

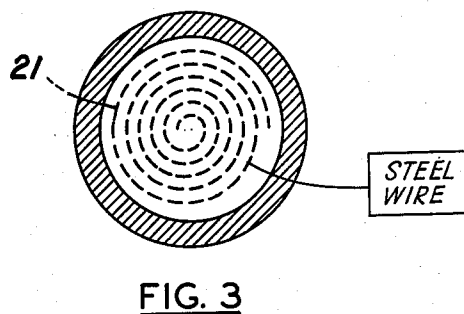
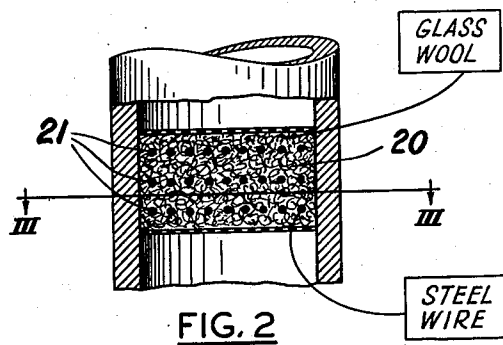
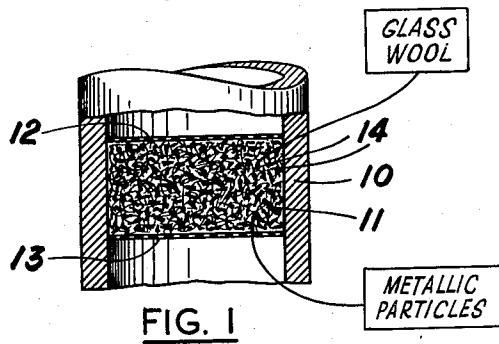
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REGENERATOR

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REGENERATOR

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1 Claim. (Cl. 257—6)

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Regenerators as used, for example, in hot-gas engines and in refrigerating apparatus operating according to the reversed hot-gas principle have for their purpose to reduce the temperature of the medium flowing from the hot side to the cold side of the engine and to accumulate the amount of heat thus liberated to be given off again to the medium flowing back through the regenerator from the cold side to the hot side of the engine. It is common practice to utilise metal, for example in the form of metal wire, such as a coil of wire or a clew of wire, as a filling mass for such regenerators. In some cases it would for certain reasons be preferred in constructing such regenerators to utilise as a filling mass, instead of metal, a material having a much lower coefficient of heat-conduction. Applicant has found that this kind of filling materials also permit of obtaining very satisfactory results, while there is the advantage that the thermal conduction through the material of the filling mass from the hot side to the cold side of the regenerator is in practice negligible. Furthermore the manufacturing cost of such filling materials is, as a rule, materially lower than with the use of a filling mass of metal.

According to the invention, it is now suggested that in a regenerator in which the filling mass, which exhibits a large number of channels for the medium flowing through, consists of material having a coefficient of heat-conduction lower than 0.005 gram calories per square centimeter per second per degree centigrade, the filling mass should be composed so as to locally comprise parts, for example metallic parts, having a coefficient of heat-conduction higher than 0.03 gram calories per square centimeter per second per degree centigrade.

It is thus possible for the thermal capacity of the filling mass to be adjusted by varying the amount of material having the higher coefficient of heat-conduction. On the other hand, it may be ensured that the temperature of various regenerator parts which are equidistant from the hot side or the cold side of the regenerator is at least approximately the same, which is advantageous for satisfactory operation of the regenerator.

The metal parts in the filling mass may be of different form. Thus, it is possible to provide in the filling mass a number of metallic particles, such as metal scales, metal snips, extremities of wire, or the like. In the embodiment of the invention, in order to ensure uniform distribution of temperature, it is advisable that the parts

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contained in the filling mass and having a coefficient of heat-conduction higher than 0.03 gram calories per square centimeter per second per degree centigrade are substantially transverse to the direction in which the medium flows through the regenerator. In a further embodiment of the invention the metal parts may be constituted by metallic strips or wires included in the filling mass.

In order that the invention may be more clearly understood and readily carried into effect, it will now be described more fully by reference to the accompanying drawing wherein

Figure 1 is a vertical cross-sectional view of one form of construction of a regenerator in accordance with the invention;

Figure 2, is a similar cross-sectional view of another embodiment of the invention; and

Figure 3 is a horizontal cross-sectional view of Figure 2 taken on the section line III—III thereof.

Figure 1 is a cross-sectional view of one form of construction of the regenerator according to the invention. It comprises a housing 10 containing the filling mass 11, which in this case is an amount of compressed glass wool. In order to ensure the correct position of the filling mass 11 in the housing 10, apertured plate members 12 and 13 are provided at the top and bottom of the filling mass, said plate members fitting in the housing in a clamping manner. The glass wool constituting the filling mass exhibits a coefficient of heat-conduction of 0.0015 gram calories per square centimeter per second per degree centigrade. In this construction the thermal capacity of the filling mass is increased by including in the glass wool a large number of metallic snips 14 of aluminum having a coefficient of heat-conduction of 0.7 gram calories per square centimeter per second per degree centigrade.

In the construction shown in Figures 2 and 3 in which Fig. 3 is a cross-sectional view of Fig. 2 taken on the line III—III, the filling mass 20 having a coefficient of heat-conduction of 0.02 gram calories per square centimeters per second per degree centigrade contains a number of metal helices 21, the location of which follows more particularly from Fig. 3. The said metal wires consist, for example, of steel wire having a coefficient of heat-conduction of 0.1 gram calories per square centimeter per second per degree centigrade, and are spaced out of thermal contact with housing 10. In addition to the advantages afforded by the inclusion of the said metal parts in regard to the increase in thermal capacity of the filling mass, their presence in the filling

mass offers the further advantage that the distribution of temperature in the filling mass is rendered as uniform as possible.

What we claim is:

A regenerator comprising a housing having an inlet and an outlet through which a medium flows, a filling mass of glass wool in said housing and contacting the wall of said housing, and a plurality of spiral-shaped steel wires embedded in said glass wool in spaced apart planes, each of said wires extending in a plane perpendicular to the flow of said medium and adjacent wires being separated by layers of said mass of material, said wires being spaced from the walls of said housing.

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