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HEAT INSULATION MATERIAL

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1 Claim. (Cl. 106—18)

My invention pertains to heat-insulating compounds or mixtures and it relates more particularly, but not exclusively, to insulating mixtures of a plastic character designed and adapted to be used in connection with boilers or the like to retain the heat therein, resulting in marked improvement in the economy of operation of the boilers or heaters with which it is used to cover the brick-work, concrete, or its equivalent externally.

The present preferred formula is substantially as follows by weight:

	Per cent
Gilsonite with a melting point of 270° to 275° F.	6.2
Parolite with a melting point of about 200° F.	18.0
Flux asphalt (Saybolt Universal Visco. at 100° F., S. O. C.—1.00)	4.4
Kerosene	20.0
Asbestos fibre	22.9
Calcium carbonate	11.3
Diatomaceous earth	12.6
Mineral spirits	4.6

The gilsonite which is a natural mined product and is one of the purest forms of asphalt with a melting point or from about 270° to 300° F. comprises an asphalt water-proofing binder which forms a part of the vehicle solids imparting hardness to the mass.

Several other natural asphalts could be used either to replace or with the gilsonite, such as grahamite, wurtzilite, uintaite, elaterite, these latter having higher melting points and lower penetration than gilsonite and they are also higher in cost and are not as readily obtainable.

The parolite is a blown asphalt water-proofing binder which forms a part of the vehicle solids and imparts elasticity to the mass. The term "blown asphalt" applies especially to residual asphalts, starting with a melting point of 85° to 125° F., and that is to be considered as quite generic, heating the asphalt to well above its melting point, and blowing with air. The characteristics of the asphalt are changed in that the melting point, after a considerable period, is from 180° to 250° F., depending on the length of the blowing time. Further properties obtained are the penetrations at the given temperatures of 32°, 77°, and 115° are considerably lower than the original asphalt, also the ductility is very much lowered.

Parolite gives long life to the binder, but it is not of sufficient ductility nor hardness and for this reason hardness is built up with gilsonite and ductility is obtained with fluxing asphalt.

The flux asphalt is a liquid asphalt vehicle used to blend the gilsonite and Parolite together in a homogeneous state, these fluxing asphalts being residual asphalts, having no further treatment to change their chemical or physical properties. They remain at a very low melting point and have very high penetrations, but they blend asphalts, and the high belting point natural asphalts, under heat to give compatible black varnishes.

The kerosene employed is a reducing agent, that is to say, a thinner. It is added to the plastic because of its slow evaporation rate, allowing the plastic to settle to the brickwork and to form an integral bond.

The asbestos-fiber constitutes a combined filler and binder, and is preferably, but not necessarily, a Canadian-mined asbestos having extremely long, tough fibre giving strength and heat insulation.

The calcium-carbonate constitutes a filler imparting density, and a preferred material, known as Surfex, is used which is a form of calcium-carbonate and this can be employed either with, or replacing ordinary calcium-carbonate.

The diatomaceous earth comprises a filler and it gives the mixture density and insulating properties due to the fact that the structure of diatomaceous earth is very high in voids or multiple air-cells, which is quite necessary in a material of this kind.

The mineral spirits represent a reducing or thinning agent and they may be in the form of Oleum or Napoleum having a distillation range of from 300 to 400 with a relatively rapid evaporation rate. Oleum imparts the working property to a plastic composition.

The gilsonite, Parolite and flux asphalt are melted together and then reduced with the kerosene and mineral spirits, the resulting liquid being allowed to cool, and then the asbestos-fibre, calcium-carbonate and diatomaceous earth are placed in the liquid in the order named and thoroughly mixed to form a uniform product.

Such product is in paste condition and it is applied to the brick-work around and over the boiler by a trowel or otherwise to a suitable thickness, say, for example, three-eighths of an inch. This coating is slow-hardening and gradually solidifies, such hardening at least in some instances being confined to the surface.

It is a common erroneous belief among brick-set boiler owners that bricks act as an insulating

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agent enabling the boiler to retain its maximum heating efficiency, whereas the truth of the matter is that bricks are porous and actually breathe—allowing the heat to escape and foreign drafts and moisture to enter.

The new plastic insulation referred to above, unlike other products on the market, affords complete insulation for brick-set boilers and it covers the entire brickwork of the boiler, completely blanketing all joints and cracks and in this way preventing also corrosion of boiler-plate by excluding moist air and water.

The novel plastic insulation detailed above does not crack, chip, or peel, thereby allowing more frequent "washing down" of the boiler, this being largely due to the proper preparation before application of the plastic material.

The use of the new and improved plastic insulation gives more uniform heating to all apartments of a building, especially that apartment directly over the boiler-room and the blanketing of the brick-work about the boiler with such insulation repels foreign drafts and permits raising steam-pressure in the morning with a minimum of effort and fuel.

"Split-drafts" are caused by cracks in the brick-work, especially at the front of the boiler around the boiler-plate, cleanout doors, and on the arch where the drafts are strongest, impairing the efficiency of the boiler, but the use of the new plastic insulation covers all brick-work like a glove, fills all cracks, and permits all drafts through the fire-box which allows the boiler to give maximum heating economy.

Those acquainted with this art will readily understand that the invention is not necessarily limited to the precise and exact details specified above and that various changes and modifications may be resorted to without departure from the heart and essence of the invention, as defined by the appended claim which should be construed as broadly as permitted by the prior art, and without the loss or sacrifice of any of the material benefits accruing from the employment of the invention.

I claim:

A heat-insulating material for boilers and the like including approximately 6.2% gilsonite, 18% Parolite, 4.4% flux-asphalt, 20.0% kerosene, 22.9% asbestos fibre, 11.3% calcium-carbonate, 12.6% diatomaceous-earth, 4.6% mineral-spirits.

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