Aug. 8, 1939. A. P. BUNT ET AL 2,168,698

DEVICE FOR FLAME SIGNALS

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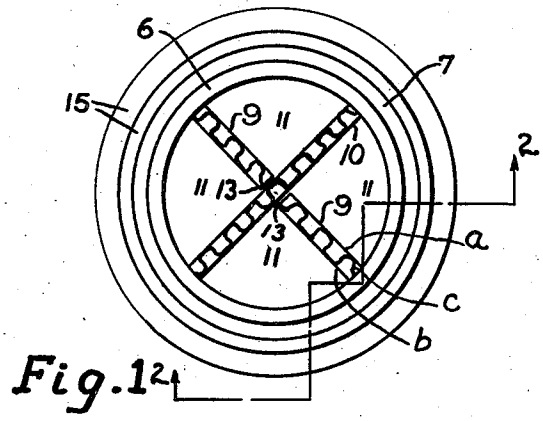


Fig. 1

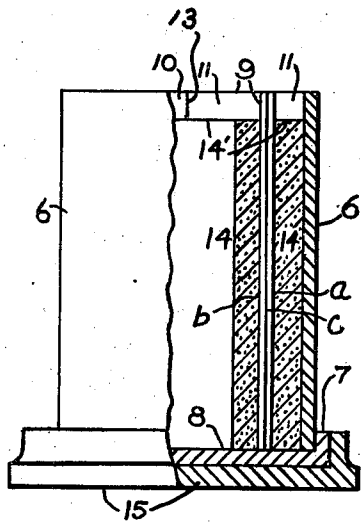


Fig. 2

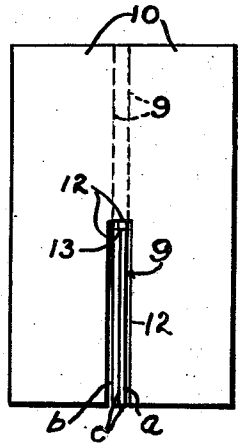


Fig. 3

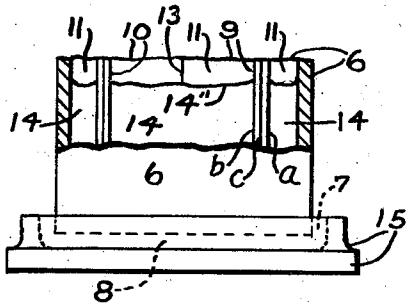


Fig. 4

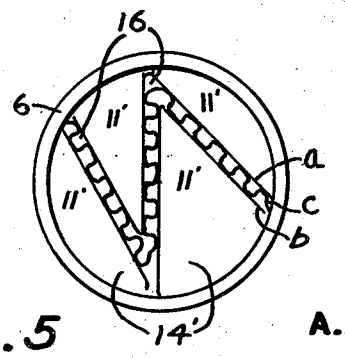


Fig. 5

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DEVICE FOR FLAME SIGNALS

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Application June 29, 1937, Serial No. 150,957

1 Claim. (Cl. 67—21)

This invention relates to devices for flames or flare signals, and particularly to a destructible container filled with paraffine and provided with a plurality of combustible partitions, arranged in varied directions across and through the paraffine, to provide wind resisting signals for use on the highways.

In the operation of automobiles, accidents frequently occur to the mechanical parts thereof which require the stopping of the vehicles upon the travelled or paved portion of the highways. This is especially dangerous, in the night time, as on such occasions the vehicle is often without lights, and other vehicles frequently crash into such stalled cars, thereby causing damages to both cars and sometimes fatal injuries to persons.

Various attempts have been made to provide some form of light signal, suitable for use to warn approaching traffic, of such stalled cars, but they have not met the requirements. Lanterns have been found too bulky, and weak in power. Ordinary candles are easily extinguished by a light breeze; and it is necessary to provide a strong light, which will withstand wind.

It is therefore an object of this invention to provide a signal for safety, which may be easily and inexpensively made, and which may be carried in any car in sufficient quantities for signals, and which may be easily ignited, and will be self sustaining on a roadway, and which will provide a strong and luminous flame, and withstand a high wind.

It is a further object to provide such a device, with a container of fusible, or combustible walls, to be filled with a hydrocarbon, with a plurality of flat bodied combustible partitions expanded in various directions through and across such hydrocarbon, whereby numerous chambers for flames will be provided, and windbreaks and gas pockets be provided, for maintaining the flames and the total heat from the burning of the hydrocarbon be divided and separated between the partitions.

A still further object is to impregnate such hydrocarbon with oxidizing agents for increasing the vigor of the flames to withstand a high degree of wind, and also to mingle with such agents, suitable chemicals for imparting various colors to the flames, whereby such flames may be seen at a great distance in the night time.

With these and other objects that will hereinafter appear, we have illustratively exemplified our invention by the accompanying drawing, of which:

Figure 1 shows a top plan of the preferred form of the device,

Figure 2 shows a front elevation thereof, taken on lines 2—2, of Figure 1, with parts broken away,

Figure 3 shows a front view of one of the wick sheets, and edge view, of parts of another,

Figure 4 illustrates the appearance of the device after it has been partially burned down, with parts broken away,

Figure 5 is a top plan of the container with the wick sheets positioned in a secondary or zig-zag form.

Like numerals on the different figures represent like parts.

Numeral 6 indicates a container, preferably in tubular form and preferably of material to be destroyed by heat. Such material may be of tinfoil or other easily fused substance, which will melt down slightly behind a lowering surface of the supply of hydrocarbon. Said material however is preferably formed of combustible or cellular material such as porous cardboard, which will be consumed, following the burning of the fuel. The top of the container is preferably open, but the bottom is closed by a cap 8, or any suitable material, and which may be turned up for attachment around the lower edge of the container as at 7.

