

PRE-CINEMA ANIMATION DEVICES

Thaumatrope (1824)
Phenakistoscope (1829)
Zoetrope (1833)
Flip Book (1868)
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Lumiere Brothers Camera (1895)
Vitascope 1895

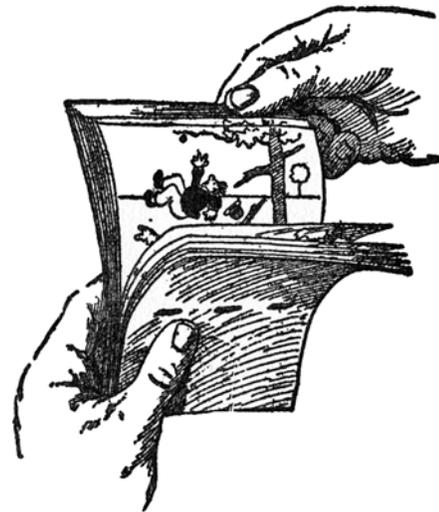
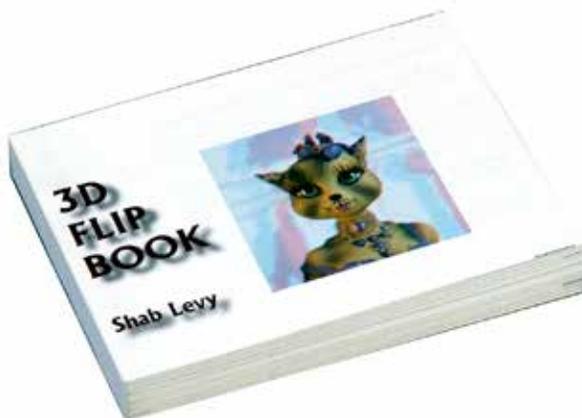
Animation

Animation is the rapid display of a sequence of images (or frames as they are called) to create an illusion of movement. The Flip Book was preceded by 3 other inventions: The Thaumatrope, the Phenakistoscope and the Zoetrope, all discussed later in this article. With the exception of the Flip Book, this condensed article shows pre-cinema inventions in more-or-less, chronological order.

