spare, this requiring about 20 sec. The defective unit can then be serviced in the shop.

Each chair is equipped with a pair of speakers which are mounted on fully adjustable side-arms, riveted to the sides of the chair. The original concept called for speakers to be invisibly mounted in the upholstery behind the viewer's head. However, serious problems were encountered because of sound interference from one chair to the next.

In an effort to solve this problem an exact cross-section of the ride tube was built at the Test Center. This cross-section was 25 ft long and was finished with the exact acoustical qualities of the actual ride. Several inches of glass fiber were used at each end to simulate the endless character of the actual ride tube.

After several experiments it was discovered that sound was bouncing off the glass wall and that this was the source of our interference. A variety of speaker positions was tried, all with similar results. The need to keep the volume low and still provide an adequate level for hearing prompted a solution that brings the speakers as near to the ear as possible.

Earphones were not considered practical for reasons of operational maintenance and sanitation. The side-arm mounted speakers represent a close approximation to earphones. One additional feature was added to the speakers as a matter of convenience. After a viewer leaves a chair the speakers remain pulled in toward the center and present a moderate hazard to the next person occupying the chair. A device was developed which automatically retracts the speakers to the sides of the chair after each trip around the ride.

Lighting equipment for the show, which was supplied by Century Lighting Co., is of the type used for television and in the legitimate theater, modified where necessary to withstand long hours of continuous use. These modifications consist of additional blowers, extra insulation of internal wiring, and extra heat filters. Special-effect discs are equipped with sealed, variable speed motors.

The show lighting is controlled by 350 autotransformer dimmers which are individually wall-mounted. These units are not interlocked and are hand operated. In practice, the dimmers were used to set levels and balance the lighting before the show opened and they are not manipulated during the show. The dimmers are Superior 1000-, 2000- and 5000-w autotransformers. The dimmer banks are located along the projector platform so that they can be reached quickly in case of emergency or for minor adjustments.

The development and production of this show was a remarkable experience for everyone connected with it. Over two years was spent in its planning and production and it was ready for the public at 10 A.M. on opening day. Without interruption and with only minor difficulties, it has been running ever since.

standards and recommended practices

Approved American Standards

Published here for your information are two American Standards approved on May 28, 1965 by the American Standards Association; PH22.4–1965, Dimensions of 35mm Motion-Picture Projection Reels, and PH22.9–1965, Specifications for Camera Usage of 16mm Motion-Picture Film Perforated Two Edges.

PH22.4 reflects several substantial changes from the earlier issue; consequently we urge the standard be examined. PH22.9 is also a revision but primarily editorial. The technical content differs in reflecting currently used rate of exposure of 18 frames per second.

Inasmuch as compliance with American Standards is purely voluntary, these standards will become truly effective if very broad publicity is given to their existence. The ASA and the SMPTE would appreciate any personal influence to promote the use of these standards where such action is appropriate and proper. Copies of the standards may be obtained for a nominal fee from the American Standards Association, 10 East 40th Street, New York City, 10016.—*A.E.A.*

Withdrawal of American Standard

On May 28, 1965 the American Standards Association also approved the withdrawal of PH22.89–1958, Scene-Change Cueing for Printing 16mm Motion-Picture Film, inasmuch as the standard is no longer being followed in the industry.—*A.E.A.*

mm Motion-Picture Projection Reels

*UDC 778.55

1. Scope

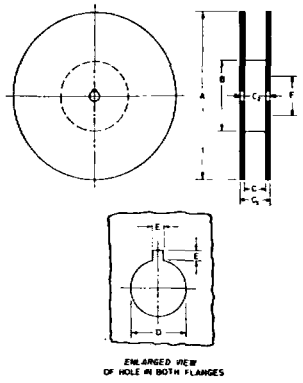
is standard specifies the dimensions of motion-picture projection reels having a l film capacity of 1,000, 2,000 and t.

is standard does not apply to shipping

2. Dimensions

e dimensions shall be as given in the and table.

