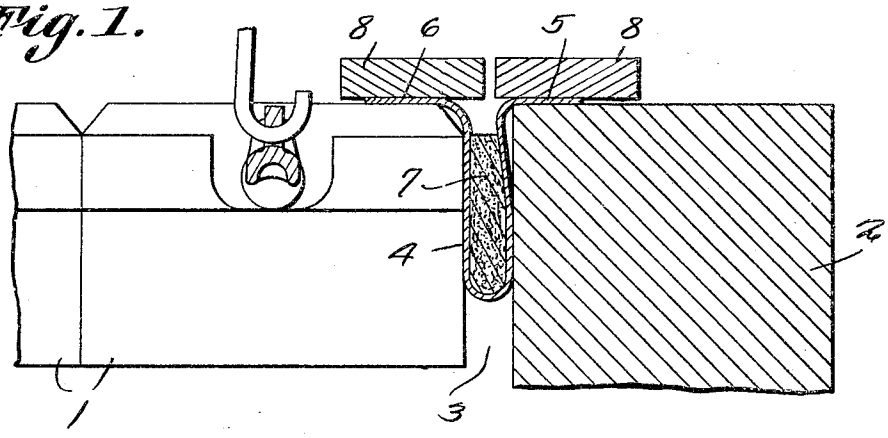
Oct. 25, 1932. S. H. LANYON 1,883,983

EXPANSION JOINT FOR FURNACES

Filed July 17, 1930

Fig. 1.



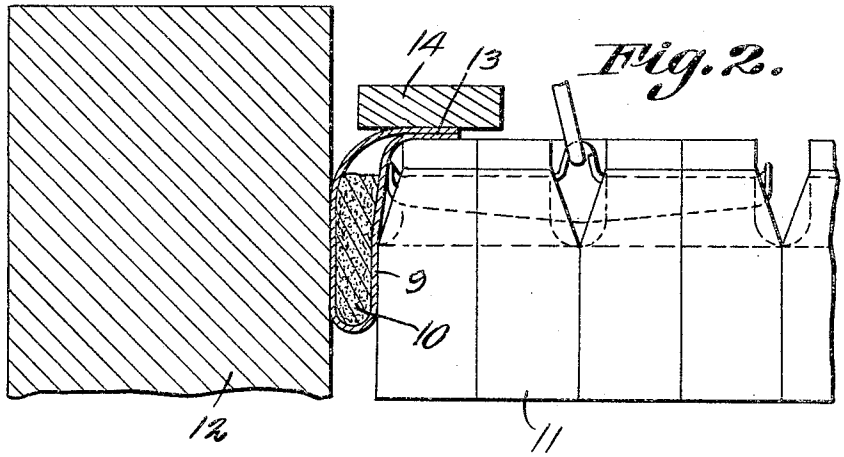
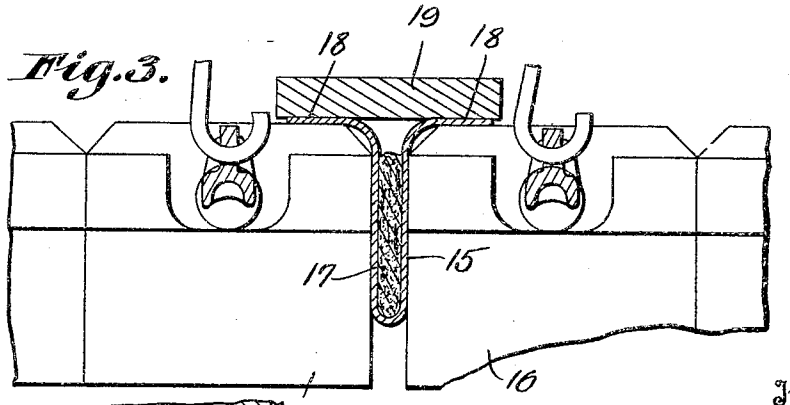


Fig. 2.

Fig. 3.



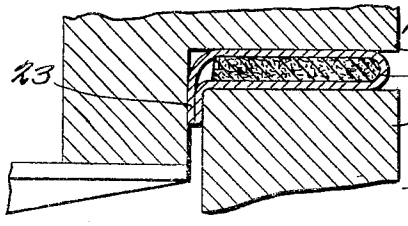


Fig. 4.

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UNITED STATES PATENT OFFICE

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EXPANSION JOINT FOR FURNACES

Application filed July 17, 1930. Serial No. 468,644.

This invention relates to an expansion joint designed primarily for use in connection with the arches and sectional walls of furnaces.

Heretofore serious difficulties have been encountered in structures of this type due to the fact that it has been difficult to prevent leakage of gas at the joints between the arch and walls of a furnace and at the same time prevent distortion of the arch due to expansion of the walls. It has also been difficult to prevent leakage of gas between arch sections and through sectionally supported refractory walls.

It is an object of the present invention to provide a simple and efficient expansion joint which can be used with various types of arches and walls, and will permit relative expansion and contraction of sections without distortion of these parts.

