June 11, 1929. W. H. HINSCH ET AL 1,717,033

THERMIC SYPHON AND METHOD OF MAKING SAME

Filed Feb. 19, 1927 2 Sheets-Sheet 1

Fig. 1.

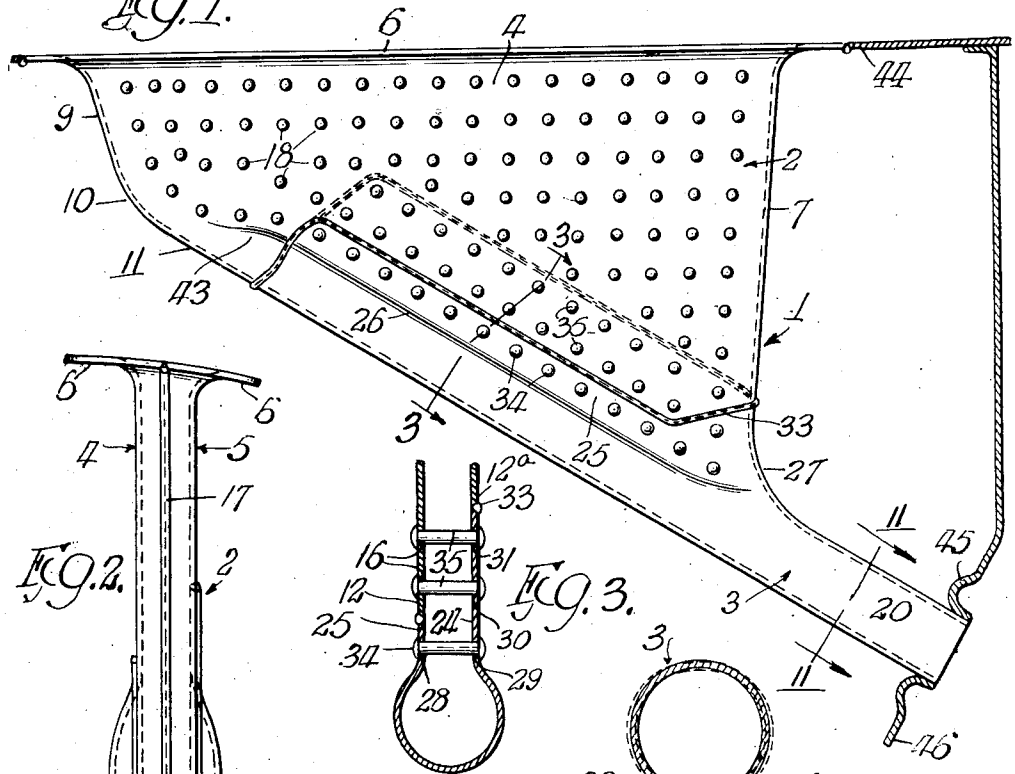


Fig. 2.

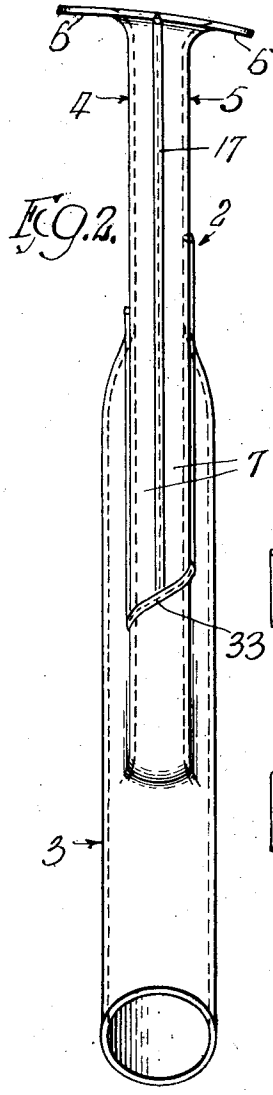


Fig. 3.

Fig. 11

Fig. 6.

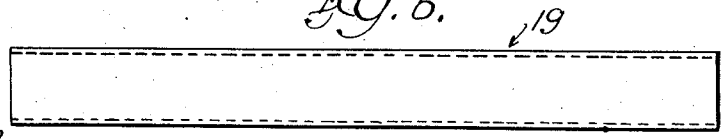
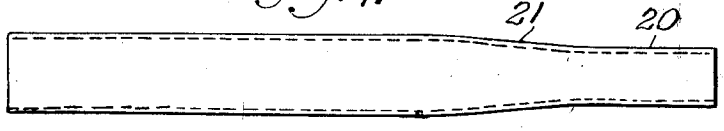


Fig. 7.



