C. C. HANSEN.

WATER HEATER.

APPLICATION FILED OCT. 8, 1920.

1,400,541. Patented Dec. 20, 1921.

Fig. 1

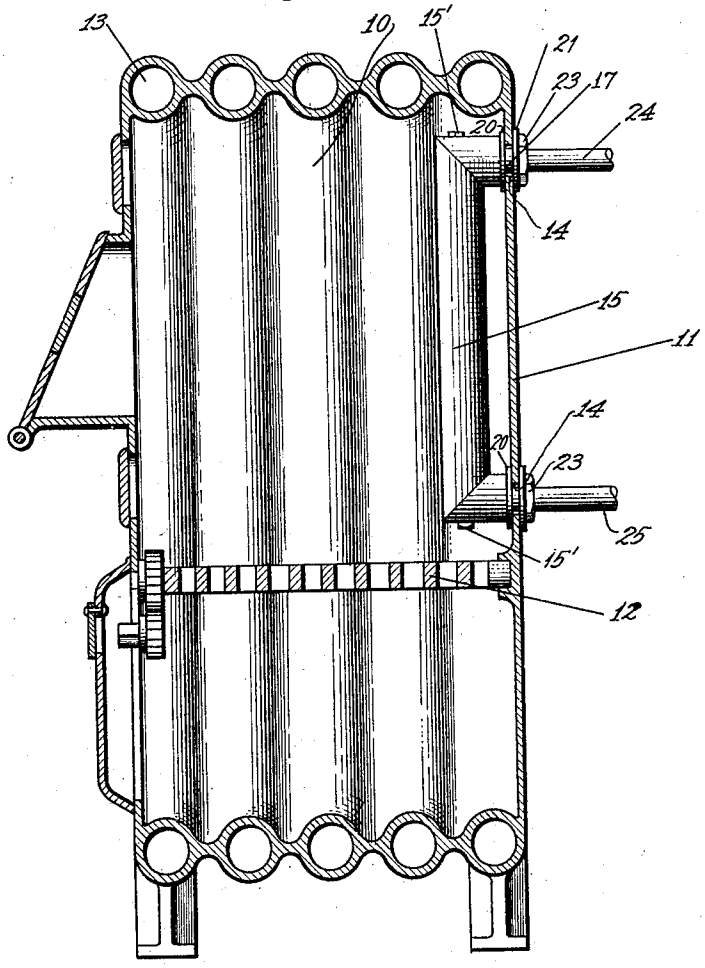
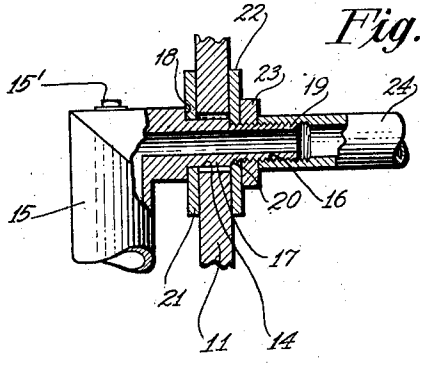


Fig. 2



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WATER-HEATER.

1,400,541. Specification of Letters Patent. Patented Dec. 20, 1921.

Application filed October 8, 1920. Serial No. 415,479.

To all whom it may concern:

Be it known that I, CHARLES C. HANSEN, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Water-Heaters, fully described and represented in the following specification and the accompanying drawing, forming a part of the same.

This invention relates to water heaters, and has for an object to provide a simple device by which water may be heated by means of a furnace utilized for another purpose without interfering with the operation of the furnace for the purpose for which it is intended.

The invention is directed particularly to means for closing the apertures in the furnace wall through which the water connections of the heater pass in such a way as to prevent the escape of gases or ashes, while at the same time leaving the connections free to move in the wall under the expansion or contraction of the heater.

The invention may best be understood by a detailed description of the embodiment of it which is shown in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a furnace of a type commonly used for steam heating, showing the application of my water heater to such a furnace; and

Fig. 2 is an enlarged detailed sectional view showing the connection between the water heater and the wall of the furnace.

The furnace shown in Fig. 1 comprises a fire box 10 having a grate 12. The sides, top and bottom of the furnace are surrounded by pipes 13 which may be utilized for the generation of steam for steam heating. In the rear wall 11 of the fire box 10 are two spaced circular apertures 14.

The water heater comprises a heating pipe 15 located in the fire box 10. The heating pipe 15 is preferably U-shaped as shown, and provided with plugs 15′ to facilitate the cleaning of the pipe. The inlet and outlet water connections are in the form of hollow studs 16 extending from the ends of the heating pipe 15 through the apertures 14. The studs 16 are most desirably made integral with the heating pipe 15 as shown. Each stud 16 comprises a cylindrical portion 17 having a shoulder 18 at its inner end. The portions 17 of the studs 16 lie in the apertures 14 in the furnace wall and for a purpose hereinafter explained, are made of less diameter than the apertures 14. The portion 19 of each stud 16 extending outwardly from the portion 17 is threaded and of less diameter than the portion 17, so that the shoulder 20 is provided at the inner end of the portion 19. A washer 21 is seated upon each portion 17 against the shoulder 18. A washer 22 is seated on each portion 19 against the shoulder 20. The outside diameter of each of the washers 21, 22 is considerably greater than the diameter of the apertures 14. A lock nut 23 is screwed upon each portion 19 outside the washer 22. An outlet pipe 24 for the hot water is screwed upon the portion 19 of the upper stud 16 outside the nut 23, and an inlet pipe 25 for the water to be heated is similarly screwed upon portion 19 of the lower stud 16.