It is a further object to provide an expansion joint capable of withstanding the intense heat from within the furnace and at the same time preventing the escape of gas and smoke at the joints.

A still further object is to provide an expansion joint which is inexpensive and can be applied readily to a furnace structure.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of constructions hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawing the preferred forms of the invention have been shown.

In said drawing,

Figure 1 is a section through a portion of a furnace wall and a flat suspended arch provided with an expansible packing or joint.

Figure 2 is a similar view wherein the wall is shown extended above the arch.

Figure 3 is a section showing the application of the expansible joint between two sections of an arch.

Figure 4 is a view showing the joint between two overlying wall sections.

Referring to the figures by characters of reference, 1 designates separate tile adapted to be suspended by any suitable means so as to form a sectional flat arch which, in the structure shown in Figure 1, is substantially flush with the top of wall 2. Where a flat arch is suspended beside a wall as shown in Figure 1 a space 3 is necessarily provided to allow for independent expansion and contraction of the structures.

In order to prevent leakage of smoke and gas through the space 3 and at the same time permit the necessary expansion and contraction, the expansion joint constituting the present invention has been provided. This joint includes a sheet 4 of fire-resisting fabric bent to form a depending channel as shown, while the upper edges of the sheet are extended laterally to rest respectively on wall 2 and the tile 1 as shown at 5 and 6 in Figure 1.

Sheet 4 can be formed of asbestos fibre or a mixture of asbestos fibre and a fire-resisting metal much as nichrome wire. Under some conditions it might be formed entirely of a fabric of fire-resisting metal.

The channel formed by the fabric is partly or entirely filled with a heat-resisting fibrous material such as loose asbestos fibres 7, although this filler might also consist of a mixture of asbestos and nichrome wool or the like, or might consist of any other kind of wool-like fire-resisting material or materials.

The portions 5 and 6 are held in place by brick or tile 8 resting thereon, and the joint is maintained constantly under compression between the wall and arch to form a reasonably efficient gas and smoke seal.

Should the arch be suspended below the tops of the furnace walls, an arrangement such as illustrated in Figure 2 could be employed. In said figure the folded fabric 9 forming the channel in which the filler 10 is packed, is suspended between arch 11 and wall 12 and the two upper edge portions of the fabric are disposed in superposed relation as shown at 13 where they can be weighted down and held by brick 14 or the like.

Where it is desired to provide an expansion

joint between sections of an arch, the folded fabric 15 forming a channel is inserted between the sections 16 as shown in Figure 3. The filler 17 will be held in the channeled fabric sheet and the upper edge portions of this sheet will be extended in opposite directions so as to overlie the two sections 16 as shown at 18. Brick 19 can then be seated on these edge portions and under many conditions can be used to bridge the space between the sections.

If the refractory wall of a furnace is formed of separately supported sections 20 and 21 forming a horizontal joint between them, an expansion device such as heretofore disclosed can be used between the sections as indicated at 22 and the edges 23 of the fabric will lap and be held between the sections as shown.

It will be understood that when an expansion joint such as herein described has been placed between the sections of a wall or of a flat suspended arch, or between such an arch and the furnace walls, the parts of the structure are free to expand and contract without distortion and at the same time leakage of gas and smoke at the joints is practically prevented.

What is claimed is:

1. In a furnace structure the combination with elements adapted to expand and contract relative to each other and having walls forming a space therebetween, of a fire-resisting flexible sheet of fabric folded to provide a channel seated in said space and contacting with the walls of said space, a fibrous filling within the channel and confined solely thereby, and means independent of the contacted walls for suspending the fabric against displacement relative to said walls.

2. In a furnace structure the combination with elements adapted to expand and contract relative to each other and having walls providing a space therebetween, of a fire-resisting flexible sheet of fabric folded to provide a channel seated within said space and contacting with said walls, a fibrous filling within the channel and confined solely thereby, and means independent of the contacted walls for holding the fabric against displacement relative to the walls of the space, including means gripping the edges of the sheet.

3. The combination with the suspended arch and the wall of a furnace spaced apart to permit independent expansion and contraction, of a flexible fire-resisting sheet of fabric folded to form a channel located between the wall and arch, a fibrous filling of fire-resisting material within the channel, the upper edges of the sheet being superposed upon the arch, and a weight bearing on said upper edge portions and constituting the sole means for holding the sheet against downward displacement.

4. In a furnace the combination with spaced sections of a suspended arch, of an expansion joint including a flexible sheet of fire-resisting material folded to form a channel suspended between said sections, a filling of fibrous fire-resisting material within the channel and confined by the fabric independently of the sections, and weights bearing on the upper edge portions of the sheet and constituting the sole means for holding said sheet against downward displacement relative to the sections.

5. In a furnace the combination with spaced sections of a suspended arch, of a suspended expansion joint including a flexible sheet of fire-resisting fabric folded to form a channel suspended between said sections, a filling of fibrous fire-resisting material within the channel and confined by the fabric independently of the sections, and weights bearing on the upper edge portions of the sheet to hold the joint against downward displacement, said edge portions overlying the respective arch sections.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

SAMUEL HERBERT LANYON.