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June 11, 1929. W. H. HINSCH ET AL 1,717,033

THERMIC SYPHON AND METHOD OF MAKING SAME

Filed Feb. 19, 1927 2 Sheets-Sheet 2

Fig. 4.

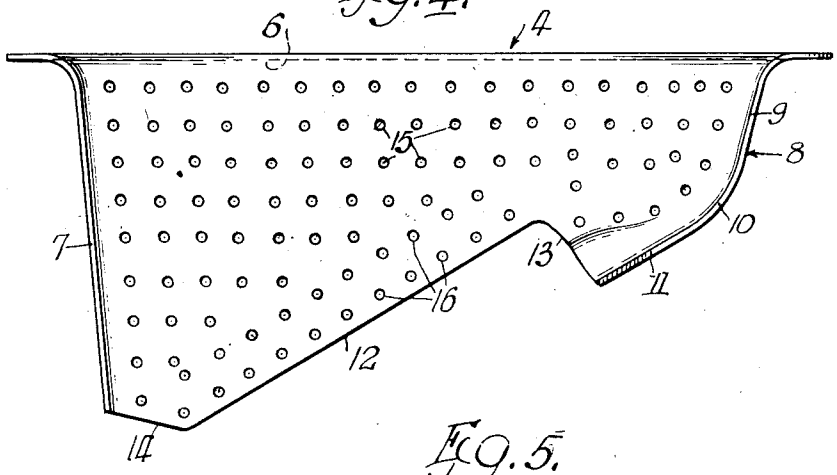


Fig. 5.

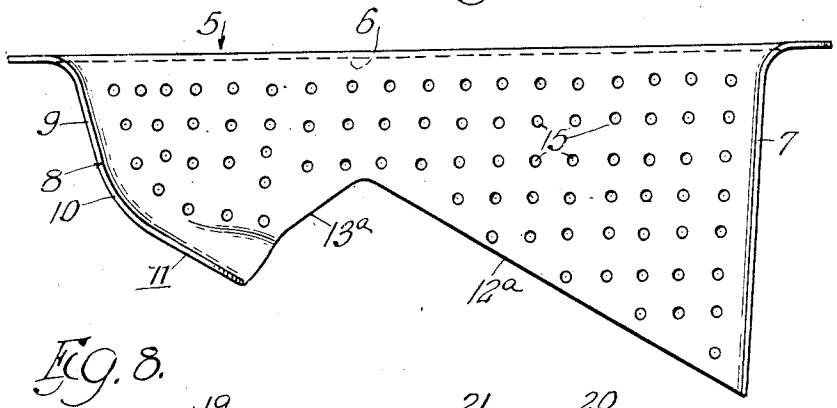
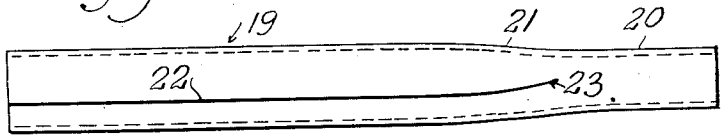


Fig. 8.



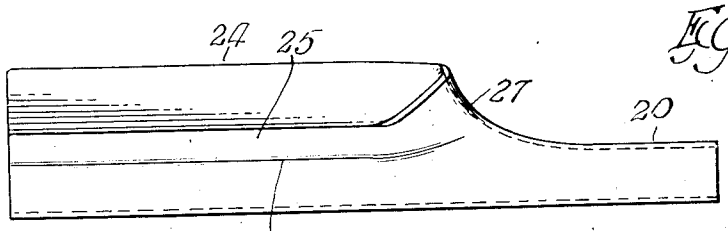
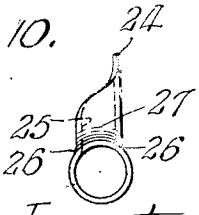


Fig. 9.

Fig. 10.



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Patented June 11, 1929. 1,717,033

UNITED STATES PATENT OFFICE.

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THERMIC SIPHON AND METHOD OF MAKING SAME.

Application filed February 19, 1927. Serial No. 169,608.

