

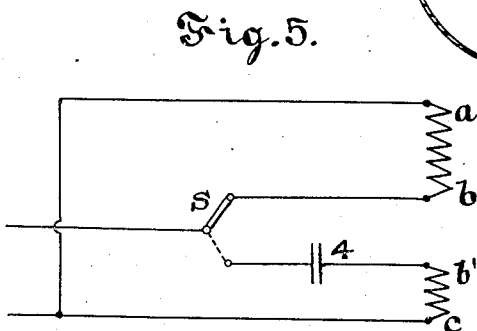
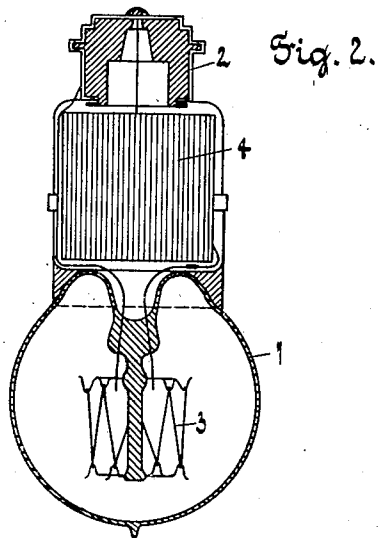
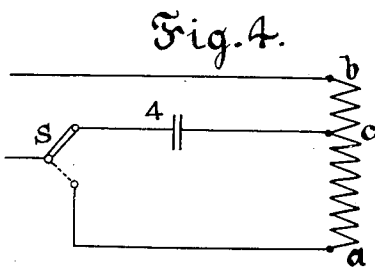
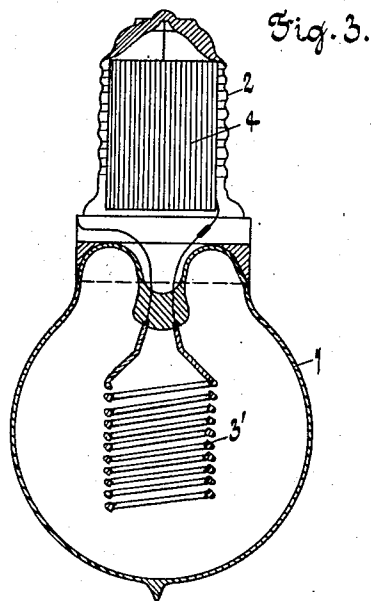
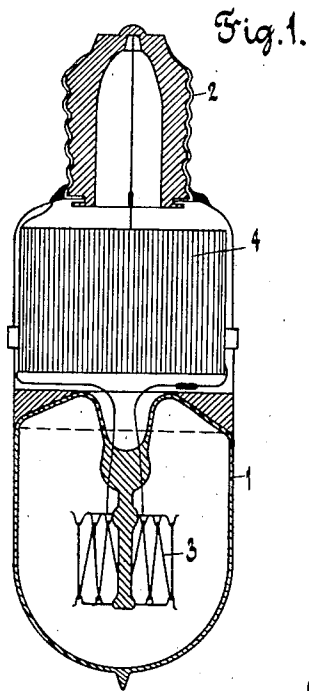
May 26, 1925.

G. HOLST

1,539,672

ELECTRIC LIGHT INSTALLATION FOR ALTERNATING CURRENT

Filed Sept. 29, 1920



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UNITED STATES PATENT OFFICE.

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ELECTRIC-LIGHT INSTALLATION FOR ALTERNATING CURRENT.

Application filed September 29, 1920. Serial No. 413,468.

To all whom it may concern:

Be it known that I, GILLES HOLST, a subject of the Queen of the Netherlands, residing at Eindhoven, in the Province of North-Brabant, in the Kingdom of the Netherlands, have invented certain new and useful Improvements in an Electric-Light Installation for Alternating Current, of which the following is a specification.

The invention relates to an electric light installation for alternating current and more particularly relates to the running of electric incandescent lamps, arc-lamps, glow-discharge lamps, gas- or vapor-lamps on alternating current circuits of a voltage higher than that of the lamps through the intermediary of condensers.

The object of the invention is to provide improvements in such arrangements.

We wish it to be understood that by the expression "electric lamps" used in the following description and in the claims are meant as well electric incandescent lamps as arc-lamps, glow-discharge lamps, gas-lamps, vapor-lamps and discharge tubes.

The simplest method for connecting electric lamps consists in connecting the lamp directly to the lighting mains. Notwithstanding, when using incandescent lamps, the use of lamps intended for voltages which are considerably lower than the usual voltage of lighting circuits is more advantageous. Incandescent lamps for low voltage generally have a higher efficiency, whilst in consequence of the greater thickness of the filament they are much stronger and can more easily be handled than lamps for high voltage. Thus, for example, it is nearly impossible to make a one candle-power lamp for 220 volts, whereas the manufacture of one candle-power lamps for 10 volts, with its thicker incandescent filament gives no special difficulties.

