March 13, 1945. C. H. MORROW 2,371,347

JACKET FOR WATER HEATERS

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Fig.-1

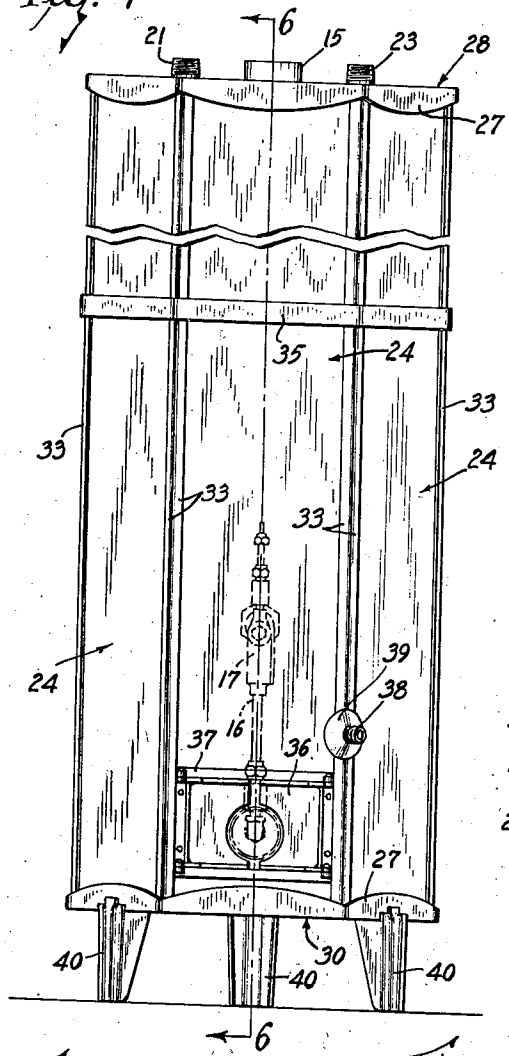


Fig.-2

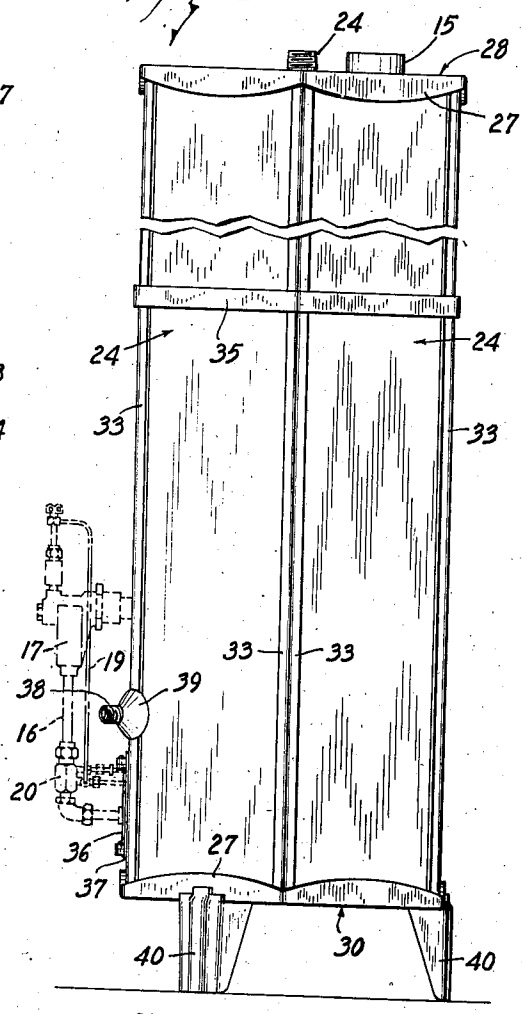


Fig.-3

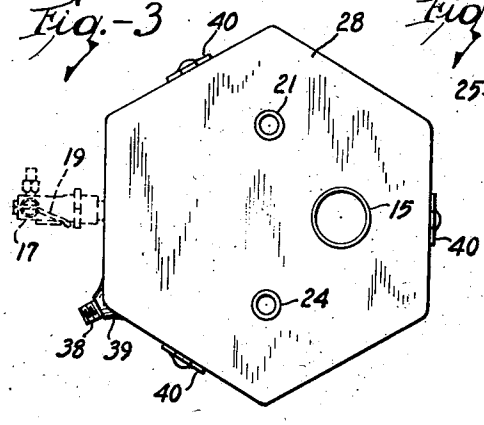


Fig.-4

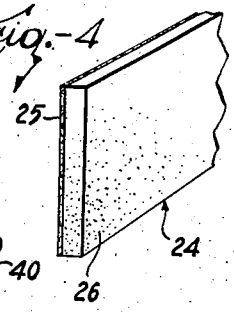
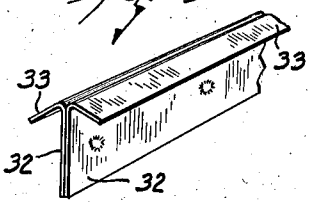


