April 13, 1943. R. KUHNERT 2,316,599

MOTION PICTURE REPRODUCING SYSTEM

Filed Jan. 24, 1941

Fig. 1

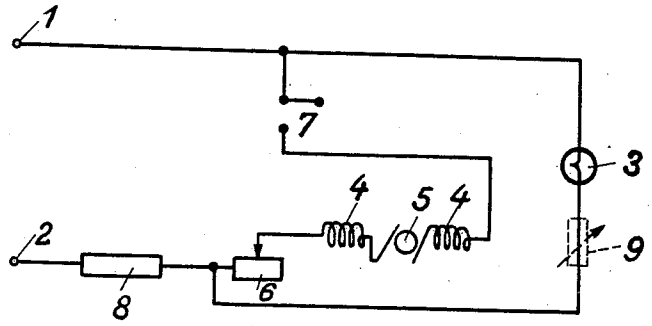



Fig. 2

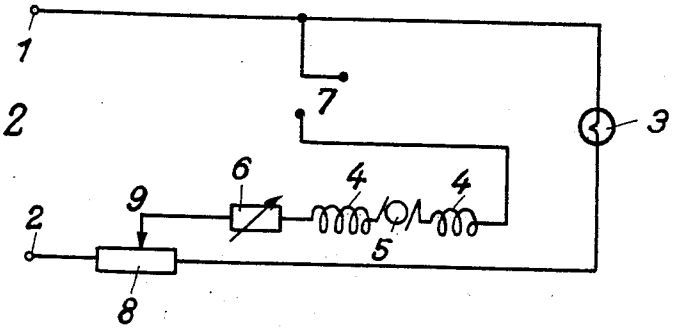
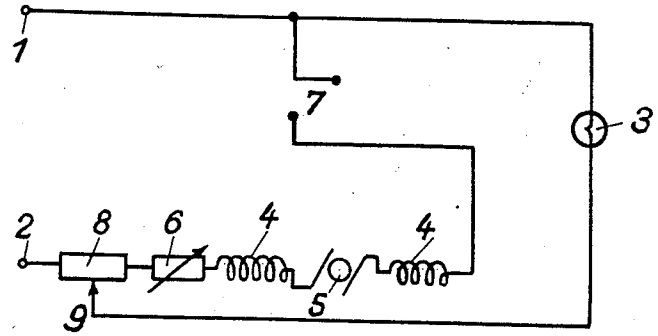



Fig. 3




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## MOTION PICTURE REPRODUCING SYSTEM

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In Germany November 16, 1939

1 Claim. (Cl. 88—17)

This invention relates to improvements in motion picture reproducing systems.

In theatres and the like it may happen that during the performance some of the essential apparatus for the reproduction ceases to be operative. The room being dark it is then difficult for the operator to locate the trouble and to eliminate it. It had already been suggested to provide as part of the equipment an auxiliary lamp which continues to burn, even though a disturbance of the projection lamp, or of the film feed motor, or of some other piece of the equipment causes an interruption of the performance. Where this auxiliary or pilot lamp was to be used in the emergency only the operator had to find first the switch in the dark room before he could turn on the pilot lamp. The operator frequently had to resort to a flashlight to find the switch before he could operate the latter.

Again in those systems in which the pilot lamp or safety light burned continuously its glow or glare interfered with the projection or with the operator's ability to observe its sharpness or other conditions.

It is an object of the present invention to provide an emergency illumination which becomes operative automatically whenever a disturbance of the normal operation of an essential part of the equipment occurs, and which normally is dark or nearly so, as long as the operation of the system proceeds properly.

It is also an object of the invention to provide a system of emergency illumination without any switch being required. In many instances this switch had been positioned adjacent the picture window or shutter of the equipment. If then during the performance the operator desired to open the switch which by inadvertence he had kept closed after the operation had been resumed he had to discontinue again the operation of the equipment before access to the switch became feasible in safety.

