

Nov. 4, 1958

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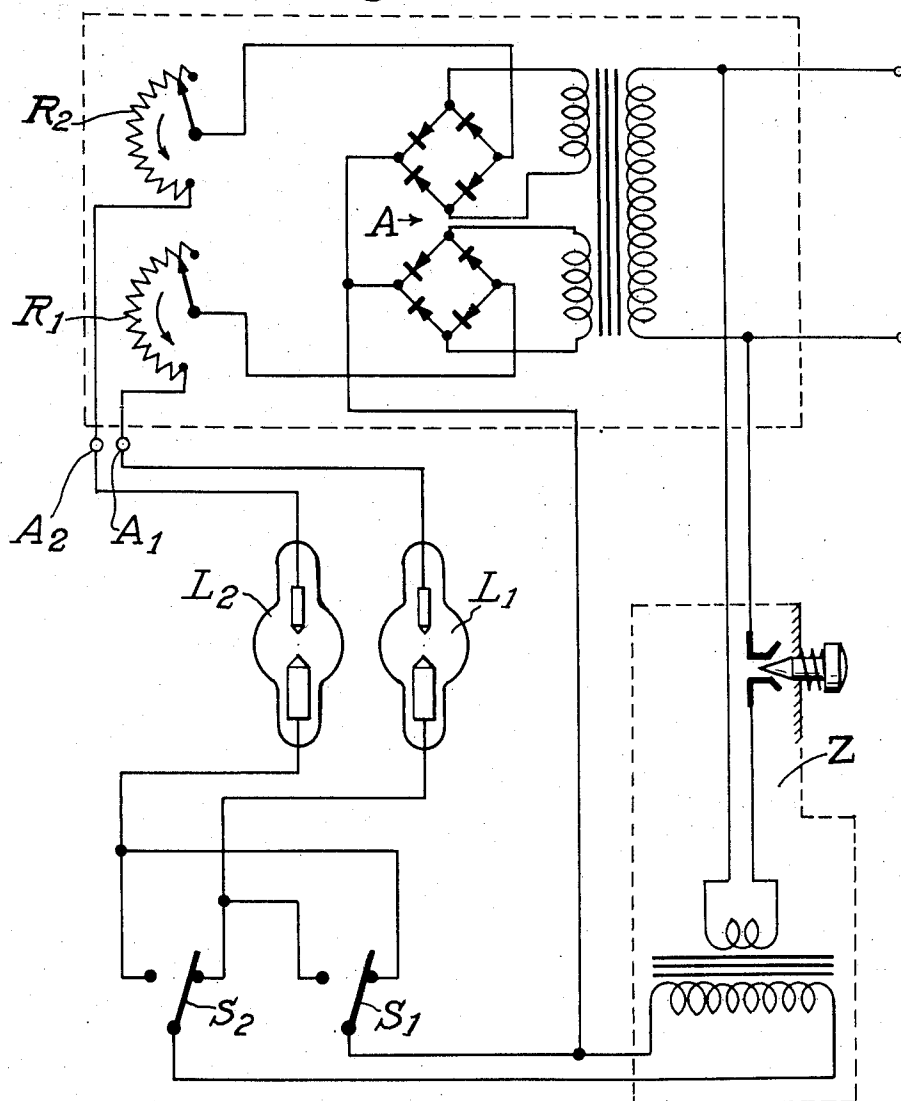
2,859,387

