

# UNITED STATES PATENT OFFICE

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## SYNCHRONOUS CONTROL OF COLOR SCREENS

Application filed June 20, 1929. Serial No. 372,282.

This invention pertains to the control of color screens in connection with the illumination of theatre stages.

Spot lights for such work are usually equipped with a number of color screens adapted to be selectively placed before the light in order to provide the desired illumination color effects.

Devices have been used heretofore by which the operator was enabled to manipulate the screens from a distance, as for instance when the lights were at the back of the auditorium and the operator on the stage. Such devices have usually been operated electromagnetically, a solenoid at the light being energized to actuate a screen whenever the operator would close a switch. Great difficulty has been encountered in securing dependable operation of such arrangements because of fluctuating line voltage, dusty contacts, noise of solenoids when used with alternating current, noise and breakage of screens due to slamming, etc. These troubles were multiplied when it was necessary to actuate screens on several spot lights simultaneously, as is often required.

The object of the present invention is to overcome all the above difficulties by the use of the Selsyn control system. This system consists of a motor and generator which are some respects like three-phase induction motors, but have shuttle wound rotors with definite poles whose windings are connected by slip rings to a single phase, alternating current source of excitation. The generator is located at the point of actuation and the motor at the point of reception. When the generator is turned by the operator the motor turns synchronously therewith in the same direction, at the same speed, and through the same arc. This system is well known and is not claimed per se but only in connection with mechanism adapting it for the purpose intended.

Further and other objects and advantages will be apparent from the specification and claims, and from the drawings which show by way of illustration what is considered the preferred form of the invention.

Fig. 1 is a side view of a spot light with

four color screens each operable by a Selsyn motor.

Fig. 2 is a front view of the spot light and screens, on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary detail on the line 3—3 of Fig. 4.

Fig. 4 is a cross-section on the line 4—4 of Fig. 1.

Fig. 5 is a cross-section on line 5—5 of Fig. 1.

Fig. 6 is a wiring diagram including the generators and lights for giving a visual indication to the operator as to the positions of the screens.

In the drawings, 10 is the spot light, to the side of which is bolted a box-like housing or frame 12 which supports the entire control mechanism. Four screens 14 are shown, each being secured by a clamp 16 to one of the concentric shafts 18, 20, 22, 24, which are supported for rotation in brackets 26 on the upper part of frame 12. Each screen is balanced about its axis by a counterweight 28 on the opposite side of its shaft.

Mounted on frame 12 are four Selsyn motors 30, the shaft 32 of each motor being provided on its upper end with a bevel pinion 34 engaging a bevel gear 36 fast on one of the shafts 18, 20, 22, 24 in such manner that when any motor 30 rotates its shaft 32, one screen shaft is rotated and the screen attached to the other end thereof is also moved. Fig. 3 shows gear 36 secured to hollow shaft 18 by means of sleeve-like clamp 38.

The Selsyn generators 40, shown in Fig. 6, are each provided with a knob 42 by means of which the generator rotor is rotated by the operator. The rotor of each generator 40 is wired to the rotor of each motor 30 by three wires 44 and the three wires 46 leading therefrom. Line wires 50 are connected to motor and generator by wires 52. With this arrangement, whenever the knob 42 on any generator is rotated through any given arc, the motor 30, wired to that generator will turn through the same arc and the particular screen geared to that motor will be moved.

It will be apparent that the above described arrangement provides very convenient means for moving the screens from op-