Dec. 7, 1948. F. S. SHERWIN 2,455,708

FIN VIBRATION DAMPENER

Filed Feb. 27, 1947

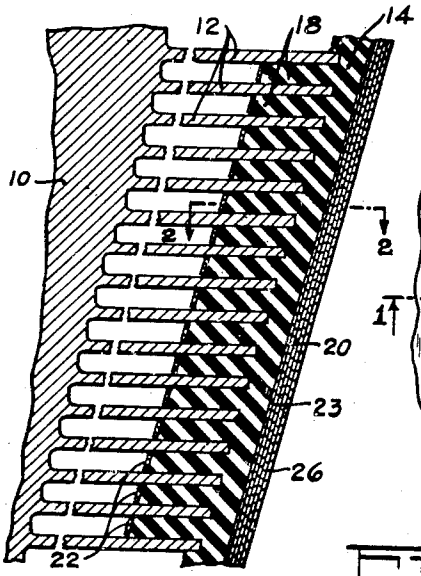


FIG. 1

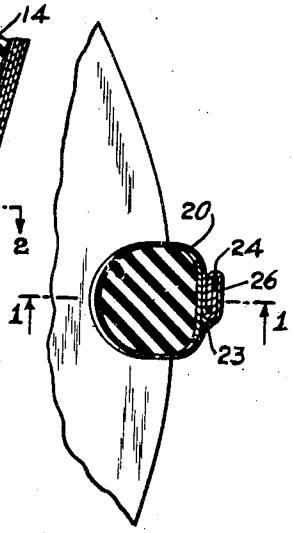


FIG. 2

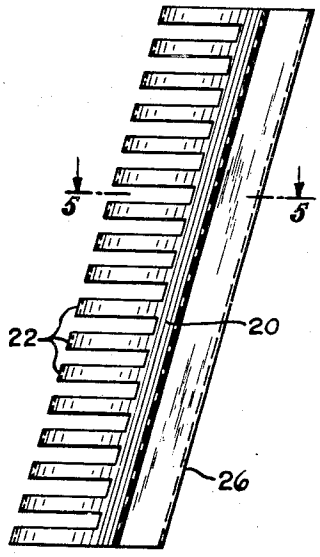


FIG. 4

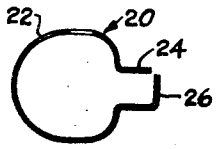


FIG. 5

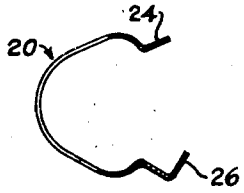


FIG. 6

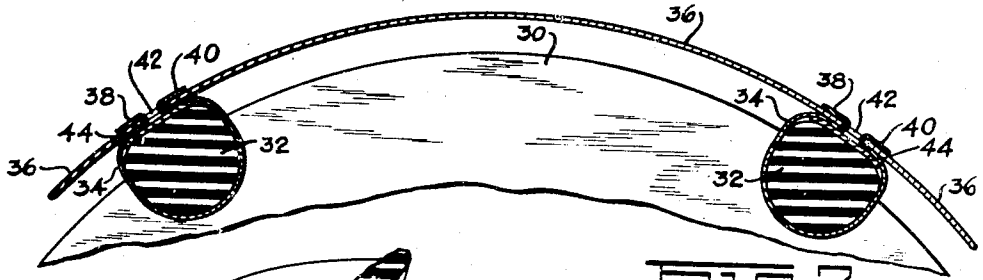


FIG. 7

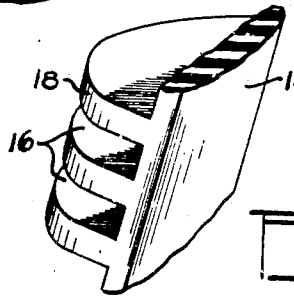


FIG. 3

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FIN VIBRATION DAMPENER

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9 Claims. (Cl. 257—261)

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This invention relates to means for damping vibrations of the cooling fins of a heat radiating body and is more particularly directed to a fin vibration damping means which requires no machining or special fabrication of the fins.

