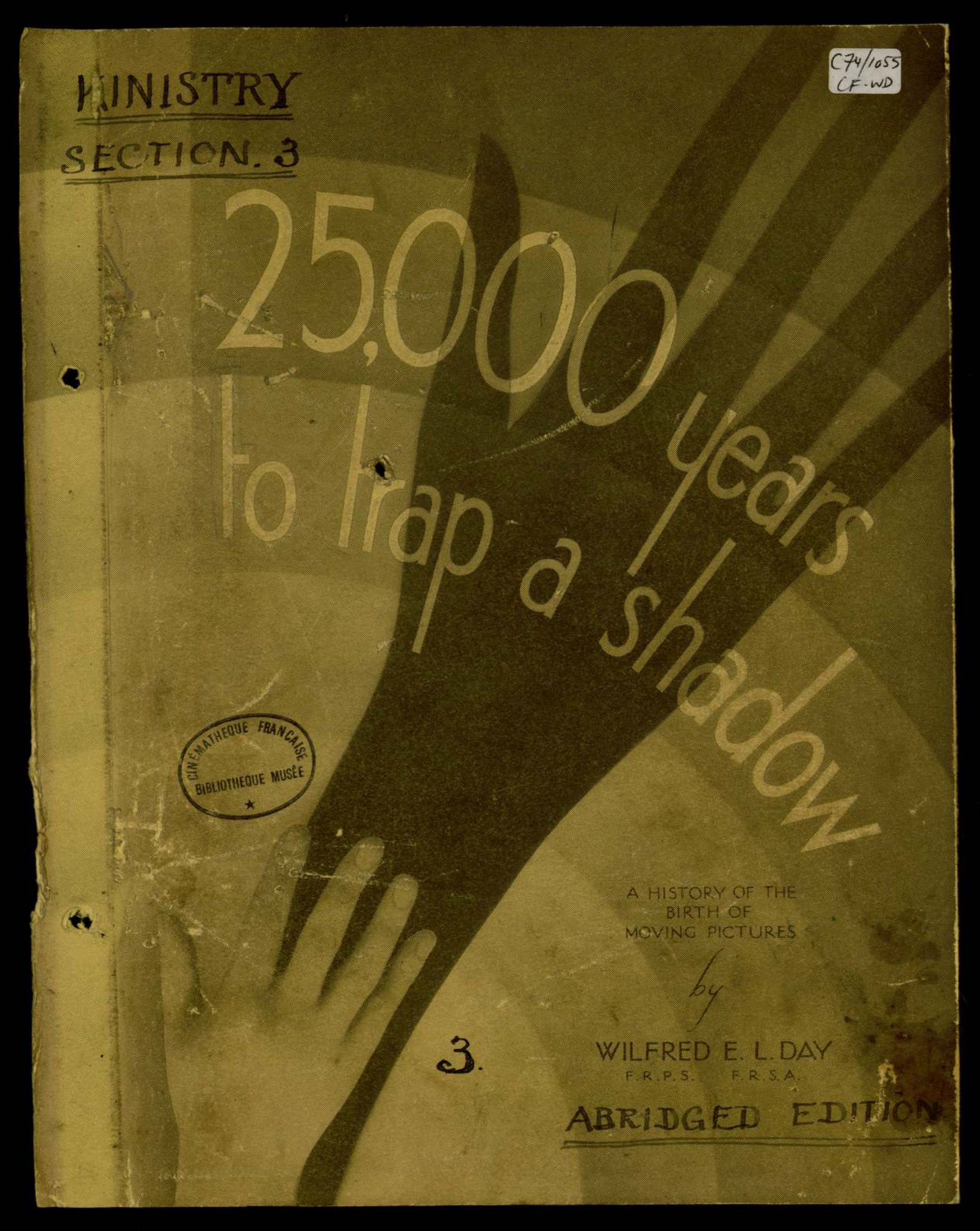
MINISTRY

SECTION. 3

25,000 years to trap a shadow



A HISTORY OF THE
BIRTH OF
MOVING PICTURES

by

WILFRED E. L. DAY
F.R.P.S. F.R.S.A.

3.

ABRIDGED EDITION

KINISTRY.
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AFTER 40YEARS A WONDERFUL REVIVAL

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DIRECT ASSOCIATES WITH EDISON.(con)

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Eugene Augustin Lauste.

Eugene Augustin Lauste, the father of sound on film.
Lauste adopts lantern for Moving Pictures at ten years of age.
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A journey to England for the British Biograph Co.,
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The Photographophone invented by Ernest Ruhmer. = RUHMER
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C.Francis Jenkins.

C.Francis Jenkins an American inventor.
A motion picture camera produced in 1893/4, which received a gold medal.
A camera with multiple front lens.
Many press notices praise Jenkins work.
Jenkins shows moving pictures at Atalanta Exhibition.
Jenkins sells his patent to Armat.
Jenkins and Armat at Law.
An invention for Television.

Jean Acme Le Roy..

Jean Acme Le Roy, an early experimenter in movies, secures film made by Wordsworth Donisthorpe.
Edison's Kinetoscope is viewed.
Le Roy constructs new projector.
A moving picture show given on Washington's birthday, 1895.
An application for a patent refused.

Georges Melies.

Georges Melies, illusionist and sleight of hand performer.
The purchase of six R.W.Paul's projectors.
Early successful trick film productions.
Elected President of French Society of Cinematography.
Elected President of International Congress of Film Producers and Manufacturers.
Builds a studio in his garden in Paris.
Gulliver's Travels film is produced.
Wide gauge film is made to compete with the Biograph.
The first long film, "A Trip to the Moon."
Astounding trick effects brought into being.
America warned to stop film duping.
Melies' Star Pictures decline.
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Bettini's rectangular glass plate machine for Kinematography.
The Spirograph rotary celluloid disc for Kinematography by Theodore Brown.

Cecil Hepworth.

Hepworth joins the Warwick Trading Co.,
A visit to Walton on Thames.
Hepworth starts a film producing company.
The A.B.C. of Cinematography.
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The Work of J.H.Joly & N.Normandin.

The Photo-Zoetrope.
An engagement at the Holborn Empire.

Charles Urban.

A figurehead in the early days of movies, Chas. Urban.
A Kinetoscope Parlour at Detroit, Michigan, U.S.A.
Urban produced his Bioscope.
Maguire and Baucus induce Urban to go to London,
The foundation of the Warwick Trading Company.
The Production of "Britian's Bulwarks," a British naval film.
Urban's pictures become a star turn under the title of "Urbanora."
The Biokam home movie outfit.
Urban moves Westward.
"Urbanora" pictures at the Palace Theatre.
Urban breaks away from the Warwick Trading Co.,
First automatic film printing plant.
Mr. Hyman and Joe Rosenthal film Boer War for Urbanora.
THe Chas. Urban Trading Company.
Films of the Russo-Japanese War.
Cherry Kearton joins Urban's staff.
Urban pursues the elusive project of colour kinematography.
A terrible set-back.
G.A.Smith tackles the colour problem with Urban.
Kinemacolour is taken to America.
The wonderful film of the Delhi Durbar in colour.
H.H.The Duke of Teck opens the Scala season.
Kinemacolour at the Scala Theatre.
Chas. Urban stricken with illness at the Royal Command Performance of Kinemacolour.

Chas. Urban. (com.)

Action at law between Biocolour and Kinemacolour.
Chas. Urban loses the action and Kinemacolour is withdrawn.
The making of the War propaganda films.
"Britain Prepared," the film that caused America to enter the War.
Presentation to Chas. Urban.
The Spirograph home projector.
Some interesting educational films.
Kinemacolour versus Chronochrome.

F.Mottershaw.

The Sheffield Photo Co.,
Some popular Early films.

~~[illegible]~~

The House of Gaumont.

Gaumont's Chrono projector made under Demeney's patent.
Leon L.Gaumont invents "La Grille," a fan shutter.
M.A.C.Bromhead becomes London Manager to the House of Gaumont.
The Chrono-de-poche.
The Gaumont Graphic.
Leon Gaumont produces sound with film in 1902.
The Chronophone and the Chronomegaphone.

Mr. James Williamsom.

Early days at Brighton.
Successful films.
Apparatus supplies, and the famous Williamson Printer.
Williamson Film Printing Works at Barnet.

The Early Exploitation of Kinematography in England, America and on The Continent.

We have seen in the preceeding chapters how moving pictures came into being, culminating in the invention of Kinematography, and the patenting of the process of Photographing a band of pictures yaken in rapid sequence upon a ribbon of Celluloid Film by William Friese-Greene and Mortimer Evans, but there were also others, who, shortly after Greene and Evans filed their original patent had acheived similar results. Amongst this gallant band of enthusiasts, who had worked extremely hard with the definite and avowed object, of reproducing life like motion Pictures by Photographic means was Mr. Wordsworth Donisthorpe whose father was a mill owner at Hunslett near Leeds, and a near neighbour of the Father-in-Law of Augustin Le-Prince who had an Engineering works at Hunslett. He resided at 17, Porchester Terrace, Middlesex, and after much research and experimenting, applied for his first provisional Patent on November 17th 1876, No. 4344. In the specification Mr. Donisthorpe's claims were very definite as they stated:-

"The object of this claim was to be able to take a succes-
"sion of Photographic pictures at equal intervals of time,
"in order to record the changes taking place in, or the move-
"ments of the object being photographed, and also by means of
"a succession of pictures so taken of any moving object to
"give to the eye a representation of the object in continuous
"movement, as it appeared when being photographed. To accom-
plish this object Mr. Donisthorpe constructed a camera of
"rather large proportions, fitted with a magazine which car-
"ried a number of prepared plates, one behind the other, and
"were caused by mechanical means to move forward progressive-
"ly, in such a manner that as soon as the foremost plate had
been exposed for the requisite length of time, the whole
"series moved forward a distance; and the plate when exposed
"was dropped into a receiver below. The second plate then
"came into position before the Lens of the Camera, and after
"exposure was dropped into the magazine, and so on in succes-
"sion, until the requisite number of plates had been exposed.
"The exposure was made by a movable screen or shutter moving
"away when the plate was stationery, and covering the lens
"during the period that the plates were shifted from one
"position to another. Both the mechanism for moving the
"plates and shutter and gears to work in unison at a uni-
"form rate of speed. After the plates had been exposed, they
"were developed in the usual manner in a dark room and prints
"made therefrom, and it is interesting to note that the in-
"ventor states:-

"If the apparatus be arranged to take the succeeding pic-
"tures at sufficiently short intervals of time, they may
"be printed a t intervals apart upon a continuous strip of
"paper, and this paper with the whole series of pictures
"upon it may be used in an instrument known as the Zoetrope
"or Phenakisticope. To allow of this the strip of paper may
"be wound on to a cylinder and unwound from it at a uniform
"speed on to another cylinder, and so carried past the eye
"of the observer, any ordinary means being used for assuring
" that each picture, shall only be exposed momentarily to the
"observer."

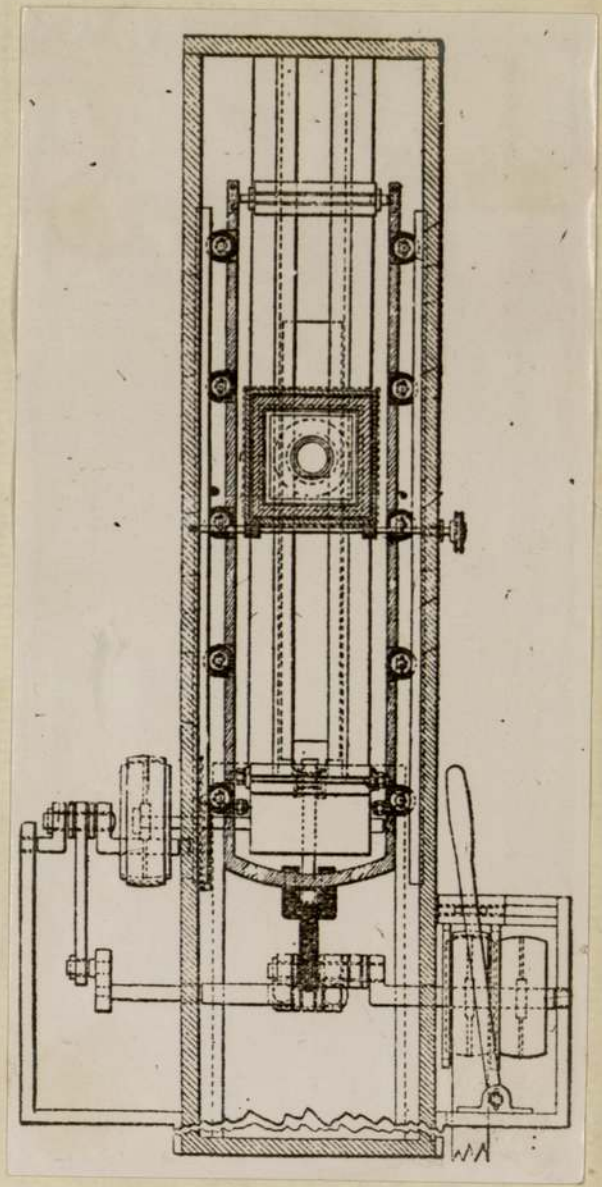
From this observation it will be at once realised how much Mr. Donisthorpe foreshadowed the subsequent inventions of Kinematography. The instrument as described had a limited range only, as a very large number of photographic plates were required to record even a small evolution of movement. In an article written by Mr. Donisthorpe for a periodical entitled "Nature" published January 24th 1878 he writes of the combination of sight and sound as follows:- It will be admitted by this means a drama acted..... may be recorded and re-acted on the screen..... .... and be repeated with the assistance of the Phonograph all the dialogue with the very voice of the actors. When this is actually accomplished, the photography of colours alone will be wanting to render the representation absolutely complete. He also stated:- "By combining my "Kinesigraph" (the name given to his invention) I will undertake to produce a talking picture of Mr. Gladstone which shall positively recite his latest Anti-Turkish speech in his own voice and tone, not only this, but the life size photograph shall itself move and gesticulate precisely as he did when making the speech."

This was surely a remarkable statement to have been made by Mr. Donisthorpe in 1878, as he not only foretold the advent of the Talkies, but made the definite statement that he could acheive the result. For many years Mr. Donisthorpe worked assiduously to try and perfect his motion pictures and show them upon a screen and after much study eventually succeeded with the aid of Mr. Crofts in producing an ingenious device for photographing a series of consecutive pictures of any moving object upon a band of celluloid film for which process they jointly filed an application a Provisional Patent on August 15th, 1889 being granted No.12921 for their application but by the irony of fate they were robbed of the fruits of their labour, by being less than three months later than Greene and Evans who had previously filed their specification for precisely the same invention, on June 21st 1889.

The invention of Donisthorpe and Croft was extremely clever as it embodied the use of a continuously moving film, without any

Dommethorpe

The Kinesigraph



With 2 Patent

Specifications

[Second Edition.]

A.D. 1876, 9th NOVEMBER. N° 4344.

Apparatus for Taking and Exhibiting Photographs.

(This Invention received Provisional Protection only.)

PROVISIONAL SPECIFICATION left by Wordsworth Donisthorpe at the Office of the Commissioners of Patents on the 9th November 1876.

WORDSWORTH DONISTHORPE, of 17, Porchester Terrace, in the County of Middlesex. "IMPROVEMENTS IN APPARATUS FOR TAKING A SUCCESSION OF PHOTOGRAPHIC PICTURES AND FOR EXHIBITING SUCH PICTURES."

This Invention has for its object to facilitate the taking of a succession of photographic pictures at equal intervals of time, in order to record the changes taking place in or the movements of the object being photographed, and also by means of a succession of pictures so taken of any moving object to give to the eye a representation of the object in continuous movement as it appeared when being photographed.

In order to obtain a succession of photographic pictures I construct the camera to receive a number of prepared plates one behind the other, and by mechanism I cause a series of plates to move forward progressively, in such manner that as soon as the foremost plate has been exposed for the required length of time the whole series moves forwards a distance; the foremost plate which had previously been exposed is then allowed to drop or is carried downwards into a receiver below. The plate which then occupies the foremost position is in its turn exposed to the light passing in through the lens of the camera, and after being exposed is similarly deposited into the receiver, and so on in succession until the requisite number of plates have been exposed.

The admission of light to the lens is controlled by a moveable screen which is moved away when one of the plates is in position for having light thrown on to it by the lens, and is brought in front of the lens whilst the plates are being shifted from one position to another.

The mechanism for moving the plates and for moving the screen is driven at a uniform rate, so that the plates are exposed one after the other at uniform intervals of time.

The plates after being exposed in the camera and carried away by the receiver are afterwards developed and set, and prints may subsequently be obtained from them in any ordinary manner.

Apparatus arranged as above described may be employed for obtaining a record of the movements of or changes taking place in any objects, and may be used

[Price 8d.]

either for photographing objects direct or in conjunction with microscopes or telescopes.

If the apparatus be arranged to take the succeeding pictures at sufficiently short intervals of time they may be printed at equal distances apart upon a continuous strip of paper, and this paper with the whole series of pictures upon it may be used in the instrument known as the zootrope or phenakistoscope. To allow of this the strip of paper may be wound on to a cylinder, and be unwound from it at a uniform speed on to another cylinder, and so carried past the eye of the observer, any ordinary means being used for ensuring that each picture shall only be exposed momentarily to the observer. By this means the movements made by a person or group of persons or of any other objects during the time they were being photographed may be reproduced to the eye of the observer.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.

[Wt. 25—25/7/1908.]

[Third Edition.]

N° 12,921 A.D. 1889

Date of Application, 15th Aug., 1889
Complete Specification Left, 14th May, 1890—Accepted, 15th Nov., 1890

PROVISIONAL SPECIFICATION.

Improvements in the Production and Representation of Instantaneous Photographic Pictures.

We, WORDSWORTH DONISTHORPE, of 32, Pembridge Villas, Bayswater, in the County of Middlesex, Barrister-at-Law, and WILLIAM CARR CROFTS, of Westminster Chambers, 7, Victoria Street, in the City of Westminster, Gentleman, do hereby declare the nature of this invention to be as follows:—

This invention has for its object improvements in the production and representation of instantaneous photographic pictures.

The pictures are produced upon a sensitive film or surface carried by a long roll of paper or other material.

The roll is continuously unwound from one drum and wound upon another and in its passage a series of images are successively thrown upon it by a photographic lens. A screen is provided between the lens and the exposed sensitive surface. This screen travels out of the way to permit the image to fall on the sensitive surface and covers the lens again as soon as the exposure is complete. These operations take place with regularity, and, usually, great rapidity so that several pictures are taken in each second during the time that the apparatus remains at work, which will be for many successive seconds, indeed for any length of time which may be desired. The scene selected for photographic presentation will be one of constant movement, for example, a street scene, so that each picture will differ slightly from the preceding and succeeding pictures.

The camera may be arranged in the following manner:—In the fore part is the lens and immediately behind the lens the screen which regulates the instantaneous exposures. This screen may be an endless band passing around pulleys and travelling at high velocity. In the band there are two perforations or apertures, and twice in each rotation of the band these perforations coincide and the light is then able to pass from the lens through the perforations onto the sensitive surface. The lens forms the scene upon the sensitive surface. The focus is accurately adjusted before commencing the operation by the aid of a slide on which there is a focussing glass and guide rollers over which the continuous sensitive paper or material passes.

The screen and the winding apparatus are so geared together that the sensitive surface travels the distance necessary to separate the pictures between one exposure and another. In place of the travelling perforated belt a disc perforated with a narrow slit and driven by bevil-wheels may serve the purpose. After the pictures have been taken the roll is removed from the camera and the pictures upon it are developed in the ordinary manner. From this continuous band of negative pictures a similar band of positive pictures is produced and rendered transparent by the application of vaseline or vaseline oil or by any other suitable process.

For the exhibition of the pictures a lanthorn similar to the ordinary magic lanthorn (or if a non-transparent positive band is used, than a lanthorn similar to the opaque magic lanthorn) is employed in which a brilliant intermittent electric light is provided. The lanthorn is provided with condensing and focusing lenses by the aid of which the light after having passed through the transparent positive picture is focused upon a screen. Each picture is thus exhibited only by one flash of the intermittent light for the band of pictures travels on and by the time the next flash occurs another picture is in place. Thus several pictures are exhibited upon the screen in each second of time throughout the whole period of exhibition which will usually be approximately the same as that occupied in taking the pictures. The change from picture to picture and the flashing of the light is so rapid (about seven flashes

[Price 6d.]

per second) as not to be discerned by the eye and the appearance on the screen is that of a picture in which the animate and other objects exhibited are in movement. In order that the flash may synchronize accurately with the picture in position contact pieces are provided upon the travelling band and by the passage of these the flashes are determined. Or a continuous light, electric or other, may be used and the recurring flashes obtained by a perforated screen travelling at high velocity as in the camera above described, the coincidence of the flashes with the centre of each successive picture being insured by increasing or diminishing the speed of the travelling band of pictures by an arrangement for the insertion or withdrawal of a tapering driving drum or other appropriate means.

Dated this 14th day of August 1889.

WORDSWORTH DONISTHORPE.
WILLIAM CARR CROFTS.

COMPLETE SPECIFICATION.

Improvements in the Production and Representation of Instantaneous Photographic Pictures.

We, WORDSWORTH DONISTHORPE, of 32, Pembridge Villas, Bayswater, in the County of Middlesex, Barrister-at-Law, and WILLIAM CARR CROFTS, of Westminster Chambers, 7, Victoria Street, in the City of Westminster, Gentleman, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

Our object is to project photographic pictures on a screen reproducing all motions as in nature.

The data we start from are:—

(i) That the eye can receive an instantaneous impression, and that it retains the impression for about $^1/_7$th of a second; (ii) that paper can be chemically prepared, so as to register instantaneous impressions, focussed upon it through a lens; and (iii) that such sensitive paper can be made in continuous bands.

We take by a suitable camera at intervals of any duration (usually at equal intervals recurring from 8 to 6 times in a second) series of as many instantaneous consecutive photographs on sensitised paper of moving objects as desired; we exhibit such series of photographs by transparencies reproduced from them being thrown through the lens of a suitable lantern upon a screen or other proper surface, consecutively at a rate not slower than 8 to 6 in a second with a blank interval between each picture not longer than $^1/_{16}$th to $^1/_{12}$th of a second. We render the sensitised surface stationary relatively to the camera lens during each exposure, and each reproduction of the photographic picture thus obtained we also render stationary, relatively to the lantern lens, during its exhibition.

Speaking in general terms we effect our object in the following manner:—We have a photographic lens fitted to a suitable camera, exposed and shut at intervals (usually at equal intervals recurring from 8 to 6 times in a second) throwing a succession of instantaneous images of moving objects upon a continuous band of sensitive paper, unceasingly travelling behind the lens, but while so unceasingly travelling, the band by a compensating motion is rendered stationary relatively to the lens during each successive instantaneous exposure, so that each image is imprinted thereon next to and touching the preceding image, without overlapping it; and from such continuous band of negative pictures duly developed a series of positive pictures, touching but not overlapping one another, are printed upon a continuous band of thin or transparent paper; and this positive band is then made to travel unceasingly behind the lens of a lantern, but while so unceasingly travelling, the band by a compensating motion is rendered stationary relatively to the lens during each successive exposure, recurring not less than 8 to 6 times in each second, so that at each exposure of the lens the interval between two exposures

being not longer than $^1/_{16}$th to $^1/_{12}$th of a second, the centre of each picture is opposite the centre of the lens; and the image of each picture thus exposed is thrown by the lens in a magnified form upon a screen or other suitable surface.

In this way we cause the spectators eye to receive therefrom the impression of each picture, just as the impression of the preceding picture is fading from the retina, which retains it until replaced in its turn by the impression of the succeeding picture and so on. Thus the blank intervals between the successive exposures of the pictures are not appreciated by the eye; and the general impression produced is that of continuous motion corresponding to the successive positions of the moving objects in the series of positive pictures.

In order that our said invention may be fully understood and readily carried into effect we will proceed to describe the drawings hereunto annexed.

Description of the Drawings.

Figure 1 is a side elevation and Figure 2 is a transverse vertical section of the driving mechanism which we employ to impart movement with the requisite regularity to the machine camera and to the lanthorn.

A B treadle and cranks and connecting rod resting on cast iron standards B^2 B^3 fixed into cast iron plate B^4 turning.

C fly wheel 80 inches in circumference resting on C^1 C^2 standards, with

D governor in connection with fly wheel and consisting of

E wheel cast in halves and held together with countersunk screws passing through a tongue on the boss of one half, which fits into a groove in the boss of the other half to which spokes with

E^1 E^1 *etc.* moveable sheaths and driving tyre are attached these parts resting on axle by means of a loose ring E^2 turning in a groove in the boss, and which revolve free on axle between

F F bosses fixed on axle, from which wheel E is kept clear by E^3 E^4 revolving pins run through its boss. Into bosses (F F) fit closely

G G G G G G G G wedge flanges of moveable spoke sheaths (E^1 E^1 *etc.*), which are pressed tightly into the bosses by

H H gutta percha rings (or, if preferred, flat circular spiral springs with a close fine thread) the elasticity of which is calculated in accordance with the desired speed (usually one revolution per second) of the fly wheel (C). When the speed of the fly wheel (C) exceeds the required degree, the spoke sheaths (E^1 E^1 *etc.*) move centrifugally along the spokes towards the tire, the gutta percha rings (H H) expanding lift the wedge flanges (G G *etc.*) clear from the bosses (F F) thus breaking connection between the axle and driving tire. As the revolving speed of the free wheel (E) decreases and the centrifugal force of the spoke sheaths (E^1 E^1 *etc.*) thereby diminishes, the gutta percha rings (H H) contract and restore connection by again pressing home the wedge flanges (G G *etc.*) into the bosses (F F). If preferred for the gutta percha rings (or circular springs) may be substituted a spiral steel spring round the unsheathed portion of each spoke, extending from the outer end of the sheath (E^1) to the driving tire. Connection as before will be broken by the centrifugal spoke sheaths (E^1 E^1 *etc.*) causing compression of the springs again to be restored by their extension as the centrifugal force diminishes. If preferred, the motive power for driving cranks (B) can be obtained from a suitable engine with an ordinary governor instead of by the treadle (A), which may then be dispensed with.

Figure 3 is a side elevation of the machine camera, it is shown partly in section and with the side of the case removed.

Figure 4 is a rear elevation of the camera also partly in section.

(1) Driving pulley 10 inches in circumference driven by

(2) Leather belt from fly wheel C.

(3) Lever and (4) loose pulley for throwing off driving belt from driving pulley.

(5) Driving shaft which passes through the side into camera.
(6) Crank, with
(7) (7) Metal washers.
(8) Connecting rod fitting on to
(9) (9) Cranks, turning
(10) Shutter shaft on to which are fixed a quarter of a revolution in advance.
(11) (11) Cranks.
(12) (12) Metal washers, and
(13) Connecting rod fitting on to bottom and driving.
(14) Shutter divided into
(14[a]) Open part, and
(14[b]) Closed part, working perpendicularly between
(15) (15) Angle plates at each side.
(16) Crank on driving shaft, with
(17) Metal washer, and
(18) Connecting rod fitting on to bottom and driving.
(19) Roller lift running perpendicularly with alternate oscillations up and down through a space of $1\frac{1}{4}$ inches, on
(20) (20) *etc.* Wheels on
(21) (21) Lines fixed to sides of camera.
(22) Crank fixed onto end of driving shaft at far side of camera with
(23) Connecting rod, fitting between
(24) (24) Metal washers and
(25) (25) Cranks on
(26) Shaft driving
(27) Pulley 5 inches in circumference, with
(28) India rubber or gutta percha belt (the other end of shaft fitting into side of camera) driving
(29) Roller pulley 10 inches in circumference fixed on to end of
(30) Roller shaft passing through
(31) Perpendicular slot $1\frac{5}{8}$ inches high by $\frac{1}{2}$ inch wide inside of camera (with
(32) Slot shutter resting on roller shaft working perpendicularly between
(33) (33) Angle plates at each side) and side of roller lift (19) and turning
(34) Wooden or metal driving roller $3\frac{1}{4}$ inches long and 5 inches in circumference (the far end of roller shaft fitting into other side of roller lift) which drives by surface friction.
(35) Wooden or metal drawing off roller $3\frac{1}{4}$ long and $\frac{3}{4}$ inch in diameter, the spindle of which rests in
(36) (36) Perpendicular slots in sides of roller-lift with
(37) Stop and
(38) Milled screw washer for fixing it on to the spindle on which turn
(39) (39) Loose rings round which pass india rubber or gutta percha bands over
(40) (40) Loose rings on pins fixed into each side of roller lift (19) in order to keep the drawing off roller (35) in contact with the driving roller (34) during the oscillations of the roller lift (19). As the drawing of roller (35) fills rising in the perpendicular slots and its momentum increases the bands stretch and exert proportionately growing pressure.
(41) India rubber or gutta percha retaining band stretched flush with surface of drawing off roller in a groove parallel with its axis, holding one end of a roll of sensitive paper or gelatine stripping film in a continuous band $3\frac{1}{4}$ inches wide passing up through
(42) (42) Horizontal slots in the top and bottom of
(43) Sliding rectangular lens tube at the back of
(44) Rapid rectilinear landscape lens $\frac{7}{8}$ of an inch in diameter, covering circular impression $2\frac{1}{2}$ inches in diameter, with the prepared side next the lens and on to
(45) Wooden or metal feeding roller $3\frac{1}{4}$ inches long and $\frac{3}{4}$ inches in diameter

(round which it is wound) with india rubber or gutta percha retaining band similar to that of drawing off roller holding the other end of the continuous band and with

(46) Stop and

(47) Milled screw washer for fixing it on to spindle fitting into sides of roller lift into which it is locked by

(48) Hinged clamps at each end with

(49) Swivel fasteners.

(50) Door at end of lens tube.

(51) Focussing ground glass screen $2\frac{1}{2}$ inches wide × $2\frac{1}{2}$ inches high in wooden frame, which, when the right focus is obtained by

(52) Rack pinions and milled head working lens tube backwards and forwards horizontally, is withdrawn through the door, the latter being then closed.

(53) Door in back of camera above lens case with

(54) Ruby glass panel for observing the feeding roller with

(54^B) Sliding shutter.

(55) Door in back of camera, below the lens case.