1868 - The Flip Book

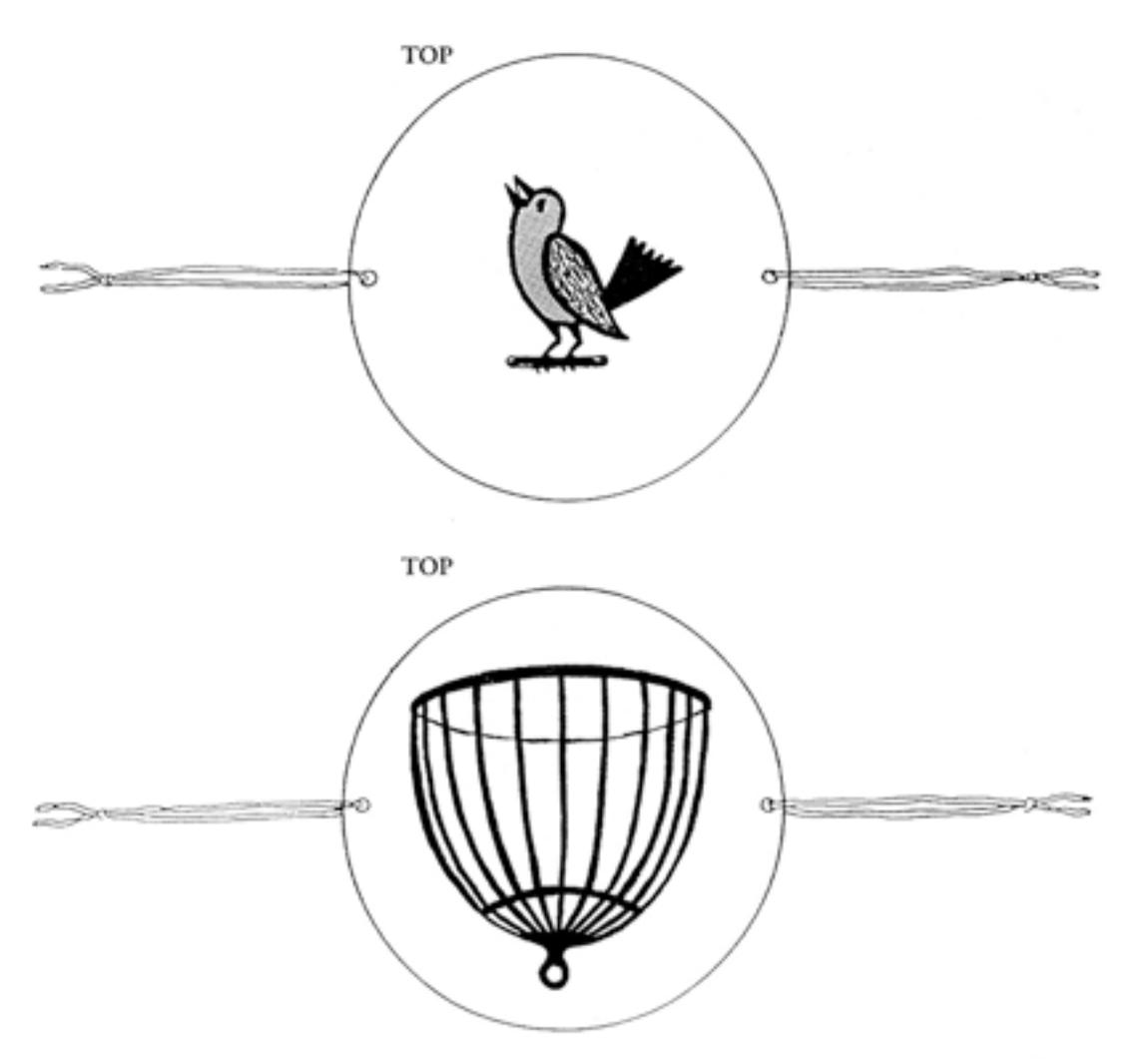
A flip book or flick book is a book with a series of pictures that vary gradually from one page to the next, so that when the pages are turned rapidly, the pictures appear to animate by simulating motion or some other change. Flip books are often illustrated books for children, but may also be geared towards adults and employ a series of photographs rather than drawings. Flip books are not always separate books, but may appear as an added feature in ordinary books or magazines, often in the page corners.

The first flip book appeared in September, 1868, when it was patented by John Barnes Linnett under the name kineograph (“moving picture”). They were the first form of animation to employ a linear sequence of images rather than circular (as in the older phenakistoscope). The German film pioneer, Max Skladanowsky, first exhibited his serial photographic images in flip book form in 1894, as he and his brother Emil did not develop their own film projector until the following year. In 1894, Herman Casler invented a mechanized form of flip book called the Mutoscope, which mounted the pages on a central rotating cylinder rather than binding them in a book. The mutoscope remained a popular attraction through the mid-twentieth century, appearing as coin-operated machines in penny arcades and amusement parks. In 1897, the English filmmaker Henry William Short marketed his “Fiscope”, which was a flip book placed in a metal holder to facilitate flipping.



THE KINEOGRAPH.

1824 - Thaumatrope



A thaumatrope is a toy that was popular in the 19th century. Invented in Paris in **1824 by John Ayrton Paris or Peter Mark Roget**, it is a disk with a picture on each side is attached to two pieces of string. When the strings are twirled quickly between the fingers the two pictures appear to blend into one due to the persistence of vision. Examples of common thaumatrope pictures include a bare tree on one side of the disk, and its leaves on the other, or a bird on one side and a cage on the other. They often also included riddles or short poems, with one line on each side. Thaumatrope were one of a number of simple, mechanical optical toys that used persistence of vision. They are recognised as important antecedents of cinematography and in particular of animation.

The coined name translates roughly as “wonder turner”, from Ancient Greek.