It is an object of the invention to provide a novel and improved method of inhibiting vibration of the heat exchange fins projecting from a body to be heated or cooled by the passage of a heat exchange fluid between the fins. A further object of the invention comprises the provision of a fin vibration damping construction in which rubber-like means is disposed between the fins to inhibit their relative vibration. Specifically, the invention comprises a member of rubber-like material extending between the fins together with means for clamping said member in position on the fins by squeezing said material against the adjacent fins.

Other objects of the invention will become apparent upon reading the annexed detailed description in connection with the drawing in which:

Figure 1 is a sectional view through a body having a plurality of heat exchange fins projecting therefrom and provided with fin vibration damping means embodying the invention, said figure being taken along line 1—1 of Figure 2;

Figure 2 is a sectional view taken along line 2—2 of Figure 1;

Figure 3 is a perspective view of a portion of the fin brace member;

Figure 4 is an end view of the fine brace clamp prior to insertion of the rubber-like fin brace member;

Figure 5 is a sectional view taken along line 5—5 of Figure 4;

Figure 6 is a sectional view similar to Figure 5 with the clamp spread to facilitate insertion of the rubber-like fin brace member; and

Figure 7 is a view similar to Figure 2 but of a modified form of the invention.

Referring now to Figures 1 to 6, a body 10, which may comprise a cylinder or cylinder head of an internal combustion engine, is provided with heat exchange fins 12 projecting therefrom and between which cooling air is adapted to flow. In order to dampen vibrations of said fins during engine operation, there is provided a fin brace member 14 of rubber-like material and of approximately circular cross section. One side of the brace member 14 is provided with flat spaced slots 16 within which the fins 12 are adapted to be received as illustrated whereby said brace member is provided with flat projections 18 arranged to be received between the fins 12.

A clamp member 20 is arranged for disposition about the brace member 14 prior to mounting the brace member on the fins 12. The clamping member, preferably, is fabricated from flexible sheet metal material into a split tubular structure which may be spread, as illustrated in Figure 6, to facilitate insertion of the brace member 14. The side of the clamp 20 disposed opposite its split is slotted similar to said brace member to receive the fins therebetween. In this way, the clamp member in effect provides straps 22 arranged to embrace the projections 18 of said brace member. An elongate backing plate 23 is shaped to fit the outer surface of the brace member 14 and is assembled between the outer surface of the brace member 14 and the split ends of the clamp member 20, said plate bridging substantially the entire width of the brace member 14.

After the brace member 14, backing plate 23 and clamp 20 are assembled with the straps 22 embracing the projections 18, the assembly is mounted on the fins by inserting the flat projections 18 and their embracing bands 22 between the fins. Preferably, the fins extend to the bottom of the slots 16 in the brace member 14. The split ends of the clamp 20 are provided with longitudinally extending tabs 24 and 26 which are pulled together and lap jointed as illustrated in Figure 2 whereby the straps 22 compress the brace member projections 18 and squeeze the rubber-like material of these projections 18 tightly against the side walls of the adjacent fins 12. The plate 23 protects the outer surface of the brace member 14 during said lap jointing operation and also permits transmission of clamping pressure to the straps 22.

With the aforedescribed construction, when the brace members 14 are mounted on the fins in the manner described, they effectively dampen any relative vibration of the fins. The brace members can be mounted on the fins without machining, peening or in any way changing the structure of the fins. In addition, each brace member can be assembled without damaging the fins. Also, the construction is such that each brace member can be mounted at most any location on the fins provided the outer periphery of the fins is fairly uniform. Obviously, any number of brace members 14 may be secured to a particular group of fins to dampen their vibrations.

Figure 6 illustrates a slightly modified form of the invention. As illustrated in Figure 6, the fins 30 are provided with fin brace members 32 identical with previously described fin brace members 14. Each fin brace member 32 is provided with a clamp member 34 which, as illustrated, has been modified from the clamp members 20 previously described in order to permit air deflector members 36 to be supported by adjacent clamp members 34. To this end, the clamp members 34 have longitudinally extending tabs 38 and 40 along their split edges which are arranged to extend through slots 42 in an air deflector member 36 and these tabs are bent over the adjacent surface of the member 36 as illustrated, so as to com-

press the brace member projections between the fins 30. Also as in Figures 1–6 backing plates 44 are disposed between the outer surface of each brace member 32 and the split ends of their associated clamp members 34.

