

# *Phi Phenomenon*

## Vintage Film Cameras and Projectors from The Van Veldhoven Collection

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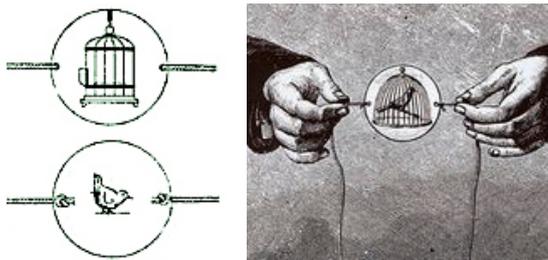
# The Phi Phenomenon

The phi phenomenon is the optical illusion of motion we experience when we see a sequence of still images of a moving object in rapid succession such as in a movie. At first, it was thought that this illusion of motion was entirely due to persistence of vision. Persistence of vision is the phenomenon by which, it is thought that an afterimage persists on the retina of the eye for 1/25 of a second. However, this only explains why we do not see black spaces between images, not why they actually are perceived to be moving. It is now thought that a great deal of the work required for perceiving motion is done by the brain. The brain has to make sense of the images captured by the eye and construct a meaningful realization of reality. The Austro-Hungarian born psychologist Max Wertheimer, one of the founders of Gestalt psychology defined this phenomenon as the *phi phenomenon* in 1912.

## Some early devices leading up to cinema

The earliest device described for showing moving images can be credited to the Chinese. Ting Huang is reported to have had such a device in 180 AD. It was called *chao hua chih kuan* (the pipe which makes fantasies appear). No drawings of it are available. Renewed interest in the 19th century in devices for showing moving images led to many new inventions that finally resulted in our modern day cinema.

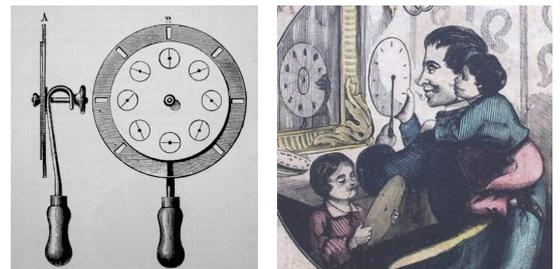
A simple toy that demonstrates persistence of vision is the *thaumatrope* (Greek: wonder turner). It is credited to



*Thaumatrope*

two British physicians, John A. Paris in 1825 and William H. Fitton in 1826. It was a disc or card with a picture, typically of a bird on one side and a cage on the other. It had two pieces of string attached to it. When the strings were twirled quickly between the fingers, the two pictures appeared to combine into a single image of the bird in the cage. Although this toy does not show animation, it relies on persistence of vision, one of the ingredients needed to create the illusions of motion.

In 1832 Joseph A. F. Plateau, a Belgian physicist invented the *phenakistiscope*. The following year, Austrian mathematician and inventor, Simon von Stampfer independently invented a similar device he called the *stroboscopic disc*. They consisted of a spinning disc mounted vertically on a handle. The disk had a series of radial drawings showing phases of an animation. It also had an equal number of radial slits cut through it. The user spun the disc and looked through one of the slits at the disc's reflection in a mirror. The sequence of drawings would appear as a moving image.



*Phenakistiscope*

An improved device commonly known as the zoetrope that allowed more than one person at a time to see the moving images was invented by the English mathematician William G. Horner in 1833. He named it *daedaleum*

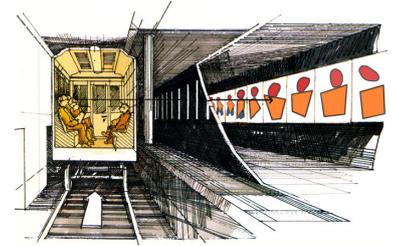


*Zoetrope*

after the skilled craftsman in Greek mythology, Daedalus who was said to have invented motion. Before Daedalus statues were said to have had arms fixed stiffly to their sides, Daedalus gave them naturalistic poses and some said power of movement. The daedaleum failed to become popular and it was not until 1867 when English, French, and American inventors patented similar devices that it became a popular toy. The American developer William F. Lincoln was the one who named his toy the *zoetrope* (Greek: zoe "life" and tropos "to turn") it was commonly known as the wheel of life. It consisted of a drum with cutout vertical slits that rotated on a spindle. A strip of paper with

drawings of cartoon figures was placed inside the drum around the lower part below the slits. The drum was spun and viewers looking through the slits would see the cartoon strips form a moving image.

The zoetrope is still in use today as a *masstransiscope*. This linear zoetrope consists of an opaque screen with thin vertical slits in it. Behind each slit is an image. Passengers sitting in a moving train and looking out of the window at the display will see the image move. Such devices were installed in subway tunnels in New York and other cities.



*Masstransiscope*

## Cinema

In 1886, 60 years after Joseph Niépce made the first photograph, Louis Le Prince shot the first motion picture using a 16-lens camera he invented. In 1888, he made a film using a single lens camera and Eastman's paper film. Initially forgotten, he is now considered by many historians to be the true father of cinematography. His work predates that of William Friese-Greene, who is also considered the father of cinematography by some. In 1891 William K.L. Dickson, an employee of Thomas A. Edison invented the *kinetographic* camera that used sprocketed film. This was the first practical movie camera and was the foundation



*Le Prince's 16 lens movie camera.*



*The World's first film poster, 1895.*

for movie cameras in the next century. By the mid-1890s, cameras and projectors by these and several other inventors found widespread use. The screening of ten very short films by the Lumière brothers at the Grand Café in Paris in 1895, where admission was charged, is considered the birth of the cinema as a commercial medium.

Since the beginning, Edison and others experimented with adding sound to their films using phonographs and gramophones. Synchronization was always a problem. In 1919 Lee De Forest was awarded several patents that led to the first optical sound-on-film demonstration in 1922 and the first commercial screening in 1923. It took several more years for *Talkies* to be accepted by Hollywood, but by mid 1930s silent films were a little more than a memory.

