

[54] **HOT GAS ENGINE HEATER HEADS**
[75] Inventor: **Per Goran Grahn**, Malmö, Sweden
[73] Assignee: **Kommanditbolaget United Stirling**
(Sweden) AB & Co., Malmö,
Sweden
[22] Filed: **Aug. 15, 1973**
[21] Appl. No.: **388,563**

[30] **Foreign Application Priority Data**
Aug. 22, 1972 Great Britain38971/72
[52] **U.S. Cl.**..... 60/517, 165/125, 165/175
[51] **Int. Cl.**..... F03g 7/06, F25b 9/00
[58] **Field of Search** 60/517, 522, 524, 525;
165/125, 175

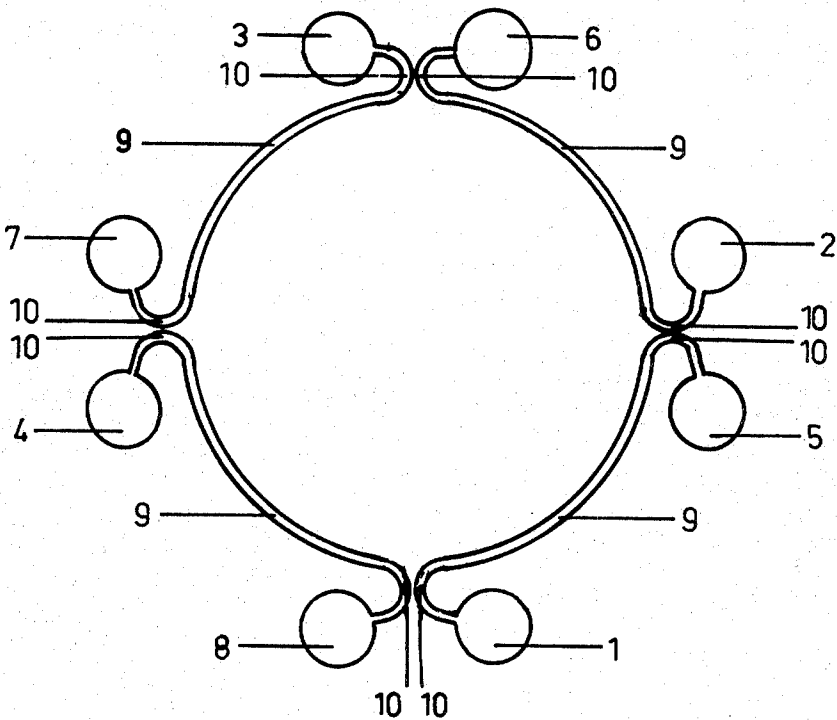
[56] **References Cited**
UNITED STATES PATENTS
2,817,950 12/1957 Van Weenan et al. 60/525
2,828,601 4/1958 Meyer 60/525

3,074,229 1/1963 Baas et al. 60/525
3,223,155 12/1965 Hubbard 165/125
3,412,787 11/1968 Milligan 165/175
3,662,817 5/1972 Kendrick et al. 165/175

Primary Examiner—Edgar W. Geoghegan
Assistant Examiner—H. Burks, Sr.
Attorney, Agent, or Firm—Laurence R. Brown

[57] **ABSTRACT**
Four pairs of manifolds of the heater head have four corresponding pipes disposed in 90° segments of a circle with the ends bent more than 90° to connect with the manifolds. This configuration provides improved engine efficiency by uniform heating and shielding of the manifolds from the most intensive radiation and convection by parts of the pipes disposed between the manifolds and the center of the heater head.