It is an object of the present invention to locate the essential piece of the equipment, as for instance the film feed motor, or the projection lamp, or both, in one branch of the circuit of the system, and the emergency lamp in another branch, and to position in a part of the circuit which is common to both branches an element, adapted to reduce the energizing voltage in the emergency branch to an insufficient value for energizing the emergency lamp, as long as the current consuming element in the other branch is operative.

It may also be stated as an object of the invention to regulate the voltage applied to an emergency lamp of this type in dependence on the operative or inoperative condition of another piece of equipment of motion picture reproducing apparatus, to effect automatically sufficient energization of the emergency lamp when the other piece of equipment becomes inoperative, and vice versa.

With these and numerous other objects in view the invention is described in the following specification in which reference is made to the drawing.

In the drawing

Figs. 1–3 show different circuit arrangements for the automatic and alternative energization of an essential part of the motion picture reproducing apparatus and an emergency or pilot lamp.

As essential piece of equipment the drawing shows diagrammatically a film feed motor having a stationary field **4** and rotary armature **5**. This particular essential piece of equipment is shown by way of example only. The invention is applicable to a projection lamp, or to different type of motor.

The motor **4**, **5** is shown to be operatively connected in the circuit by means of a variable resistance **6** serially alined therewith and permitting the regulation of the voltage at the motor to attain the optimum running conditions. Upon closure of switch **7** the motor is connected with the terminals **1** and **2** and operation takes place.

The emergency or pilot lamp **3** also is connected with the terminals **1** and **2**, its circuit branch being parallel to that of the motor **4**, **5**. A resistance **8** is located in that part of the circuit which is common to both branches, that for the motor **4**, **5** and that for the pilot lamp **3**.

Assuming for instance that the voltage at the terminals **1**, **2** be 220 volt and that the emergency lamp **3** is built for this voltage at a current consumption of 0.068 amp. while the motor **4**, **5** is operative at a voltage of 110 volt and at an average consumption of 0.5 amp., it is obvious then that for the operation of the motor the resistance must produce a drop of voltage of about 110 volt. (The accurate regulation of the voltage for the motor itself may be effected through the variable resistance **6**.) With a resistance **8** of 200 ohms and a current of 0.5 the drop is about 100 volts. This leaves only about 120 volts for the emergency lamp, and at this voltage the lamp is not energized sufficiently to light up. But when the current consuming part **4**, **5** is disconnected the drop in voltage in the resistance is for a cur-

rent of 0.068 amp. only 13.6 volts, leaving a voltage of more than 205 for the operation of the lamp 3, which is quite sufficient.

In Fig. 2 the resistance 8 as far as it is serially connected with the essential piece of equipment 4, 5 is variable, owing to the movable contact connector 9 being interposed between it and the motor.

In Fig. 3 the resistance 8 as far as it is serially connected with the emergency lamp 3 is variable, owing to the movable contact connector 9 being interposed between it and the lamp.

Where the emergency lamp 3 is a lamp operating on low voltage, as for instance 20 volts or 4 volts an additional resistance 19 of suitable throttling value may be serially connected with it, or if the current at the terminals 1, 2 is alternating current the low voltage lamp may be energized through the secondary of a suitable transformer, as may well be understood.

While reference has been made to motion picture reproducing systems it is obvious that this automatic emergency device also readily lends itself to sound-film reproduction, as for instance to light up the sound reproducing equipment when an essential part thereof should become inoperative.

I claim:

In a system of the character described, the combination with an electric motor of a motion picture reproducing machine and a manually operable switch for controlling the operation of said motor, of a pilot lamp in a circuit arranged in parallel to said electric motor and said switch, and means in a portion of the circuit which is common to said electric motor and said pilot lamp for producing during the operation of said electric motor a voltage drop of sufficient magnitude to prevent an operation of said pilot lamp, the voltage applied to said pilot lamp when said motor is rendered inoperative being such that the pilot lamp is automatically energized to full luminosity.

RUDOLF KUHNERT.