This invention relates to signalling lamps and has for its principal object to provide such devices in which the fuel is liquid hydrocarbon and in which the flame is caused to flicker, that is to say is alternately reduced and intensified.

It has for a further object so to form such flickering-flame hydrocarbon fuel signalling lamps that the periodicity of their flicker can be adjusted.

As a further object, means are provided to enable the maximum intensity to be adjusted.

In accordance with the invention, a petroleum burner, or burner for other hydrocarbon liquid fuel employing a wick operating by capillary attraction, is formed of rectangular, circular or other section and is surrounded by an incombustible sheath shich extends beyond the upper end of the burner and the interior surface of which sheath is spaced from the exterior surface of the burner to leave an empty space around the burner and on the interior of the sheath. Means are provided to admit air to the lower portion of the sheath, the amount of air being regulatable so that this air passes up in the space between the exterior of the burner and the interior of the sheath.

In operation the wick at the time of lighting is brought to the height of the upper part of the sheath so that the flame is similar to that of an ordinary petroleum lamp. The portion of the wick above the burner, yet coming within the sheath, not being free does not become ignited. Consequently, the heat of the flame passes to the sheath and to the burner to vaporise the fuel from this lower part of the wick and the air passing upwards in the free space carries this vaporised

fuel with it. Thus the petroleum or other carburant rising in the wick under the effect of capillary attraction is transformed into combustible gas all around the non-ignited lower part of the wick and that under the influence of the heat given off.

These gases coming into contact with the flame become ignited to intensify momentarily the flame. This ignition, however, being in the nature of an explosion, produces a displacement of air which drives back towards the lower part of the interior of the sheath the gas currents which follow those which have been ignited. Their driving back being very rapid, the gases which are formed again begin their upward movement in order to become ignited and produce another intensification of the flame.

In this manner there is produced a flame having a reduced lighting followed by an intense lighting to give the necessary flicker. The maximum intensity of the flame can be regulated according to the height of the wick and the periodicity of the flicker by the regulation of the entry of air into the sheath. This latter can be effected in various ways.

In order that the invention may be better understood it will now be described with reference to the accompanying drawing, in which :-

Fig. 1 shows in front elevation and partly in section a lamp and burner constructed according to one method of carrying the invention into effect.

Fig. 2 shows a fragmentary view in side sectional elevation.

Fig. 3 is a plan view of a part of Fig. 1.

Figs. 4 and 5 show in elevation and plan a device for

regulating the entry of air, and

Figs. 6 and 7 a front elevation and side elevation of a lantern having a lamp with flickering flame formed in sheet metal made according to the invention.

The burner of the lantern 1 is formed in any usual manner by a wick-holder 2 of rectangular form through which passes the wick 3 which extends in the usual manner into the carburant contained in the reservoir 4. The wick-holder is soldered to a ring 5 in turn fixed by screwing or soldering to the reservoir 4 by means of a ring 7. 9 is the usual wick-ajusting control similar to an ordinary petroleum lamp.

6 is a sheath of incombustible material of general rectangular section and of such size as to leave a space between its inner surface and the burner 2 when placed therearound. As shown, it extends well above the top of the burner 2 and at its lower end is fixed to or made integral with a cylindrical portion 8 which takes over the fixing ring 7 and has a slot 8' for the passage of the control rod 9.

10 are orifices which come opposite and at the lower portion of the sheath 6. The size of the openings 10 can be regulated by the device shown in Fig. 4. This device comprises a stirrup 14 with notches 12, the free ends of the limbs being connected by a headed screw 13 with a clamping milled nut 14, a spring 15 coming between the limbs to ensure an automatic opening of the limbs when the nut is unscrewed. This device is placed over the sheath 6 and is disposed at the lower portion thereof. It can be slidden into any suitable adjusted position, where it is clamped by the nut 14 so that the notches 12

more or less close the openings 10. The object is to regulate the amount of air entering these openings 10 to pass upwards between the wick-holder 2 and the interior of the sheath 6.

The operation will be readily understood. The wick is brought to the level of the upper end of the sheath 6 and ignited. This heats the sheath and the burner so that air entering through the orifices 10 mixes with the vaporised carburant given off by the exposed surface of the wick coming within the sheath 6. On passing upwards this mixture comes into contact with the flame at the upper end of the wick and becomes ignited. The slight explosion forces the gas following upwards in the sheath 6 downwards into the interior so that the amount of the carburetted mixture passing upwards in the sheath which is ignited is limited. Immediately thereafter the carburetted gas again rises and is ignited and so on. There is thus produced a continuous series of rapid ignitions of a certain quantity of carburetted gas which gives the flame the desired flickering or intermittent quality.

It will be understood that the form and dimensions of the burner can be varied, the sheath being shaped accordingly to give the free space necessary for the flickering effect.

Flickering systems according to the invention can readily be installed in practically every position whilst flickering systems as at present known either necessitate the use of batteries with short life and high price or heavy and bulky accumulators requiring recharging and having all the disadvantages of supervision, maintenance and the like, or requiring connection to an electric supply.

All these disadvantages are avoided by lamps according th the invention which can be located in positions without any preliminary installation.

Moreover, their maintenance consists simply in filling the lamp, trimming the wick from time to time and replacing it when consumed.

Flickering flame burners as herein described provided with a reservoir such as 4 can be located in any suitable lantern and as shown in the drawing (Figs. 6 and 7) this may take the form of a truncated square pyramid formed from bent sheet metal.