1829 - Phenakistoscope



The phenakistoscope invented in **1829 by Eadward Muybridge**, was an early animation device that used the Persistence of Vision principle to create an illusion of motion. The Phenakistoscope is regarded as one of the first forms of moving media entertainment that paved the way for the future motion picture and film industry.

The phenakistoscope used a spinning disc attached vertically to a handle. Arrayed around the disc's center was a series of drawings showing phases of the animation, and cut through it was a series of equally spaced radial slits. The user would spin the disc and look through the moving slits at the disc's reflection in a mirror. The scanning of the slits across the reflected images kept them from simply blurring together, so that the user would see a rapid succession of images that appeared to be a single moving picture.

A variant of it had two discs, one with slits and one with pictures; this was slightly more unwieldy but needed no mirror. Unlike the zoetrope and its successors, the phenakistoscope could only practically be used by one person at a time. The phenakistoscope was only famous for about two years due to the changing of technology.

1833 - Zoetrope

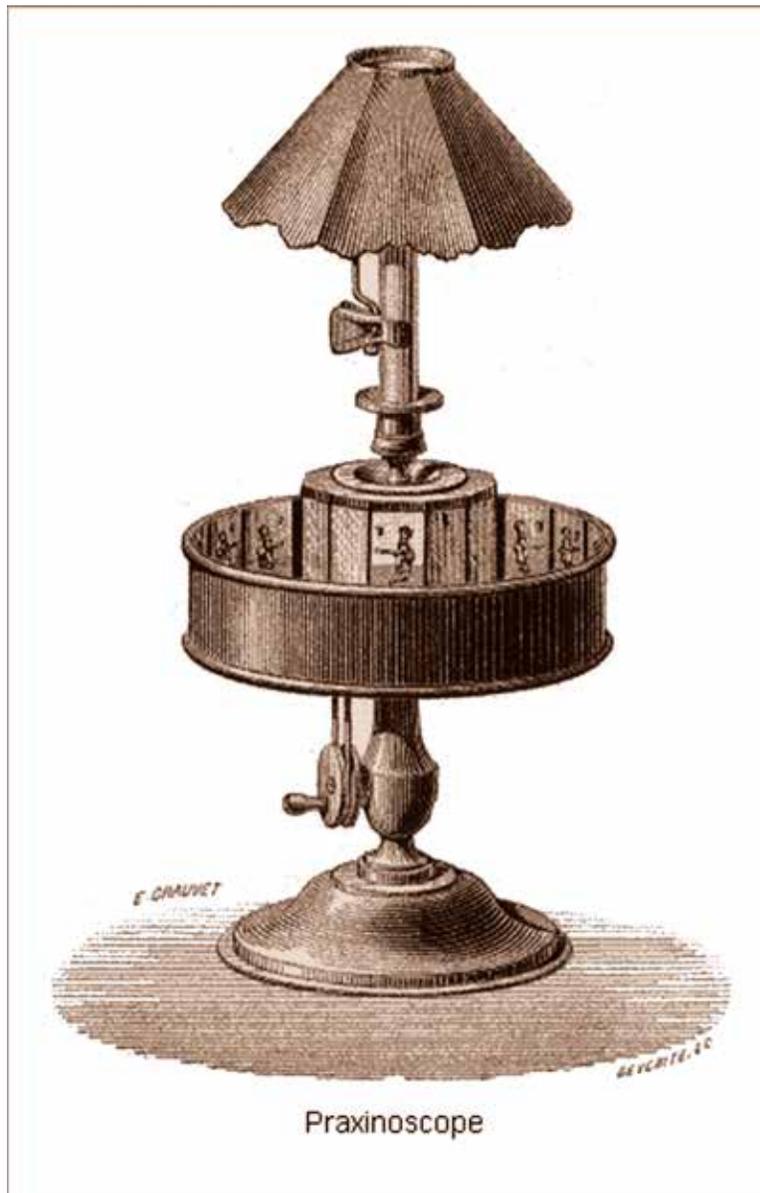
A zoetrope is one of several pre-cinema animation devices that produce the illusion of motion by displaying a sequence of drawings or photographs showing progressive phases of that motion. The name Zoetrope was composed from the Greek root words **zoe**, “life” and **tropos**, “turning” or as is commonly known as the **Wheel of Life**. **It was invented in 1833 by British mathematician William George Horner.**

