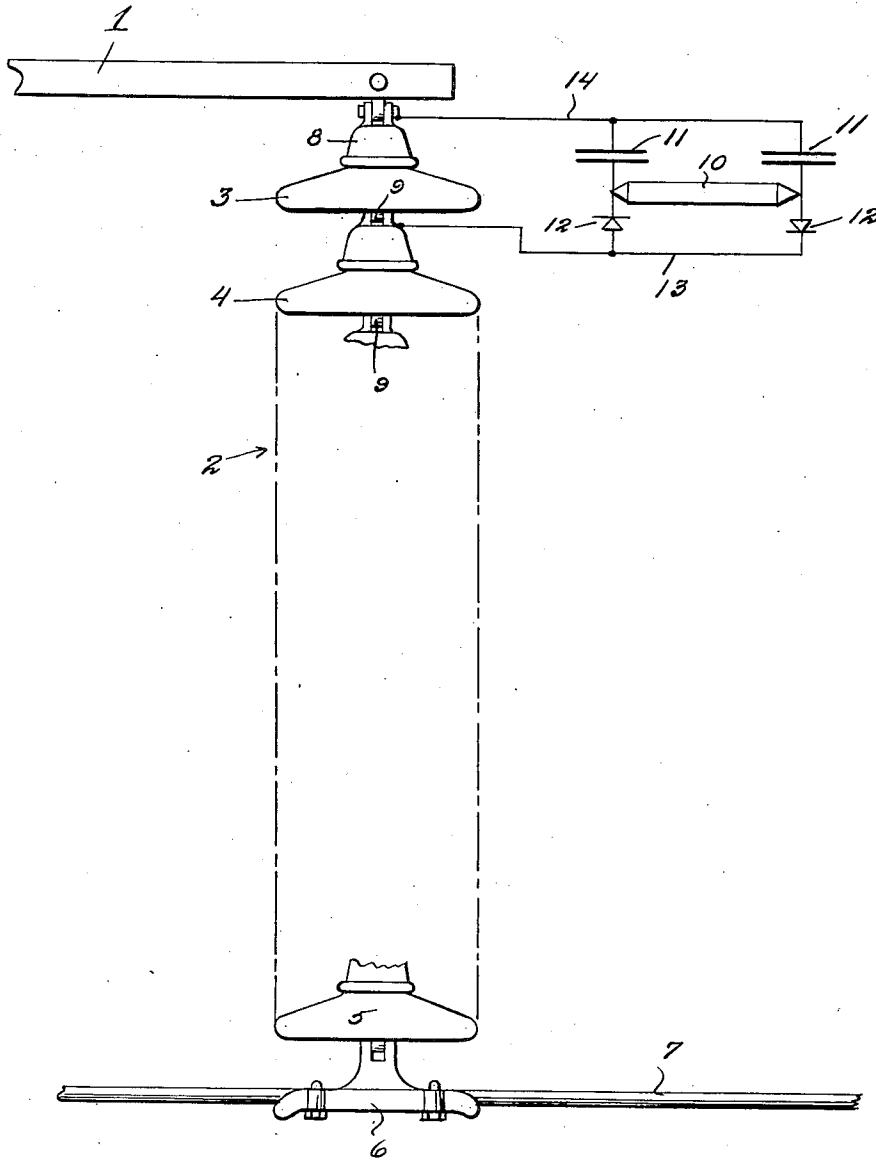


April 16, 1935.

E. C. VROOMAN  
FLASHING AVIATION BEACON  
Filed Oct. 17, 1930

1,998,107



Inventor  
Edward C. Vrooman

By *Edward C. Vrooman*  
Attorney

## UNITED STATES PATENT OFFICE

1,998,107

## FLASHING AVIATION BEACON

Edward C. Vrooman, Schenectady, N. Y., assignor  
to Locke Insulator Corporation, Baltimore, Md.,  
a corporation of Maryland

Application October 17, 1930, Serial No. 489,411

4 Claims. (Cl. 177—329)

The invention relates to beacons for the guidance of aviators and has special reference to a beacon which will apprise the pilot of an airplane of his proximity to a high tension transmission line.

It is well known that the country is traversed by a network of high tension transmission lines which are naturally invisible at night, particularly if the weather be foggy. There is danger that an aviator losing his bearings and flying too low or attempting to make a forced landing may collide with either the tower or the conductor or conductors of a transmission line with serious results which may even be fatal.

It is with the above facts in view that I have devised the present invention which has for its general object the provision of an electric signal lamp which is energized by the current normally leaking over the insulators which support a high tension conductor, this signal light warning the aviator of his approach to the transmission line so that he may govern himself accordingly and avoid contact with it.

Another object of the invention is to provide a signal lamp or apparatus which in addition to warning a pilot as above described will, by making the transmission line visible, serve to guide him or enable him to obtain his bearings in case he is lost as it is readily conceivable that charts may be prepared indicating where transmission lines provided with the beacons are located.

In my co-pending application for patent for Aviation marker, filed October 7th, 1929, Serial No. 398,007, I have disclosed the use of a neon lamp connected across an insulator in a string or chain used for suspending a high tension transmission line. However, in said application the light is supposed to be continuous. It is an important object of the present invention, as compared with the pending one, to provide a system wherein the beacon light will flash on and off or operate intermittently by the discharge through a neon or other equivalent lamp of electrical energy stored up in condensers shunted across preferably one insulator unit in the supporting string or chain, the flashing of the beacon being thus brought about without the necessity for the employment of any mechanical circuit making and breaking means.