This invention relates to improvements in methods of making thermic siphons and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The thermic siphon with which our invention is most particularly concerned is the well known Nicholson thermic siphon as best shown in the Nicholson Patent No. 1,337,720. A siphon of this kind is especially adapted for use in the firebox of a locomotive boiler for increasing the water steaming and circulating efficiency of the boiler and at the same time reducing temperature strains and stresses in the boiler structure. Furthermore it acts to keep the crown sheet flooded with boiler water even at low water levels and raises the capacity efficiency and durability of both the firebox and boiler. Such a siphon element includes an upwardly and rearwardly inclined bottom or neck portion fixed in the throat sheet of a firebox and a progressively upwardly enlarging generally triangular flat tubular body portion, flanged at its top to fit in an elongated longitudinal opening in the crown sheet. Such a siphon or circulating element heretofore was made from a single metal sheet of the same kind and thickness as the firebox sheet. This sheet after being cut to the desired shape and punched or drilled for the stay bolts was placed in a heavy forming machine which folded the sheet upon itself along its median line and the meeting edges of the sheet were permanently united by an autogenous weld. The upper portions of the sheet were then bent over to provide a flange for attachment of the crown sheet. These operations consume a large amount of time and call for experienced labor and require special and expensive machinery. Hence the cost of producing such siphons by prior known methods is great.

Again under the prior methods of constructing siphons the tubular intake neck portion contained a seam. As a result of this seam it has been necessary to strengthen the intake neck by means of stay bolts. Not only does such practice add labor and material to the siphon, and hence cost, but what is even more objectionable such staybolts interfere with the best functioning of the intake neck. That is to say when the siphon is installed in the locomotive boiler and is in operation there is a constant movement of the neck under changing temperature and pressure conditions. Our observations lead us also to the conclusion that the cross sectional shape or form of the neck also changes, more or less, from the true cylindrical form to a somewhat elliptical form. The staybolts are disposed generally along the major axis of this modified and elliptical form and they act to restrain the free modifying movement of neck. The result is that an undue strain is imposed upon that portion of the siphon with the result that failure of that portion of the siphon occurs sooner than would otherwise be the case.

A general object of our invention is to provide an improved method of making such siphons whereby they may be produced in less time with less material and with less labor, thereby reducing the cost of manufacture thereof.

Again it is an object of our invention to provide an improved method of producing siphons by the practice of which it shall be possible to make a siphon better adapted for its intended purpose to the end that its efficiency may be increased and its effective life lengthened.

A further object of the invention is to provide a method of manufacture whereby the neck portion of the siphon may be made from seamless tubing, thereby eliminating all seams in the neck portion of the siphon and obviating the necessity of stay bolts as heretofore required and thereby removing the principal contributing agency to breakage of the siphon neck portion.

Still another object of the invention is to provide a siphon wherein the body thereof may be produced either of a single folded sheet or from two coacting preformed sheets butt-welded together and to which the seamless neck may be thereafter welded, the body and neck having meeting parts so formed that the lines of welding at the sides of the siphon are offset, to provide a stronger structure and a better stay bolt arrangement or lay out.

The invention consists generally of the steps, acts and sequence thereof and a device resulting therefrom whereby the above mentioned objects, together with others, as well as the several advantages thereof, that will hereinafter appear, are attainable; and our invention will be more readily understood by

reference to the accompanying drawings which illustrate our improved method of making such siphons.

In the drawings:

Fig. 1 is a view in side elevation of one form of thermic siphon made in accordance with our improved method.

Fig. 2 is a view, in elevation thereof, on an enlarged scale.

Fig. 3 is a detail vertical sectional view on an enlarged scale as taken on line 3—3 of Fig. 1.

Figs. 4 and 5 are views in elevation of the two preformed sheets which when welded together in accordance with one embodiment of the invention, make up the body portion of the siphon.

Fig. 6 is a view in elevation of an oversize length of seamless tubing from which the neck of the siphon is made, said figure showing said tubing before any operations have been performed thereon.

Fig. 7 is a view in elevation of said length of tubing after the first operation or step has been performed thereon as by swedging one end thereof to reduce the diameter thereof.

Fig. 8 is a view, which may be considered as a top plan view, of the tube after another operation or step has been performed thereon as by slitting the tube longitudinally along the unswedged part thereof, and off center with respect to a vertical plane passing through the axis of the tube.

Fig. 9 is a view in side elevation after the tube has been opened up along the line of slitting to form upstanding parallel side walls of different lengths but before drilling for stay bolts and trimming to fit the siphon body.

Fig. 10 is an end view of the formed tube shown in Fig. 9.

