June 15, 1954

R. H. CHURCHILL

2,680,963

CANDLE BURNER

Filed Aug. 11, 1950

Fig. 1

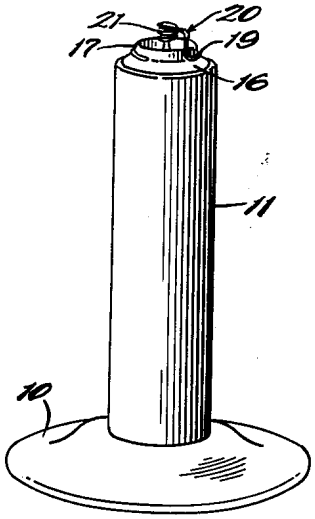


Fig. 2

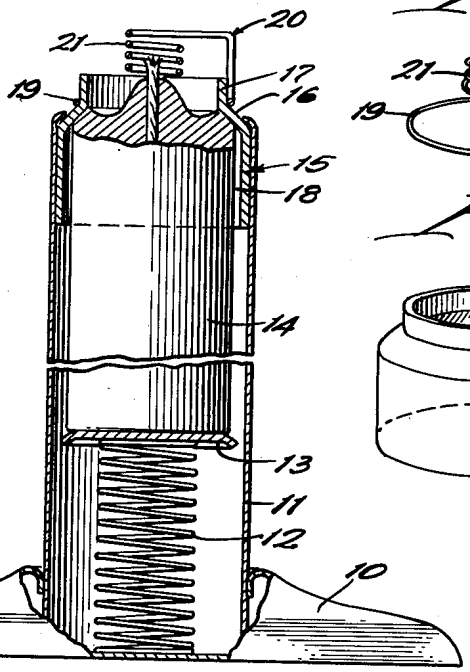


Fig. 3

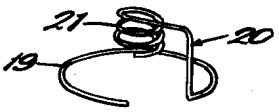


Fig. 4

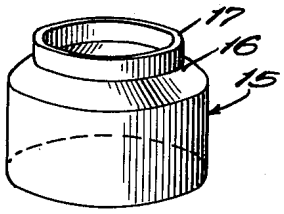


Fig. 5

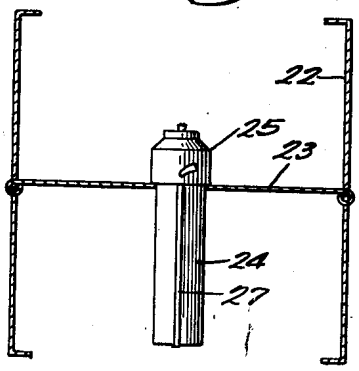


Fig. 6

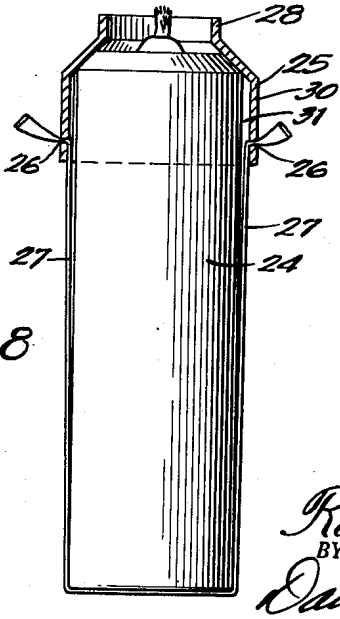


Fig. 7

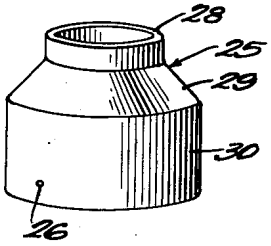
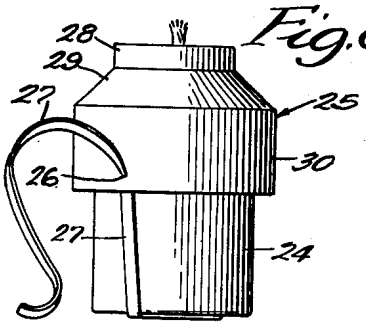


Fig. 8



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CANDLE BURNER

Ralph H. Churchill, Chicago, Ill.

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7 Claims. (Cl. 67—27)

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This invention relates to a candle burner, and more particularly to means for causing the candle to burn with greater efficiency.

