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April 5, 1932.

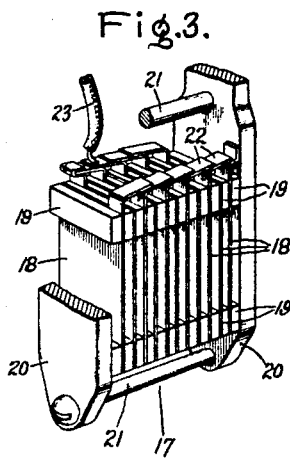
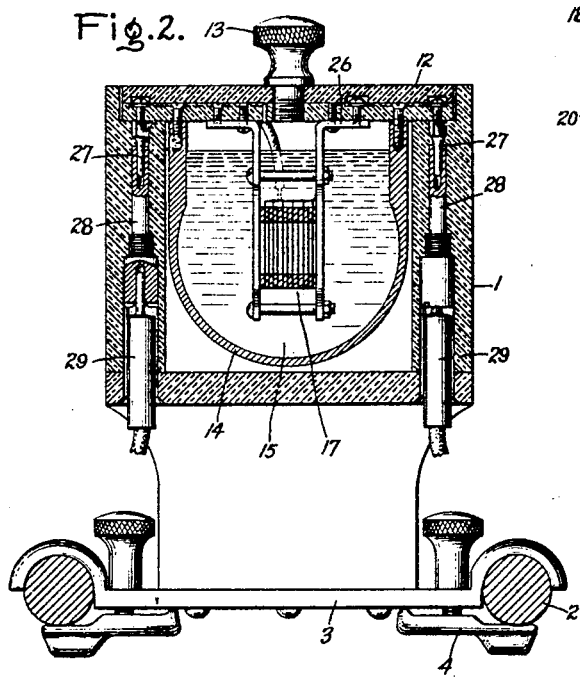
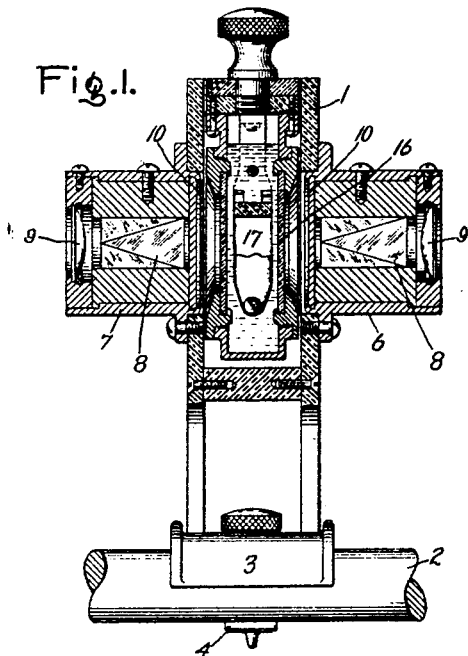
L. J. HARTLEY

1,852,806

LIGHT CONTROLLING APPARATUS

Filed July 29, 1930

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Inventor:  
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## UNITED STATES PATENT OFFICE

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## LIGHT CONTROLLING APPARATUS

Application filed July 29, 1930. Serial No. 471,573.

My invention relates to light controlling apparatus and particularly to apparatus which depends for its operation upon the Kerr effect. Such apparatus is commonly employed in certain forms of television receivers and includes a Kerr cell as an element thereof. It is the object of my invention to provide improved apparatus of this character including an improved form of Kerr cell.

My invention will be better understood from the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

In the drawings, Figs. 1 and 2 are cross-sections taken at right angles to each other of an embodiment of my invention; and Fig. 3 is a perspective view of a portion of that part of the apparatus comprising the Kerr cell which is drawn to a larger scale.

The embodiment which I have illustrated comprises the casing 1 which is shown as built up of plates of insulating material and which is adapted to be attached to the two bars 2 by means of the base plate 3 and clamping members 4. Opposite sides of the casing 1 are provided with openings in which are mounted the sleeves 6 and 7. Each sleeve supports therein a polarizing prism 8 and a lens 9 at the outer end of the prism. The prisms employed are a form of Nicol prism being modified for the sake of greater compactness in the manner suggested by Ahrens. To protect the prisms at their inner ends I have shown the glass plates 10. The two prisms 8 usually termed the analyzer and the polarizer are identical with each other with the exception that they are mounted with their planes of polarization at right angles to each other. For convenience in illustration, they have not so been shown but have been shown as if their planes of polarization were coincident.