The zoetrope consists of a cylinder with slits cut vertically in the sides. On the inner surface of the cylinder is a band with images from a set of sequenced pictures. As the cylinder spins, the user looks through the slits at the pictures across. The scanning of the slits keeps the pictures from simply blurring together, and the user sees a rapid succession of images, producing the illusion of motion. From the late 19th century, devices working on similar principles have been developed, named analogously as linear zoetropes and 3D zoetropes, with traditional zoetropes referred to as “cylindrical zoetropes” if distinction is needed.

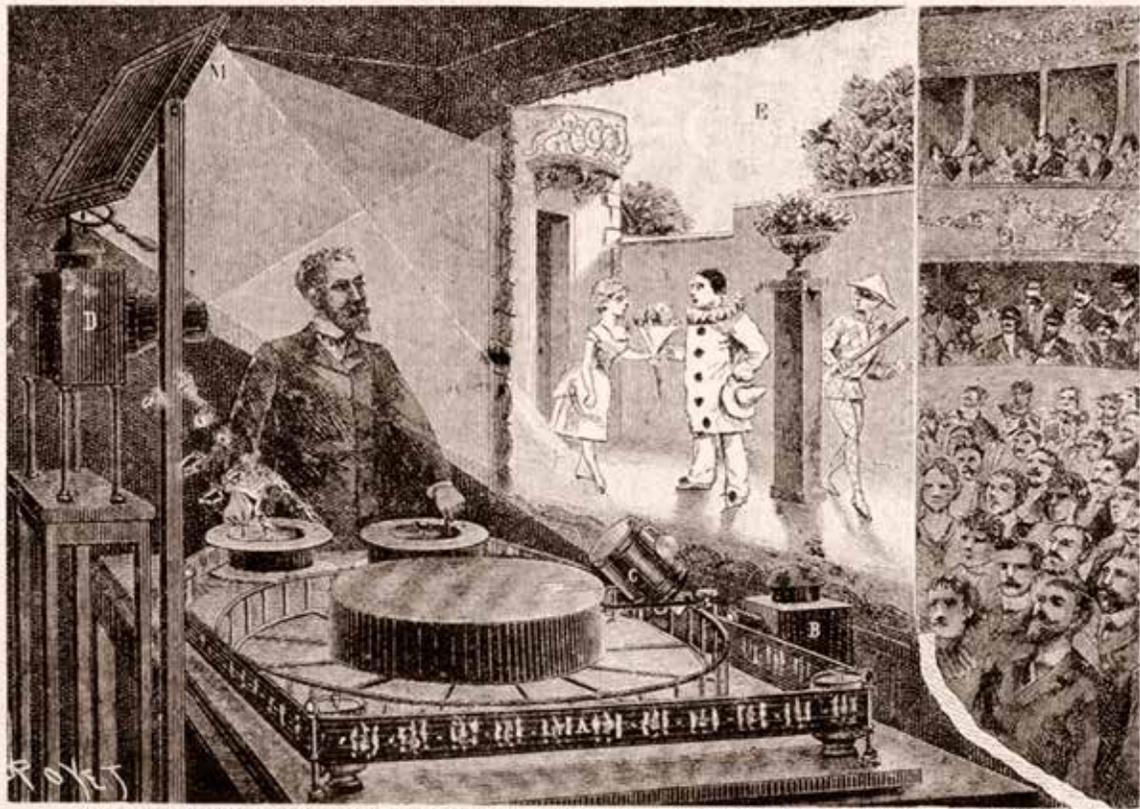


1877 - Praxinoscope

The praxinoscope was an animation device, the successor to the zoetrope. It was **invented in France in 1877 by Charles-Émile Reynaud**. Like the zoetrope, it used a strip of pictures placed around the inner surface of a spinning cylinder. The praxinoscope improved on the zoetrope by replacing its narrow viewing slits with an inner circle of mirrors, placed so that the reflections of the pictures appeared more or less stationary in position as the wheel turned. Someone looking in the mirrors would therefore see a rapid succession of images producing the illusion of motion, with a brighter and less distorted picture than the zoetrope offered.



