Oct. 18, 1938. N. E. HEIL 2,133,450

WICK FOR LIQUID FUEL BURNERS

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Fig. 1.

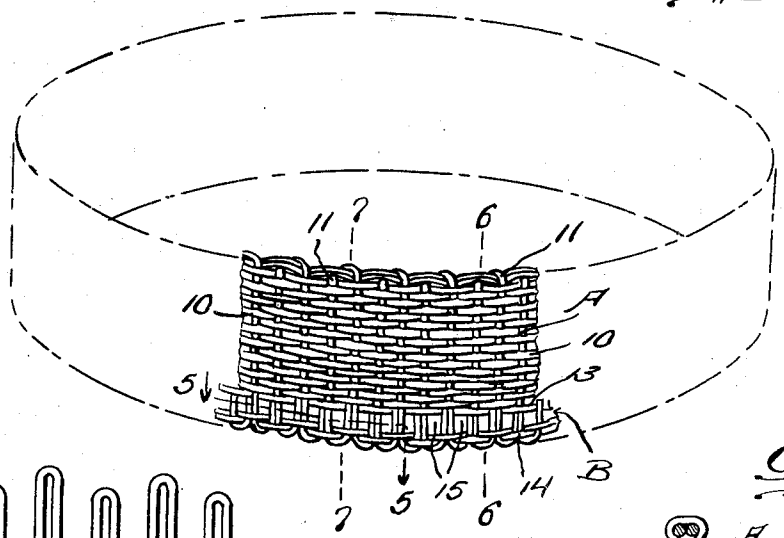


Fig. 2.

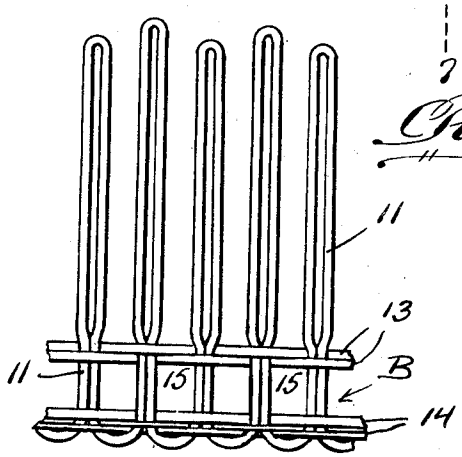


Fig. 6.

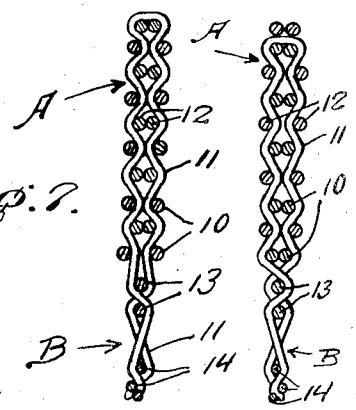


Fig. 7.

Fig. 3.

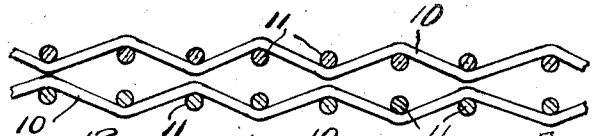


Fig. 4.

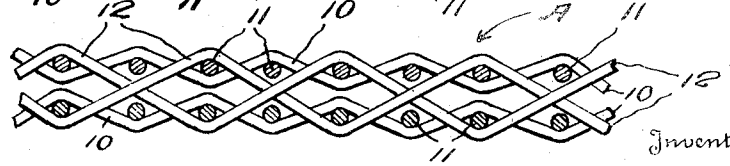
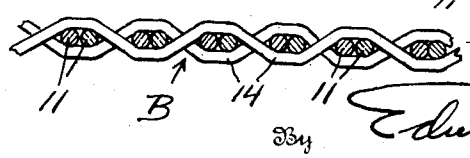


Fig. 5.



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WICK FOR LIQUID FUEL BURNERS

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Fig. 8.

