

Report of Committee on Electrical Devices

Society of Motion Picture Engineers

YOUR Committee wishes to report that its field of activity has been very much limited by reason of other Committees already functioning. Many communications have been sent out and every effort has been made to collect data on electrical developments during the past year with very little success. Most of the developments antedate the beginning of the past year and the only developments which the Committee has found feasible to describe are:

- (a) Arc controls,
- (b) Generating equipment.

The Committee has appealed to the membership for information and the following is a collection of the data secured.

ARC CONTROLS

Arc controls may be listed in three classes: Double motored, single motored, and mechanical.

Double Motored

This type consists of two similar motors connected through differential gearing, the central gear of the train being connected to the arc feed handle. One of the motors is connected across the line and the other across the arc terminals. The proper carbon setting is selected and the speeds of the two motors made identical by a rheostat in series with the one placed across the line. Once this adjustment has been made there will be no movement of the carbons as long as the voltage across the arc gap remains unchanged. When this voltage does change, the speed ratio of the differential will cause a movement of the arc feed shaft and the arc gap will be altered either one way or the other until normal conditions have been restored.

The double motored type makes it possible to have the striking of the arc carried out automatically, without attention on the part of the projectionist beyond the throwing of the switch. The double motored arc control is typified commercially in the Simplex.

Single Motored

In the case of the Peerless, the device consists of a make and break mechanism connected across the arc terminals which, in turn, starts and stops the motor driving the arc feed shaft. A solenoid is connected in series with the arc through a suitable rheostat. The armature is held away from the contact points by the magnetic force of the solenoid but when the current through the solenoid decreases due to the increase in arc length, and consequently the arc voltage, the tension of the spring overcomes the magnetic motive force and the armature is pulled over against a contact point which establishes the motor circuit. The gearing between motor and arc feed shaft is in the ratio of about 800 to 1 so that a considerable number of revolutions of the motor are required to revolve the feed shaft a sufficient number of times. As soon as the current across the arc increases to the correct amount, the tension of the spring is overcome and the

motor circuit is broken. This device can be used only on direct current installations.

Still another single motor controller is the Speedco. The motor used with this controller is shunt-wound, the fields being connected across the incoming line while the armature is connected across the arc terminals. A centrifugal clutch between the motor and the feed mechanism allows the motor to run free until such time as the arc voltage becomes too high. When the arc voltage rises to too high a value, the centrifugal clutch operates, thereby allowing the motor to drive the arc feed mechanism directly. As soon as the arc has been shortened enough to reduce the arc voltage to the proper value, the motor speed, having decreased, the centrifugal clutch disengages and no further feeding takes place.

The Mechanical Type

The action of the mechanical type of arc controller differs from that of the other makes by the fact that its operation is in nowise affected or controlled by the variations in current or voltage at the arc. The mechanical control is usually connected to the projector motor in some way so that whenever the motor is in operation, the carbons are fed together at a continuous rate by means of a flexible shaft extending from the motor attachment to the arc feed handle. Once adjusted this device will continue to operate at the same rate as long as the motor turns. The Tepico arc feed is of this type.

GENERATING EQUIPMENT

Two different types of apparatus have been developed for obtaining direct current for use with arc projectors, namely, the constant voltage type and the constant current type. The constant voltage generator is substantially the same type as that used in power plants, namely compound wound machines in which the series winding assists the shunt field. The Westinghouse equipment is an example of this type. This type of generator permits the use of several projectors or spot lights at the same time.

Several types of constant current generators are on the market at the present time. In one case regulation is produced with a generator similar to the constant voltage machine with the exception that the series field is connected in opposition to the shunt winding. The Compensarc manufactured by the General Electric Company is an example of this type.

A similar performance is obtained in another way, namely, by shifting the brushes so that the armature reactions demagnetize the shunt fields. The Transverter is an example of this type. This type of device permits of the starting up and warming of a second arc and the dissolving of one picture into another without appreciable fluctuations.

The new Mazda C lamp and electrical control apparatus are described in Mr. Halvorson's paper and are therefore not treated of here.

W. F. LITTLE, *Chairman.*

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