1889 - Projecting Praxinoscope



The Théâtre Optique, 1892. This ultimate elaboration of the Praxinoscope used long strips with hundreds of narrative images.

In 1889 Reynaud developed the Théâtre Optique, a very large version of the Praxinoscope and an improved version capable of projecting images on a screen from a longer roll of pictures. This allowed him to show hand-drawn animated cartoons to larger audiences, but it was soon eclipsed in popularity by the photographic film projector of the Lumière brothers.

1879 - Zoopraxiscope

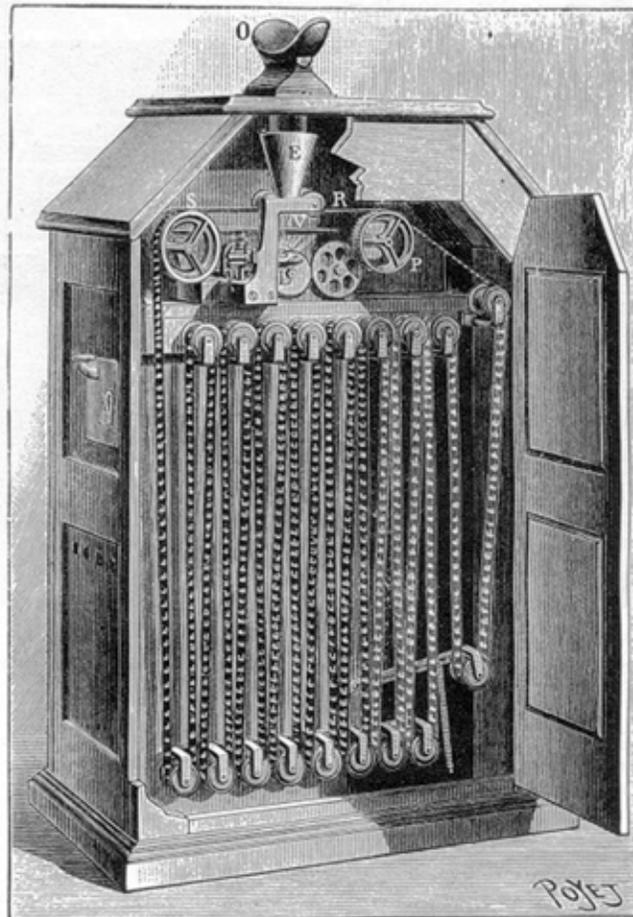
The zoopraxiscope is an early device for displaying motion pictures. **Created by photographic pioneer Eadweard Muybridge in 1879, it may be considered the first movie projector.** The zoopraxiscope projected images from rotating glass disks in rapid succession to give the impression of motion. The stop-motion images were initially painted onto the glass, as silhouettes. A second series of discs, made in 1892–1894, used outline drawings printed onto the discs photographically, then colored by hand. Some of the animated images are very complex, featuring multiple combinations of sequences of animal and human movement.

The device appears to have been one of the primary inspirations for Thomas Edison and William Kennedy Dickson's Kinetoscope, the first commercial film exhibition system.



1889 - Kinetoscope

The Kinetoscope is an early motion picture exhibition device. The Kinetoscope was designed for films to be viewed by one individual at a time through a peep-hole viewer window at the top of the device. The Kinetoscope was not a movie projector but introduced the basic approach that would become the standard for all cinematic projection before the advent of video, by creating the illusion of movement by conveying a strip of perforated film bearing sequential images over a light source with a high-speed shutter. **First described in conceptual terms by U.S. inventor Thomas Edison in 1888, it was largely developed by his employee William Kennedy Laurie Dickson between 1889 and 1892.** Dickson and his team at the Edison lab also devised also the Kinetograph, an innovative motion picture camera with rapid intermittent, or stop-and-go, film movement, to photograph movies for in-house experiments and, eventually, commercial Kinetoscope presentations.