All movie cameras operate on the same basic principle. The film moves until a frame is in the right position. It then stops and the shutter opens to allow light passing through the lens to expose it. After a short period, the shutter closes and the film is moved to the next frame and the process is repeated. The devices for achieving this intermittent motion were ingenious and exhibited great skill and craftsmanship of their inventors.

Projectors work on a similar principle as cameras, except that now a light source in the projector illuminates the film from behind. The illuminated image on the film is controlled by the shutter and focused by the lens onto a screen. As with the camera, the shutter is only open when the film is standing still with the frame in place.

## Oldest surviving film taken on Curaçao

Between 1894 and 1912, Thomas A. Edison sent his cameramen with his newly invented portable camera around the world to film and document foreign countries. In 1903, one of his cameramen came to Curaçao and filmed a three-minute scene of Punda from the deck of a ship as it leaves the harbor. The title of this film is *Panorama of Willemstadt, Curacao, Taken from the River*. This film is probably the oldest surviving film of Curaçao and is part of the Library of Congress Paper Print Collection.



*A frame taken from the 1903 film.*

Prior to 1912 there were no clear copyright laws in place for motion pictures. In order to protect their films by copyright, moviemakers had to make contact prints of their films on paper strips and register them as photographs. The Library of Congress in the USA acquired a collection of these “paper films” spanning 1894 to 1915. This collection consists of approx. 3,000 titles that had been deposited in the Copyright Office as part of registration of motion picture productions. This paper print collection outlived the original much less durable and highly flammable nitrate films. In fact, the Edison plant consisting of 10 buildings containing his original films went up in flames in 1914.



*A Library of Congress paper print on a reel.*

## Common film sizes

Throughout the years, film came in various sizes (gauges). By the 1890s, 35 mm film mass-produced by Eastman Kodak Company soon became the dominant size because of its use in the popular Edison and the Lumière cameras and projectors. Although it is rapidly being replaced by digital technology, 35 mm is still used in today’s cinemas. As 35 mm film was too expensive for amateur use, smaller film sizes came on the market. Of these, the 9.5 mm film introduced in 1922 by Pathé Frères and the 16 mm by Eastman Kodak in 1923 gained wide popularity. The 9.5 mm film format was first used to show commercially made films to the home viewer using the Pathé Baby projector. It was later also used by various camera and projector manufacturers. The 16 mm, originally an amateur format, was extensively used for newsreels during WW2. After the war, it was accepted by professional filmmakers especially for documentaries and television. The even smaller 8 mm film introduced in 1932 became the standard for amateur home use. There were several variations including Straight 8 and Single-8. The original 8 mm film also known as standard 8, regular 8, or double 8 was actually a 16 mm film with twice the number of perforations. The film ran through the camera exposing half of the film. After the film ran in one direction, the spools were reversed and the other half of the film could be exposed. The film lab developed the film and split it down the middle. The Super 8 with its smaller sprocket size and therefore larger frame size soon took over the lead in the amateur home movie market when it was introduced in 1965.



*Various Films*

### 1. Zoetrope Model ZT1

**Manufacturer:** Fred M. Chumaceiro

**City, Country:** Curaçao

**Introduction/Production date:** 2014

**Function:** Demonstrate the Phi Phenomenon.

**Note:** Six-inch drum with 12 slots driven by a silent speed controlled electrical motor.



*Copy of an original cartoon strip*



## 2. Pathé-Baby

**Manufacturer:** Pathé Frères

**City, Country:** Paris, France

**Introduction/Production date:** 1922

**Function:** Film projector.

**Film Size:** 9.5 mm film in a cartridge.

**Accessories:** Tools necessary for lubricating and maintenance. Wooden press to splice and or glue plastic ring to repair the torn perforations in the film. Book Filmathèque Pathé-Baby catalogue of all their commercial films.

**Note:** In 1922, Pathé Frères introduced the new 9.5 mm amateur film format and the Pathé-Baby projector. It was originally designed as an inexpensive format to provide copies of commercially made films to the home user. There was a large library of film either for sale or for rent available. Due to its success, the following year the company introduced a 9.5 mm camera. The projector was designed for 110V AC or DC. It had a variable resistor in its base to adjust speed. Some models could be used even if there was no electricity available, these were hand driven, and had dynamo to power the lamp.



## 3. Debrrie Sept

**Manufacturer:** Etablissements André Debrrie

**City, Country:** Paris, France

**Introduction/Production date:** 1923-1927

**Function:** Seven functions. 1. Film camera. 2. Takes single photos. 3. Takes sequential photos. 4. Projects single photos. 5. Projects cine film. 6. Enlarger to print photos. 7. Transfers cine film.

**Film Size:** 35 mm loaded into cartridge.

**Accessories:** Extra 35 mm Debrrie Sept film cassette.

**Note:** The Sept is an unusual camera. It could do seven jobs as its name in French "Sept" implies. This camera could make single or sequential photos and it could also shoot short films. When a light source was attached to the back of the camera, the same camera could project still or cine film and could be used as an enlarger or as a cine transfer machine transferring film onto unexposed film. The negatives or cine film could be slid via two slits at the top and bottom of the camera. It was a popular camera used by film studios such as in Hollywood and Sovetskoe Kino (Russian Cinema). The camera was used for special shots requiring small and portable cameras. Newsreel cameramen used the Sept for undercover shots. The Sept is made of aluminum and is composed of two distinct parts: the camera and the motor. The Sept uses 35 mm film rolled up in a special film magazine capable of holding 5 meters of film. At 16 frames per second, a film of up to 15 seconds could be made. The motor was spring wound, and intermittent motion is provided by a Maltese cross. The viewfinder can be used as a waist level reflecting viewfinder or a retracting direct-vision lens viewfinder, that you pull out of the side of the camera.