Located within and throughout the length of the container are a plurality of combustible partitions, 9 and 10, which are positioned in several directions, preferably crossed at right angles with each other, as shown in Figure 1. These provide a series of compartments as 11 between the partitions. The partition material is preferably formed of strips of porous cardboard, or strawboard in thin layers as *a* and *b*, with a thinner tongue *c*, in corrugated formation between the outside layers. This leaves a plurality of small tubes through the partition, and the partitions may be the same construction as the packing between bottles used by druggists, and commonly known as "honey comb" packing. When two partition sheets as 9 and 10 are used, they are preferably each provided with notches or slits 12 and 13 extending from one end thereof centrally to midway the length, and the two sheets then conjoined by extending the severed portions over the unsevered portion of the other respective sheet as indicated in Figure 3. Such conjoined partitions are then inserted within the container, and a hydrocarbon, preferably a low grade of paraffine indicated as 14 is poured in heated liquid state over the partitions until the

compartments are filled to near the tops thereof as to line 14' and then allowed to cool and harden. The devices are then ready for immediate use, or may be packed for transportation.

In use the operator simply ignites the tops of the partitions, as by a match, and the blazes therefrom are fed by the paraffine, and spread to the walls of the container if combustible. A strong set of flames is so maintained for a considerable period until the paraffine is exhausted. The heated paraffine forms a gas and a blaze in the tops of the compartments, and the several partitions provide windbreaks for the partitions and chambers behind, or in lee thereof. In this combination of partitions gases form and eddy and burble between the same and feed and hold the flames against a hard side wind. However, in event the operator desires to extinguish the flames he may do so, by covering the same with any cover. Such extinguished device may be readily later reignited, as the partitions retain a quantity of the paraffine, which extends to the tops and congeals therein.

In burning, the paraffine becomes liquid at the top thereof, and as the top surface of the paraffine is lowered by the flames, the combustible partitions also burn downward, remaining approximately a quarter of an inch above the paraffine; with a body of soot or carbon along the top of the partitions, and a line of red coal beneath the carbon. This coal aids in retaining the flames and in rekindling the same in event of momentary extinction of the top flame. Said gases are formed within the open area above the paraffine and below the tops of the partitions. Where the walls of the container are of card, or straw-board, they also burn down along with the partitions, and if of fusible material, they waste away as the partitions descend, at approximately the same level above the paraffine, thus providing the shallow pockets or basins for the formation of the gas and flames. The windward wicks also serve as windbreaks for the leeward partitions against a sidelong wind. Said walls by burning or wasting down at the same level above the partitions permit the full length of the flames from the burning paraffine and partitions, to be displayed for a signal above the partitions.

While the ordinary amount of oxygen, forming approximately one fifth of the atmosphere, is sufficient with the combustion of the paraffine, to maintain the flames in many winds, it has been found that in a very high wind that the larger supply of nitrogen, forming approximately the other four fifths of the atmosphere, will overcome the flames by the excessive pressure thereof in the high velocity.

To overcome this danger, it has been found advisable to suitably impregnate the partitions and paraffine, with a suitable oxidizing agent, for providing a greater amount of oxygen while burning, whereby the flames will be reinforced and enabled to continue against the greater wind velocity. The quantity of such agents and the material therefor may be varied in accordance with the amount of oxygen required, and other material may be added thereto to provide the colors desired.

Suitable oxidizing agents are found to be, bichromates, nitrates, perchlorates and chlorates. Each of these contains a large proportion of oxygen, which becomes available for flames when the partitions and agents are burned, and will thereby reinforce the strength of the flames and enable them to resist the pressure of the nitrogen in powerful wind currents. The rapidity with which such agents burn and the respective amounts of oxygen released by each, is in the order just named. The first one being fastest and the last one the slowest.

Suitable chemicals or bases to be added for colors, may be varied as desired. Strontium, producing a red flare, barium producing a green flare, and sodium producing a yellow flare, etc.

In the application of the oxidizing agents and coloring matter, it is advisable to provide a saturated liquid solution thereof and immerse the partition material briefly therein, and thereafter dry such partition materials, before assembling the same, as above described and before applying the paraffine.

Such agents and coloring material may also be applied or otherwise added to the paraffine in paste form to the surfaces of the partitions.

Where the walls of the container are combustible, it is sometimes advisable to provide a coating of any suitable blaze retarding substance, on the outer sides of such containers, to prevent the flames from extending down over such outer sides, faster than the lowering top edges, of such walls, are being entirely consumed.

In Figure 4, is illustrated the appearance of the device when the walls and partitions and paraffine have been respectively lowered during a period of combustion; the upper surface of the paraffine being indicated at 14''.

In Figure 5 is shown a variation in the arrangement of the partitions, there indicated as 16 made of the same materials as the partitions first described, but assembled in zigzag line. This method of assembly is somewhat easier, and is ordinarily effective in light winds, particularly if the devices are positioned so that the flat faces of the sheets are across the path of the wind currents.

A base block is illustrated at 15, which may be used when placing the device on a roadway in a high wind, to assure its upright position; but ordinarily the flat cap 8 is a sufficient support.

The devices, especially when provided with matter for producing colored flames, may be used for spectacular displays, as well as for the utility in providing signals for warnings and for other purposes. While we have definitely described certain constructions and materials for the device, we may vary the same and desire to protect any variations that may be made within the scope of the claim allowed herein.

Having described our invention, we claim:

A device for flame signals consisting in an outer casing of an easily fusible material, a central wick member formed of two portions crossed at right angles to each other and contacting opposing portions of the outer casing and a solidified combustible filling material within the casing and surrounding and supporting the wick member, whereby the combustible filling material is divided into a plurality of burning areas protected from being extinguished by said wick member.

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