

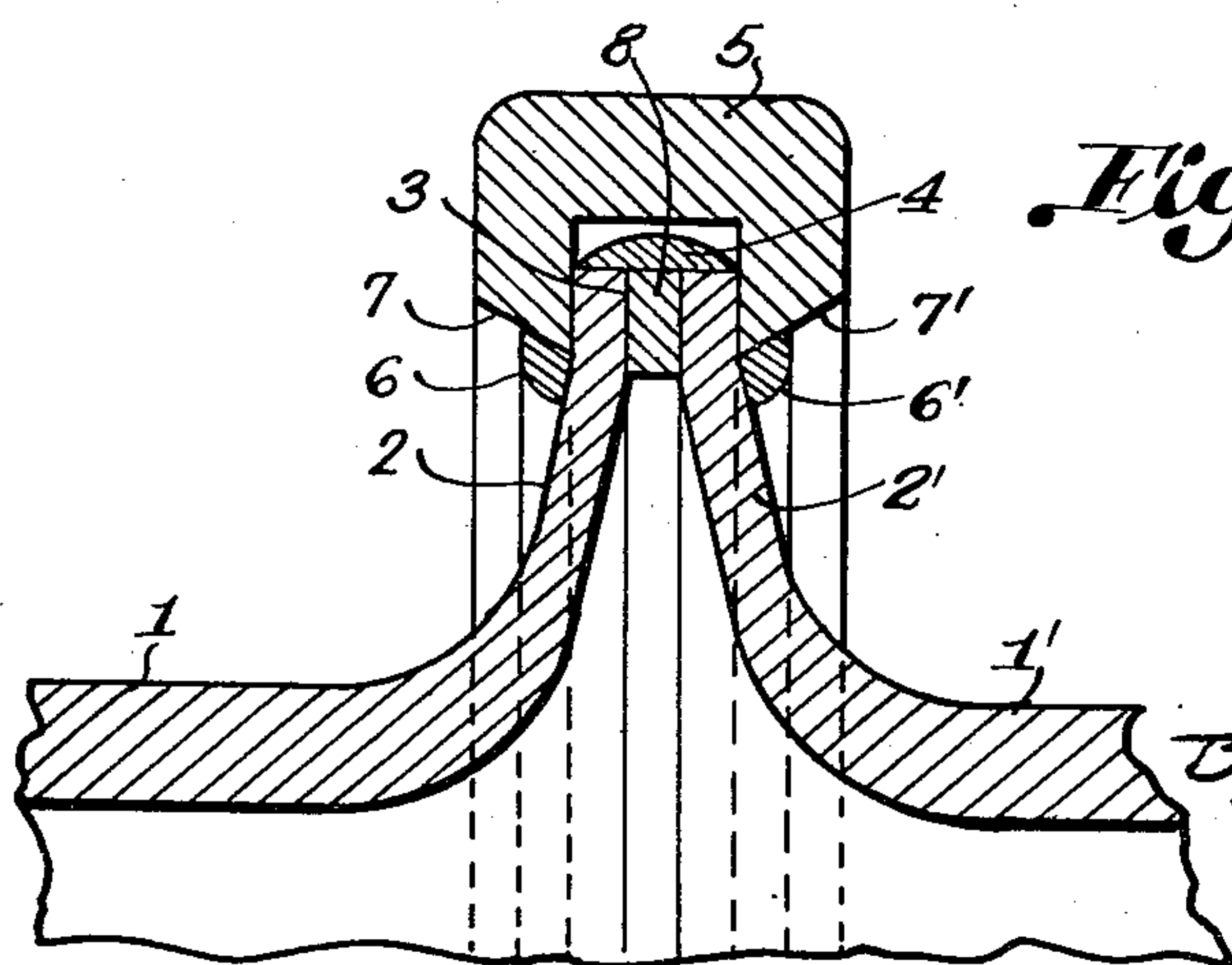
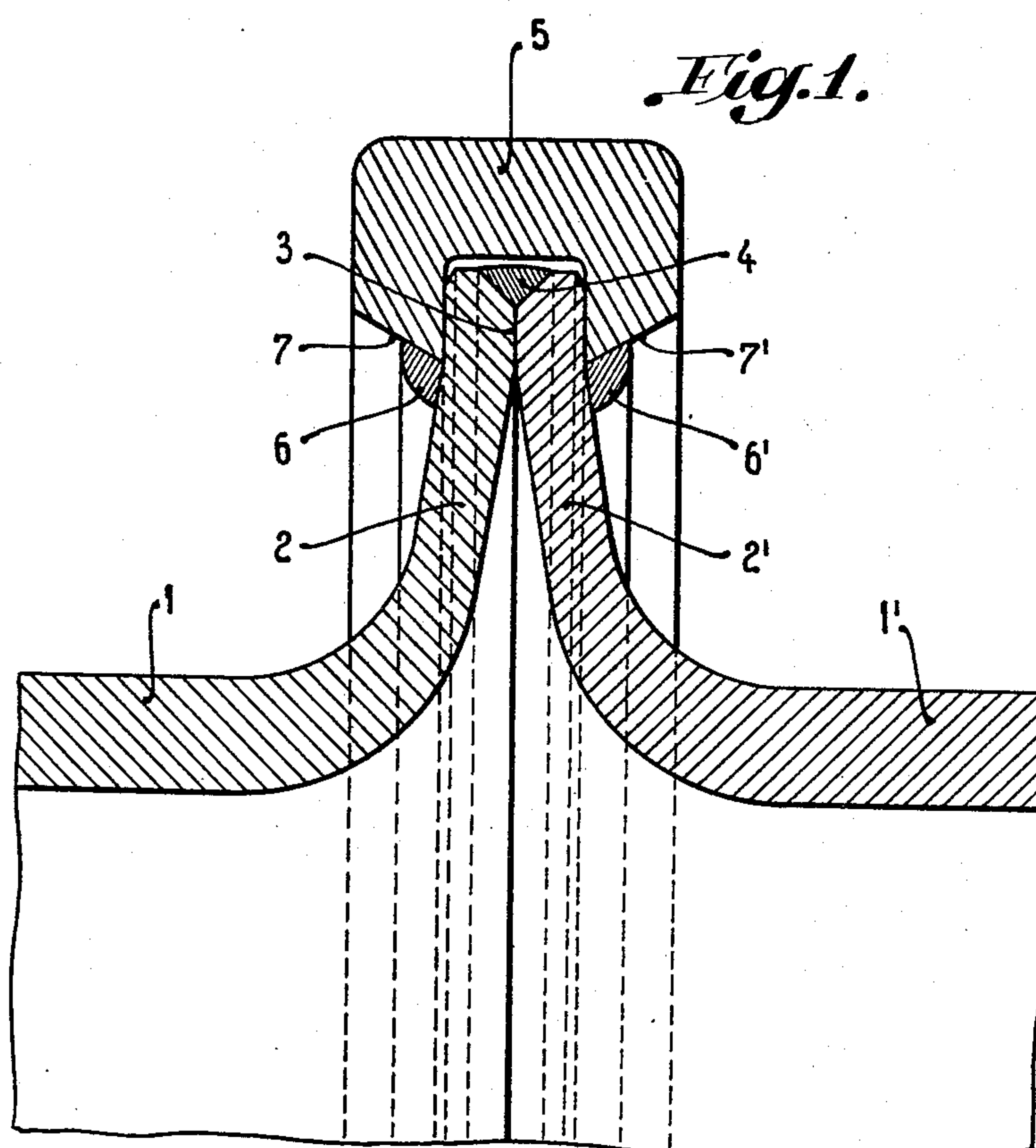
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FLUE TUBE FOR STEAM BOILERS