When the treadle (A) is set in motion (usually at a speed of one revolution per second) as the continuous band of paper is wound off feeding roller (45) through slots (42) (42) in lens tube (43) the lens (44) is exposed and shut alternately by shutter (14) simultaneously with the oscillations up and down of the roller lift (19) through a space of $1\frac{1}{4}$ inches (or half the diameter of each successive circular impression thrown on to the travelling band by the lens) during each exposure the roller lift (19) moving in the opposite direction to and at exactly the same speed as that of the travelling band, thus rendering the travelling band stationary during each exposure relatively to lens (44) and imprinting consecutive circular negative impressions $2\frac{1}{2}$ inches in diameter thereon, touching but not overlapping one another.

After passing down through lens tube (43) the travelling band is wound onto drawing off roller (35) which as it fills, rises in slots (36) (36) and when full assumes the position indicated by the dotted lines.

Then by a suitable process the negative band after being rendered transparent by immersion in hot castor oil, or by a preparation of vaseline or vaseline oil is developed toned fixed and washed and a positive continuous band $3\frac{1}{4}$ inches wide is printed from it with circular impressions each $2\frac{1}{2}$ inches in diameter touching but not overlapping one another on thin pliable gelatine stripping skin or thin diaphanous paper or paper rendered transparent by soaking in hot castor oil or in vaseline or vaseline oil or by any other suitable process.

rendering paper transparent

Figure 5 is a vertical section of the machine lanthorn by the aid of which the pictures are exhibited.

Figure 6 is a front elevation partly in section of the same.

Figures 7 and 8 show details.

(41) India rubber or gutta percha retaining band under which is inserted the end of the positive band nearest to the last impression taken, stretched flush with surface of

(45) Feeding roller $3\frac{1}{2}$ inches long and $\frac{3}{4}$ inches in diameter in a groove parallel with its axis (on to which the positive band is wound) with

(46) Stop, and

(47) Milled screw washer for fixing it onto spindle fitting into sides of

(19) Roller lift into which it is locked by

(48) Hinged clamps at each end with

(49) Swivel fasteners.

The free end of positive band after passing down through

(42) (42) Slots, with

(42^B) (42^B) Vertical guide pieces, in

(43) Circular lens tube behind

(44) Object glass $2\frac{1}{2}$ inches in diameter throwing a disc of 10 feet diameter onto a screen 14 feet distant with

(56) Rack, pinion and milled head for focus adjustment, and in front of
(57) (57) Two plano-convex condensers $3\frac{1}{2}$ inches in diameter mounted in a suitable cell, is inserted under
(41) India rubber or gutta percha retaining band (similar to that on feeding roller) of
(35) Wooden or metal drawing off roller $3\frac{1}{4}$ inches long and $\frac{3}{4}$ inches in diameter driven by surface friction by
(34) Wooden or metal driving roller $3\frac{1}{4}$ inches long and 5 inches in circumference, the spindles of drawing off roller resting in
(36) (36) Perpendicular slots in sides of roller lift with
(37) Stop and
(38) Milled screw washer for fixing the roller onto spindle, on which turn
(39) (39) Loose rings, round which pass India rubber or gutta percha bands over
(40) (40) Loose rings on pins fixed into each side of roller lift (19) in order to keep the drawing off roller (35) in contact with the driving roller (34) during the oscillations of the roller lift (19). As the drawing off roller (35) fills, rising in the perpendicular slots (36) (36) and its momentum increases, the bands stretch and exert proportionately growing pressure.

The driving mechanism employed is similar to that used with the camera.
A Treadle and B cranks and connecting rod.
C Fly wheel with one revolution per second.
D Governor *etc.*

If preferred the motive power can be obtained from a suitable engine with ordinary governor, as in the camera.

The following parts are similar to parts of the camera already described.
(1) Driving pulley 10 inches in circumference driven by
(2) Leather belt from fly wheel C.
(3) Lever and (4) loose pulley for throwing off driving belt from driving pulley.
(5) Driving shaft which passes through the side into lanthorn.
(6) Crank.
(7) (7) Metal washers and
(8) Connecting rod fitting on to
(9) (9) Cranks, and
(9^B) (9^B) Metal washers, turning
(10) Shutter shaft, onto which are fixed a quarter of a revolution in advance.
(11) (11) Cranks.
(12) (12) Metal washers, and
(13) Connecting rod fitting on to bottom and driving.
(14) Shutter divided into
(14^A) Open part, and
(14^B) Closed part, working perpendicularly between
(15) (15) Angle plates at each side.
(16) Crank on driving shaft with
(17) Metal washer, and
(18) Connecting rod fitting on to bottom and driving
(19) Roller lift running perpendicularly with alternate oscillations up and down through a space of $1\frac{1}{4}$ inches, on
(20) (20) *etc.* Wheels on
(21) (21) Lines fixed to sides of lanthorn.
(22) Crank fixed onto end of driving shaft at far side of lanthorn with
(23) Connecting rod and
(25) Crank on
(26) Shaft.

In the lanthorn the shaft (26) carries
(27) Cone pulley $3\frac{1}{4}$ inches long and 5 inches circumference in the centre with
(28) India rubber or gutta percha belt, driving
(29) Roller cone pulley $3\frac{1}{4}$ inches long and 10 inches in circumference in centre,

tapering in the opposite direction equally with cone pulley between which on each side of belt (28) are

(29A) (29A) Regulating plates, moving belt backwards and forwards by means of (29B) Screw turned by

(29C) Wheel, the speed of the revolution of roller cone pulley (29) being increased or diminished as the belt (28) is pushed onto a smaller or larger part of its diameter, respectively, the roller cone pulley driving

(30) Roller shaft, passing through

(31) Perpendicular slot $1\frac{5}{8}$ inches high by $\frac{1}{2}$ inch wide in side of lantern (with

(32) Slot-shutter working perpendicularly between

(33) (33) Angle plates at each side) and side of roller lift (19) and turning driving roller (34) the far end fitting into other side of roller lift (19).

(51) Glass screen between condensers and

(52) Flame of paraffin oil lamp (with

(52A) Reservoir, with

(52B) Wick regulator, with

(52C) Milled head) in

(52D) Flame chamber, with

(52E) Chimney and

(52F) Cap, and

(52G) Door with

(52H) Reflector and

(52K) Backglass screen.

(53) Door in front of lantern above lens tube.

(55) Door in front of lantern below lens tube.

We arrange, where it is preferred not to render the band transparent, for projecting the pictures on the travelling band through the object glass (44) onto the screen by means of an opaque lantern of the usual construction.

The machine lanthorn operates as follows:—

When the treadle (A) is set in motion 20 inches of the continuous band per second with the consecutive series of circular transparent pictures each $2\frac{1}{2}$ inches in diameter is wound off feeding roller (54) through slots (42) (42) of circular lens tube (43) the shutter (14) alternately exposing and shutting off the light through the condensing lenses (57) (57) each exposure of $\frac{1}{16}$th of a seconds duration, coinciding with the oscillation of the roller lift (19) through a space of $1\frac{1}{4}$ inches (or half the diameter of each transparent picture on the band) in the direction opposite to and at exactly the same speed as that of the transparent travelling band, which is thus rendered stationary during each exposure relatively to the condensing lenses (57) (57) and object glass (44) each exposure also coinciding with the arrival of the centre of each picture on the travelling continuous band exactly opposite the centre of the condensing lenses (57) (57) and object glass (44) any failure in synchrony being corrected by turning the regulator (29C) of the driving roller (34). After passing down through lens tube (43) the travelling band is wound onto drawing off roller (35) which as it fills rises in slots (36) (36) and when full assumes the position indicated by the dotted lines. In this way 8 reflections per second each $\frac{1}{16}$ of a seconds duration, separated by blank intervals of the same duration are thrown through the positive pictures on the transparent travelling band and through the object glass in a magnified form onto the screen; and the general impression of continuous natural motion in all moving objects is thereby produced.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed we declare that what we claim is:—

1. The means substantially as described for the accurate pictorial representation of motion; such means consisting in taking a series of instantaneous consecutive photographs of the moving objects desired to be represented; and by the aid of a

lanthorn and transparencies or pictures derived from such photographs projecting images consecutively onto a screen or receiving surface at equal intervals and in such rapid succession that the transition from picture to picture is inappreciable.

2. Apparatus substantially as described for the production and representation of instantaneous photographic pictures as herein set forth.

Dated this 13th day of May 1890.

W. DONISTHORPE.
W. C. CROFTS.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.
[Wt. 3—25/5/1915.]

(2nd Edition)

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

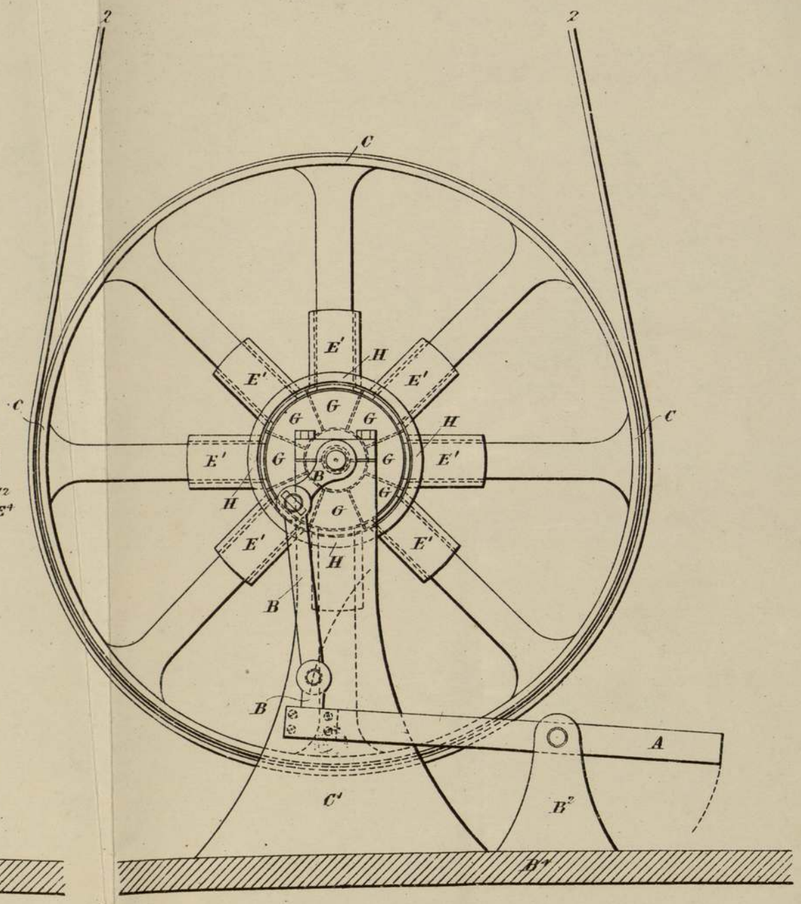
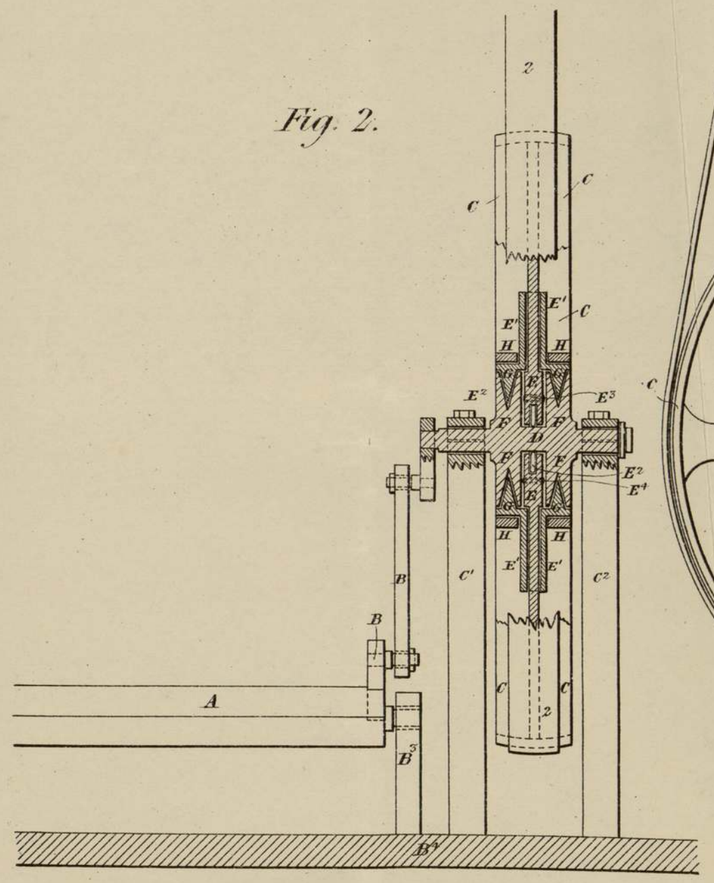


Fig. 2.



Malby & Sons, Photo-Lith.

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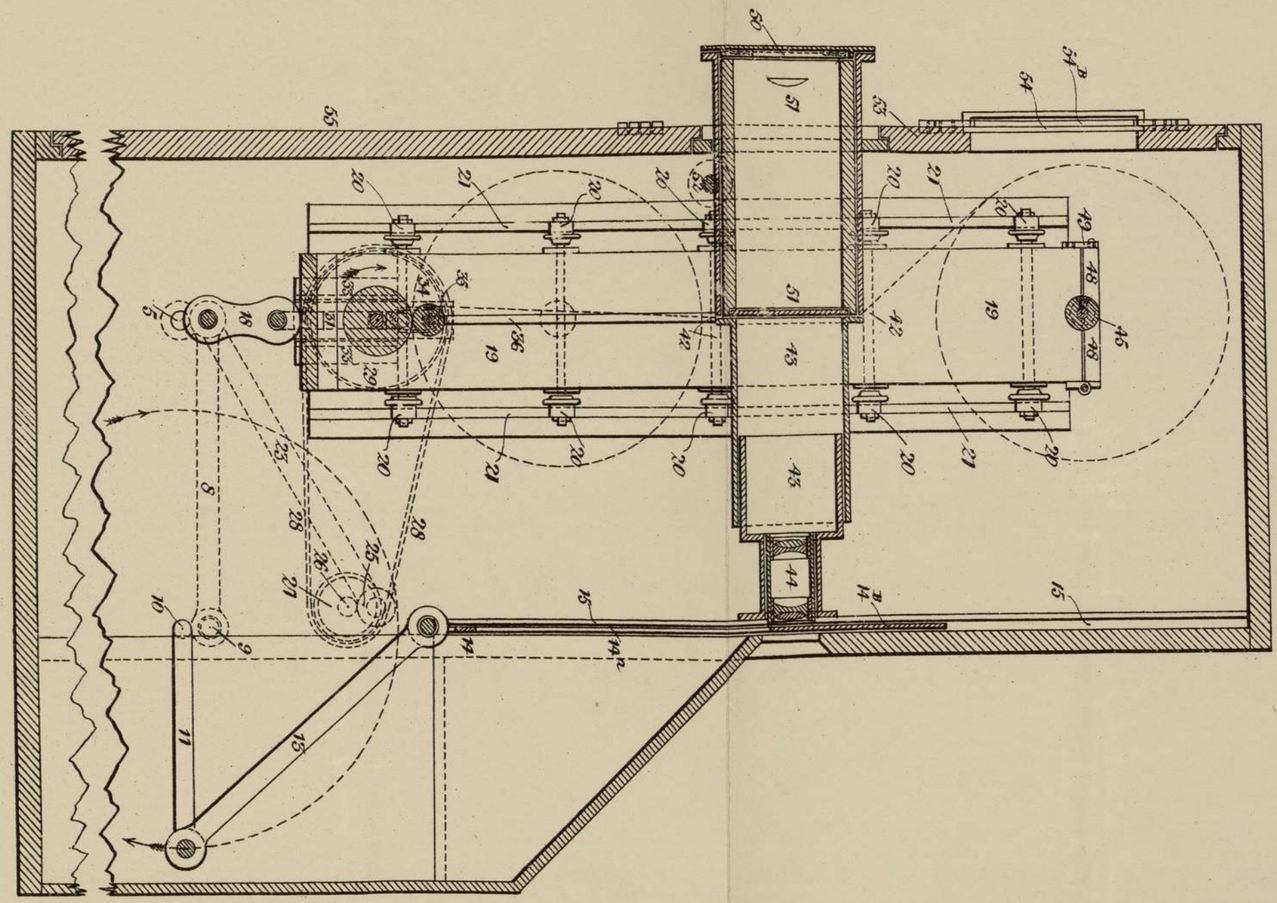

Fig. 5.

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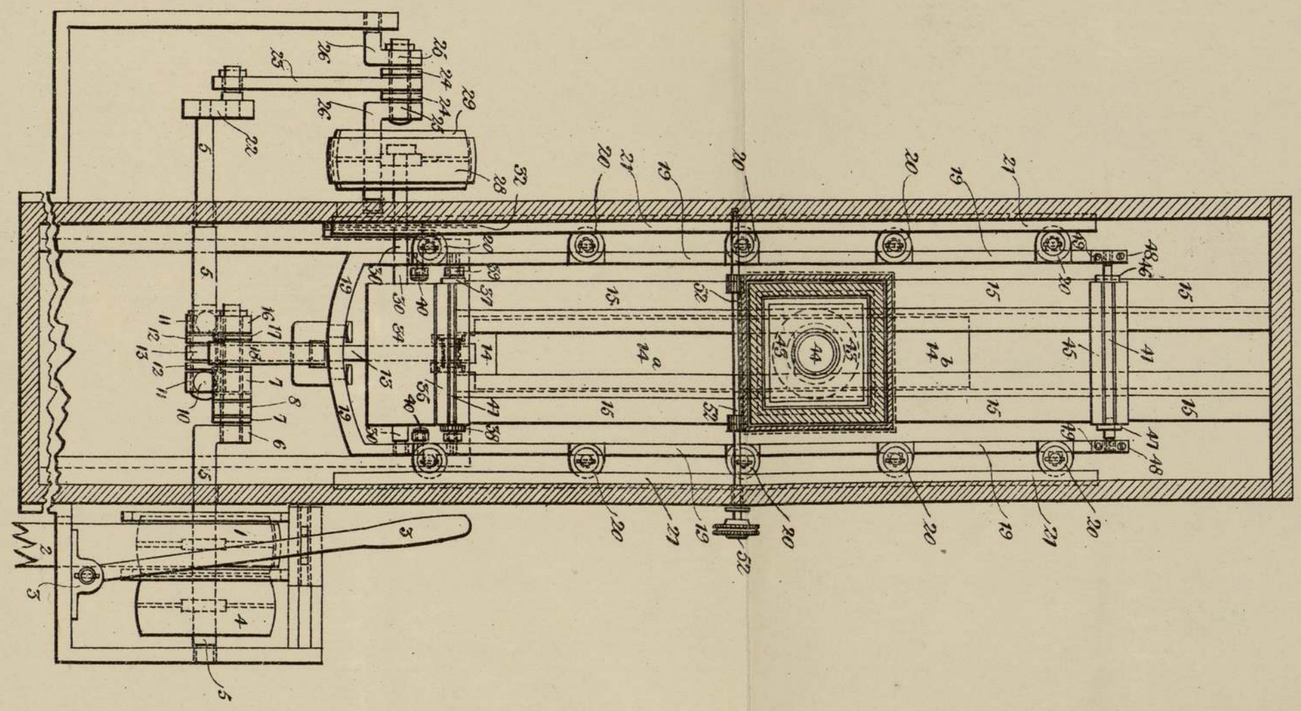

Fig. 4.

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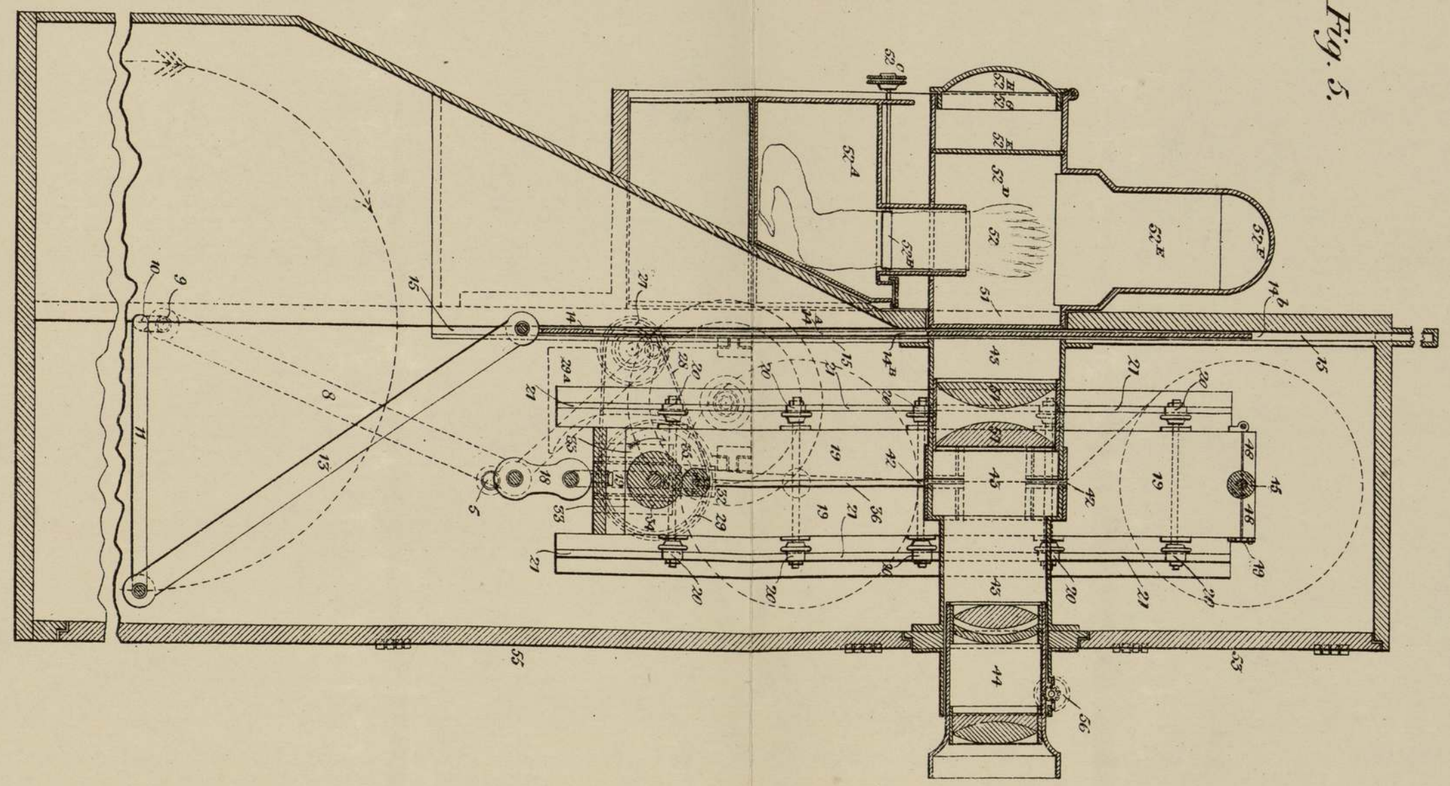
Fig. 3.



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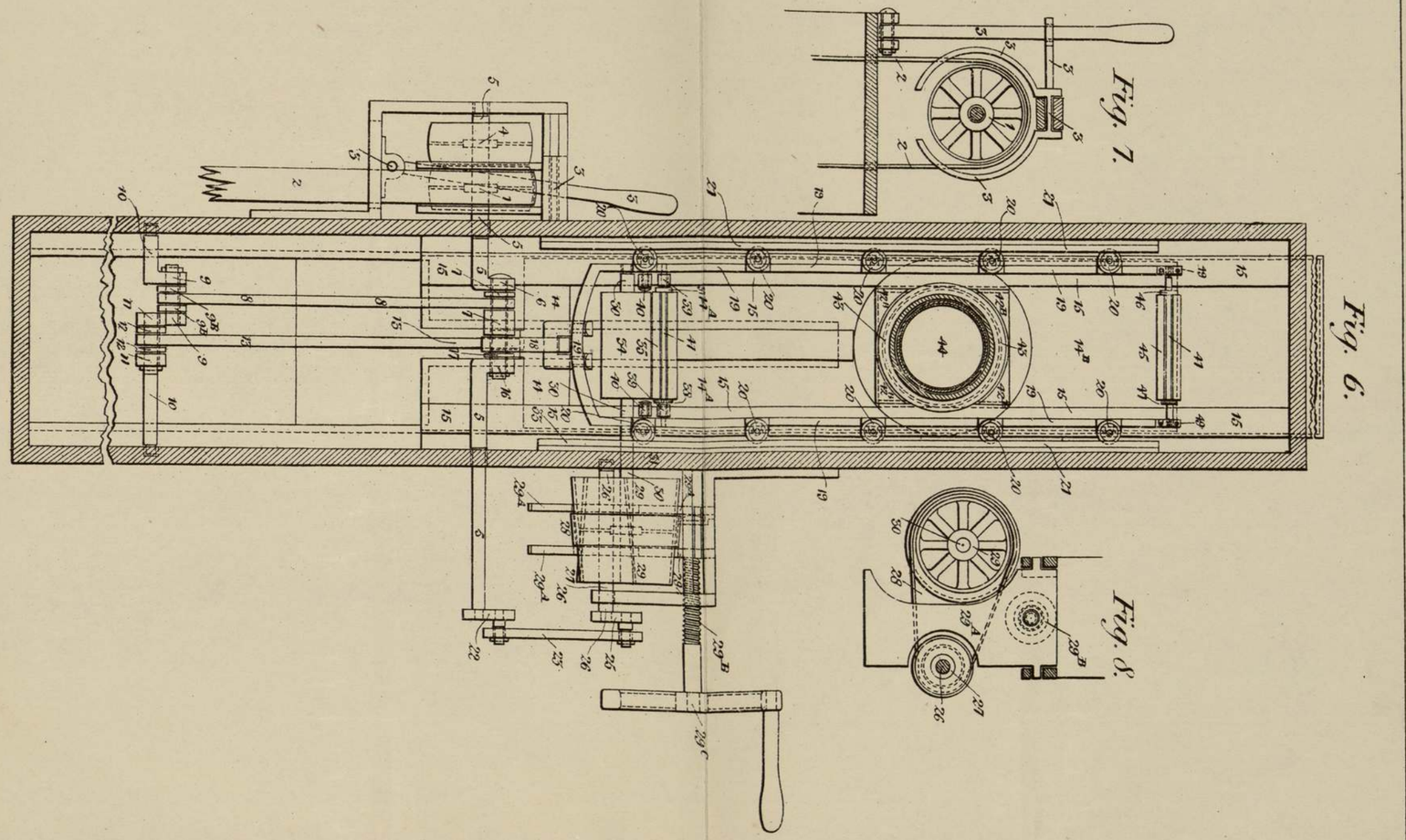


Fig. 7.

Fig. 6.

Fig. 8.

Malby & Sons, Photo-Litho

intermittent movement. The rate of exposure adopted for this invention was eight pictures or frames per second, which of course with an intermittent movement, would have set up a great deal of flicker, but with the continuously moving film system, was quite passable for results upon the screen.

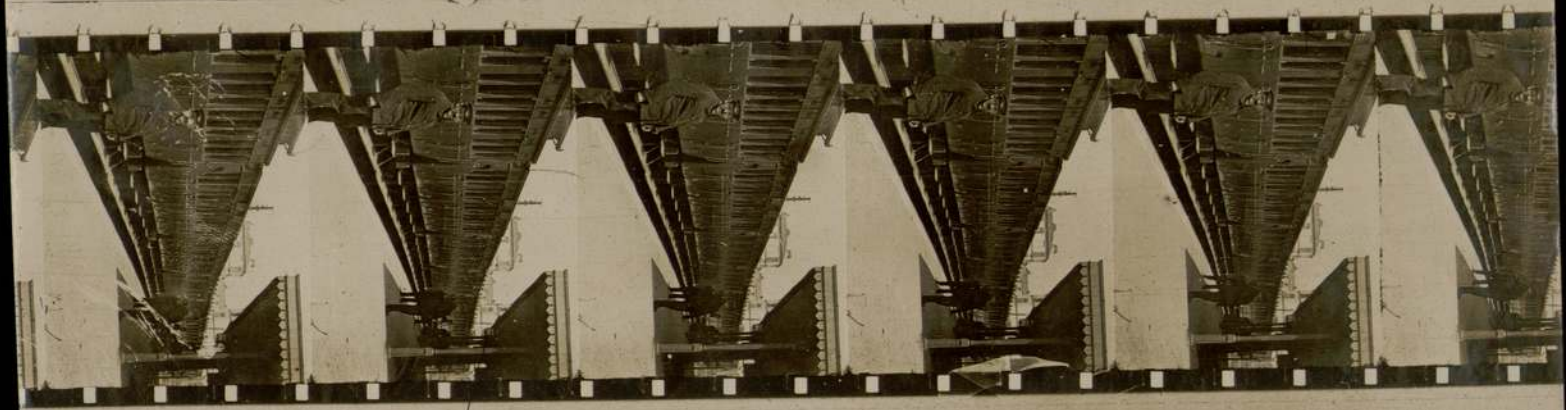
It has always seemed a great pity that Donisthorpe did not proceed further with his clever ideas and the vast store of knowledge he had attained of Kinematography, but he was very disheartened after his many years of patient labour to be forestalled by, Greene and Evans, and great credit is due to him for his untiring efforts spent in his quest, which had he been first with the Patent, might have altered the whole commercial aspect of the exploitation of the movies.

George Demeney.

Another clever inventive Engineer who had done so much to assist Professor Marey in his Chrono-Photography was Monsieur Georges Demeney a native of France. Not only had he worked assiduously, and been responsible for the production of all Marey's moving Picture apparatus, but he also acted in an advisory position to the Brothers Lumiere, whilst they were carrying out their their experiments prior to 1895, when they produced their moving pictures under the title of "La Cinematographe".

In the year 1892 Demeney produced and patented a Photographic Gun Camera, which was a great improvement upon Janssen's Gun, and also the one made for Marey. This he patented in Great Britain on September 1st. No. 15709 and he exhibited the instrument at the International Exhibition of Photography held in Paris in 1892. The camera worked from a trigger movement and was capable of taking 24 Snap Shots upon a rotary glass plate in rapid sequence. This instrument he called the PHONOSCOPE which he was also able to use as a Projector by the addition of an Optical Lantern.

