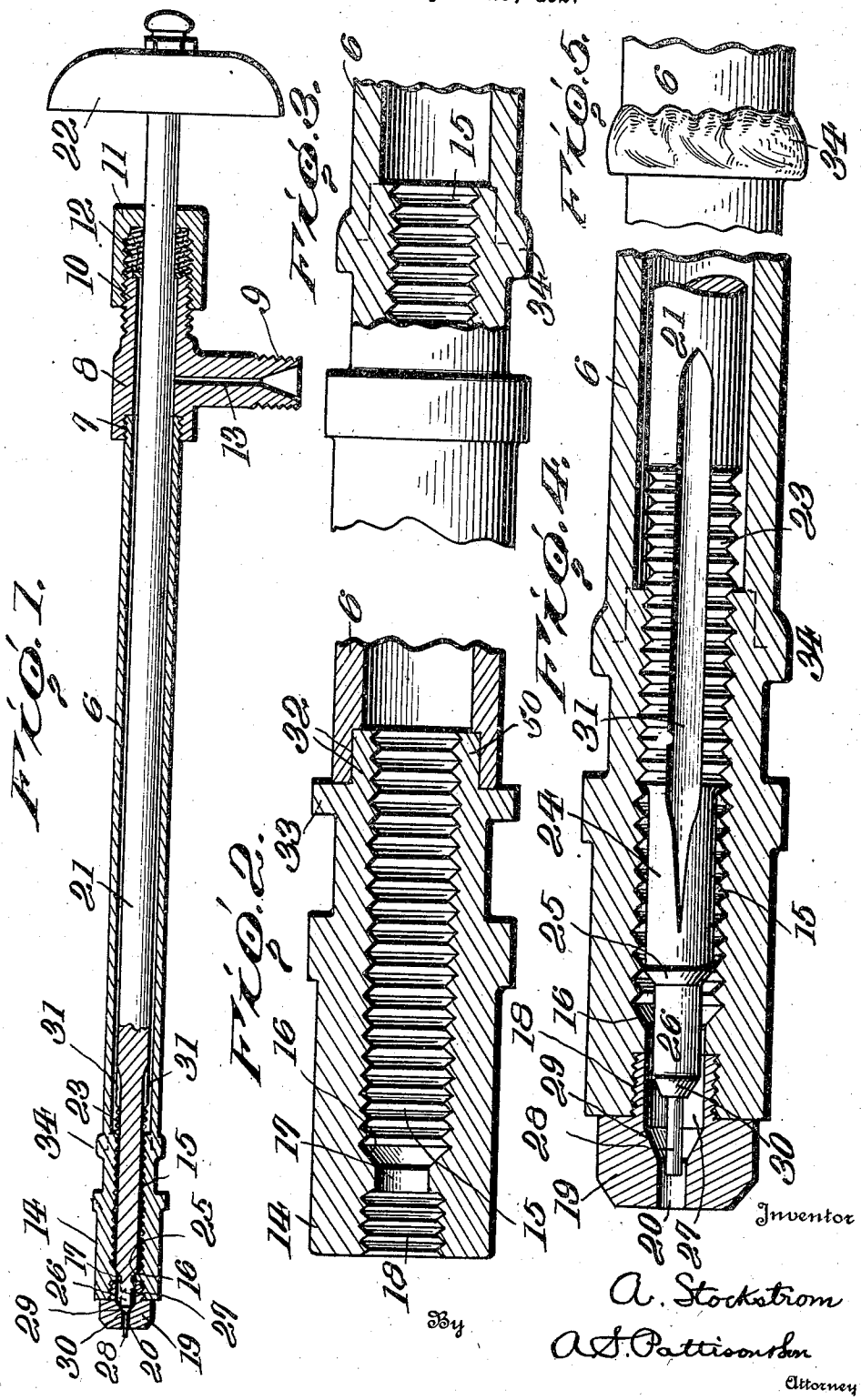
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VAPORIZER AND METHOD OF MAKING THE SAME

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VAPORIZER AND METHOD OF MAKING THE SAME.

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This invention relates to improvements in vaporizers and the method of making the same and contemplates more particularly a vaporizer designed for use in connection with gas or liquid fuel burning stoves.