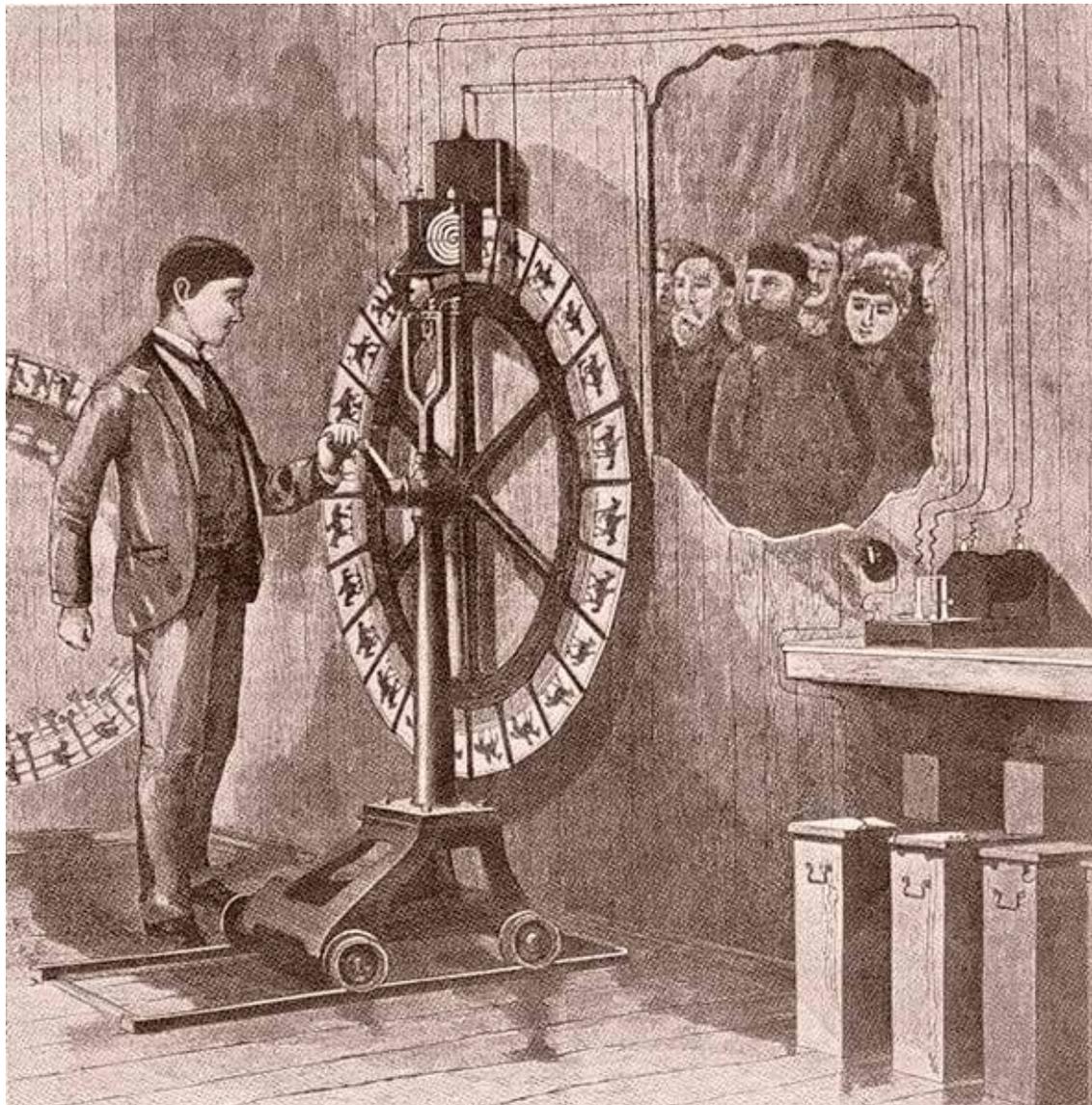


1887 - Electrotachyscope

The **electrotachyscope** is an **1887 invention of Ottomar Anschütz of Germany** which presents the illusion of motion with transparent serial photographs, chronophotographs, arranged on a spinning wheel of fortune or mandala-like glass disc, significant as a technological development in the history of cinema.

