

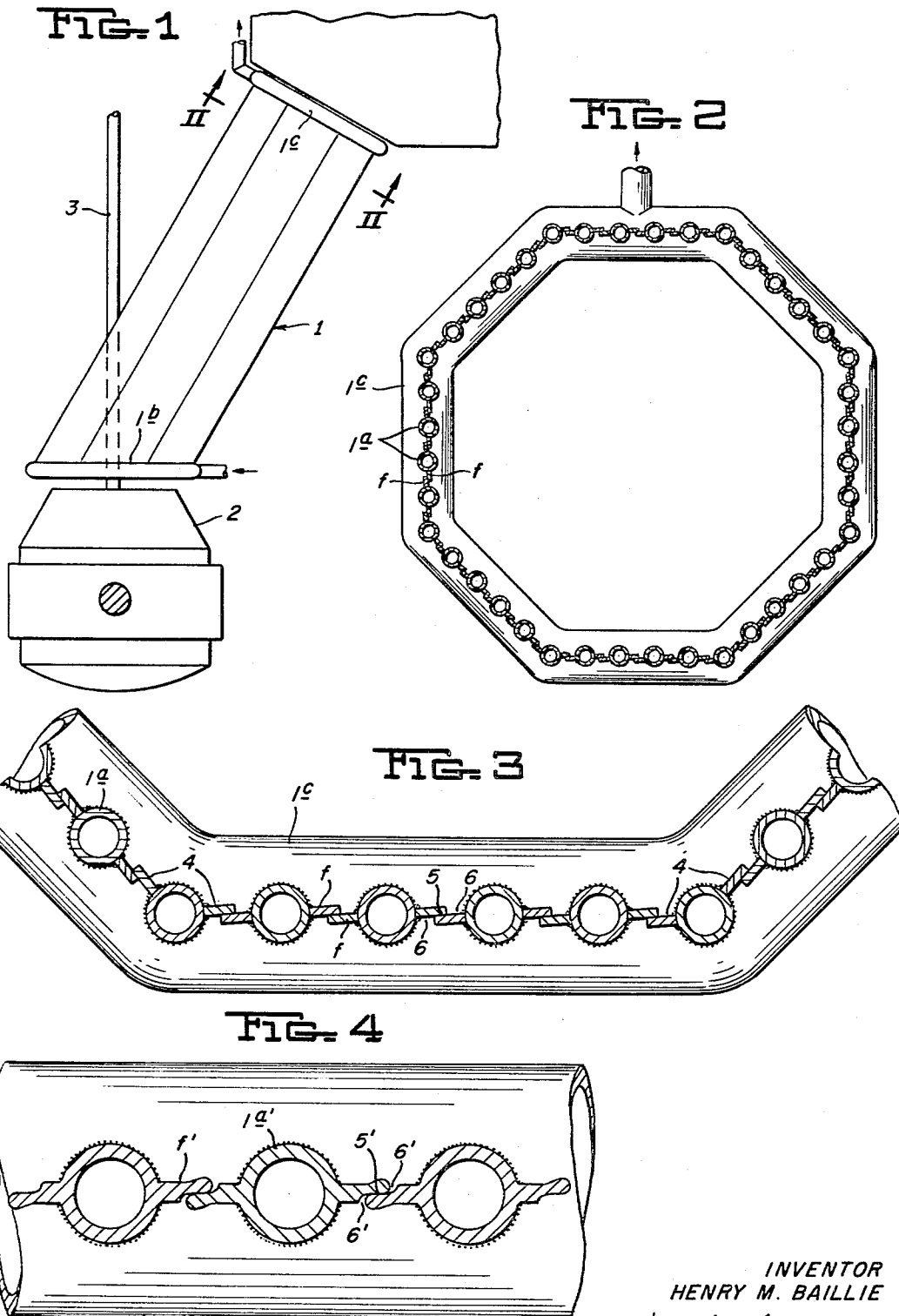
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LIQUID COOLED WALL FOR CONFINING HOT GASES

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LIQUID COOLED WALL FOR CONFINING HOT GASES

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ABSTRACT OF THE DISCLOSURE

A liquid cooled wall for use in the forming of gas conduits or hoods. The wall is made of a plurality of modular elements having a pipe-like body portion and longitudinal fins protruding from opposite sides of the pipe body. The fins of adjacent elements overlap, but are free to slide relative to one another when heating or cooling causes expansion or contraction in the wall.