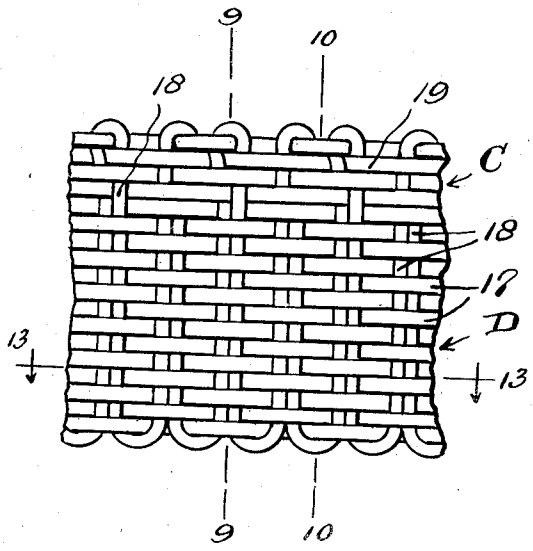


Fig. 9.

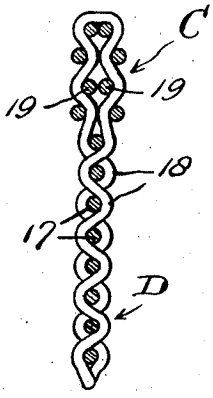


Fig. 10.

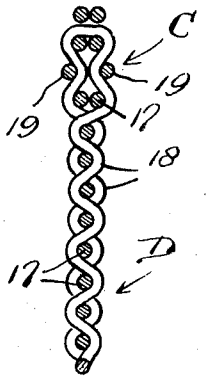


Fig. 11.

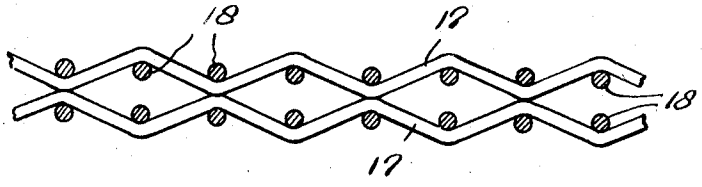


Fig. 12.

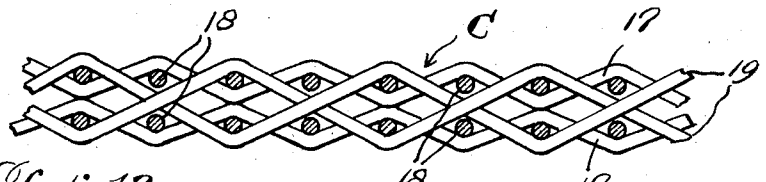
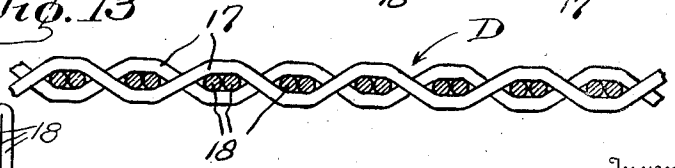


Fig. 13



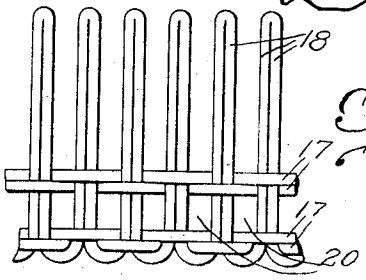


Fig. 14

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UNITED STATES PATENT OFFICE

2,133,450

WICK FOR LIQUID FUEL BURNERS

Norman E. Heil, Ridgewood, N. J.

Application February 23, 1937, Serial No. 127,230

4 Claims. (Cl. 67—69)

The present invention relates to wicks for liquid fuel burners, and comprehends a novel construction of wick which may be quickly lighted, and assures even burning of the flame, maximum heat with a minimum consumption of fuel, and possesses longer life and service than other wicks of the same general character.

One of the most outstanding features of the invention resides in a wick possessing a comparatively high degree of capillary attraction, thereby assuring a quicker flow of fuel to the flame edge of the wick and an even burning of the flame, in addition to materially expediting the lighting of the wick.

