COMMITTEE ACTIVITIES

REPORT OF PROJECTION AND SOUND REPRODUCTION COMMITTEE*

Education.—The committee feels that the Society will be interested in the following activities, all of which have for their main purpose the circulation of information pertaining to projection and sound reproduction to projectionists through the world.

The American Projection Society has chapters in all the principal cities of America. Its purpose is to disseminate information on projection and sound to its members at regular individuals. The RCA School, conducted in New York City, enrolled over six hundred projectionists from New York and the surrounding area. A handbook is now available which incorporates the essentials of this course and is supplied with new equipment installed by that corporation. The Projection Advisory Council organized only two years ago now has an international membership and has selected as officers regional vice-presidents from the ranks of the best-known projectionists in the United States, Canada, the Canal Zone, and Great Britain. Its most important activities are bringing to the attention of projectionists the publications of the Society of Motion Picture Engineers, the American Projection Society, the Academy of Motion Picture Arts and Sciences, and all other sources of technical development and information which are helping to raise the standards of projection. The Kaplan Projection Society, consisting of members of Local 306 of New York City, is organized for educational purposes only. This society meets twice a month with a regular attendance of from four hundred to six hundred projectionists. Similar societies are conducted by the majority of the Locals of the I. A. T. S. E. & M. P. M. O. of the United States and Canada.

Standard Release Print Make-Up and Practice.—Mr. Lester Cowan, representing the Academy of Motion Picture Arts and Sciences, appeared before the committee in connection with the approval of a

* Presented at the Fall 1930 Meeting at New York, N. Y.

Standard Release Print Make-Up and Practice. The committee wishes to recommend that the proposed standard be adopted by the Standards Committee with what minor changes may be found necessary after being put into actual practice.

Design of Projection Rooms for Sound Reproduction.—Some very complete and elaborate designs for projection rooms were submitted to the committee for consideration by Mr. J. H. Goldberg. These plans and layouts were very comprehensive, including what would be considered an ideal up-to-date layout for small, medium, and large theaters. It was decided to turn this material over to the new committee which will report at the Spring Meeting in Hollywood, California.

Fire Prevention for Motion Picture Projectors.—Most fires in motion picture projectors are caused by stopping or packing of film at or near the aperture when exposed to the intense beam of light from the illuminant. An ideal device to prevent fire in a motion picture projector should function when any of the following conditions occur:

Jamming of the mechanism due to lack of proper oiling
Broken gears or parts
Failure of take-up mechanism
Interruption of motive power due to broken belts or chains
Failure of clutch
Blowing of fuses
Extreme drops in motor supply voltage
Poor condition of film
Film breaks
Running off sprockets
Loose patches
Torn sprocket holes
Improper threading

A device which will give complete protection against the hazards in a motion picture projector by making impossible any stoppage of the film in the beam of light for a period longer than 0.1 second should operate within that space of time, first cutting off the light beam, and then stopping the mechanism. This can be done by a remote-control system which would detect any of the above dangerous conditions and function so quickly that ignition could not occur. A device of this character should consist of a light douser, a motor control relay, two film switches, and a rotary switch.

The douser should be mounted on the cone of the projector lamp and be equipped with a douser plate mounted on one end of a lever

which could be rotatably held in the unit. In order to operate the projector, the lever could be turned through one quadrant, lifting the plate clear of the light beam. The latter should be held in suspension by a well-designed, high-speed release mechanism. A pair of contacts should be arranged so as to energize the motor control relay as the plate is being turned through the first five degrees. A stop should also be arranged to prevent running of the plate beyond 10 degrees until a predetermined film velocity has been attained. This stop could be controlled by a no-voltage release coil in circuit with the film and rotary switches.

The film switches should be connected in series with the douser no-voltage release coil. Any interruption or derangement of the film during its passage through the projector would cause instant operation of these switches, whose function would be to de-energize the no-voltage coil and cause the douser plate to fall in the path of the light when a fire hazard occurs due to poor condition of the film. These switches should be equipped with contacts of pure silver to avoid difficulties due to corrosion. Various arms and rollers should be placed in loops and other strategic places, mechanically connected to the film switches so as to function at the proper moment.