This invention relates to a flexible liquid cooled wall for confining hot gases. The wall is formed of modular pipe-like elements which lend themselves to assembly into various forms of curtains, including stack-like structures suitable for use as hoods for oxygen steelmaking furnaces, for example. The latter application represents very severe service, to which the invention lends itself by virtue of its ability to provide for the expansion and contraction resulting from the severe temperature ranges encountered. Also, it permits relatively ready repair in the event of failure.

The invention may be more fully understood by reference to the drawing, wherein:

FIGURE 1 is a schematic view of an oxygen steelmaking furnace with hood;

FIGURE 2 is an enlarged cross-sectional view of the hood of FIGURE 1, taken along the line II-II of FIGURE 1;

FIGURE 3 is an enlarged view showing the pipe structure of FIGURE 2; and

FIGURE 4 is an enlarged view of a modification in pipe structure.

In FIGURE 1, hood 1 is shown in place over oxygen furnace 2, with oxygen lance 3 inserted therein. The hood is made up of parallel-laid pipe elements 1a extending between liquid inlet and outlet headers, 1b and 1c respectively, to which the pipes are welded at their ends for mechanical support and cooling fluid circulation purposes.

Pipes 1a, depicted in FIGURES 2 and 3, are provided with fins f extending outward from the pipes, on opposite sides, and running the length of the pipes. These may be fabricated by welding strip material to pipe. When installed, the fins overlap, as shown, to provide a gas seal between successive parallel-laid pipes, assembled to form a furnace hood or other structure for retaining hot gases.

In instances where the pipes are assembled in a straight cross-sectional line, the fins on opposite sides of individual pipes are directly opposite each other. However

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where a curved configuration is desired, the fins are preferably angled somewhat, with respect to each other, as shown by fins 4, for example, in FIGURE 3.

The fins are of sufficient width to permit installation which will insure continuing overlap 5 under dimensional changes incident to temperature variations. In installation, sufficient space 6 is allowed between fin edges and pipe body to allow for thermal dimensional changes, whereby buckling of fins against adjacent pipe bodies is precluded.

FIGURE 4 depicts a modified finned pipe 1a', with fins f' installed with overlap 5' and spacing 6', which is functionally similar to the pipe 1a arrangement depicted in FIGURE 3. These pipe elements may be made by extrusion, for example.

In addition to providing wide compensation for dimensional changes incident to drastic thermal changes, the modular individual pipe unit construction facilitates repairs which may be required as a result of leakage, arising under corrosive gas situations, since only the failed pipe need be replaced.

While certain specific embodiments of the invention have been presented, these are to be regarded as illustrative, to facilitate practice of the invention, and not as a limitation thereof.

I claim:

1. A flexible liquid cooled wall for confining hot gases comprising modular elements in parallel array, attached to fluid carrying header elements, each modular element comprising a pipe-like body portion having two continuous fins lengthwise thereof, said fins extending outwardly on opposite sides of said pipe, the fins of adjacent modular elements overlapping to provide a gas seal while leaving expansion space between outer fin edges and adjacent pipe bodies.

2. The flexible liquid cooled wall of claim 1 constructed in the form of a hood for an oxygen steelmaking furnace.

3. A flexible liquid cooled wall for confining hot gases comprising modular elements in parallel array, attached to fluid carrying header elements, each modular element comprising a pipe-like body portion having two continuous fins lengthwise thereof, said fins extending outwardly on opposite sides of said pipe, the fins of adjacent modular elements overlapping in a free sliding planar contact with one another while leaving expansion space between outer fin edges and adjacent pipe bodies.

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