ARRANGEMENT FOR SIMULTANEOUSLY OR ALTERNATELY OPERATING
A PLURALITY OF XENON HIGH PRESSURE LAMPS

Filed May 26, 1955

2 Sheets-Sheet 1

Fig. 1



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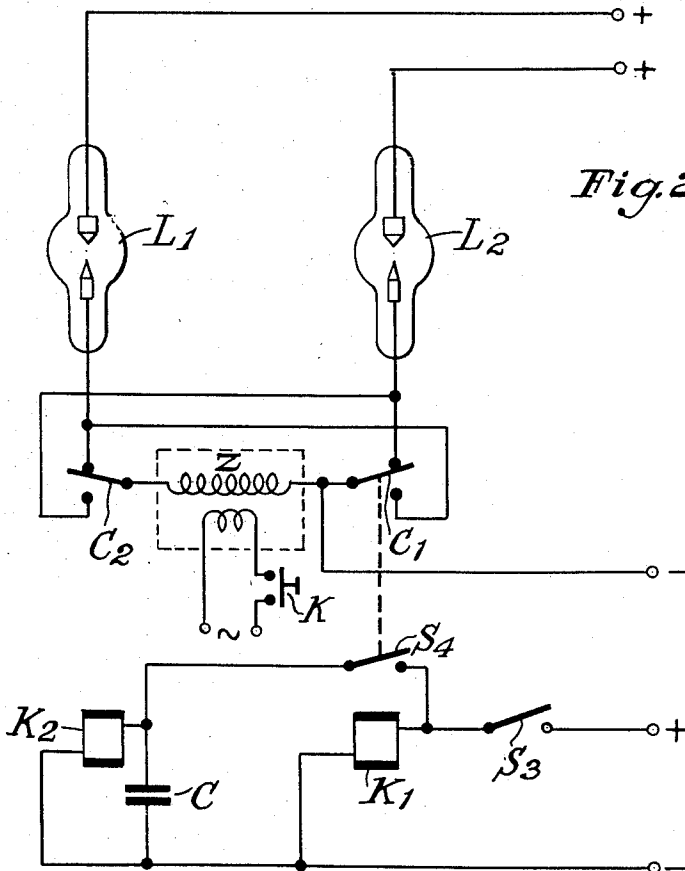
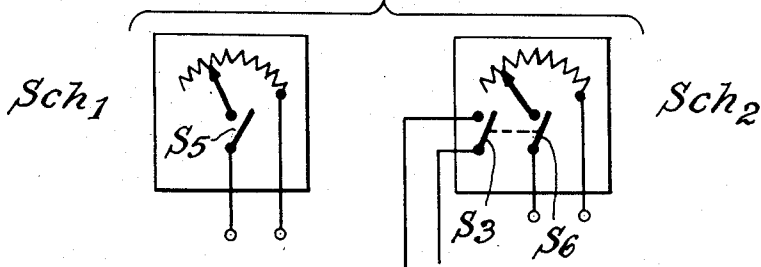


Fig. 3



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ARRANGEMENT FOR SIMULTANEOUSLY OR ALTERNATELY OPERATING A PLURALITY OF XENON HIGH PRESSURE LAMPS

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Application May 26, 1955, Serial No. 511,369

Claims priority, application Germany July 30, 1953

3 Claims. (Cl. 315—201)

The invention relates to an arrangement for simultaneously or alternately operating a plurality of xenon high pressure lamps, and constitutes a continuation-in-part of my co-pending application Serial No. 446,538, filed July 29, 1954, now abandoned.

It is known that xenon high pressure lamps require a high voltage impulse of several thousand volts for their ignition in addition to the normal operating voltage, and such an impulse of high voltage is usually supplied by a special ignition device. In many motion picture or still picture projection systems, it is necessary to operate either simultaneously or alternately a plurality of xenon lamps which usually are arranged in a common lamp housing. Such is, for instance, the case when for motion-picture projection and for still-picture projection, a separate lamp is provided, but in which both lamps may be used alternately or for a short time also simultaneously. Since ignition devices require a considerable amount of space and switching means, their simplification is of great economic interest.

To place the ignition device simply in one of the supply leads of the lamp is not possible since, as tests have shown, in such a case only one lamp will be ignited and after ignition of this lamp the other lamp can subsequently not be put into operation.

It is an object of the invention to solve the above ignition problem by providing a common ignition device for all lamps which device is selectively inserted into one of the supply leads of the lamp to be ignited, while the corresponding supply leads of all other lamps are directly connected to the line.

The accompanying drawing illustrates by way of example a practical embodiment of the invention.

Fig. 1 illustrates diagrammatically an arrangement for manually operating the switches which cause ignition and operation of the two lamps.

Fig. 2 illustrates diagrammatically an automatic operation of the two lamps, and

Fig. 3 illustrates a modification of the automatic circuit disclosed in Fig. 2.

Referring to the drawing, two xenon high pressure lamps L_1 and L_2 are each connected with one of their respective poles to a separate supply circuit, for example, to the output terminals A_1 and A_2 of a conventional motion-picture rectifier A . R_1 and R_2 are the respective regulating devices for the two circuits of said rectifier A . The other pole of each lamp is connected to the switch S_1 and S_2 , respectively. The switch S_2 effects the switch-over of the ignition device Z to the desired lamp, while the other switch S_1 connects the lamp not to be ignited directly to the line.