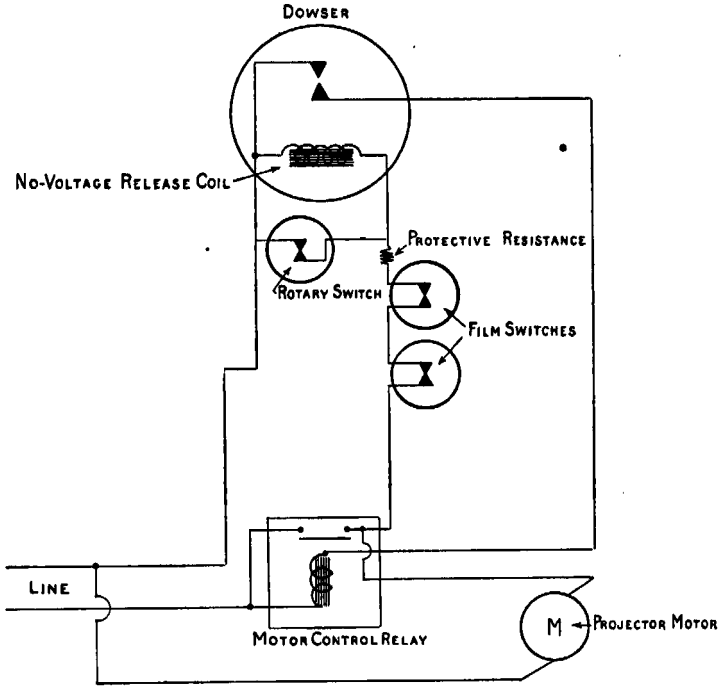
The rotary switch should be driven direct from the projector mechanism and should be designed to short-circuit the no-voltage release coil through a protective resistance until the projector accelerates to a speed at which it will pass film at the rate of 50 feet per minute. The contacts in this switch should open and allow the no-voltage release coil to hold the douser open for any speed above 50 feet per minute. When the velocity decreases to 50 feet per minute the contacts should close, short-circuiting the no-voltage release coil and thus cause the douser plate to fall.

The motor-control relay should be equipped with contacts and blow-out coils of sufficient capacity to successfully interrupt a current equal to that obtained when the rotor of a $^1/_2$ hp. motor is stalled. This device should be designed to meet the requirements of the Underwriters' Laboratories.

Theater Acoustics.—The committee recommends that the exhibitor should first look to the manufacturer of his sound equipment for acoustic analysis and acoustic recommendations for his theater. If the manufacturer has no consulting service to offer, he should go either to a recognized acoustic consultant or to a manufacturer of acoustic materials having a staff of acoustic experts. The committee

strongly advises every exhibitor to have his theater acoustically analyzed in every case, and to have it treated wherever there is economic justification.

Analysis of Quality Losses.—In approaching the subject of the analysis of quality losses an attempt has been made to group these losses into various classifications. In grouping such factors so closely related to one another, it is obvious that some overlapping will occur,



Suggested circuit for protective switches and relays.

and consequently several different groupings have been prepared. It seems likely that further study of this subject might make it possible to arrange these items into a more acceptable form than as presented at this time.

In the accompanying résumé four main causes are listed for the poor quality sometimes encountered during projection.

PRINCIPAL FACTORS AFFECTING REPRODUCTION QUALITY

1. *Wave-form distortion.*
   (*a*) Distortion caused by overloading:
      Overload during recording.
      Effect of poor prints.
      Overload of photoelectric cell.
      Overload of photoelectric cell amplifier.
      Overload of power amplifier.
      Overload of loud speaker units.
   (*b*) Distortion caused by irregular film motion:
      Regularly recurrent changes in film speed causing pulses.
      Irregular changes in film speed causing flutter.
      Changes in amplitude causing modulation.
2. *Frequency discrimination.*
      Discrimination introduced during recording.
      Effect of poor prints.
      Effect of sound-optical system.
      Effect of photoelectric cell and couplings.
      Discrimination in amplifiers.
      Discrimination by loud speakers.
      Discrimination by screens.
      Effects of acoustics of theaters.
3. *Improper reproducing volume.*
4. *Extraneous noises.*

As a further elaboration, section 1(*b*) in the above table may be subdivided as follows:

CAUSES OF IRREGULAR MOTION OF FILM

(*a*) *Eccentric motion of sound sprocket:*
   Unbalanced flywheel.
   Sprung shaft.
   Defective filter.
   Binding gears.
   Excessive end-play in shutter shaft.

