

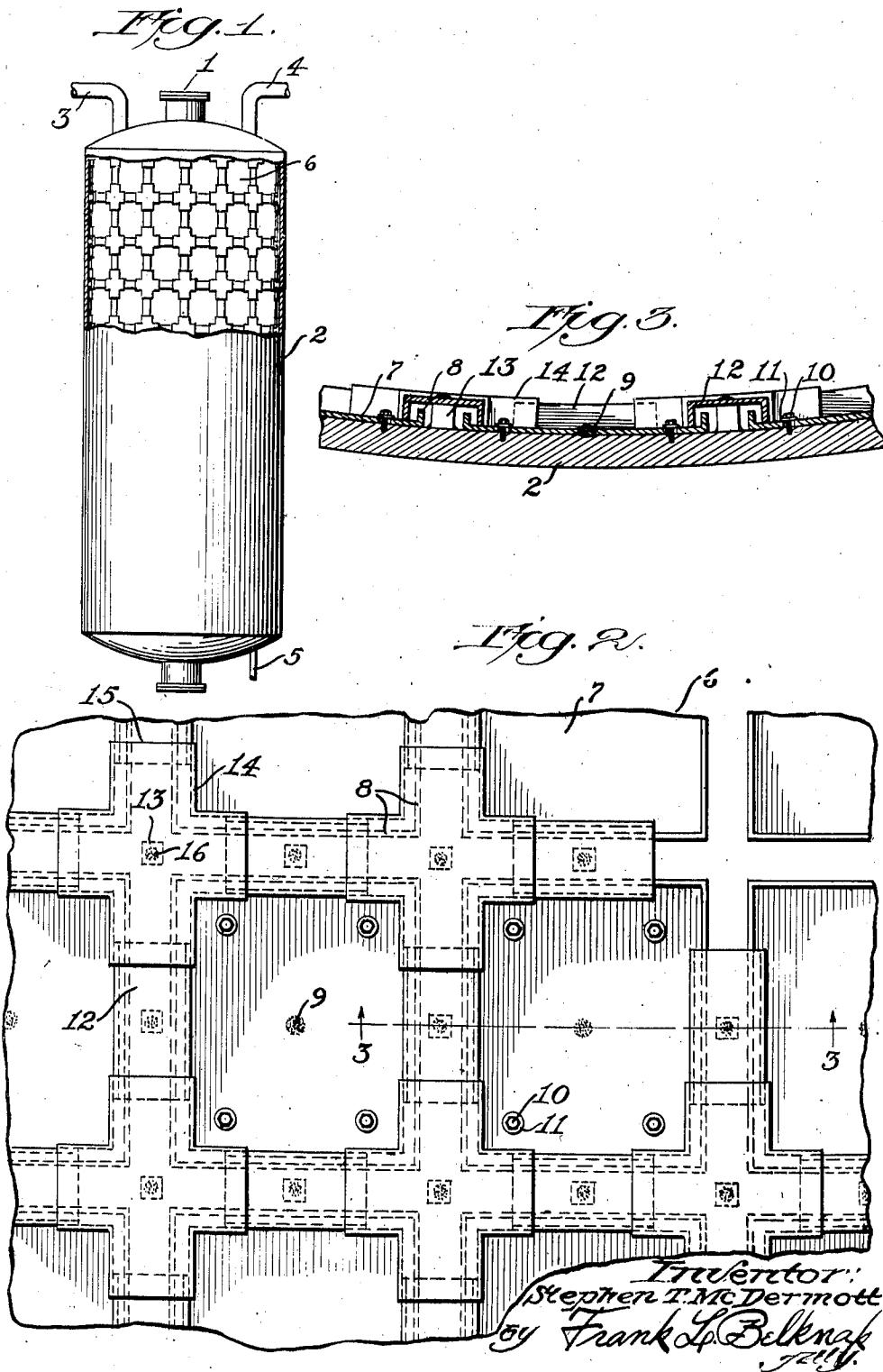
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METALLIC LINING FOR HIGH TEMPERATURE VESSELS

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METALLIC LINING FOR HIGH TEMPERATURE VESSELS

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This invention relates to improvements in means for lining high temperature vessels, and refers particularly to the provision of a continuous metallic lining formed of a plurality of sections which may expand and contract freely with changes in the temperature of the vessel to which they are applied, thereby eliminating warping and distortion of the lining and at the same time maintaining a tight protective metallic surface over the surface of the vessel.

The utility, objects and advantages of my invention will be apparent from the accompanying drawings and following detail description.

In the drawings, Figure 1 is an elevational view, parts being broken away and parts being shown in section, of a high temperature vessel provided with my invention.

Figure 2 is a fragmentary detail development of a portion of the inner surface of a vessel, as shown in Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Referring in detail to the drawings, 1 indicates a vessel which in the present instance may assume the form of a reaction chamber used in connection with a cracking operation. Said chamber may comprise an outer shell 2 and be provided with an inlet 3 for hot fluid, an outlet 4 for vapors, and a discharge 5 for residual liquids which have not vaporized in said chamber. It is to be understood, of course, that although a reaction chamber is shown utilizing my invention, my invention can be used in any type of vessel which may be provided with an inner lining and may be subjected to relatively high temperatures.

