Jan. 18, 1927. 1,614,746

H. LYON

BROILER BURNER

Filed August 19, 1924

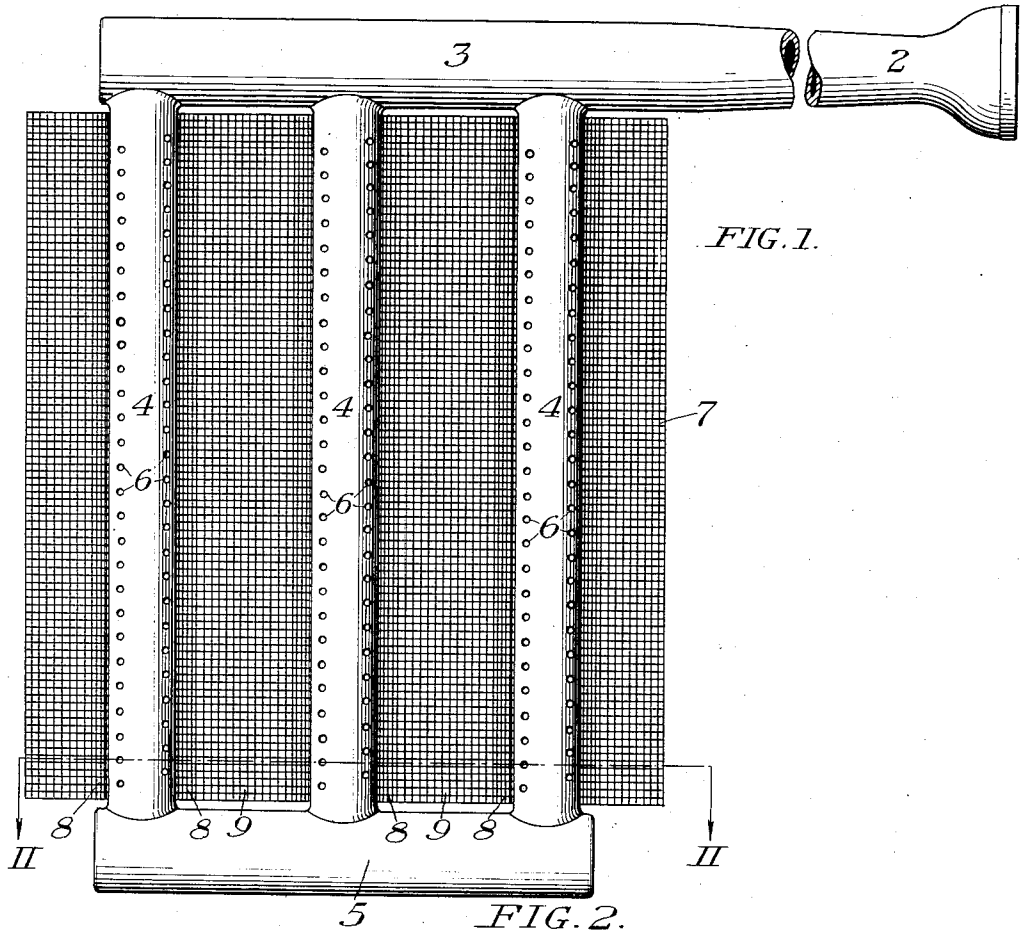


FIG. 1.

FIG. 2.

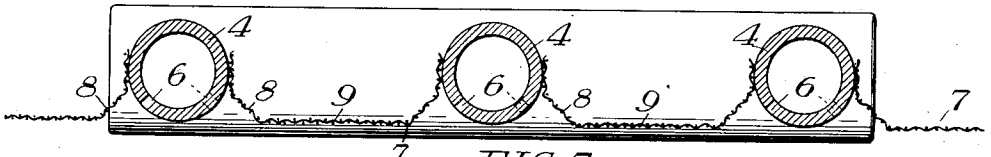


FIG. 3.

