May 20, 1958 L. VIGNERE, SR 2,835,322

FIRING HEAD FOR FURNACES

Original Filed Sept. 4, 1952

FIG. 1

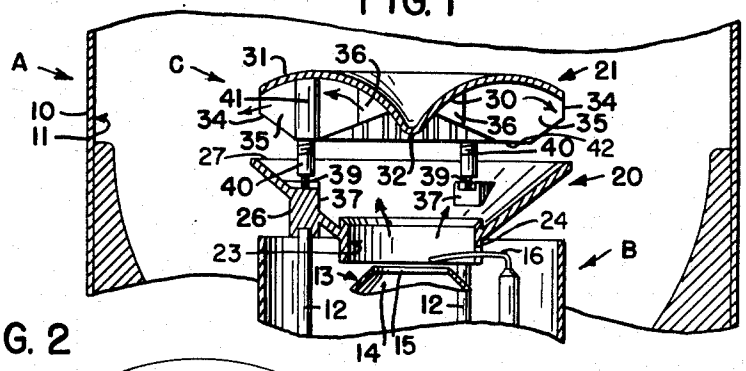


FIG. 2

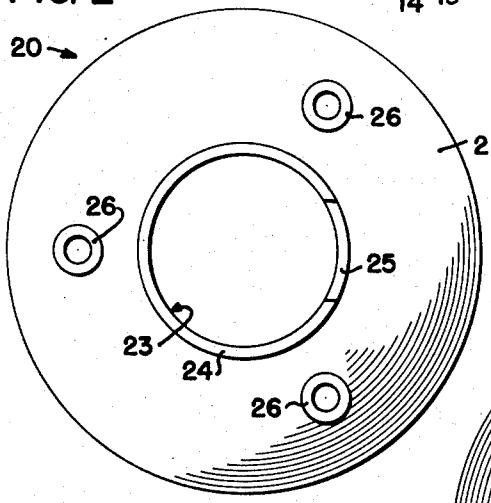


FIG. 3

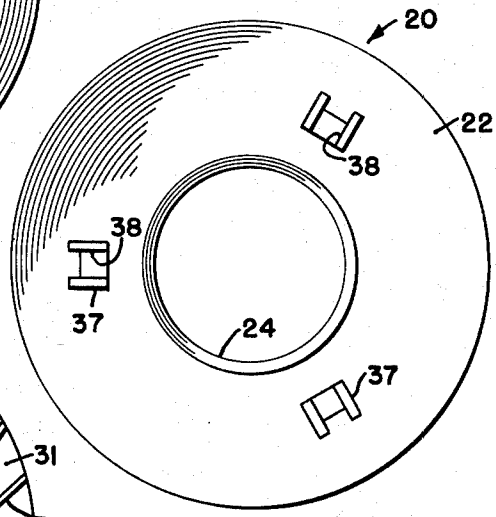
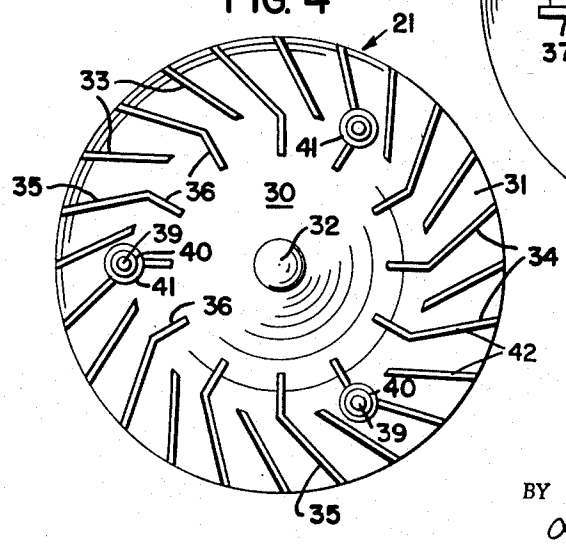