## 4. Ciné-Kodak Eight Model 25

**Manufacturer:** Eastman Kodak Company

**City, Country:** Rochester, USA

**Introduction/Production date:** 1933

**Function:** Film camera.

**Film Size:** Standard 8 mm film on spool.

**Note:** This Ciné-Kodak Eight camera was introduced in 1933 as the successor to the first 8mm amateur movie camera the Model 20 and was produced with slight variations until 1948. This particular model is from circa 1934. It has a metal body partly covered by black grained leatherette exposed metal parts are covered by black enamel with silver flex. An optical parallax viewfinder was built into the grip. The camera has a spring wound motor and runs at 16 fps. It took a 25 ft. spool of standard/double 8 mm film. (This was actually a 16 mm film, but with 8 mm perforations.) When projected, the resulting 50 ft. of film ran for a little over 4 minutes. A pointer on the lens shows the aperture setting on an exposure guide located below it. This exposure guide was for Kodak B/W film. The aperture sizes vary from *Very Dull in Shade* f 2.7 to *Intensely Bright* f 11. For filming in the tropics, f 16 was recommended.



## 5. Alef

**Manufacturer:** Optische Anstalten A. Lehmann

**City, Country:** Fürth, Germany

**Introduction/Production date:** 1933

**Function:** Film camera.

**Film Size:** 9.5 mm film in a cassette.

**Note:** The direct vision viewfinder is very conveniently placed symmetrically upon the top of the camera. The footage indicator and release is located on the side of the camera. On the front of the camera is a speed regulator giving half speed, normal speed (16 fps), and 32 fps for moderately slow motion. The housing of the camera is made of metal and finished with black lacquer and chromium plated edging. As commented in a review from 1933 this finish should wear well and many may prefer it to the conventional leather covering. The lens is of excellent quality a Meyer Trioplan with 20mm focus and large aperture f 2.8. The interior construction of the camera is of high quality and it uses a single claw mechanism to move the film forward. It uses 9.5 mm standard daylight loading chargers (cassettes). The spring wound motor will run about half a charger (cassette) before requiring to be wound again.



## 6. Eumig C2

**Manufacturer:** Elektrizitäts und Metallwaren Industrie Gesellschaft (Eumig)

**City, Country:** Vienna, Austria

**Introduction/Production date:** 1935-1938

**Function:** Film camera.

**Film Size:** 9.5 mm film in a cassette.

**Accessories:** 2 extra cassettes.

**Note:** In 1934, the C2 film camera came on the market; this was a C1 body with a built-in semi-automatic light meter. This was the first movie camera with semi-automatic exposure control. It was based on the patent by the Hungarian inventor Ödön Riszdörfer, who had many patents to his name in the field of light meters and automatic exposure controls for cameras. The camera housing of molded Bakelite had the advantage of lower production costs. In order not to infringe patents held by Pathé for preloaded film cassettes, Eumig developed their own cassettes that could be loaded by the user. A knob on the right side of the camera is used for setting the film speed (ASA). These are referred to by letters A, B, C, and D. The camera had a spring wound motor that could shoot the whole 9 meters of film in one go.



## 7. Eumig-Wien 6-1

**Manufacturer:** Elektrizitäts und Metallwaren Industrie Gesellschaft (Eumig)

**City, Country:** Vienna, Austria

**Introduction/Production date:** 1932

**Function:** Film projector.

**Film Size:** 9.5 mm.

**Accessories:** Comes in a carrying case made of thick carton.

**Note:** Eumig was an Austrian manufacturer of electric and electronic devices and to diversify their market they added a cinematographic department, which became famous for their amateur movie cameras and projectors. The company founded in 1919 began production of its first film projectors in 1931. This projector was first manufactured as a 16 mm model named P1. Sales of this projector were above expectation, so Eumig designed a 16 mm film camera to complement the projector but the camera never made to production. At that time, 16 mm film was popular but expensive and the cheaper 9.5 mm format became popular. Eumig decided to scrap the 16 mm camera and instead rebuilt their P1 16 mm projector into a 9.5 mm projector in 1932 and added a 9.5 mm camera the C1 in 1933 to their list of cinematographic products.



## 8. Schmalfilm Projektor Zeiss Ikon

**Manufacturer:** Zeiss Ikon AG

**City, Country:** Dresden, Germany

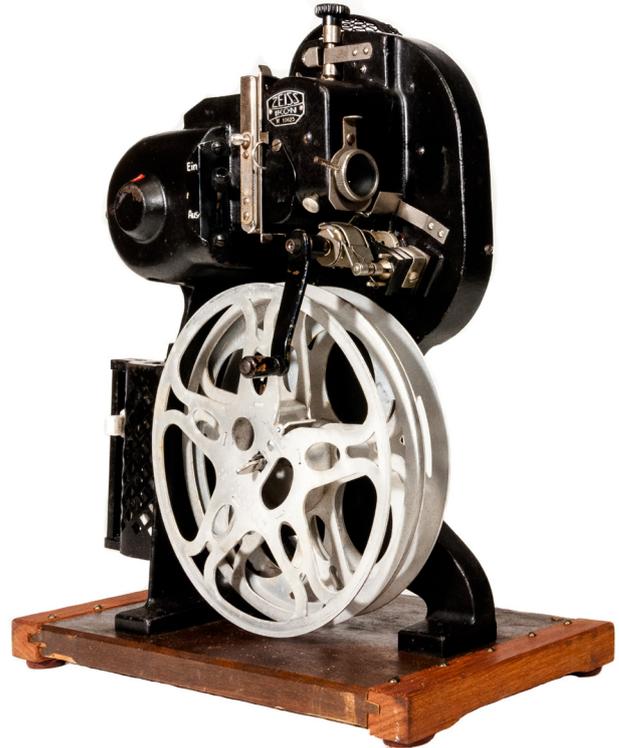
**Introduction/Production date:** c. 1931

**Function:** Film projector.

**Film Size:** 16 mm.

**Accessories:** Comes in a wooden case.

**Note:** After Kodak came out with their 16 mm format the name given to that format in Europe was *smalfilm* (Dutch) *Schmalfilm* (German). This was Zeiss Ikon's first 16 mm projector. The 16 mm reels are on the same axis beneath the lamp house, which gives this projector an interesting design. This is a motorized version; you can disconnect the motor so that the projector can be hand cranked. The spool capacity is 120 m of film. This projector uses a triple claw driven by cams. Light passes through a condenser, a prism, and a further condenser in order to handle variations in lamps efficiently.