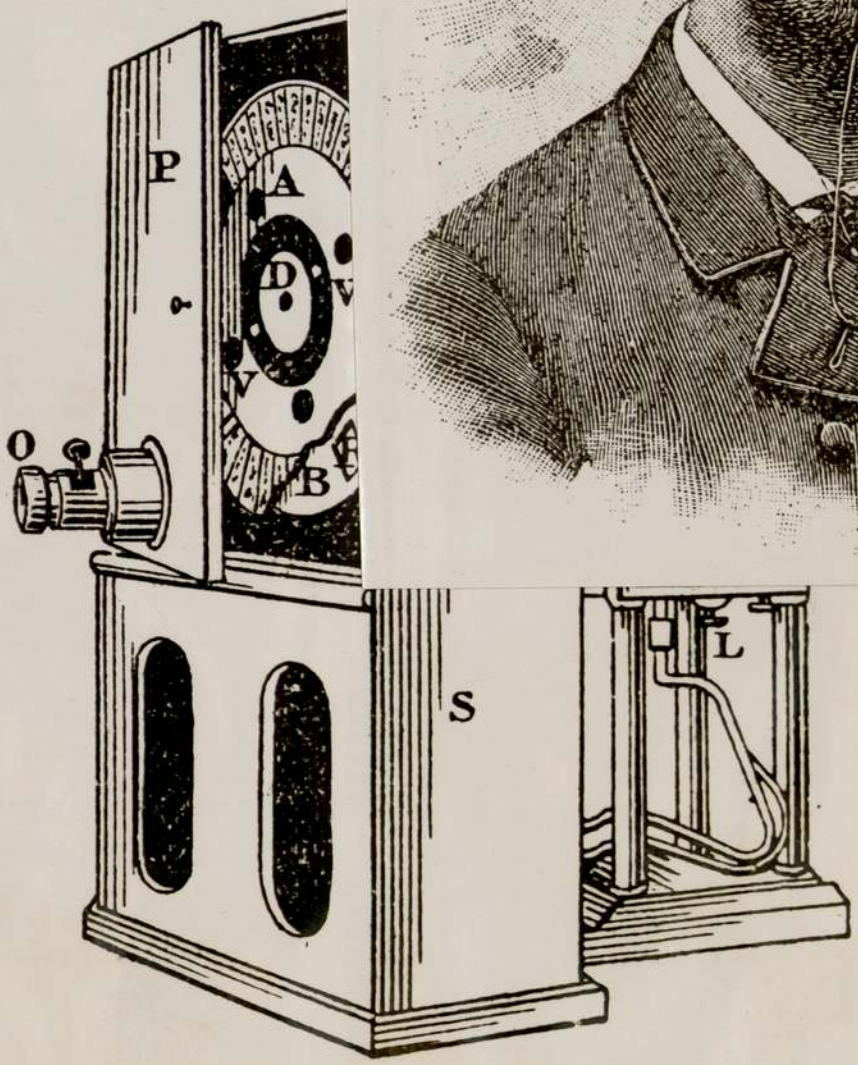
In 1898 this instrument was placed upon the market as a popular toy for showing a limited series of moving pictures in the home. On June 30th 1893 Demeney was granted another British patent No.12794 for mounting views in the Phonoscope and showing them Stereoptically, but nothing seems to have been done to render this invention a commercial impossibility



Train leaving Gare Du Nord. Film by ~~Lumière~~ Demenÿ of Paris 1898

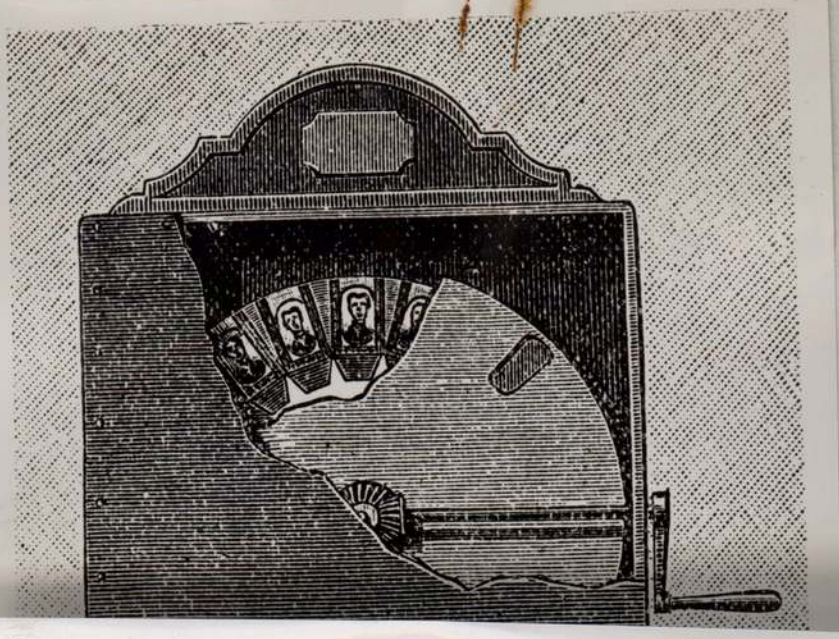
Garde
23

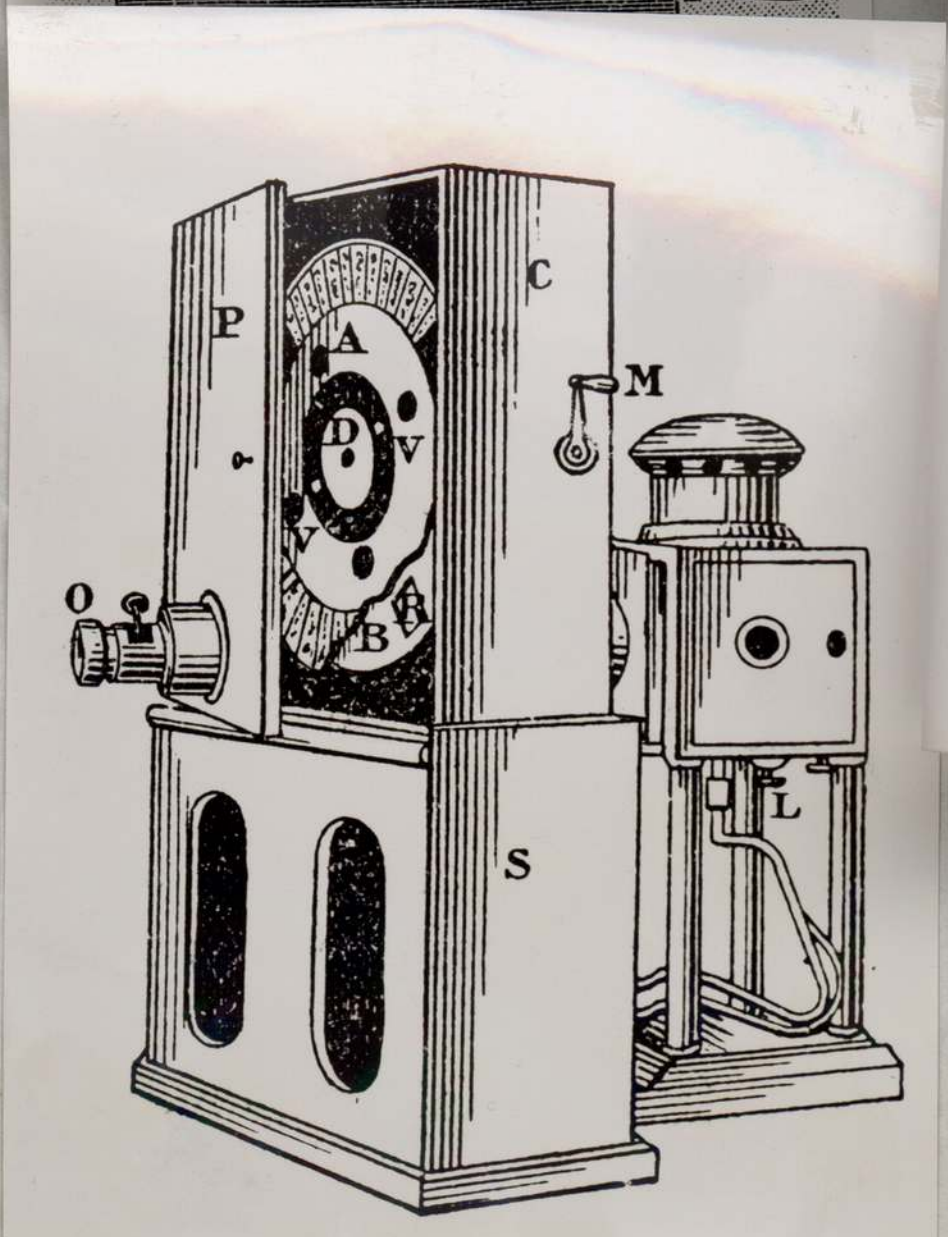
Demeney.



Demeney's Projector

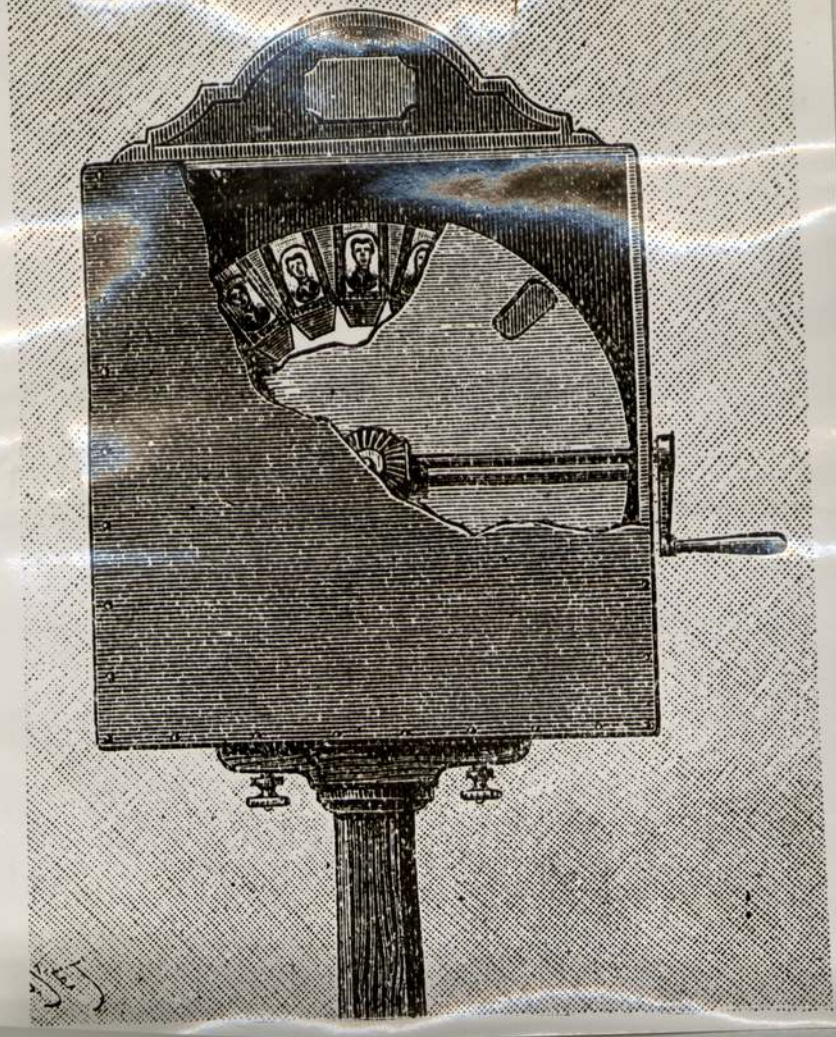
Demeney.



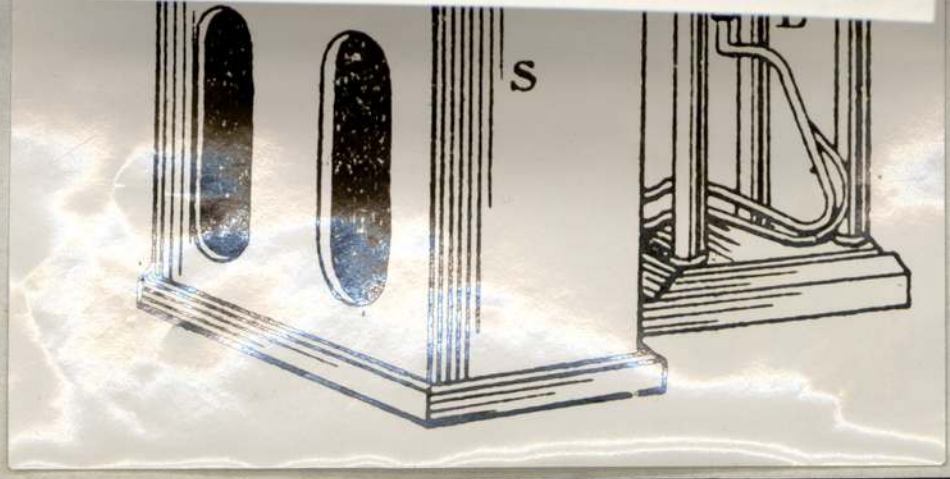


Demeney's Projector

Demeney.



G. Demeney
Projector



Demeney's
Projector

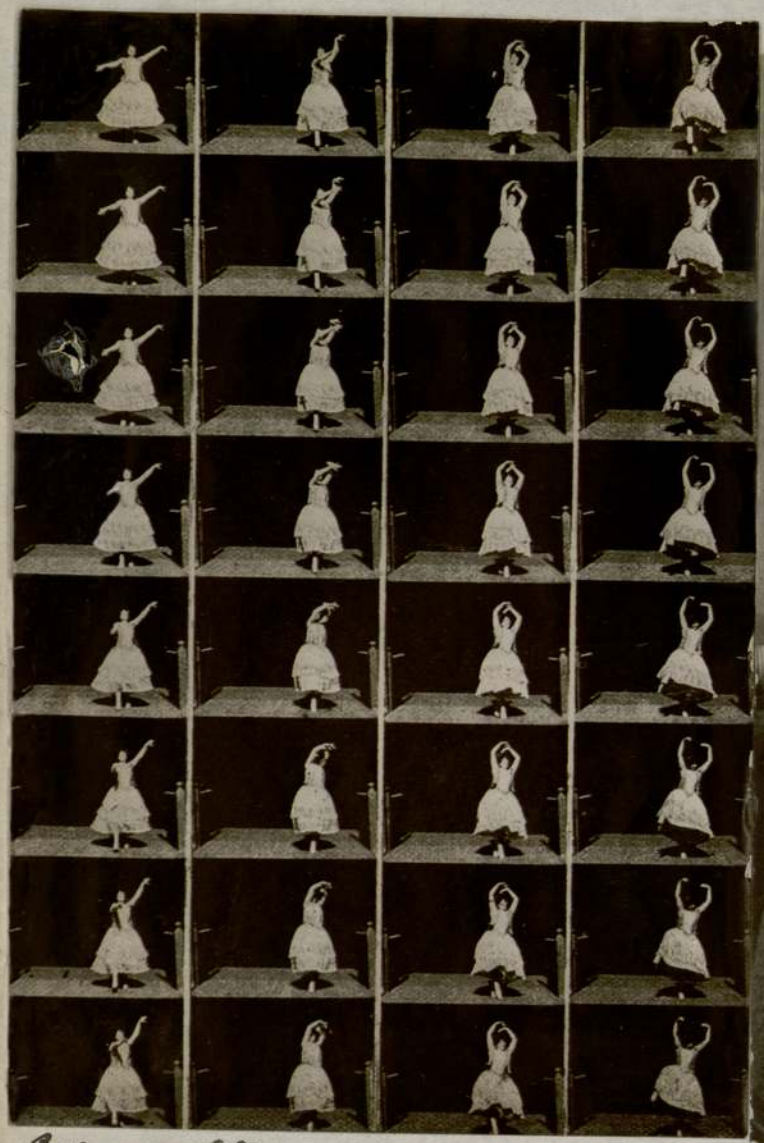
In October of 1893 Demeney took out a French Patent for a small projector using a reel of Cinematograph Film which he called the Biographe into which mechanism he introduced an eccentric dog or beater movement to impart the necessary intermittent motion to the film. By this method he was able to use a top and bottom spool for his film, and so important did he think this invention, that he atonce took out a British Patent and on Dec.19th 1893 was granted Patent No. 24475, he also patented this in Germany at the same Time, and what is most remarkable he omitted to patent this in his own country, France. It was not until the month of July 1894 that he discovered this oversight and he applied for this addition to be added to his original French Specification which request was subsequently agreed to by the French Patent Office, although it must not be forgotten that W.Freise-Greene and Mortimer Evans were using the dog movement long before this time.

The final rights for using Demeney's patents were vested in Mr. Leo Gaumont who adopted this movement for all his Cameras and Projectors which carried the Trade Mark of "Gaumont's" Chrono" made under license from George Demeney. These projectors were marketed in two gauges the one to take the Edison Standard Gauge Film of 35 m.m. and the other to take the large size Film of 60 m.m. similar to that used in the Biograph. Demeney also carried out numerous experiments with the Synchronisation of Sound and Film which finally resulted in the production of the CHRONOPHOTOPHONE in 1892 and although this instrument was never placed upon the market it was certainly a clever production, embodying many features used in several of the sound systems, whic appeared upon the market many years later, where the Gramophone using a Disc, was used to accompany the film.

Thomas Alva Edison.

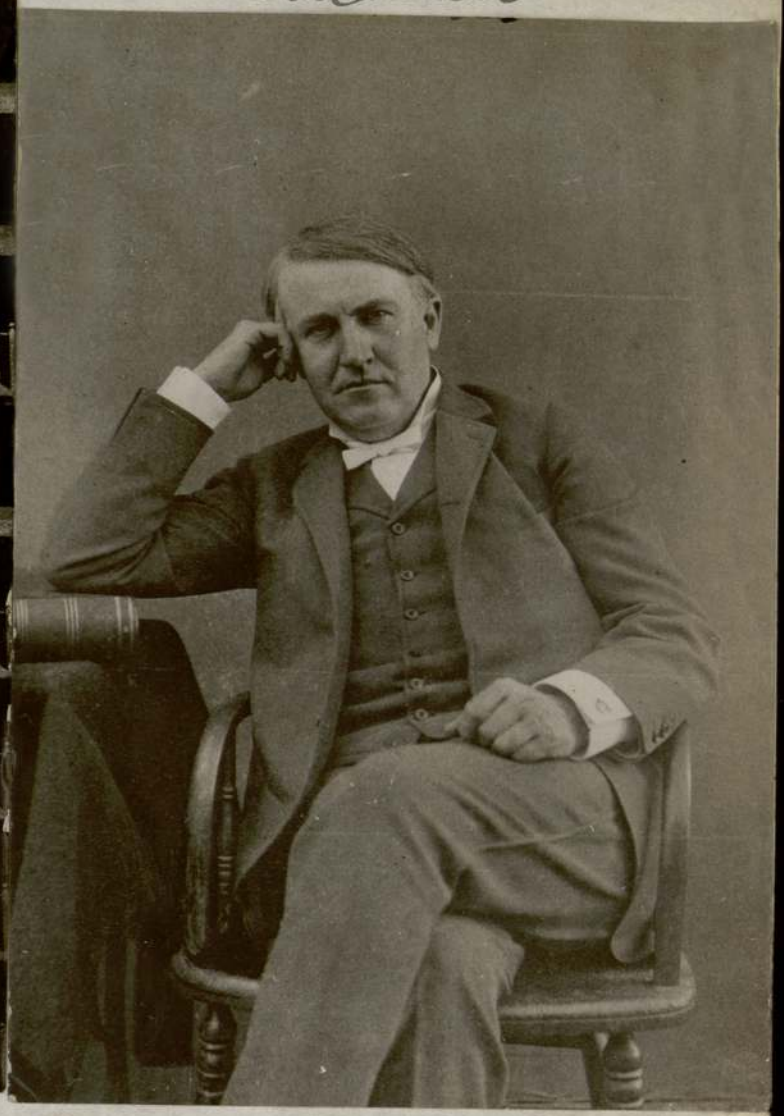
The year 1887 should ever be memorable for the future writer of motion picture history, as it was in that year that Thomas Alva Edison, that great Wizard of the West, conferred with his particularly able and clever assistant William Kennedy Laurie Dickson. Together they talked over the possibility of recording movement by Photographic means, as Edison had already had proof of the capabilities of Dickson having taken out some patents applicable to machinery for breaking up gold bearing Quartz in their joint names. Before proceeding with the description of EdisoN's work on the commercializing and perfecting of moving pictures it will perhaps be of interest to the reader to learn a few facts of Edison's life culled from the pages of a remarkable book writ-

Edison

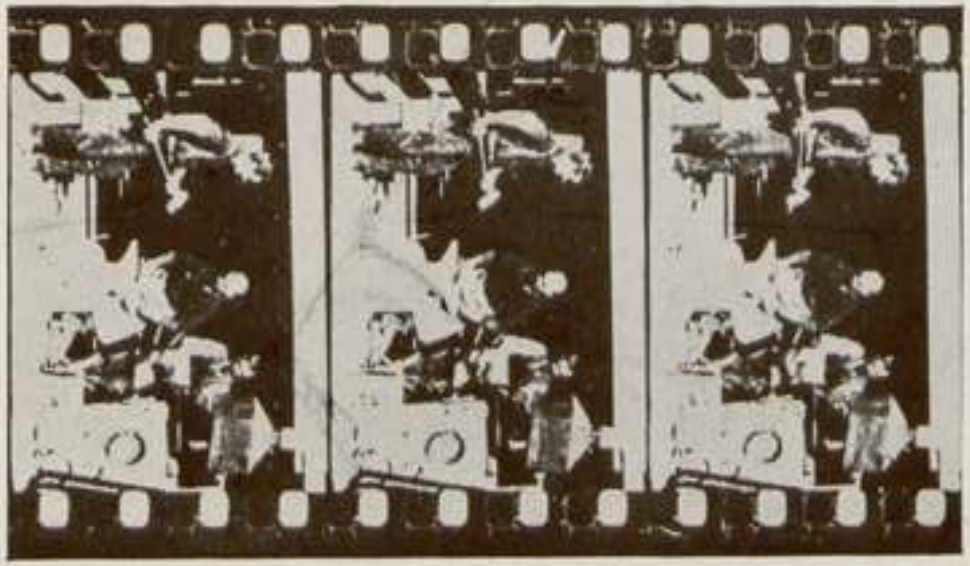


Carmencita

T. A. Edison



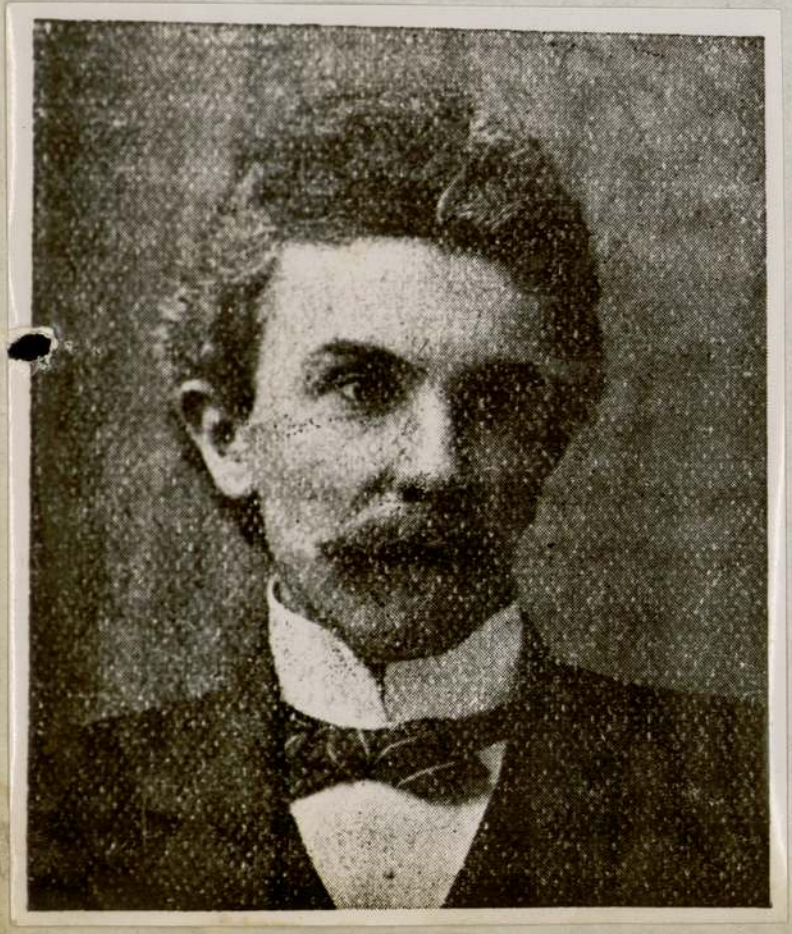
Edisons Kinetoscope Picture Parlors
at 1155 Broadway Near 28th Street
New York. The first Kinetoscope
Exhibition started April 14th 1894



Edisons First Close up Film The Kiss 1896 Contact Print

Edison

Fred Ott
Sneezes
for Edison's
first film



William
Kennedy
Laurie
Dickson

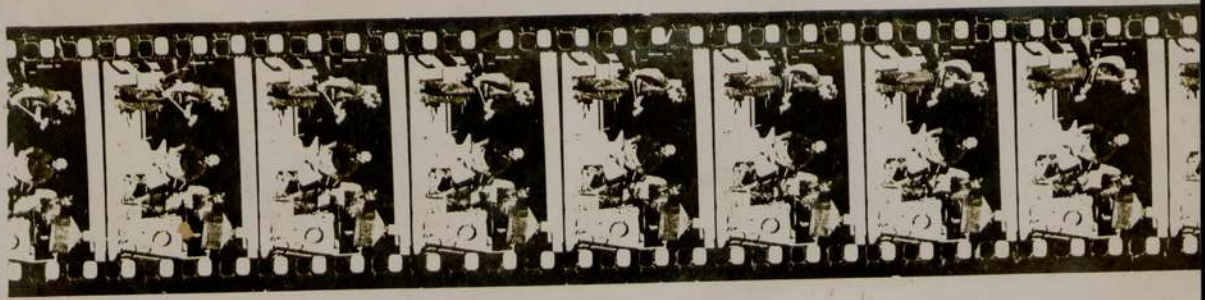
"The life and Inventions of Thomas Alva Edison," written and illustrated by W.L.K.Dickson and Antonia Dickson published in 1895, :- "Born at Erie County, Ohio, U.S.A. on February 11th 1847 of humble parentage, Thomas Alva Edison in the home of his Parents, first saw the light of this world. His mother who was a school teacher, played alarge part in guiding the destinies of her son, and although his start in life was hard, his manner was cultured and refined; he was self educated and books were his one absorbing hobby. Every penny he could put on one side from his meagre earnings was spent on books of learning, his thirst for learning being one of the most outstanding characteristics of his life."

*which he invented in 1878

About the period of the latter 80s. Edison's interests were largely absorbed in perfecting the Phonograph;* The incandescent lamp Multiple Telephone Transmission, and it was while all these wonderful inventions were being developed commercially, that Edison in 1887 conceived the idea of adding Moving Pictures to his already long list of successes. We learn from the record of incidents in the life of Muybridge that he visited Edison at his laboratory at Orange, New Jersey, in 1888, which showed his keen desire to learn all he could about moving pictures. Muybridge showed Edison his band of figures of a trotting horse, which he had reconstructed so as to be shown moving in the Zoetrope, and at the same time, he asked Edison if he thought it would be possible to couple the Phonograph to his moving pictures. Upon this point Edison would give no definite answer, as of course he had himself conceived the same idea some time before. He had also made himself acquainted with the various instruments which had already been produced to show moving pictures, such as, the Phenakisticope, Stroboscope, Ross Wheel of Life, and others, so that he had a fair idea of the basis of the theory of moving Pictures, and the, large part played by the Phenomenon of Persistence of Vision.

Having talked over the possibilities of reproducing sight and sound with Dickson to whom Edison expressed the idea of coupling the Phonograph and Zoetrope together, but this idea was discarded as not being practical.

Edison's next conception of a motion picture machine was on exactly similar lines to that of his Phonograph consisting of a glass cylinder in place of the wax cylinder used for the recording sound. Many difficulties presented themselves to thwart the objects of Edison's desires, as unlike the Phonograph which in recording sound had to run continuously, the glass picture cylinder had to run intermittently, to allow of recording each little photograph separately. These photographs measured only about 1/16th of an inch square, and the speed considered necessary by Edison to record a correct impression



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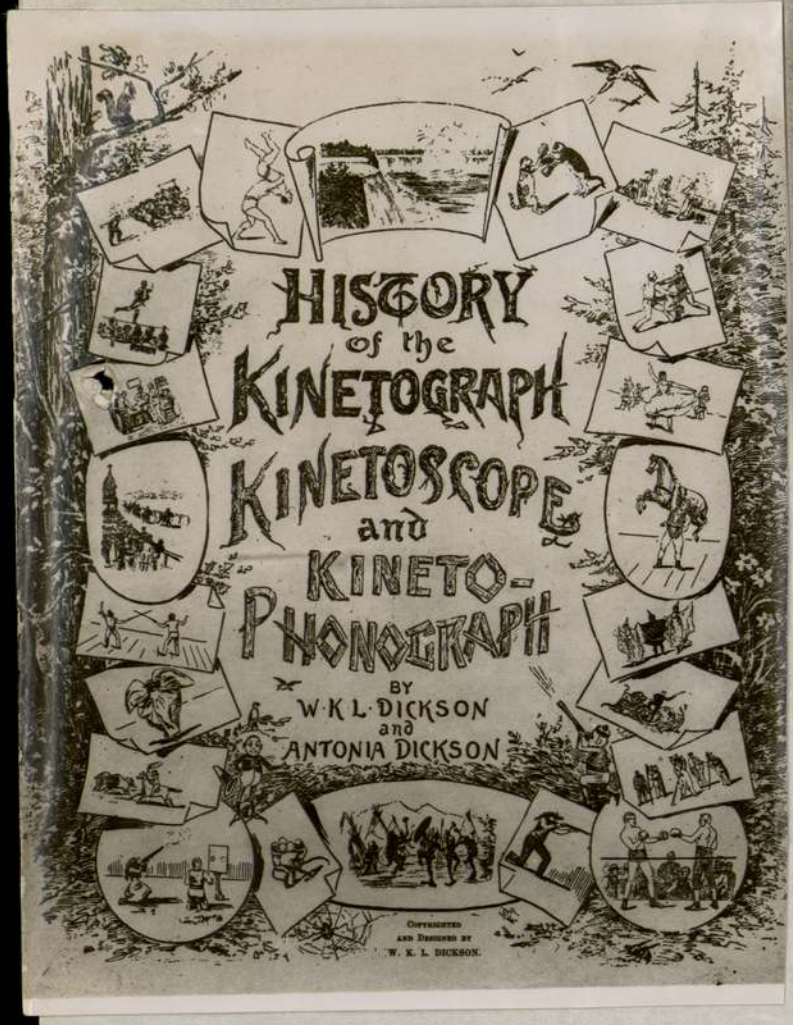
THOMAS ALVA EDISON

During his lifetime, the author had the pleasure of many conversations with this brilliant worker. Arising out of his history two facts stand out prominently. He gave the best years of his life to recording life motion portrayals by means of photography ; he spent two fortunes in the elusive pursuit of his study and research to portray movement in colour.