The length of the portion 17 of each of the studs 16, that is to say, the distance between the shoulders 18 and 20 is equal to, or a few thousandths of an inch greater than, the combined thickness of the washer 21 and the rear wall 11 of the fire box 10. Consequently when the nut 23 is tightened against the washer 22, the inward thrust of the washer is received by the shoulder 20, so that the washers 21, 22 are not forced tightly against the wall 11. The portions 17 of the studs 16 may, therefore, move within the apertures 14 so as to allow for the expansion and contraction of the heating pipe 15. This is of great importance, as the heating pipe 15 is subjected to a great range of temperature extending from ordinary room temperatures when the fire in the fire box 10 is extinguished to the highest temperature of the fire itself during the operation of the furnace.

The portions of the washers 21, 22 engaging the wall 11 around the apertures 14, while taking no firm grip on the wall,

nevertheless engage it with sufficient tightness to prevent the leaking of gases or ashes from the fire box 10.

Many modifications may be made in the specific apparatus described without departing from my invention. Among these are the following:—A plurality of heating pipes may be substituted for the pipe 15. A sliding connection between the water heater and the furnace wall to take up the expansion may be used at one end of the heater only. Furthermore, the water heater may, of course, be used in connection with types of furnaces other than that shown in the drawings.

What I claim is:

1. In combination with a furnace having a wall containing spaced apertures, a water heater comprising a heating pipe within the furnace and water connections in the form of hollow studs extending from said heating pipe through said apertures, one of said studs fitting loosely in one of said apertures, a washer on said stud lying against the inside of said wall, a washer on said stud lying against the outside of said wall, a nut on said stud adapted to force the washers together, and means on said stud for maintaining the washers spaced at a distance substantially equal to the thickness of said wall and preventing them from binding against the wall when forced together by said nut.

2, In combination with a furnace having a wall containing spaced apertures, a water heater comprising a heating pipe within the furnace and inlet and outlet water connections in the form of hollow studs, one of said studs having a cylindrical portion extending through one of said apertures in the furnace wall, a shoulder at the rear of said portion, a threaded portion extending outwardly from said cylindrical portion, of less diameter than said cylindrical portion and having a shoulder at its inner end, a washer on said cylindrical portion within the furnace wall, a washer on said threaded portion without the furnace wall, and a nut on said threaded portion adapted to force said washers together, the outside diameter of said washers being greater than the diameter of said aperture and furnace wall and the diameter of said cylindrical portion being less than the diameter of said aperture, and the length of said cylindrical portion being substantially equal to the combined thickness of the furnace wall and the washer within the furnace wall so that when said washers are forced together by said nut they do not bind against said furnace wall.

3. In combination with a furnace having a wall containing spaced apertures, a water heater comprising a heating pipe lying within the furnace and having a middle portion extending parallel to the wall of said furnace and two end portions extending transversely to said wall and inlet and outlet water connections in the form of studs extending from said end portions of the heating pipe, one of said studs having a cylindrical portion extending through one of said apertures in the furnace wall and of less diameter than said aperture and of less diameter than said end portions of the heating pipe, and a threaded portion extending from said cylindrical portion and of less diameter than said cylindrical portion, a washer on said cylindrical portion within the furnace wall, a washer on said threaded portion without the furnace wall, said washers being of greater external diameter than said apertures in the furnace wall, and a nut on said threaded portion adapted to force said washers together, the length of said cylindrical portion being substantially equal to the combined thickness of the furnace wall and the washer within the furnace wall so that the thrust of said nut is taken upon said cylindrical portion.

4. A water-heating attachment for furnaces, comprising a U-shaped heating pipe having at each of its ends a hollow stud integral with the heating pipe, one of said studs having a cylindrical portion of less diameter than the heating pipe, and a threaded portion of less diameter than the cylindrical portion, a washer on said cylindrical portion, and a washer and a nut on said threaded portion.

5. In combination with a furnace having a wall containing spaced apertures, a water heating attachment comprising a single integral member formed to provide two hollow studs serving as pipe connections and containing a continuous passage for the circulation of water extending from one of said studs to the other, said attachment being adapted to be placed within the furnace with its studs projecting outwardly through the apertures in the furnace wall, and means for making a substantially gas-tight connection between the furnace wall and said studs while permitting a transverse movement of one of said studs in the furnace wall under the contraction and expansion of the attachment.

6. The combination with a furnace having a wall containing spaced apertures, of a water heating attachment comprising a single integral member formed to provide two hollow studs serving as pipe connections and containing a continuous passage for the circulation of water extending from one of said studs to the other, said attachment being adapted to be placed within the

furnace with its studs projecting outwardly through the apertures in the furnace wall, one of said studs fitting loosely in one of said apertures, means on said stud for engaging opposite sides of said furnace wall so as to make a substantially gas-tight connection, and means on said stud for maintaining said engaging means spaced from each other at a distance substantially equal to the thickness of said wall so as to prevent them from binding against the wall.

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

CHARLES C. HANSEN.

Witnesses:
ALBERT JARECKY,
MAISIE MAURUS.