Fig.-5



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Fig.-6

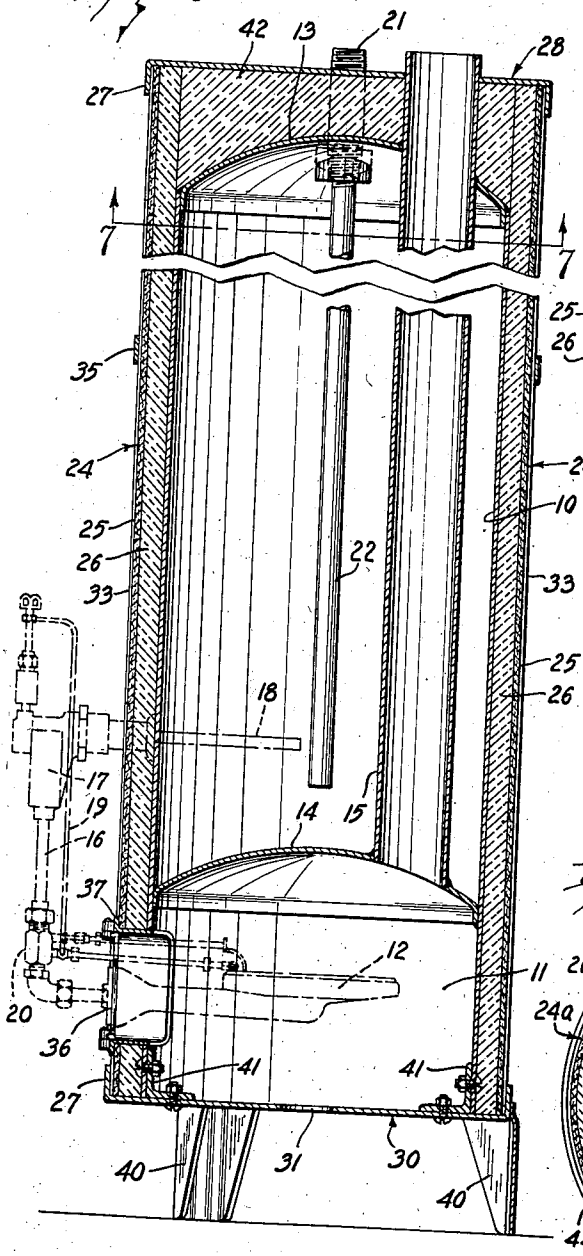


Fig.-7

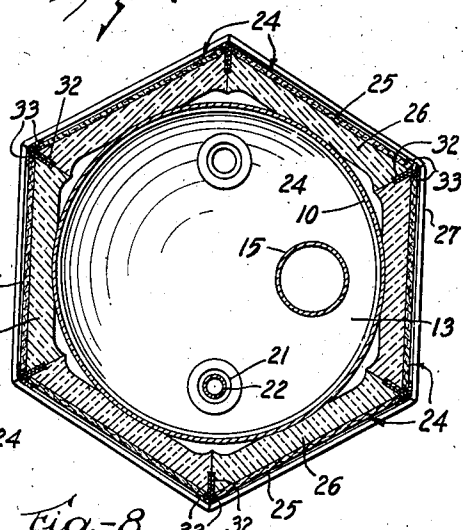


Fig.-8

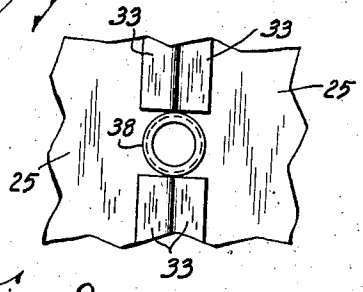
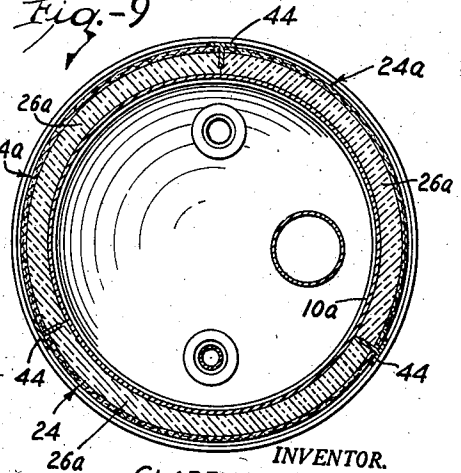


