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2,998,640

METHOD OF FORMING A WALL FROM A PLURALITY OF TUBES

Filed March 4, 1957

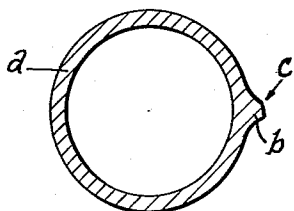


FIG. 1.

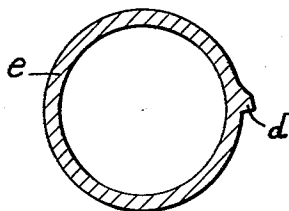


FIG. 2.

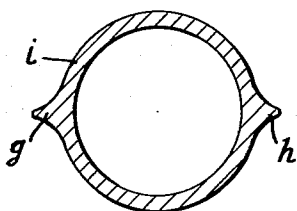


FIG. 3.

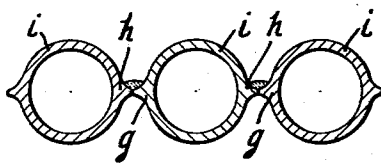


FIG. 4.

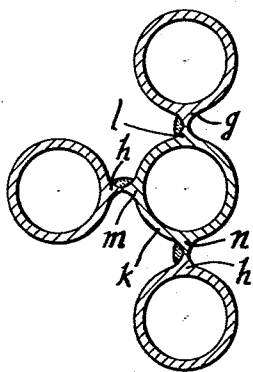


FIG. 5.

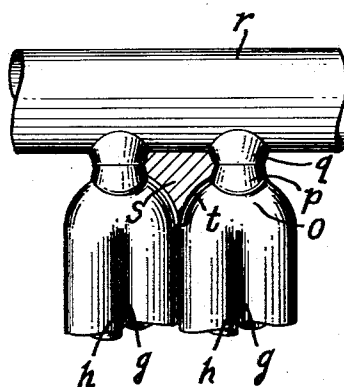


FIG. 6.

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METHOD OF FORMING A WALL FROM A PLURALITY OF TUBES

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2 Claims. (Cl. 29—157.4)

Several methods are known for assembling an uninterrupted wall from a multiplicity of tubes, said tubes being arranged parallel and close to one another to form panels such as are used for lining the combustion chamber of boilers.

In particular it has already been proposed to provide these tubes with protrusions to be welded together or on to a contiguous tube having a smooth surface, that is to say having no such protrusion.

However, it is of advantage to have the tubes as close to one another as possible so that the available area can be used to the best advantage. This close packing of the tubes is theoretically possible if these tubes are connected at the end to elbows of very small radius, provided in some case with tubulures. In actual practice these elbows with tubulures would be used for connecting up with the header, and the tubulures on the header could be separated from each other by the usual intervals required in making a header with tubulures.

However, this involves another difficulty since these almost contiguous tubes are difficult to weld together along their generatrices of contact, since welding—especially when thin-walled tubes are concerned—impairs the strength of the tube wall.

The known methods of assembling an uninterrupted wall from closely packed tubes involve difficult and costly methods of making the welds.

The purpose of the present invention is to assemble an uninterrupted wall from closely packed parallel tubes without the need for special methods of welding.

According to the present invention, in a known manner, one or more ridges are formed on the tube by compression of the tube, along one or more generatrices. The profile of these symmetrical or asymmetrical ridges may also have a chamfered lip. To assemble the uninterrupted panel it is then sufficient to weld together the chamfered lips of two adjacent tubes, and so on.

The following description with reference to the accompanying drawings, given by way of example, explains how the invention may be embodied.

FIG. 1 shows a sectional tube having a symmetrical, chamfered ridge.

FIG. 2 is a section of a tube with an asymmetrical ridge.

FIG. 3 is a section through a tube having two symmetrical ridges at 180° from each other.

FIG. 4 is a section through part of a panel assembled from tubes as shown in FIG. 3.

FIG. 5 is a section through part of a T-shaped wall.

FIG. 6 is a side elevation of the connection of the tubes to a header.