A Geissler tube was used to flash light through the transparencies to provide a weak projection to a single person or small audience through a small window.

It was first publicly demonstrated at the Chicago World's Fair of 1893.

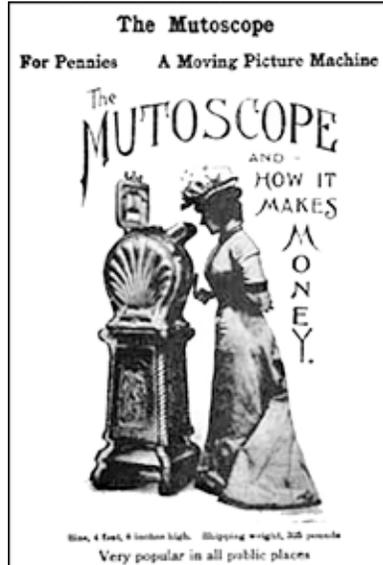


1894 - Mutoscope

The Mutoscope was an early motion picture device, **invented by Winsor McCay and later patented by Herman Casler on November 21, 1894**. Like Thomas Edison's Kinetoscope, it did not project on a screen and provided viewing to only one person at a time. Cheaper and simpler than the Kinetoscope, the system, marketed by the American Mutoscope Company (later the American Mutoscope and Biograph Company), quickly dominated the coin-in-the-slot peep-show business.

The Biograph Company, also known as the American Mutoscope and Biograph Company, was a motion picture company founded in 1895 and active until 1928. It was the first company in the United States devoted entirely to film production and exhibition, and for two decades was one of the most prolific, releasing over three thousand short films and twelve feature films. During the height of silent film as a medium, Biograph was the America's prominent film studio, and one of the most respected and influential studios worldwide, only rivaled by Germany's UFA, Sweden's Svensk Filmindustri, and France's Pathé. The company was distinguished with pioneering director D. W. Griffith and such actors as Mary Pickford, Lillian Gish, and Lionel Barrymore.

An advertisement



1895 - Panopticon - The First Movie Projector

On April 21, 1895, Woodville Latham and his sons, Otway and Gray, demonstrate their “Panopticon,” the first movie projector developed in the United States.

Although motion pictures had been shown in the United States for several years using Thomas Edison’s Kinetoscope, the films could only be viewed one at a time in a peep-show box, not projected to a large audience. Brothers Grey and Otway Latham, the founders of a company that produced and exhibited films of prize fights using the Kinetoscope, called on their father, Woodville, and W.K.L. Dickson, an assistant in the Edison Laboratory, to help them develop a device that would project life-sized images onto a screen in order to attract larger audiences.

A former Confederate officer during the American Civil War, Woodville Latham was also a chemistry professor at the University of West Virginia for a time. Together with Dickson and another former Edison employee, Eugene Lauste, Woodville came up with the so-called “Latham Loop”—a loop that was placed in the strip of film just before it entered the gate of the camera so that the projector could quickly pause to display the image and then advance the film, without pulling directly on the film strip and risking a tear. That simple innovation allowed the Lathams to film long sequences, such as an entire prize fight, on one strip of film. This was a major improvement over the Kinetoscope, whose jerky motion had tended to tear any strip of film measuring over 100 feet.