Fig. 11 is a transverse vertical view on an enlarged scale through the seamless tubular neck of the siphon the plane of said section being indicated by the line 11—11 of Fig. 1.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawings, 1 indicates as a whole a thermic siphon made in accordance with the preferred manner of our improved method. Said siphon which is of a substantially irregular shape when viewed in side elevation, is somewhat triangular and includes a flat upright hollow body portion 2 and a tubular inclined neck 3 so formed that it not only provides the neck proper for the siphon but also the major bottom part of the body portion. Although the body portion of the siphon may be made of a single piece of sheet metal shaped to size in a suitable forming machine without departing from the essential features of our invention, we prefer to make up said body portion from two separate sheets each of such an outline that when the coacting edges thereof are welded together they will produce the body portion shown in Fig. 1.

In Figs. 4 and 5 are shown the preformed right and left hand halves, side portions or walls 4 and 5 respectively, of the siphon body. The side portion 4 has a substantially straight top defined by an outwardly extending flange 6 and the front end thereof is arranged at an angle less than a right angle and is defined by an inwardly extending curved flange 7. The rear end of said side portion 4 is also defined by an inwardly extending curved flange 8, a portion 9 of which is arranged at an angle substantially opposite that of the flange 7 to thereafter be connected by a curved corner part 10 with a bottom portion 11 arranged in the plane of the inclination of the neck 3 of the finished siphon. The major bottom edge portion 12 of said side wall while arranged in a plane parallel with the plane of said flanged bottom portion 11 is offset upwardly therefrom as indicated at 13 and said edge portion 12 joins the front flange portion 7 by a part 14 arranged substantially parallel to the plane of the top flange 6. The end portions of the flange 6 merge into the flange portions 7 and 9 respectively. Throughout the major portion of this half of the siphon body, stay bolt openings 15 are provided in spaced rows paralleling the flanges 6 and 7 respectively while in the bottom portion, stay bolt holes 16 are provided in rows parallel with said edge portion 12.

The side portion or half 5 is of a substantially similar shape as the side portion 4 so the like parts are indicated by the same reference numerals. However, it is herein pointed out that the only substantial differences are that the bottom edge portion 12^a starts at the flange 7 and is inclined upwardly and rearwardly and is joined to the flange 11 by a portion 13^a of a length greater than that of the portion 13 of the siphon half 4. Thus if the siphon body halves thus described were measured on the same vertical line it will be found that the siphon body half 4 is of a depth greater than that of the siphon body half 5 by an amount sufficient to accommodate the two rows of stay bolt holes 16.

In assembling the siphon body the two halves are placed with their matched flanged edges in engagement, which edges are then welded together as at 17, as best shown in Fig. 2 after which stay bolts 18 are positioned in the registering holes 15 and then headed in each half. When the siphon body has thus been assembled it provides a flat hollow structure open at its top and bottom with transversely rounded ends and with an outwardly extending flange bounding its top, the bottom edge portions 12 and 12^a thereof being of different lengths so that the portion 12 projects downwardly a greater distance than the portion 12^a. The construction of

the siphon body and steps mentioned in the production of the same just above described is indeed advantageous because of the economy thereof over the method of making a one piece siphon. The respective halves may be readily produced and this without wastage of either material or time as they may be readily made by coacting dies.

The method in the production of the siphon neck, which we pursue, indeed is novel and provides a seamless neck. Said neck is made from a piece of seamless steel tubing 19 (see Fig. 6) preferably oversize in length and diameter when compared to the length and diameter of the neck ready for attachment to the siphon body. The first operation performed on said tubing is to swedge one end thereof to reduce its diameter down to that of the neck of the finished siphon. This swedged down end is best illustrated at 20 in Fig. 7, the said end being connected to the remainder of said tube by the tapered portion 21. Thereafter the other end of the tube is slit longitudinally as at 22 (see Fig. 8, which assumes that the tube is viewed as a top plan view), along a line offset with respect to a vertical plane 23 passing through the axis of the tube. Said slit terminates at its inner end in the said vertical plane passing through the tube axis and adjacent said swedged down end of the tube. Those portions of the tube on both sides of the slit are then opened or upset into parallel spaced relation to provide side wall parts 24 and 25 of different heights arranged equal distances on both sides of the axis of the tube. During this opening up of said side wall parts the remainder of said tube is reduced in diameter to provide the excess material necessary for said side walls and also to bring it down to the diameter of the swedged end 20 as best shown in Fig. 9. The side walls 24 and 25 are spaced apart a distance equal to the opening between the side walls of the siphon body halves and as the diameter of the tubular part of the neck is greater than that of said side walls, it is apparent that lines of fold 26—26 are developed along each side thereof. During this opening or upsetting of said walls of the neck tube, it is apparent that the point 23 moves radially way from the axis of the tube, and for a distance greater than the diameter of the tube and this point is gradually merged into the top side of the neck 20 by a rounded corner or curve 27. The neck walls thus formed are then punched or drilled for stay bolts, the shorter wall 25 having one row 28 of such holes and the longer wall having bottom, intermediate and top rows of holes 29, 30 and 31 respectively. The rear end of the tube thus far operated upon is then trimmed to fit the edge portions 13, 13ª of the siphon body halves.