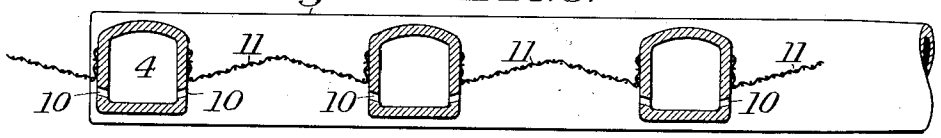
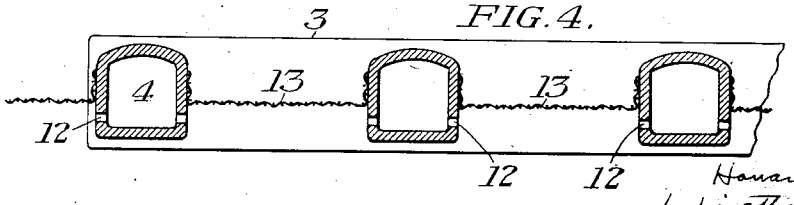


FIG. 4.



INVENTOR

Howard Lyon

by his attorneys

Burns, Stubbins & Parmelee

Patented Jan. 18, 1927. 1,614,746

UNITED STATES PATENT OFFICE.

HOWARD LYON, OF GLOUCESTER, NEW JERSEY, ASSIGNOR TO WELSBACH COMPANY, OF GLOUCESTER, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BROILER BURNER.

Application filed August 19, 1924. Serial No. 732,930.

The present invention relates broadly to burners, and more particularly to gas burners of the type especially adapted for domestic purposes, such as broiling, although certain features of the invention admirably adapt it to other uses.

It is recognized at the present time that the effectiveness of a broiler depends upon its ability to radiate heat or direct heat toward the material being broiled. In order to accomplish this concentration of heat more effectively it has heretofore been proposed to provide deflecting plates or heat radiating bodies intermediate the tubes of a broiler burner. I have found, however, that such bodies, in order to be effective, must be of such mass that they can be quickly brought to a temperature at which they become luminous whereby they act as effective heat radiants, and must be of such construction as to be durable to prevent the dropping of objectionable particles on the material being broiled. It is also desirable that such bodies have a uniform radiating surface so as to uniformly subject the material being broiled to heat, that they be flexible enough to prevent distortion, and permit their easy installation, and that they be inexpensive enough to make their addition to commercial burners an attractive proposition.

After a considerable number of experiments, I have found that calorized gauze most effectively meets the requirements of such a heat resistant and radiating body provided it be constructed to possess the characteristics hereinafter more fully pointed out.

In the accompanying drawings there are shown, for purposes of illustration only, certain preferred embodiments of the present invention, it being understood that the drawings do not define the limits of my invention as changes in the construction and operation disclosed therein may be made without departing from the spirit of the invention or scope of my broader claims.

In the drawings:—

Figure 1 is a bottom plan view of one form of burner constructed in accordance with this invention,

Figure 2 is a sectional view on an enlarged scale on the line II—II of Figure 1 looking in the direction of the arrows, and

Figures 3 and 4 are views similar to Figure 2 illustrating slightly modified embodiments of the invention.

In carrying out the present invention, there may be provided a broiler burner of any desired construction, preferably, however, comprising a Bunsen and mixing tube 2 opening into a burner manifold 3 having a series of branches 4 connected at their opposite ends by a header 5.

Formed in each of the branches is a plurality of outlet openings 6 preferably arranged in rows extending in diverging relationship. These openings are commonly adapted to initially direct the flame and resulting products of combustion downwardly toward the material to be broiled, although, as will be hereinafter fully apparent, the present invention is not dependant upon any particular arrangement of such openings. Above the outlet openings, and between and at the sides of the branches 4 is placed a suitable heat resistant material 7 preferably comprising a calorized wire gauze. This gauze is so shaped that its under surface will not impair the flame velocity so as to interfere with complete combustion and, with the arrangement of outlet openings illustrated in Figures 1 and 2, will preferably have its edge portions 8 angularly extending and its intermediate portions 9 extending in a substantially horizontal direction.

The use of wire gauze is highly desirable as it presents a uniform body insuring uniform heat radiation and is of such slight mass that it may be quickly brought to a temperature at which it becomes luminous. It will also be apparent that by reason of its construction it effectively resists distortion, while permitting it to be easily installed. The openings in the gauze permit the products of combustion to escape upwardly as desired while the strands, at the

temperature at which they become luminous, not only radiate a considerable amount of heat, but illuminate the material being broiled in such manner as to facilitate observation thereof.

