

Sept. 3, 1935.

C. J. KESSLER

2,013,274

OIL BURNER

Filed June 13, 1932

2 Sheets-Sheet 1

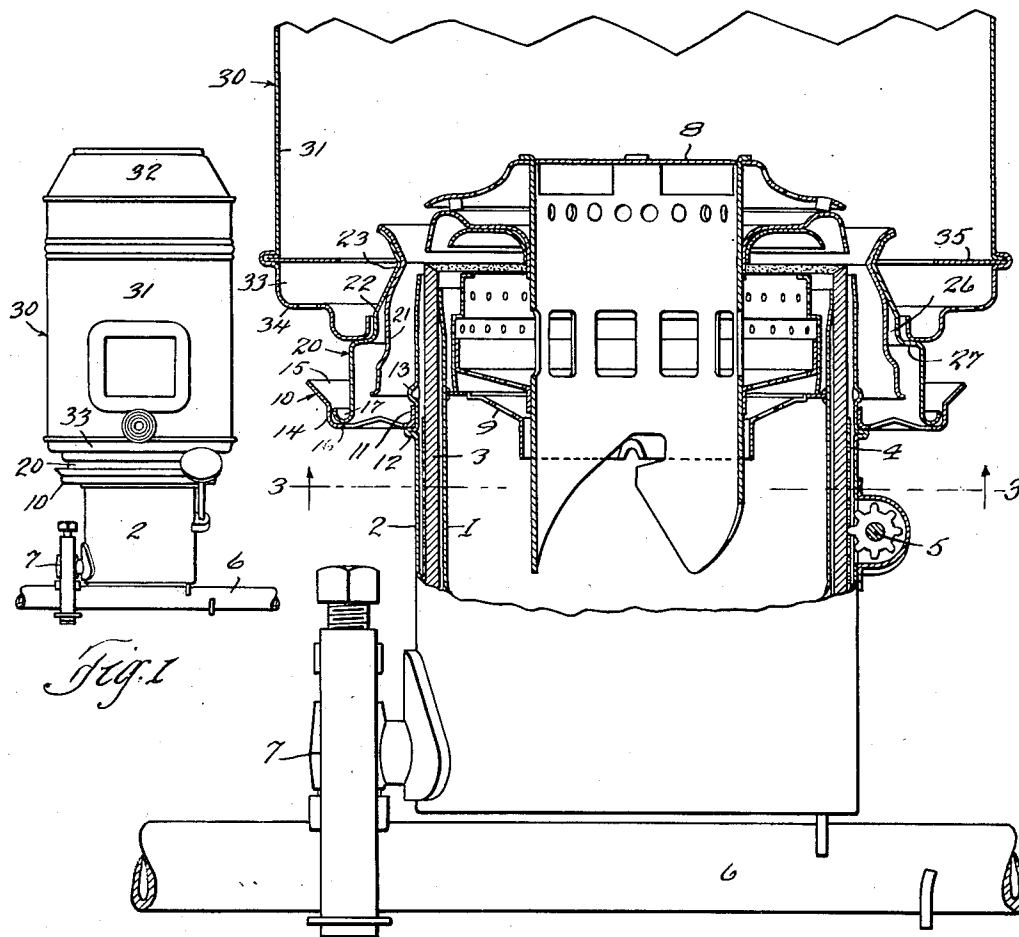


Fig. 1

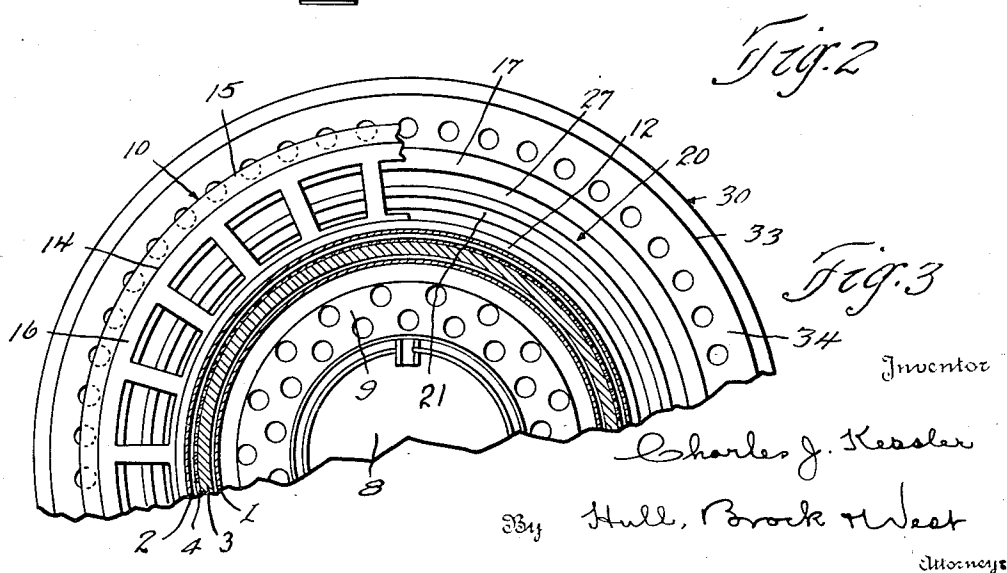


Fig. 2

Fig. 3

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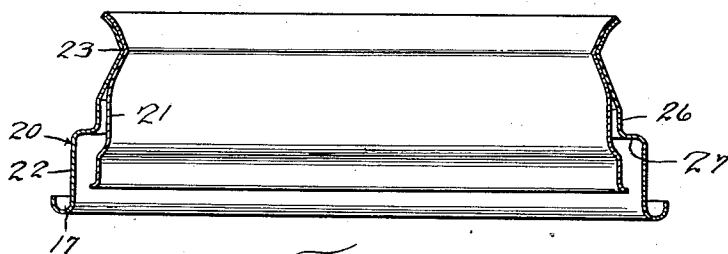
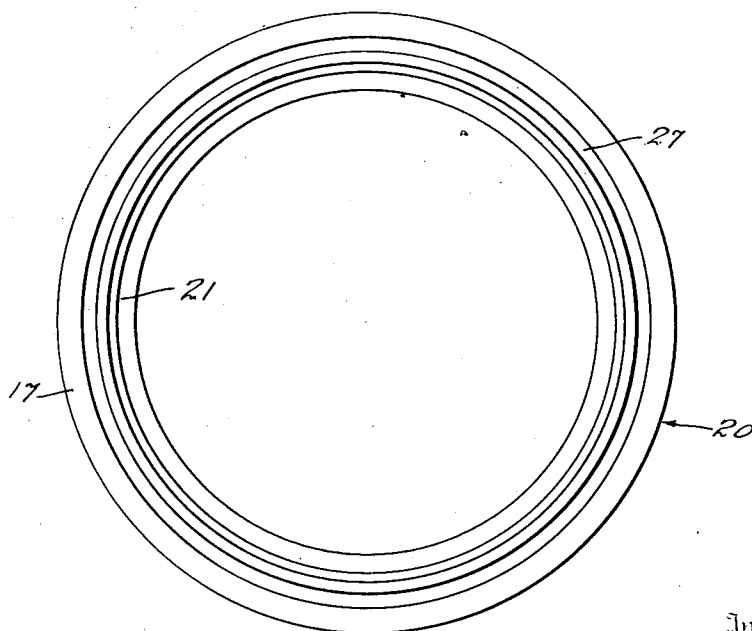


Fig. 4



Inventor

Fig. 5 Charles J. Kessler

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UNITED STATES PATENT OFFICE

2,013,274

OIL BURNER

Charles J. Kessler, Cleveland Heights, Ohio, assignor to Perfection Stove Company, Cleveland, Ohio, a corporation of Ohio

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5 Claims. (Cl. 158—94)

This invention relates to tubular wick oil burners of the long chimney type, in contradistinction to the short drum commingling tube type of either the wick or wickless variety.