In his unceasing labours to overcome obstacles, which hitherto had been regarded as impossible, he often went without food and sleep. In this connection, it must be remembered that during his earlier studies photography itself had reached no great stage of perfection ; celluloid, as a transparent base to carry the emulsion, was to all intent and purpose, an unknown quantity.

When first he set out to achieve by photography that which had only been accomplished by drawings — such as the figure discs and bands of paper used in the

Edison



5/

A strip of the original Edison Kinetograph, with the pictures running horizontally.

Williams Kennedy Laurie Dickson 1889

Edison

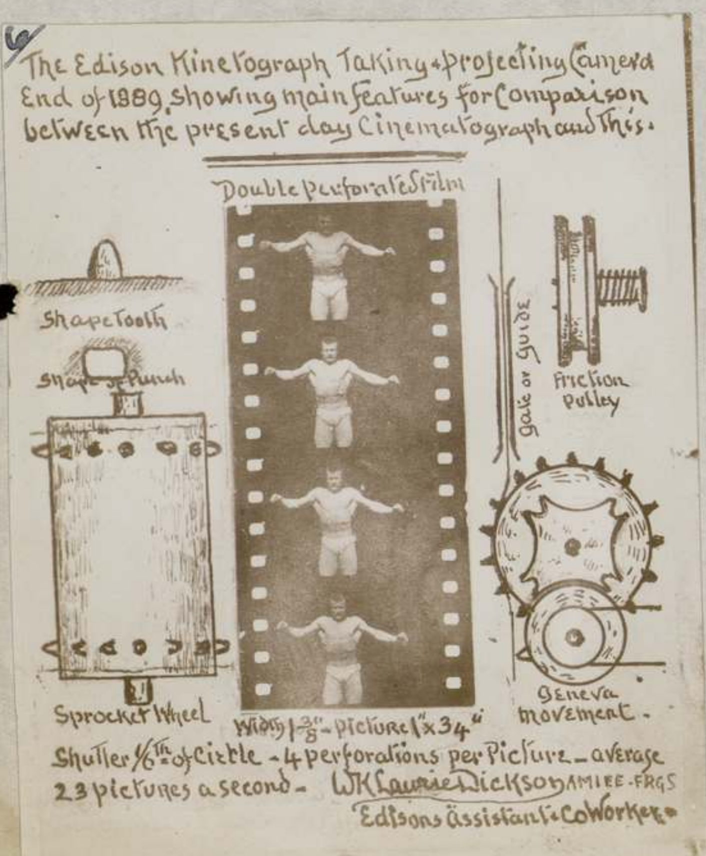
Jersey 29 Aug –

Sorry I forgot the postage 1/6 Enclosed Stereo & Turb – which gives me a chance to send print – of the 1889 – 1933 Kinema (for comparison – paper just come fr Boots – Best of luck ~~WKLD~~

Tom McW Day
London

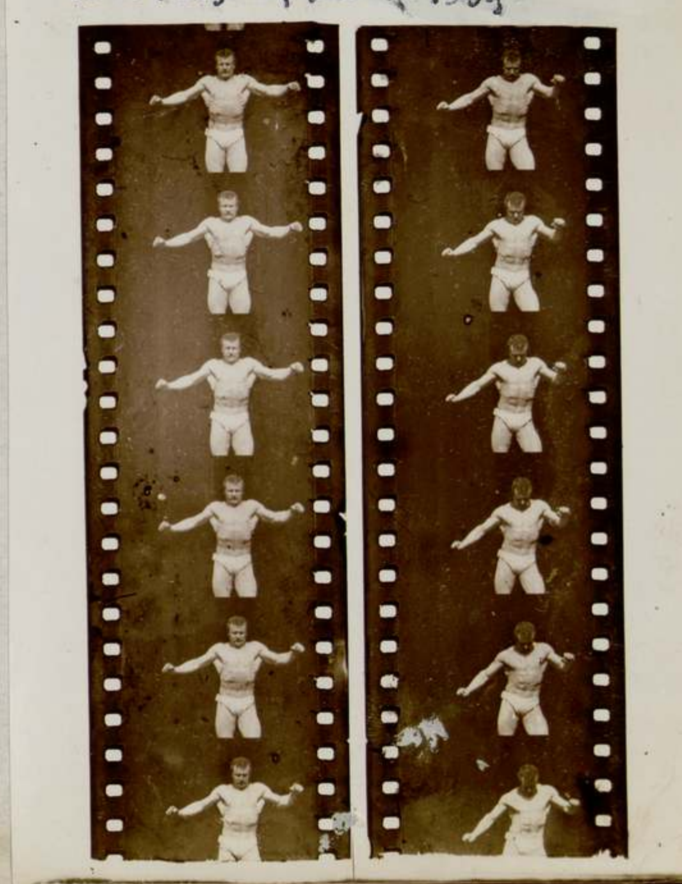
If on this "Challenge" photo sketch which I regret was reduced by mistake you c^d cut out 3 or 4 correct size pictures from the other print & paste on – but I am afraid that won't do as the other items such as sprocket &c are also reduced –
Should you want to reproduce then I'll send you my original sketch
It's a great idea that I can prove this my

1889 gift to the world – same size etc?



Faulty copying – reduced – fully width measurements

Exact Size of film 1889



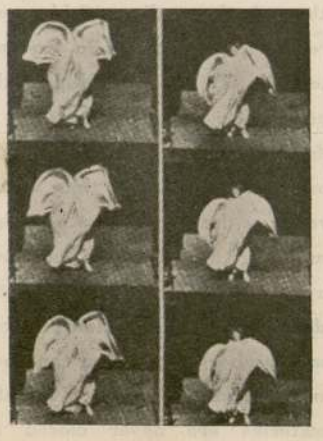
of movement was at the rate of 40 pictures per second, which he found out later was greatly in excess of the number required, vz:- 16 per second, for Monochrome silent pictures.

The first attempts were made upon a glass cylinder, the same size as an original Phonograph Record, the surface of which was sensitized with gelatine and bromide of silver, and the resultant photographs could only be viewed through a microscope. This effort was quickly discarded as being both unsatisfactory and noncommercial. The next attempt was made with much larger pictures, of about 1/4 inch square, and were recorded upon the edge of a glass disc, the finished photographs being illuminated from beneath, by a geisler tube, which was operated by a series of pins, making contact each time a picture was centred and in position for viewing.

This arrangement although an improvement upon the first, left much to be desired, so experiments were conducted with some half plate celluloid snap shot negatives, purchased from J. Carbutt of Philadelphia. These were fastened around the glass cylinder, and exposed as before and after development were printedfrom, and the resultant positive again fastened to the glass cylinder, and a small pip bulb lamp inside the cylinder, illum-inated each picture whem it was correctly centred for viewing

In all these efforts attempts were made to synchronize sound with the pictures, and an ordinary wax cylinder was cut with suitable music to run at the same time as the pictures were shown. These last experiments using the celluloid sheets were carried out at the latter part of 1887, and although the idea in the main was fairly satisfactory, it did not satisfy either the ambitions of Edison or his clever assistant, Dickson, as it was too limited in its scope for the number of pictures portrayed.

Still undismayed after all the time spent upon these experiments, Dickson tried out a new idea entirely, and obtaining some strips of sentisized celluloid from Carbutt about 12 ins. long by half an inch in width and 1/16th of an inch thick, he attempted to secure a series of pictures thereon, but the results were not satisfactory, as the pictures were too small. He then increased the width of the film to 1½ ins the outer edge of which was perforated to engage with the mechanism of the camera, this also allowed each picture to be locked into position for viewing. In this attempt a rotating shutter was used to mask the picture shift, but the rapid rate of 46 pictures per second for the exposure, gave such a lack of detail that it had to be abandoned, notwithstanding that a light of 50,000 candle power was concentrated upon the subject being photographed.



Ida Fuller, sister of La Loie, in her Fire Dance; an early Kinetoscope picture.

Edison
~~Early~~ Motion Picture Film Strip Record of One-Half Inch Width

Reproduced from p. 12 of W.K.L. Dickson's book

"Photographic Scientific Experiments and Developments leading to the Perfection of the Vitascope." published about 1896.

Thomas Alva Edison. (con.)

By the end of 1886 a new laboratory at West Orange, New Jersey, had been completed, where the previous experiments had been carried out in a special room set apart for the purpose known under the title of room 5. To this room there were only three persons that had means of entry, they were Mr. Edison, Mr. Dickson and Mr. William Heisse, a very capable mechanic, and sworn to strict secrecy, many were the trials and attempts to arrive at a satisfactory solution to produce moving pictures that were carried out. Attempts were made to join several lengths of stout celluloid 1/16th in. thick into a long strip, but even when several lengths were so joined the results were still of a limited nature.

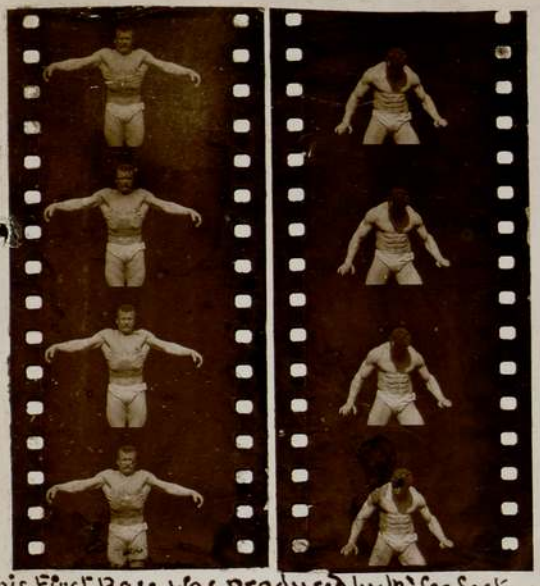
Dickson was now at the end of his tether, as he could get no farther with the materials at his command, when news was brought to him at the latter part of 1888 the Geo.Eastman had produced a ribbon film coated with emulsion. This offered a satisfactory solution to his great problem of securing a continuous band of photographs, and after attending a meeting of the New York Camera Club and hearing Geo. Eastman's lecture upon this new film, he begged a piece of negative from him.

After showing Edison this new product, it was not long before a new mechanism was constructed to use it, and after numerous trials it gave great promise for success, so much so, that Edison, who was leaving on the boat for the Paris Exhibition in August 1889, turned to Dickson and said "Having got the desired medium for your needs, work like Hell!, and finish it," and as the steamer left the pier, he pantomined to Dickson as if he were gazing into his Peep Show Kinetoscope. (This is great proof that Friese-Greene was greatly prior to Edison with his patent for Kinematography which was taken out in 1889.)

On his visit to France, Edison made the acquaintance of Dr. Marey, and through the kind offices of his assistant Demeney, was agreeably surprised to see the wonderful results he had achieved with his Chrono-Photography of Birds in Flight, Movements of various animals and insects, but best of all a series of pictures of Athletes exhibiting their prowess. After a stay of two months in France Edison returned to America on October 6th. 1889, and lost no time in paying a visit to the mysterious room 5, at his West Orange Laboratory, to witness the progress made by Dickson during his absence. After being comfortably seated, his surprise can be better imagined than described, when he was shown a film of his faithful assistant William Kennedy Laurie Dickson who appeared on the screen, taking off his hat and bowing, whilst a gramophone record at the same time, uttered the following sentence:- "Good morning Mr. Edison! ! Glad to

For Mr. Will Day for his book – compl. of. W.K.Laurie Dickson – Jersey 1933.

An Early Edison Perforated Film
Taken between 1889-91 – by W.K.Laurie Dickson
at Edisons Laboratory – Orange N.J.

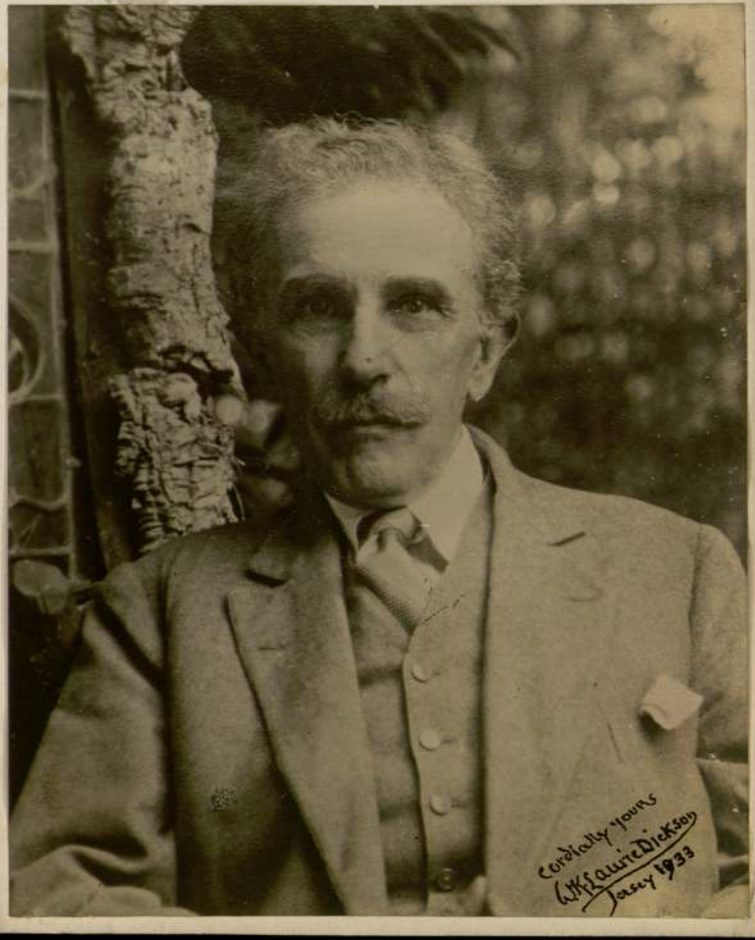


This First Base was produced by Mr. Geo Eastman
in 1888 at Rochester N.Y. Exclusively for Mr. Edison –
Thus completing in 1889 the First Commercial and
Standardized perforated Film. etc, same as now in use 1933

no filling in this positive sample

Edison – Pioneer of the Commercial moving pictur industry
Created in 1889 – as now 1933 in use – photo by Edisons Co Worker W.K.Laurie Dickson
Jersey 1933

Note Mr Willings (May 1889) – which Mr Eastman soon overcame. (Neg Film)



Jersey June 7/33 –

Reply to yrs of June 1/33

Dear friend Day –

I often wonder if you dont feel like throwing a fit when the Post brings you another Jersey missive – but its difficult for me to refrain from ans. by return – so I try to let up as much as possible to save your forehead – I was getting a bit worried about you, hence my P.C. to yr firm – wont you be able soon to let up?

I note all you say in yr letter especially re Mathews – yes these good people take a lot of feeding – but what I shall send the Society will be mostly personal stuff – leading up to details of Experiments, perhaps with small Explanatory outlines or Sketches only if demanded – I wont do that however unless they repeat this wish – I am carefully watching what you are publishing in yr great book, where all my & your interest lies – but I fancy Mathews has it up his sleeve to get me into their Society if I can prove this early work –

Since Marvin had it out with T.R. he has from his correspondence with Marvin & me turned over a new leaf – but is his repentance a genuine thing you?

How I should have loved to hear your Presidential address - well it wont belong now, next year June I shall be installed at Twickenham once more, & then yours will make the world buzz with new discoveries -

You need never fear anything Papa Lauste has to say - its all for his being 1st in the field in ALL - what you get from me is Exact & true & can be relied on - You are making me come out of my shell - bless Em -

I am now daily Expecting a reply fr. Ch. Edison re permission to pub. his letter -

Thanks for your very kind appreciation of my wish to be Ever loyal to Edison although as you know all to the core - that he had his chance to support me against Gilmore's accusation - and didn't - I forgave & tried to forget which was inexpressibly difficult -

Naturally if it comes from you pen as the Editor of your book to Express your views as to my loyalty it would do me infinitely more good than if I tried to show this - But please dont do anything more for me re corrections - I am genuinely ashamed to have given you so much trouble -

By the way - I came across a most interesting & unpublished lot of letters fr Edison - and made one,

a but too greatly reduced photo copy for you to smile over — the original you will get (as I haven't here in Jersey a larger camera) to copy in case you want it for yr book —

The story is simply, that when in England I had read of a Mr Edison in America, & of his experiments & wrote him to get me on his staff — & got this reply — anyway I paid no attention to that, & persuaded my mother to pull up stakes & went out in 1879 — & had an amusing interview with E. at 65 5th Ave 1881 — I showed him his letter but he wouldn't bother to read my testimonials — which as he kept turning the pages while staring at me —


T. A. EDISON.

Menlo Park, N. J., Mch 4th 1879

Dear Sir,

Your favor of the 17th ult has just been rec'd. I cannot increase my list of employees as I have concluded to close my works for at least 2 years as soon as I have finished experiments with the Electric Light.

Very Truly
T. A. Edison

T. A. EDISON,
Menlo Park, N. J.

MENLO PARK N. J.

William Kennedy Laurie Dickson
Care of Mrs Aubin
[illegible] Tregunter Road
West Brompton
London [illegible]

"Remarked — "What made you come "out? I told you not to — "Well I reckon you had better "Take your coat off & get to work now you are here!!" — I won — In less than a year I took W. S. Andrews place as Superintendent of the Goerck St. Elec Works — Funny & very historical — Now dont be sick — & get well, is the earnest wish of your Old friend

W. K. Laurie Dickson

not clear — "as I cannot increase my emp[illegible]yees etc"

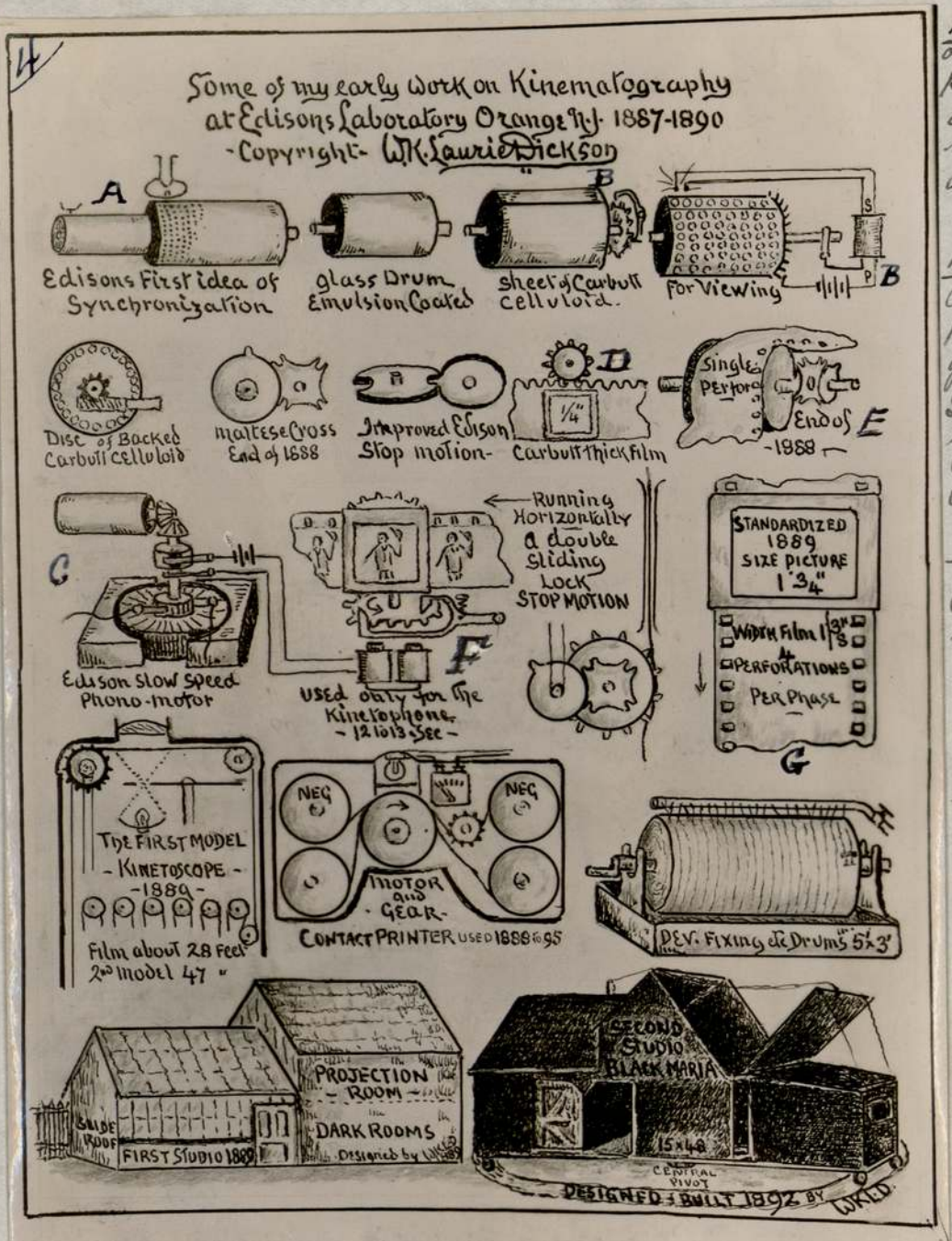
use magnifying glass — Over

Will send original if wanted Keep this of course

Edison

F. Second type of film with two rows of perforations film of wider gauge than rackwork film D

G The Edison standard gauge Film as in use at the present time Four perforations each side of Margin



A. Edison's own original idea of producing 40 Photos a second upon the same shaft as phonograph record.

B Cylinder Containing reproduced Photographs on to Glass drum with Geisler tube illumination Cylinder ends of Aluminium

C Synchronizing Attachment Working from Bevel gear

D First form of Celluloid film used 1/16th of an inch thick from Carbutt of Philadelphia in lengths of about 4 feet.

E. First thin film supplied by Geo Eastman Note perforations on one Margin only.

an interesting record of the work carried out on behalf of T. A. Edison by William Kennedy Laurie Dickson after receiving instructions from his chief.

Edison (con).
"see you back! I hope you are satisfied with the Kineto-Phonograph."

Here then was the successful issue of many years of research, to produce a moving picture accompanied by sound, and it says much for the inventive genius of Dickson, who had successfully accomplished this invention, that the film he produced was exactly similar to that in use today, measuring 35 millimetres in width, and having four perforated holes upon each side of the picture.

It was thus that the Edison standard gauge for film came into being, which has ever since been adopted as the standard for the whole world. It is also interesting to note that this demonstration placed on record, that it was one of the first talking films, popularly termed "The Talkies," ever produced in the world, the date being October 1889. As a proof of this occurence a sworn declaration before a Notory Public by William Kennedy Laurie Dickson is here reproduced.

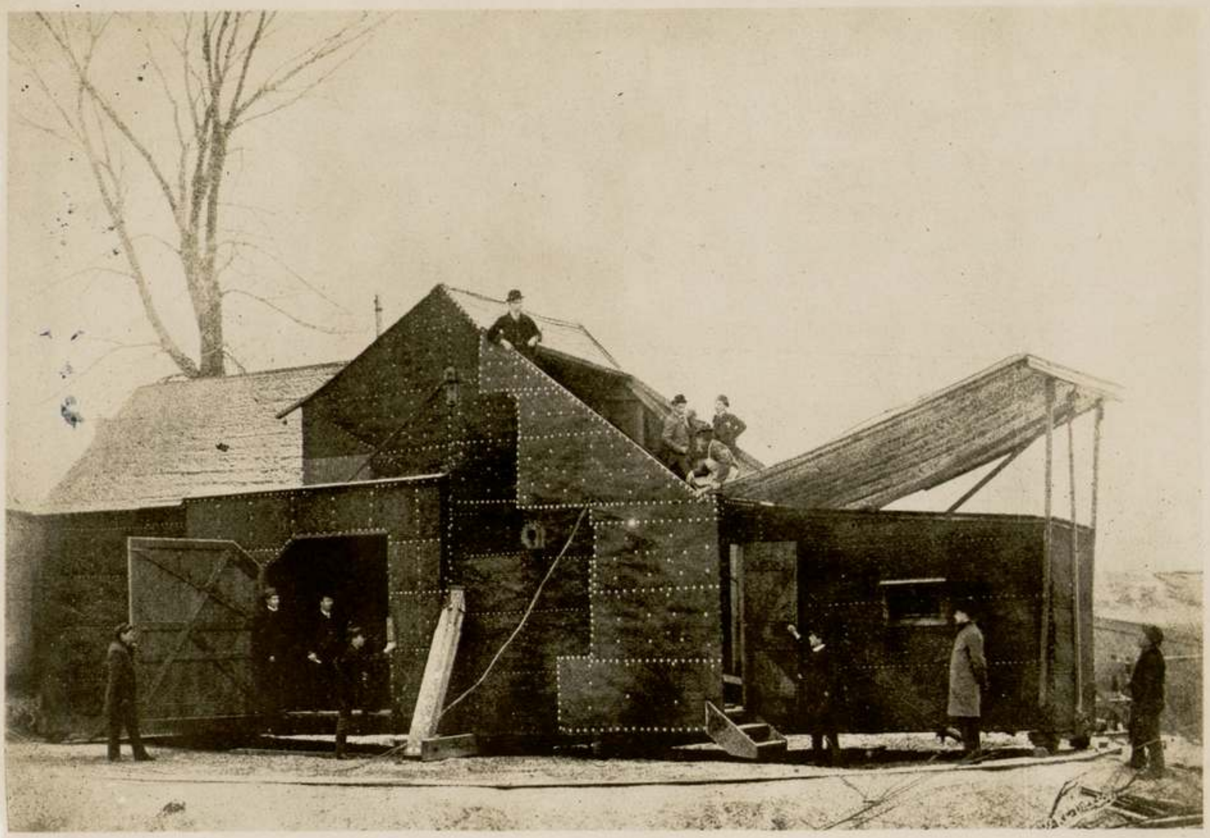
Not withstanding the perfect success of this invention, it seems very remarkable, in the light of subsequent events, that Edison with his usual business acumen, did not at once devote himself to the commercialization of this invention for showin upon the screen, as it was only necessary to substitute a slightly different gauge sprocket to convert the camera into a projector, which Dickson had already accomplished. To this idea Edison always was averse, as he considered the whole feature of moving pictures lay in viewing them, peepshow fashion, in his Kinetoscope, which by now had become a perfected instrument.

Dickson looking perhaps a little further ahead, begged his chief many times to reconside r his decision, and produce a projector for showing pictures upon the screen, but to all his entreaties Edison remained adamant, saying. "Why destroy the Goose that lays the golden eggs" as we are selling our Kinetoscopes faster than we can produce them, and if we projected the pictures upon a screen, ten machines would suffice for the whole united states. Many films were taken amongst which, as being the very first to be produced in Edison's Black Maria Studio as it was called, were "Two Cocks Fighting,""The Kiss,""Tyring a Wheel in a Blacksmiths Shop," "Annie Oakley the Famous Rifle Shot," "Buffalo Bill," "Eugene Sandow," Carmencita the Dancer," and others.

It was not until August 24th 1891 that Edison lodged an application for a patent for a machine to view his moving pictures, which as already ramarked he called the Kinetoscope. This application had many citations of prior patents brought against it, and it was only by the deletion of many daims that an American Patent was granted on March 14th 1893, the number being 493,426, whilst the patent for the camera, applied for on the same date,

Edison's Black Maria Film Studio

The Black Maria Studio designed & built by Kennedy Dickson for a wooden framework covered in tarred felt ~~pin~~ on with Clout nails Cost about £200

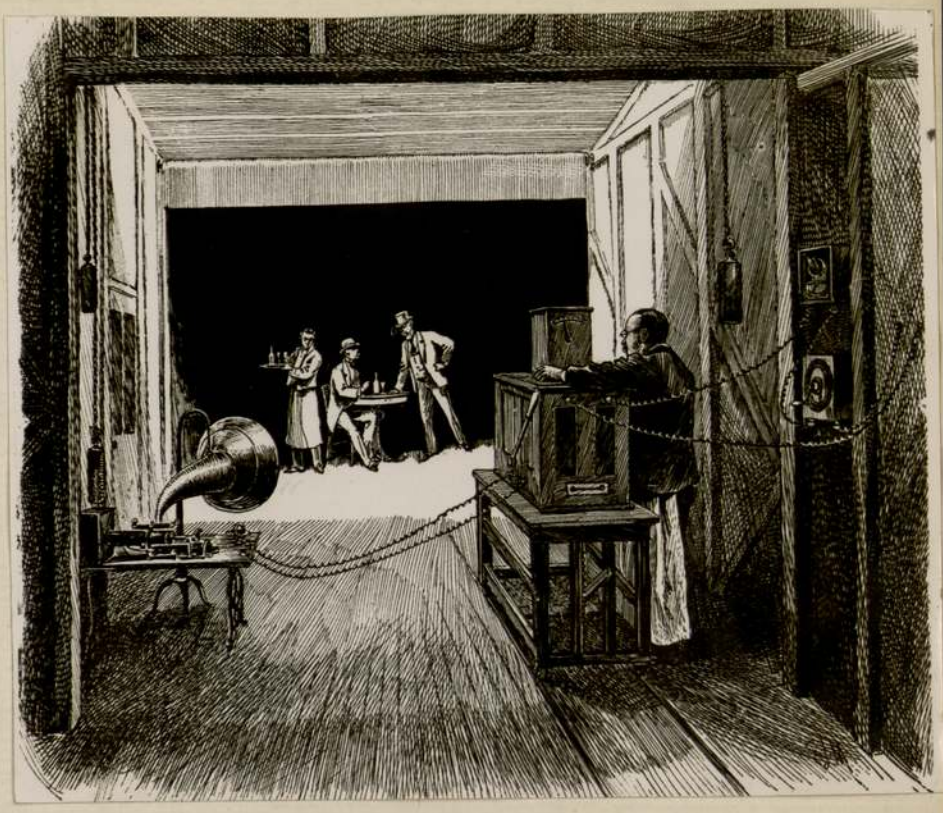


Edison's Film Studio built in 1911 was practically a glass Building.
100 feet long
65 feet wide
45 feet high
Cost £20,000 to build, and was fitted with a tank ~~for water scenes~~ of 130,000 gallons capacity, for filming water scenes.

