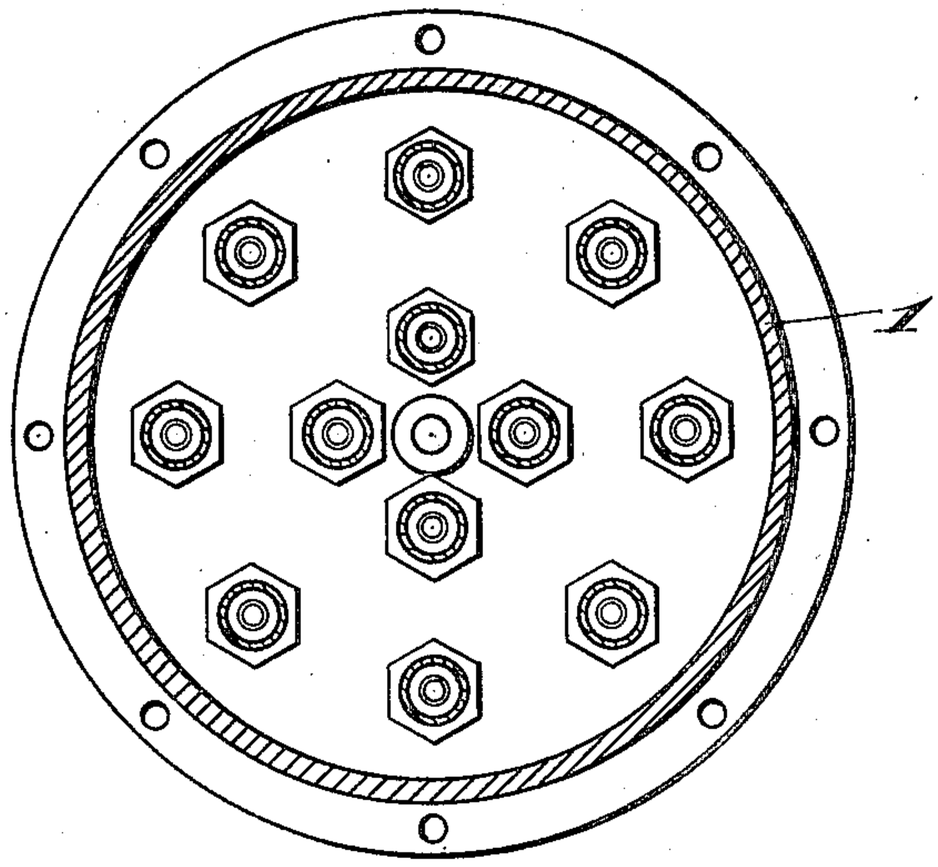


Fig. 4

Witnesses:

L. A. Gauvin

E. Toupin

JOSEPH WILLIAM GUIMONT
Inventor,

By Marion & Marion

Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH WILLIAM GUIMONT, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO DORINA LAFRAMBOISE GUIMONT, OF MONTREAL, CANADA.

INJECTOR FOR HOT-WATER HEATERS.

935,015. Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed March 15, 1909. Serial No. 483,404.

To all whom it may concern:

Be it known that I, JOSEPH WILLIAM GUIMONT, a subject of the King of Great Britain, residing at 1982 St. Denis street, Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Injectors for Hot-Water Heaters; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention to be hereinafter described relates to heaters for hot water heating systems and particularly to the combination therewith of an injector, and a special construction of check valve therefor.

Broadly speaking, it comprises a casing adapted to contain a plurality of circulating and heating tubes, means for delivering water to and from the casing, means for delivering live steam to the tubes, specially constructed check valves reciprocably mounted within the tubes, and means for mixing the live steam with the water within the casing.

In order to more clearly disclose the construction, operation and use of the invention, reference should be had to the accompanying drawings forming part of the present application.

Throughout the several figures of the drawings, like reference characters designate the same parts.

In the drawings:—Figure 1 is a longitudinal section through one of the tubes; Fig. 2 is a similar view of a modified form; Fig. 3 is a longitudinal section through a complete heater showing water pipe connections; and, Fig. 4 is a vertical cross section of Fig. 3.

When used for hot water heating systems for houses, a large heater casing 1 is provided. Within this casing are supported a plurality of longitudinal pipes comprising perforate sections 2 and imperforate sections 3, coupled together by valve casings or valve chambers 4. Extending from the valve casings are small perforated injector tubes 5 of considerably less diameter than the tube sections 2 and lying concentrically within the same. They are held in position by being simply threaded into the valve casings 4. The tube sections 2 are similarly threaded into the valve casings 4. The tube sections 3 are connected to the opposite ends of the valve casings in substantially the same manner.

Within the valve casings 4 are reciprocably mounted spring actuated check valves 6 for a purpose to be later disclosed. These valves are held normally in operative position by springs 7 disposed about the valve stems and confined between the valve faces and the usual form of spiders through which the stems pass. In order to insure smooth and regular movement of the valves and prevent pounding of the same on their valve seats, the longitudinal faces of the valves have been provided with spiral grooves 8. Pins 9 project through the valve casings and play freely within the grooves. By engagement of the pins 9 with the walls of the grooves 8 the valve bodies will be rotated as they are moved longitudinally within their casings. The upper ends of the valves are guided by vanes 10 which slide freely in openings in the valve casings.

It is desired to heat the water by direct contact and intermixture of live steam. To that end a steam chest 11 is connected to one end of the casing and adapted to receive live steam through a steam pipe 12 and deliver the same direct into the open ends of the imperforate tube sections 3 which are threaded into one head of the casing 1. The steam passes through the imperforate sections 3, through the valve chambers 4, through the injectors 5, through the perforate tube sections 2, and out through the perforations 13 thereof mixing with and heating the water as it goes. As the steam rushes from the injector nozzle or end through the perforations therein, it will create a strong suction in the adjacent portion of the perforate pipe sections 2. As a result of this suction the water in the casing will rush through the perforations 14 to the interior of the section and will be caught in the steam and driven forward with it and out through the perforations 13 in the end of the tube sections. The perforations 14 should be made with a capacity about double that of the perforations of the injector in order to insure the passage of an ample quantity of water to the interior of the tube sections for mixing with the steam. The heated water, of course, passes from the casing 1 by a delivery pipe 15 and,

after going through the heating system, returns to the casing by way of a pipe 16 for reheating.

The check valve, of course, is adapted to allow passage of steam under pressure to the injector while at the same time preventing reverse flow of water from the tube sections 2.

In small heaters where only a single tube section is necessary, the imperforate section and the valve, valve casing and steam chest may all be very well omitted and the perforate section may be simply threaded onto the injector which itself may be threaded or otherwise directly connected to the steam pipe.

The valve casing may be very conveniently made of several separable sections threaded together or otherwise connected.

It is thought that the application and use of the invention will be clear from the preceding detail description.

Changes may be made in the construction, arrangement and disposition of the several parts of the invention without in any way departing from the field and scope of the same and it is meant to include all such within this application wherein only preferred forms have been disclosed.

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

A device of the character described comprising a casing, a plurality of pipes disposed within said casing, and each comprising a perforate and an imperforate pipe section, a valve casing connecting said sections, injectors connected to said valve casings and extending within said perforate pipe sections, check valves adapted to control delivery of steam to said injectors, means for delivering steam to the aforesaid imperforate pipe sections and means for delivering water to and from said casing.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOSEPH WILLIAM GUIMONT.

Witnesses:

L. A. GAUVIN,

M. S. BABCOCK.