The long chimney type of tubular wick oil burner has many advantages over the short drum commingling tube type, principal among which are a very great range of heat; a nicety, as well as accurate maintenance, of flame adjustment; instant lighting and extinguishing, and longevity of the wicks; but, on the other hand, there has always been a difficulty of a rather serious nature peculiar to the long chimney type, tubular wick oil burner that is commonly referred to as "seepage" and which manifests itself in the presence of a film of oil over the outer surface of the outer wick tube and, frequently, in a dripping of the oil therefrom.

The condition responsible for the advantages above enumerated (as well as for the trouble to which reference has just been made, as will hereinafter be pointed out) is the comparatively low temperature of the wick tubes in the long chimney type of burner when the burner is in operation.

This condition results in the highly desirable effect of the oil being vaporized directly at the top of the wick, where the vapor-producing or primary flame occurs, instead of at a lower point within the wick space by heat transmitted to the oil through the metal of the tubes, as would be the case if said tubes were highly heated. It is this vaporization of the oil from the top surface of the wick which gives, not only long life to the wick, but the perfect flame control and the wide heating range so essential in burners of the class to which the invention pertains, inasmuch as they are intended for use particularly in cooking stoves.

"Seepage", so-called, is a resultant evil of the otherwise beneficial cool-wick-tube condition. It is most noticeable when the top of the wick is substantially even with the top of the wick tubes (giving a medium low flame) and, according to the best analysis of the condition, it consists in condensation of the heavier oil vapors on the outer surface of the relatively cool outer wick tube within a short distance below the upper edge thereof. By raising the temperature of the wick tube somewhat, condensation may be prevented, and by increasing the velocity of the air which rises through the space between the upper end of the outer wick tube and the collar that surrounds the same, the vapors may be carried upwardly into the zone of combustion. However, if the wick tube is allowed to get too hot, car-

bonization of the oil occurs and char forms upon the exposed portion of the wick and on the adjacent parts of the wick tubes, greatly impairing the character of the flame; and unless the up-draft previously referred to is properly controlled, a disagreeable humming noise occurs that is produced by vibrations or fluctuations of the air about the flame.

The history of the tubular wick long chimney oil burner, as developed to avoid the humming noise just referred to and to obviate the objectionable condition known as "seepage"—as it existed in connection with the inner wick tube—is brought out in Jeavons Patents Nos. 848,828 and 908,997, issued, respectively, April 2, 1907 and January 5, 1909.

It is the fundamental purpose of this invention to so construct and improve the air controlling member or collar that surrounds and is spaced from the upper end of the outer wick tube, and extends a substantial distance above the same, as to raise the temperature of the burner, and more especially that of the upper end of said wick tube, just enough to avoid condensation, and effect sufficient draft to lift the heavier vapors, thereby to eliminate the trouble commonly referred to as "seepage", as it occurs in connection with the outer wick tube, at the same time wholly preserving the function of said air controlling member or collar as it has to do with preventing air vibrations or fluctuations.

Other objects of a more specific nature will appear as this description proceeds, in the course of which reference is made to the accompanying drawings forming a part hereof and wherein Fig. 1 is a front elevational view, and Fig. 2 a fragmentary sectional front elevation, of a tubular wick oil burner of the long chimney type incorporating the invention; Fig. 3 is a partial horizontal section on the line 3—3 of Fig. 2, looking upwardly, as indicated by the arrows associated with said line; Fig. 4 is a central vertical section through the improved air controlling member or collar, and Fig. 5 is a bottom plan view of the same.

The burner proper is of a well known type comprising inner and outer wick tubes 1 and 2, respectively, that are cylindrical and are arranged in concentric relation to each other and are joined together at the bottom in a manner familiar to those acquainted with the subject. The space between said tubes contains a wick 3 that is equipped with a perforated metallic carrier 4 with which wick raising means, designated 5, cooperates; and the wick space is supplied with

oil from a pipe 6 through the usual fitting 7. A flame spreader 8 is removably supported within the top of the inner wick tube by a spanner 9 that is secured to said wick tube as by having its periphery locked between vertically spaced flanges or projections that extend inwardly from the tube.