Fig.-9



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JACKET FOR WATER HEATERS

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Application August 22, 1942, Serial No. 455,704

3 Claims. (Cl. 154—44)

This invention relates to enclosing jackets for water heaters, the invention being particularly applicable to storage water heaters.

The present invention has for its general object the provision of a water heater jasket which is of simple and inexpensive form, of strong and sturdy character, and which is largely made of nonmetallic material.

A further object of the present invention is the provision of a water heater jacket having an enclosing side wall fabricated from a series of strong, durable and inexpensive nonmetallic panels, said panels being arranged side by side in upright position in use thereof, and being capable of compact shipment and storage prior to their use.

A further object of the present invention is the provision of a water heater jacket in which each of the nonmetallic side wall panels consists of an outer layer of relatively hard and relatively dense material, such as fibre glass or asbestos, and an inner layer of resilient insulating material, such as rock wool or the like. Preferably, each of said panels is of unitary form, the inner layer of insulating material being adhesively secured to or otherwise suitably carried by said outer relatively hard and relatively dense layer.

A further object of the present invention is the provision of a water heater jacket in which the side wall panels are maintained in side-by-side enclosing relationship by peripheral flanges or equivalent means of the jacket top and bottom caps or closures.

A further object of the present invention is the provision of a water heater jacket having upright joint strips, of sheet metal or other suitable material, arranged between adjacent side wall panels, said joint strips having headed portions overlying the side edges of the panels and the end portions of said joint strips being surrounded and engaged by the peripheral flanges or equivalent means of the jacket top and bottom caps or closures.

A further object of the present invention is the provision of a water heater jacket in which the upright side wall panels and the joint strips therebetween are encircled and engaged intermediate their ends by a sheet metal band or equivalent means, the function of which is to prevent any outward bulging or bowing of said panels or said joint strips.

A further object of the present invention is the provision of an enclosing jacket for a water heater having a storage tank provided with a laterally extending drain nipple, two of the side wall panels of said jacket having complementary notches in their adjacent side edges for the reception of said drain nipple, the joint strip between said two panels being interrupted at said nipple, and the adjacent ends of said joint strip, at such interruption, being covered by a ferrule or the like surrounding said drain nipple.

Further objects of the present invention, and many of its practical advantages, will be referred to in or will be evident from the following description of two embodiments of such invention, reference being had to the accompanying drawings, in which

Fig. 1 is a front elevational view of a water heater having an enclosing jacket embodying the present invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a top plan view thereof;

Fig. 4 is a perspective view of a section of one of the jacket side wall panels;

Fig. 5 is a perspective view of a section of one of the jacket side wall joint strips;

Fig. 6 is a vertical sectional view of said water heater, on the line 6—6, Fig. 1;

Fig. 7 is a cross-sectional view thereof, on the line 7—7, Fig. 6;

Fig. 8 is a front elevational view of that portion of the jacket side wall through which extends the drain nipple of the water storage tank, the ferrule which surrounds said nipple being removed; and

Fig. 9 is a view corresponding to Fig. 7 and showing a slightly modified form of water heater jacket, the jacket side wall panels being of arcuate form.

Before a detailed description is given of the water heater jackets here illustrated, it is to be understood that the invention here involved is not limited to the details of construction or the specific arrangement of parts herein illustrated or described, as the invention obviously may take other forms. It also is to be understood that the terminology or phraseology herein employed is for the purpose of description and not of limitation, the scope of the present invention being indicated by the appended claims.