This lantern is fixed by means of a circular socket formed with an orifice and situated at the central part of the base. Into this orifice will pass a wood screw adapted then to screw into a thick plank for example. The door 15 of the lantern can be padlocked so as to prevent the theft of the lamp. If necessary, the lantern can be suspended by the handle 16. Under the cap there is a perforated sheet or a wire gauze for the purpose of preventing extinction by a strong wind. The lantern carries on its sides red light intensifiers or lenses 17 on which conventional signs can be painted or indicated for the purpose of indicating cross roads, dangerous traffic spots, and the like.

The consumption of the lamp when utilising petroleum as carburant is very low and duration of operation very long (minimum average : 50 hours for a wick of 25 m/m width with a litre of petroleum).

The invention can be applied to different types of lamps, lamps for yards, public works, various undertakings.

railways and more especially for designating level crossings, cross roads, and everywhere where there exists inconvenience or danger for traffic.

The invention only being represented by way of example, it is clear that all forms of lamp burners working with liquid hydrocarbons and provided with the heating sheath permitting a flickering flame to be obtained, fall within the scope of the present invention.

Having regard to the foregoing disclosure, the patent of which this specification forms part confers, subject to the conditions prescribed in the Patent Act. 1935, the exclusive right, privilege and liberty of making, constructing, using and vending to others to be used, the invention as defined in claims submitted by the patentees as follows : -

1. A flickering flame signal lamp adapted to employ liquid hydrocarbon fuel, comprising a reservoir for fuel, a wick-tube adapted to carry a wick, means for regulating the length of wick projecting above the said wick-tube, an incombustible sheath located around and extending above said wick-tube and adapted to become heated by the flame produced at the end of the said projecting wick in order to vaporize fuel from that portion of the wick which extends above the wick-tube but is within the said sheath, and means at the lower end of said sheath to permit the entry of air into the free space between the sheath and the wick-tube for the purpose of forcing such fuel vapour into contact with the flame in order to momentarily intensify said flame and so produce periodic flickering of the latter.

2. A flickering flame signal lamp as claimed in claim 1 wherein the incombustible sheath located around and extending above the wick-tube is provided with apertures for the entry of air towards its lower end and including sliding shutter means for regulating the size of such air inlets so that the periodicity of the flickering of the flame of the lamp can be adjusted.

3. A flickering flame signal lamp as claimed in claim 1 in which the wick tube and the incombustible sheath located around and extending above said wick tube are of flattened rectangular section, air inlet apertures are provided towards the lower end of said incombustible sheath and there is included, as air regulating means, a stirrup member adapted to be adjustably clamped on said sheath, said stirrup having cut away portions for adjustable positioning with respect to the air inlet apertures.

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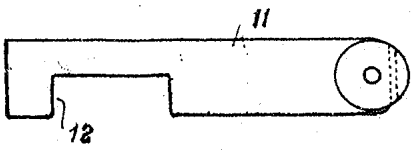
Fig. 4



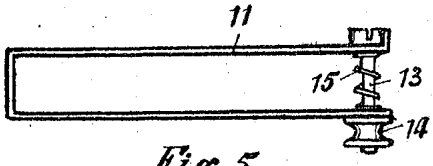


Fig. 5

Fig. 1.

Fig. 2.

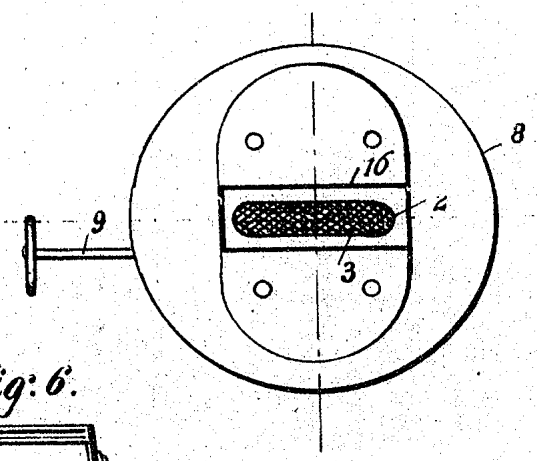


Fig. 3.

Fig. 6.

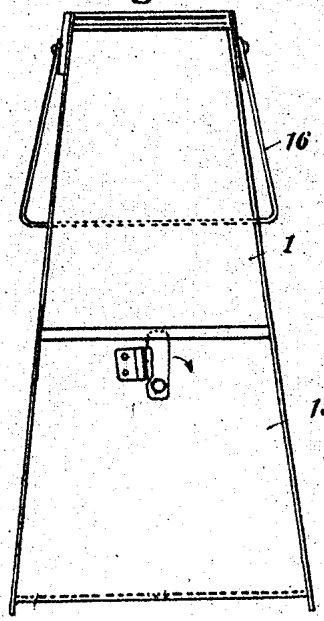
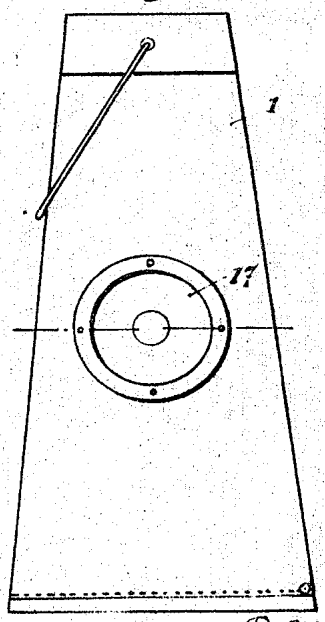


Fig. 7.



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CERTIFIED TO BE THE DRAWINGS REFERRED TO IN THE SPECIFICATIONS HERETO ANNEXED.

TORONTO

Sept. 7th 1937