Another important object of the invention resides in constructing the wick so that fuel can readily flow through the interior thereof, unaffected or unretarded by carbon deposits on the exterior surface of the wick, thereby maintaining the outstanding comparatively high degree of capillary attraction characteristic of the invention.

By virtue of the construction, the invention further provides for the passage of the fuel through the interior of the wick to the flame edge thereof, with a minimum exposure of the fuel direct to the flame, so that a more complete combustion of all the fuel gases is obtained, with a resultant production of maximum heat with a minimum consumption of fuel.

In carrying out the invention I comprehend a wick structure of relatively different thicknesses, including a relatively thick upper portion through the interior of which the fuel is permitted to flow to its flame edge, and a relatively thin lower portion adapted to be positioned within the wick receiving groove of the burner with which it is used, and characterized by an annular series of openings to insure an uninterrupted flow of fuel through the groove in all directions, thereby maintaining a uniformly even distribution of fuel to the flame edge with an outstanding comparatively high degree of capillary attraction.

The nature and advantages of the invention will be better understood when the following detail description is read in connection with the accompanying drawings, wherein like numerals of reference indicate similar parts in the several views and wherein:

Figure 1 is a fragmentary perspective view of the wick.

Figure 2 is a fragmentary detail view of the lower relatively thin portion of the wick.

Figure 3 is a horizontal sectional view through the relatively thick portion of the wick without the binding strands.

Figure 4 is a similar view including the binding strands.

Figure 5 is a sectional view on line 5—5 of Figure 1.

Figure 6 is a sectional view on line 6—6 of Figure 1.

Figure 7 is a sectional view on line 7—7 of Figure 1.

Figure 8 is a fragmentary elevation of a modified form.

Figure 9 is a sectional view on line 9—9 of Figure 8.

Figure 10 is a sectional view on line 10—10 of Figure 8.

Figure 11 is a horizontal sectional view on line 11—11 of Figure 8.

Figure 12 is a similar view including the binding strands.

Figure 13 is a horizontal sectional view on line 13—13 of Figure 8.

Figure 14 is a fragmentary detail view showing a modification of the lower edge of the wick illustrated in Figure 8.

As hereinabove stated, the invention is constructed to maintain an outstanding comparatively high degree of capillary attraction throughout the entire life of the wick, and therefore embodies a relatively thick upper portion A and a relatively thin lower portion B. It will be noted from the drawings that the relatively thick upper portion A constitutes the major portion of the depth of the wick, while the lower portion B is relatively narrow. The upper portion A is preferably a double or two ply weave, having its opposite sides or walls composed of interwoven asbestos warp and weft strands. As illustrated in Figure 3, the warp strands 10 of each side or wall of the wick are interwoven with the weft strands 11, while also interwoven in the structure are binding strands 12. What is herein referred to as weft strands 11, is preferably a continuous weft strand interwoven in the manner illustrated in Figure 2, to provide vertical runs arranged in spaced pairs entirely around the wick, and extended over the upper edge of the structure, forming part of the flame edge as illustrated in Figure 7. While the respective pairs of the vertical runs of the weft strand 11 may be spaced apart any suitable or desired distance about the wick, it will be noted that the adjacent runs of each pair of said weft strands are closely related and extend an appreciable distance beneath the lower edge of the relatively