(*d*) *Dirt accumulations:*
   Dirt on sound sprocket.
   Dirt on rollers and guide rollers.
   Emulsion piling up on sound gate and film tension pad.

(*c*) *Miscellaneous causes:*
   Irregular pull from take-up reel.
   Lateral motion of film at sound gate.
   Lack of pressure at film tension pad.
   Insufficiently dried or poorly lubricated prints.
   Sprocket tooth distortion.

Section 3 of the table includes a number of effects with which all are familiar, and which may be improved or eliminated by suitable or improved control apparatus and supervision. This subject was given considerable attention by the projection committee in their report last spring.

Section 4, covering extraneous noises, may be elaborated as in the table below, including noises introduced by the projection apparatus itself, in addition to ground noise due to imperfections of the film. The latter form of disturbance is, of course, one of the principal causes of certain kinds of wave-form distortion introduced by overloading of the film during recording in attempting to reduce the ground noise resulting during projection.

4. OBJECTIONABLE NOISES ENCOUNTERED IN PROJECTION

(*a*) *Continuous noises with machine not running:*
- Regular hum:
  - Improper grounds on amplifiers.
  - Defective tubes in power amplifiers.
  - Charging equipment interference.
  - Light from incandescent bulb reaching photoelectric cell.
- Irregular noises:
  - Noisy photoelectric cells.
  - Noisy vacuum tubes.
  - Noisy batteries.

(*b*) *Noises introduced by running machine without film:*
- Regular hum or rumble:
  - Microphonic sound lamps.
  - Microphonic sound lamp bracket.
  - Microphonic adjustment of sound lamp.
  - Microphonic vacuum tubes in photoelectric cell amplifier.
- Irregular noises:
  - Loose connections in wiring.
  - Poor contacts on rheostats, *etc.*

(*c*) *Noises accompanying running of film through projector:*
- Regular noise effects:
  - Hum due to light falling on sprocket holes.
  - Hum or echo due to light falling on picture frames.
  - Ground noise in film emulsion.
  - Ground noise due to accumulated oil and dirt.
  - Noise of projection machines coming directly from booth.
  - Direct sound from monitor horn, sometimes causing echo.
  - Ringing sound caused by monitor horn acting on vacuum tubes.
- Intermittent noise effects:
  - Clicks due to wax accumulations on sound track.

Clicks due to poorly-made splices.
Sounds emanating from booth during re-winding of film.

(*d*) *Miscellaneous noises:*
Interference from projection arc and automatic feed relays.
Clicks due to automatic change-over switches.
Clicks and volume changes due to sound lamp switches.

Last fall an inspection was made of six motion picture theaters, including three of the largest and most up-to-date in the country and three of moderate size. While the inspection was restricted to certain classes of defects, other defects which were present were not of an order to be particularly objectionable in those houses in comparison with other theaters employing the same apparatus. The theaters inspected were selected quite at random with no previous knowledge of their conditions.

Included as a part of this report is a résumé of the defects found. These are classified in various groups and their prevalence is given in per cent. Owing to the fact that only six houses were covered, the figures appearing on this sheet cannot be regarded as accurate averages for all houses.

RÉSUMÉ OF DEFECTS ENCOUNTERED IN SOUND EQUIPMENTS IN SOME OF THE LARGEST MOTION PICTURE HOUSES

	Per cent
Optical systems:	
Out of focus	27
Adjusted too near picture	73
Adjusted too near sprockets	0
In focus and properly adjusted	7
Defective vacuum tubes:	
Lack of emission in small tubes	11
Loud speaker equipment:	
Poling reversed at loud speaker units	18
Loud speaker units not operating	5
Tone lines connected to wrong units	9
Horns tilted too high	73
Horns not flared sufficiently	45
Obstructions in front of horns	9
Additional loud speaker units necessary for safe load capacity	64
Additional horns necessary for proper house coverage	18
Miscellaneous defects:	
Inability to obtain sufficient filament current	17
Objectionable projection machine noise emanating from booth	17
Manager forces projectionists to run over 90 feet per minute	17

Objectionable noise disturbances from loud speakers when sound lamp switches are operated	100
Noticeable changes in volume when sound lamp switches are operated	100

It is believed that the conditions as indicated by these figures are gradually improving, but an analysis of quality losses would be incomplete without some mention of the effects upon sound quality which are due to apparatus not being properly maintained and operated.