FIG. 4



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FIRING HEAD FOR FURNACES

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Original application September 4, 1952, Serial No. 307,860, now Patent No. 2,732,890, dated January 31, 1956. Divided and this application November 7, 1955, Serial No. 545,272

2 Claims. (Cl. 158—28)

This invention relates to firing heads of furnaces and this application is a division of my application Serial No. 307,860 dated September 4, 1952, which matured into Patent No. 2,732,890, dated January 31, 1956, and was, in turn, a continuation-in-part of my application Serial No. 188,380, filed October 4, 1950 which has matured into Patent No. 2,670,032 dated February 23, 1954.

An important object of the present invention is to improve the firing head disclosed in the application, Serial No. 188,380, referred to above, in order to render it more efficient when in use. This has included the rearrangement of baffles to cooperate with oil gas generating burners, particularly of the structure disclosed in my application Serial No. 307,860, referred to above, to provide for effective gasifying of oil mist, utilization of all of the oil gas, and elimination of most of the undesirable solid products of combustion; the formation of the firing head in two readily separable parts for efficient assembly and disassembly; the provision of means to adjustably support an upper firing head section upon a lower firing head section, so that the spacing apart of the two may be varied as required and the upper section levelled; and the reduction in the body weight of the firing head by forming the body portion of the upper section thereof as a shell rather than a solid member.

Other objects and advantages of the invention will be apparent during the course of the following detailed description of the invention, taken in connection with the accompanying drawing, forming a portion of this disclosure and in which drawing:

Fig. 1 is a vertical section through the firing head and associated structure of a furnace of which it forms a part.

Fig. 2 is a bottom plan of the lower section of the firing head.

Fig. 3 is a top plan of the lower section of the firing head.

Fig. 4 is a bottom plan of the upper section of the firing head.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the letter A designates a furnace; B, an oil gas generating combustion head; and C, the firing head of the present application.

The furnace A includes an outer wall **10** defining a chamber **11** while the combustion head B, which is fully described in my application Serial No. 307,860, referred to above, includes support means which contains upwardly extending suports **12**, which may be spaced apart cylindrical members with flat, horizontal upper end faces. The combination head B is also shown to include a casing **13** having an upper truncated cone-shaped wall **14** with a central opening **15**. There is also shown an electrode **16** (being one of a pair) which may be employed in

the production of electric discharges for igniting the oil gas and which extends with its free end over the mouth **15**.

Referring now to the firing head C, the same comprises a lower section **20** and upper section **21**, with the lower section having a somewhat dish-shaped body portion **22**, open at its bottom to provide a substantially circular opening **23** surrounded by a tubular flange **24** carried by the body portion **22** and which may be provided with a cut-out **25** extending from the lower edge of the flange to accommodate portions of the pair of electrodes mentioned. It will be noted that the flange **24** extends both downwardly and upwardly from the lower end of the body portion **22** but the greater portion of the flange extends downwardly with the edge of its lower end portion being slightly above the horizontal plane of the upper edge **27** of the truncated cone-shaped wall **14**, and the inner diameter of the flange **24** is considerably greater than the diameter of the central opening **15**. For example, the inside diameter of the flange **24** may be about twice the diameter of the central opening **15**. Carried by the body portion **22** is means to detachably mount the lower section **20** upon the support **12**. The means may be a plurality (three being shown, by way of example) of socketed members or projections **26** with the downwardly-opening socket thereof adapted to rather snugly receive the upper end portions of supports **12**. This arrangement will support the lower section **20** and also prevent rotation thereof.