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FLUE TUBE FOR STEAM BOILERS

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Various methods have hitherto been employed for strengthening the flue tubes of steam boilers against external pressure and of providing for longitudinal expansion and contraction. For example, the Morrison or Fox corrugated tube has been widely used both for land and marine boilers but is now going out of favour on account of their high cost and loss of thermal efficiency due to the deposit of ash and soot in the hollows of the corrugations on the inside and the incrustation of lime and salt in the hollows at the top on the outside of the flue.

In another design, known as the Adamson flanged seam, a ring is placed between the outwardly flanged ends of adjacent plain tubes and the parts connected together by rivets. This method whilst providing adequate resistance to external pressure has the disadvantage of being too rigid in the axial direction, so that cracks are likely to develop in the bends of the flanges if the distribution of temperature in the boiler walls is not uniform.

The object of the present invention is to provide a method of construction of flue tube which combines the capacity of the Adamson ring to resist external pressure with the freedom for expansion which is characteristic of the Fox tube but without the disadvantages of either of these types.

The improved flue tube is of the Adamson type, that is to say, it is constructed of non-corrugated tubular elements, the adjacent ends of which are outwardly flanged. According to the present invention, however, the necessary capacity for longitudinal expansion and contraction is provided for by reducing the thickness of the outer marginal portions of the flanges and welding them together with or without the interposition of a ring between them.

The weld which extends only around the reduced marginal portions of the flanges can be and preferably is strengthened by means of inverted U-shaped bridges, clips or the like welded to the flanges and embracing the outer marginal portions thereof. If necessary these strengthening devices may extend completely around the flanges in the form of an encircling ring made in two or more segmental sections.

The improved method of construction whilst providing adequate resistance to external pressure is also very elastic in the longitudinal direction, the contiguous thin marginal portions of the flanges being sufficiently flexible to allow for longitudinal expansion and contraction without setting up stresses tending to produce cracks.

The ring encircling the flanges also protects the joint against the effect of any tensile stresses that may result from sudden cooling and in this way relieves the weld from stresses tending to adversely affect its efficiency.

In order that the invention may be clearly understood and readily carried into practice, reference is made in describing the same to the accompanying drawing wherein:

Figure 1 is a partially broken away longitudinal sectional view of a joint made in accordance with the present invention showing the flanges in abutting relationship; and

Figure 2 is a partially broken away longitudinal sectional view of a joint similar to that shown in Figure 1 but having a ring interposed between the flanges.

Referring in further detail to the drawing 1, 1¹ represent a pair of flue tube sections having flanges 2, 2¹ at their adjacent ends. These flanges are only contiguous around a narrow marginal portion 3 where they are made thinner than at the bends. The connection between the flanges is, therefore, sufficiently flexible to allow for expansion and contraction. The marginal portions of the flanges may be reduced in thickness in any suitable manner as by machining or rolling.

The edges of the flanges are connected together by a continuous annular weld bead 4 and are encircled by a ring 5 of inverted U-section which may be made in two or more parts and connected to the flanges by continuous or interrupted weld beads 6, 6¹. The ring 5 shown is made from rectangular bar iron and is bevelled at 7, 7¹ so that the welds 6, 6¹ are easily accessible. This ring can, however, be formed in any other suitable manner.

A modified form of the invention is shown in Figure 2 wherein a ring 8 is interposed between the narrow marginal portions 3, the portions being connected together by a weld 4.

What I claim is:

1. A flue tube composed of non-corrugated tubular elements, wherein adjacent ends of said elements are outwardly flanged and the flanges are connected together, characterised in that the flanges are reduced in thickness, contiguous only through a small radial width and welded together around their marginal edge portions only.

2. A flue tube composed of non-corrugated tubular elements, wherein adjacent ends of said elements are outwardly flanged and the flanges are connected together with the interposition of

a ring between them, characterised by this, that the flanges are reduced in thickness, contiguous with the ring through only a small radial width, and welded together around their marginal edge portions only.

5. 3. A flue tube joint between non-corrugated tubular elements wherein adjacent ends in said elements are outwardly flanged and the flanges are connected together, comprising flanges of reduced thickness in abutting relationship only through a small radial width near the periphery thereof, welded together around their marginal edge portions only, and strengthening pieces embracing the flanges only through the small abutting radial width near the periphery.

- 10 4. A flue tube composed of non-corrugated tubular elements wherein adjacent ends of said elements are outwardly flanged and the flanges are connected together with the interposition of

a ring between them characterized by this, that the flanges are reduced in thickness, welded together around their marginal edge portions only and in abutting relationship with the ring only through a small radial width near the periphery. 5

5. A flue tube composed of non-corrugated tubular elements wherein adjacent ends of said elements are outwardly flanged and the flanges are connected together with the interposition of a ring between them, characterized by this, that the flanges are reduced in thickness, are contiguous with the ring only through a small radial width near the periphery, are welded together around their marginal edge portions only and are embraced by strengthening pieces only through the small contiguous radial width near the periphery. 10 15

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