L. M. TOWNSEND, *Chairman*
H. W. DREYER
G. C. EDWARDS
P. H. EVANS
T. FAULKNER
J. H. GOLDBERG
C. GREENE
H. GRIFFIN
N. M. LA PORTE
R. H. MCCULLOUGH
W. A. MACNAIR
R. MIEHLING
W. B. RAYTON
F. H. RICHARDSON
H. B. SANTEE
D. F. WHITING

PROJECTION PRACTICE COMMITTEE

The third meeting of the committee was held on Wednesday evening, March 18th, in the Paramount Building, New York, N. Y.

Secretary Hopkins reported that he had obtained the code on projection rooms from the authorities in British Columbia, and Pennsylvania, and also a letter from the Fire Marshall in Vancouver relative to their methods of reducing fire hazards. The codes in question were referred to the Chairman of the sub-committee on Projection Room Standardization.

Chairman Goldberg of the sub-committee on the Planning of an Ideal Lay-out of Projection Rooms submitted a report dealing with projector spacings; the size and location of observation ports and projector ports; recommendations for projection arc conduits and conduits for sound equipment; recommendations on desirable types of projection room lighting and ventilation and the location of extra rooms.

Chairman Griffin of the sub-committee on Improvements in Projector Design, reported that as a result of the suggestion of the committee, the manufacturers concerned had decided to build a projector unit which will eliminate the necessity of shimming, whereby the projector mechanism can be slipped on and off the base as was permissible before the advent of sound equipment.

Among other matters discussed were the problems relating to screen brightness and projection angles.

Members present were: H. Rubin, Chairman, H. B. Santee, Herbert Griffin, F. H. Richardson, J. H. Goldberg, J. J. Hopkins, P. A. McGuire, Rudolph Miehling.

MEETING OF THE PROJECTION THEORY COMMITTEE*

At a meeting of the committee held at the Hotel Sagamore in Rochester on March 25, 1931, three of the regular members of the committee were absent but the meeting was attended by Mr. F. K. Moss of Nela Park, Cleveland, as an advisory member of the committee and also by Mr. J. I. Crabtree, president of the Society. Subcommittees were appointed to deal with:

(1) Summarizing the literature
(2) Non-intermittent projectors
(3) Translucent screen projection
(4) The effect of curved film gates on picture quality
(5) Distorting systems for photography and projection
(6) Methods of measuring and expressing screen illumination

There was considerable discussion of the need for research in what might be called the physiological optics of motion picture projection and of means for having that research performed.

W. B. RAYTON, *Chairman*

PROGRESS COMMITTEE**

Most of those members serving on the committee last year accepted appointments for 1931. In order that all phases of the industry would be represented more fully, the chairman recommended several additional appointments to the president both in this country and abroad. In view of the wide geographical separation of the committee members, all business has to be conducted by correspondence, making it necessary that one member, actually the chairman, be responsible for the bulk of the work of preparing the semi-annual report.

It has been found effective, however, to distribute some of the duties of the committee fairly widely among its personnel. Some idea of the distribution may be gathered from the following assignments:

* Received by the Editor March 28, 1931.
** Received by the Editor April 1, 1931.

Studio and Theater Illumination (including projection)—R. E. Farnham, E. R. Geib; Technic of Production (scenarios, direction, acting, set design, costumes, make-up, *etc.*)—M. W. Palmer (Eastern Studios), G. F. Rackett (Western Studios); Sound Recording, Camera Technic, and Special Process Photography—J. G. Frayne, Carl Dreher; Laboratory Problems—R. C. Hubbard; Sound Reproduction, Acoustics, and Television—S. K. Wolf; Exhibition Technic—H. B. Franklin; Optics and Applied Cinematography—A. A. Cook, A. C. Hardy; Statistics—F. S. Irby; Cinematography in France—M. Abribat; Cinematography in Austria—P. von Schrott; Cinematography in Great Britain—W. Clark; Cinematography in Japan—M. Ruot; Cinematography in India—H. Sintzenich. Reports were also promised by L. Busch on Germany, and F. A. Jeffery on Australia. The abstracting of technical articles from various journals is also distributed among several members of the committee. Reports have been requested from each member to be forwarded to reach the chairman from four to six weeks before the Spring Meeting. These will be digested, a card reference prepared and filed with other card references of all abstracts. The final report will then be prepared from the card references and an abridgment written for press distribution.