As can be seen in FIG. 1, and in accordance with the present invention, a heated tube *a* of circular cross-section has been subjected to compression in dies of suitable shape along one of its generatrices, the effect of this compression being to reduce the diameter of the tube without disturbing its circular cross-section, and to produce a ridge *b* in the zone of the heated generatrix.

To give an example; if it is desired to obtain tubes with a final diameter of 30 mm., and 4 mm. thick, a tube of about 40 mm. diameter is compressed and a ridge of about 4 mm. is obtained along the generatrix, thus increasing the thickness of the wall at this point to 8 mm.

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The lip of the ridge *b* may be chamfered directly as seen at *c*, by suitably shaping the compression die.

It is also possible, by using the same method and by making the dies of suitable shape, to obtain an asymmetrical profile *d* for the ridge of the tube *e* (FIG. 2).

The method of compressing the tube also makes it possible to obtain ridges situated at 180° to each other, like *g* and *h* on the tube *i* in FIG. 3. These ridges may have a triangular profile as represented.

The wall is then assembled, as shown in FIG. 4, by welding together the two ridges *h* and *g* of two adjacent tubes. In this case only the ridges undergo welding so that the tube wall as such remains unaffected.

The two ridges *g* and *h*, instead of being at 180° to each other, may be at 90° for the angle tube in case it is desired to make an angle wall.

It is also possible to provide three or four ridges distributed round the periphery of the tube so as to effect all sorts of combinations for assembling uninterrupted walls. FIG. 5 shows an angle tube *k* having three ridges *l*, *m*, *n* for a T-shaped wall.

The walls or panels of tubes obtained in accordance with the present invention have the advantage of being easily assembled and of having tubes as closely spaced as possible which allows of using the area available to the best advantage.

To assemble these tubes at their ends in the header, an elbow *o* may be provided, as shown in Fig. 6, for joining two adjacent tubes, this elbow *o* having, for instance, a tubulure *p* which is connected with the tubulures *q* on the header *r*. This method of assembly by means of elbows having tubulures allows of leaving the absolutely indispensable intervals on the header between the tubulures *q* while still producing a panel in which the tubes are as close together as possible. The spaces between two tubulures *q* and the adjacent elbows *o* may be closed by a plate *s* which may be welded to the ribs *t* forming part of the outer area of the elbow *o*.

It is, of course, understood that the details of the performance of the invention may be modified without departing from its principle.

What I claim is:

1. A method of producing an uninterrupted wall from a plurality of thin-walled tubes wherein each of said tubes has at least one longitudinal ridge extending outwardly from its exterior surfaces with the remainder of each tube being of substantially circular cross section which comprises, compressing inwardly circular tubes to form circular tubes of smaller diameter having at least one integral longitudinal exterior ridge with a chamfered edge remote from said tube, disposing said tubes in axial parallel relationship by abutting the chamfered edges of the ridges of the tubes, and welding each ridge to the corresponding ridge of the next adjacent tube, whereby said uninterrupted wall is formed without damage to the tubes.

2. A method of producing an uninterrupted wall from a plurality of thin-walled tubes wherein said tubes are formed with two substantially diametrically opposite longitudinal ridges extending outwardly from their exterior surfaces with the remainder of the tubes being of substantially circular cross section which comprises, compressing inwardly circular tubes to form circular tubes of smaller diameter having two diametrically opposite exterior integral longitudinal ridges each formed with a chamfered edge remote from said tube, disposing said tubes in axial parallel relationship by abutting the chamfered edges of the ridges of the tubes, and welding each ridge to the corresponding ridge of said next ad-

jaacent tube, whereby said uninterrupted wall is formed
without damage to the tubes.

2,594,232
2,660,155
2,734,259

Stockstill ----- Apr. 22, 1952
Chapman ----- Nov. 24, 1953
Beck ----- Feb. 14, 1956

References Cited in the file of this patent.

UNITED STATES PATENTS

1,339,970 Murray et al. ----- May 11, 1920

21,066

FOREIGN PATENTS

Great Britain ----- 1892