Compare this with the Black Maria Studio

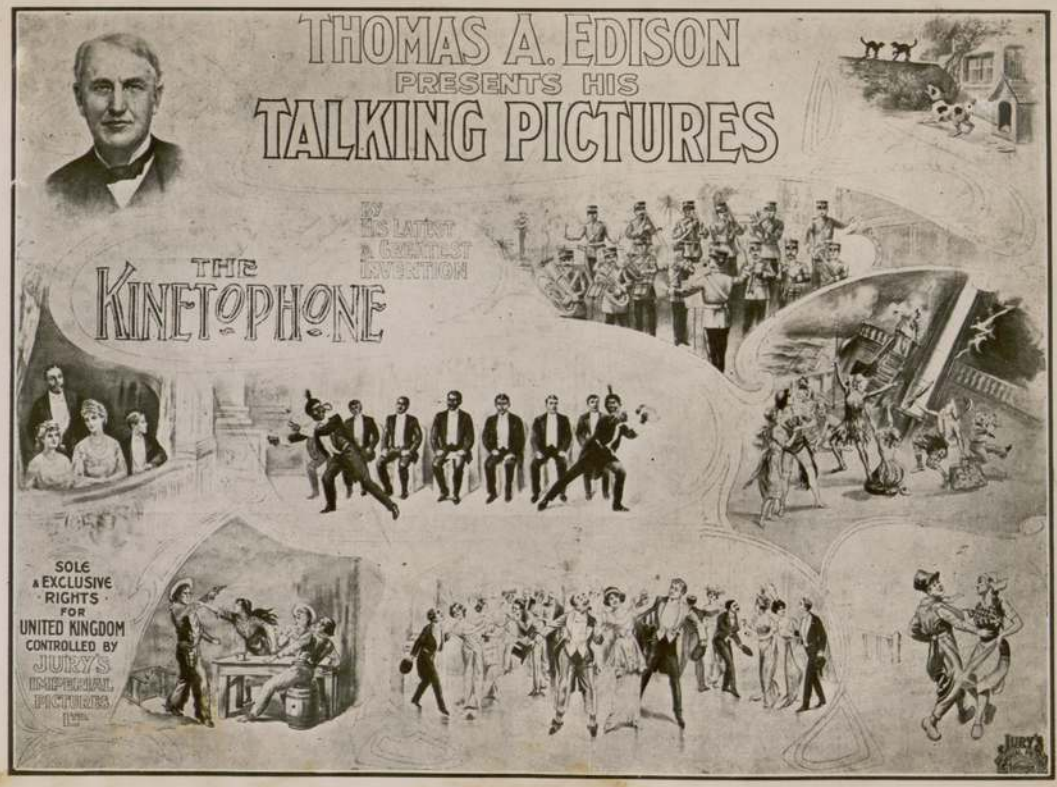
Edison

Interior of Black Maria Film Studio showing Edison's first Talking Pictures as Synchronized and arranged by William Kennedy Laurie Dickson



Edison's last Talking Pictures

The Kinetophone



was not granted until August 31st 1897, No.589,168. Edison applied for a patent for the film on August 24th 1891, notwithstanding that he did not invent it, but this was not granted to him until September 30th, 1902, No.12038, and then only as a re-issue.

The Kinetoscope was a pedestal machine, as used later at fairs and exhibitions, where by dropping a coin in a slot a moving picture could be viewed, which, in most instances, when the subject began to get interested usually stopped. This invention was notice in the "Times" newspaper in England, in their issue of May 28th, 1891 and in "Harper's" Weekly Magazine in America on June 13th, 1891, both of which dates it will be noted, were prior to Edison's application for his original patent, and although he secured American Patents for his invention of the Kinetoscope, he did not patent it in England or any other country, perhaps because he was aware of the prior patents already existing.

Dickson had many times successfully demonstrated to Edison the fact that the camera he had produced could be immediately converted into a projector, but Edison, jealous of his motion picture camera ~~into a projector,~~ getting into other hands, was always afraid of creating opposition. To try and avoid such an occurrence, he engaged another mechanic to produce a separate instrument entirely, as unlike Dickson's machine as possible, yet capable of performing the same work.

During this period, another clever operative, that had previously been engaged in the Edison Works, Mr. Eugene Lauste, the original inventor of sound-on-film had produced a projector called the "Pantoptikon" for the Lambda Company. This projector embodied the use of a Geneva Cross Movement, and a loop to feed the film through the camera and projector, and figured later in a very important law case fought by Edison as an original patent and known as the "Latham" Loop.

When this machine was first shown at New York, it was called the "Eidoloscope" and Dickson, recognising in it a serious rival to his invention for Edison, made it is business to find out all he could regarding both the projector and the men that produced it. Unfortunately for Dickson, this curiosity on his part, was misrepresented to Edison as being desirous of joing up with the Lambda Company. This led to a stormy interview which was the means of severing the associations which had existed so pleasantly since 1881, between Edison and Dickson

1 [illegible]
2 Geo. L. Spoor
3 [illegible]
4 [illegible]
5 [illegible]
6 [illegible]
7
8 [illegible]
9 [illegible]
10
11 Samuel Long
12
13 [illegible]
14 Geo. Kleine
15 [illegible]
16 [illegible]

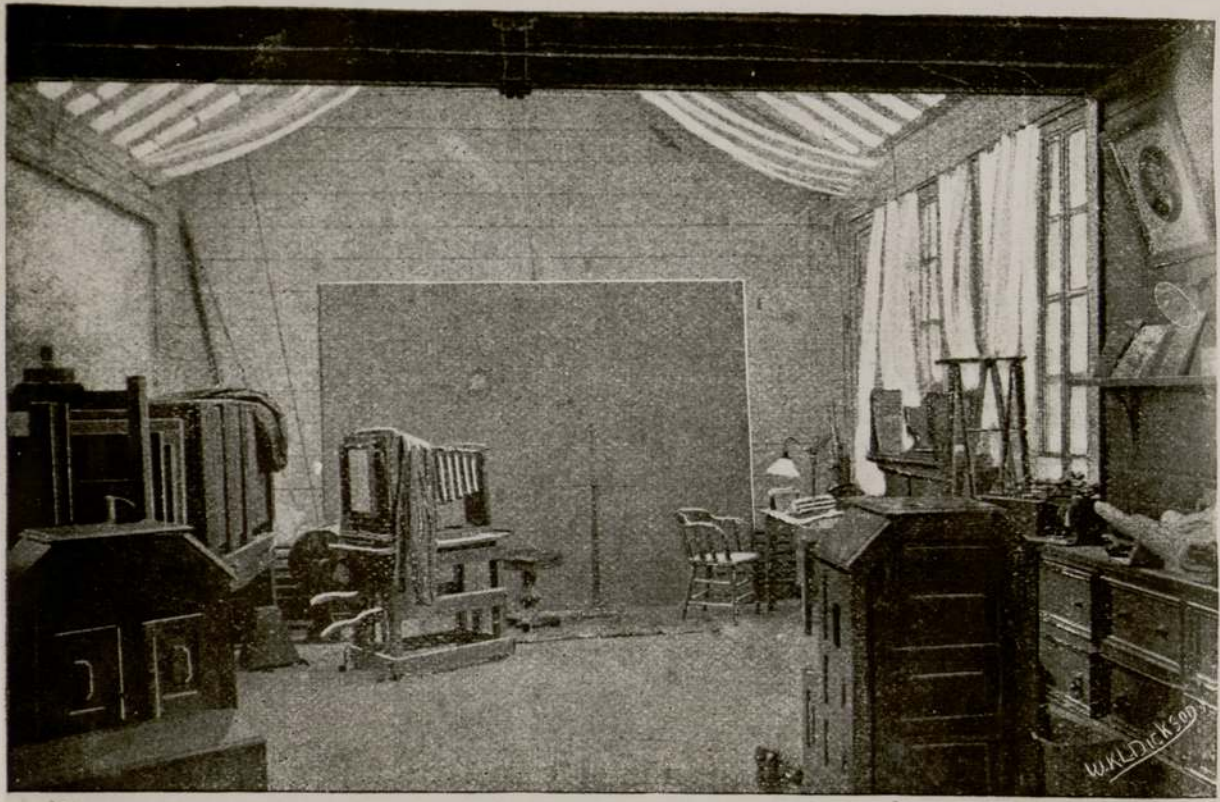
90-2B.

Licensees of the Motion Picture Patents Company - December 19, 1908.
Photographed in Mr. Edison's library at E. Orange, N. J.

Very Historical. presented to W. A. Day
by his old friend Mr E H Montagu 30/4/31

1.	Wm. T. Rock	(Vitagraph)
2.	Geo. K. Spoor	(Essanay)
3.	Peter Weber	(Edison)
4.	J.A. Berst	(Pathe)
5.	H.N. Marvin	(Biograph)
6.	S. Lubin	(Lubin Mfg.)
7.	J.J. Kennedy	(Biograph)
8.	Albert Smith	(Vitagraph)
9.	J. Stuart Blackton	(")
10.	F. Singhi	(Lubin Mfg.)
11.	Samuel Long	(Kalem)
12.	Thomas A. Edison	
13.	W.N. Selig	(Selig Polyscope)
14.	Geo. Kleine	
15.	F.J. Marion	(Kalem)
16.	Frank L. Dyer	(Edison)

To my friend E. H. Montagu
Geo. Kleine


W.K.L. DICKSON

Edisons first Studio

The Chest of drawers
Contained all
Samples of Experiments
from 1887 to 1889
and after also all Eastmans first films

Edison

In the year 1887, the idea occurred to me that it was possible to devise an instrument which should do for the eye what the phonograph does for the ear, and that by a combination of the two all motion and sound could be recorded and reproduced simultaneously. This idea, the germ of which came from the little toy called the Zoetrope, and the work of Muybridge, Marié, and others has now been accomplished, so that every change of facial expression can be recorded and reproduced life size. The Kinetoscope is only a small model illustrating the present stage of progress but with each succeeding month new possibilities are brought into view. I believe that in coming years by my own work and that of Dickson, Muybridge Marié and others who will doubtlessly enter the field that grand opera can be given at the Metropolitan Opera House at New York without any material change from the original, and with artists and musicians long since dead.

The following article which gives an able and reliable account of the invention has my entire endorsation. The authors are peculiarly well qualified for their task from a literary standpoint and the exceptional opportunities which Mr Dickson has had in the fruition of the work.

Thomas A. Edison

Edison's Letter

Interior of First Film Studio before Black

CABLE
"KURILIAN" NEW YORK.

EDISON-LALANDE BATTERY.

SALESROOMS:
110 EAST 23RD ST., NEW YORK.

Edison Manufacturing Company,

FAN MOTOR OUTFITS,

EDISON · KINETOSCOPES · MEDICAL · APPARATUS,

DENTAL AND SURGICAL MOTOR OUTFITS.

Orange N. J., August 5, 1895. 189

B. B. Hamn Esq.,

Guy's Hospital,

London, S.E. England.

Dear Sir :-

Your favor of the 18th of July addressed to Mr. Thomas A. Edison, has been referred to us for prompt attention and reply.

Although experiments to the end of introducing a machine to throw through pictures on a screen are now being made, the results thus far have not been sufficiently satisfactory to warrant our saying anything at this writing. In the course of the next thirty to sixty days, however, we hope to have something of this kind out.

Yours very truly,

W. E. Gilmore

GENERAL MANAGER.

and they parted company.

After Dickson left Edison, there were many urgent calls from Edison's Agents, Messrs. Raff and Gammon for a projector to show moving pictures upon a screen, and as by that time T. Armat had patented his Vitascope on May 14th.1901 in America, receiving the patent No.673,992 for his invention, he offered this to Edison through Raff and Gammon who promptly came to terms and secured the rights of same using his own name and well known signature of T. A. Edison upon the machine.

This projector was the source of much trouble and many legal actions and the lawyers were kept trying to uphold Edison's rights together with those embodied in Armat's Vitascope. Meanwhile, Edison had perfected a projection machine of his own make, which he called the Edisonograph. Here again fresh complications arose as by placing the Vitascope Projector for sale upon the open market, it also opened the market for the manufacture of a large number of nondescript machines,not only those of American manufacture, but also those imported from other parts of the world.

Again this forced Mr. Edison to assert his legal rights and lawyers were kept busy all over the United States, issuing summonses, and applying for injunctions against every concern that infringed his patent. One of the principle actions was against the American Mutoscope and Biograph Co., in which he failed as it was clearly proved that the machanism was entirely different from that adopted by Edison, and also that the film used was more than twice the width.

It is perhaps of interest to review this action which was reported in the U.S. Federal Reporter, No.114,1902, Page 925.The trial took place on March 10th,1902 before Judge Wallace of the United States Circuit court of appeals, Southern District of New York, and was marked, "Eidson Versus The American Mutscope Co.," It was rather a long report and to give it in part, Judge Wallace stated:-

"It is Obvious that Mr. Edison is not a pioneer in the large "sense of the term, or in the more limited sense if he had in- "vented the film. He was not the inventor of the film. He was "not the first inventor of apparatus capable of producing suit- "able negatives taken from practically a single point of view "in single line sequence."

affidavit Sworn before a
Notary Public by William
Kennedy Laurie Dickson

I, William Kennedy Laurie Dickson A.M.I.E.E., F.R.G.S. of Vermont Cottage, La Haule, St. Brelade, Jersey, Channel Islands, make oath and say:

1. THAT I was on the staff of Thomas Alva Edison, as chief of the Electro-Mining and Kinematographic Work Departments, from 1881 to 1895.

2. THAT in the year 1889, as the result of experiments conducted by me during the absence from the United States of America of Mr. Edison, and with the sole assistance of Mr. William Heisse, a special film of myself was taken by Mr. Heisse, in conjunction with a reproduction of my voice on an Edison phonograph.

3. THAT in this film which was projected in Mr. Edison's Laboratory at Orange, New Jersey, I welcomed Mr. Edison back to the United States from the Paris Exhibition and as I appeared on the screen I spoke the words: "Good morning, Mr. Edison, glad to see you back. I hope you are satisfied with the Kineto-phonograph &c." This Exhibit took place on Sunday November 6. 1889.

4. THAT at Mr. Edison's own request no one was present except Mr. Edison, Mr. William Heisse, who was the operator, and myself, at this entirely successful exhibition of the first synchronization of phonograph and Kinetograph.

5. THAT at no time during the period whilst I was carrying on my experiments with Mr. Heisse in Mr. Edison's absence did I receive from the latter any communication whatsoever either by cable or letter. I received his instructions before he went abroad.

6. AND FINALLY that after appearing in the form of articles in magazines a detailed narrative of these experiments and of the results achieved was published by me in or about the year 1895 in an illustrated booklet entitled "The History of the Kinetograph - Kinetoscope and Kineto Phonograph" which publication was entered by me according to Act of the United States of America Congress in the year 1895 in the office of the Librarian of Congress at Washington D.C. and subsequently entered at Stationers Hall,

-London

London, the copyright being secured for Great Britain, France, Belgium, Switzerland, Germany, Italy, Denmark and Portugal, in addition to that registered in the United States of America.

Sworn by the said William Kennedy Laurie Dickson at Jersey (Channel Islands) this 15th day of May 1933

W.K.L. Laurie Dickson

"

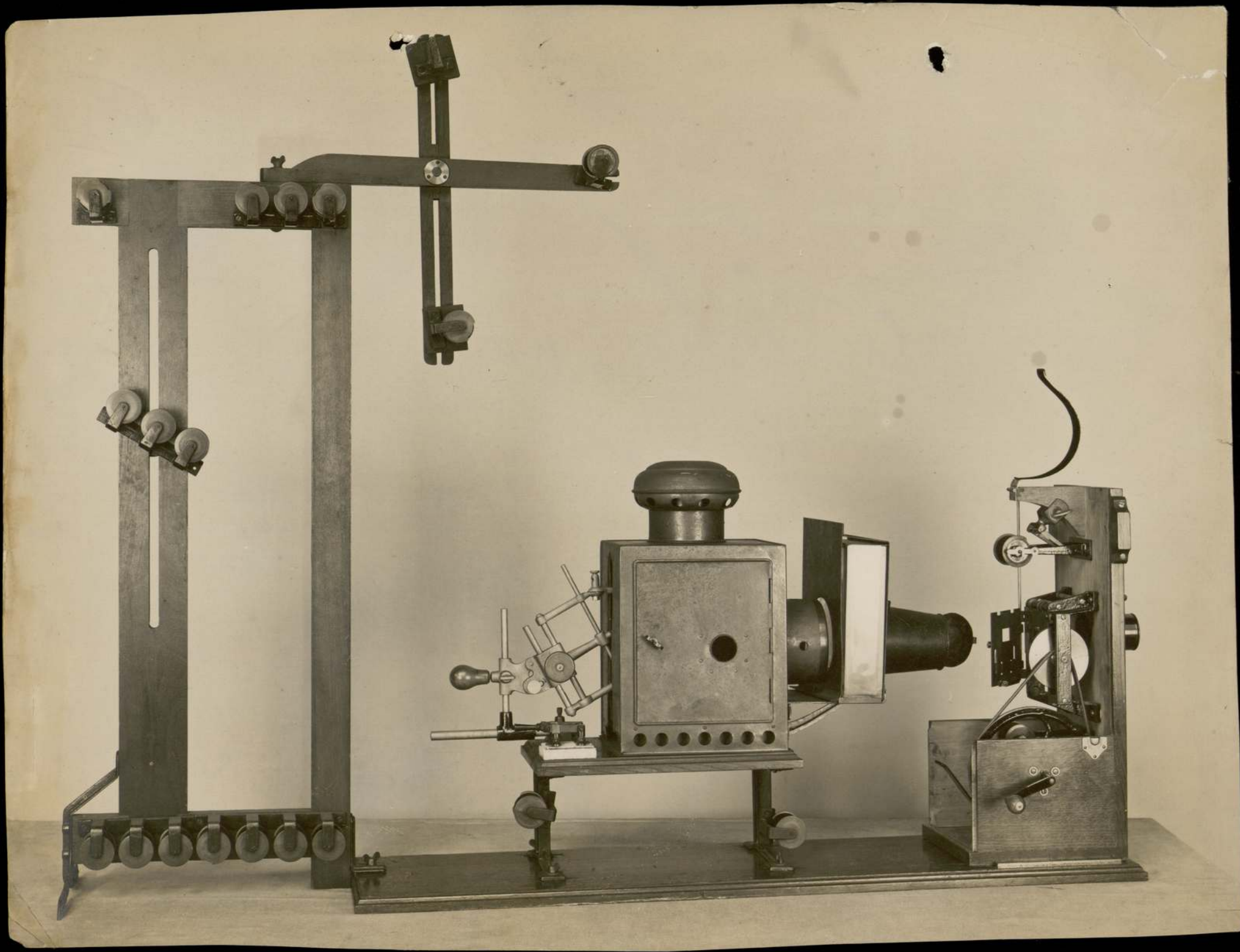
Before me

Oliver Mourant.

Notary Public

Jersey.

Lisa Emil
Cohen



W.K. Day Copyright

Mr Will Day.
19 Lisle St. W.C 2
Leicester Sq.

928

SM 4082

7½ × 9½

Photo Journal. Urgent

← 4½" →

Edison's first Edisonograph 1897
for Projecting a continuous band

" Neither was he the inventor of apparatus capable of pro-
" ducing suitable negatives, and embodying means of passing
" a single lens camera, at a high rate of speed, with an inter-
" mittent motion, and for exposing successive portions of the
" surface during periods of rest".

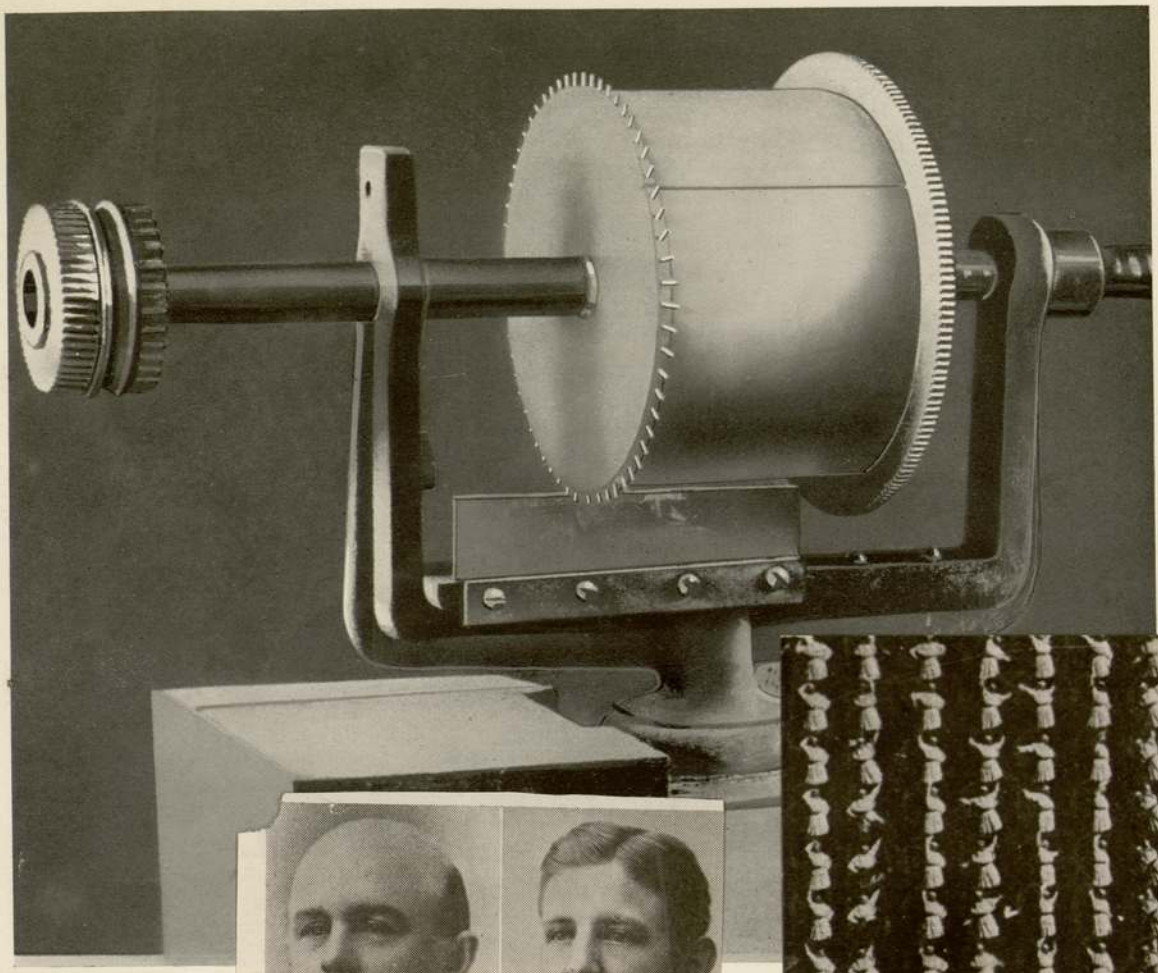
His claim for such an apparatus was rejected by the Patent Office, and he acquiesced in its rejection. Undoubtedly, Mr. Edison met all the conditions necessary to commercial success, this however under the Patent Laws, did not entitle him to a monopoly. Thus it will be seen the Court denied all Edison's claims for invention and originality, as far as the necessary apparatus and film was conerned for the production of moving pitures. Many more legal actions were fought until even Edison's legal advisers were weary of the numerous conflicts being carried on, and they advised him to call together W. N.Selig and all other interested parties and a meeting was accordingly held at the Hotel Astor followed by a dinner at the Hotel Brevoort in New York, the outcome of which was the forming of the Motion Picture Patents Co., of America.

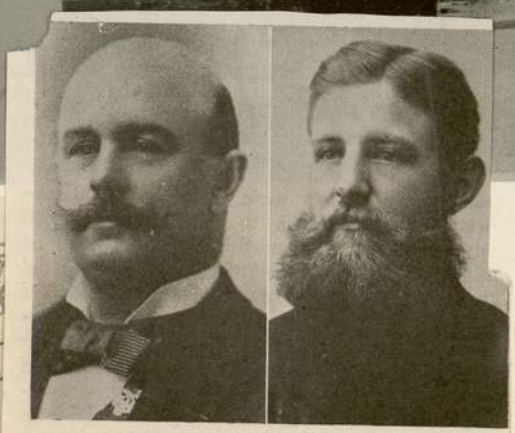
This consisted of the following sixteen well-known members of the Motion Picture Industry at that time, trading in America, who formed themselved into "THE MOTION PICTURE PATENTS COMPANY OF AMERICA":-

W. T. Rock	representing	Vitagraph.
G. Spoor.	"	Essanay.
Peter Weber.	"	Edison.
I. A. Berst.	"	Pathe.
H.N.Marvin.	"	Biograph.
S. Lubin.	"	Lubin Manufacturing Co.,
I. I. Kennedy.	"	Biograph.
Albert Smith.	"	Vitagraph.
I.Stuart Blackton.		Vitagraph.
F. Singhi.	representing	Lubin Manufacturing Co.,
Samuel Long	"	Kalem.
Thomas Alva Edison.		
W. M. Selig	representing	Selig Polyscope.
George Klein.		
F. I. Marion	representing	Kalem.
Frank L.Dyer.	"	Edison.

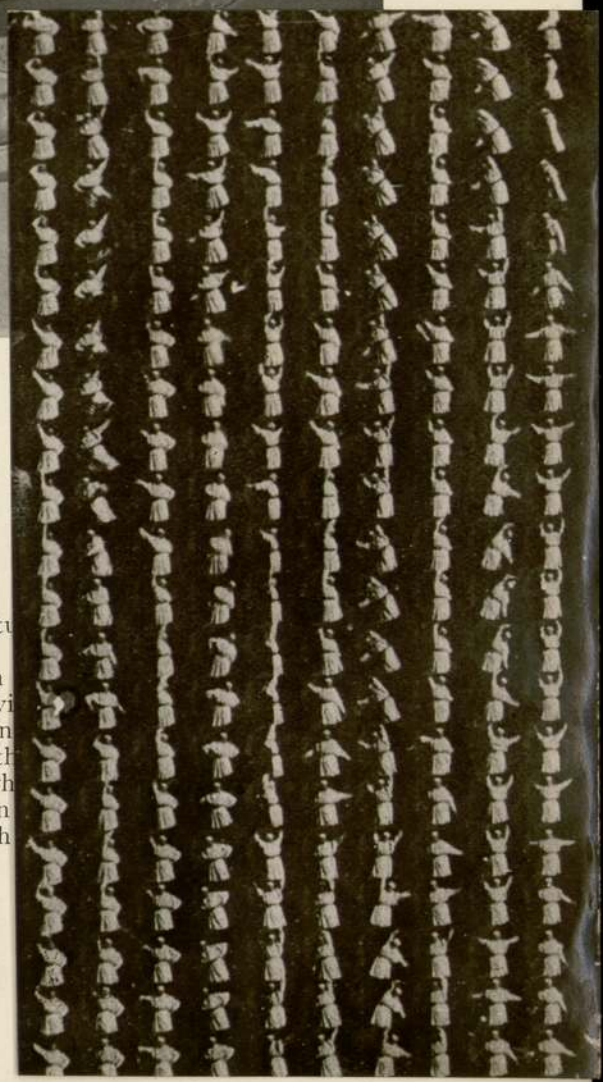
For some little time after the forming of this powerful trust there was peace but in 1910 a case was brough in the American Courts being an action in equity, by the Motion Picture Patents

Edison

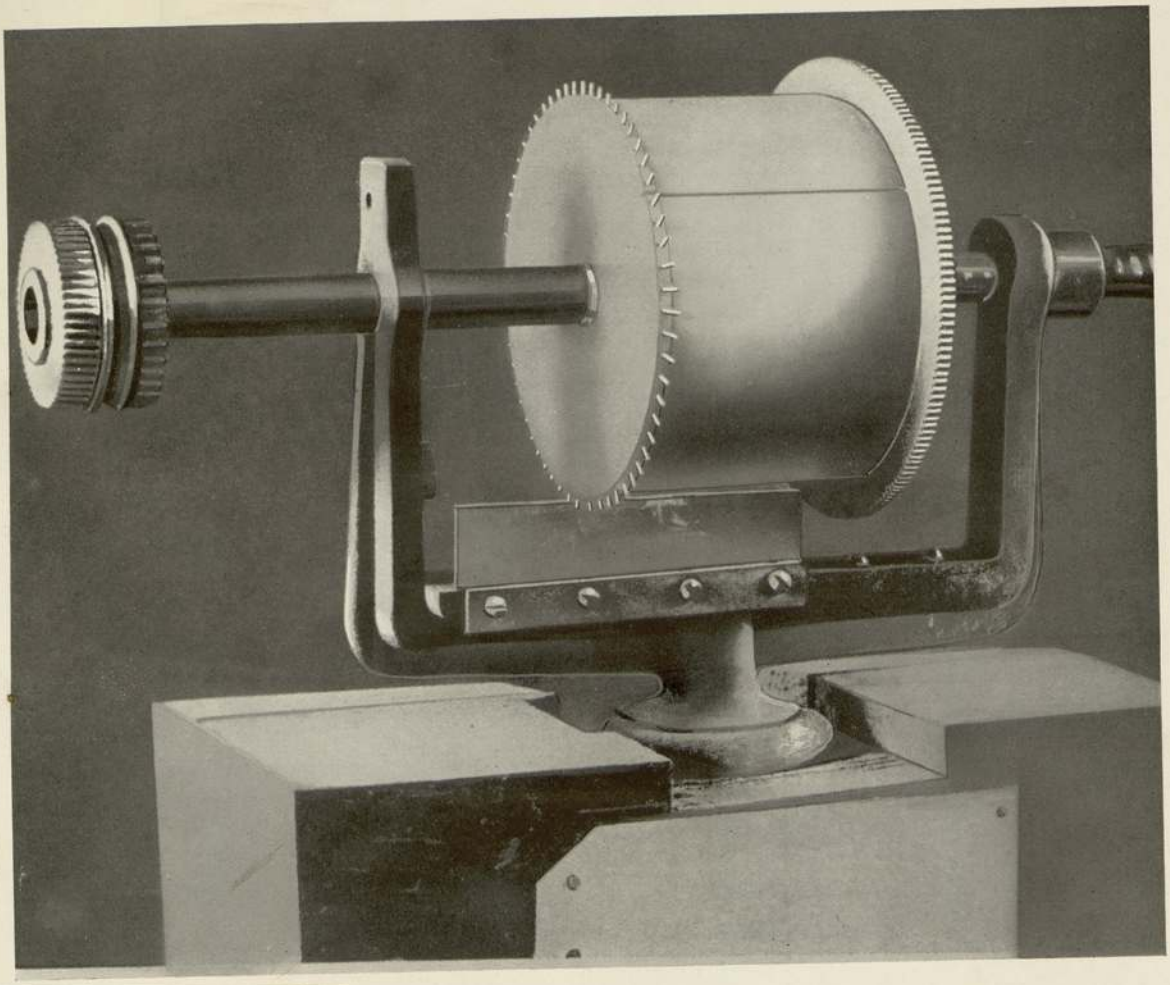




Frank R. Gammon (left) and Norman T. Raff (right) constituted the firm of Raff and Gammon, famous in the pioneer days as energetic and capable business men. They were the distributors in the United States of Edison's Kinetoscopes and films. In 1895 they acquired the rights of distribution of the Vitascope, the first commercial projector. They retired in 1897. For many years prior to the demise of these far-seeing pioneers, they occupied a high plane in American business and financial circles, where they acquired a reputation for sterling worth and honesty. They were among the founders of the industry as we know it today.



