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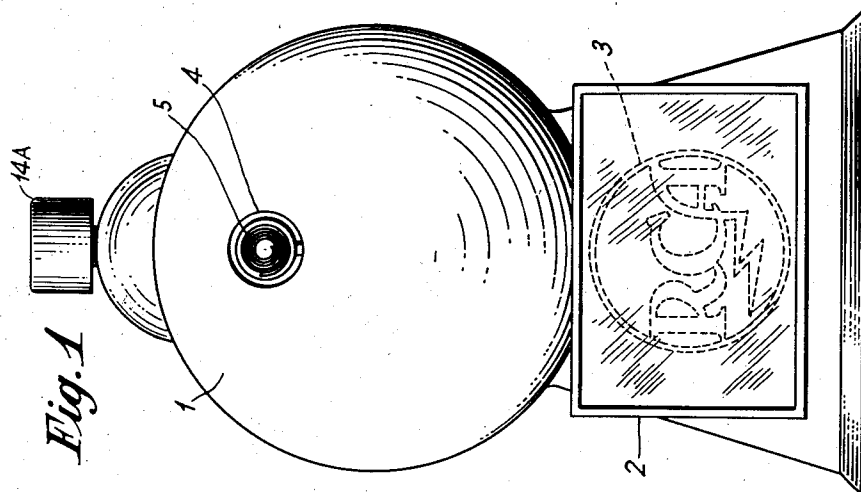
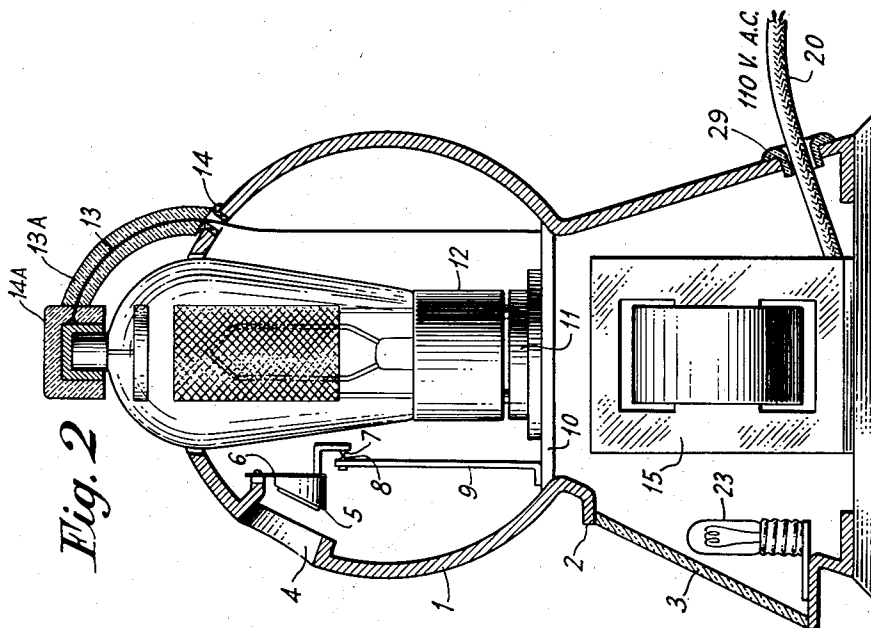
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2,182,336