It has been the practice to use followers comprising tubular members of substantial weight upon candles while providing a neck extending upwardly and around the wick. Also tubular means are employed for enclosing the candle while employing springs for pressing the candle upwardly against a shoulder at the top of the tube as the candle is consumed. In both structures, the heat of the candle and the melted wax, which circulates in a pool at the base of the exposed portion of the wick, produces a softening of the shoulder of the candle and a premature yielding of this portion of the candle. Further, in the spring-urged structure, the follower block is wedged deeply into the softened wax at the top of the candle and considerable effort and work is required to separate it from the follower and to clean the follower.

An object of the present invention is to provide an extremely simple structure which obviates the above difficulties while at the same time increasing the efficiency of the burning of the candle. A still further object is to provide a disposable well-cap which may be stripped off and thrown away after the follower block has pressed the softened wax therethrough. A still further object is to provide an extremely light weight well-cap which imposes a minimum of weight or stress against the shoulder of the candle while at the same time forming a protective enclosure and support for the shoulder. A still further object is to provide with such a well-cap, simple and adjustable means for drawing a candle upwardly against the cap as the candle is consumed. A still further object is to provide a candle structure adapted for use in a portable stove or cooking device. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in preferred embodiments by the accompanying drawing, in which—

Figure 1 is a perspective view of a candle support structure equipped with means embodying my invention; Fig. 2, a broken vertical sectional view; Fig. 3, a perspective view of one form of carburetor that may be used; Fig. 4, a perspective view of a well-cap embodying my invention; Fig. 5, a vertical sectional view of a collapsible stove equipped with a candle support device embodying my invention; Fig. 6, a vertical sectional view of the candle well-cap and candle support

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means employed therewith; Fig. 7, a perspective view of the well-cap shown in Fig. 6; and Fig. 8, a side view in elevation of the support device being drawn to exert pressure against a candle which is almost consumed.

In the illustration given in Figs. 1 to 4, inclusive, 10 designates a candle burner base provided with a tube member 11. The tube 11 may be secured within the base 10 by friction, or, if desired, threaded connections may be employed. A spring 12 is supported in the lower portion of the base 10 and presses a follower block or member 13 upwardly. A candle 14 is carried upon the block 13.

About the top of the candle 14, I employ a well-cap 15 having an elongated, inclined shoulder 16 and an upper tubular well portion 17 of reduced diameter. The well-cap 15 is preferably formed of light weight, frangible, heat-nonconducting material such as, for example, paper which is made fireproof by treatment with carbon tetrachloride or any fireproofing material. Also, materials such as casein or ceramic materials may be used. I prefer to use a very light weight well-cap which has cone-like shoulders fitting about the top cone portion of the candle while extending laterally thereof so as to provide an air space between the inner portion of the candle and the skirt or lower portion of the cap 15. The space between the skirt and the candle is shown as indicated in Fig. 2 by the numeral 18. The depending skirt of the cap 15 is cylindrical in shape and forms an insulation against the metal tube 11 of the candle support so that the shoulder portion of the candle is kept free of any heat transmitted through tube 11. The shoulder portion 16 of the well-cap forms a seal with the shoulder and centers the candle within the cap, while preventing the transfer of heat downwardly about the shoulder portion. At the same time, the skirt portion below the shoulder 16 provides the dead air space 18 for insulating the lower portion of the candle shoulder and for shielding the shoulder from heat that would otherwise be transmitted by the tube 11.

Upon the neck portion 16 I place the collar 19 of the carburetor device 20. The carburetor comprises a tubular member formed of coils 21 and having air passages extending transversely therethrough. If desired, a metal tube having perforations therethrough may be used. I prefer, however, to form the tubular member by coiling the wire 21, as illustrated best in Figs. 2 and 3. The carburetor 20, together with its support 19, may be readily placed upon and removed from the

well-cap 15. The collar 19 may be dropped over the well 17 to install the carburetor, and may be lifted off of the well portion 17 when it is desired to remove the well-cap after the candle has been consumed.

Operation

In the operation of the structure shown in Figs. 1 to 4, inclusive, the spring 12 urges the follower block 13 upwardly and the candle 14 is centered by the engagement of its shoulders with the shoulder portion 16 of the well-cap 15. The end of the wick may be below or in the lower portion of the tubular carburetor 20, and the flame is rendered more efficient by the coils 21 thereof. The tubular structure 21 gives an effective control of the volume of air admitted to the flame and creates a sufficient turbulence of the air within the neck to give a more complete combustion for the flame and prevents smoking of the flame. The coils are preferably formed of metal wire which become heated during burning of the flame and the heat of the coil greatly increases the efficiency of the combustion of the flame.