The water heater illustrated in Figs. 1 to 8 inclusive, for the disclosure of one form of an enclosing jacket embodying the present invention, includes an upright water storage tank 10 of the usual cylindrical form, said tank being made of steel or other suitable material. Below said tank is a combustion chamber 11 containing a suitable burner 12—a Bunsen-type drilled

gas burner, as shown—for heating the water in said tank. In the present instance, the side walls of the tank 10 and the combustion chamber 11 are formed by a hollow tubular metal member, closed at its upper end by a convex cap 13 (which constitutes the top wall of the storage tank) and provided near but spaced from its lower end with a convex cross wall 14 which separates the tank 10 from the combustion chamber 11. Extending through the storage tank, from its bottom wall 14 to its top wall 13, is an upright metal tube 15 providing a flue passageway for the products of combustion produced by the burner 12, the lower end of said tube being welded or otherwise suitably secured to the tank bottom wall 14 and the upper end portion of said tube extending through a suitable aperture with which the tank top wall 13 is provided. For the retardation of the hot combustion gases flowing upwardly through said flue passageway, to the end that the water in the storage tank may absorb from such gases as much of their heat as possible, suitable baffles (not shown) may be located in said flue passageway, as will be readily understood. Gas is supplied to the burner 12 from the supply line 16, and included in such line, as is usual, is a suitable valve 17 for controlling the flow of gas to said burner, the immersion thermostat 18 here shown for the control of said valve extending radially into the tank 10 and being responsive to the temperature of the water therein. The thermostatically controlled valve 17 may be, and here is, by-passed by a pilot gas supply line 19, and a thermostatically controlled valve 20 may be included, if desired, in the main gas supply line 16 for shutting off the supply of gas to the burner 12 should the pilot light become extinguished.

Suitably secured in the tank top wall 13 is an upright nipple 21 to which is connected a depending pipe 22 for the supply of cold water to the storage tank, hot water being withdrawn from the tank through an upright nipple 23 suitably connected to the tank top wall 13. The upper end of the flue tube 15 communicates, of course, with a suitable pipe (not shown) leading to the stack or chimney.

Referring now to the water heater jacket of Figs. 1 to 8 inclusive, it will be noted that said jacket comprises, as is usual, an enclosing side wall, a top wall and a bottom wall, the jacket bottom wall constituting the bottom wall of the combustion chamber 11.

As will be evident from Figs. 1, 2 and 6, the jacket side wall comprises a series of upright panels 24 arranged side by side in continuous manner so as to completely surround the storage tank 10 and the combustion chamber 11 therebelow, the length of such panels being coextensive with that of the tubular metal member which constitutes the side wall of said tank and said combustion chamber. As here shown, (see Fig. 7), there are six such panels which form a jacket side wall of hexagonal form, the panels being substantially duplicates, differing only to the extent that is necessary to alter certain panels for the reception of the water heater door (to be hereinafter referred to) and to provide the necessary openings for pipes and the like, as will hereinafter more fully appear.

As best shown in Fig. 4, each of the side wall panels 24 comprises an outer layer 25 of relatively hard and relatively dense sheet material, such as fibre glass, asbestos or the like, and an inner layer 26 of resilient insulation, such as entwined or matted fibre glass, rock wool or the like. The inner layer of insulation is of considerably greater thickness than that of the outer layer and is carried by said outer layer by the use of any suitable means. In the present instance, the layer of insulation, which is coextensive in area with that of the outer layer 25, is adhesively secured to said outer layer, the adhesive, in liquid form, being preferably applied to the inner surface of the outer layer. Each panel, therefore, is of unitary form, which enables them to be readily handled and easily and conveniently assembled side by side to provide an enclosing jacket side wall. Although the thickness of the insulation layer 26 of each panel and its yieldability or compressibility may be such as to enable it to engage, through substantially its entire width, the tubular metal member which constitutes the side wall of the storage tank 10 and the combustion chamber 11 therebelow, said tubular member is here engaged only by the middle portions of the panel insulation layers, the side edges of such layers being slightly spaced from said tubular member and said middle portions being slightly compressed thereby, as clearly shown in Fig. 7. Inasmuch as normally, before the panels are assembled with each other, the two layers of each panel are of equal width, with coinciding side edges, the hexagonal arrangement of the panels and their consequent tangential relationship with the cylindrical side wall of the storage tank and the combustion chamber result in a slight inward bulging of the insulation layers at their meeting side edges (see Fig. 7), the effect of which is to bring such edges in rather close proximity to said tank and combustion chamber side wall, as will be readily understood.

