

reactance in the transformer you will maintain reasonably constant d-c. output under wide variations of a-c. voltage. A 10-volt variation in a 220-volt line might cause a variation of only 0.5 to 1 volt in d-c. output. Some very recent developments using highly reactive transformers are better than that.

MR. THOMAS: What happens when we strike the arc? Does the voltage jump, and then return to the proper value for operating the arc?

MR. KOTTERMAN: To answer your question completely and accurately it would be necessary to put an oscillograph on the output of the rectifier.

However, I have measured the current at the instant of striking the arc, and have found it to be of the order of 200 amperes. However, that only lasts but a fraction of a second, and immediately the carbons are separated the current and voltage return to normal.

MR. FIFERLIK: Is the rectifier likely to heat up if connected when the arc is not burning?

MR. KOTTERMAN: The rectifier for the projection arc or any other heavy-current application can withstand normal line-voltage input without suffering damage in any way. The leakage current of the copper-sulfide rectifier is much higher, of course, than that of the copper-oxide rectifier, but is not high enough to result in any dangerous temperature.

MR. DASH: With regard to "useful life," I should like to mention that there are motor-generator sets in operation in theater service that have had 20 years of useful service, and are still operating well. The presence of rotating parts does not limit the life of equipment if the equipment is well designed.

MR. CUTHBERT: Is there any disadvantage in breaking the d-c. circuit instead of breaking, as you normally do, the a-c. rectifier circuit?

MR. KOTTERMAN: It is more desirable, of course, to break the a-c. circuit because it is more sensitive to excess voltage than other types of contact rectifiers. But as I have said, we endeavor to engineer into each rectifier application the correct electrical characteristics so that if you do break the d-c. side or operate it under other circuit conditions, it will stand such operation without harmful results.

AUTOMATIC EMERGENCY SHUTTER SWITCH FOR THEATER FAN AND LIGHT CONTROL*

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Everyone in the industry is impressed with the special fire hazards incident to the use of nitrocellulose film, and many precautions are taken for the abatement of fire and panic hazards in theaters. Herein is described a recent and very important development designed to control film fires in projection rooms by the installation of an automatic emergency control switch in addition to the usual

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manually controlled switches. This automatic switch is installed on the front wall of the projection room and is connected with the automatic shutter control

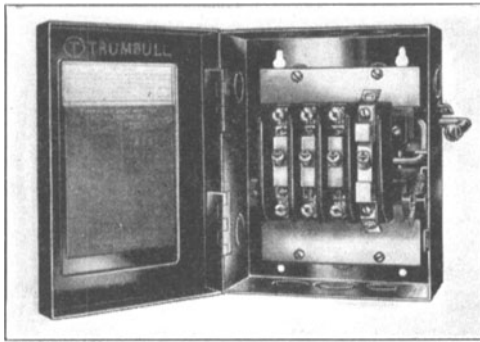


FIG. 1. Automatic emergency shutter switch for theater fan and light control.

operated by the melting of a fusible link so that in the event of fire the action is automatic, instantaneous, and positive.

This development was primarily instigated by the Inspection Department of the Connecticut State Police, who have felt for some time that there was a def-

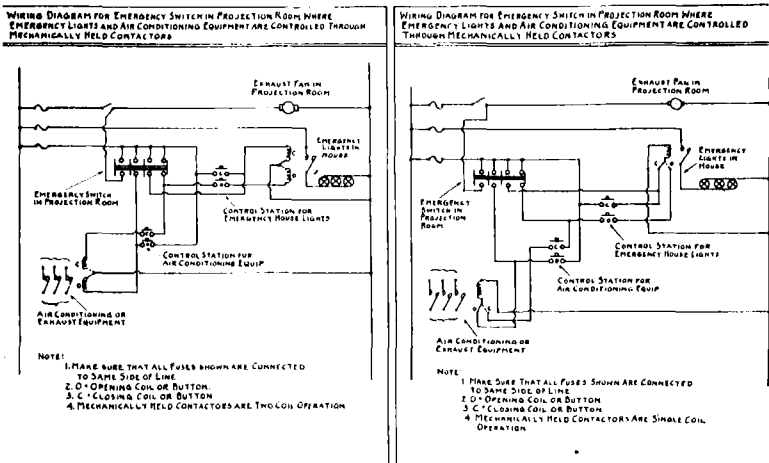


FIG. 2. One of many possible arrangements of the switching circuits.

nite need and requirement for a safety device of this type. This Department spent considerable time and effort in study and experimental work on the problem, with the primary objective of producing a device that would speed up emergency