The neck tube is then fitted in place with the edges of its walls 24—25 in butt-weldable relation with respect to the edges of the side wall portions 12—12ª of the siphon body halves, after which they are autogenously welded together by a line of welding as at 33. Thereafter stay bolts 34 are anchored in the registering rows of holes 28—29 of the neck tube and other stay bolts 35 are anchored in the rows of holes 30—31 of the wall 24 and in the rows of holes 16 in the portion 12 of the siphon body. It is of course apparent that the stay bolts 34 which as above described are anchored after welding the neck tube to the siphon body, may be applied to the siphon tube before said tube is so welded.

When attached to the body the tube provides the neck for the same and at the same time the major portion of the bulge or enlarged bottom thereof. To make a good tight practical welded connection between the rear end of the neck tube and those parts of the siphon body as defined by the flanges 11—11 and edge portions 13—13ª we provide a bulge as at 43 on the body which decreases in width or diameter toward the rear to merge with or disappear into the sides of said body.

When such a siphon is in place within the firebox of a locomotive boiler, the top flange is welded in an elongated longitudinally extending opening in the crown sheet 44 thereof, while the extreme end of the neck is fixed within the yielding diaphargm portion 45 of the throat sheet 46. In the operation of the locomotive the siphon is subjected to an intense heat which causes it to expand and when the fire is drawn and the siphon cools down, it of course contracts. This contraction and expansion movement of the siphon is not all in the plane parallel with the axis of the neck as heretofore assumed but such movement appears to be one which fulcrums about a peripheral portion of the neck and this portion is always at the top side of the neck adjacent the diaphragm part of the throat sheet. This movement causes a slight downward flexing or bowing of the neck and this part of the neck then seeks to change its cross sectional shape from circular to elliptical to accommodate this flexing or bowing. In other words the vertical axis of the neck at this point becomes decreased and its horizontally disposed axis becomes increased as best shown by the dotted lines in Fig. 11. In a siphon made from a single piece of metal as before mentioned, the welded seam is on the top side of the neck and this neck necessitated the use of staybolts. These staybolts were arranged horizontally and when the neck bowed or flexed and changed its cross sectional shape with the major axis thereof extending horizontally across the neck, the resulting action occurring was the pulling away from said stay bolts with a consequent breaking down of said neck. Another break

down tendency also occurs as the cross section changes and that is the opening up or splitting of the welded seam along the top of the neck at about the middle of that part thereof which becomes alternately bowed and straightened. From the above it is apparent that such a welded seam, stay bolted neck did not have the required flexibility to accommodate itself to these movements.

A neck such as is provided by our improved method, may readily change its cross sectional shape; there are no stay bolts to pull out and there is no seam to open or split, so that as is apparent, said neck has that degree of flexibility both longitudinally and transversely whereby it readily accommodates itself to such movement without splitting cracking or otherwise breaking down. Again no drilling or stay bolt setting is required in the neck so that time and material costs are thereby saved.

The seamless neck being devoid of stay bolts permits the use of a rotary mechanical cleaner to clean out the neck and bulge which is indeed much preferred to that system of cleaning a stay bolted neck and bulge known as "bombarding".

Again the siphon bodies and necks may be made up in quantities and of such lengths that they may be readily cut and trimmed to the requirements of any individual siphon. Again our method eliminates the use of the heavy folding machines employed in making one piece siphons which not only had a large initial cost but also a large maintenance cost.

Another advantage resulting from the ability to omit the stay bolts from the siphon neck is that the capacity thereof is increased. That is to say, there are no obstructions to interfere with the free and rapid movement of the water and steam through this inlet neck on the way to the body of the siphon.