## 9. Magazine Ciné-Kodak Eight Model 90

**Manufacturer:** Eastman Kodak Company

**City, Country:** Rochester, USA

**Introduction/Production date:** 1940-1946

**Function:** Film camera.

**Film Size:** Standard 8 mm film in a magazine/cartridge.

**Note:** The Magazine Ciné-Kodak Eight Model 90 was introduced in June 1940 and was produced until 1946. The name changed in July 1946 to Ciné-Kodak Magazine 8. These cameras came with a cartridge/ magazine instead of a spool of film. The concept of a Kodak cartridge-loading movie camera had been around since 1936, when it was introduced with the Ciné-Kodak Magazine 16 mm Camera. The spring wound motor driven clockwork mechanism and could run at 16, 24, 32, and 64 fps. The lenses were interchangeable; this particular camera has a Kodak Anastigmat f/1.9 13 mm. The viewfinder could be altered according to the focal length of the lens using the wheel at the top of the camera. Focal lengths were 9, 13, 25, 38, 50, 63, 76 mm. There was an exposure guide on the left side of the camera. The guide was made so that different exposure cards that came with the film could be slipped into the guide. The cards were two-sided one side of the card is for daylight exposures the other side for flood lamp exposures.



## 10. Ciné-Kodak Magazine 8

**Manufacturer:** Eastman Kodak Company

**City, Country:** Rochester, USA

**Introduction/Production date:** 1946-1955

**Function:** Film camera.

**Film Size:** Standard 8 mm film in a magazine/cartridge.

**Accessories:** 2 interchangeable lenses; Kodak Anastigmat f/1.9 25 mm f1.9-f16, Kodak Anastigmat f/1.9 13 mm f1.9-f22. Kodak tan leather covered hard camera case.

Envelope with exposure cards for several film types.

**Note:** The Ciné-Kodak Magazine 8 was the successor to the Ciné-Kodak Magazine 8 Model 90 (previous camera No. 9), which had been introduced in June 1940. This is a spring wound camera.



## 11. Filmo Sportster Double Run Eight

**Manufacturer:** Bell & Howell Company

**City, Country:** Chicago, USA

**Introduction/Production date:** 1939-1950

**Function:** Film camera.

**Film Size:** Standard 8 mm film on spools.

**Note:** The Filmo Sportster is relatively small and solidly made metal camera, surprisingly hefty for its size. Private detectives preferred using cameras such as the Filmo Sportster for its small size. The lens is removable by pressing together the two knobs to the left of the lens. The shutter release button is just below these knobs. The viewfinder in front has two little frames, which can be flipped in front of the viewfinder to frame the scene for more telephoto lenses. It could film in several speeds 16, 32, 48, and 64 fps. The exposure guide was on the left side of the camera and gave very detailed instruction for both winter and summer filming whether in the morning or afternoon depending on the film speed you were using.



## 12. Revere 8 Model 88

**Manufacturer:** Revere Camera Company

**City, Country:** Chicago, USA

**Introduction/Production date:** 1940

**Function:** Film camera.

**Film Size:** Standard 8 mm film on spools.

**Note:** The Revere Camera Company started making budget 8 mm movie cameras in 1939. The Revere name is taken from the Revere Copper Company, which provided financial backing. Paul Revere the famous patriot of the American Revolution started the Revere Copper Company in 1801. This model was introduced by Samuel Briskin owner of Revere Camera Company as a similar camera to a Bell & Howell but at half the price. By the 50's the Revere Camera Company was the second largest manufacturer of cameras in the USA, they outsold Kodak. The housing is made of metal. This is a spring wound camera.



## 13. Dralowid II

**Manufacturer:** Dralowid-Werke Steatit Magnesia AG

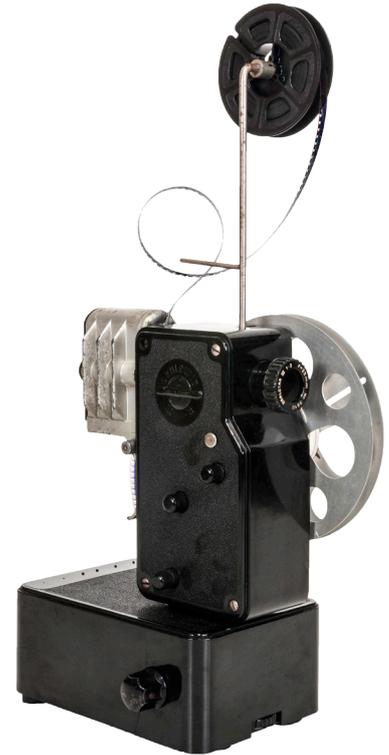
**City, Country:** Teltow Bei Berlin, Germany

**Introduction/Production date:** 1937

**Function:** Film projector.

**Film Size:** Standard 8 mm.

**Note:** An affordable electrical 8 mm film projector with an unusual shape and design. The projector consists of two parts; a Bakelite base that houses the power supply and the actual projector that plugs into the base with three pins. The projector part consists of an aluminum lamphouse with cooling fins for a 12V 15W lamp and a Bakelite body where the lens (1:2 F= 25 mm) and mechanism are housed. It could project a 1 m wide picture from a distance of 5 m with sufficient light for the period. The arm for the film reel is a wiry metal pole that sticks straight up which can be folded for transportation. The film comes from the reel above, loops freely around a side arm using the natural elasticity of the film and enters the projector between the light source and the main Bakelite body. There are no sprockets involved to guide the film. The free-floating loop helps compensate the jerky film movement. This unusual film guide was patented but was never used in any other projector. The film exits from the back, is lead around the corner on a roller, and is fed to the take-up reel. The take-up reel is located directly on the projector, which limits the reel size to 60 meters. The projector was made for AC 110/220V but for households without AC power, an inverter could be attached allowing it to be run from a battery. It had a 4-way rotary switch; off, light on without motor at reduced voltage (single-frame analysis), motor, and lamp (projection), motor without lamp (rewind). The projector could be ordered in a suitcase for easy transport and storage and came with a silver screen for projecting. The magazine *Film for All* wrote in 1939 that the Dralowid is one of the most interesting and most noteworthy new designs in the field of cine-projector. The Second World War interrupted further development.



