

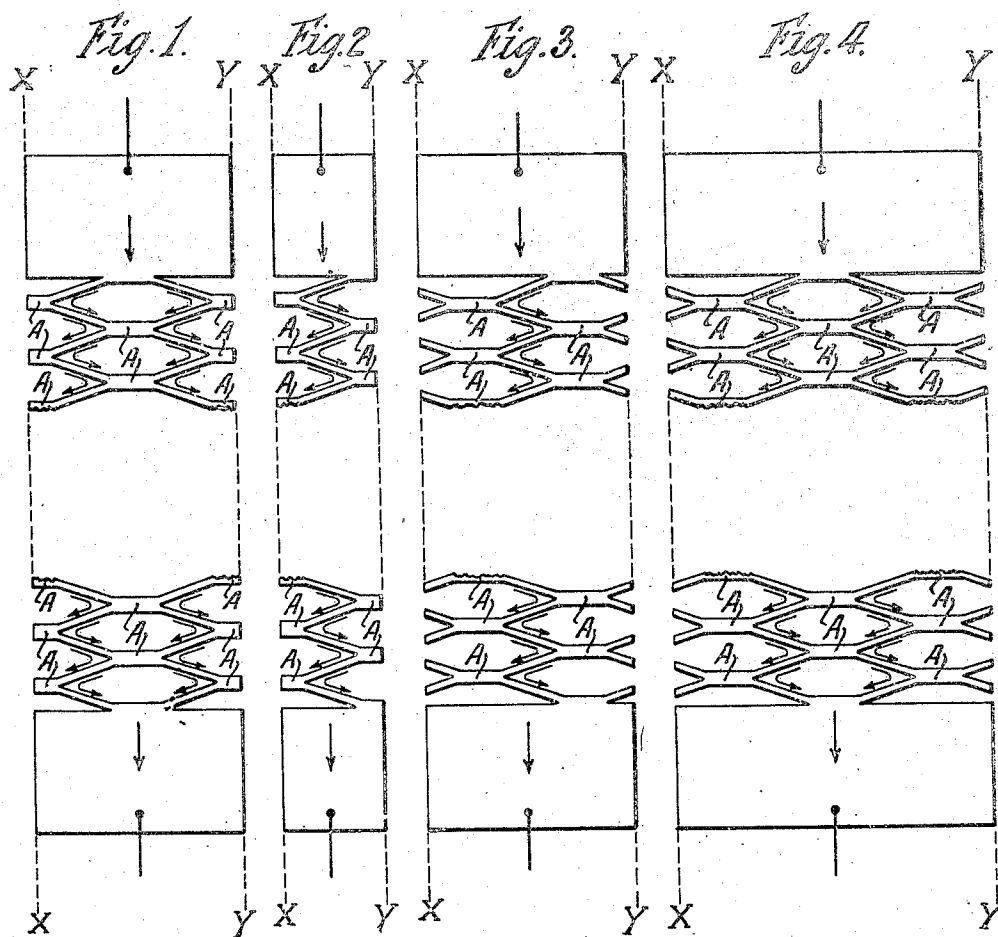
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B. H. N. H. HAMILTON

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ELECTRICAL RESISTANCE AND HEATER ELEMENT

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Inventor:
BENJAMIN HENRY NOEL HANS HAMILTON.
By his attorneys,
Baldwin & Wight

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ELECTRICAL RESISTANCE AND HEATER
ELEMENTBenjamin Henry Noël Hans Hamilton, West Har-
tlepool, England, assignor to The Expanded
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6 Claims. (Cl. 201—73)

This invention relates to electrical resistances and heater elements of the kind constituted by expanded metal.

It is well known to make electrical resistances and heater elements of expanded metal which may be left with unexpanded edges for making connection to the expanded metal portions and numerous forms of such resistances and heater elements have been proposed.

The principal advantages of expanded metal electrical heater and resistance elements are:— great ease of manufacture; relatively large cooling surface; light weight for a given wattage dissipation; and good mechanical strength (particularly where vibration is in question) as compared to cast and similar resistance units. The present invention has for its object still further to improve expanded metal resistances and heater elements in the direction of providing large cooling surfaces.