Vaporizers for use with gas or liquid fuel burning stoves are old in the art and for the most part are in a general way similar in construction. That is to say, they comprise a long tube or conduit for conducting the fuel and a valve is formed in the outlet end of the tube.

The prior art discloses vaporizers made in one piece and the prior art discloses vaporizers made in two or more pieces. When the tube is made of a plurality of pieces, the prior art discloses that these pieces have been screw threadedly attached to one another either internally or externally or the pieces have been attached to one another by a butt weld.

Vaporizers made in the manner as indicated above, have certain disadvantages. Where the vaporizer is made in one piece, the manufacture of the vaporizer is quite difficult and expensive as it necessitates several operations to bring about a small bore adjacent the outlet end of the tube and adjacent the small bore a valve to cooperate with a valve to form a liquid tight closure at this end of the tube. As a matter of fact, it is impractical and practically impossible to produce as an economical commercial vaporizer, one which is made in one piece. Where the vaporizer is made in two or more pieces and threaded together, it has been found that the joint between the pieces has a tendency to break or crack and also to leak at this point. This is undoubtedly due to the fact that the vaporizer is subjected to quite an intense heat when in operation, and that consequently the vaporizer, when the stove is turned out, will cool off quite rapidly, and that this repeated cooling and heating brings about the objectionable result above referred to. That form of vaporizer wherein the tube is made in two pieces and the pieces are butt-welded together, also has objections and disadvantages. The butt-weld is usually an electric one and of a consequence, carries a large burr both internally and externally of the tube, and this necessitates the removal of at least the inside burr, after the weld is made, to prevent the burr from forming an obstruction in the tube. The removal of this burr requires an extra operation in the manufacture of the device, and it has been found will oftentimes result in a loosening or breaking of the weld, should the weld not be perfectly made.

Having the above objections to the present known forms of vaporizers in mind, the present invention has been conceived which constitutes a vast improvement over the vaporizers now known, and additionally overcomes the objections of the vaporizers now known and on sale.

The primary object of the invention is the provision of a vaporizer tube which is made in two parts united together by a lap weld.

A further object of the invention is the provision of a vaporizer having a tube made in two pieces lap welded together, the parts being so constructed that one piece acts as a guide for the other, and insures perfect alinement of the pieces.

A still further object of the invention is the provision of a vaporizer having a tube made of two pieces which are united together by a lap weld which weld is accomplished by melting a portion of one piece into a molten state to bring it to a homogeneous weld between the pieces.

Another and further object of the invention is the provision of an outlet plug or vaporizer tube having at one end a valve seat while its other end is reduced for internal engagement with the vaporizer tube and provided with an external collar adapted to be lap welded to the exterior of the vaporizer tube.

Other further objects, improved features of construction and improved results of the invention will appear from the following description and accompanying drawings.

In the drawings:

Figure 1 is a longitudinal vertical sectional view of a vaporizer made in accordance with the present invention.

Figure 2 is an enlarged detail longitudinal sectional view showing the outlet plug applied to the vaporizer tube prior to the welding operation.

Figure 3 is an enlarged detail view partially in vertical longitudinal section, showing the outlet plug applied to the tube after the welding operation.

Figure 4 is an enlarged view in vertical longitudinal section showing the outer end of the vaporizer and the outlet plug, together with the vaporizer valve.

Figure 5 is an enlarged side view illustrating a weld between the tube and the plug.

Referring now in detail to the drawings, it will be seen that the vaporizer comprises a main tube, one end of which is threadably attached as at 7 to the T fitting 8 which fitting is adapted to be attached at 9 to a fuel supply conduit (not shown), while the end portion 10 of the fitting carries a nut 11 with suitable stuffing material 12 to form a stuffing box. As is common in such construction, the fitting in provided with a conduit or fuel passageway 13 for conveying the fuel from the supply conduit to the main vaporizer tube 6.

The outer end of the vaporizer tube 6 is provided with a plug 14 which plug has a main bore internally threaded as at 15 which terminates adjacent the outer end of the plug in a bevelled valve seat 16 which seat in turn communicates with a reduced bore portion 17 which in turn communicates with the internally threaded bore 18 at the outer end of the plug. The bore 18 carries a nozzle plug or nut 19 which nozzle has a very minute orifice 20.