## 14. Paillard Bolex G816

**Manufacturer:** Paillard Bolex

**City, Country:** Sainte Croix, Switzerland

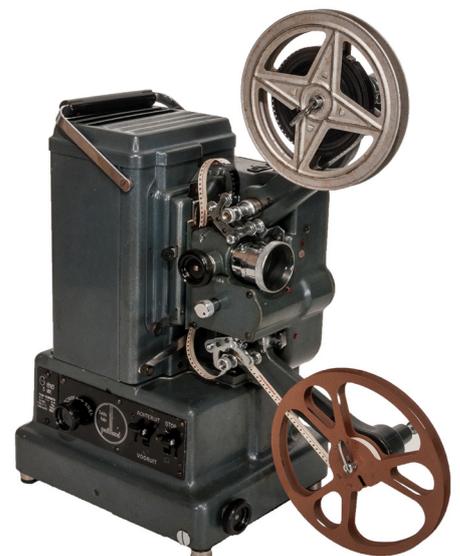
**Introduction/Production date:** 1941-1942

**Function:** Film projector.

**Film Size:** Standard 8mm/16mm Dual-film Format.

**Accessories:** 2 interchangeable lenses; Cinor Projection 1:1.6 F=25 mm SOM Berthiot Paris, Cinor Projection 1:1.5 F=50 mm SOM Berthiot Paris. Parts kit for various film gauges and a wooden carrying case.

**Note:** Paillard Bolex introduced the newly designed Model G projector in 1936 and manufactured this model with slight variations until 1957. It was available for single film format or multiple film formats. This dual format model included a parts kit of reel spindles, sprockets, gate, and guide rollers that could be used without tools to adapt the projector to Standard 8 and 16 mm film formats. The film transport mechanism featured helical gears and sprocket, rather than the more common belt driven system. Reel capacity is 120 meters. On the rear of the projector is a built-in illuminated ammeter indicating the current drawn by the projection lamp. This particular model was made for the Dutch market; labels on projector are in Dutch.



## 15. Victor Model 5

**Manufacturer:** Victor Animatograph Corp.

**City, Country:** Davenport, USA

**Introduction/Production date:** 1934

**Function:** Film camera.

**Film Size:** 16 mm film on a spool.

**Lenses:** On turret 3 interchangeable lenses Kodak Anastigmat  $f=1.9$  25 mm, Schneider Kreuznach Xenon 1:2.3 50 mm, Ploymar 17 mm  $f=2.7$  M-O-C.

**Note:** When Kodak came out with their 16 mm film in 1923 Alexander Victor, a maker of film cameras and projectors, immediately set out to make the first 16 mm film camera, but Kodak beat him by a few months. In 1925 Victor started on a new camera modeled after a Bell & Howell Filmo, it was a hand held spring driven camera and by 1930 he had added a three lens turret with variable speeds 8, 16, 24 and 32 fps both additions were a first for 16 mm. The Model 5 also had a fifth speed ultra-slow motion. All makes of 16 mm interchangeable lenses may be used on the Victor camera. The hand crank could be wound in less than 30 seconds and each complete winding runs 10 m (33 ft.) of film.



## 16. The Arrow Cine Camera Model 55

**Manufacturer:** Arrow Works Foto News Sha

**City, Country:** Sha, Japan

**Introduction/Production date:** c. 1934

**Function:** Film camera.

**Film Size:** 16 mm film on a spool.

**Note:** This camera looks very similar to the Victor Model 3 (16 mm) cine camera. It was a well-used camera the black enamel is total worn off on the left side of the camera. This is a spring wound camera.



## 17. Ampro Premier 20

**Manufacturer:** Ampro Corporation

**City, Country:** Chicago, USA

**Introduction/Production date:** c. 1947

**Function:** Sound film projector.

**Film Size:** 16 mm.

**Note:** The Premier 20 gained its 20 identity because of its powerful 20 W amplifier. With a 1000 W lamp, it was capable of large auditorium work. The amplifier gives a clear reproduction of sound through 70 to 7000 Hz via a single extension speaker. The Ampro comes in two cases one with the projector and amplifier the other case houses the speaker.