To explain the operation of the arrangement of this invention, it may be assumed that both lamps are in a not-ignited condition. The ignition device Z is connected by the switch S_2 to the lamp L_1 which lights up after the ignition device has been energized. The lamp L_2 is directly connected to the source of current through the switch S_1 . When subsequently also the lamp L_2 shall

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be put into operation, then the switches S_1 and S_2 are operated one after the other in such a manner that, in order to avoid an interruption of current in the burning lamp, the switch S_1 has already established the bridging-over of the burning lamp before switch S_2 interrupts the current flow to lamp L_1 . The ignition device Z is now connected with lamp L_2 so that this lamp can also be ignited. This operation of the switches S_1 and S_2 in timely succession is carried out suitably in an automatic manner, for example, by means of a delayed action contactor. Since the connection of the lamps is symmetrically arranged, it does not matter whether the one or the other of the two lamps is first put into operation.

According to the invention, the above switching operation may be performed automatically—for example, by coupling the switches S_1 and S_2 to the action of the switches installed in the regulating devices R_1 , R_2 so that no further operative manipulations have to be carried out besides connecting the respective regulator and eventually pressing the push-button for the ignition. If the lamp L_1 shall be put out of service after lamp L_2 has been ignited, the switch S_1 is either thrown into the opposite position or else it is at least momentarily disconnected from its line leading to the lamp L_1 .

Fig. 1 illustrates an arrangement in which the lamps L_1 and L_2 are operated in the desired manner manually by the switches S_1 and S_2 . According to Fig. 2, however, the operation of the lamps takes place by employing the relays C_1 , K_1 and C_2 , K_2 . K_1 and K_2 designate the windings of these relays.

In the rest position in which both relays are not energized, the ignition device Z is connected with the lamp L_1 . By depressing the push button K , the lamp L_1 is ignited. If now the lamp L_2 is also to be set in operation, the switch S_3 is closed, which causes an energization of the relays C_1 , K_1 and the lamp L_1 is directly connected with the negative side of the supply lines and remains lit. The relays C_1 , K_1 carries in addition to the switch C_1 also an auxiliary switch S_4 which is actuated simultaneously with the switch C_1 and thereby causes an energization of the relays C_2 , K_2 as soon as the auxiliary switch S_4 is closed. A condenser C is arranged parallel to the relay winding K_2 which results in the desired delay in the closing of the switch C_2 , so that a separation of the previously ignited lamp L_1 from the supply lines is prevented, before the switch C_2 connects the bridging line which connects the lamp L_1 with the supply lines. Upon actuation of the push button K , the second lamp L_2 is ignited.

The operation is completely automatic and one may start when the switch S_3 is closed. The switches C_1 and C_2 and S_4 are then closed, i. e. the switch arms engage the lower switch contacts in Fig. 2. Upon actuation of the push button K , the lamp L_2 is ignited first. If now the switch S_3 is opened, the relays C_1 , K_1 drops and therewith the switch S_4 is opened also. This has the result that the ignited lamp L_2 is connected with the supply lines and remains lit. The switch C_2 is, however, automatically opened after a certain delay which is determined by the size of the condenser C arranged in parallel to the relay winding K_2 . Since the switches C_1 and C_2 are now in their rest position, as shown in Fig. 2, an actuation of the push button K will effect an ignition of the lamp L_1 .

The control boxes of the conventional arc lamp rectifiers are provided with a regulating resistance which is used to adjust the premagnetizing current for the control chokes. The control boxes also contain a small toggle switch S_5 and S_6 , respectively, which is arranged in series with the respective regulating resistance. In order to connect the switches C_1 and C_2 with the regulating resistance R_1 and R_2 to connect the ignition device with the lamp to be ignited, it is sufficient to con-

nect the switch S_3 with the toggle switch S_6 in the control box *Sch 2*, as shown in Fig. 3. As soon as the toggle switch S_3 in the control box *Sch 1* is closed, the lamp L_1 is connected to the supply lines so that it may be ignited. Thereupon the toggle switch S_6 in the control box *Sch 2* is closed, and since this switch S_6 is mechanically coupled with the switch S_3 , the latter is also closed so that the above mentioned connection from switch C_1 to C_2 takes place. In this manner the lamp L_2 is also ready for operation. This circuit arrangement is, however, not reversible as described in connection with the arrangement shown in Fig. 2, and it is not possible to ignite first the lamp L_2 and then the lamp L_1 .