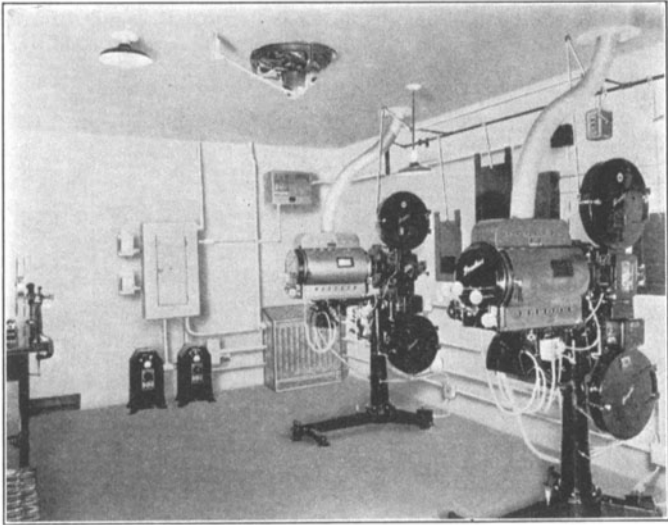


FIG. 3. Projection room layout.

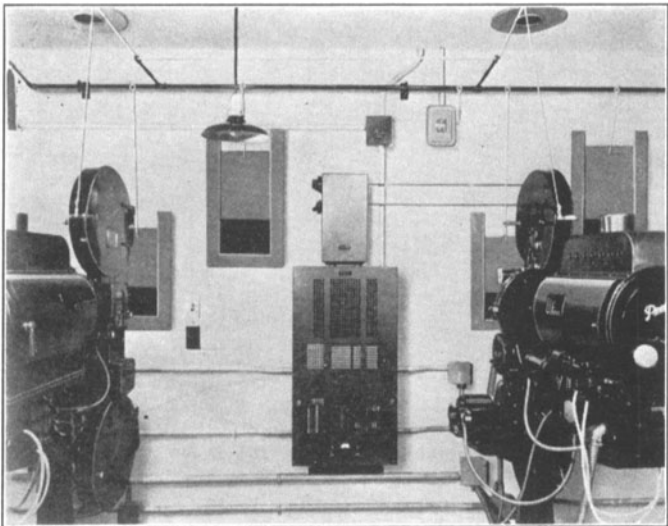


FIG. 4. Projection room layout.

action. They felt that this function was of such importance that it should operate automatically in the time of need without the hazard of human element.

As a result of this study, and after further experimental work on this problem, the Trumbull Electric Manufacturing Co., of Plainville, Conn., have developed a switch that will meet the needs and requirements for this particular application. The device is a four-pole, no-fuse, manually or automatically operated switch, with one normally closed and three normally open contacts. The construction of the switch can be varied to suit local needs and requirements, both in the number and arrangement of the poles. Its construction is flexible enough so that it may be incorporated in the wiring layout of any theater and may be used in combination with present existent equipment. The switch is shown in Fig. 1, and a representative arrangement of it is shown in Fig. 2.

Briefly, some of the duties and functions that this switch will perform are as follows:

- (1) Start projection room exhaust fan.
- (2) Throw on auditorium lights to their full brilliancy. Where the auditorium lighting is controlled through dimmers, the switch can be connected to the cut-around switch so that it will operate regardless of the position of dimmers or control switches.
- (3) To stop all auditorium supply and exhaust fans.
- (4) To stop the operation of air-conditioning equipment in compliance with local codes.
- (5) To stop the operation of oil burners, principally those utilized in heating the auditorium or assembly hall.

This switch will prevent the operation of any or all of the above equipment from any point on the premises until such time as the shutter switch has been reset to its normal position.

In many instances, it is practically impossible for a man to work in a projection room with the projection room exhaust fan on, especially in the winter time. Through the medium of this device, it is possible for him either to put in a speed regulator or shut off the fan if the draft becomes too severe.

The purpose of incorporating the control of house lights on this device is to prevent a panic, and should one of the projection room shutters fail to close, would prevent glare at the time of fire. It is also quite desirable, in most cases, to stop the operation of the house ventilator in case of fire, because in most instances, the exhaust in the auditorium is likely to be greater than in the projection room and if any of the shutters fail to close, all the smoke and flame would automatically be drawn into the auditorium.

When the auditorium ventilator is shut down, the port opening would become an intake, instead of an exhaust.

In a good many cities, especially in Connecticut, fire marshals require an emergency switch in the ticket booth to shut down all heating, refrigeration, and air-conditioning equipment in case of fire. For this reason, provision has been made on this emergency switch to provide control for this type of equipment.

Figs. 3 and 4 show projection room layouts incorporating the switch.