## 18. Hortson 16

**Manufacturer:** Hortson

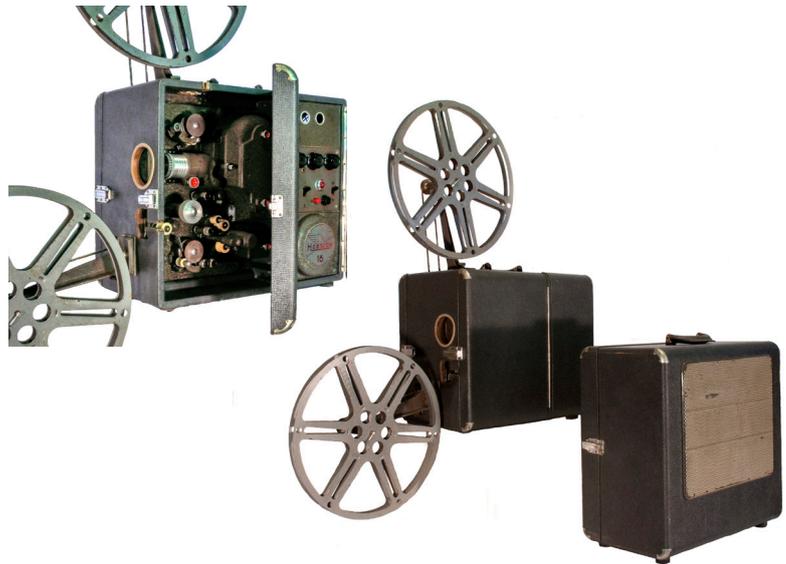
**City, Country:** Paris, France

**Introduction/Production date:** c. 1946

**Function:** Sound film projector.

**Film Size:** 16 mm.

**Note:** A massive portable professional 16 mm sound projector. Two cases, one case houses the projector weighing 26 kg, and one with the amplifier and speaker at 20 kg. This French projector has the access to the projector on the left side. Usually projectors have access on their right side.



## 19. Kodak Brownie 8 mm Movie Camera

**Manufacturer:** Eastman Kodak Company

**City, Country:** Rochester, USA

**Introduction/Production date:** 1951

**Function:** Film camera.

**Film Size:** Standard 8 mm film on a spool.

**Note:** The Brownie 8 mm movie camera was introduced in 1951 to reach the masses. This camera was very simple and cheap and was succeeded by the Brownie II in 1956. The aperture could be adjusted by rotating a wheel next to the lens and the collapsible viewfinder had two settings. This is a spring wound camera.



## 20. Kodak Brownie 8 mm Movie Camera II

**Manufacturer:** Eastman Kodak Company

**City, Country:** Rochester, USA

**Introduction/Production date:** 1956-1958

**Function:** Film camera.

**Film Size:** Standard 8 mm film on a spool.

**Note:** The model "II" was introduced in 1956 and was produced until 1958. It was equipped with an Ektanon 13 mm f/2.3 - f/16 lens. The aperture could be adjusted by rotating a wheel, indicating the weather conditions (sun, cloudy, etc.). The clear plastic viewfinder was collapsible and had three squares (green, red, and orange) corresponding to the focal length settings. This is a spring wound camera.



## 21. Paillard Bolex 8C

**Manufacturer:** Paillard Bolex

**City, Country:** Sainte Croix, Switzerland

**Introduction/Production date:** 1957

**Function:** Film camera.

**Film Size:** Standard 8 mm film on spool.

**Note:** The 8C was in production from 1954-1958. According to its serial number, this model is from 1957. The body is made of duralumin, covered with leatherette. Metal parts are chrome plated. At the front bottom of the camera, there is an exposure table. This camera is spring wound.



## 22. AGFA Movex 88L

**Manufacturer:** Agfa AG

**City, Country:** Berlin, Germany

**Introduction/Production date:** 1958

**Function:** Film camera.

**Film Size:** Standard 8 mm film on a spool.

**Note:** Gray wrinkled finish metal body, with a spring motor. The “L” in the model name 88L stands for the coupled “Lucimeter”, a semi-automatic exposure control using a selenium cell with a pointer in the viewfinder.



## 23. Bell & Howell 323

**Manufacturer:** Bell & Howell Company

**City, Country:** Chicago, USA

**Introduction/Production date:** 1956

**Function:** Film camera.

**Film Size:** Standard 8 mm film on spool.

**Note:** In 1953, Bell & Howell produced the model “220”, a very cheap movie camera, and the forerunner to the 323. The company produced several models similar to the model 323. All were descendants of the 220; they all had the same structure, only the “number” of the model and some minor details changed. This model has a light meter on top and is spring wound.



## 24. Rondo Splicer

**Manufacturer:** Rondo Company Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** c. 1950

**Function:** Cement film splicer.

**Film Size:** Standard 8 and 16 mm.

**Accessories:** Kodak Film Cement, Instructions (Wipe any oil from film. Remove emulsion. Roughen splice area. Apply cement. Press film ends together for 15 seconds. Wipe excess cement.)

**Note:** Bakelite base with stainless steel splicing unit on top. Has a price sticker indicating “El Globo 10 Fl”. Cement splicers join films together using a chemical called film cement, which is made of a film base dissolved in a solvent. The photographic emulsion is removed from the area to be joined and the base of the other end is brought into contact with it. Film cement can only be used with acetate, triacetate, and nitrate films. Polyester film used for “current” production prints will not bond with standard film cement.



## 25. LPL 8mm 16mm Splicer

**Manufacturer:** Luxe Photo Laboratory/LPL Company Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** 1950s

**Function:** Cement film splicer.

**Film Size:** Standard 8 and 16 mm.

**Accessories:** Agfa film cement; Cinecol.

**Note:** The LPL splicer features a nylon broom plus the emulsion scraper. The scraper with its keen filing edge is spring controlled to produce an evenly scraped surface. The wire brush has been specially designed to give an even scraping to the underside of the overlapping film for perfect precision at the cemented portion, which is often liable to be irregular. The nylon broom gives a smooth finish to the joint by removing the scraped dust and improves the film's screening effects. It also cleans the emulsion scraper to maintain its sharpness at all times.



