April 25, 1933. S. W. EXCELL 1,905,832

INSULATING WALL

Filed Sept. 17, 1930

Fig. 1.

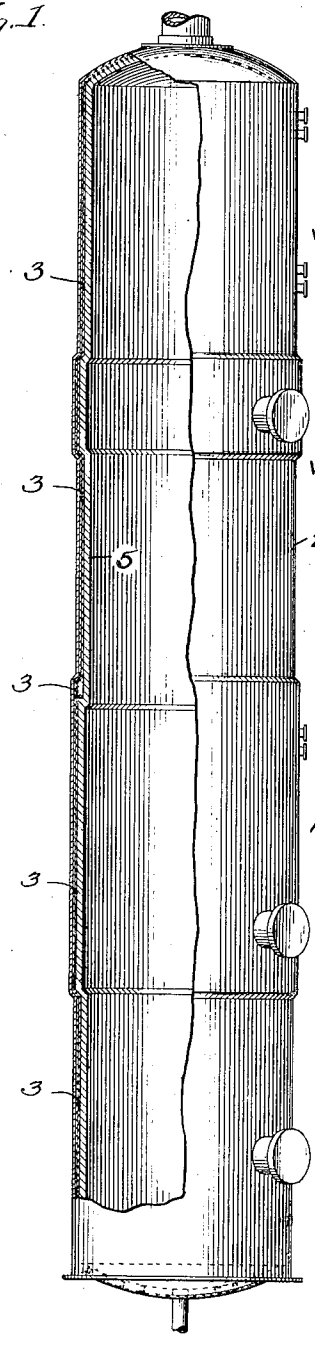
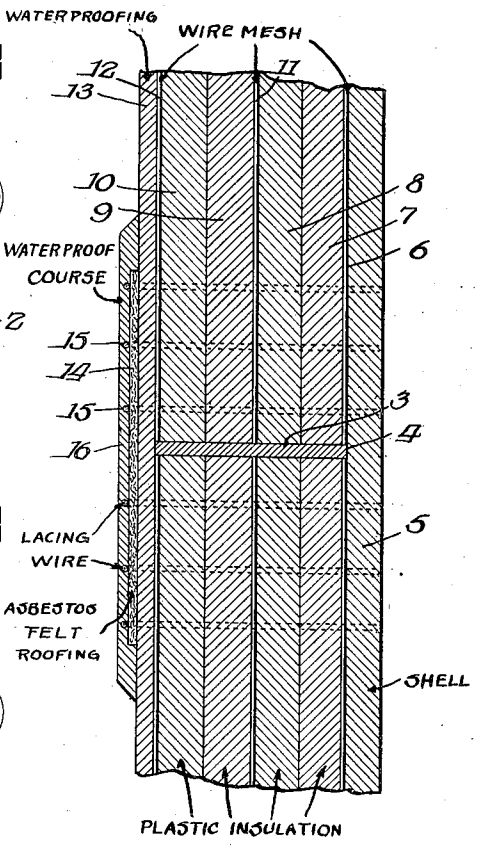


Fig. 2.



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UNITED STATES PATENT OFFICE

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INSULATING WALL

Application filed September 17, 1930. Serial No. 482,505.

This invention relates to a construction for insulating walls subjected to high temperatures and rapid expansion and contraction and more particularly to an insulating covering including a combined expansion joint and support.

The embodiment of the invention illustrated herein, namely an insulated bubble tower, may be referred to for an understanding of the difficulties heretofore encountered in providing adequate insulation for walls subjected to high temperatures. In the interests of efficiency in the design of bubble towers, provision is made for only a reasonable amount of heat loss through the insulation with which they are normally covered to prevent heat loss. However, the high temperature to which such walls are subjected and their rapid expansion and contraction as well as the rigors or climatic conditions, etc. soon cause the insulation to crack and warp with resultant sags and cracks and sometimes complete disintegration, leaving large areas of wall surface exposed to the elements. This in turn results in large heat losses, the prevention of which requires frequent and costly repairs. Part of this trouble has been found to be attributable to inadequate support of the ordinary forms of insulation on the walls but, due to the construction of walls such as bubble towers have, it has not heretofore been found practical to provide an adequate support.

I have devised what has proven in practice to be a very desirable and practical form of support which also serves as an expansion joint member whereby the insulation for the wall is divided along predetermined lines or planes of cleavage and each section is supported independently of every other section and at such intervals that the strength of each section is amply sufficient to carry the weight thereof.

Further objects as well as the advantages, uses and purposes of the invention will be or should become readily appreciated and understood from the following description and claims and after viewing the drawing in which:

Fig. 1 is a side elevational view of a bubble tower with one form of my invention applied thereto and

Fig. 2 is an enlarged sectional detail of a portion of the tower wall showing the construction at a joint between two sections of insulation.

The bubble tower 2 is adapted to be mounted on a base not shown and at spaced intervals along its height has steel rings 3 extending thereabout. Each steel ring 3 is welded at its inner edge 4 to the steel wall 5 of the tower so that the ring extends in a substantially horizontal plane outwardly from and around the tower. The width of the ring as well as its thickness will depend on the amount and weight of the material it is to support as well as upon other factors, as will be appreciated.

