Oct. 25, 1927. 1,646,388

M. L. BULLARD

HEAT INSULATOR

Filed Sept. 24, 1923

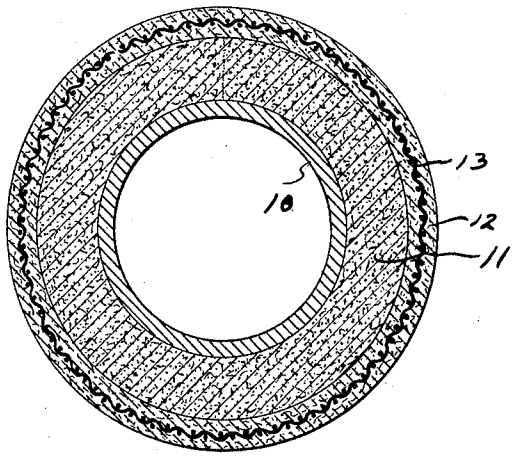


Fig. 1.

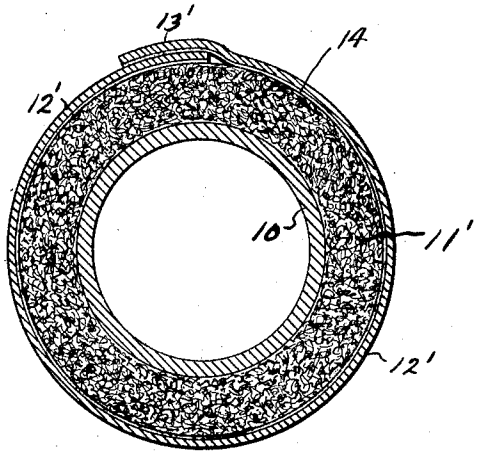


Fig. 2.

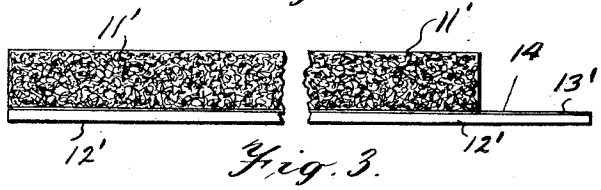


Fig. 3.

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Patented Oct. 25, 1927. 1,646,388

UNITED STATES PATENT OFFICE.

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HEAT INSULATOR.

Application filed September 24, 1923. Serial No. 664,344.

My present invention relates to heat insulators which may be used as a covering for structures to prevent the passage of heat. One form of heat insulation which has been widely used is a mixture of magnesia and asbestos fibre, but to be most efficient a mass of this material should be sealed on its exterior to prevent the passage of air. Similarly felted hair has been used, but it also should be sealed to form closed air spaces within it to secure the best effects.

By my invention I secure a waterproof and substantially non-porous coating to the exterior of the insulating material, using for this purpose asphalt with which preferably I mix various materials in order to secure the best results for different purposes. More particularly I produce my asphalt layer by coating the insulating material with a layer of asphalt which has been reduced to a condition in which it may be mixed with water and applied in a plastic state while cold, the asphalt hardening as the water used in mixing it evaporates to form a waterproof, substantially non-porous layer. One form of asphalt which may be mixed with water is known as "emulsified asphalt", and it will be understood that in the following description and the annexed claim, when I refer to "emulsified asphalt", I mean any asphalt which is plastic when cold and which will harden after it is applied.

In the drawing I have shown in Fig. 1 a pipe covering in section embodying one form of my invention, and in Fig. 2 another form of pipe covering also embodying my invention, Fig. 3 being the heat insulation of Fig. 2 in a form ready to be applied to the pipe in the manner shown in Fig. 2.

In the arrangement shown in Fig. 1, 10 is a section of a pipe around which is placed a layer 11 of insulating material, which in this case is represented as the ordinary "magnesia" insulation.

On the exterior of the layer 11 I place a layer 12 of emulsified asphalt which, as has been said, is applied cold and in a plastic condition so that the outer portion of the fibres forming the layer 11 become embedded in the inner layer of the coating 12 to form a tight connection between the two layers. Then as the emulsified asphalt in the layer 12 hardens, a waterproof and substantially non-porous layer is formed which not only protects the layer 11, but which cooperates with the layer 11 to form a more complete heat insulation by sealing the spaces between the fibres making up the layer 11.

A sheet of wire netting 13 is inserted in the emulsified asphalt of the layer 12 when it is applied so as to strengthen it and also the heat insulating qualities of the arrangement may be increased by incorporating in the emulsified asphalt a quantity of asbestos fibres. Furthermore, by incorporating a quantity of sand in the layer 12, greater hardness may be obtained.

The following mixture is one which I have found to give excellent results: To one volume of emulsified asphalt I add one-half volume of asbestos fibre and thoroughly incorporate the fibre into the asphalt; then to one volume of this latter mixture of asphalt and fibre I add from one to two volumes of sand according to the degree of hardness desired.

In Figs. 2 and 3 I have shown another form of my invention, in which 10 is a section of a pipe to be covered, 11′ a layer of felted animal fibre and 12′ a sheet of paper which may be conveniently impregnated with asphalt in the usual manner. On the surface of the sheet of paper 12′ I apply a relatively thin coating 14 of emulsified asphalt and place the layer 11′ thereon, the emulsified asphalt serving as a cement to cause the layer 11′ to adhere to the paper 12′ and, at the same time, formnig a coating when hardened which is substantially impervious to air. The two layers 11′ and 12′ thus united may be conveniently wrapped around the pipe 10, as shown in Fig. 2, with the end 13′ of the sheet of paper 12′ overlapping the exterior of the opposite end of the sheet with the emulsified asphalt between them, so as to seal the joint between the ends of the paper, thus making a completely air-tight coating around the fibre layer 11′

It will be understood that the arrangement shown in Figs. 2 and 3 may be applied to any insulating material other than the animal fibre which I have chosen for purpose of illustration and similarly that any insulating material other than the magnesia which I have illustrated in Fig. 1 may be used.

While I have shown my insulating material as applied to pipe covering, it will be understood that it may be applied to any

other surfaces to be protected, the emulsified asphalt permitting the placing of a waterproof and substantially air-tight coating on any conformation of the insulating material.

I claim:

A heat insulator comprising an inner layer of fibrous insulation, an outer layer of hardened emulsified asphalt on said inner layer with the contacting surfaces of the two layers united and a metallic reinforcement in said outer layer.

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