The air deflector members 36 are sheet-like members disposed along and adjacent the outer periphery of the fins 30. Accordingly, in the case of an air cooled engine cylinder, the deflector members 36 would be disposed on two sides of the cylinder leaving an inlet and an outlet opening therebetween for the engine cooling air to enter and leave the spaces between the fins as is conventional practice. In this way, the deflector members 36 help to confine the cooling fluid to the spaces between fins.

While I have described my invention in detail in its present preferred embodiment, it will be obvious to those skilled in the art, after understanding my invention, that various changes and modifications may be made therein without departing from the spirit or scope thereof. I aim in the appended claims to cover all such modifications.

I claim as my invention:

1. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising an elongate member having spaced projections of rubber-like material extending from one side of said member for reception between said fins, and a clamp arranged to be disposed about said member and having strap-like portions embracing said projections, said clamp with its strap-like portions being arranged to squeeze said projections laterally into engagement with adjacent fins.

2. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising a member made of rubber-like material having projections extending therefrom for reception between said fins, a clamp arranged to be disposed about said member and having strap-like portions embracing said projections, said clamp with its strap-like portions being arranged to clamp said rubber-like member therewithin to squeeze said projections laterally into engagement with adjacent fins.

3. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising an elongate member of rubber-like material having one side provided with a series of spaced slots to form spaced flat projections adapted to be received between said fins, a clamp arranged to be disposed about said member and having strap-like portions embracing said projections, said clamp with its strap-like portions being arranged to clamp said rubber-like member therewithin to squeeze said projections laterally into engagement with adjacent fins.

4. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising an elongate member of rubber-like material having one side provided with a series of flat spaced projections adapted to be received between said fins, and a split clamp arranged to be disposed about said member and having strap-like portions embracing said projections, said split clamp being arranged to be drawn tightly about said member to squeeze said projections laterally into engagement with adjacent fins.

5. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising an elongate member of rubber-like material having one side provided with a series of flat spaced projections adapted to be received between said fins, and a split clamp of sheet-like material disposed about said member and having strap-like portions embracing said projections, said split clamp being adapted to be drawn tightly about said rubber-like member to squeeze said projections laterally into engagement with adjacent fins.

6. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising a member made of rubber-like material having one side provided with a series of flat spaced projections adapted to be received between said fins, and a split clamp disposed about said member, said split clamp having strap-like portions embracing said projections and having tabs extending along its split edges, said clamp being adapted to be drawn about said member by pulling and securing together its said tabs thereby squeezing said projections laterally into engagement with adjacent fins.

7. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising an elongate member of rubber-like material having one side provided with a series of flat spaced projections adapted to be received between said fins, a split clamp of sheet-like material disposed about said member and having strap-like portions embracing said projections, and an elongate plate member disposed between the outer surface of said rubber-like member and the split ends of said clamp, said split clamp being adapted to be drawn tightly about said rubber-like member and plate member to squeeze said projections laterally into engagement with adjacent fins.

8. In combination with a body having a plurality of heat exchange fins projecting therefrom, a plurality of elongate members of rubber-like material each having flat spaced projections on one side adapted to be received between said fins, a clamp disposed about each member and having strap-like portions embracing said projections, said members and their associated clamps being disposed on said fins in spaced relation with said clamps tightly drawn about their members to squeeze said projections laterally into engagement with adjacent fins, and an air deflector member secured to a pair of said clamps and extending across the outer ends of said fins between said pair of clamps.

9. Means for damping vibrations of heat exchange fins projecting from a body, said means comprising a member having spaced projections of rubber-like material extending therefrom for reception between said fins, and a member engageable with said projections for squeezing said projections laterally into engagement with said fins.

FREDERICK S. SHERWIN.

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