Still another advantage inhering in our method of manufacture and in the devices resulting therefrom is that the neck tube portion of the siphon is of such size and shape that it can be conveniently treated if desired to make it better adapted to serve its intended purpose. That is to say this neck tube portion is the part in which the greatest movement and change of shape takes place. Hence it is possible, conveniently to anneal or otherwise treat this portion to make it more ductile than the remainder of the siphon. When so treated it would obviously be better adapted to withstand for a longer period, the severe conditions obtained in use.

While in describing our improved method we have referred in detail to the various steps and stated sequence thereof, these are to be considered as by way of illustration only. Hence we do not wish to be limited thereto except only as may be necessary by the appended claims.

We claim as our invention:

1. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, in longitudinally slitting a seamless metallic tube throughout a portion of its length beginning at one end thereof, opening portions of said tube on opposite sides of the slit to provide upstanding walls thereon, fitting said walls to the open bottom of the siphon body and then welding the same thereto, the unslitted end of said tube providing a neck extension for the siphon.

2. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, in longitudinally slitting a seamless metallic tube throughout a portion of its length, beginning at one end thereof, opening portions of said tube on opposite sides of the slit to provide upstanding walls thereon, fitting said walls to the open bottom of the siphon body, in staybolting desired portions of said upstanding walls, and then welding said staybolted walls to the siphon body, the unslitted end of said tube providing a neck extension for the siphon.

3. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, and having side walls of different depths, in longitudinally slitting a seamless metallic tube throughout a portion of its length beginning at one end thereof, opening up portions of said tube on opposite sides of the slit to provide upstanding walls thereon of different heights, and then welding the edges of said siphon body and tube walls together, the unslitted end of said tube providing a neck extension for the siphon.

4. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in longitudinally slitting a seamless metallic tube throughout a portion of its length beginning at one end thereof, opening up portions of said tube on opposite sides of the slit to provide upstanding walls thereon of different heights, in staybolting desired upstanding wall portions of the tube together and then welding the edges of said siphon body and tube walls together, the unslitted end of the tube providing a neck extension for the siphon.

5. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in longitudinally slitting a seamless metallic tube throughout a portion of its length beginning at one end thereof, opening up portions of said tube on opposite sides of the slit to provide upstanding walls thereon

of different heights, in staybolting desired upstanding wall portions of the tube together, in welding the edges of said siphon body and tube walls together, and then staybolting one of the tube walls to the opposed wall of the siphon body, and unslitted end of the tube providing a neck extension for the siphon.

6. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, and having side walls of different depths in longitudinally slitting a seamless metallic tube beginning at one end thereof and extending throughout a portion of its length along a line offset from a vertical plane passing through the axis of the tube, opening portions of the tube on opposite sides of the slit, to provide upstanding walls of different heights, fitting the upstanding walls of the tube to the side walls of the siphon body and then welding the same thereto.

7. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths in longitudinally slitting a seamless metallic tube beginning at one end thereof and extending throughout a portion of its length along a line offset from a vertical plane, passing through the axis of the tube, opening portions of the tube on opposite sides of the slit to provide upstanding walls of different heights, staybolting portions of the upstanding walls of the tube, fitting the upstanding walls of the tube to the side walls of the siphon body, and then welding the same thereto.

8. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in longitudinally slitting a seamless metallic tube beginning at one end thereof and extending throughout a portion of its length along a line offset from a vertical plane passing through the axis of the tube, opening portions of the tube on opposite sides of the slit, to provide upstanding walls of different heights, welding the said walls together and then staybolting the siphon body wall of greater depth to the upstanding wall of greater height of the tube.

9. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, in providing a length of seamless metallic tubing and reducing the diameter of one end thereof, in longitudinally slitting said tube beginning at the other end thereof, opening portions of the tube on opposite sides of the slitted portion to provide upstanding walls thereon, fitting said walls to the open end of the siphon body and then welding the same thereto.

10. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, in providing a length of seamless metallic tubing and reducing the diameter of one end thereof, in longitudinally slitting said tube beginning at the other end thereof, opening portions of the tube on opposite sides of the slit to provide upstanding walls thereon and at the same time reducing the diameter of said tube end substantially to that of the first mentioned end, fitting said upstanding walls to the open end of the siphon body and then welding the same thereto.

11. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths in providing a seamless tube and in swedging one end thereof to reduce its diameter, in longitudinally slitting the other end of said tube along a line to one side of a vertical plane through the axis of the tube, and then opening up portions of the tube on opposite sides of the slit to form upstanding walls of different heights thereon, and at the same time reducing the diameter of the last mentioned end of the tube to provide the excess metal required for said upstanding walls, fitting the walls of the tube to the side walls of the siphon body and then welding the same together.

12. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in providing a seamless tube and in swedging one end thereof to reduce its diameter, in longitudinally slitting the other end of said tube along a line to one side of a vertical plane passing through the axis thereof and then opening up portions of the tube on opposite sides of the slit to form upstanding walls of different heights thereon, and at the same time reducing the diameter of the last mentioned end of the tube to provide the excess metal required for said upstanding walls, welding the same together and then staybolting the siphon wall of greater depth to the upstanding wall of greater height on the tube.

13. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in providing a seamless tube and in swedging one end thereof to reduce its diameter, in longitudinally slitting the other end of said tube along a line to one side of a vertical plane of the axis of the tube and then opening up portions of the tube on opposite sides of the slit to form upstanding walls of different heights thereon, and at the same time reducing the diameter of the last mentioned end of the tube to provide the excess metal

required for said upstanding walls, staybolting desired portions of the upstanding walls of the tube together, fitting the walls of the tube to the walls of the siphon body, and then welding the same together.

14. The method of making thermic siphons of the kind described which consists in forming matched parts of a siphon body each with an inturned end flange, fitting the end flanges together and when welding them to provide a flat hollow siphon body having an open bottom, longitudinally slitting a seamless metal tube throughout a portion of its length beginning at one end thereof, opening up portions of the tube on opposite sides of the slit to form upstanding side walls, fitting said walls to the open bottom of the siphon body and then welding the same thereto.

15. The method of making thermic siphons of the kind described which consists in forming matched parts of a siphon body each with an inturned end flange, fitting the end flanges together and then welding them to provide a flat hollow siphon body having an open bottom, longitudinally slitting a seamless metal tube throughout a portion of its length beginning at one end thereof opening up portions of the tube on opposite sides of the slit to form upstanding side walls, staybolting desired portions of said upstanding walls together, fitting said walls to the open bottom of the siphon body and then welding the same thereto.

16. The method of making thermic siphons of the kind described which consists in forming matched parts of a siphon body each with an inturned end flange, one of said parts having a side wall of a depth greater than the side wall of the other part, fitting said end flanges together and then welding the same to provide a flat hollow siphon body open at one end, longitudinally slitting a seamless metal tube throughout a portion of its length, beginning at one end thereof and along a line offset with respect to a vertical plane passing through the axis of said tube, opening up parts of said tube on opposite sides of the slit tube to provide upstanding walls of different heights, staybolting portions of said walls together, fitting said upstanding walls to the walls of said siphon body, welding the fitted walls together and then staybolting the siphon body wall of greater depth to the upstanding tube wall of greater height.

17. The method of making thermic siphons of the kind described which consists in forming matched parts of a siphon body each with an end flange, fitting said end flanges together and then welding them to provide a flat hollow siphon body open at one end, providing a seamless metallic tube and swedging one end to reduce its diameter, slitting said tube longitudinally beginning at the other end thereof, opening up portions of the tube on opposite sides of the slit to form upstanding spaced walls, fitting said walls to the open end of the siphon body and then welding them together.

18. The method of making thermic siphons of the kind described which consists in forming matched parts of a siphon body each with an end flange, fitting said end flanges together and then welding them to provide a flat hollow siphon body open at one end, providing a seamless metallic tube and swedging one end to reduce its diameter, slitting said tube longitudinally beginning at the other end thereof, opening up portions of the tube on opposite sides of the slit to form upstanding spaced walls, staybolting desired portions of said upstanding walls together, fitting said walls to the open end of the siphon body and then welding them together.

19. The method of making thermic siphons of the kind described which consists in forming matched parts of a siphon body each with inturned end flanges and each with a side wall, one of which is of a depth greater than the other, fitting and welding the inturned flanges together, providing a seamless metal tube and swedging one end thereof to reduce its diameter, longitudinally slitting said tube off center and beginning at the other end of said tube, opening up portions of the tube on opposite sides of the slit to provide upstanding walls of different heights and at the same time reducing the diameter of said slitted end of the tube down to that of the first mentioned end, staybolting desired portions of the upstanding walls together, in fitting and welding said upstanding walls to the side walls of the siphon body and then staybolting the siphon body wall of greater depth to the tube wall of greater height.