## 26. Ising Bergneustadt Editor

**Manufacturer:** Ising (Eugen Ising Photo & Kionogeräte)

**City, Country:** Bergneustadt, Germany

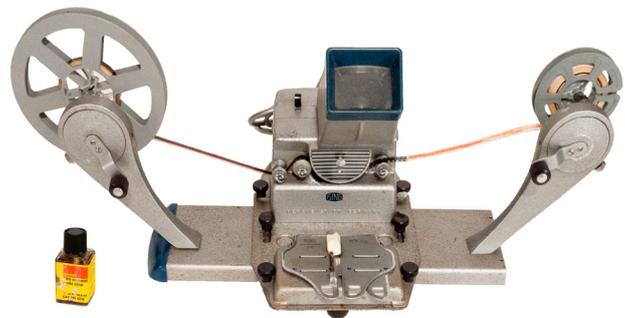
**Introduction/Production date:** 1950s

**Function:** Film editor and cement splicer.

**Film Size:** Standard 8 mm.

**Accessories:** Kodak film cement.

**Note:** Standard 8 mm film viewer with built-in cement splicer.



## 27. Paillard Bolex M8

**Manufacturer:** Paillard Bolex

**City, Country:** Sainte Croix, Switzerland

**Introduction/Production date:** 1959-1960

**Function:** Film projector.

**Film Size:** Standard 8 mm.

**Accessories:** Carrying case.

**Note:** The M8 was produced from 1950 to 1960. A cast aluminum and steel projector with a reel capacity of 120 m (400 ft.). It has variable speed and an audible signal to warn if the speed drops below a safe limit. This model has a built-in stroboscope, to allow the speed to be adjusted to 18 fps.



## 28. Rondo Auto-VS

**Manufacturer:** Rondo Company Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** c. 1960

**Function:** Film projector.

**Film Size:** Standard 8 mm.

**Note:** A small metal-bodied film projector with a built in film cutter.



## 29. Nizo Editor 220

**Manufacturer:** Nizo (Niezoldi & Krämer)

**City, Country:** Munich, West-Germany

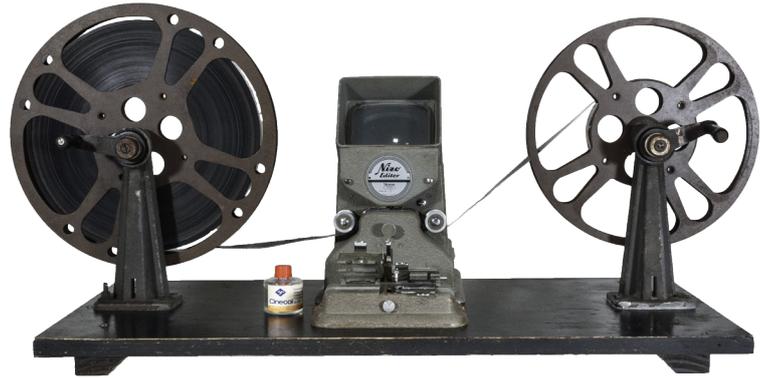
**Introduction/Production date:** c. 1950s

**Function:** Film editor.

**Film Size:** 16 mm.

**Accessories:** Rewind arms.

**Note:** Film viewer used to edit film. Viewers are normally fixed to a baseboard with rewind arms on either side. The best gear ratio for hand operated rewind arms is one turn of the handle to four turns of the spindle. Some rewind arms have long spindles in order to hold more film reels alongside each other.



## 30. Nizo 8 & 16 mm Splicer

**Manufacturer:** Nizo (Niezoldi & Krämer)

**City, Country:** Munich, West-Germany

**Introduction/Production date:** c. 1950s

**Function:** Cement film splicer.

**Film Size:** Standard 8 mm and 16 mm.

**Accessories:** Kodak film cement.



## 31. Kodak Brownie 8 Movie Camera

**Manufacturer:** Eastman Kodak Company

**City, Country:** Rochester, USA

**Introduction/Production date:** 1961-1962

**Function:** Film camera.

**Film Size:** Standard 8 mm film on a spool.

**Note:** The Brownie 8 is a very basic camera made from plastic. Aperture is controlled by a plastic turret with different sized holes located in the front of the camera. This is a spring wound camera.



## 32. Mansfield Holiday II

**Manufacturer:** Mansfield Industries, Inc.

**City, Country:** Chicago, USA

**Introduction/Production date:** 1960

**Function:** Film Camera.

**Film Size:** Standard 8 mm film on a spool.

**Note:** The Mansfield Company produced inexpensive movie cameras and projectors. The Holiday II came with a turret with three fixed lenses: a wide angle, a telephoto, and an f/1.8 13 mm lens. The camera had a built-in light meter and a spring wound motor.



### 33. Yashica Automatic 8 EE

**Manufacturer:** Yashica Company, Ltd.

**City, Country:** Japan

**Introduction/Production date:** 1960

**Function:** Film camera.

**Film Size:** Standard 8 mm film on a spool.

**Accessory:** Pistol grip with remote release.

**Note:** The "EE" in the model name of this Yashica camera stands for Electronic Eye. The 8 EE had a built-in exposure meter with a selenium photocell. It is a spring wound camera and has three settings for light: *Tungsten Color*, *Daylight Color*, and *Black and White*.



### 34. Canon Reflex Zoom 8

**Manufacturer:** Canon Camera Company Inc.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** 1954

**Function:** Film camera.

**Film Size:** Standard 8 mm film on spool.

**Accessories:** Carrying case, close-up lens 48 mm.

**Note:** Canon's first film camera with a zoom lens 10-40 mm f/1.4. It also had a detachable trigger grip and the motor was spring wound.



### 35. Minolta Zoom 8

**Manufacturer:** Minolta Company Ltd.

**City, Country:** Osaka, Japan

**Introduction/Production date:** 1962

**Function:** Film Camera.

**Film Size:** Standard 8 mm film on spool.

**Note:** Four AA batteries in the handle power the drive motor and new CdS exposure meter.



### 36. Tormat 8 EEZ

**Manufacturer:** Tor Optical Co., Ltd.

**City, Country:** Japan

**Introduction/Production date:** 1963

**Function:** Film camera.

**Film Size:** Standard 8 mm film on a spool.

**Note:** Selenium photocell and spring wound motor.



## 37. Walz Movie Editor

**Manufacturer:** K.K. Walz

**City, Country:** Japan

**Introduction/Production date:** c. 1950s

**Function:** Film editor.

**Film Size:** Standard 8 mm.

**Note:** For easy transport and storage, the arms of this viewer can be folded inwards.



## 38. Fujica Single-8 P300

**Manufacturer:** Fuji Photo Film Co., Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** 1972

**Function:** Film camera.

**Film Size:** Single-8 film cartridge.

**Accessories:** Fuji ridged carrying case for camera.

**Note:** A simple and easy aim and shoot film camera, just drop in the film cartridge and you were ready to shoot. The drive motor is powered by four AA batteries. A 2.6 V mercury battery powered the automatic electric eye. You could also do special effects such as fade-in and fade-out or even more unusual superimpose one scene over another. Fuji used its own proprietary film cartridges for these cameras.