The upper section **21** includes a downwardly extending inverted cone-shaped central body portion **30** and an outwardly-extending arched peripheral flange portion **31** extending therefrom. Preferably, the body portion **30** is hollow, as may be seen in Fig. 1 and the outer edge parts of the flange portion **31** are above the tip **32** of the cone. Carried by the flange portion **31** are a plurality of spaced apart flanges **33** and **34** depending from the lower face of the flange and with the inner end portions of the baffles **34** extending to the central body portion **30**. It will be noted in Fig. 4 that the longitudinal axes of the baffles **33** are tangential to the periphery of the central body portion **30**, while the longitudinal axes of the main body portions **35** of the baffles **34** are also similarly disposed but the longitudinal axes of their minor body portions **36** are radially disposed with respect to the vertical axis of the central body portion **30**. All baffles have lower edges **42** in the same horizontal plane and extend with their outer edges substantially in the same vertical plane as that of the outer edge of the flange portion **31**. The central body and outer flange portions **30** and **31** respectively and the baffles **33** and **34** provide means, when heated, to complete gasification of fuel from the combustion head B and burning of the fuel below the upper section **21**. For example, I have discovered that, employing an average grade of fuel oil under normal pressure and with the furnace in operation, the temperature just below the central opening **15** will be in the neighborhood of 900° F., while the temperature within the lower section **20** will be around 1000° F., but the temperature within the confines of the upper section **21** will have climbed to substantially 1840° F., and the heated gas emerging from the upper section **20**, as shown by the arrows, will be at substantially 1840° F. and it is this heated gas which is provided for heating by the furnace.

Fig. 1 illustrates the preferred elevational view of the baffles **34** and the baffles **33** have substantially the same shape except that they do not have the minor portions **36**. The shape has been discovered very conductive to good circulation of heated gas and its contact with the heated walls of the central portion **30** and flange portion **31**.

Means to detachably support the upper section **21**

from and spaced above the lower section 20 preferably comprises a plurality of spaced-apart lugs 37 extending inwardly from the lower section 20 and provided with upwardly-opening recesses 38 which recesses also preferably open toward the vertical axis of the section 20. These recesses 38 are adapted to receive the lower ends of screw threaded levelling shanks 39 carried by downwardly-extending interiorly screw threaded sleeves 40, with the screw threads of the shanks and sleeves mating, and the sleeves being exteriorly screw threaded at their upper end portions for mating with the screw threads of spaced-apart socketed members 41 carried by the section 21 and extending downwardly therefrom. This permits ready removal of the section 21 from the section 20 without unscrewing or unbolting the sections, and the section 21 may be levelled as is obvious or lowered or raised as may be found desirable.

The tubular flange 24, where it extends above the opening 23 provides, in conjunction with the wall of the body portion 22, a circular recess or pocket for any solid products of combustion which might form above the body portion 22 and below the flange portion 31 and are not blown outwardly from the baffles. The flange 24 also tends to prevent fuel from passing outwardly in a generally horizontal flow as it emerges from the upper end of the opening 15.

The arrangement of the specific baffles provided, in conjunction with the inverted conical central body portion 30 and arched peripheral flange, is conductive to consumption of substantially all the oil gas which is combustible.

Various changes may be made to the form of the invention herein shown and described without departing from the spirit of the invention or scope of the claims.

What is claimed is:

1. A furnace firing head including a lower section provided with a dish-shaped body portion having an upper edge of greatest diameter, a centrally-disposed lower opening and a tubular flange extending downwardly from said body portion at said opening, an upper metallic section having means to promote gasification and ignition of fuel from said lower section when said upper metallic section is heated, and to guide the gasified and ignited fuel outwardly of said upper metallic section, including an inverted cone-shaped central body portion, an arched flange portion extending outwardly from said central body portion with the vertical plane of said upper edge extending beyond the outer edge of said central body portion and a plurality of spaced-apart baffles extending downwardly from said arched flange portion, each baffle having a major body portion with its longitudinal axis tangential to the vertical axis of said central body portion, and adjustable levelling means supporting said upper metallic section with the lower edges of all of said baffles substantially paralleling the horizontal plane of said upper edge and spaced from said lower section.

2. A furnace firing head according to claim 1 characterized in that some of said baffles have minor baffle body portions extending radially toward said vertical axis of said central body portion.

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