Aug. 8, 1933. F. S. ELRICK 1,921,735

HOT WATER GENERATOR

Filed Nov. 2, 1931

Fig. 1.

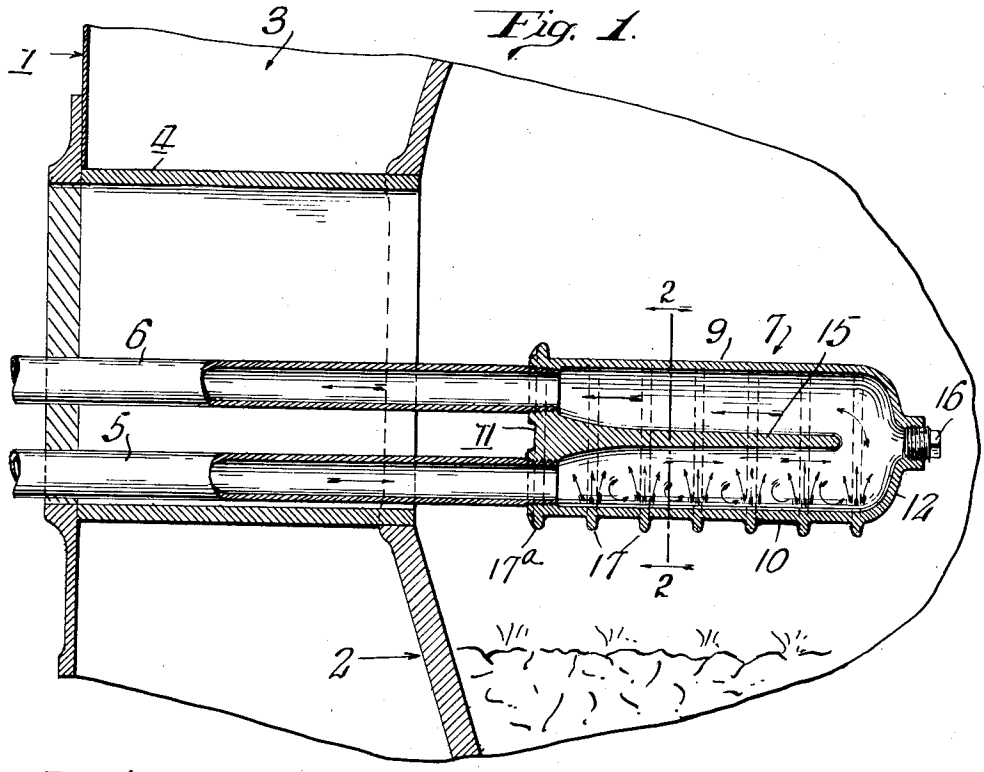


Fig. 2.

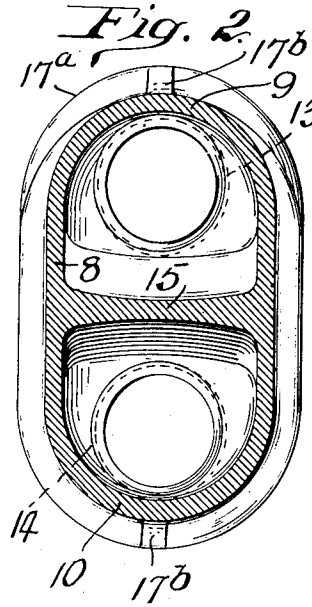
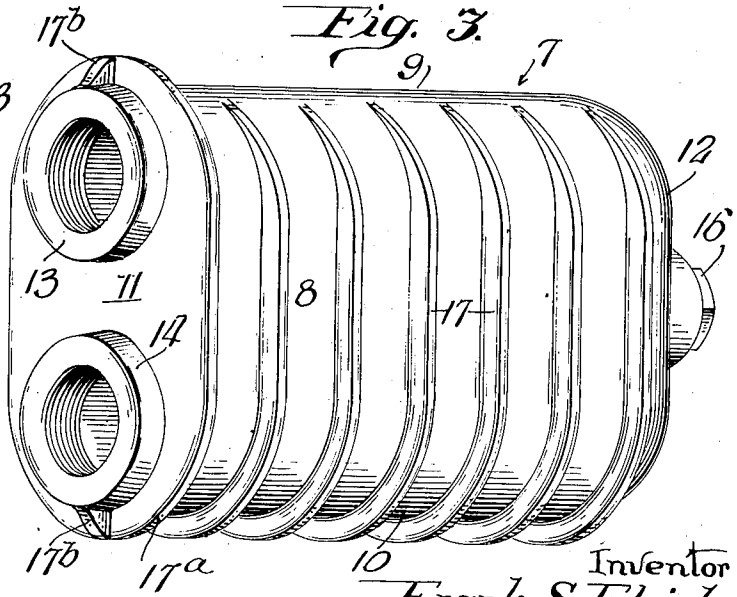


Fig. 3.



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HOT WATER GENERATOR

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2 Claims. (Cl. 122—20)

This invention relates to improvements in hot water generators and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The primary object of the invention is to provide a simple and efficient device to take the place of the return bend and pipe used in domestic furnaces and boilers for water heating purposes and which device is so formed as to prevent the precipitation and accumulation of foreign matter which heretofore resulted in clogging up said bend and pipe.

Another object of the invention is to provide a device of this kind providing a greatly increased superficial heating surface and which includes certain ribs or fins which not only greatly increase the strength of the device in resisting temperature and pressure changes, but which all act to increase the turbulence of the water therein so to prevent incrustation of the foreign matter contained in the water passing through the same.

Still a further object of the invention is to provide a device of this kind which is simple and economical to install and which can be produced at a cost much less than the inefficient return bend and pipe heretofore used for the same purpose.