Edison



The small band of Pictures was photographed on to a band of Sensitized Celluloid film and after development, the emulsion was floated off the celluloid base on to a Glass drum for Viewing.

The first Experimental Motion Picture Machine constructed for Mr. T. A. Edison by W. K. Laurie Dickson in 1888 in an attempt to produce moving pictures upon a metal cylinder, in a somewhat similar manner to that adapted for use in the Phonograph when Mr. Edison produced sound upon a cylinder of Wax. This photograph is reproduced by kind permission of Terry Ramsey, Esq,

Mr. Alexander Parkes, of Birmingham, England.
The inventor and patentee of Celluloid, in 1854.

Edison Continued.

Company versus the Yankee Film Co., when W.Friese-Greene the original inventor and patentee of Kinematography in 1889 journeyed over to the United States and gave evidence to that effect and after his testimony, the Unites States Courts upheld Greene's Patent as being the prior patent of the World for commercial Kinematography and this ended the Motion Picture Patent Company, which was one of the most powerful trusts ever formed.

Edison produced several other types of Projectors, one of which

* The Edison Co produced some very fine films in their splendidly equipped studio as well as numerous films made of scenes in the open. Perhaps one of their greatest successes was their "Great Train Robbery" Film, some copies of which were sold hand coloured this being the artistic achievement of Miss Christiansen who was an acknowledged expert in her tedious occupation.

withdrawn from the market. This was shown at Knowsley on Thursday July 10th, 1913, before Their Majesties, King George, Queen Mary, Lord Derby and a very distinguished audience upon Their Majesties visit to Lancashire. This must have resulted in another great loss financially to Edison, who always asserted that his work in conjunction with moving pictures had proved unremunerative, as the numerous law actions he was forced to fight in his endeavours to uphold his patents, had cost more than any profits derived from their exploitation.

This great Wizard of the West Edison, remained active both in mind and body up till the commencement of the year 1931, when those that were nearest and dearest to him noticed signs of wariness which had not hitherto been apparent and from thence onward he gradually declined, but just before he passed into the great beyond, he turned to the Physician who was in close attendance upon him and said:- "It is very beautiful over there" after which his eyes closed in eternal sleep on October 18th 1931, the whole

Edison Continued.

Company versus the Yankee Film Co., when W.Friese-Greene the original inventor and patentee of Kinematography in 1889 journeyed over to the United States and gave evidence to that effect and after his testimony, the Unites States Courts upheld Greene's Patent as being the prior patent of the World for commercial Kinematography and this ended the Motion Picture Patent Company, which was one of the most powerful trusts ever formed.

Edison produced several other types of Projectors, one of which was a small home projector using a film carrying three bands of pictures side by side, which embodied the use of a very ingenious mechanism to impart the necessary movement to the film and a change-over device to change over the direction of the film.

The last contribution to the world of moving pictures by Edison was his Kinetophone, or talking picture machine, which he placed on the market in 1913, being issued under limited license only. This was a perfectly synchronized Gramophone using a flat disc record in conjunction with a standard Kinematograph film, which unfortunately for it's inventor did not prove a commercial success, although the synchronization left nothing to be desired but, as the sound relied solely upon the gramophone, it was useless for use in any but the smaller halls, it therefore failed to attract the public, and after only six months exploitation was withdrawn from the market. This was shown at Knowsley on Thursday July 10th, 1913, before Their Majesties, King George, Queen Mary, Lord Derby and a very distinguished audience upon Their Majesties visit to Lancashire. This must have resulted in another great loss financially to Edison, who always asserted that his work in conjunction with moving pictures had proved unremunerative, as the numerous law actions he was forced to fight in his endeavours to uphold his patents, had cost more than any profits derived from their exploitation.

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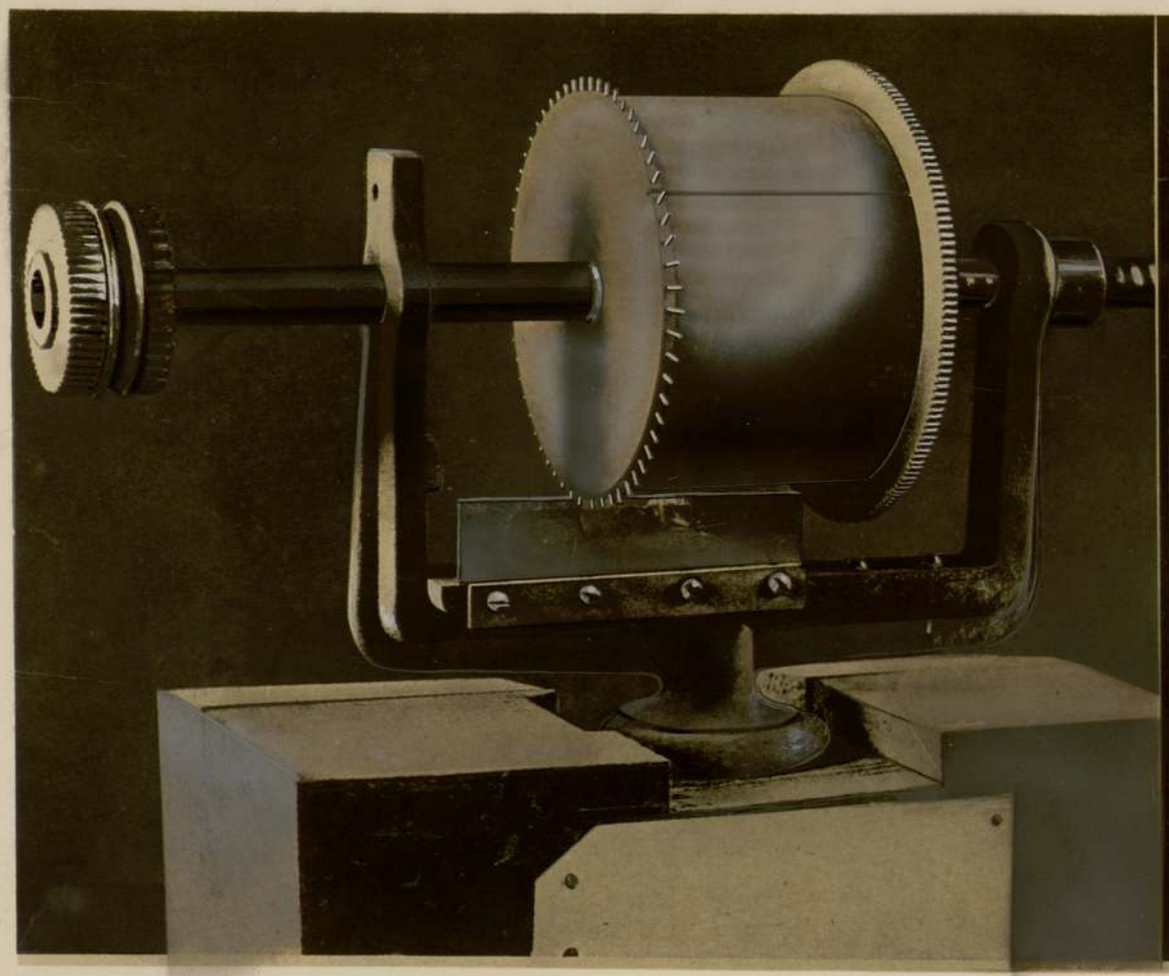
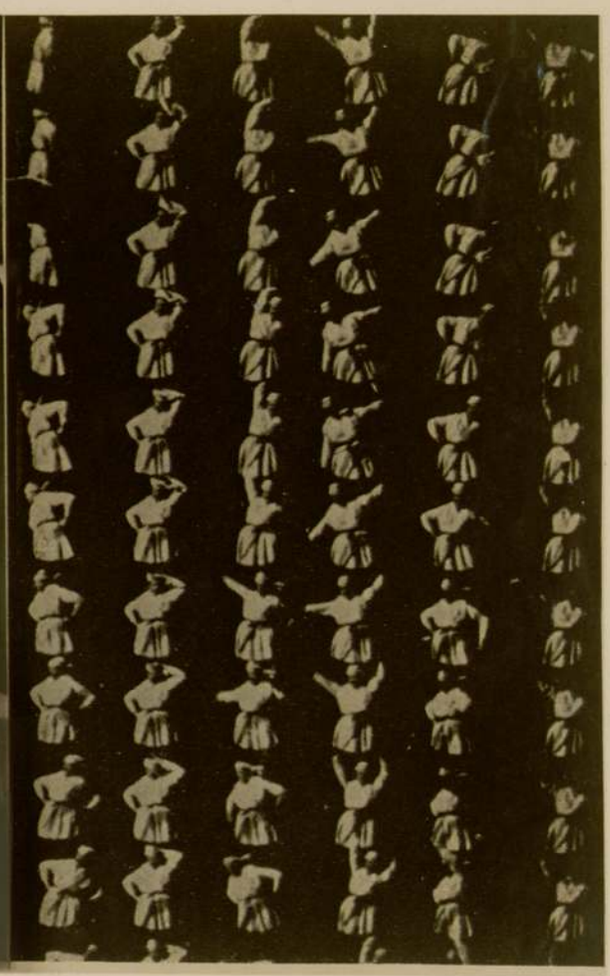




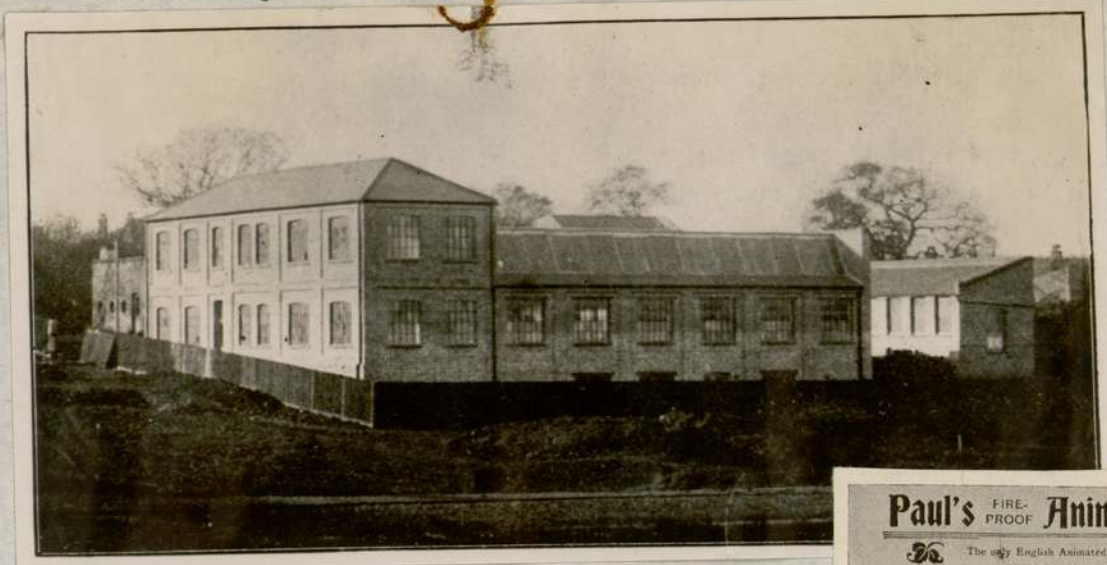
The first Experimental Motion Picture Machine constructed for Mr. T. A. Edison by W. K. Laurie Dickson in 1888 in an attempt to produce moving Pictures upon a ~~Glass~~ Metal Cylinder, in a somewhat similar manner to that adopted for use in the Phonograph when Mr Edison produced sound upon a Cylinder of wax. This Photograph is reproduced by kind permission of Jerry Ramsaye Esq and shows also a portion of the picture record produced.

being the poorer for the passing of a great man, who had done so much to help mankind, by his genius and ability in commercializing and making available for all The Telephone, The Multiple Telegraph, Electric-Lighting, The Phonograph, The Kinetoscope, The Kinetophone and many other aids to better the conditions of mankind, and in the words of his ever loyal and great friend William Kennedy Laurie Dickson, who expressed a wonderful tribute to his late Chief's memory, when he said:- "God bless his memory, "for he was a man with a great heart".

The work accomplished by Edison in placing his Kinetoscope on the world's market was directly responsible for the entry into the active ranks of Kinematography, many, whose names afterwards became quite famous, and amongst the first to recognise the true merits of the Motion Pictures as 100% Entertainment, was R.W.Paul in England and the Brothers Lumiere in France. In the following chapters will be shown how these gentlemen entered the ~~THIRD~~ greatest industry in the world, and played their part in establishing it upon a solid business basis; In the year 1895, that old lantern supply for Messrs. Riley Brothers of Bradford, England patented a small projector as an attachment to be fitted in front of an optical lantern, which was called the Kineoptoscope but although a few machines were sold, it was never a great success and was withdrawn from the market.

R. W. Paul's first film showing McHose jumping over golden gate at Southgate.

R. W. Paul



R. W. Paul's Factory at New

R. W. Paul's first studio at New Southgate
This studio for Film Production could be
hired complete with scenery, trap door
effect &c. for £1-1-0 per ~~Week~~. Film Subject
Mr. Martin seen manipulating the Camera

Paul's FIRE-PROOF **Animatographe**

The only English Animated Photograph Machine with an
ESTABLISHED REPUTATION.

RECORD: *Exhibited continuously for a year at the Alhambra, London; and in all important Provincial Towns. £15,000 worth of Machines and Films sold, with universal satisfaction. See Press Notices and Testimonials on application. Two years' Improvements in construction.*

PRICES:

Mechanism complete, with Lens of any focus for Lantern Attachment, **£10.**

Complete on Folding Tripod, with Lantern, Arc Lamp or Jet, as shown, **£15.**

Adapted for use as a Camera at a small charge.

100 Films
(including Jubilee), from all parts of the world, the finest ever taken, at **30s.** each.

Complete show of Films can be run at one setting.

No wear on Films. Patent continuous feed, obviating strain.
Simple, quick, accurate adjustment.
Durable as a Steam-Engine.
Accurate as a Chronometer.
Does not touch picture surface.
Working parts open and accessible.
No flickering or unsteadiness.
Lenses interchangeable in a second.
Utmost portability and convenience.

CANNOT CAUSE FIRE! CONTAINS EVERY IMPROVEMENT POSSIBLE.

R. W. PAUL, 44, Hatton Garden, LONDON, E.C.
Factories: 124-15, Great Saffron Hill, *and* 36, Leather Lane.
TELEGRAMS: "CALIBRATE." Contractor to War Office and Admiralty.

One of the first projector ads. on record. An early Paul announcement from Cecil M. Hepworth's "Animated Photography." (By courtesy of J. Coverdale Bell)

R. W. Paul

R. W. Paul's Factory at New Southgate

R. W. Paul's first studio at New Southgate
This studio for Film Production could be hired complete with scenery, trap door effects &c. for £1-1-0 per ~~Week~~. Film Subject
Mr. Martin seen manipulating the Camera

THE DIFFERENCE OF A WEEK AND A DAY.
A SALARY SURPRISE. HOW H.G.WELLS
PROPHESIED MOVIES IN 1894.
THE EARLY EXPLOITATION OF KINEMATOGRAPHY
IN ENGLAND BY R.W. PAUL.

The name R. W. Paul will ever be remembered in conjunction with the founding of the Motion Picture Industry in England. Many persons whose names afterwards became world famous , must truthfully acknowledge this highly skilled technician and scientific mechanic, as the source from which they derived their numerous successes.

R. W. Paul was born on October 3rd 1869, and received his early education at the City of London School, afterwards furthering his studies at the Finsbury Technical College, where he received the training in the science of Physics and Engineering which he applied so successfully to the art of Kinematography. The first importation of Edison's Kinetoscopes into England was by two Greek gentlemen,Tragidis and Georgiades, who in August 1894 opened a shop at Dashwood House, Old Broad Street, in the City of London and placed therein, three of Edison's Peep Show Kinetoscopes, similar to the Edison Picture Parlours, which had been set up in New York; a charge of two pence was made for each person to look into each of the machines, and see a very short film. This novelty drew huge crowds, and the two Greeks were inundated with enquiries to supply similar machines and films, for every town in England. The charge for the Kinetoscope machines delivered in London was £62..10..0 each, to which had to be added the carriage from America to London; this made the cost of these instruments a somewhat heavy item.
The two Greek gentlemen were very astutue and business like and quickly made enquiries regarding the manufacture of similar machines in England. Amongst others, they were recommended to R. W. Paul as being one of the few men who could be entrusted with such a task, being at that time a recognized maker of scientific and optical instruments. Satisfactory arrangements having been made and an order placed, R. W. Paul made and delivered the machines as ordered by the two Greeks and finding no patents existed in England for Edison's Kinetoscope, at the same time recognizing the value of this instrument for show purposes, he at once commenced the manufacture of these on his own account at his premises, 44, Kirby St.,Hatton Garden. The fame of R. W. Paul as the producer of these machines soon spread all over England, and orders simply poured in. Many anxious showmen beseiged his premises in their anxiety to secure an early delivery of this latest optical novelty, and some, in their enthusiasm, even slept upon his stairs.

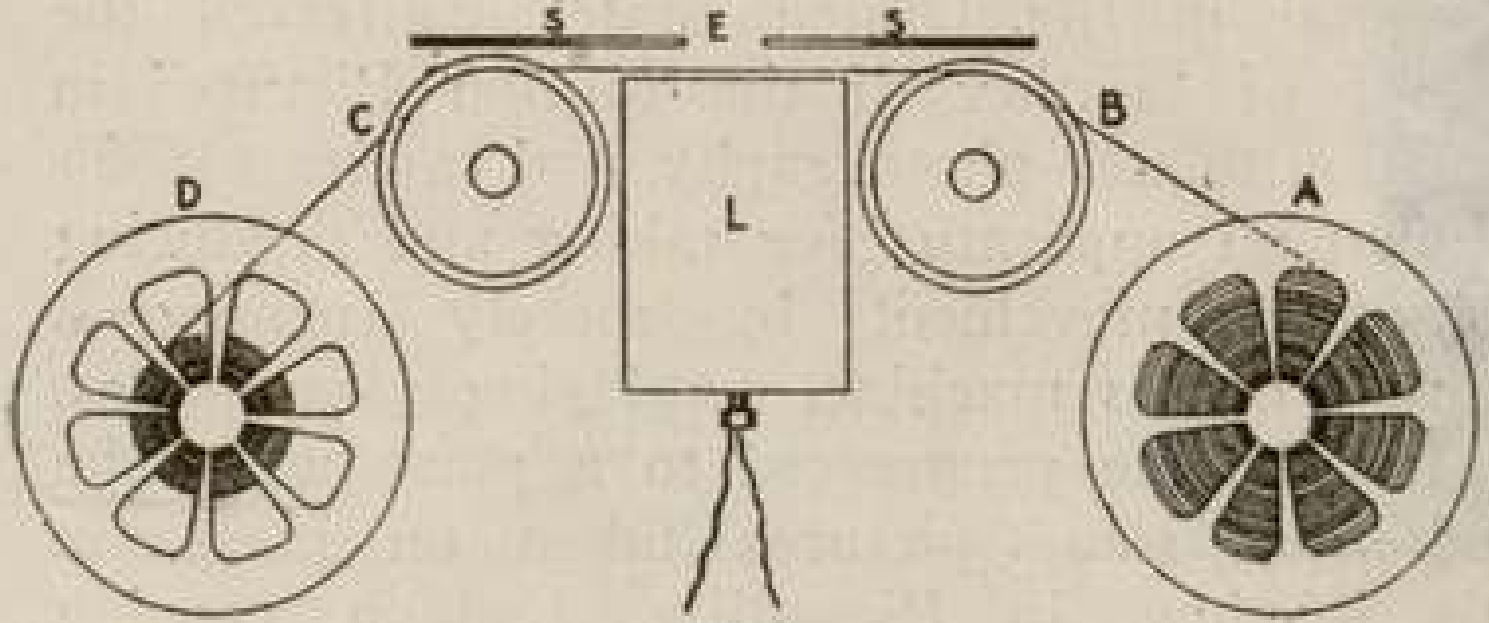
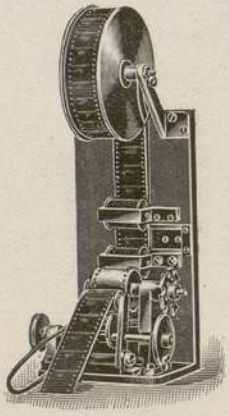
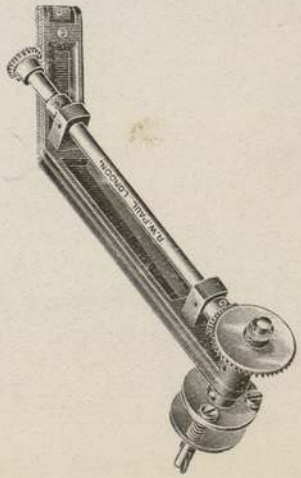


Fig. 1.

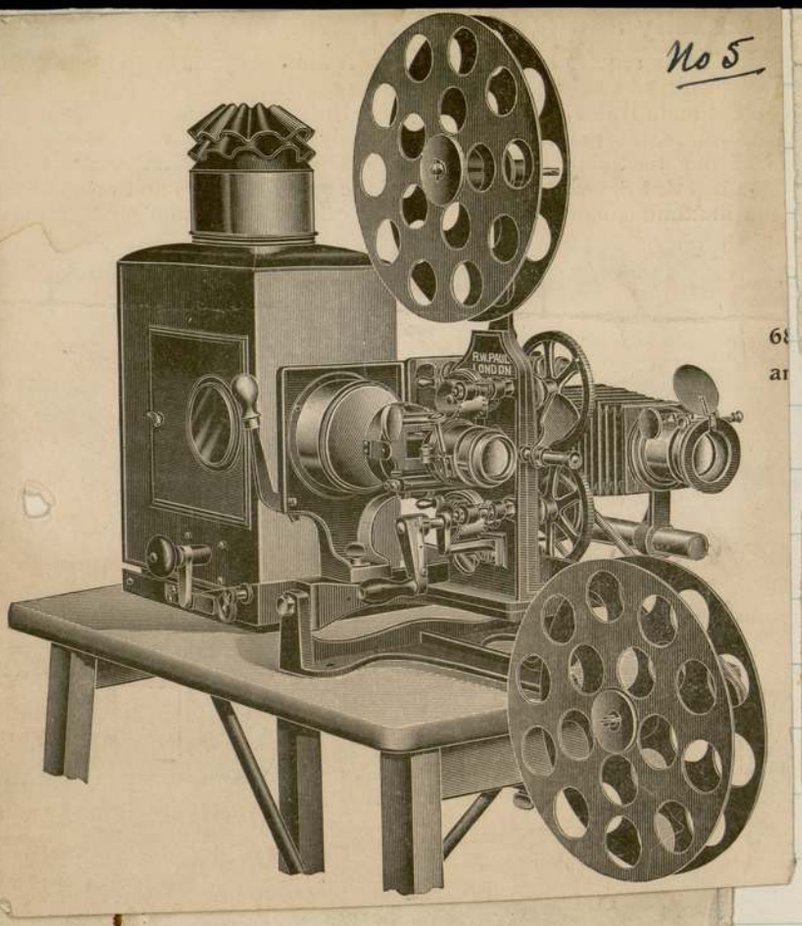
Exposure detail of the Edison Kinetograph.

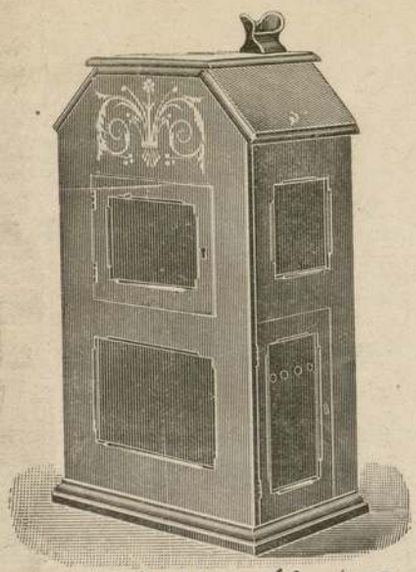




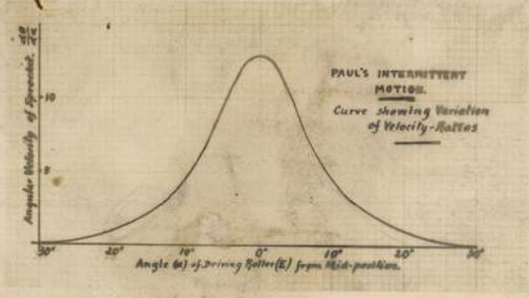
The first Projector
used at the Finsbury T. College
& Royal Institution only
called the Theatrograph