20. The method of forming a part of a thermic siphon of the kind described which consists of providing a seamless metallic tube, and swedging one end thereof to reduce its diameter, slitting the tube longitudinally from the other end and stopping short of said swedged end, and opening up portions of the tube on opposite sides of the slit and at the same time contracting the diameter of said slitted end down to that of the swedged end, said side walls meeting at the forward end of the slit to there merge into one side of the swedged end of the tube.

21. The method of forming a part of a thermic siphon of the kind described which consists in providing a seamless metallic tube, swedging one end thereof to reduce its diameter, slitting said tube longitudinally beginning at the opposite end of the tube and extending in a plane offset with respect to the axis of the tube and opening up portions of the tube upon opposite sides of the slit forming upstanding walls of different heights and at the same time contracting the diameter of said slitted end to that of the swedged end, said side walls meeting at the forward end of

the slit to there merge into one side of the swedged end of the tube.

22. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, in providing a seamless metallic tube having a slit therein throughout a portion of its length, said slit beginning at a point spaced from one end thereof, opening portions of said tube on opposite sides of the slit to provide upstanding walls thereon, fitting said walls to the open bottom of the siphon body and then permanently securing the same thereto, the unslitted end of said tube providing a neck extension for the siphon.

23. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom, in providing a seamless metallic tube having a slit therein, throughout a portion of its length, said slit beginning at a point spaced from one end thereof, opening portions of said tube on opposite sides of the slit to provide upstanding walls thereon, fitting said walls to the open end of the siphon body, in staybolting desired portions of said upstanding walls, and then permanently securing said staybolted walls to the siphon body, the unslitted end of said tube providing a neck extension for the siphon.

24. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in providing a seamless metallic tube having a slit therein throughout a portion of its length beginning at a point spaced from one end thereof, opening up portions of said tube on opposite sides of the slit to provide upstanding walls thereon of different heights, and then fitting and permanently securing the edges of said siphon body and tube walls together, the unslitted end of said tube providing a neck extension for the siphon.

25. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom and having side walls of different depths, in providing a seamless metallic tube having a slit throughout a portion of its length, said slit beginning at a point spaced from one end thereof, opening up portions of said tube on opposite sides of the slit to provide upstanding walls thereon of different heights, placing the tube and body together and then staybolting one of the tube walls to the opposed wall of the siphon body, the unslitted end of the tube providing a neck extension for the siphon.

26. The method of making thermic siphons of the kind described which consists in providing a flat hollow siphon body having an open bottom open at one end, in providing a length of seamless metallic tubing having a reduced portion at one end thereof, in longitudinally slitting said tube beginning at a point adjacent the juncture of the reduced portion with the remainder of the tube, opening portions of the tube on opposite sides of the slitted portion to provide upstanding walls thereon and fitting and securing said walls to the open bottom of the siphon body.

27. The method of making a part for a thermic siphon of the kind described which consists in providing a seamless tube and swedging one end thereof to reduce its diameter, in longitudinally slitting the other end of said tube along a line to one side of a vertical plane passing through the axis of the tube and then opening up portions of the tube on opposite sides of the slit to form upstanding walls of different heights thereon, and at the same time reducing the diameter of the last mentioned end of the tube to provide the excess metal required for said upstanding walls.

28. As an article of manufacture, a part for a thermic siphon of the character described comprising a one-piece member, having a seamless tubular neck portion, a pair of upstanding walls upon the remaining portion, said upstanding walls forming a slotted opening, and one thereof being of greater height than the other.

29. As an article of manufacture a thermic siphon comprising an upper hollow body portion and a lower hollow member secured thereto, said lower hollow member being in one piece and forming a part of the bottom of said siphon body and including a seamless tubular portion forming an intake neck.

30. As an article of manufacture a thermic siphon comprising an upper hollow body portion and a lower hollow member secured thereto, said lower hollow member being in one piece and forming a part of the bottom of said siphon body and including a seamless unstaybolted tubular portion forming an intake neck.

In testimony whereof, I have hereunto set my hand, this 16th day of February, 1927.

WALTER H. HINSCH.

In testimony whereof, I have hereunto set my hand, this 16th day of February, 1927.

GUST J. CHRISTENSON.

CERTIFICATE OF CORRECTION.

Patent No. 1,717,033. Granted June 11, 1929, to

WALTER H. HINSCH ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, line 6, claim 5, for the word "and" read "the"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of July, A. D. 1929.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

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