10 is a support for an air controlling member or collar, and the same is preferably constructed of a sheet metal annulus whose inner edge is flanged upwardly, as shown at 11. The support is adapted to be slipped down over the outer wick tube 2 and bear upon a circumferential flange 12 thereof, and the support is held in place upon said flange by projections 13 that are struck outwardly from the wick tube at intervals about the same. It may be explained that there is sufficient flexibility of the parts to allow the flange 11 to ride over the projections 13 in applying the collar support to the burner. Adjacent its outer edge the support 10 is provided with a shallow vertical wall 14 that merges with an upwardly diverging lip 15, and immediately inside the wall 14 is a bearing portion 16 on which the outwardly curled lower edge 17 of the air controlling member 20 rests, the perimeter of said outwardly curled portion fitting easily but reasonably accurately within the wall 14.

The air controlling member 20, in which the present improvements reside, will now be described in detail. This member, according to the present preferred embodiment of the invention, comprises inner and outer collars 21 and 22, respectively, which are nested one within the other. The outer collar 22 has a restricted throat 23, above which the collar flares outwardly and upwardly and below which it diverges downwardly to a point where it merges into a cylindrical part 26. Beyond this part the collar extends outwardly horizontally to form a chimney seat 27 from which it continues downwardly to join the previously mentioned outwardly curled portion 17. The enlarged end below the chimney seat may be considered the base of the collar. The inner collar 21 conforms to the contour of the outer collar downwardly from the top to a point above the cylindrical portion 26 of the outer collar, and from this point the inner collar curves away from the outer collar and continues downwardly to a point below the seat 27 where it flares abruptly outwardly and thence downwardly and again slightly outwardly, the inner collar terminating an appreciable distance above the lower edge of the base of the outer collar. Experiments indicate that the space between the separated portions of the collars, which may function as an insulating space, is of importance. The collars are interlocked at their upper ends, in the manner illustrated, as a manufacturing expedient. Large openings, spaced relatively closely together, occupy the portion of the support 10 between the bearing portion 16 and the flange 11.

The chimney, designated generally by the reference numeral 30, consists of a cylindrical wall 31, an annular converging top wall 32 that is suitably interlocked with the upper edge of the former wall, and a downwardly converging bottom wall 33 formed with a step or ledge 34 that is spaced a suitable distance above the lower extremity of the chimney. The chimney rests with such extremity upon the chimney seat 27 of the air controlling member 20. Extending inwardly over the step or ledge 34 a suitable distance thereabove is a baffle 35 that is preferably in the form of a ring which is shown as secured

to the drum by having its outer edge confined within the seam between the drum walls 31 and 33.

When the burner is in operation, a draft of air is induced upwardly through the openings in the support 10 and through the space between the air controlling member 20 and the upper portion of the outer wick tube. Air is also drawn upwardly through the inner wick tube, and through the flame spreader which serves to direct it outwardly across the top of the wick. The air admitted through both of these courses is augmented by air that rises through perforations in the bottom wall 33 of the chimney, which air is directed inwardly about the flaring top of the air controlling member 20 by the baffle 35. The air entering through the inner wick tube and through the space between the air controlling member 20 and the outer wick tube supplies oxygen to the flame to which proper shape is imparted by the manner in which the air is delivered to the zone of combustion by the air controlling member and flame spreader. The supply of air renders combustion practically complete, producing a highly satisfactory flame from the properly proportioned mixture of air and oil vapor, the latter being generated at the top of the wick by the primary flame which nestles close to the wick. The air rising through the perforations in the bottom of the chimney flows upwardly along the wall of the latter, maintaining it relatively cool.

The shape of the air controlling member 20 and its relation to the adjacent parts of the burner are such as will avoid the vibration or fluctuation of the air in the zone of combustion, thereby to obviate the disagreeable humming noise which occurs if these conditions are not correct.

With an air controlling member constructed as herein shown, it is found that the burner parts, especially the upper portion of the outer wick tube, is maintained at such a temperature, when the burner is in operation, as will prevent condensation of any oil vapors that drift downwardly from the top of the wick, and the upward draft of air through the air controlling member is of sufficiently high velocity to carry the vapors upwardly into the zone of combustion, thus avoiding completely the undesirable condition known as "seepage".