## 39. Canon 310XL

**Manufacturer:** Canon Camera Company Inc.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** 1975

**Function:** Film camera.

**Film Size:** Super-8 film cartridge.

**Note:** The 310XL had the world's fastest lens at f/1.0 with a 3x zoom. Macro shooting was possible as close as 215 mm. This was a battery-powered camera; two AA batteries powered the film drive, power zooming and exposure meter.



## 40. Cinepress Dry Movie Splicer S8-11 Sound

**Manufacturer:** Hama GmbH

**City, Country:** Monheim, Germany

**Introduction/Production date:** c. 1970s

**Function:** Tape splicer.

**Film Size:** Super-8 and Single-8.

**Accessories:** 3x cinekett S8-II tape for sound, stereo sound and silent movies.

**Note:** Tape splicers use a thin transparent adhesive tape to join the two ends. The tape may be pre-perforated for the film perforations. Tape splicers can be used on most types of film and is the most popular way to join polyester prints.



## 41. Yashica 8PE-RS

**Manufacturer:** Yashica Company Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** c. 1970s

**Function:** Film editor.

**Film Size:** Standard 8 mm and Super-8.

**Note:** Reel capacity 180 m. The arms fold back for easy transport and storage.



## 42. Filmosound Specialist 552

**Manufacturer:** Bell & Howell Company

**City, Country:** Richmond Hill, Canada

**Introduction/Production date:** 1962-1969

**Function:** Sound film projector.

**Film Size:** 16 mm.

**Note:** Automatic threading.



## 43. Fujica Single-8 Z850 Sound

**Manufacturer:** Fuji Photo Film Co., Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** 1980-1982

**Function:** Film Camera with sound.

**Film Size:** Single-8 with sound in a cartridge.

**Accessories:** Lens hood, Single 8 mm cartridge.

**Note:** The Z850 Sound came with a microphone and magnetic recording on single 8 film. The camera ran on four AA batteries located in the handle. Special effects included simultaneous fading of sound and picture.



## 44. Fujica 2-Track Sound Splicer

**Manufacturer:** Fuji Photo Film Co., Ltd.

**City, Country:** Tokyo, Japan

**Introduction/Production date:** c. 1970s

**Function:** Tape splicer.

**Film Size:** Super-8 and Single-8.

**Note:** Dry tape splicer that leaves the sound track free. It does Stereo sound, 2-track sound, 1-track sound, and silent film. Uses Fujifilm pre-perforated roll tape.



## 45. Erno E-600 Super

**Manufacturer:** Sansei Koki

**City, Country:** Kawasaki, Japan

**Introduction/Production date:** 1969-1970

**Function:** Film editor.

**Film Size:** Standard 8 mm and Super-8.

**Note:** Screen magnified 19x. Reel capacity 240 m.



## 46. Noris Norimat Deluxe S

**Manufacturer:** Noris Projektion Ernst Plank KG

**City, Country:** Nuremberg, Germany

**Introduction/Production date:** 1973-1974

**Function:** Film projector.

**Film Size:** Super-8 and Single-8.

**Note:** This is the top model from Noris it has a built-in audiocassette recorder and the reel capacity is 180 m.



## 47. Eumig Mark 610D

**Manufacturer:** Eumig (Elektrizitäts und Metallwaren Industrie Gesellschaft)

**City, Country:** Vienna, Austria

**Introduction/Production date:** 1973

**Function:** Film projector.

**Film Size:** Standard 8 mm, Single-8 and Super-8.

**Note:** The 610D has several slow motion speeds and a single image setting. The reel capacity is 120 m (400 ft.) A pause light goes on when projection lamp is off and vice versa. It also has a contact for reel-to-reel tape recorder or audio cassette recorder.



## 48. Kodak Pageant 250S-R

**Manufacturer:** Eastman Kodak Company

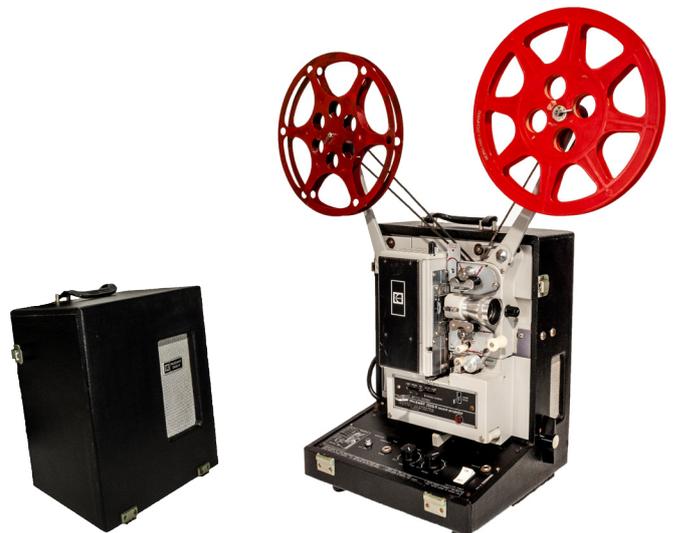
**City, Country:** Rochester, USA

**Introduction/Production date:** 1970s

**Function:** Sound film projector.

**Film Size:** 16 mm.

**Note:** Speaker is in the cover.





*Photo taken by Joon van Veldhoven-Soesan 1956*

Michel van Veldhoven 1921-2009  
Founder of The Van Veldhoven Collection