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METHODS FOR FABRICATING GAS MANIFOLDS

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METHODS FOR FABRICATING GAS MANIFOLDS

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This invention relates to methods for fabricating gas manifolds and particularly to methods for fabricating such manifolds which are especially adapted for use on gas ranges, furnaces, infra-red heaters, space heaters and unit heaters.

Manifold assemblies of this type comprise an elongated main hollow tubular section to which gas is supplied through a main supply pipe and from which gas is distributed to individual burners through a plurality of take-off spud connections. Brackets are provided at the opposite ends of the main tubular member for mounting the manifold assembly on the gas burning equipment.

For many years it was the practice to construct such gas manifold assemblies from pipe sections and pipe fittings which necessitated many joints and parts, both the parts and the fabricating techniques being relatively expensive.

Because of the many disadvantages of such methods of assembly, it was proposed to simplify the method of construction by closing the ends of the single long pipe by a spinning process. While this method did result in a substantial simplification of prior fabricating methods with a consequent reduction in the cost of the completed product, nevertheless spinning the relatively heavy gauge manifold pipe is a process requiring machinery designed specifically for this purpose and essentially instantaneous as contrasted with the expense of such equipment that is not justified by the relatively limited quantities in which gas manifolds are produced.

With the foregoing considerations in mind, it is the principal purpose and object of the present invention to provide improved methods of fabricating gas manifolds which are substantially less expensive than prior methods and which eliminate the need for expensive highly specialized machinery.

It is also an object of the invention to provide improved methods for fabricating gas manifolds by simultaneously attaching brackets to the manifold ends which permit the utilization of inexpensive simple components which may be formed by simple cutting or stamping operations.

Further objects and advantages will become apparent as the description proceeds in connection with the accompanying drawings in which:

FIGURE 1 is a perspective view of the completed manifold assembly fabricated in accordance with the method of the present invention;

FIGURE 2 is a fragmentary section taken along line 2—2 of FIGURE 1 showing details of the construction of the ends of the manifold;

FIGURE 3 is a fragmentary sectional view taken along line 3—3 of FIGURE 1 showing the construction by which the spuds are attached; and

FIGURE 4 is a fragmentary elevation of a manifold assembly fabricated in accordance with prior methods.

Referring now more particularly to the drawings, the manifold assembly illustrated therein is of the type utilized in gas ranges, furnaces, infra-red heaters, space heaters and unit heaters and serves to distribute gas from a main intake connection through a relatively enlarged main manifold section 12 to a number of gas burners through a like number of spuds 14. When the manifold assembly is installed for use, it is suspended from the range structure at its opposite ends by sheet metal attaching brackets 16 and 18 which are provided with attaching flanges 20 and 22 respectively. In view of the service requirements of such manifolds, it is essential that they have sufficient strength and durability to remain gas tight over an extended service life.

As pointed out above, it has long been the practice to fabricate the main manifold section 12 from a piece of stock which is initially tubular. Prior to the present invention, the ends of the main manifold section 24 were sealed off by an expensive process to the form shown in FIGURE 4. The end brackets 25 were then welded along two arcuate lines 26 and 27 in a separate assembly process. While this prior assembly did produce an assembly meeting all of the service requirements, nevertheless, it could be fabricated only at relatively high cost and the method was available only to one or two manufacturers who made up such a unit as a sub-assembly to serve the entire industry, primarily because of the expense of the spinning apparatus required to seal the ends of the main manifold section.

In accordance with the present invention, the manifold assembly is fabricated from the same mass of components as those employed in the more expensive prior art methods. Initially the main manifold section 12 is cut to the proper length from cylindrical stock. The desired number of uniformly spaced openings 28 are formed in aligned relation in the wall of the main tubular member 12. The surface of the manifold and the manifold openings 28 is spot faced as at 30. One end of the spuds 14 is chamfered as at 32 leaving a pilot section 34 for accurately locating the spud in the opening 28. Electrodes of a resistance welding machine engage the spud and manifold and securely weld one to the other, circumferential contact of the spud manifold being insured by the spot faced area 30. The inlet pipe 10 is welded to the manifold body by conventional techniques.

The end of the manifolds are flattened by a suitable clamping or pinching apparatus so that the ends of the manifold are deformed to place portions of the end wall section in contact to form a straight line joint indicated at 36. In the particular installation shown, the joint 36 is parallel with the major axis of the inlet pipe 10 and normal to the axes of the spuds 14. However other installations may dictate another relationship. The flattening operation is substantially instantaneous as contrasted with the prior time-consuming spinning operation and can be effected with readily available relatively inexpensive apparatus of conventional construction.

The final step in the process involves attaching the support brackets 16 and 18 to the opposite flattened ends of the main manifold tube 12. This is done by welding the straight edge 38 of the brackets to the straight line joint 36. Thus the single operation of welding the bracket fulfills two purposes in that the ends of the manifold are made gas tight and the brackets are securely attached. The two operations, therefore, are combined into one and at the same time only straight edge welds are required so the operation lends itself to automatic machine welding processes if desired.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A method of fabricating a gas manifold assembly comprising the steps of providing an open-ended tubular manifold member and bracket members having a straight attaching edge, flattening the ends of said manifold mem-
ber to thereby substantially close the ends of said manifold member along substantially straight parallel joints and welding the bracket members to the respective ends of said manifold along a single weld line covering said joint at each end of said manifold, said single weld thereby sealing said joints and simultaneously attaching said bracket members to said manifold members.

2. A method of fabricating a gas manifold assembly comprising the steps of providing an open ended tubular manifold member, bracket members having a straight attaching edge and spud members; flattening the ends of said manifold member to thereby substantially close the ends of said manifold member along substantially straight line joints; welding the bracket members to the respective ends of said manifold member along said straight joint with a single weld at each end of said manifold member to thereby simultaneously seal said joint and attach said bracket members; and welding said spuds to said manifold member.

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