While I have described the present construction in detail, it will be understood that the invention is not limited to the structural features shown further than is required by the terms of the appended claims.

Having thus described my invention, what I claim is:

1. In a so-called long chimney type oil burner comprising inner and outer wick tubes that are spaced apart at their upper ends and are connected together at their lower ends with a leak-proof joint, a conduit communicating with the space between said tubes for delivering oil thereto, a cylindrical wick in said space, and a relatively long slender chimney arranged with its lower end about the upper ends of said tubes, an air controlling member surrounding and spaced from the top of the outer wick tube and interposed between said tube and the chimney, the same comprising an outer upwardly converging collar having a ledge intermediate its ends to provide a support for the aforesaid chimney, and an inner collar of less convergence nested within the outer collar and separated therefrom adjacent its lower end.

2. In a so-called long chimney type oil burner comprising inner and outer wick tubes that are spaced apart at their upper ends and are connected together at their lower ends with a leak-proof joint, a conduit communicating with the space between said tubes for delivering oil thereto, a cylindrical wick in said space, and a relatively long slender chimney arranged with its lower end about the upper ends of said tubes, an air controlling member surrounding and spaced from the top of the outer wick tube and interposed between said tube and the chimney, the same having a restricted throat and flaring outwardly above and diverging downwardly below said throat, the lower part of said member comprising flange like portions that are spaced apart in a radial direction to provide for the insulation of one of said portions from the other.

3. In a so-called long chimney type oil burner comprising inner and outer wick tubes that are spaced apart at their upper ends and are connected together at their lower ends with a leak-proof joint, a conduit communicating with the space between said tubes for delivering oil thereto, a cylindrical wick in said space, and a relatively long slender chimney arranged with its lower end about the upper ends of said tubes, an air controlling member surrounding and spaced from the top of the outer wick tube and having a restricted throat and flaring outwardly above the same, the member diverging downwardly from said throat and continuing therebelow as radially spaced flange like portions, the outer portion extending outwardly to provide a seat for the aforesaid chimney and continuing downwardly therebeyond to form a base flange, the inner portion descending in spaced relation to the outer portion and being stepped outwardly below the plane of said chimney seat and thence downwardly and terminating above the bottom of the base flange.

4. In a so-called long chimney type oil burner comprising inner and outer wick tubes that are spaced apart at their upper ends and are connected together at their lower ends with a leak-

proof joint, a conduit communicating with the space between said tubes for delivering oil thereto, a cylindrical wick in said space, and a relatively long slender chimney arranged with its lower end about the upper ends of said tubes, an air controlling member surrounding and spaced from the top of the outer wick tube and interposed between said tube and the chimney, the same comprising an outer collar having a restricted throat and flaring outwardly thereabove said collar diverging downwardly from said throat and thence extending outwardly to provide a seat for the aforesaid chimney beyond which said collar continues downwardly to form a base flange, and an inner collar nested within the outer collar and having its lower end spaced inwardly from said base flange.

5. In a so-called long chimney type oil burner comprising inner and outer wick tubes that are spaced apart at their upper ends and are connected together at their lower ends with a leak-proof joint, a conduit communicating with the space between said tubes for delivering oil thereto, a cylindrical wick in said space, and a relatively long slender chimney arranged with its lower end about the upper ends of said tubes, an air controlling member surrounding and spaced from the top of the outer wick tube and interposed between said tube and the chimney, the same comprising an outer collar having a restricted throat and flaring outwardly thereabove, the collar diverging downwardly from said throat and thence extending outwardly to provide a seat for the aforesaid chimney and continuing downwardly therebeyond to form a base flange, and an inner collar nested within the outer collar and conforming to the contour thereof downwardly from the top to about the plane of the chimney seat and thence continuing downwardly in spaced relation to the outer collar and being stepped outwardly below said seat and thence extending downwardly and terminating above the bottom of the outer collar.

CHARLES J. KESSLER.