While the wire coils on becoming heated transfer the heat from the flame down into the neck and thus bring the gas from the molten pool of wax up to a temperature for most efficient combustion, the shoulders of the wax are protected against such radiated heat and heat conducted by the collar 19 by the use of the light weight insulator cap 15. The depending tubular skirt of substantially uniform diameter forms an insulating wall against the tube 11 while at the same time providing a dead air space 18 about the lower portion of the candle shoulders. Thus the candle shoulders are protected against premature softening and further the increased protection for the shoulders enables them to serve effectively in centering the candle by their engagement with the conical wall 16 of the well-cap 15.

After the candle has been consumed substantially, the spring-urged block 13 presses the molten wax about the cap 15 to produce an irregular molten body covering the inside of the cap and wedging the block therein. The frangible cap 15 may now be torn to free the block and remove the wax and the cap may be thrown away. By providing a frangible cap which can be readily stripped or broken away from the block, the separting of the mass from the block requires but an instant and the cap with the waste mass therein may be disposed of.

In the structure shown in Figs. 5 to 8, inclusive, I provide a structure which provides a sheltered candle, causing the flame to burn more efficiently while at the same time adapting the candle for use in a stove or other heating device. In the specific illustration given, the stove 22 is provided with a hinged portion 23 apertured centrally to receive the candle 24. The candle 24 is supported within the aperture by a well-cap 25 having a small slit or aperture 26 therein and on each diametrically opposed side of the cap. A rubber ribbon 27 is drawn through the apertures 26 and the bottom portion of the loop thus formed engages the bottom of the candle. As the candle is consumed, the protruding portions of the rubber band 27 may be drawn to equalize the pressure against the bottom of the candle. As the rubber band 27 is drawn, the neck thereof passing through the apertures 26 becomes elongated so as to allow the band to be drawn therethrough. However, when the band is released, the upper portion of the band expands and prevents that portion of the band from being drawn downwardly by the tension of the lower stretched loop portion of the band. In Fig. 8 is illustrated the condition of the band 27 when the candle 24 is almost consumed. In the structure illustrated, the cap 25 is provided with a rather high well portion 28 adapted to extend around the lower portion of the flame and wick, while the shoulder portion 29 is adapted to bear against the upper end of the candle and to center the candle therein. The shoulder extends beyond the circumference of the candle and provides a depending tubular skirt 30 spaced from the candle by a dead air space 31, as shown more clearly in Fig. 6.

A variety of fireproof materials which may be readily torn or stretched away without shattering, may be employed. For example, in addition to treated paper, certain cloths may be treated to render them fireproof; fireproof resins or plastics which are readily split may also be used, and various impregnated plastics may be used with fibrous materials. I prefer paper because of its light weight, high insulating value, and adaptability for receiving fireproofing materials and stiffening impregnating materials. The paper may be readily impregnated with lacquer to stop the capillary action of the paper while at the same time rendering it fireproof.

Instead of using a rubber band 27, artificial rubber or any other elastic material may be employed. The aperture 26 may be a small horizontal slit tightly receiving the elastic band, or it may be of any size smaller than the normal cross-section of the unstretched band.

While, in the foregoing specification, I have set forth specific structures in considerable detail for the purpose of illustrating embodiments of the invention, it will be understood that such details of structure may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a candle burner, a tube having relatively good heat conductivity, a candle axially movable in said tube, means for urging said candle upwardly in said tube, a well-cap member having relatively good heat insulating properties in telescopic engagement with the upper end of said tube and extending thereabove for preventing the upper portion of the candle from overheating, and a carburetor carried by said cap member and having portions surrounding the wick of said candle and tending to distribute the heat of a flame about the wick for establishing optimum combustion conditions.

2. The structure of claim 1 in which at least the upper portion of said cap member about the flame of the candle is fire-resistant.

3. The structure of claim 2 wherein said cap member is frangible.

4. The structure of claim 1 in which said tube is metal and said carburetor is metal.

5. The structure of claim 1 in which said cap member has a lower tubular portion of enlarged diameter telescopically engaging said tube, and an upwardly and inwardly inclined shoulder portion terminating in a well portion of reduced diameter.

6. The structure of claim 5 in which said carburetor is equipped with an annular ring frictionally engaging said well portion of reduced diameter.

7. In a candle burner, a tube having rela-

tively good heat conductivity and being adapted to receive a candle therein, means for urging a candle received in said tube upwardly therein, a well-cap member having relatively good heat insulating properties in telescopic engagement with the upper end of said tube and extending thereabove for preventing the upper portion of a candle supported in said tube from overheating, and a carburetor carried by said cap member and having portions thereof adapted to surround the wick of a candle supported in said tube and tending to distribute the heat of a candle flame

about the wick of the candle for establishing optimum combustion conditions.

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