2 Claims, 2 Drawing Figures



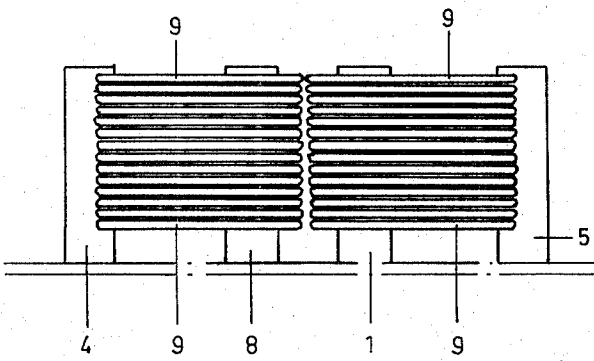


Fig 1

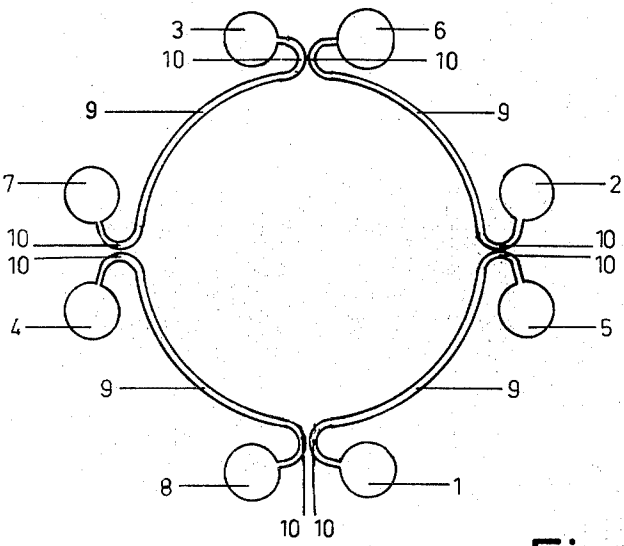


Fig 2

HOT GAS ENGINE HEATER HEADS

This invention relates to a hot gas engine heater head of the kind comprising at least one pair of parallel manifolds connected to at least one cylinder top and one top of a regenerator-cooler unit, the two manifolds in each said pair of manifolds being interconnected by substantially parallel pipes extending in planes perpendicular to the axes of the manifolds.

During the running of a hot gas engine the heater head is exposed to radiation of heat from a burner and to contact with a flow of hot combustion gases. The heater head is cooled internally by a flow of working gas. In order to obtain a high efficiency of the engine the pressure and the temperature of the working gas should be very high — the limit being determined by the material used in the heater head. Therefore it is desirable that the parts of the heater head exposed to the highest temperatures regarding radiation and convection should be uniformly heated and uniformly internally cooled and they should also form a substantial part of said heater head. With these requirements in mind the invention is intended to provide an improved heater head of the kind referred to.

According to the present invention a heater head of the kind referred to is characterised in that said pipes are formed as segments of circles along the greater parts of their lengths and that adjacent to their ends they are bent through more than 90° prior to their connections to said manifolds.

In a preferred construction the heater head comprises four pairs of manifolds and the said segments are of substantially equal length each extending through approximately 90° of a circle.

How the invention may be put into practice is described in more detail with reference to the accompanying drawing in which:

FIG. 1 is a side view of a heater head according to the invention, and

FIG. 2 shows the heater head of FIG. 1 viewed from

above.

The drawing shows four manifolds 1, 2, 3 and 4 extending from the high-temperature cylinder ends (not shown) of a four cylinder hot gas engine. Four manifolds 5, 6, 7 and 8 are connected at their lower ends to regenerators (not shown) of the same engine. The manifolds form four pairs, i.e. 1-5, 2-6, 3-7 and 4-8. In each pair the two manifolds are interconnected by a plurality of horizontally-extending pipes 9 of substantially equal length and shape. The said pipes are formed as segments of circles along the greater parts of their lengths and adjacent to their ends they comprise end portions 10 which are bent through more than 90° prior to their connections to the manifolds.

During operation of the engine heat is supplied by a burner (not shown) disposed centrally relative to the pipes 9. Heat is transmitted to the pipes by radiation and convection. It will be understood that according to the invention the manifolds 5-8 are shielded from the most intensive radiation and convection by the parts of the pipes 9 located between the manifolds and the center of the heater head.

What is claimed is:

1. A hot gas engine heater head of the kind comprising at least one pair of parallel manifolds connected to at least one cylinder top and one top of a regenerator-cooler unit, the two manifolds in each said pair of manifolds being interconnected by substantially parallel pipes extending in planes perpendicular to the axis of the manifolds, characterised in that said pipes are formed as segments of circles along the greater parts of their lengths and that adjacent to their ends they are bent through more than 90° prior to their connections to said manifolds.

2. A heater head according to claim 1, characterised in that it comprises four pairs of manifolds and that the said segments are of substantially equal length each extending through approximately 90° of a circle.

* * * * *

45

50

55

60

65