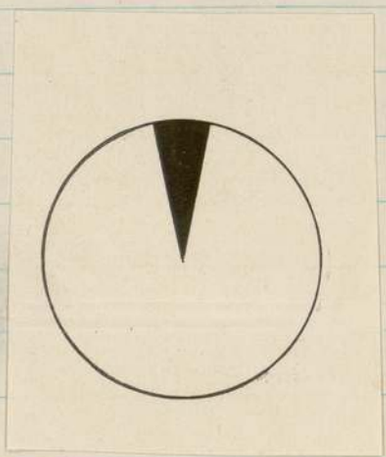
No 5



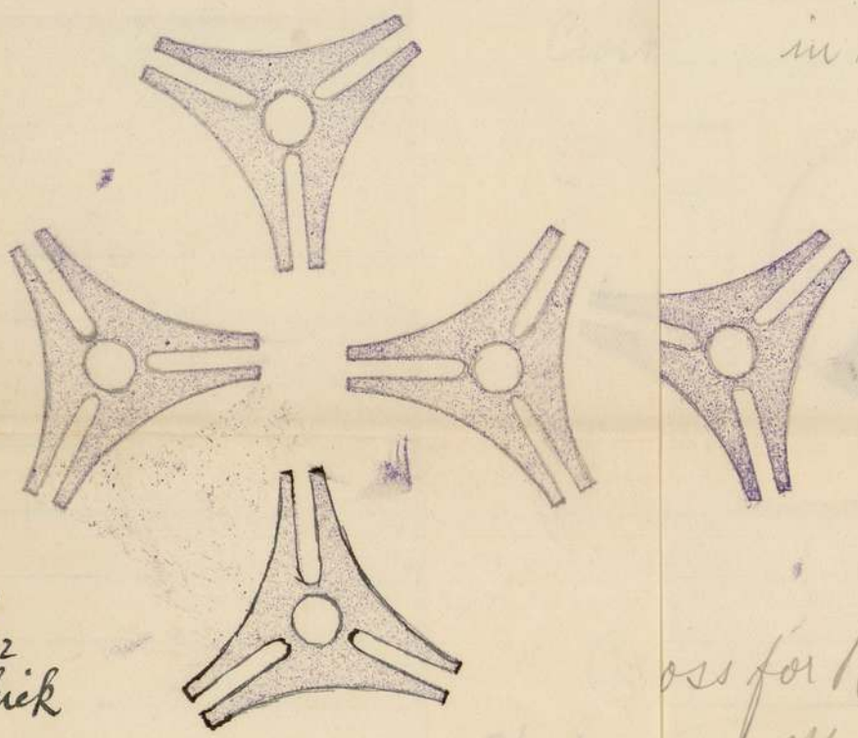


R. W. Paul's Kinetoscope
a copy of Edison's Machine.





in thickness

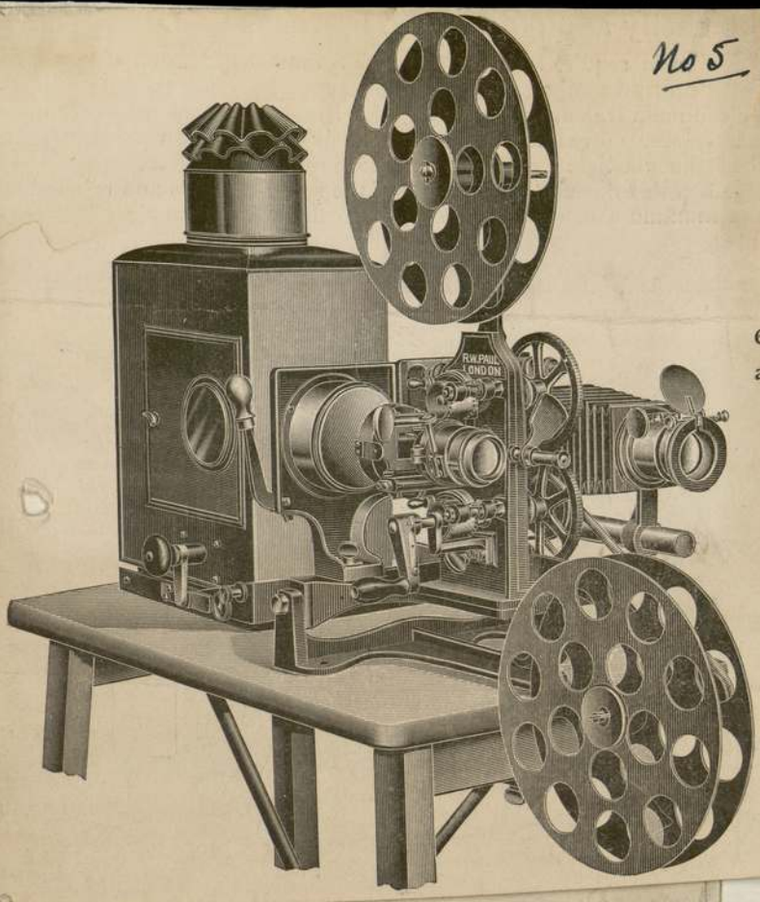


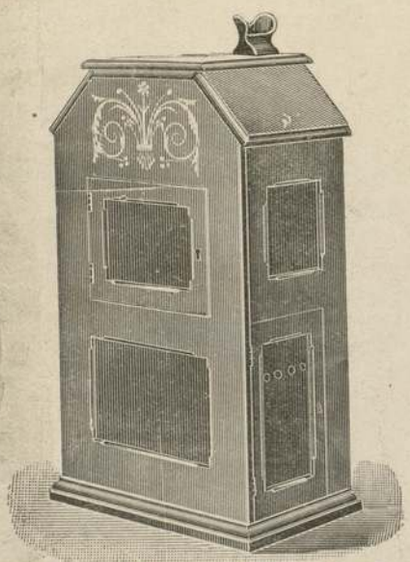
3/32
Thick

Cross for R W Paul M/c

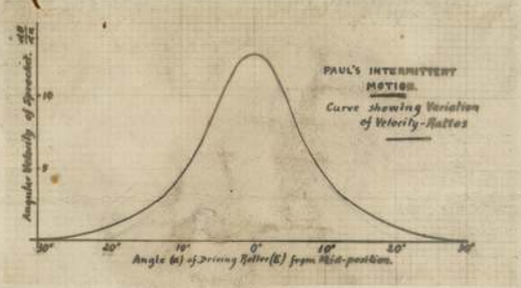
oss for R W Paul's
Machine

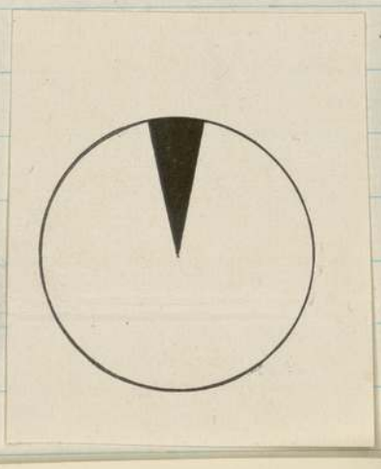
No 5



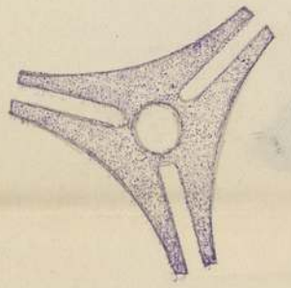


R. W. Paul's Kinetoscope
a copy of Edison's Machine.





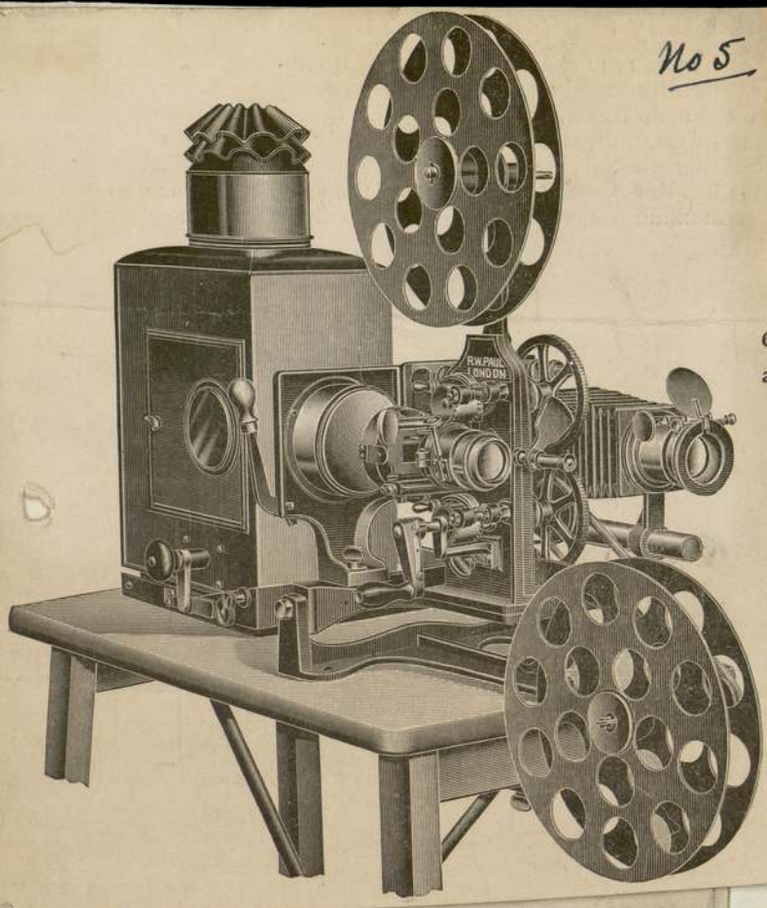
Cross in thickness

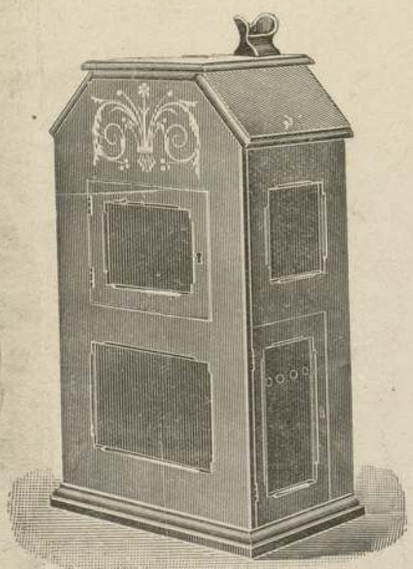


Cross for R.W. Paul's Machine

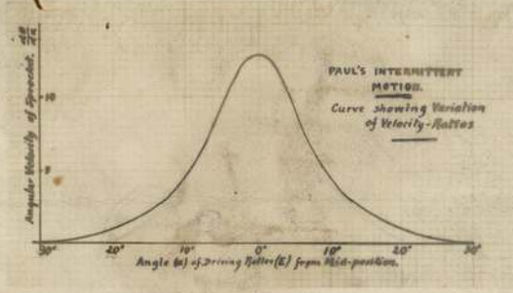
3/32" Thick

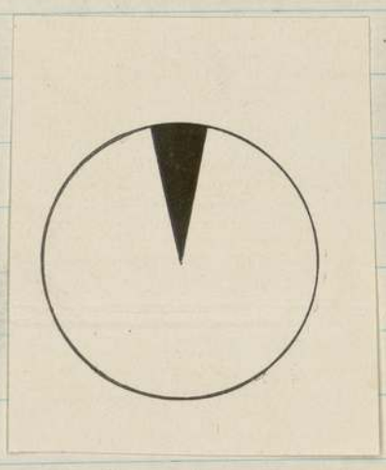
No 5

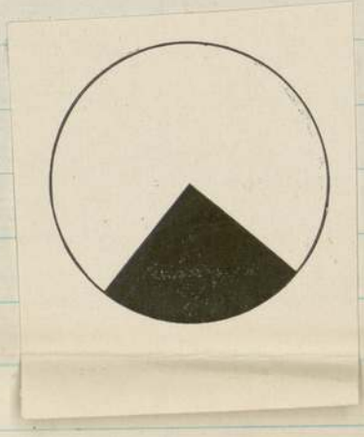




R. W. Paul's Kinetoscope
a copy of Edison's Machine.





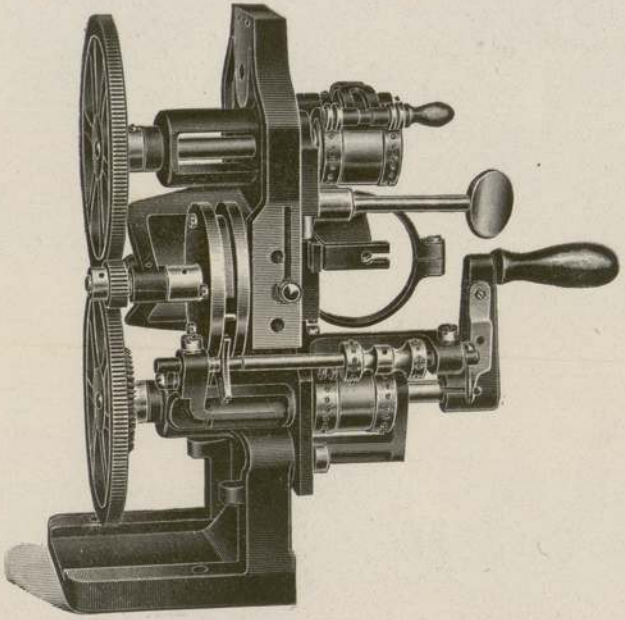


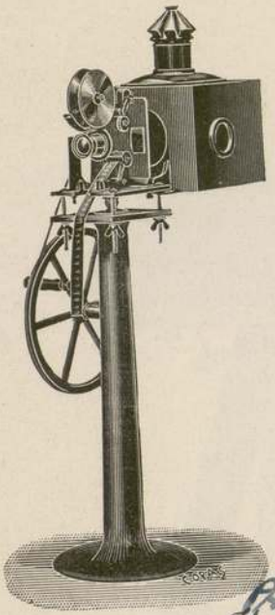
A rather serious set back occurred in the making of these instruments, owing to the dearth of film subjects obtainable, the only source of supply being from Edison's Agents, Maguire and Baucas, two of Edison's attorneys, who held the sole Agency for the distribution of Edison's machines and films in England, through the Kinetoscope Co., of America. Being faced with this dilemna, R. W. Paul was forced to produce his own films, or cease supplying the machines, as upon Edison finding the Kinetoscopes were being made in England, he immediately stopped all supplies of films, other than to those that purchased Edison's Kinetoscopes. Upon consulting his friend, Mr. H. W. Short, who was an expert Photographer, R. W. Paul arranged for an introduction to Mr. Bert Acres, a photographer well versed in his art, and between them, they soon evolved both a camera and printer, and early in March, 1895, they commenced to make some trial films. The camera which was rather an unwieldly instrument was placed upon a hand truck and a film was taken of a street scene at Blackfriars Bridge. The first rolls of film were purchased from Mr. Blair at Footscray in Kent, these were cut to an approximate width of 1 3/8" the edges being left very rough. As at that time there was no such thing as a film perforating machine, a hand punch was constructed with 32 teeth, which, when a fly press was turned upon it, perforated 16 holes each side of the film, and to reduce the film to the correct width for passing through the camera, it was wound into a tight roll and rubbed down upon sheets of sandpaper, until it was reduced to the correct gauge.

Maguire and Baucas.

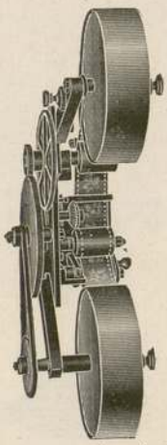
one and three eighth

On March 29th, 1895, an agreement was entered into for Bert Acres to produce films exclusively for R. W. Paul and a studio was set up at Barnet in the North of London, thus a reasonable supply of films, independant of Edison was assured. In 1894, R. W. Paul, was very much impressed by reading one of the first books written by H. W. Wells entitled "The Time Machine". This story was written around the life of a physicist, and tells very vividly the story of a wonderful adventure, practically portraying the watching of a motion picture upon a screen. This was truly a remarkable prediction, when the year in which it was written, 1894, is taken into consideration, and he went on to make a very realistic allusion to living in the past, present and future, by the motion being reversed. After reading H. G. Well's book, Paul at once wrote asking him to call, which he did, and as a result of this interview, Paul conceived the idea of patenting a system, whereby people could be given the sensation of travelling through the past and future and on October 24th 1895, was granted a British Patent No.19984, for a novel form of entertainment founded upon Well's book. This consisted of seating the spectators upon a rocking





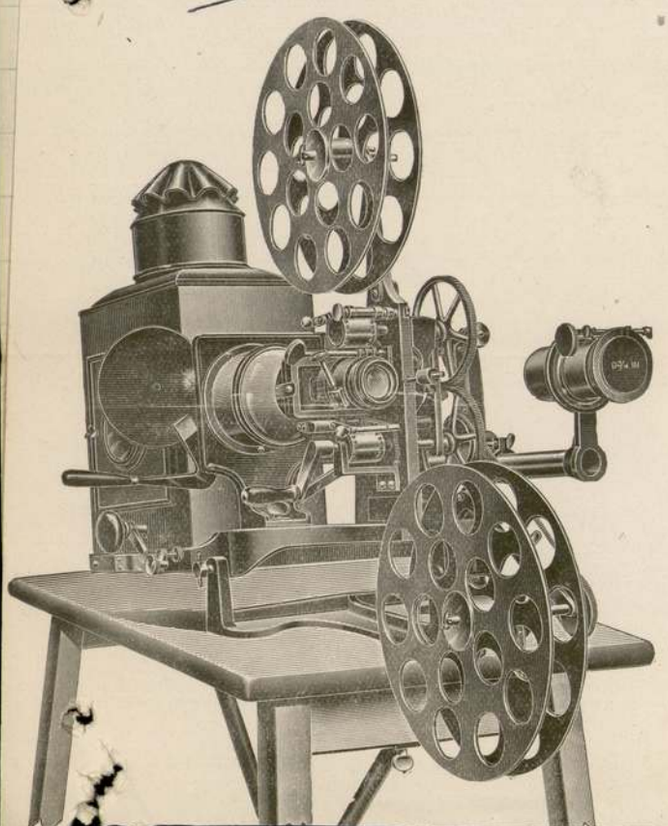
R.W Paul. first ~~Animatograph~~ Projector
used at the Alhambra
+called the animatograph
only ~~to~~ at this Theatre
(Note the first iron Pedestal stand)



First instance and
application of fire proof
Spool boxes.
Theatrograph
Model No 3.
as used at Sandringham

(2)

No 4



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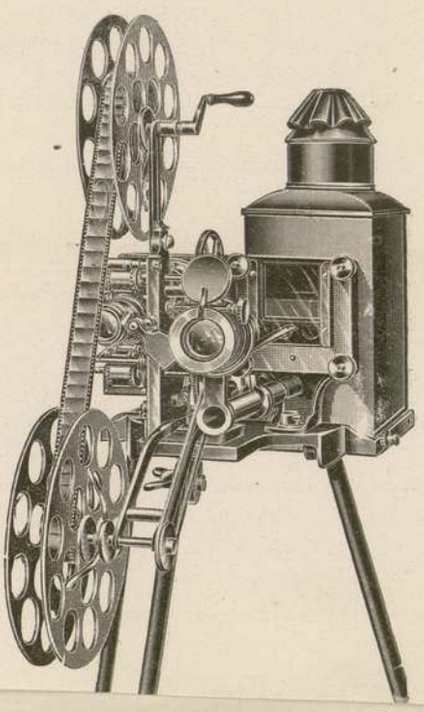
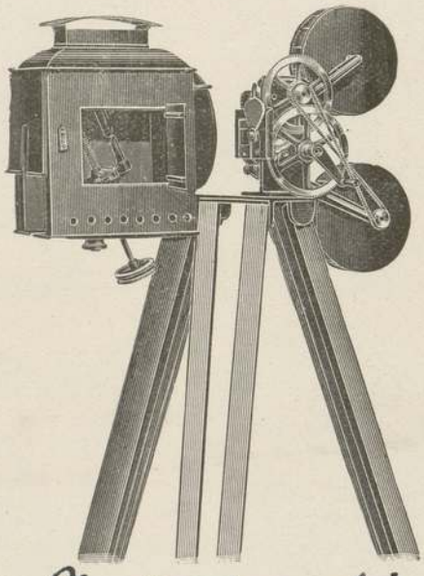
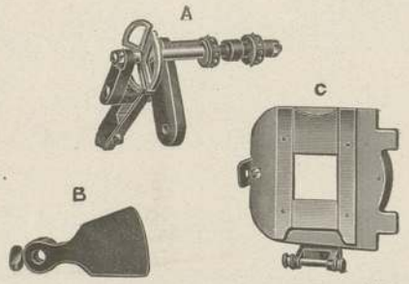




First Fire proof machine

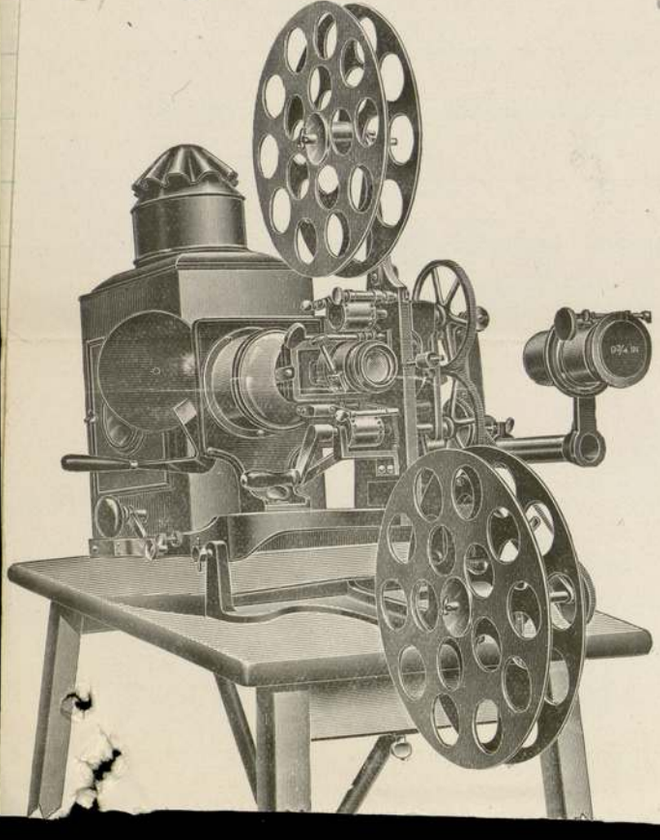
No 4 Movement
1902



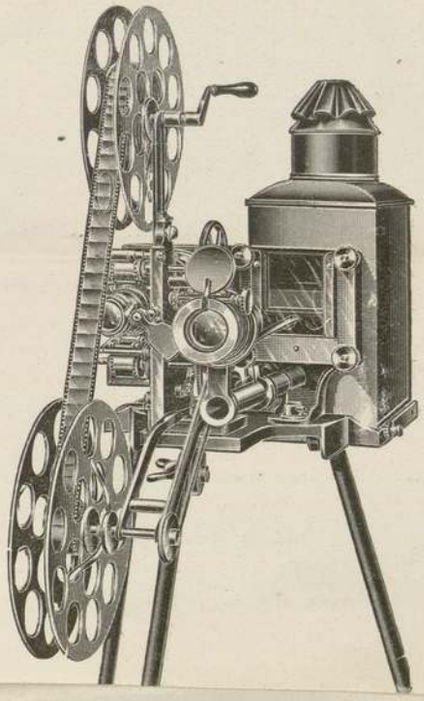
First attempt
at fire proof gate

(2)

No 4



No 4



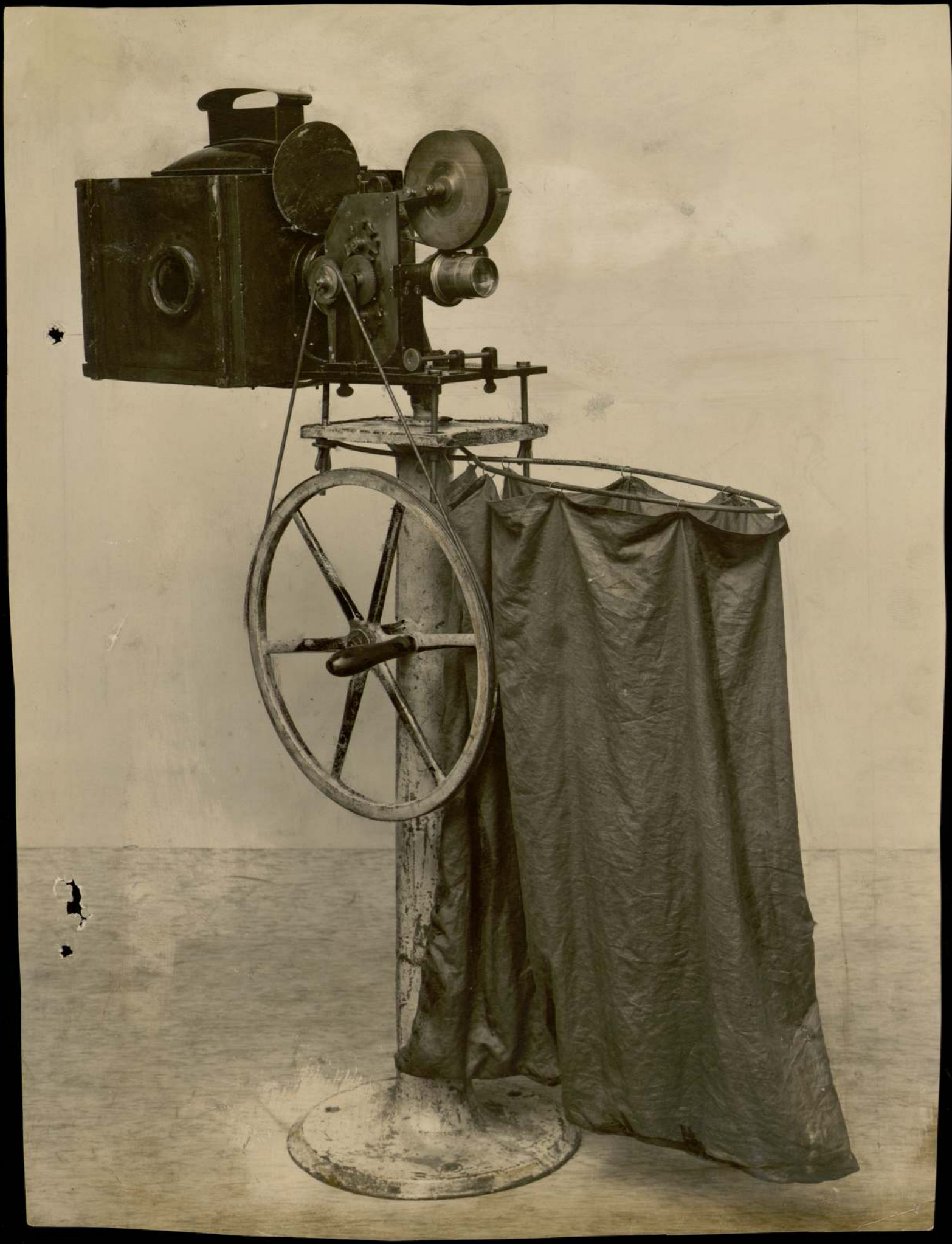
Illustrations

for R. W. Paul.

platform and according to the film being shown upon the screen, could be made to resemble the movements of a ship or train and to add the deception, a current of air was to be blown through the hall. The whole illusion could be made to run forward or backward, but as this would have cost a lot of money to construct and Mr. Paul being so busy with his other business, he let his patent lapse. Some years later a similar combination was exploited under the title of Hale's Tours, which achieved quite a large measure of success and proved a very popular form of entertainment. In looking through Mr. Paul's early sales ledger for May, 1895, it is interesting to see the sales of film subjects entered therein, amongst which, might be mentioned, "A Rough Sea at Dover", "The Boat Race", London Street Scenes, etc., all of these exciting episodes being 40 feet in length which were sold outright to the purchaser for 1/6d per foot, or £3 per copy. The idea of showing films upon the screen by R.W. Paul seems to have coincided with that of Messrs. Lumiere of Paris, as he showed his original Theatrograph, as his first machine was called, at Finsbury Technical College on February 20th 1896, a notice of this appearing in the City Press on February 22nd 1896. This date it will be noticed was the same as that of Lumiere's first show in London at the Royal Polytechnic , Regent Street, February 20th, 1896. Film subjects were now being produced readily, and were selling in large numbers, and a real record was achieved when a successful film was taken of the Derby of 1896, showing "Persimmon", winning this classic event for his Royal Master, The Prince of Wales, later, King Edward Vll, and a copy of this film is still to be seen in a perfect state of preservation. It is interesting to look at the dress of the people at this time, the ladies sporting a tight waist line, with a bustle and Alexandrian Boater Hats, whilst the Policemen on the course sported long beards, and the cry of Beaver, later given to this hirsute adornment, had not then, been heard in the land. This film of the Derby was shown the next day at the Alhambra Theatre, where the crowd in their enthusiasm refused to let the programme proceed, until the film had been shown three times. It was also shown at the Earl's Court Exhibition, where the building in which it was exhibited was thronged with spectators from morning until night, and this ran without a break during the whole of the latter part of 1896. It was during an exhibition of animated pictures given by Mr. R. W. Paul at the Royal Institution of February 28th, 1896, that Lady Harris, wife of that illustrious personage, Sir Augustus Harris, asked for full particulars of this wonderful moving picture, and to his great surprise, Mr. Paul

received a telegram asking him to take breakfast with Gus Harris the next morning, who was at that time managing Olympia. It was at this meeting that an agreement was entered into to show these moving pictures at Olympia in a side show, on a 50% basis, the price of admission was 6d per person, and 3 or 4 small films were shown at each audition, so vast were the crowds that flocked to see the new entertainment, that it necessitated several extra policemen to control them, and the business transacted was colossal. A similar entertainment was also being given at the Ceylon Exhibition at Earl's Court, where the same unparalleled success was achieved, and capacity business was the order of the day. Many new improvements in apparatus were introduced by Mr. Paul, but his first idea, was to produce a small projector for use in the house, to sell at £5 each, thinking thereby to create a vast market for his films, but he soon found that this idea was not practical and discarded it, devoting his whole attention to producing apparatus and films for Public Entertainment only. Finding the new entertainment at the Empire Theatre drawing large crowds to see Lumiere's Movies, Mr. Mould, the manager of the Alhambra Theatre, at once asked Mr. Paul to call and see him and after a very short business-like interview, he asked what would be the charge for a similar show at the Alhambra. Mr. Paul after due consideration quoted a price of £12, afterwards agreed at £11, meaning of course for the week, Mr. Mould agreed at once, and what was Mr. Paul's great surprise when he drew his first week's cheque to find the sum of £66 enclosed in an envelope and a contract for two weeks to continue at that rate, Mr. Mould having thought that Paul had quoted per night and accordingly multiplying his quotation by six, a very agreeable misunderstanding. Mr. Paul opened his show at the Alhambra on the 24th March, 1896, going directly into the regular programme which ran without a break for nearly two and a half years, so great was the draw of the motion pictures put on by Paul, many of which were of a topical nature, and included some very fine films of scenes in Foreign Lands, taken by his own camera-man. The name given by Paul to his machine and the moving picture item was the "Animatograph". In looking at the columns of the "Evening News" for April 10th, 1896, it states, that an "Eastern Dance"Scene was depicted in all the georgeous colours that the film warranted. This film was 40 feet in length, the colouring having been beautifully executed by hand, and constitutes the first record of a film shown in colour. Amongst the first purchasers of Paul's Animatograph Projectors was Mr. David Devant, who purchased the first projector for Maskelyne & Cooke, when it was shown at the Egyptian Hall, Piccadilly. During the month of March,1896, and April,1896, were recorded the sales of other

projectors to:- Mr. Esme Collings of Brighton; Mr. A.D. Thomas, one of the most famous provincial showmen, Mr. Howard, who showed the pictures of the Moss and Thornton circuits, Mr. George Melies of Paris, who later produced the first long film, "A Trip to the Moon", and Chas Pathe of Paris, the price charged for these instruments was £75 each, and orders were received faster than they could be delivered Mr. Paul next turned his attention to the production of a motor driven step by step film perforator and a new camera both of which proved of immense value in speeding up and improving the production of new films. Many were the contracts also entered into for showing at other music halls such as the Canterbury, Brittania Theatre Hoxton, and others, the charge for each hall being £50 per week. Paul next turned his attention to the building of a properly equipped film studio in the grounds of his factory at the freehold, New Southgate, which was equipped with many useful adjuncts such as trap doors for Trick Films Scenes and a full compliment of scenic effects. It is interesting to note in an old catalogue issued by Mr. Paul that the studio with all appliances could be hired for 21/- per SUBJECT for the use of any person wishing to produce their ownfilms. I often wonder how this would compare with the hire of a film studio today. By the year 1901 Mr. Paul had so enlarged his dark rooms, and laboratory, that he could turn out 8000 feet or 1½ miles of film per day, no mean achievement, and the whole plant was kept working at its full capacity. After a disastrous film fire at a Charity Bazaar in Paris in 1897 new and stringent laws were brought into force, and Paul at once produced a new projector fitted with fire proof spool boxes to mitigate against the great danger of using films on uncovered spools, he also introduced ~~in~~many valuable improvements to his projection apparatus and owing to the vast growth of his business, he was forced to open new premises in 1900 at 68, High Holborn in the West End of London. Many and varied were the new types of apparatus offered for sale, all of which found ready purchasers. Following the trend of other houses in the trade, another move was made still further in 1911 to premises at 33, Leicester Square, where Mr. Paul remained until 1914, when owing to the unsettled state of the film market, and the unfair competition which at that time prevailed, he decided to give up the film business., entirely. This he accordingly did, devoting the whole of his energies henceforth to the production of some of the most delicate electrical precision instruments and other highly technical scientific apparatus that the world has ever seen, much of which is being used to a very great advantage by the Navy, Army and Air Force. Another great enthusiast of Kinematography, whose name was always linked closely with that of R.W.Paul, was Mr. Bert Acres, who was under direct contract to takeanimated photographs for no one else other than Paul.