In order to make it possible nevertheless to use such lamps for low voltage, transformers have already been used, with which the voltage of the lighting circuit is transformed into the desired lower voltage.

Besides these incandescent lamps for lower voltage, there is a second group of lamps, which cannot be directly connected with the lighting mains. To this class belong arc-lamps, glow-discharge lamps, gas- or vapor-lamps, etc. in which a part of the circuit is

formed by a conductive gas or vapor. With these lamps it is necessary to limit the current, for which purpose generally resistance or choking coils are utilized.

According to the present invention it becomes possible to connect directly with the alternating current lighting mains as well as incandescent lamps for a low voltage as gas- or vapor-lamps.

The invention provides an electric light installation comprising in combination an electric lamp and a condenser adapted for limiting the amperage through a given lamp and forming a single member with the lamp.

The advantages of the installation are, among others, the following: The condenser causes practically no loss of energy. In using lamps for small currents the condensers when manufactured in compact form will have very small proportions, whilst otherwise a big resistance or induction-coil would be necessary. The condensers can be cheaply manufactured.

When applying the invention to glow-discharge lamps there is another advantage. With these lamps it is necessary to put in circuit a stabilizing device. Hitherto a stabilizing resistance was used causing an appreciable loss of energy. By substituting the current limiting resistance by a condenser no extra stabilizing device is necessary and the efficiency of the lamp is considerably improved.

When applying the invention to incandescent lamps it is possible to construct a lamp in which an incandescent filament is provided capable of being directly connected to the alternating current circuit, whereas a part of said filament or another incandescent filament in the same lamp may be connected to the circuit with intermediary of a condenser forming a single member with the lamp.

The accompanying drawings show the connections for a lighting installation according to this invention, as well as several embodiments of the invention.

Figures 1 and 2 are cross-sections of examples of incandescent lamps according to the invention.

Fig. 3 is a similar section of a glow discharge lamp.

Figs. 4 and 5 are diagrams which show the connections of incandescent lamps ca-

pable of giving different illuminating intensity.

Fig. 1 shows an incandescent lamp with Edison-fitting, the condenser being provided in the base of the lamp. Fig. 2 shows an incandescent lamp with Swan-fitting, the condenser being arranged in the same manner. Fig. 3 is a glow-discharge lamp with condenser according to the invention. In all three cases 1 is the lamp bulb, 2 the lamp-base, whilst 4 is the condenser forming a single member with the lamp. In Figs. 1 and 2 the filament is indicated at 3, whilst in Fig. 3 the number 3' relates to the electrodes.

It will be apparent to persons skilled in the art that other modifications of the invention are possible; the condenser may also be provided in the stem of an incandescent lamp or may be provided on the lamp in any suitable way.

In Fig. 4 the filament *bc* forms a part of the filament *ab*. The condenser 4 forming a single member with the lamp is connected in series with the filament *bc*, so that the filament with condenser may be directly connected to the same alternating current circuit as the filament *ab* without giving rise to an undue temperature rise of the filament *bc*. By means of a switch either the filament *ab* or the part *bc* with the condenser may be connected to the circuit, different illumination being obtained in these cases.

It will be apparent that in this manner the use of a very thin filament for the part *bc* intended for a small candle power is avoided.

Fig. 5 illustrates another embodiment of the same inventive idea. According to this construction there are two separate filaments provided in the lamp, the filament *ab* for normal candle power, the filament *b'e* for small candle power. By a switch *S* filament *ab* may be directly connected to the circuit or by the same switch *S* one may

connect the filament *b'e* with the condenser directly to the circuit.

With my invention, therefore, it is possible to have a high voltage system and a series of metallic loops, each with a lamp of low voltage in series with the loop, inasmuch as the individual condenser restricts the flow of current in the loop to the maximum amount which a lamp can safely carry. Therefore, each lamp may be turned on or off without seriously affecting any other lamp in the system. Such would not be the case, where, for example, a large condenser were made common to a number of lamps, such an arrangement with a common condenser would be in the nature of a constant current arrangement. And turning off a number of the lamps indiscriminately would cause the remaining lamps to burn out. With the arrangement herein disclosed any number of lamps may be turned on or off with impunity.

I claim as my invention:

1. An electric lamp having a filament and base with terminals thereon, a condenser in the base, the lamp filament and the condenser being electrically connected to the same terminals in the base whereby the flow of current from the source of power is limited by the capacity of the condenser, said lamp and condenser forming a unit structure.

2. An electric lamp having a filament and base with terminals thereon, a condenser in the base, the lamp filament and the condenser being electrically connected in series to the same terminals in the base whereby the flow of current from the source of power is limited by the capacity of the condenser, said lamp and condenser forming a unit structure.

In testimony whereof I have hereunto set my hand and seal.

GILLES HOLST. [L. S.]