The upper wall or top 12 of the casing 1 is removably attached to the casing and is shown as comprising two parallel contiguous plates which normally are secured together by the thumb-screw 13 which also affords a suitable handle by which the top wall may be removed. This wall is constructed to make a sufficiently close fit with the side walls of the casing so that dust, dirt and moisture are excluded from the interior. Tightly secured to the top 12 is the receptacle 14 which contains the doubly refracting liquid 15, such for example as nitrobenzene. In opposite walls of the receptacle 14 are mounted the glass windows 16 whereby a light beam traversing the prisms may pass with as little obstruction as possible through the receptacle. In alignment with the windows 16 and supported from the top 12 is the plate assembly 17 which is shown in detail in Fig. 3. This assembly comprises the series of plates 18 which are held in parallel spaced relation by the spacers 19. These are arranged adjacent the upper and lower ends of the plates and have flat faces which engage the plates. The plates and spacers are firmly clamped together by the end plates 20 through which extend the clamping bolts 21. Each plate is provided with a terminal extension 22, the extensions of alternate plates being secured to each other, for example by soldering. Electrical connection is made to one set of alternate plates by means of the conductor 23 and to the other set by connection with one of the end plates 20. Good results have been obtained by constructing the plates 18 .0055" thick and spaced apart .045". By clamping the plates 18 firmly together between two sets of spacers 19 having flat engaging faces, the plates 18 are effectively maintained in their proper position and are able to withstand the distorting electrostatic force of the voltage applied thereto. It will be seen that each plate is thereby supported at both ends in the manner of a cantilever whereby it is given a maximum stiffness. The end plates 20 by which the plates 18 are clamped together, also serve to support the latter plates from the top of the casing. For this purpose the end plates 20 are shown having outwardly turned upper ends 26 which ends are attached by screws to a part of the top 12. Electrical connection is made to alternate plates of the series through detachable connections 27 and 28 shown mounted in the side walls of the casing whereby the top 12 is automatically connect-

ed in the external circuit when placed in position. Insulation covered terminals 29 of the connecting leads may also be readily disconnected from the connections 28.

5 What I claim as new and desire to secure by Letters Patent of the United States, is:

1. Light controlling apparatus comprising a casing having a removable wall, polarizing prisms secured in alignment to opposite walls thereof, a liquid containing receptacle secured to said removal wall and arranged between said prisms, and spaced electrodes supported in said receptacle and arranged parallel with the path of light passing through the prisms.

2. Light controlling apparatus comprising a casing having Nicol prisms mounted in alignment in opposite walls and having a removable top, a liquid containing receptacle secured to said top having windows in opposite sides thereof, and an electrode assembly secured to said top and comprising a plurality of spaced plates arranged parallel with the path of light passing through said prisms.

3. Light controlling apparatus comprising a casing having openings in opposite sides thereof, sleeves mounted therein enclosing Nicol prisms, a detachable liquid containing receptacle in said casing having windows in opposite sides in alignment with said sleeves, and an electrode assembly mounted in said receptacle comprising a plurality of parallel spaced plates of which alternate plates are connected together and end clamping plates having portions secured to the receptacle for supporting the assembly in alignment with said windows.

4. Kerr cell apparatus comprising a series of parallel plates, spacing means arranged between adjacent plates at opposite ends thereof, means connecting together alternate plates of the series, a receptacle containing a doubly refracting liquid and means for clamping together the plates and spacing means and for suspending them immersed in said liquid.

5. Kerr cell apparatus comprising a series of parallel plates, having terminal lugs thereon, spacers between adjacent plates having flat plate engaging faces arranged adjacent the ends of said plates, the lugs of alternate plates being connected together, a receptacle containing a doubly refracting liquid and having a detachable cover and transparent sides, and end plates having bolts therebetween for clamping together said parallel plates and spacers independently of said lugs and means for securing said end plates to said cover whereby said series of plates are suspended in the liquid.

In witness whereof I have hereunto set my hand this 28th day of July 1930.

LOWELL J. HARTLEY.