As here shown, the top and bottom walls of the jacket are in the form of sheet metal caps, the peripheral flanges 27 of which engage the outer surfaces of the end portions of the side wall panels 24 and thus maintain said panels in enclosing side-by-side relationship. Although said cap flanges 27 may be of uniform width, they are here shown as of generally scalloped form, which enhances the appearance of the jacket as a whole without any sacrifice in the panel-holding function of said flanges. For manufacturing economy, the two jacket caps preferably are made as duplicates, and later altered. The alteration of the jacket top cap 28 consists in providing its hexagonal top portion with three apertures, two (see Fig. 3) for the reception of the cold and hot water nipples 21 and 23, and the third for the reception of the flue tube 15. The alteration of the jacket bottom cap 30—which constitutes the bottom wall of the combustion chamber 11—consists in providing the hexagonal bottom portion of such cap with one or more secondary air inlet openings for proper combustion of the gas supplied to the burner 12, a single centrally disposed secondary air inlet opening 31 being here shown.

In the embodiment of the invention here illustrated in Figs. 1 to 8 inclusive, strips of generally T-shaped cross section are disposed at the joints between the side wall panels 24. As best shown in Fig. 7, each of said strips has a body portion extending radially inwardly between the neighboring side edges of a pair of adjacent panels, and a headed portion overlying such panel side edges. Although these joint strips may be made as one-piece members, of metal, plastic material or the like, each such strip is here formed, as best shown in Fig. 5, from two identical sheet

metal members of somewhat L-shaped cross section, the body portions 32 thereof being welded or otherwise rigidly secured back-to-back, and the outer flanges 33 thereof being disposed in opposite directions. In order that said flanges, which constitute the headed portions of the strips, may properly contact the outer surfaces of the side edges of the angularly disposed side wall panels, said flanges are disposed at an acute angle with respect to the body portions 32, as clearly shown in Figs. 5 and 7, and as will be readily understood. Preferably and as here shown, these joint strips are co-extensive in length with the side wall panels 24, so that the ends of said strips are surrounded and engaged by the peripheral flanges 27 of the jacket top and bottom caps 28, 30 and thus are securely maintained in place thereby.

In order to prevent any outward buckling or bowing of the side wall panels 24 and the joint strips therebetween, a sheet metal band 35 or equivalent means may encircle and engage said panels and said joint strips intermediate their ends, as shown in Figs. 1, 2, and 6, the ends of said band or the like being connected in any suitable manner or by the use of any suitable means.

In assembling a jacket, such as shown in Figs. 1 to 7 inclusive, the six panels are brought together into edge to edge relationship surrounding the tank 10, joint strips 32 are inserted into place, and the assembled set is subjected to compression, squeezing them inwardly into close contact with the tank and to compress the side edge portions of the inner softer layers. As before described, the end caps are then applied and one or more encircling bands 35 may be attached, whereupon the pressure is released. In some cases the assembling process starts with insertion of the lower ends of the panels and joint strips into proper position in the lower cap, with compression of the assembled parts to bring their upper ends together for application of the upper cap.

In the finally assembled panels, the tendency to expand outwardly, as the result of the resiliency of the compressed parts of the inner soft layers, is resisted by the rigidity of the outer layers of the panels, by the enclosing or embracing flanges of the end caps, by the rigidity of the T-shaped joint strips, and also by the enclosing bands, as will be readily understood.

To provide access to the combustion chamber 11 and the burner 12 therein, the side wall panel 24 at the front of the jacket is provided with a suitable opening, of rectangular shape as here shown, for the reception of a door 36 and its surrounding frame 37, the tubular metal member which laterally defines said combustion chamber being provided with a correspondingly aligned opening, as best shown in Fig. 6. Any suitable means, such as screws, rivets or the like, may be utilized for securing the door frame 37 to the front jacket panel, the door 36 being mounted in said frame in any suitable manner. As here shown, the door 36 is in two separately hinged sections, the free meeting edges of said door sections, at the middle of the door opening, being provided with complementary notches for the reception of the gas supply lines, etc. To permit the extension therethrough of the thermostat 18, the front jacket panel and the storage tank side wall are provided with suitably aligned openings, as will be evident from Figs. 1 and 3.

For the draining of the storage tank 10, a nipple 38 is provided, said nipple communicating with the tank adjacent its lower end and extending radially outward for the attachment thereto of a suitable drain cock or the like (not here shown). For the reception of such nipple, the front jacket panel and the one to the right thereof (as viewed in Fig. 1) are provided in their neighboring side edges with complementary notches, which preferably are concealed from view by the use of a suitable ferrule 39 or the like surrounding said nipple and overlying the adjacent outer surfaces of the two notched panels. The joint strip between these two panels is interrupted, of course, at said nipple, the adjacent ends of said strip, at the point of interruption, lying behind the ferrule 39 and thus being securely held in place thereby.