As a feature of my invention I may provide a lining 6 which may comprise a plurality of square or rectangular metallic plates or panels 7 having a flange or lip 8 formed around the outer edge thereof. Said panels may be placed in rows aligned horizontally and vertically around the inner surface of the chamber 1 and may be welded or otherwise fastened to the shell 2 at their central portions as shown best at 9 in Figs. 2 and 3. By this means of attachment of the panels 7 to the inner surface of the shell 2, it can

readily be seen that the panels will be free to explain either longitudinally or transversely.

If relatively large panels 7 are utilized, it may be desirable to provide additional supporting and guiding means for said panels which may take the form of cap screws 10 or the like, which may be threaded into the wall of the shell 2 and may extend through the panel 7, a washer 11 being provided between the head of the cap screw 10 and the surface of said panel. When such additional supports are used, the portion of the panel 7 through which cap screws 10 may pass may be drilled substantially larger in diameter than the diameter of said cap screws to allow for the movement of the panel in expanding and contracting when subjected to changes in temperature.

Channels 12 may be disposed in an inverted position over the upstanding adjacent flanges or lips of adjacent panels, and said channels may be fastened at their central portion as by welding or by other suitable means, as shown best at 13 in Fig. 3. By this means of fastening, channels 12 may also be free to expand in either direction.

A cross-channel 14 may cover adjacent corners of each of the panels 7 and may be provided with a web 15 of such dimensions that the ends of said cross-channels may completely enclose adjoining ends of the channels 12. By this provision, channels 12 and cross-channels 14 may be independently movable when either contraction or expansion occurs. Cross-channels 14 may be joined to the inner surface of shell 2 as at 16, which may be substantially the central portion of said cross-channel, thereby permitting said channel to expand in either a longitudinal or transverse direction.

It can readily be seen that by the construction hereinbefore described, an inner lining is provided which may act as a perfect seal within a chamber which may be subjected to relatively high temperatures, and yet will not warp or become distorted due to expansion or contraction. All of the elements comprising the lining are firmly attached to a supporting wall or shell and are maintained in contact

with each other in such manner that upon contraction or expansion they will slide relative to each other.

I am aware that many modifications may be constructed without departing from the spirit of my invention; for instance, the size and/or shape of panel 7 may be changed to any suitable or desirable dimensions or shape, the channels 12 instead of taking the form of the usual channel may be formed similar to a bead, that is, the same may be semi-cylindrical in cross-section. The same alteration may also be made in cross-channels. Further, the panels 7, channels 12 and cross-channels 14 instead of being attached to the supporting wall or shell 2 by means of welding, may be riveted thereto or may be bolted thereon. If desired, additional supporting means may be provided in connection with the channels 12 and cross-channels 14 which may take a form similar to the auxiliary supporting cap screws 10 which may be used in connection with panel 7. Many other modifications may be devised or material of which the lining is constructed may be changed. hence I do not wish to be limited except as necessitated by the prior art.

I claim as my invention:

1. In combination, a metallic lining for vessels subjected to relatively high temperatures comprising a plurality of panels connected at substantially their central portions to the inner wall of a vessel, and means attached to said inner wall for slidably connecting abutting spaced edges of adjoining panels.

2. In combination, a metallic lining for vessels subjected to relatively high temperatures comprising a plurality of panels connected at substantially their central portions to the inner wall of a vessel, said panels having flanged edges, and means attached to said inner wall for slidably connecting abutting spaced edges of adjoining panels.

3. In combination, a metallic inner lining for a vessel or receptacle, which comprises a plurality of spaced panels connected to the inner wall of the vessel at substantially their central portions, means slidably bridging the spaces between adjacent edges of adjoining panels, and means slidably contacting and enclosing adjacent ends of the adjoining bridging means.

4. In combination, a metallic inner lining for a vessel or receptacle, which comprises a plurality of spaced panels connected to the inner wall of the vessel at substantially their central portions, means slidably bridging the spaces between adjacent edges of adjoining panels, and means slidably contacting adjacent ends of the adjoining bridging means.

5. In combination, a metallic inner lining for a vessel or receptacle which comprises, a plurality of spaced plates connected to the inner wall of the vessel at substantially their

central portions, said plates having flanged upturned edges, and a plurality of channels frictionally contacting and enclosing adjacent flanged edges of adjoining plates permitting relatively slidable motion between the plates and the channels, said channels being attached at substantially their central portions to the inner wall of the vessel.

6. In combination, a metallic inner lining for a vessel or receptacle which comprises, a plurality of spaced plates connected to the inner wall of the vessel at substantially their central portions, said plates having flanged upturned edges, a plurality of channels frictionally contacting and enclosing adjacent flanged edges of adjoining plates permitting relatively slidable motion between the plates and the channels, said channels being attached at substantially their central portions to the inner wall of the vessel, and a plurality of cross channels attached at substantially their central portions to the inner wall of the vessel, said cross channels frictionally contacting and enclosing adjacent ends of said channels.

7. In combination, a metallic inner lining for a vessel or receptacle which comprises, a plurality of spaced plates connected to the inner wall of the vessel at substantially their central portions, said plates having flanged upturned edges, a plurality of channels frictionally contacting and enclosing adjacent flanged edges of adjoining plates permitting relatively slidable motion between the plates and the channels, said channels being attached at substantially their central portions to the inner wall of the vessel, and a plurality of cross channels attached at substantially their central portions to the inner wall of the vessel, said cross channels frictionally contacting and enclosing adjacent ends of said channels and frictionally contacting and enclosing adjacent corner portions of said plates.

In testimony whereof I affix my signature.
STEPHEN T. McDERMOTT.