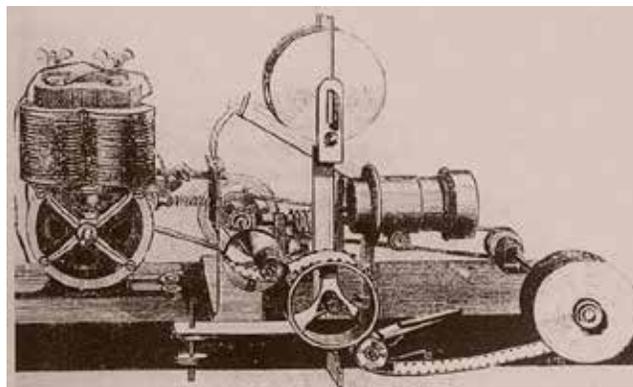
“Panopticon Rivals the Kinetoscope” read the headline over a small report in the New York Times on April 22, 1895. “Prof. Woodville Latham yesterday gave a private exhibition of the workings of what he calls a Panopticon, which is a combination of the kinetoscope and stereopticon, at 35 Frankfort Street. The effect is precisely like that of a kinetoscope, only that the pictures are much larger, and can be seen by a large number of people assembled in the darkened room.” That June, the elder Latham officially filed a request for a patent for his “Projecting-Kinetoscope”.

Inspired by a Kinetoscope exhibition in Paris, another pair of brothers, the Frenchmen Auguste and Louis Lumiere, would invent their own motion-picture projector, the cinematographe, by the end of 1895. Projected movies were first shown to paying audiences starting the following year, usually as part of a vaudeville show. The first theater devoted solely to projected movies, the Electric Theater in Los Angeles, opened in 1902. Less than a year after the Lathams’ demonstration, Thomas Armat used a method similar to the Latham Loop to develop a state-of-the art projector he would sell to Edison, who marketed the machine as the Vitascope. Even in present day Hollywood, versions of the famous loop can be found in every motion-picture film camera and projector.

1895 - Vitascope

Vitascope was an early film projector **first demonstrated in 1895 by Charles Francis Jenkins and Thomas Armat**. They had made modifications to Jenkins patented “Phantoscope”, which cast images via film & electric light onto a wall or screen. The Vitascope is a large electrically-powered projector that uses light to cast images. The images being cast are originally taken by the kinetoscope mechanism onto gelatin film. Using an intermittent mechanism, the film negatives were produced up to fifty frames per second. The shutter opens and closes to reveal new images, this device can produce up to 3,000 negatives per minute. With the original Phantoscope and before he partnered with Armat, Jenkins displayed the earliest documented projection of a filmed motion picture in June 1894 in Richmond, Indiana.

Armat independently sold the Phantoscope to The Kinetoscope Company. The company realized that their Kinetoscope would soon be a thing of the past with the rapidly advancing proliferation of early cinematic engineering. Just two years after the Vitascope was first demonstrated (1897) the technology was being nationally adopted. Hawaii and Texas were among the first to incorporate the Vitascope into their picture shows.



1890s - History of Film

The History of film began in the 1890s, when motion picture cameras were invented and film production companies started to be established. Because of the limits of technology, films of the 1890s were under a minute long and until 1927 motion pictures were produced without sound. The first decade of motion picture saw film moving from a novelty to an established large-scale entertainment industry. The films became several minutes long consisting of several shots. The first rotating camera for taking panning shots was built in 1897. The first film studios were built in 1897. Special effects were introduced and film continuity, involving action moving from one sequence into another, began to be used. In the 1900s, continuity of action across successive shots was achieved and the first close-up shot was introduced (that some claim D. W. Griffith invented). Most films of this period were what came to be called “chase films”. The first use of animation in movies was in 1899.

The first feature length multi-reel film was a 1906 Australian production. The first successful permanent theatre showing only films was “The Nickelodeon” in Pittsburgh in 1905. By 1910, actors began to receive screen credit for their roles, and the way to the creation of film stars was opened. Regular newsreels were exhibited from 1910 and soon became a popular way for finding out the news. Overall, from about 1910, American films had the largest share of the market in Australia and in all European countries except France.

The Lumiere brothers’ historic camera in Paris.



1895 - The Lumière Brothers

Auguste Marie Louis Nicolas (19 October 1862, Besançon, France 10 April 1954, Lyon) and Louis Jean (5 October 1864, Besançon, France 6 June 1948, Bandol) were the first filmmakers in history. They patented the cinematograph, which in contrast to Edison's "peepshow" kinetoscope allowed simultaneous viewing by multiple parties.

Their first film, *Sortie de l'usine Lumière de Lyon*, shot in 1895, is considered the first true motion picture in history.



