

Centennial of the Biograph Motion Picture System

By D. Karl Malkames

As this century draws to a close it would seem that the history of motion pictures is fairly well established within the time frame of the 1900s. It may surprise many to know that there is one important activity that is in operation today, much as it was 100 years ago.

The Mutoscope Camera

In 1895 Herman Casler, together with William Dickson, perfected the Mutoscope camera (Fig. 1), which used unperforated film. At the moment of exposure, the film was punched with two registration holes, one on each side of the frame. To escape infringement on the Edison patents, which specified "equally spaced perforations," the Casler camera produced studiously irregular perforations caused by the friction advance of each frame with a "beater" movement. The film in this first camera was 68mm and meant to be exhibited via the flipped cards used in hand-cranked Mutoscope arcade viewers.

The 35mm offspring of this ingenious camera was constructed in 1899 (Fig. 2a and b), and the five or six cameras completed thereafter were used by cameraman Billy Bitzer to film many of D. W. Griffith's earliest productions. At this stage, the state of the art consisted of a variety of notoriously undependable perforators, cameras, and printers for which few, if any, standards were extant. Due to the perforation being performed in the camera and the printing process accomplished with the ingenious Biograph printer, the American Mutoscope and Biograph Co.* serendipitously produced pictures of unequalled steadiness.

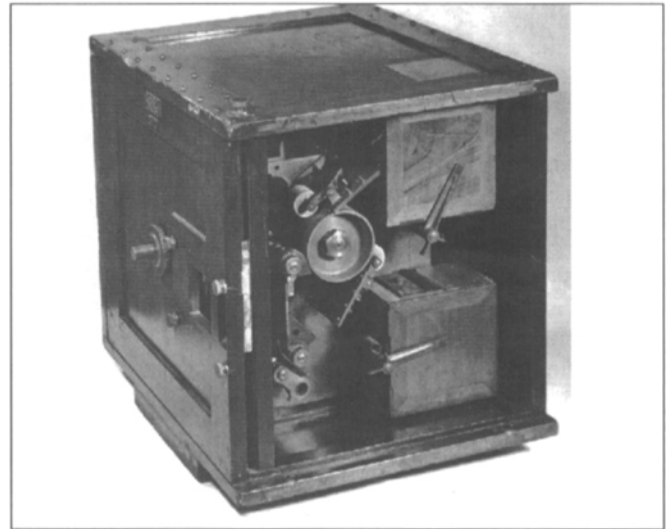


Figure 1. Interior of the 68mm Mutoscope camera (c. 1895).

The Biograph Printer

The printer, designed and built by Herman Casler, H. N. Marvin, and William Dickson at Canastota, NY in 1899 (Fig. 3), sought out the random spaced perforations with spring-loaded pilot pins that slid into position to mate with standard printing stock. Many of these precious nitrate negatives survive today in surprisingly stable condition, however, they can be printed only with the original equipment built in 1899. For the past 30 years, the only known Biograph printer in existence has been maintained and operated by Karl Malkames, Inc. It is used to strike fine-grain masters from those unique negatives, in a project for the Museum of Modern Art. This activity is perhaps the only motion picture

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*The American Mutoscope and Biograph Co. was formed by H. N. Marvin, William Kennedy Lauria Dickson, Herman Casler, and E. B. Koppmen in September 1895.