mension F defines the area over which l thickness, specified by Dimension C_2,



ENLARGED VIEW OF HOLE IN BOTH FLANGES

ominal Reel Capacity eet	Meters	Dimensions	Inches	Millimeters
00	300	A	11.50 ± 0.03	292.1 ± 0.8
00	600	A	15.00 ± 0.03	381.0 ± 0.8
00	900	A	16.88 ± 0.03	428.6 ± 0.8
		B	5.00 ± 0.03	127.0 ± 0.8
		C	1.530 ± 0.03	38.86 ± 0.8
		C_1	1.885 ± 0.03	47.88 ± 0.8
		C_2	1.625 ± 0.03	41.28 ± 0.8
		D	0.317 min	8.05 min
			0.319 max	8.10 max
		E	0.156 ± 0.006	3.96 ± 0.15
		F	2.25 min	57.2 min

Appendix

ndix is not a part of American Standard Dimensions of 35mm Motion-Picture Projection Reels, PH22.4-1965, but is included to facili-.)

utside diameter of the flanges was made as permitted by past practice in the design of s, containers for reels, rewinds, and similar nt. This was done so that the value of B could as great as possible. As a result, there is less throughout the projection of a roll on the o which the film is subjected by the take-up mechanism. This is especially true if a constant-torque device is used. The film tension in a projector should be kept low to avoid perforation damage. In order to maintain low tension, it is necessary to keep the ratio of core diameter (Dimension B) to flange diameter (Dimension A) as large as possible.

May 28, 1965, by the American Standards Association, Incorporated
ociety of Motion Picture and Television Engineers, Inc.

*Universal Decimal Classification

he American Standards Association, Incorporated
New York, N.Y. 10016

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ASA1M865/50

Perforated Two Edges

*UDC 7

1. Scope

This standard specifies the position of the emulsion and the rate of exposure for 16mm motion-picture film perforated two edges, not used for sound.

2. Position of Emulsion

Except for special processes, the emulsion shall be toward the camera lens.

3. Rate of Exposure

The usual rate of exposure shall be 18 frames per second. For high-speed photography, the speed can be from 128 to 3,000 or more frames per second. In some cases, a speed of 24 frames per second is used even though sound is not being recorded on the film.

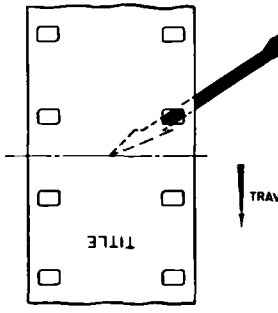

Figure shows film as seen fron camera, looking toward cam

Appendix

(This Appendix is not a part of American Standard Specifications for Camera Usage of 16mm Motion-Picture Film Perf PH22.9-1965, but is included to facilitate its use.)

Section 3, giving the usual rate of exposure as 18 frames per second, is in apparent contradiction with 16 frames per second associated with silent film speeds. In modern 16mm practice, however, 16mm film perforated along two edges is used to a large extent in the amateur field; cameras designed for the amateur are usually spring wound, portable, and not closely governed in taking speed. Variations from 20 to 14 frames per second, at least, are commonly observed. It is not customary to design amateur projectors that will reproduce exactly the taking speeds and, as a matter of fact, it has been found that, for amateur cinematography, this exact speed reproduction is not necessary. Projection at 18 frames does not detract objectionably from films exposed at 20, 16 or even 14 frames, and it has the advantages discussed in American Standard Specifications for Projector Usage of 16mm Motion-Picture Film Perforated Two Edges, PH22.10-1964.

Therefore, the camera dial setting of 16 or 18 frames per second is regarded as an aim to which considerable tolerance will normally apply. Pictures t having this speed tolerance, as well as cameras having a constant-speed motor frames per second, will show some chan ent velocity of movement when projecte per second, but this is not considered able.

For professional camera work, the fil film perforated 2R-2994. The rate of e class of work is 24 frames per second. normally used as originals from which

There are cameras used to take pictur Many of these high-speed cameras 16mm film perforated 2R-3000 which the purpose and labeled "For Use in Hi eras" even though the same emulsion at 0.2994 in. pitch for professional ca pictures from which prints will be made in high-speed cameras are generally us of measurement and prints are seldom

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