For supporting the jacket and the heater parts enclosed thereby, feet 40 are here utilized, said feet (three in the present instance) being circumferentially spaced beneath the peripheral portion of the jacket bottom cap 30 and being suitably secured thereto. As best shown in Fig. 6, one or more angular brackets 41 are used to rigidly connect the jacket bottom cap 30 to the tubular metal member which constitutes the side wall of the storage tank 10 and the combustion chamber 11 therebelow, there being two such brackets, diametrically disposed, in the present instance.

To insulate the top of the water storage tank, the space between the top wall 13 of said tank and the jacket top cap 28 is filled with insulation 42, as clearly shown in Fig. 6.

Referring now to Fig. 9, wherein is illustrated a slightly modified form of an enclosing jacket embodying the present invention, it will be evident that such jacket differs from the one heretofore described chiefly in the number and the shape of its side panels. Instead of being of flat form, the jacket side wall panels 24*a* of Fig. 9 are of arcuate form, three being used to provide an enclosing side wall. As shown in Fig. 9, the panels 24*a* conform to the curvature of the tubular metal member which constitutes the side wall of the storage tank 10*a* and the combustion chamber (not shown) therebelow, the insulation layers 26*a* of said panels being thus in engagement with said tubular metal member. It also will be noted that the joint strips (designated generally by the reference numeral 44) between the panels 24*a* are of one-piece character, although they obviously could be made of the two-piece form heretofore described. In other respects, the jacket of Fig. 9 is like the one heretofore referred to, and no further description thereof is believed to be necessary.

From the foregoing, it will be evident that the water heater jackets here illustrated are of simple, inexpensive and attractive character, requiring for their fabrication no heavy gauge steel or the like, as the jacket side walls are made of nonmetallic panels. These panels, of strong and sturdy character and of unitary form, are not easily dented or otherwise deformed, and may be easily and quickly coated with enamel or the like. The panels of either jacket may be readily stacked for shipment or storage, and may be easily, quickly and conveniently assembled in enclosing side-by-side relationship, such assembly being firmly maintained by the peripheral flanges of the jacket top and bottom caps.

To those skilled in the art to which the present invention relates, other features and advantages of water heater jackets embodying such in-

vention will be evident from the foregoing description of two embodiments thereof.

What I claim is:

1. A water heater enclosing jacket, comprising a side wall of continuous form, a top wall, and a bottom wall, the jacket side wall comprising a series of unitary panels arranged side by side and each comprising an outer layer of relatively hard and dense non-metallic material and an inner softer layer of resilient insulating material permanently secured to said outer layer, the two layers of each panel being normally of equal width, the jacket top and bottom walls having peripheral flanges engaging the end portions of the outer layers of said panels for maintaining the panels in continuous side by side relationship with the side edges of their hard outer layers closely adjacent and consequently with side portions of their softer inner layers under compression.

2. A water heater enclosing jacket, comprising a side wall of continuous form, a top wall, and a bottom wall, the jacket side wall comprising a series of unitary panels arranged side by side and each comprising an outer layer of relatively hard and dense non-metallic material and an inner softer layer of resilient insulating material permanently secured to said outer layer, the two layers of each panel being normally of equal width, the jacket top and bottom walls having peripheral flanges engaging the end portions of the outer layers of said panels for maintaining the panels in continuous side by side relationship with the side edges of their hard outer layers closely adjacent and consequently with side portions of their softer inner layers under compression, and means engaging said panels between the jacket top and bottom walls for preventing any outward bowing of said panels by reason of the tendency of the compressed inner layers to expand.

3. A water heater enclosing jacket, comprising a side wall of continuous form, a top wall, and a bottom wall, the jacket side wall comprising a series of panels arranged side by side and each comprising an outer layer of relatively hard and dense, non-metallic material and an inner softer layer of resilient insulating material, the two layers of each panel being normally of equal width, the jacket top and bottom walls having peripheral flange portions engaging the end portions of the hard outer layers of said panels for maintaining the panels in continuous side by side relationship, with the side edges of their hard outer layers closely adjacent and consequently with the side portions of their softer inner layers under compression, and T-shaped joint strips arranged with their webs lying between adjacent panels and having lateral flanges overlying the outer surfaces of the side edges of said panels, the ends of said strips being enclosed and confined between flanges of the top and bottom walls.

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