The above mentioned objects of the invention as well as others, together with the many advantages thereof will more fully appear as I proceed with my specification.

In the drawing:—

Fig. 1 is a view in longitudinal vertical section through a hot water generator device embodying my invention, illustrating its location in the fire pot of a domestic heating furnace.

Fig. 2 is a transverse vertical sectional view through the same on an enlarged scale as taken on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of the same on the scale of Fig. 2.

The invention is herein illustrated and will be so described as employed in the fire pot of a domestic hot air, heating furnace but this is only by way of illustration as the device may also be employed for the same purpose in the furnaces of domestic hot water and steam heating systems, as is readily apparent.

In general, my improved hot water generator consists of a single, unitary, hollow, cast iron member intended for horizontal disposition in a fire chamber and which member is provided at one end with vertically spaced threaded openings to receive the associated inlet and outlet pipes of the water system. This member is of a horizontal length greater than its height, which in turn is greater than its width. Within said hollow member and extending longitudinally from one end thereof is a partition which stops short of the other and somewhat rounded end of said member so as to provide a U-shaped passage in said member, the legs of which each have a cross sectional area greater than that of the associated inlet and outlet pipes.

On the outer surface of the member are longitudinally spaced ribs extending up along each side and around the bottom of said member and these ribs function not only to brace the member against pressure and temperature changes, but also to provide areas within the member wherein water turbulence is accelerated to insure against the incrustation of the solids in the water upon the inside of the member.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawing:—1 indicates the shell or casing of a domestic, hot air, heating furnace and 2 indicates the fire pot spaced within the same to provide the usual air heating space 3 and 4 indicates the usual conduit between said casing and fire pot, closed at its outer end and disposed in a plane above the high level of the fire bed. This conduit accommodates the pipes 5 and 6 forming a part of household water systems. The pipe 5 is connected at one end to a water main and the pipe 6 leads at one end to a storage tank (not shown) in the usual manner.

7 indicates as a whole my improved hot water generator. Said generator is in the form of a horizontally disposed, hollow casting or member of a length greater than its height which in turn is greater than its width. Said member includes laterally spaced upright side walls 8—8, rounded top and bottom walls 9 and 10 respectively, a flat front or inlet and outlet and 11 and a somewhat rounded, plugged rear end 12. In said flat end are top and bottom internally threaded bosses 13 and 14 respectively, into which are threaded the associated ends of the pipes 6 and 5 respectively, and whereby the member as a whole is supported centrally within the fire pot.

The member 7 also includes a longitudinal partition 15 connecting the side walls 8—8 together and extending from the front wall 11 to a point spaced from the rear wall to provide a U-shaped passage within said member having its ends opening into the bosses 13 and 14 respectively.

The partition 15 is thicker at its front end and is disposed in line with a removable plug 16 in the rear end wall, the thickened end of said

partition tapering in a manner avoiding sharp corners in the vicinity of the ends of the pipes 5 and 6.

On the outside of the member 7 are longitudinally spaced fins or ribs 17 which extend around the bottom and up the side walls of the member and preferably all of said ribs except the one 17*a* adjacent the front wall 11, taper off toward the top wall of the member which is devoid of such ribs. By omitting the ribs mentioned, from said top wall, the possibilities of deposits of ashes and other products of combustion upon the top wall of the member is avoided and which deposits would act as a heat insulation. The rib 17*a* is connected to the respective bosses 13 and 14 by fillets 17*b* which strengthens the member as a whole and prevents fracturing of the casting as a whole at these points.

In the operation of the device, the heat rising from the fire bed is first absorbed by the fins or ribs 17—17*a* and then by the various walls of the device and is then conducted to the water within the generator. Areas of greater or intensified temperature are produced in line with the ribs as shown in Fig. 1 with the result that reverse currents are created which increase turbulence of the water to insure such a movement thereof as to bring all portions thereof into intimate contact with the various walls of the device. Thus the water absorbs a maximum number of heat units in its passage through the generator.

As the member is always filled with water and as this water is quite turbulent, no water solids can remain inert upon the interior surfaces of the member long enough to adhere to the said surface and accumulate thereon. Thus the inner surface of the member remains constantly clean so that the device operates to its fullest efficiency in imparting heat units to the water passing through the same. As the device provides a chamber in the associated system of a cross sectional area greater than that of the pipes connected thereto, it acts as a relief expansion element to eliminate water knocks so that the device is quiet in operation.

It is self cleaning, both inside and out, and it heats more water to a higher temperature than is possible with the return bend and pipes now used for the same purpose and is much easier to install and may be produced at a much lower cost.

While in describing the invention, I have referred in detail to the form and arrangement of the parts thereof, the same is to be considered merely as illustrative of one embodiment of the invention so that I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:—

1. A device of the kind described comprising an integral, flat, hollow member having side walls, top and bottom walls and end walls, one of said end walls having spaced tubular bosses opening into the top and bottom of said member at one end, a longitudinal partition in said member and extending from said one of said end walls toward but terminating short of the other end wall to form a U-shaped chamber in said member communicating with said bosses and longitudinally spaced ribs on the external surface of the side and said bottom walls only of said member.

2. A device of the kind described comprising an integral flat hollow member having side walls, top and bottom walls, there being a substantially flat wall at one end of the body and a substantially rounded wall at the other end of the body, vertically spaced tubular bosses on said substantially flat end of the body, a central partition extending from said substantially flat end of the body, longitudinally thereof toward but terminating short of the substantially rounded end of said member to provide a U-shaped channel communicating at its ends with said bosses and longitudinally spaced ribs on the external surface of the side and bottom walls only of said member.

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