AUTOMATIC LIGHTER AND DISPLAY DEVICE

Filed Oct. 24, 1936

2 Sheets-Sheet 1



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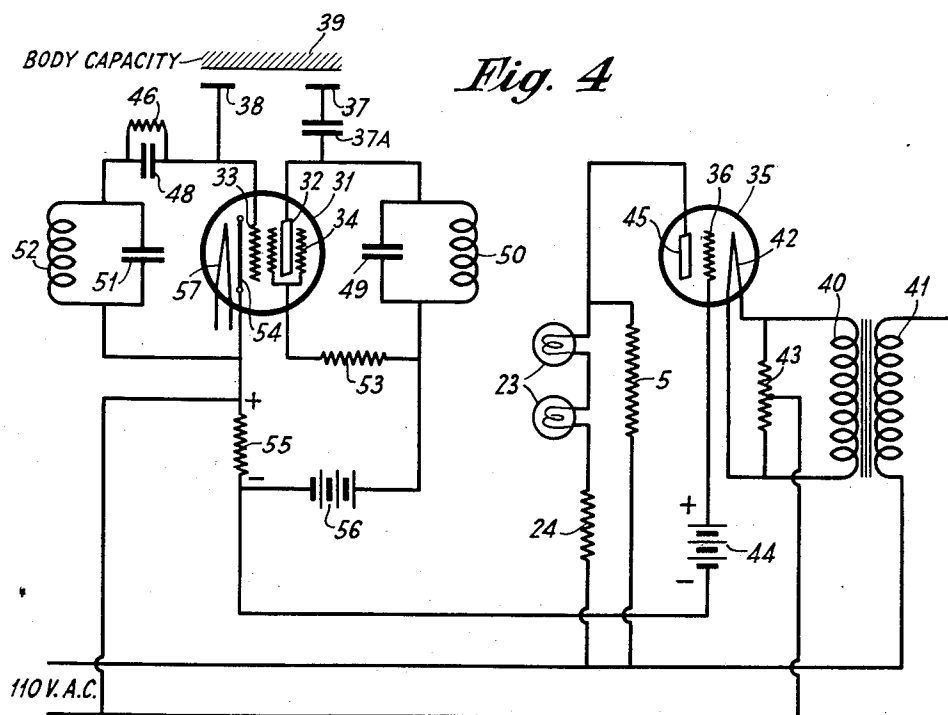
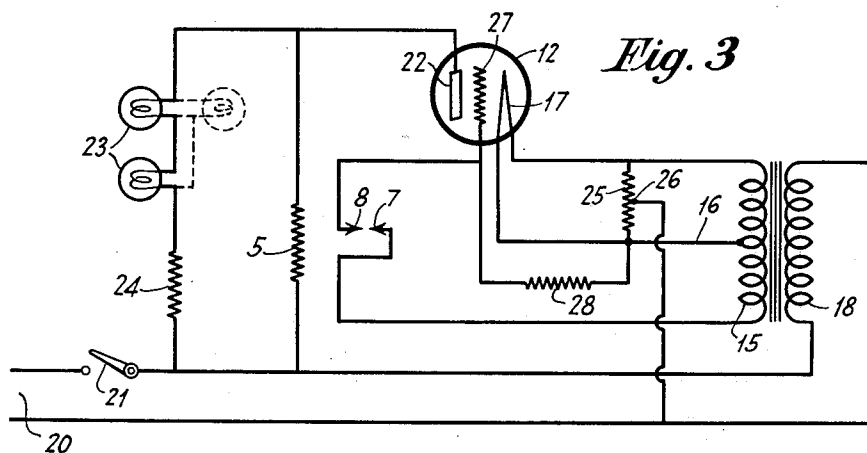
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AUTOMATIC LIGHTER AND DISPLAY DEVICE

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2 Sheets-Sheet 2



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2,182,336

AUTOMATIC LIGHTER AND DISPLAY
DEVICEHallan Eugene Goldstine, Rocky Point, N. Y., as-
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poration of Delaware

Application October 24, 1936, Serial No. 107,374

4 Claims. (Cl. 219—32)

This invention relates to a new and novel au-
tomatic lighter and display device.

The invention is particularly directed to the
art of using electric discharge tubes as a relay
device and deals especially with applying this
principle to a novel lighter.

An object of this invention is to simplify and
improve automatic lighters such as those em-
ployed for lighting cigars and cigarettes.

Another object of this invention is to provide
a relatively novel automatic lighter which is
capable of instantaneous lighting although only
a relatively small current is broken by the con-
tacting elements.

Another object of this invention is to provide
an automatic lighter which is capable of con-
tinuous intermittent use and requires a mini-
mum amount of servicing.

Still another object of this invention is to pro-
vide a simple improved lighter having no con-
tact elements which are broken, the heater cir-
cuit being controlled by body capacity.

A feature of this invention is the improved
arrangement whereby a very slight pressure of
the object to be ignited such as a cigar or ciga-
rette, against the heating element causes it to
instantly heat.

Another feature of this invention is the ar-
rangement whereby at the same time the heating
element is caused to heat there is also flashed a
display or advertising sign.

Still another feature of this invention is that
the device as arranged fulfills both the purposes
of a lighter and an advertising device and is
arranged to attract the customer's attention and
arouse his curiosity as to the control member,
itself. The electrical circuit of the device is ar-
ranged so that when the heating arrangement
heats the sign will be illuminated, the tube giv-
ing off its characteristic glow which is a note-
worthy advertising feature.

Although automatic lighters are old in the
art, such devices generally required the break-
ing of the total heater current when the object
to be lit was heated. As the heated current
which was broken was relatively large, a sub-
stantially heavy contact pressure was necessary.
Also, such devices required frequent servicing
due to the burning out of the contacts.