Extending throughout the length of the vaporizer tube 6 and through the stuffing box or nut 11, is a valve stem 21 carrying at one end an operating handle 22. The inner end of the valve stem is threaded as at 23 and is of a diameter to properly engage and turn in the internal threaded main bore 15 of the outlet plug 14. The rod beyond this threaded portion terminates in a reduced end of the threaded portion 24 which in turn terminates in a tapered valve 25 adapted to cooperate with and engage the tapered valve seat 16 of the outlet plug. The valve stem continues beyond the tapered valve 25 in the form of a still greater reduced portion 26 which is of a size to pass freely through the bore 17 of the outlet plug and the bore 27 of the nozzle. A fine needle 28 extends outwardly from the portion 26 of the valve stem through the minute orifice 20 of the nozzle. The bore portion 27 and the inner end of the orifice 20 of the nozzle, meet in a tapered seat 29 and the outer end of the valve portion 26 is tapered as at 30 to engage this seat. This particular construction insures that the needle will be properly alined with the nozzle orifice and at the same time the tapered portion 30 and the tapered seat 29 form, in a sense, a supplemental or secondary valve.

To permit a passage of fuel from the main vaporizer tube 6 to the orifice 20 of the nozzle, when the valve is open as appears in Figure 4 of the drawings, the valve stem is provided at its opposite sides with grooves 31 which extend from a point slightly in the rear of the threads 23 to a point which is short of the tapered valve portion 25 of the stem. It will be readily understood that this groove extends through the valve stem threads and provides a passageway to the nozzle.

In the present invention, however, the important part is the attachment between the outlet plug 14 and the main vaporizer tube 6. By reference to enlarged views 2, 3 and 4 of the drawings, it will be seen that the outer end of the tube 6 is provided with an internal circumferential groove 32, and that the inner end 50 of the outlet plug 14 is reduced in diameter and is of a size to fit within the groove of the vaporizer tube, and that the length of this reduced portion of the plug is similar to the depth of the groove. It will be seen that with this construction, a perfect alinement between the outlet plug and the tube is assured. The outlet plug at the inner end of its reduced end 50 is provided with a circumferential flange or collar 33. This collar performs two functions. In the first place it acts as an abutment for the outer end of the vaporizer tube 6 and in the second place it provides the metal which is melted down to form a homogeneous weld (see Figures 3, 4 and 5) with the outer face of the outer end of the vaporizer tube.

The connection between the outer plug and the vaporizer tube is spoken of and described as a lap weld for want of a better definition. In carrying out the invention I have accomplished this weld by melting down the collar 33 and welding this material to the outer wall of the tube by means of an oxy-acetylene welding torch. I do not, however, think it impossible to accomplish the weld in some other manner as it could undoubtedly be readily welded by means of electricity or some other equally well known heating medium.

With a vaporizer constructed in the manner described, the objections noted to those vaporizers now known, are overcome, and it has been additionally found that by reason of the internal engagement between the outlet plug and the vaporizer tube, a proper alinement between these members is always had, which insures that the valve stem entering the plug and the needle entering the nozzle, will always work freely and be correctly centered.

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

1. A vaporizer comprising a vaporizing tube, a plug having therein a bore which forms a valve seat, a collar carried by said plug adjacent one end, the end of the plug beyond the collar fitted within the end of the tube with the tube end abutting the collar, said collar melted down and overlapping the tube end to form a circumferential homogeneous lap-weld between the plug and the tube ends, a valve stem extending through said tube, and a valve on said stem co-operating with said valve seat.

2. The method of forming a vaporizer con-

sisting of providing a vaporizing tube and a plug with an internal bore and an external circumferential projection adjacent one end thereof, telescoping the ends of the plug and the tube with the tube end abutting the plug projection, and melting said plug projection and causing it to overlap the tube end to form a circumferential and homogeneous lap weld between the tube and plug ends.

3. The method of forming a vaporizer consisting of providing a vaporizing tube and a plug with an internal bore and an external circumferential collar adjacent one end thereof, telescoping the ends of the plug and the tube with the tube end abutting the plug collar, and melting said plug collar and causing it to overlap the tube end to form a circumferential and homogeneous lap weld between the tube and plug ends.

In testimony whereof I hereunto affix my signature.

ARTHUR STOCKSTROM.