thick upper portion A. These extended portions of the vertical runs of the weft strands are interwoven with the warp strands 13 at the immediate lower edge of the thick portion A of the wick. Preferably two of such warp strands 13 are used at this point, and as illustrated are arranged one above the other and alternately interwoven with the respective pairs of weft strands. From that point the extended portions of the vertical runs of the weft strands compose a part of the relatively thin lower portion B of the wick, and are arranged in contacting engagement with each other. While the lower portion B is relatively narrow compared to the depth of the thick portion A, the relative depths of these respective portions can be varied within the scope of the invention. Upon inspection of Figures 2, 6 and 7 of the drawings, it will be noted that these contacting portions of the vertical runs of the weft strand 11 are interwoven with the warp strands 13 immediately adjacent the lower edge of the thick portion A, and are also interwoven with a pair of superimposed warp strands 14 at the lower edge of the wick. These warp strands 14 are spaced an appreciable distance beneath the warp strands 13 and also form part of the single ply relatively thin lower portion B of the wick, and provides the latter with a continuous uninterrupted fuel conducting lower edge, and an annular series of spaced openings 15 immediately adjacent said edge. As illustrated in Figure 2, these warp strands 14 are superimposed and alternately interwoven through the loops defined by the lower edges of the weft strands 11. Manifestly, by virtue of this construction, the wick in its entirety is possessed of a comparatively high degree of capillary attraction, which is maintained throughout the entire life of the wick. The annular series of openings 15 permit the free flow of fuel through the wick and around the wick receiving groove of the burner with which it is associated, and also permits the fuel to flow freely through the wick from an inner to an outer wick receiving groove, on burners of the type where more than one wick is employed. Furthermore, by reason of the construction the fuel is permitted to flow through the interior of the relatively thick portion of the wick to the flame edge, unaffected or unretarded by carbon deposits on the exterior of the wick, and with a minimum exposure of the fuel direct to the flame, so that a more complete combustion of all fuel gases is obtained producing maximum heat with a minimum consumption of fuel, and at all times maintaining a comparatively high degree of capillary attraction though the wick

As hereinabove stated, the relative depths of the respective thick and thin portions of the wick may be varied within the scope of the invention, and I have accordingly illustrated a modified construction in Figures 8 to 13 inclusive.

In these views, C indicates the relatively thick upper portion of the wick embodying the flame edge, which obviously is comparatively narrow with regard to the relatively thin lower portion D. The wick is composed of horizontal warp strands 17 interwoven with the spaced pairs of vertical runs 18 of a single weft strand, while also interwoven with the upper portion of the vertical runs 18 are binding strands 19. Manifestly, the binding strands 19 are only used in the thick upper portion C of the wick, embodying the flame edge, and from the immediate lower edge of the thick portion C, the adjacent runs of each pair of vertical runs are held in contacting engagement throughout the entire depth of the thin portion D of the wick. It is by virtue of this construction, coupled with the fact that the vertical runs 18 form part of both the flame edge and the continuous lower fuel conducting edge, that the wick possesses an outstanding relatively high degree of capillary attraction. Consequently, quick lighting of the wick, and an even burning of the flame with maximum heat is assured. In this form of the invention, the lower portion of the wick may also be provided with an annular series of spaced openings, if desired, as illustrated in Figures 1 and 2.

While it is believed that from the foregoing description the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown or described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What I claim is:

1. A wick for a liquid fuel burner, comprising a double ply upper portion composed of horizontal warp strands interwoven with vertical runs of a continuous weft strand, said vertical runs being arranged in spaced pairs and extended beneath the lower edge of said thick upper portion of the wick, and interwoven with warp strands to provide the wick with a single ply lower portion characterized by an annular series of openings immediately adjacent its lower edge.

2. A wick for a liquid fuel burner, comprising a double ply upper portion composed of horizontal warp strands interwoven with vertical runs of a continuous weft strand, said vertical runs of the weft strand being arranged in spaced pairs and extended beneath the lower edge of said upper portion in contacting engagement with each other and interwoven with spaced warp strands to provide the wick with a single ply lower portion having an annular series of spaced openings, and a continuous fuel conducting lower edge.

3. A wick for a liquid fuel burner, comprising a double ply upper portion embodying the flame edge, and composed of horizontal warp strands interwoven with spaced pairs of vertical runs of a continuous weft strand, the runs of each pair extending beneath the immediate lower edge of said upper portion in contacting engagement throughout the remaining portions of their length, and interwoven with warp strands to provide the wick with a single ply lower portion constituting the major depth of the wick, said wick having a continuous fuel conducting lower edge.

4. A wick for a liquid fuel burner, comprising a double ply upper portion composed of horizontal warp strands interwoven with vertical runs of a continuous weft strand, said vertical runs of the weft strand being arranged in spaced pairs and extended beneath the lower edge of said upper portion in contacting engagement with each other and interwoven with spaced warp strands to provide the wick with a single ply lower portion, and a continuous fuel conducting lower edge.

NORMAN E. HEIL.