It is the purpose of this invention to permit
the use of very light sensitive contact pressure
to control automatically the lighter. In fact,
the only pressure required is the slight touching
of the heater element with the cigar or ciga-
rette or other object to be lit.

The contacts are arranged in the circuit so
that a display sign flashes on and off when the
heating element is on.

This invention will be more completely under-
stood by referring to the accompanying draw-
ings, in which:

Fig. 1 is a front view of the automatic lighter
and display device;

Fig. 2 is a cross-sectional view of Fig. 1;

Fig. 3 is a circuit diagram of the automatic
lighter;

Fig. 4 is a circuit diagram of another modifi-
cation wherein the heating circuit is controlled
by body capacity.

Referring now in detail to Figs. 1 and 2 of the
drawings, a metal casing 1 of any suitable con-
figuration is provided to enclose the necessary
apparatus or control elements. Directly in front
of the casing 1 is arranged a space 2 for a suit-
able display device which may be in the form of
a transparent or translucent glass having lo-
cated therein the desired display device or ad-
vertising legend 3. In the central upper por-
tion of casing 1 there is located a small aperture
4. Supported within the aperture 4 is a heating
element 5 which is pivotally located at a depend-
ing portion 6. On the lower portion of heating
element 5 a light contact element 7 is arranged;
a second contact 8 is located in front of contact
7 and is supported on a relatively long light
spring member 9 which is secured to a support-
ing member 10, preferably of insulating mate-
rial. Also located on member 10 is a socket 11
for an electron discharge device 12 which may be
of the type known as a "Thyratron." This ther-
mionic device acts as a relay tube for controlling
the heating current supplying the heating ele-
ment 5. Lead 13 passes through a small aper-
ture 14 in the rear of casing 1 and is electrically
connected in series with contacts 7 and 8 and
the secondary of a transformer 15. Lead 13 is
insulated by an insulated tube 13A and the plate
terminal is insulated by a cap 14A. The circuit
arrangement of transformer 15 is shown in Fig.
3, the secondary being provided with a suitable
tap 16 which also supplies the cathode 17 of the
"Thyratron" device 12 and also the bias for tube
12. A primary 18 is connected to any suitable
supply source 20 which is preferably that of an
alternating current source. A switch 21 is pro-
vided to disconnect the lighter from the circuit
when desired. The plate 22 of the electric dis-
charge device 12 is connected in series with a pair
of small electric lamps 23. The lights 23 can
be connected in parallel as well as in series with

the supply, as shown by dotted lines. However, a parallel arrangement of the lamps from the plate of tube 12 to the incoming power line might be found to be a better arrangement, because if one light should fail, the device would still operate. A resistance 24 is connected from one side of the alternating current supply source to maintain the voltage for lamps 23 at a desired value. There is also provided in the circuit a cathode resistance 25 having a mid-tap 26. In order that the bias of grid 27 may be properly controlled, a suitable biasing resistance 28 is connected in series with the grid 27 and secondary transformer tap 16. The secondary of the transformer may be that of the center tap type used as an auto transformer by tapping the primary; also, the supply source obtained on the anode of the tube may be either 110 or 220 volts. It will be noted that with the circuit arrangement shown, no direct current bias is required, thus making the device self-contained except for the flexible connecting cord passing through bushing 29, which is adapted to connect with the external supply source 20.

The operation of this improved automatic lighter and supply device is as follows:

The heating element 5 which is supported by three spring strips which maintain it in a vertical position and also furnish an electric connection by way of contacts 7 and 8. When a cigar or cigarette is pressed across the heating element 5, the contacts 7 and 8 are broken and a positive bias is then placed on the electron discharge device 12. This positive bias trips the grid and rectified plate current, then flows through the heater element 5 and also through the lamps 23 in the display device 2, the contacts breaking a very relatively small current in the order of five microamperes. The tube is generally non-conductive, that is, when the contacts are closed by keeping a negative bias on the grid at all times. This negative bias is obtained by the drop through the resistance 28, the current of which is supplied through the transformer secondary 15.