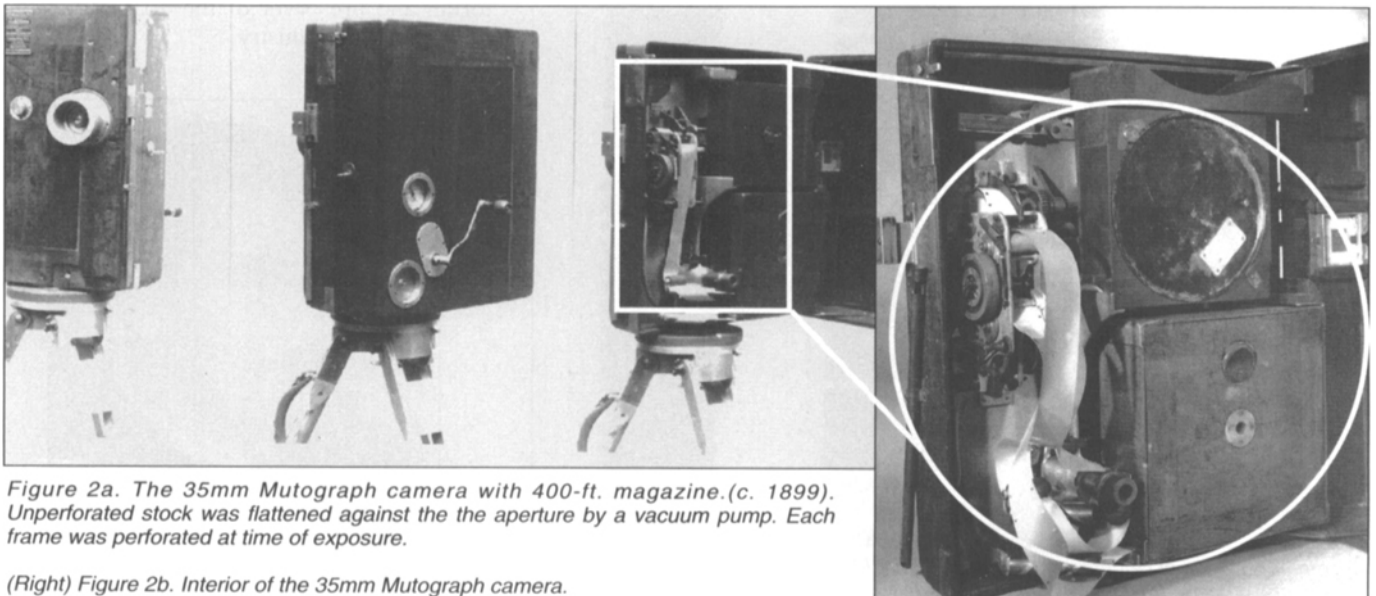


Figure 2a. The 35mm Mutoscope camera with 400-ft. magazine.(c. 1899). Unperforated stock was flattened against the the aperture by a vacuum pump. Each frame was perforated at time of exposure.

(Right) Figure 2b. Interior of the 35mm Mutoscope camera.

process that continues to this day using the same devices introduced before 1900.

The Biograph printer is basically unchanged with the exception of such modifications as the camera magazine feeding the print stock and an automatic takeup for the nitrate negative, which originally fell into a bag placed below the camera. A calibrated printing light must be monitored constantly for intensity changes, applied manually as the film advances at two frames per sec. The negative can be measured and timed only with a special friction counter and results in a print about 10% shorter in overall length.

The finished film when projected even today is far superior in terms of steadiness than any produced by Biograph competitors. In addition, the genius of D. W. Griffith along with stars such as Mary Pickford and Lillian Gish is being preserved for posterity. We may well ponder what equipment used in 1999 might still function after the next 100 years.

