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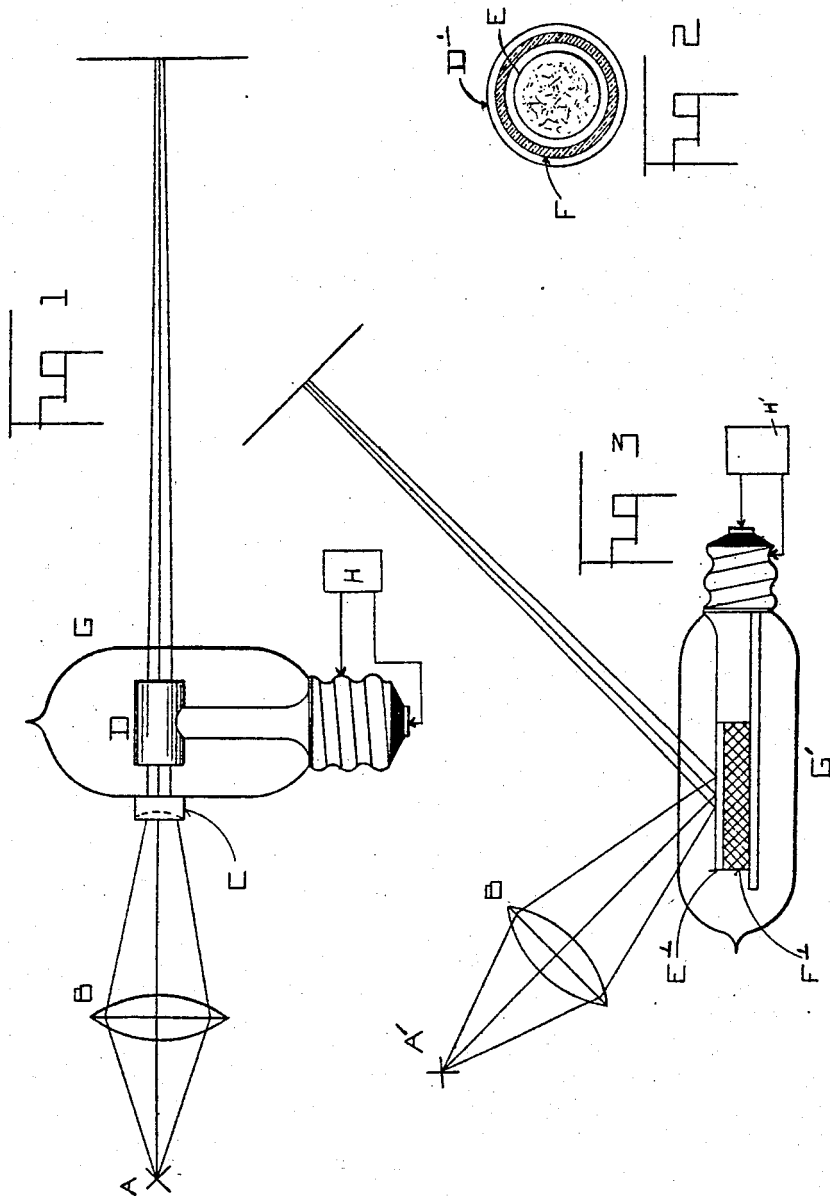
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C. F. JENKINS

1,894,042

GASEOUS LIGHT VALVE

Filed June 22, 1927



Inventor

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WITNESS:

Sybil R. Almond.

See also 1,740,352 88-61A which shows an application of the light valve.

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# UNITED STATES PATENT OFFICE

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## GASEOUS LIGHT VALVE

Application filed June 22, 1927. Serial No. 200,752.

This invention relates to devices for intercepting a pencil of light, and has for its main object means for blocking and releasing light with great rapidity.

5 Heretofore such light valves have consisted of bi-sulphide or similar liquids in a magnetic or electrostatic field through which polarized light is passed, but such valves require very high voltages or high current strength, and  
10 so are impractical for many purposes, radio vision, for example, where currents available are necessarily small, and where voltages should be small because of the danger involved in high potentials.

15 Applicant has observed that, while a gaseous glow lamp, a neon lamp, for example, has a low intensity value as a tubular light source, and that increasing the length of the tube does not increase the light, it consequently has the property of blocking light of greater  
20 intensity, that is, acts as a valve therefor.

Such gaseous light valve is almost infinitely fast, and is usually triggered off with small change in voltage. It, therefore, serves admirably as a light valve for radio vision work.

With this and other objects in view the invention consists of the novel method and combination of parts disclosed herein, and more particularly pointed out in the claims.

30 In the drawing, Figure 1 is a diagrammatic illustration of one form of the invention; Figure 2 a detail; and Figure 3 another form of the application of the invention.