I have found that gauze calorized in such manner as to preserve in each strand a core of metal substantially in its original condition while providing an outer protective portion which effectively resists oxidation at high temperatures possesses characteristics best suited to this use. For this purpose I have found that gauze finer than sixteen mesh or utilizing wire smaller than twenty-seven gauge is impractical due to the tendency of the same, when being calorized, to permit the penetration of the aluminum throughout the entire body, thereby destroying the central core, and further, due to the tendency of the openings between the strands to become bridged with the calorizing material during the dipping operation, thereby tending to close the openings found to be essential for the effective passage of the products of combustion. I therefore preferably utilize gauze coarser than sixteen mesh and preferably constructed of wire coarser than twenty-seven gauge. A gauze possessing such characteristics is capable of withstanding the usual broiler temperatures for substantially the life of the broiler and may be quickly and easily applied to the burner. Irrespective of the mesh and gauge of the wire, I control the period of dipping and the period of baking in such manner as to insure the preservation of a core of the original metal.

In Figure 3 there is illustrated a slightly modified embodiment of the invention in which the burner openings 10 project upwardly, the gauze 11 in such cases having its main portions converging upwardly so as to substantially conform to the direction of travel of the flame.

In the embodiment illustrated in Figure 4 the outlet openings 12 are such as to project the flame in a substantially horizontal direction, and in such cases the gauze 13 will be disposed with its major portion in a substantially horizontal plane.

The advantages of the present invention arise from the provision of a broiler burner having associated therewith a heat resisting gauze preferably of calorized material in which the strands have cores of their original material whereby oxidation of the outer surface is effectively prevented while the desired strength is imparted by reason of the cores in the strands.

Further advantages arise from the provision of a light mass of the character set forth which may be quickly brought to a luminous temperature, and which possesses a uniform radiating surface substantially conforming to the direction of flame travel and so located as to insure the impinging of the flame thereagainst to an extent sufficient to raise the same to the temperature desired.

This application is a continuation in part of my application Serial No. 592,741, filed Oct. 6, 1922.

I claim:

1. In a broiler burner, a burner tube having spaced outlet openings therein for directing a flame outwardly therefrom, and a reticulated heat radiator formed of heat resistant material of slight mass cooperating with said burner and out of the direct path of the flame but sufficiently close thereto to be raised to incandescence by the flame, substantially as described.

2. In a broiler burner, a burner tube having spaced outlet openings therein for directing the flame outwardly therefrom, and a reticulated heat radiator formed of heat resistant material of slight mass cooperating with said burner and out of the direct path of the flame but shaped to substantially conform to the flame travel from said burner openings, substantially as described.

3. In a broiler burner, an elongated burner tube having spaced outlet openings therein for directing a flame outwardly therefrom, and a gauze heat radiator of slight mass cooperating with said burner and out of the direct path of the flame but sufficiently close thereto to be raised to incandescence, substantially as described.

4. In a broiler burner, an elongated burner tube having spaced outlet openings therein for directing a flame outwardly therefrom, and a heat radiator gauze of slight mass cooperating with said tube, said gauze being shaped to substantially conform to the direction of travel of the flame to prevent interference with the flame velocity, substantially as described.

5. In a broiler burner, a burner element having spaced outlet openings therein for directing a flame outwardly therefrom, and a radiator formed of heat resistant material of slight mass cooperating with said element and so located as to be raised to incandescence by the flame issuing from said openings without impeding the flame velocity, said material having a plurality of openings extending therethrough for the escape of products of combustion, substantially as described.

6. In a broiler burner, spaced burner branches each having outlet openings therein, heat resistant material intermediate said branches shaped to substantially conform to the direction of travel of the flame from said openings, substantially as described.

7. In a broiler burner, spaced burner branches each having outlet openings therein, heat resistant calorized gauze intermediate said branches shaped to substantially conform to the direction of travel of the

flame from said openings, substantially as described.

8. In a burner, spaced burner branches each adapted to direct a flame outwardly therefrom, and calorized gauze intermediate said branches, said gauze being shaped to substantially conform to the direction of travel of the flame, substantially as described.

9. In a broiler burner, a burner branch having an outlet opening, and reticulated material cooperating with said burner and so closely adjacent said opening as to become incandescent when the burner is in use, said recticulated material comprising a body of calorized gauze substantially conforming to the direction of travel of the flame from said opening.

In testimony whereof I have hereunto set my hand.

HOWARD LYON.