In all of the described circuit arrangements the disconnection of the lamps L_1 and L_2 takes place by interrupting the anode voltage, so that it is not necessary to provide any additional switches or the like in the switching and control circuits.

It will be appreciated by those skilled in the art that the invention is not limited to the details of the foregoing example and that various changes of the arrangement shown and described are possible within the scope of the appended claims.

What I claim is:

1. In an illuminating system comprising xenon high pressure lamps, an arrangement for selectively simultaneously and alternately operating said two xenon high pressure lamps including a source of alternating current supply, a rectifier having an input circuit connected to said source of alternating current supply and having two output circuits and two output lines connecting said output circuits separately to said two lamps, a common output line for both said output circuits of said rectifier, a single ignition device for both said lamps, said ignition device having an input circuit connected with said source of alternating current supply and having a high voltage output circuit with two output lines, a push button switch in said input circuit of said ignition device for momentarily energizing the latter, said common output line of said two output circuits of said rectifier being connected to one of the two output lines of said high voltage output circuit, two switch devices one in each one of said two output lines of said output circuits of said ignition device, and means respectively connecting said switch devices with said lamps and connecting said switch devices with one another to selectively permit a connection of either output line of said high voltage circuit with either one of said two lamps so that in one position of said switch devices one of said lamps is ignited and the other lamp is connected to its rectifier circuit without being ignited, while upon movement of said switch devices to another position the other lamp is ignited and the lamp previously ignited remains lit.

2. In an illuminating system comprising two xenon high pressure lamps, an arrangement for selectively simultaneously and alternately operating said two xenon high pressure lamps including a source of alternating current supply, a rectifier having an input circuit connected to said source of alternating current supply and having two output circuits and two output lines connecting said output circuits separately to said lamps, a common output line for both said output circuits of said rectifier, a single ignition device for both said lamps, said ignition device having an input circuit connected with said source of alternating current supply and having a high voltage output circuit with two output lines, a push button switch in said input circuit of said ignition device for momentarily energizing the latter, said common output line of said two output circuits of said rectifier being connected to one of the two output lines of said high voltage output circuit, two switch devices, one in each one of said two output lines of said output circuits of said ignition device, and means respectively connecting said switch devices with said lamps and connecting said switch devices with one another to selectively permit a connection of either output line of said high voltage circuit with either one of said two lamps so that in one position of said switch devices one of said lamps is ignited and the other lamp is connected to its rectifier circuit without being ignited, while upon movement of said switch devices to another position the other lamp is ignited and the lamp previously ignited remains lit, said last mentioned lamp when lit being adapted to become extinguished by momentarily opening the switch device which caused the ignition of said other lamp.

3. An illuminating system according to claim 1, including two relay windings, one for each of said switch devices which are arranged in the output lines of the output circuits of said ignition device, circuit means for energizing said relay windings by current supplied by said rectifier to operate said switch devices, and a normally open relay control switch in said last named circuit means, one of said relay windings having a condenser arranged in parallel thereto to delay the action of the switch device associated with said relay winding upon closing of said normally open relay control switch, thereby preventing the extinguishing of one lamp when the other lamp is to be lit.

References Cited in the file of this patent

UNITED STATES PATENTS

1,662,114	Hotchner	Mar. 13, 1928
2,062,960	Barclay	Dec. 1, 1936
2,309,525	Mohr	Jan. 26, 1943
2,312,050	Place	Feb. 23, 1943
2,691,755	Zirker	Oct. 12, 1954
2,707,247	Anderson	Apr. 26, 1955

UNITED STATES PATENT OFFICE
Certificate of Correction

Patent No. 2,859,387

November 4, 1958

Heinz Ulffers

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the grant, lines 2 and 3, for "assignor to Zeiss Ikon A. G., of Stuttgart, Stuttgart, Germany," read —assignor to Zeiss Ikon A. G. Stuttgart, of Stuttgart, Germany,—; line 11, for "Zeiss Ikon A. G., its successors" read —Zeiss Ikon A. G. Stuttgart, its successors—; in the heading to the printed specification, lines 5 and 6, for "assignor to Zeiss Ikon A. G., Stuttgart, Stuttgart, Germany", read —assignor to Zeiss Ikon A. G. Stuttgart, Stuttgart, Germany—.

Signed and sealed this 28th day of April 1959.

[SEAL]

Attest:

T. B. MORROW,
Attesting Officer.

ROBERT C. WATSON,
Commissioner of Patents.

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