35 In the figures, A is a light source; B a condensing lens; C a plano-concave lens; D a composite tube, of which E (Figure 2) is an inner tube of metal, separated from the outer metal tube D' by an insulating tube of glass  
40 F, or other suitable dielectric. The tube D is enclosed in a lamp shell G filled with neon, or other suitable gas. The lamp terminals are connected as schematically shown to a source of current variations H which may be  
45 produced in any well known manner depending upon the type of system wherein the valve is to be used. In Figure 3, E' is a highly polished plate, and from which light from the source A' is reflected. In a like manner the  
50 terminals of valve G' are connected to a

source of modulated currents H' in a well known manner.

The operation of the invention is readily understood, i. e., when the light from the source A is focused through the tube D, it normally passes unobstructedly, but when the tube E is filled with a bombarding stream of electrons the light is largely or wholly shut off, depending on the density of the stream. Similarly the light reflected from the polished surface of E' (Fig. 3) is dimmed by the density of the glowing gas on its surface.

It is not believed necessary to explain in detail the employment of this light valve in Radio Vision mechanism, the method is too well known, but rather to point out its merits, of which low voltage operation, small energy required, instantaneous action, and simplicity of construction are perhaps the most conspicuous.

It is also obvious that other fluids might be substituted for the neon gas mentioned, and other means of clouding it could be employed, without departing from the spirit of my invention. Nor is the ratio of length to diameter of the gas tube shown in the drawing the only ratio that could be chosen.

What I claim is—

1. A light valve of the gaseous discharge type having a passage for the transmission of light of greater intensity than that produced in the valve, and means for obstructing the free passage of the said light of greater intensity through said valve, the last mentioned means including spaced metallic electrodes, one of said electrodes being shaped to provide a light confining path.

2. A light valve of the glow discharge type having means therein adapted to produce a gaseous discharge of low light intensity, said means including a pair of metallic tubes separated by a layer of insulation, the inner tube forming a passage for the transmission of light from a light source exterior to the valve.

3. In combination a constant source of light, and means for changing light from said source into a varying one, including a gaseous discharge light valve interposed in the path of the rays from said source, said

valve including a pair of spaced electrodes immersed in a gaseous medium to provide a light transmission channel of varying characteristics for said rays, and a source of variable signaling current connected to said valve.

4. The combination according to claim 3 in which the light valve includes a pair of tubular electrodes, one of said electrodes providing a normally free path for the said rays and adapted to have a gaseous discharge of varying intensity produced therein.

5. In combination a light beam to be valved and a gaseous discharge valve for said beam operable with minute currents generally available in radio work, said valve including a pair of spaced electrodes immersed in a gaseous medium, and means for passing the light beam through the discharge between said electrodes, and means for impressing varying signal currents upon said electrodes.

6. In combination a light beam of constant intensity to be valved and a gaseous discharge light valve therefor, said valve being operable with low voltages generally available in radio vision systems, and including a pair of spaced electrodes immersed in a gaseous medium, and means for passing said light beam through said gaseous medium, and means for impressing varying signal currents upon said electrodes.

7. A light beam to be valved, a gaseous discharge valve having a glowing plate electrode, means for projecting said light beam upon said plate, a surface to be illuminated by the light beam as reflected from said plate, and a source of variable signaling currents for said valve.

8. In combination a light valve having a normally unobstructed light passage therethrough, said valve including a pair of spaced electrodes immersed in a gaseous medium adapted to have its light transmission characteristics varied in accordance with the corresponding electric variations applied to said electrodes, a light beam, means for projecting said beam through said gaseous medium to be valved thereby, and a source of variable signaling current connected to said electrodes.

9. In combination a gaseous discharge light valve having a normally unobstructed light passage therethrough, said valve including a pair of spaced electrodes immersed in a gaseous medium adapted to have its light transmission characteristics varied in accordance with corresponding electric variations applied to said electrodes, a light beam of constant intensity, means for passing said beam through said medium to be valved thereby, and a source of variable signaling current connected to the said electrodes.

10. In combination a gaseous discharge light valve having a normally unobstructed

light passage therethrough, said valve including a pair of spaced electrodes immersed in a gaseous medium, means for producing an electron stream between said electrodes to control the light transmission characteristic of said passage, a light beam, means for passing said light beam through said passage, and a source of variable signaling current connected to said electrodes.

11. In combination a gaseous discharge light valve having a normally unobstructed light passage therethrough, said valve including a pair of spaced electrodes immersed in a gaseous medium, means including said electrodes and a source of variable signaling current for producing a discharge in said passage to vary the light transmission characteristics of said passage, a light beam, and means for projecting said beam through said passage.

12. The method of translating electrical variations into corresponding light fluctuations which includes the steps of producing a light beam of constant intensity, interposing in the path of said beam a gaseous discharge, and varying the said discharge by variable signaling currents.

13. Apparatus for modulating light comprising a source of light, a tube containing a gas or vapor in the path of the light from said source, and means for applying a varying potential difference to said gas or vapor to cause a varying glow thereof for controlling the passage of light therethrough.

In testimony whereof I have affixed my signature.

CHARLES FRANCIS JENKINS.