In the modification shown by the circuit diagram in Fig. 4, the display device is generally similar in all its features with the exception of the omission of contacts 7 and 8 and in place thereof are two capacitive electrodes 37 and 38. The heating current supplying the heater 5 is controlled by body capacity when a person approaches to light his cigar or cigarette, the extra capacity causing the tube to trip, thus heating the element and illuminating the advertising device. An electron discharge device 31 provides a high frequency amplifier of a tuned plate and grid circuit, the plate 32 and grid 33 being shielded from each other. A screen grid 34 prevents feedback through the tube. The "Thyratron" tube 35 has a grid 36 which is held at a negative potential when tube 31 is not oscillating. In the grid and plate circuit of tube 31 there is connected the capacitive elements or electrodes 37 and 38 which are suitably arranged on casing 1 so that when the body capacity 39 of a person who approaches the lighter intercepts electrodes 37 and 38, feedback occurs between plate 32 and grid 33, thus causing tube 31 to oscillate. This lowers the plate current of tube 31 which in turn lowers the negative bias on the "Thyratron" tube 35 enough so that the positive bias applied to the secondary 40 of the transformer will cause the tube to conduct. When the extra capacity is removed tube 31 will cease oscillating and tube 35

will then be non-conducting. A small blocking condenser 37A is employed to insulate the plate voltage from the exposed plate. It may be desirable also to work the plate at ground potential for the supply voltage and work the cathode at a negative voltage, so that the plate 27 has only a very low voltage radio frequency impressed on it.

There is also the possibility of using an audio frequency capacity bridge circuit; the unbalance due to body capacity causes a change in the audio voltage, this is amplified, rectified and caused to control the relay tube. Other elements of this circuit are transformer primary 41, cathode 42, cathode resistance 43, a grid bias battery 44, plate 45, heating element 5, and lamps 23 which are connected in series by the plate 45 and the series resistance 24. The oscillator tube contains grid leak 46 and grid condenser 48, plate 32 having connected in the tuned circuit condenser 49 an inductance 50. The circuit of grid 32 has also a tuned circuit comprising condenser 51 and inductance 52. Screen grid 34 is provided with a resistance 53, the cathode 54 of tube 31 being maintained at a desired positive potential by resistance 55 and a battery supply source 56. The filament 57 of heater 31 is heated by any suitable means, such as a tap on the transformer secondary.

By a slight change in the circuit, batteries 44 and 56 may be eliminated and the bias potential obtained from the alternating current supply source.

Another circuit arrangement may accomplish the same effect by having the body capacity of the person approaching the lighter vary the neutralizing capacity of an amplifier, thus causing the tube to go in and out of oscillation.

Still another method of control would be to have the cigar or cigarette make or break a light beam which is inserted within the lighter, a photoelectric cell being connected in the circuit so as to cause the relay tube to trip and the heating element would thus be heated and the advertising device flashed.

Another modification would be that of a mechanical relay arranged to be actuated by the plate current of the relay tube if it is desired that a larger amount of power be required than the tube can control.

While only a few modifications of this invention are disclosed, it is to be distinctly understood that it is not to be limited thereto except by such limitations as are imposed in the appended claims.

What is claimed is:

1. An automatic lighting device comprising a spherical shaped casing having a small aperture therein, an electric heating element located in the aperture of said casing, means within said casing whereby pressure from the object to be lighted as it passes through said aperture causes said heating element to heat up, an electron discharge device and an alternating current transformer within said casing, said means comprising a pair of contacts connected in series with the control element of said electron discharge device and said alternating current transformer whereby said heating element is heated.

2. An automatic lighting device comprising a casing having an aperture therein, an electric heating element within said casing and located in said aperture, means within said casing whereby pressure from the object to be lighted as it passes through said aperture causes said heating

element to heat up, an electron discharge device and an alternating current transformer within said casing, said means comprising a pair of contacts, at least one of said contacts being secured to said heating element, said contacts being connected in series with the control element of said electron discharge device and said alternating current transformer whereby said heating element is heated.

- 10 3. An automatic lighting device comprising a casing, the upper portion of which is spherical in shape, an aperture located in the said spherical portion, a base in the lower part of said spherical portion, an electron discharge device supported
15 from said base, an electric heating element in said aperture, means within said casing whereby pressure from the object to be lighted as it passes through said aperture causes said heating element to heat up, and means comprising a pair of

contacts connected in series with the control element of said electron discharge device whereby said heating element is heated.

4. An automatic lighting device comprising a casing, the upper portion of which is spherical in shape, an aperture located in said spherical portion, a base in the lower part of said spherical portion, an electron discharge device supported from said base, an electric display device located below said electron discharge device, an electric heating element in said aperture, means within said casing whereby pressure from the object to be lighted as it passes through said aperture causes said heating element to heat up, and means comprising a pair of contacts connected in series with the control element of said electron discharge device whereby said heating element is heated and also flashes said display device.

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