Preferably the steel rings 3 are put in place and welded and a band of wire mesh indicated at 6 is placed around and against the wall between adjacent rings 3. This wire mesh may be secured to the wall or about the wall in any suitable manner and serves as the holding means against which a first course 7 of plastic insulation may be troweled. The first course may be followed by a second course 8 of insulation and between which and the third and fourth courses 9 and 10 a second band of wire mesh 11 is placed and secured in any suitable manner. The last course of insulation is followed by a third band 12 of wire mesh upon which a water proof coat 13 is superimposed and held. It should be understood that the entire insulating covering from the inner layer or band of wire mesh designated 6 to and including the outside layer or band of wire mesh designated 12 and between and adjacent upper or lower ring 3 constitutes a section of insulation which is independent of every other section except insofar as the sections are tied together by the wall construction as a whole. In other words, rings or plates 3 serve as parting strips or expansion joints between the several sections of the body of insulation, and each ring or plate serves to support the section of insulation immediately above it.

Under some circumstances the insulation,

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including the wire mesh against which the insulation is laid, could be hung from the ring or plate supports 3 as by drilling holes through the plate and forcing the insulation therethrough, the wire mesh being pushed through the openings and bent over on the opposite side. In other cases hooks or other projections might be welded or otherwise secured to the under side of the plate supports and the wire mesh and insulation supported from the hooks. Other methods of securing the insulation and the wire mesh may be used.

Ordinarily it will be sufficient to support the insulation at one end only but where it may be desirable to support it at both ends this may be readily accomplished in the manner described.

The water proof coating 13 is preferably continuous throughout the length and girth of the tower and is somewhat elastic to provide for expansion and contraction. A strip or band of asbestos felt roofing 14 of liberal width to extend well above and below each joint is applied against the water-proof layer 13 and laced with wire lacing 15 thereagainst. Finally a water-proof course 16 is applied over the top of the roofing strip, particularly the top edge thereof and down to and including the lowermost lacing 15. Of course, it may be desirable to put a suitable paint over the entire structure after it is complete and to repaint, from time to time, as conditions dictate.

With a construction such as that described, each section of insulation may expand and contract without affecting any other section and cracking will be minimized and focused along parting lines provided between sections by the plates or rings 3. Should the insulation shrink or for any other cause pull away from the rings 3, the courses 13, 14 and 16, which carry over the joint, will prevent any material heat losses. The courses 13, 14 and 16 should be sufficiently resilient to compensate for considerable expansion and contraction of the sections.

While I have illustrated and described a preferred form of the invention in connection with a bubble tower or fractionating column, the invention in its broader aspects is not to be limited thereto. Furthermore as many modifications and changes may be made in the structural arrangement, I desire to be limited only by the spirit of the invention and the scope of the appended claims.

I claim:

1. A construction for insulating walls comprising a wall, a plurality of horizontally disposed and outwardly directed strips secured at one edge to said wall between the top and bottom of the latter, and a layer of insulation against said wall and supported by said strips.

2. A construction for insulating walls comprising, a wall, a plurality of sections of insulation covering said walls said sections being substantially independent of one another along planes substantially perpendicular to the plane of the wall and a rigid supporting strip secured to said wall beneath each insulation section for supporting the insulation section immediately thereabove.

3. A construction for insulating walls comprising, a metal wall, a plurality of sections of insulation covering said wall, and a strip of metal of greater width than thickness secured along one longitudinal edge to said wall and beneath at least one of said insulation sections, said edge extending in a substantially horizontal direction along said wall and supporting the insulation immediately thereabove.

4. A construction for insulating walls comprising, a metal wall, a plurality of metal strips welded along an inner edge of each to said wall at vertically spaced intervals, and projecting from and extending along said wall in a substantially horizontal plane, and a plurality of superimposed courses of insulation covering said wall between each metal strip and the next metal strip immediately thereabove, said insulation between strips being supported by the lower strip.

5. A construction for insulating walls comprising, a metal wall, a plurality of metal strips welded along an inner edge of each to said wall at vertically spaced intervals, and projecting from and extending along said wall in a substantially horizontal plane, a plurality of superimposed courses of insulation covering said wall between each metal strip and the next metal strip immediately thereabove, said insulation between strips being supported by the lower strip, and a covering over the outer edge of each strip.

6. A construction for insulating wal's comprising, a metal wall, a plurality of metal strips secured to said wall at vertically spaced intervals, each strip being welded along its inner edge to said wall and projecting from and extending along said wall in a substantially horizontal plane, a wire mesh extending over the surface of the wall between each strip and the strip above it, plastic insulation extending over and attached to said wire mesh. and a covering over the outer edge of said strip.

7. In a tower of the character described for distilling volatile materials, insulation extending over the external surface of the tower and divided along horizontal lines into a plurality of independent sections, and means intermediate said sections and secured to said tower for maintaining said sections in divided arrangement.

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