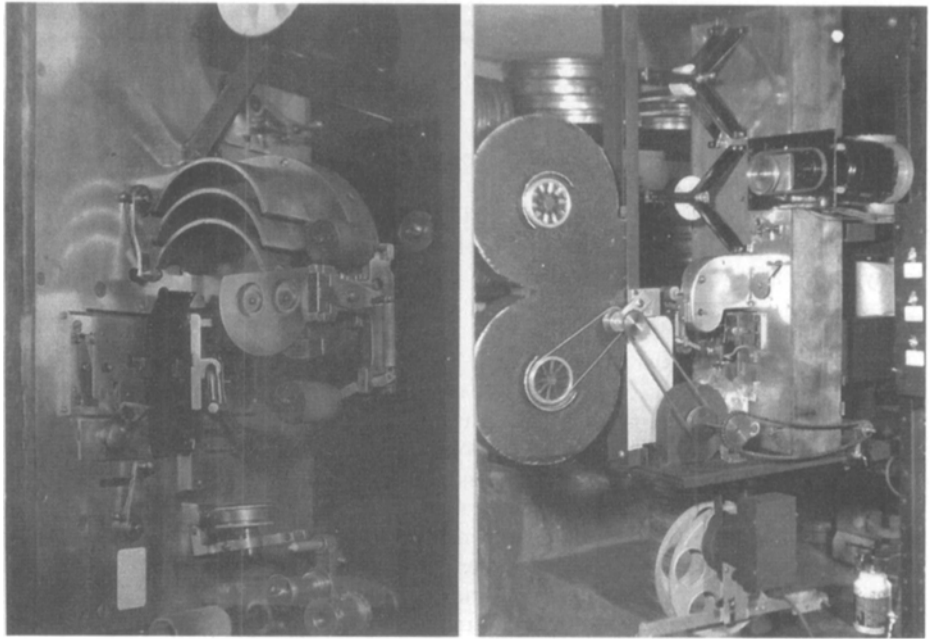


Figure 3. The Biograph printer (c. 1899).

The Author

Karl Malkames has been extremely active in the construction of equipment and techniques to solve specialized photographic problems and has contributed in the development of

custom-designed optical printers for the reproduction of archival motion pictures for the Museum of Modern Art, the American Film Institute, and the George Eastman House. He is currently the president of Karl Malkames, Inc., a company he formed in 1966 to produce a variety of films to solve numerous technical problems in the camera and film industry.

Malkames has worked as a cameraman/director of photography for Warner Bros., Pathe, Pathe Newsreel, Pathe Pictures, Inc., and as a freelance cameraman or director of photography for a number of short feature productions and commercials.

A Life Fellow of SMPTE and an active member of ASC, Malkames has presented several papers concerning camera technology to both organizations. He is an active historian and preserver of the artifacts of the motion picture industry.

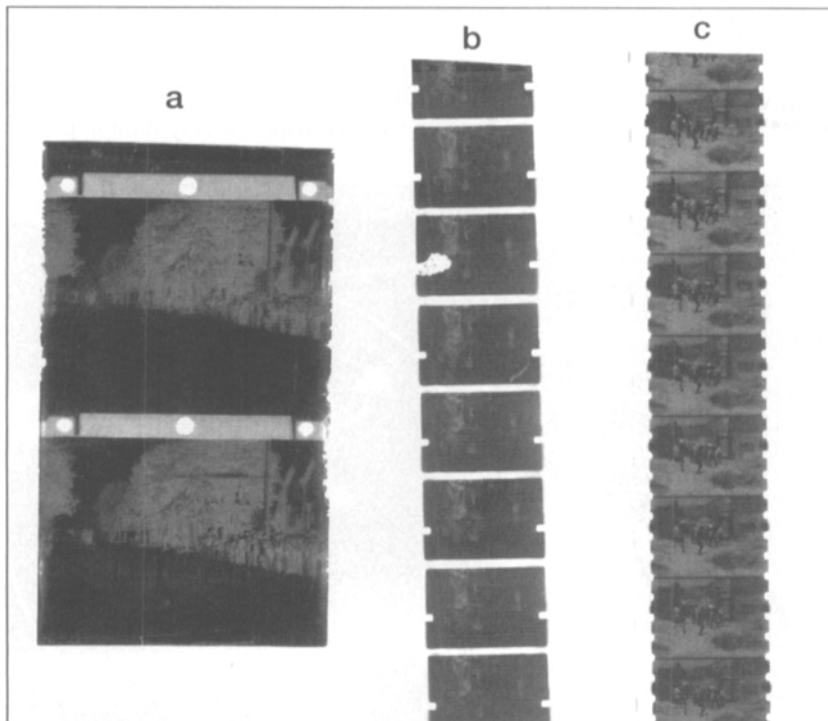
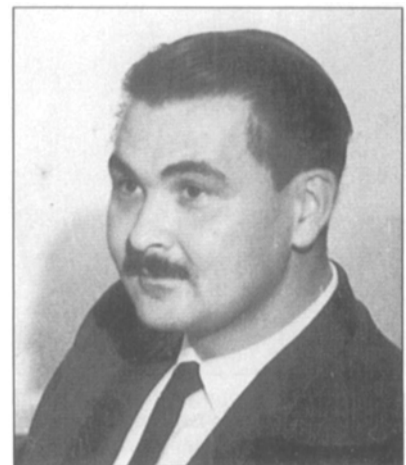


Figure 4. (a) Original camera negative from 68mm Mutograph camera; (b) from 35mm Mutograph camera; (c) contact print from 35mm Mutograph negative.



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