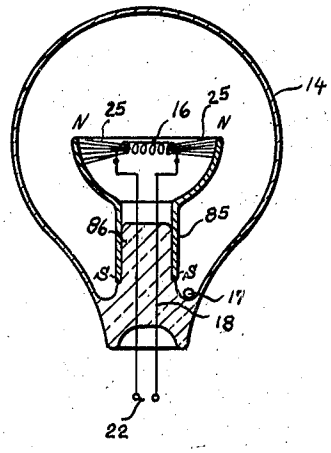
Nov. 16, 1937. C. SPAETH 2,099,144

MAGNETIC DISCHARGE DEVICE

Filed Dec. 11, 1933



CHARLES SPAETH.
INVENTOR.

BY Rudolf Wildenauer
ATTORNEY.

Patented Nov. 16, 1937 2,099,144

UNITED STATES PATENT OFFICE

2,099,144

MAGNETIC DISCHARGE DEVICE

Charles Spaeth, Flushing, N. Y.

Application December 11, 1933, Serial No. 701,843

4 Claims. (Cl. 176—1)

This invention relates to a new and improved magnetic discharge device and to novel methods of using and operating the same.

I have discovered that certain emissions of suitable glow-bodies have distinctive magnetic characteristics.

Electronic emissions are diverted by magnetism. By way of contrast, the emissions herein referred to—and for sake of convenience called "magnetic emissions" altho that term is not strictly correct—are magnetically attracted regardless of polarity; in certain instances, i. e., in connection with diamagnetic bodies, they are magnetically repelled.

It is one object of this invention to produce novel and useful results by magnetic emissions and by a predetermined control thereof.

In some applications of my invention I make use of a particular phenomenon under which the magnetic emission increases the permeability or reluctivity of media, for instance of a space through which it passes.

Since I here deal with certain phenomena which have not been observed heretofore a more specific synopsis of the objects of my invention will be difficult to comprehend, unless I set forth a tangible foundation. I shall explain the devices used for, the electric circuits and the methods of procedure applied in, and the results obtained by various executions of my invention, those familiar with this field of science will then readily perceive other objects pursued by me and particular phases of the objects broadly stated above.

The figure is a longitudinal section of an electric light bulb embodying an application of my invention.

Like numerals refer to like parts throughout the drawing.

Referring to the figure the globe or envelope 14 is made of any suitable material, if desired it could be made of quartz or special glass which will permit the transmission of ultraviolet rays. Where use is not made of visible radiation, a suitable opaque material may be used for the envelope. Under certain circumstances, with arc lamps for instance, the envelope may be omitted.

The interior of the envelope 14 is exhausted to a high vacuum, but it may also contain a suitable gaseous atmosphere. I prefer to make use of the vapors of metals, and the body 17 thus indicates a drop of mercury in the figure. However, I do not wish to limit myself to the use of mercury as I can use the vapor of any other suitable metal, such as sodium, cadmium etc., or any suitable gaseous atmosphere, like argon, helium, neon, xenon, crypton. The use of an envelope facilitates of such atmosphere. During experiments I used within the envelope a pressure of the order of a few microns of mercury column.

However my invention may be executed at various pressures as long as a free movement of the emitted magnetic particles hereinafter referred to is provided for and as their movement may be controlled.

The heating element or electrode 16 (sometimes called cathode) consists of a loop of wire or a coil made from a magnetic material, such as iron, nickel or cobalt. Alloys of such magnetic metals or paramagnetic materials such as tungsten, molybdenum, tantalum, rhenium or thorium may also be used.

Said filament 16, consisting of a metal of magnetic properties, may also be impregnated with a coating of oxides of barium, strontium, calcium or thorium intermixed with fine metallic magnetic particles of nickel, iron or cobalt, finely divided dia-para-magnetic particles can be obtained from a colloidal metal solution, which is used for impregnating any of the elements contained in the envelope. Such finely divided dia-para-magnetic particles can thus be added to the mercury so as to form an amalgam or to sodium metal or any other mercury-alkaline metal amalgam, which is put into the envelope in the form of a drop. The lead-in wires 22 are made of any suitable metal as known to those acquainted with the art of making lamps.