An additional object is to provide a signal apparatus of this character which will be simple and inexpensive to make and install, positive in action, efficient and durable in service, and a general improvement in the art.

To the attainment of the foregoing and other

objects and advantages, the invention preferably consists in the arrangement and combination of devices or instrumentalities to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

The figure is a diagrammatic view showing my invention applied to a string of insulators supporting a high tension line.

Referring more particularly to the drawing it will be observed that I have shown, more or less roughly, a metallic support 1 which may be or which may form a part of the usual supporting tower or the like. Suitably suspended from this support is a string or chain 2 of insulators, the uppermost two units of which are indicated by the numerals 3 and 4 and the lowermost unit by the numeral 5. Any ordinary or preferred clamp, shown conventionally at 6, is suspended from the lowermost unit 5 and supports the conductor 7. The units are here disclosed as of the cap and pin type, that is to say each unit is provided at its top with a metal cap 8 pivotally connected with a pin 9 on the unit next above so that the string or chain will be more or less flexible as is customary. Up to this point there is nothing novel disclosed.

In carrying out my invention it is of course necessary to provide certain specific apparatus which is, however, neither illustrated nor described as the mechanical details of the construction thereof are principally immaterial and as a diagrammatic showing should be entirely sufficient to an understanding of the principles involved.

To accomplish the desired object, I make use of a neon lamp 10 together with suitable condensers 11 and rectifiers 12, all connected across a unit of the string, preferably the uppermost one as illustrated. Each condenser is in series with one rectifier and the neon lamp is connected across the latter or in other words has its terminals connected between the condensers and rectifiers which are in series. The rectifiers are here shown as connected by a conductor 13 with the cap of the unit 4, or pin of the unit 3, while the condensers 11 are shown as connected by a conductor 14 with the cap of the uppermost unit 3 or with, what is the same thing, the structural support or tower. The two rectifiers are of course reversed with respect to each other so that upon flow of alternating current leaking over the insulators and passing through the conductors 13 and 14 as offering less resistance than the insulators, impulses of one sign will pass into and charge one condenser, the other condenser being

similarly charged by impulses of the opposite sign. When these condensers become charged to their capacity they will discharge and the current will of course flow through the neon lamp 10 in alternate directions, resulting in energization thereof so that a brilliant light will be given off at intervals and lasting for a short period of time. The frequency of the charge and discharge of the condensers and of course the duration of the light flash will depend principally upon the capacity of the condensers and of course upon the strength of the current leaking over the string as well as upon the exact nature of the neon lamp itself in so far as its characteristics are concerned.

The reason for using a neon lamp is that it requires but little current to operate and another is that it has been found that the light from a neon lamp seems to possess the faculty of permeating fog so that there will be visibility from a much greater distance than if a light of some other character were used.

From the foregoing description and a study of the drawing it will be apparent that I have thus provided an extremely simple system and apparatus whereby current leaking to the ground at the insulators supporting the transmission lines may be taken advantage of for the automatic operation or energization of a beacon which will be a great safeguard to aviators. It is thought that the construction, operation and advantages and the development or provision of actual devices for carrying out the invention will be readily apparent to one skilled in the art without further explanation.

While I have shown and described the use of a certain number of condensers and a single possible circuit for carrying out the invention, and have referred to a specific location, it should of course be understood that the disclosure is merely illustrative of the principles involved as the right is reserved to make all such changes in the details of construction as will widen the field of utility and increase the adaptability of the device provided such changes constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. Means for producing periodic energization

of a signal lamp of the luminous gas type by means of an alternating current, comprising a lamp of the luminous gas type having terminals, condensers connected with the respective terminals of the lamp and with one side of an alternating current supply, and rectifiers connected in series with the respective condensers and with the other side of the alternating current supply, the rectifiers being in reversed relation.

2. A flashing beacon comprising an electrically operated light producing means of the luminous gas type, and a pair of units each including a condenser and a rectifier connected in series, said units being connected across an alternating current source, said light producing means having its terminals connected with the respective units between the condenser and rectifier of each, said condensers becoming charged by storing up current impulses and discharging the accumulated impulses through the light producing means alternately in opposite directions in accordance with the sign of the impulses, the rectifiers being reversed with respect to each other for utilizing both halves of the alternating current wave.

3. A signal circuit comprising a lamp of the luminous gas type, oppositely arranged rectifiers connected on one side with the respective terminals of the lamp and on the other side with a common conductor connected with one side of a source of alternating current, and condensers connected between the respective lamp terminals and the other side of said alternating current source.

4. A flashing beacon comprising an electrically operated light producing means of the luminous gas type, and a plurality of units each including a condenser and a rectifier connected in series, the rectifier in one unit being reversed with respect to the rectifier of the other unit, said units being connected across an alternating current supply, and the respective terminals of said light producing means being connected with said units between the condensers and rectifiers thereof, said condensers becoming charged by storing up current impulses and discharging the accumulated impulses through the light producing means.

EDWARD C. VROOMAN.