

Artificial Illuminants for Use in Practical Photography-cinematograph Work. C. E. K. MEES. (*Proceedings of the Illuminating Engineering Society*, September 20 to 23, 1915.)—In moving-picture studios a considerable amount of light is necessary, owing to the speed at which the pictures are taken, the exposure being only $1/40$ of a second with an aperture of about F/8. The average stage, including an area of perhaps 240 square feet, requires about 60 kilowatts of illumination, and a typical arrangement of lights will consist of 40 to 50 kilowatts expended in mercury-vapor lamps or quartz arcs arranged about 12 or 15 feet above, as a roof to the stage, and down one side to a distance of about 3 feet from the floor, and about 12 kilowatts used in some form of arc, conveniently a flame arc about 10 feet in front of the stage and the same distance from the floor. Such an arrangement is typical of many of the stages used by the large producers of moving pictures in this country, and the importance of artificial illumination in this work can be realized when it is understood that many producers will have six such stages working at one time.

Concerning Aluminum Pistons. ANON. (*The Horseless Age*, vol. xxxvi, No. 9, October, 1915.)—It is sometimes argued that, since aluminum has a very much higher heat conductivity than cast iron, an aluminum piston will not get nearly as hot as a cast-iron piston under similar service, and that consequently, although the coefficient of expansion of aluminum is much greater than that of cast iron, not much more clearance between piston and cylinder need be allowed with aluminum pistons than with the old kind. Extended experience, however, shows that this theory is entirely wrong. It does not seem logical that an increase in the heat conductivity of the piston material should make any important difference in its temperature, because any slight reduction of the temperature of the piston head would result in a corresponding increase in the temperature difference between the burning charge and the piston and in greater heat absorption by the piston. Moreover, the dissipation of the heat absorbed by the piston depends much more on the low conductivity of the oil film separating piston and cylinder wall than upon the conductivity of the piston material. Hence it seems reasonable to suppose that the working temperature of the aluminum piston will be substantially the same as that of a cast-iron piston, and that the clearance allowances must be nearly in proportion to the coefficients of expansion of the two metals, not absolutely, because the piston must not become an absolute fit in the cylinder at working temperature, as then there would be no room left for the oil.

One objection sometimes raised against aluminum alloy pistons is that the rings are harder than the metal of the grooves in which they fit, and that consequently the grooves soon wear. Whatever the explanation may be, experience here again is said to show that the rings wear before the groove.