According to this invention an expanded metal electrical resistance or heater element comprises at least one strip of expanded metal at least one side boundary edge of which passes through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element.

The invention will now be particularly described with reference to the accompanying drawing. Figures 1 to 4 inclusive show modifications of my invention.

The normal practice hitherto in expanded metal resistances and heater elements is to use one or more strips of expanded metal so cut from a sheet of expanded metal that the width of the zig-zag path for electric current through the strip is the same or substantially the same as the width of the strip. For example Figure 1 illustrates a known resistance or heater element composed of a strip of expanded metal one "mesh" wide. In Figure 1 the side edges of the strip are bounded by lines XX, YY, passing through the portions A of solid material each of which (in the original expanded metal from which the strip is cut) joined two adjacent "meshes" or "diamonds" end to end. Thus in the one "mesh" strip illustrated the electric current in passing from end to end of the strip follows two zig-zag paths passing back and forth from the side edges of the strip as indicated by the arrows so that the width of the electric current path is substantially the same as the width of the strip.

Similarly with a known "half mesh" strip as illustrated in Figure 2 the strip is cut in such manner that the electric current path is a simple zig-zag path passing back and forth from side edge to side edge of the strip and proceeding longitudinally thereof.

In carrying out this invention, however, the strip or strips of expanded metal in an expanded metal resistance or heater element is or are cut at least in respect of one side edge, in such manner that the said edge is not bounded by lines passing through solid material at the ends of "meshes" but is bounded by a line passing through the meshes themselves. For example Figure 3 shows a half "mesh" strip in accordance with this invention wherein both side edge bounding lines pass through meshes. Accordingly, although the electric current path through said half "mesh" strip is a simple zig-zag path of the same width as and precisely similar to the electric current path through the known half "mesh" strip of Figure 2 the width of this current path is substantially less than the total width of the strip for upon each side of the said current path will be a series of pieces of expanded metal none of which is in a series circuit but which are, of course, available for cooling purposes. Accordingly the result is achieved that the width of the strip for cooling purposes is substantially greater than its width as a current conductor it being possible, therefore, to regard the invention as consisting in so forming the expanded metal strip that there are laterally projecting rating fins or "mesh" portions which are not effectively current carrying but act purely as cooling fins or projections. Figure 4 shows a "one mesh" strip in accordance with the invention with lateral cooling extensions on both sides.

It is not necessary so to cut the strip in carrying out the invention that additional cooling portions which do not effectively carry electric current are present at both sides of the strip, but, of course, it is preferred so to cut the strip since the cooling effect is obviously better than it would be if such cooling projections were left on one side only.

The invention is of course not limited to expanded metal strips which are only half a "mesh" wide electrically for the expedient above described in connection with the half mesh strip may be adapted in precisely similar manner for strips one "mesh" or more than one "mesh" wide.

The maximum length of the laterally projecting cooling portions which are provided in an

expanded metal element in accordance with the invention must obviously be less than the length of one "mesh" for otherwise electric current will be able to flow through them.

5 What I claim is:—

1. An expanded metal electrical heater or resistance element comprising at least one strip of expanded metal at least one side boundary edge of which passes through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element.

15 2. An expanded metal electrical heater or resistance element comprising at least one strip of expanded metal both side boundary edges of which pass through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element.

25 3. An expanded metal electrical heater or resistance element comprising at least one strip of expanded metal at least one side boundary edge of which passes through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element, said element providing a zig-zag electrical current path therethrough which is one half mesh wide.

4. An expanded metal electrical heater or resistance element comprising at least one strip of expanded metal both side boundary edges of which pass through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element, said element providing a zig-zag electrical current path therethrough which is one half mesh wide.

5. An expanded metal electrical heater or resistance element comprising at least one strip of expanded metal at least one side boundary edge of which passes through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element, said element providing a zig-zag electrical current path therethrough which is one mesh wide.

6. An expanded metal electrical heater or resistance element comprising at least one strip of expanded metal both side boundary edges of which pass through the meshes of the expanded metal as distinct from passing through solid "mesh-joining" portions, whereby the zig-zag current path or paths through the element occupy a total width substantially less than the total width of the element, said element providing a zig-zag electrical current path therethrough which is one mesh wide.

BENJAMIN HENRY NOËL HANS HAMILTON.