One of the most difficult problems of the chairman is that of securing photographs of new apparatus or developments to be used to illustrate the report. Lantern slides are also made from these to enhance the interest of the report during its presentation. It is earnestly requested that all members or friends of the society send in such photographs that may be of use to the committee. They should be mailed directly to the central office of the Society at 33 West 42nd Street, New York, N. Y.

G. E. MATTHEWS, *Chairman*

JOINT MEETING OF THE MEMBERSHIP AND SUBSCRIPTION, AND PUBLICITY COMMITTEES*

Members Present: W. H. CARSON, H. T. COWLING, J. I. CRABTREE, C. D. ELMS, F. C. ELLIS, W. C. KUNZMAN, G. E. MATTHEWS, W. WHITMORE.

At the outset, Chairman Cowling explained that the meeting

* Held at Rochester, N. Y., March 23, 1931.

was called to consider ways and means of increasing both the membership and publicity of the Society of Motion Picture Engineers. The increase in membership bears a close relation to the publicity given the Society, and the fullest coöperation between the two is therefore essential.

After a lengthy discussion, it was resolved to make the following recommendations to the Board of Governors:

(1) That the initiation fee for associate members be cut in half, and that the dues for such members remain unchanged.

(2) That the new membership certificate designed by the chairman of the Membership Committee be accepted, and that the names and grades of members be hand-lettered, and that a charge for the certificate be made to associate members. It was also recommended that a gold seal be used on the active members' certificates, and that the seal be impressed in the paper stock for certificates of associate members.

(3) That a booster circular be issued for use only for obtaining JOURNAL subscriptions.

(4) That a pocket-size handbook outlining the aims and accomplishments of the Society be issued for the purpose of increasing the membership.

(5) That sample copies of the JOURNAL be mailed to applicants to the extent of 10 per cent of the mailing list.

A large number of business matters were transacted, including the following:

(*a*) The meeting did not favor any change in the present policy toward delinquents.

(*b*) A suggestion that Junior memberships be established for applicants under 21 years of age was regarded unfavorably.

(*c*) The suggestion that a biography of members be published was regarded favorably but was held in abeyance.

SOUND COMMITTEE

A general program outlining the activities of the committee has been prepared and circulated to its members. The following is a specific listing of the matters to be considered. It has seemed expedient to have a status report prepared on each of the items by individual members, as noted. In investigating matters for standardization and projects for further consideration, however, the need for sub-com-

mittees is indicated. To that end the following selections have been made:

(1) **STANDARDIZATION**— N. M. LA PORTE, *Chairman*
M. C. BATSEL
R. V. TERRY
S. K. WOLF

(2) **STATUS REPORT**—

Directional Sound Pick-Up Devices	M. C. BATSEL
Camera Silencing	W. C. MILLER
Noiseless Recording Methods	H. C. SILENT
Set and Studio Acoustics Theater Acoustics	S. K. WOLF
Preservation of Sound Prints	R. C. HUBBARD
Sound Apparatus for the Home Sound Apparatus for Non-Theatrical Activities	R. V. TERRY
Theater Reproduction	N. M. LA PORTE
New Methods or Mechanisms (not covered above)	P. H. EVANS

(3) **ITEMS FOR FURTHER INVESTIGATION**—

Preferred Sound Track Size and Location	H. C. SILENT, *Chairman* W. C. MILLER R. TOWNSEND
Sound from Separate Film	W. C. MILLER, *Chairman* H. C. SILENT R. TOWNSEND
Volume Control in Recording	P. H. EVANS, *Chairman* M. C. BATSEL R. V. TERRY
Film Processing	R. C. HUBBARD, *Chairman* N. M. LA PORTE P. H. EVANS

The individual and sub-committee reports will be assembled into a main report to be submitted to the Society at the Spring Meeting.

H. B. SANTEE, *Chairman*