A source of electric current is connected to the terminals 22. The electric current flowing through the lead-in wires heats the filament or electrode 16 to incandescence, thereby liberating, evaporating or emitting dia, or para magnetic metallic particles besides the regular emission of electrons emitted by a heated body. If the electrode or emitter 16 emits at ordinary temperatures and does not require heating to cause emission, no heating is required. This is the case, when I provide an electrode or emitter 16 comprising radioactive substances in combination —impregnated for instance—with finely divided dia-para-magnetic particles. There will be an emission for magnetic particles while the radioactive substance disintegrates.

These emitted magnetic particles are attracted by the magnet. If the globe 14 contains a high vacuum, these magnetic particles travel with high speed towards the magnet and form a metallic deposit on the globe wherever the magnets hap-

pen to be located. The emitted magnetic particles are invisible while travelling through a vacuum from the filament 16 towards the magnet. But since I provide in the globe a mercury vapor atmosphere of a few microns pressure a very intense luminous blue ray 25 extends from the filament 16 towards the magnet. The luminous magnetic ray or streamer 24 or 25 will follow the magnet wherever it may be located, indicating the magnetic properties of said emission. This effect is due to ionization of the mercury vapor under the impact of the magnetic particles travelling at very high speed towards the magnet. The magnetic emission demonstrated by the luminous streamer should not be compared with the regular electron or cathode ray emission taking place in high vacuum between a cathode and an anode, where the anode has a high positive potential. There the electrons may be controlled by an electrostatic field or a magnetic field, as for instance in a magnetron or a cathode ray tube. But in a device of that type the electrons are only deflected by a magnet and not attracted, as it is the case in the phenomenon which I discovered. A visible proof of the magnetic emission is rendered by a deposit, which appears after a period of operation at the point where the emission strikes in travelling towards the magnet or magnets.

A tubular magnet 85 is mounted upon the stem 86 of a bulb and is curvedly flared out at one end 85. If the flare part 85 is parabolically shaped—the heating electrode 16 being displaced from the focal point of said part—a characteristic sodium light will be set up by the sodium vapor or other vapors, which are set free from the sodium or sodium amalgam particle 17. The magnetic emission emitted from the heated element 16 travels towards the flared out part 85 of the magnetic element 85 because it is attracted by the same—regardless of the polarity of the flared out magnetic element 85—thereby causing said sodium vapor or other vapors to form a very intense luminous band extending from the heated element 16 to the flared-out part 85. If sodium vapor alone is used an extremely efficient light source for illuminating purposes is produced, having the incandescent spectrum of the heated element 16 superimposed on the sodium light as long as the temperature of the element 16 is sufficiently high. If a sodium-mercury amalgam is used for instance, an extremely efficient white light approximating sunlight is produced. Of course said magnetic element 85 need not be located within the bulb, but could be located outside the bulb.

Thus magnetic emission may be converted to a multitude of uses by regulating its flow and interposing matter in its path. The modifications shown, while disclosing concrete examples of application are merely suggestions as to the great field of new uses opened up to those acquainted to the related arts and I claim protection for my invention for the whole range of new uses to which magnetic emission may be converted.

Although I have shown and described one form of embodiment of my invention in detail, yet I do not wish to be limited thereby, except as the state of the art and the appended claims may require, for it is obvious that various modifications and changes may be made in the form of embodiment of my invention, without departing from the spirit and scope thereof.

What I claim is:

1. An electric lamp comprising, an emitter of ferromagnetic material adapted to emit minute ferromagnetic particles when heated, means for heating the same, and magnetic means for directing said emitted particles.

2. An electric lamp comprising, an emitter of ferromagnetic material adapted to emit minute ferromagnetic particles when heated, means for heating the same, and magnetic means for directing said emitted particles, said means surrounding said emitter.

3. An electric lamp having a gas-containing envelope containing an emitter of ferromagnetic material adapted to emit minute ferromagnetic particles when heated, lead wires through said envelope connected to said emitter and to a source of electric current for heating said emitter, magnetic means adjacent said emitter to control the movement of said material, said gas adapted to radiate light where said material passes from said emitter toward said magnet.

4. An electric lamp having a gas-containing envelope containing an emitter of ferromagnetic material adapted to emit minute ferromagnetic particles when heated, lead wires through said envelope connected to said emitter and to a source of electric current for heating said emitter, magnetic means adjacent said emitter to control the movement of said material, said gas adapted to radiate light where said material passes from said emitter toward said magnet, said gas being a metallic vapor.

CHARLES SPAETH.