23

(9)

(8)

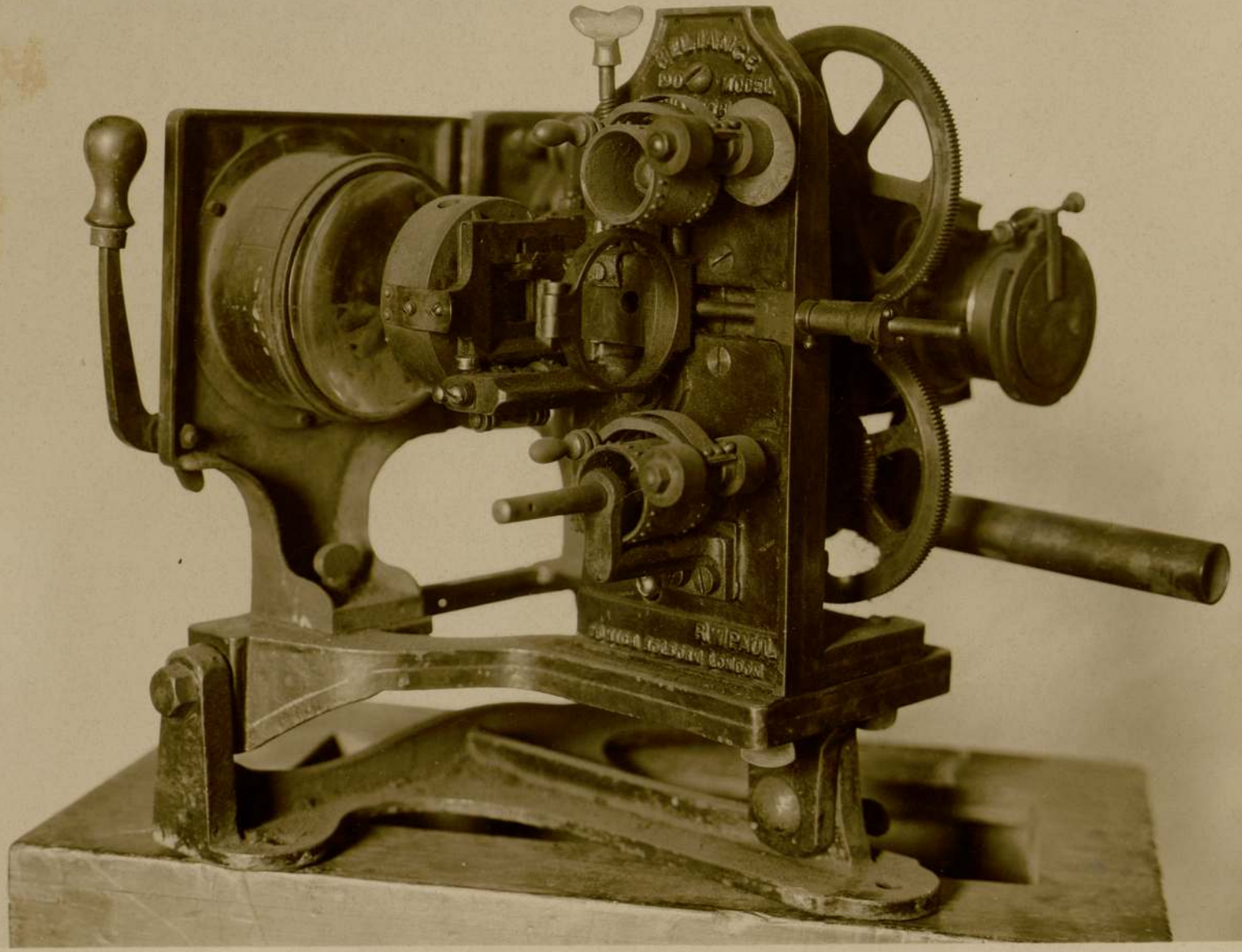
Pickley 1748

8890

$2\frac{3}{4} \times 3\frac{5}{8}$

one rule
round panel

The first Animatograph invented and manufactured
by R. W. Paul to show the first Animated Pictures at
the Alhambra Theatre Leicester Square. March 1896


R. W. PAUL

The last Model of machine made for projecting animated Pictures by W. R. W Paul 1904

The Animatograph

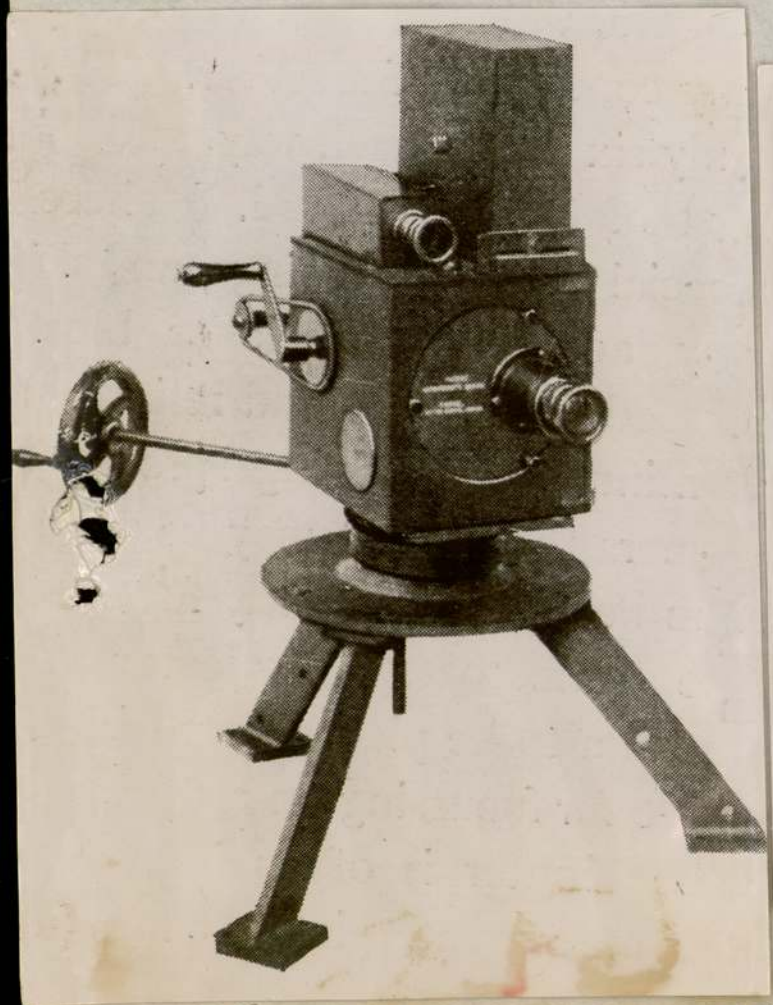
R. W. Paul

Boer War Film Crossing the Modder River

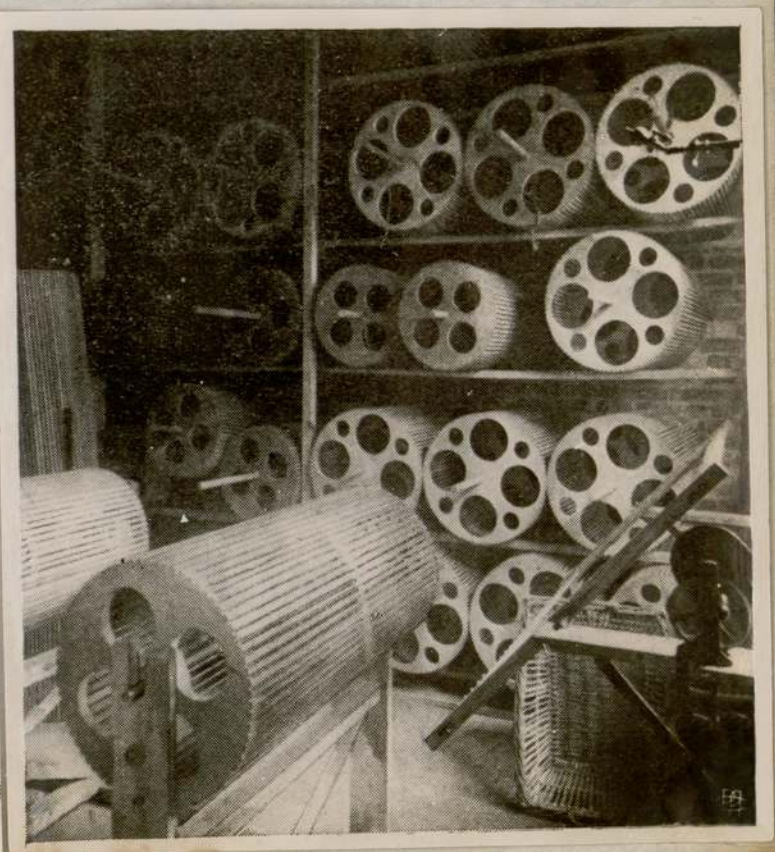
R.W. Paul's Camera Outfit
at the Boer War.

R. W. Paul

Paul's Developing Room at New Cattle
Mr Martin on left in Charge
with two assistants



Paul's Camera Front View



Drying Drums

[Second Edition.]

N° 10,474 A.D. 1895

Date of Application, 27th May, 1895

Complete Specification Left, 27th Feb., 1896—Accepted, 2nd May, 1896

PROVISIONAL SPECIFICATION.

Improved Apparatus for Enabling Photographic Images to be Taken, Projected, or Viewed in Rapid Succession.

I, BIRT ACRES, of Clovelly Cottage, Barnet, Herts, Photographer, do hereby declare the nature of this invention to be as follows :—

My invention relates to improved apparatus for enabling photographic images to be taken, projected or viewed in rapid succession and consists more particularly in so arranging the apparatus as to permit of the film being clamped for the period necessary for exposure, projection or viewing without causing undue strain on the film notwithstanding that the motion of the apparatus is continuous.

For this purpose a continuous sheet of film is drawn off a roller by means of a pin wheel taking into perforations preferably made at the edges of the film. It is caused to pass behind the lens and is clamped there for the short period necessary for exposure. During the time the film is so clamped, the pin wheel still revolving would cause undue strain on the film. This I obviate by causing the film to be deflected out of the straight line by a roller acted on by a spring. Whilst the film is travelling this spring is free to act, but whilst it is clamped in position the pin roller continuing to revolve takes up the slack due to this deflection in opposition to the spring. Immediately the clamp is released the spring again acts on the roller causing the film to be deflected as before. The film is then wound onto a second roller.

Dated this 27th day of May 1895.

ABEL & IMRAY,
Agents for the Applicant.

COMPLETE SPECIFICATION.

Improved Apparatus for Enabling Photographic Images to be Taken, Projected, or Viewed in Rapid Succession.

I, BIRT ACRES, of Clovelly Cottage, Barnet, Herts, Photographer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to improved apparatus for enabling photographic images to be taken projected or viewed in rapid succession and consists more particularly in so arranging the apparatus as to permit of the film being clamped for the period necessary for exposure, projection or viewing without causing undue strain on the film notwithstanding that the motion of the apparatus is continuous.

For this purpose a continuous sheet of film is drawn by feeding wheels off a roller by means of two pin wheels taking into perforations made at the edges of the film. It is caused to pass behind the lens and is clamped there for the short period necessary for exposure. The clamping is effected by an open frame pressed against the film by a cam turned by gear from the axis of the shutter, which is turned by hand or otherwise.

During the time the film is so clamped, the pin wheels still revolving would cause undue strain on the film. This I obviate by causing the film between the

clamping frame and the pin wheels to be deflected out of the straight line by a roller acted on by a spring. Whilst the film is travelling this spring deflects the film but whilst the film is clamped the spring yields and the pin wheels continuing to revolve take up the slack. Immediately the clamp is released the spring again acts on the roller causing the film to be deflected as before. The film is then wound onto a second roller.

Instead of acting on the deflecting roller by a spring it may be moved by a cam lever timed to the cam which works the clamp.

The accompanying drawing is a section of the casing of a photographic apparatus with mechanism according to my invention for moving and clamping the film. A is the objective tube behind which is mounted the disc shutter *f* which is caused to revolve by hand or otherwise driving by any suitable gear a cam *e* and pin wheels *c* c^1 over which passes the continuous film *a* drawn from one spring roller *b* and wound on another b^1.

The film passes between a pair of rollers *r* and the face of a lever *d* which is pivotted at *h* and is alternately pressed by the cam *e* against the film clamping it and holding it stationary, and releasing it so as to allow it to move onwards. The pin wheels *c* c^1 which are geared together are so set in the first instance as to leave between them a certain amount of slack of the film which is taken up by the roller *g* urged by a spring g^1 causing a bend of the film. As the wheels go on while the film is clamped the wheel *c* delivers slack and the roller *g* yields allowing the wheel c^1 to take up the slack of the bend.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is :—

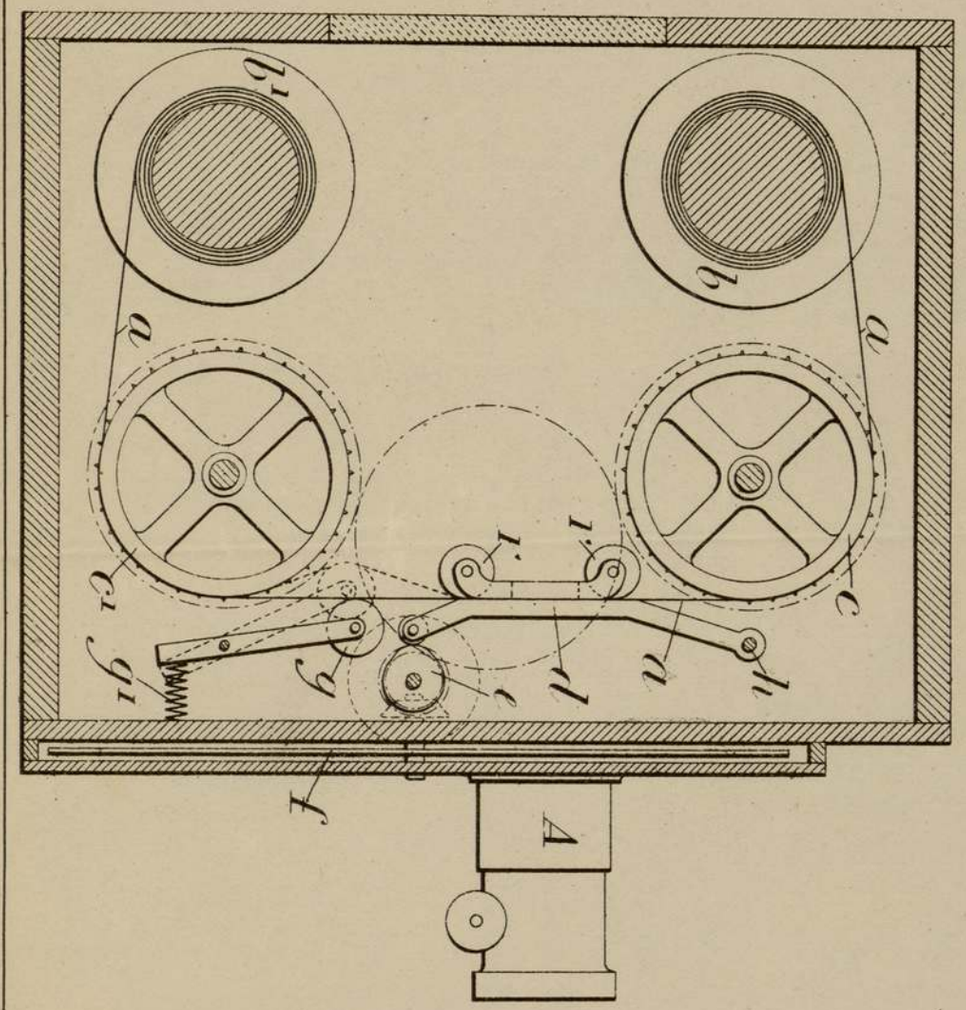
In photographic apparatus, in combination with continuously revolving feeding and drawing wheels for moving the film, and a clamp for temporarily holding it, a roller arranged to deflect the film while it is not clamped and to yield while it is clamped, substantially as described.

Dated this 27th day of February 1896.

ABEL & IMRAY,
Agents for the Applicant.

London: Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—P 13976-125-9/96-G 3189

(2nd Edition)

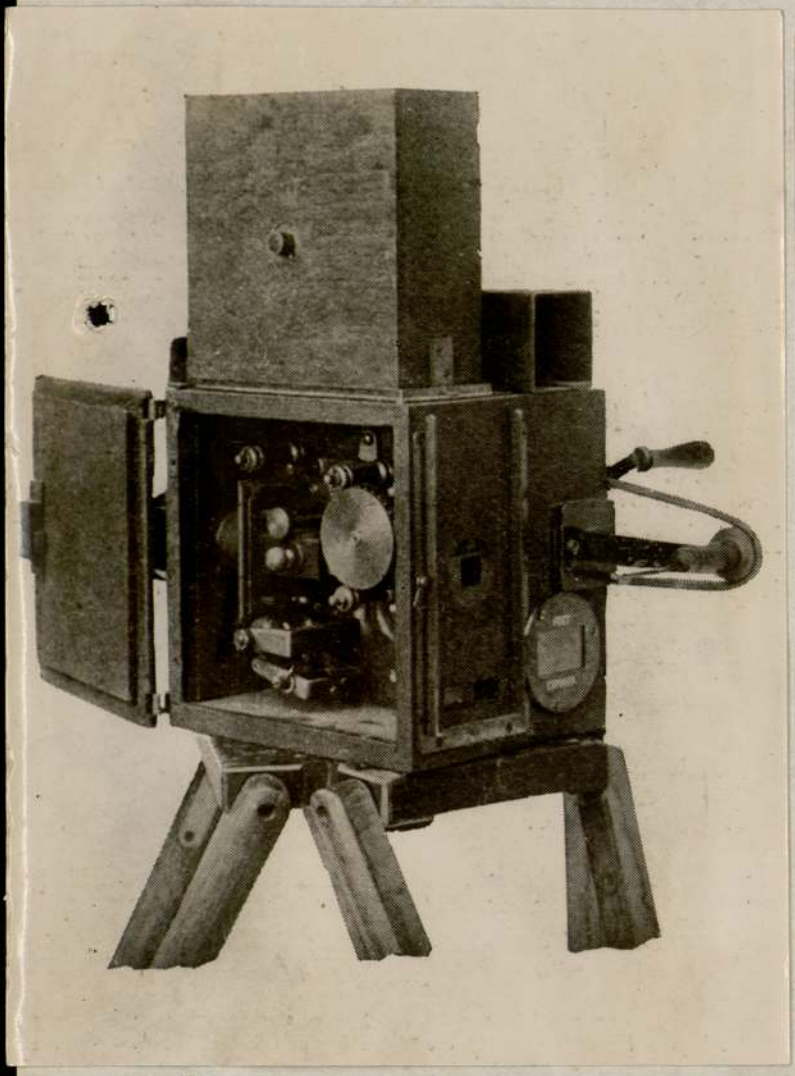


[This Drawing is a reproduction of the Original on a reduced scale.]

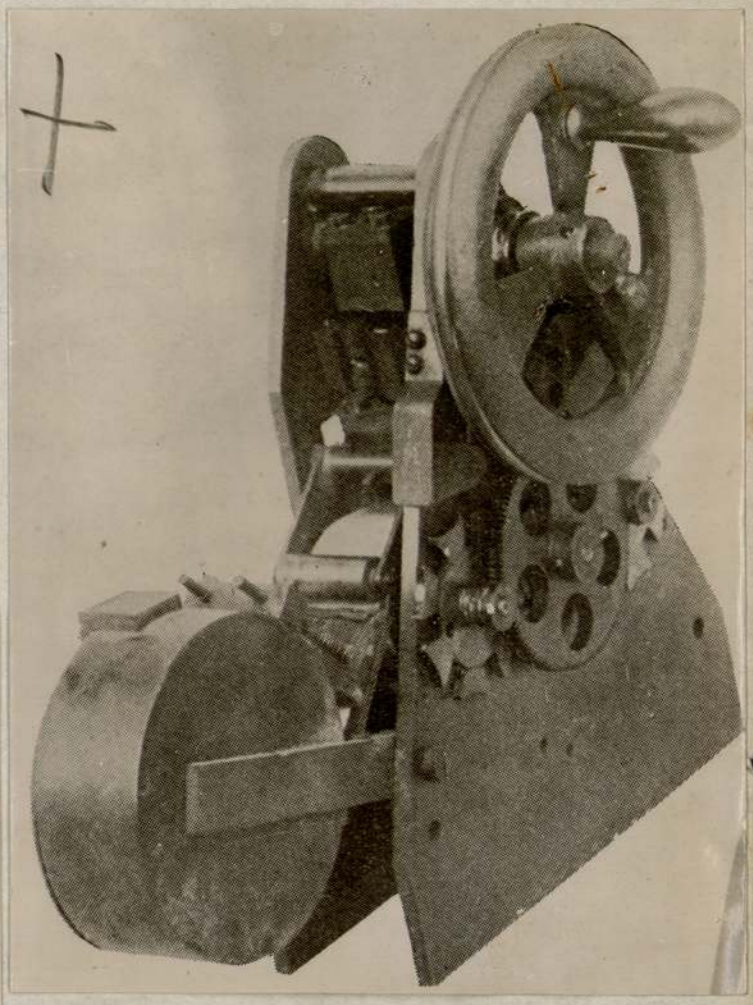
London: Printed by Darling and Son Ld.
for Her Majesty's Stationery Office. 1896.

Malby & Sons, Photo-Litho

R. W. Paul.



Paul's Animatograph Camera
Side View Showing Mechanism



Paul's Rotary Film Perforator

Paul's Derby Film 1896 Persimmon Wins

Birtac Camera

Birtac Patents &c

BIRT ACRES.

The exact advent of Mr. Birt Acres into the circle of enthusiasts and early pioneers to achieve the invention of commercial kinematography is unknown. It is a well-known fact that many years before he took up the study, as an expert of the art of still photography and held an important position with Messrs. Elliot and Sons, makers of photographic plates and papers at Barnet, and after being introduced to Mr. R.W.Paul in January 1895 with whom all his early efforts were associated, a camera was constructed, and a trial film taken of a London street scene, which was not a great success, the films being under-exposed.

After a few experiments this trouble was quickly overcome, and on March 30th, 1895, he secured a very good picture of the University Boat Race with his Kinetic camera. This is a very interesting occurence, insomuch that this event happened only a day or two after Messrs. Lumiere filed their French patent, and certainly before they deposited their claim for an English one.

In the course of conversation with Birt Acres, he often remarked to the author that, knowing of the existence of the prior patent of Greene and Evans of 1889, he failed to see how anyone could secure a patent in this country, if they used perforated films, although, finding Lumiere's had patented their Cinematographe in England, he was persuaded by his friends to do the same and was granted an English Patent, No.10,474, on May 27th, 1895. A diagram drawing from his patent specification is here reproduced.

DIAGRAM OF BIRT ACRES'MOVEMENT.

This camera was of rather simple construction, the film being held in the gate by a clamp plate, upon which pressure was exerted by a cam, and whilst the exposure was taking place the top sprocket fed out another length of film ready for the next picture. As soon as the shutter came into operation and covered the lens the pressure exerted by the clamp plate was released and the roller shown bearing upon the film was thrown into the position indicated by the action imparted thereto by a spring. The slack portion of the film which had accumulated above the clamp plate was then drawn down and replaced by a fresh unexposed portion. When the exposure was commenced the bottom sprocket moved, and the looped film to be taken up on to the rewind bobbin, and this action forced the roller back into the original position, for the repetition of the movement.

The

The projector to show his first film was marketed under the name of the Kinetic Lantern in January,1896, but upon Birt Acres being asked to give a command performance with his instrument, and show a series of animated photographs before the late King Edward, who was then Prince of Wales, which he did in July,1896, he found that upon referring to the Royal Programme issued for the occasion, his machine had been renamed the "Cinematoscope", which title he adhered to.

Another clever invention by Acres was that of a duplicate camera for which he was granted a patent on April 28th, 1897, the number of this being 10,603. The object of producing this apparatus was to secure a number of photographs through two distinct lenses. The views did not run consecutively, but alternated from lens to lens, appearing on the film thus:-1,3,2,4,5,7, 6,8 and so on. The film behind one of the lenses was moved whilst the exposure was made with the other, and a glance at the accompanying drawing from the patent specification will perhaps make the method of manipulation more clear.

In this camera, two sprockets imparted the necessary movement to the film, which, as willbe noticed, had a loop formed between them. A double-toothed rack driven by a crank was caused to move backward and forward, by which movement the sprockets were caused to rotate in one direction only, a locking rachet being brought into action prevented any backward movement.

When an exposure is taking place through one lens the slide will move to the opposite side, the corresponding sprocket will not move, as already explained, but will rotate and cause the film to move one picture length forward. As soon as the shutter begins to move to expose the lens, the rack moves back to the other side, and the movement, just explained, is repeated on the next sprocket, and allows enough film to pass to reform the necessary loop between the lenses.

This camera with its dual lens system was found in practice to contain the usual faults that always occur with one object taken through two different lenses, and as the two lenses were in different points of view, and no two lenses could ever be exactly the same, the resultant photograph when exhibited showed an apparent movement between each picture,which was very distressing.The object of this invention was to show a film without the usual interference of a rotating front shutter, and the projector was perhaps nearer to effecting this object than the camera.

The above drawing shows the arrangement of the lens system for projecting. A parallel bream of light passing through the single light tube was passed alternately through first one lens and then the other, by the deflection of a rotating mirror. This morror did not achieve any commercial success for the reasons stated. The next instrument brought out by Birt Acres was a small combined machine which was indeed a trinity, a projector, a printer and camer combined, three in one; this was called, after the inventor's own name, "Birtac", and the films used were exactly half the width of the Edison gauge, with a row of perforations down one margin side, and a reproduction of the film is here shown.

BIRTAC CAMERA.

The LITTLE instrument itself was very compact and extremely simple in construction, being fitted with a dog movement, and having special cardboard film magazines, which could be used for daylight loading when in use as a camera, whilst brass spools were used for the positive when exhibiting. By an ingenious arrangement of shutters the instrument could be converted to either projector or camera in a few seconds. The first view of the "Birtac" shows the instrument closed for use as a camera.

BIRTAC CAMERA.

The second view shows the same instrument with the side, which was hinged, let down for use as a projector. The necessary spool, lens, and other equipment, were contained in a receptacle in the top portion of the case. This formed the total of the number of machines invented and produced by Birt Acres himself, but he was associated with several instruments produced by others.

He also founded one or two different film producing companies, one of which was established at Wickford in Essex whilst later another studio was erected at Raleigh in Essex.

Birt Acres gave many shows before Royalty, and his services were in constant demand in the early years of the industry. He also wrote various papers on the subject of Kinematography, the first appearing in the "Amateur"Photographer" in 1896 and another in the same paper; another article entitled "The Making and Exhibiting of Living Pictures" appeared in the Camera Club Journal in 1897.

During the latter years of his life, Birt Acres was very unsuccessful in his business ventures, and he died at Barnet in the year 1921, after making an unsuccessful attempt to found a film production studio and laboratory at Raleigh in Essex.

BLAIR'S PATENT

Another patent taken out in 1896 by Mr. T. H. Blair, one of the early producers of films in England, at Footscray, Kent, and the first man to supply sensitized celluloid film stock to the trade in England, was called the VIVONTOSCOPE, but owing to the sale of his Company and all interests therein, to the Eastman Kodak Company of America, whereby he specifically agreed to remain out of all business connected in any way with photography or moving pictures for a certain number of years, he was precluded thereby from carrying out the exploitation of this invention.

Having through the preceding Chapters been made conversant with the direct outcome of Edison's Kinetoscope, with it's films of moving pictures in England, it will next be the Author's object to trace the evolution of this invention in France.

A Peep SShow Movie Founds a Vast Business.

The early exploitation of Kinematography in France and England by the Brothers Lumiere.

Until the year 1895 no one can claim to have achieved the success of being able to show upon a screen, a public exhibition of Moving Pictures by means of Kinematography. The advent of the Brothers Lumiere into the moving picture industry, was brought aboutthrough first viewing a series of films in Edison's Kinetoscopes, These machines were set up in a saloon at the latter part of 1894 by Werner Bros. at 20 Boulevard Poisoniere, Paris, where they were seen by Louis Lumiere the father, who induced his two sons Auguste and Louis to also view them. So struck were they by the pictures they saw, that their ambition was roused to do something better. Upon putting the project before their father, who was the proprietor of a large photographic plate and paper business, he at one shared their enthusiasm, and said providing the pictures could be shown upon a screen, there were huge possibilities for the new branch of the Photographic art. This was all that was necessary to fire their enthusiasm and these two young men at once devoted their attention to the production of a suitable machine which would be both capable of taking and exhibiting animated Pictures. A private workshop was quickly equipped at Lyons and an endeavour was made to convert an Edison Kinetoscope into a Camera. By making several alterations suggested by Mr. George Demeney they were able to carry out a series of tests upon bands of paper which were reasonably successful.

Their next endeavour was to secure a supply of both negative and positive film stock and they eventually secured a supply of plain celluloid film from their American agents, which, like all the first stock, was matted. This they sensitized with an emulsion made up from their own formula. Having now got the necessary equipment and film they conducted many experiments in order to arrive at the correct speed at which the pictures should be taken, and after many trials they found at the conclusion of their experiments that sixteen pictures per second was the correct ratio, and this speed was accordingly adopted. In the early part of 1895 they had completed their trials, having by that time produced their first camera, which also acted as printer, and projector, they were not long in taking a few short films.

The camera was turned by hand, and measured approximately eleven inches square. Finding there was no patent existing for such an instrument in France, they applied for a patent on Feb. 13th

Lumiere The Brothers Lumiere

TREWEY
Officier de l'Instruction Publique
Médaille de la Mutualité
Président et Membre d'honneur
de plusieurs Sociétés de Gymnastique
de Sauveteurs, de Secours Mutuels
Bienfaisance, Académie de Billoquet, etc.

VILLA TRAVERSIÈRE
ASNIÈRES (SEINE)

29/10.
/20

Dear Mr De Vere

The Cinematographe I have sold to you is the Original and first one of the Serie ever exhibited at the Grand Café in Paris wich open the 2nd of Febreuary 1896 and at the ~~Polytechnic Institution~~ London on the Febreuary 20th in sametimes on the Empire Theatre London on the monday 9th March 1896 for Eigting months.

Yous old frind
E. Trewey

Trewey's letter to DeVere Co

A tous ici, sincèrement,
Je souhaite une bonne année ;
Santé parfaite constamment,
Vie heureuse et bien fortunée.

PROFESSOR
TREWEY A.

Film Strip to hold 50 ft.

Lumiere

The Brothers Lumiere

TREWEY
Officier de l'Instruction Publique
Médaille de la Mutualité
Président et Membre d'honneur
de plusieurs Sociétés de Gymnastique
de Sauveteurs, de Secours Mutuels
Boulomane, Académie de Billoquet, etc

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Yours old frind

F. Trewey

Trewey's letter to DeVere

Louis and Auguste Lumi

A tous ici, sincèrement,
Je souhaite une bonne année :
Santé parfaite constamment,
Vie heureuse et bien fortunée.

PROFESSOR
TREWEY A. ✪ ★

use to:—
Will Day
19 Lisle St
W.C

Lumieres Kinora, book form
Motion Picture Machine, hand
operated 1898 also sold Clockwork
operated

to be returned } to Will Day 19 Lisle St
after use } WC2

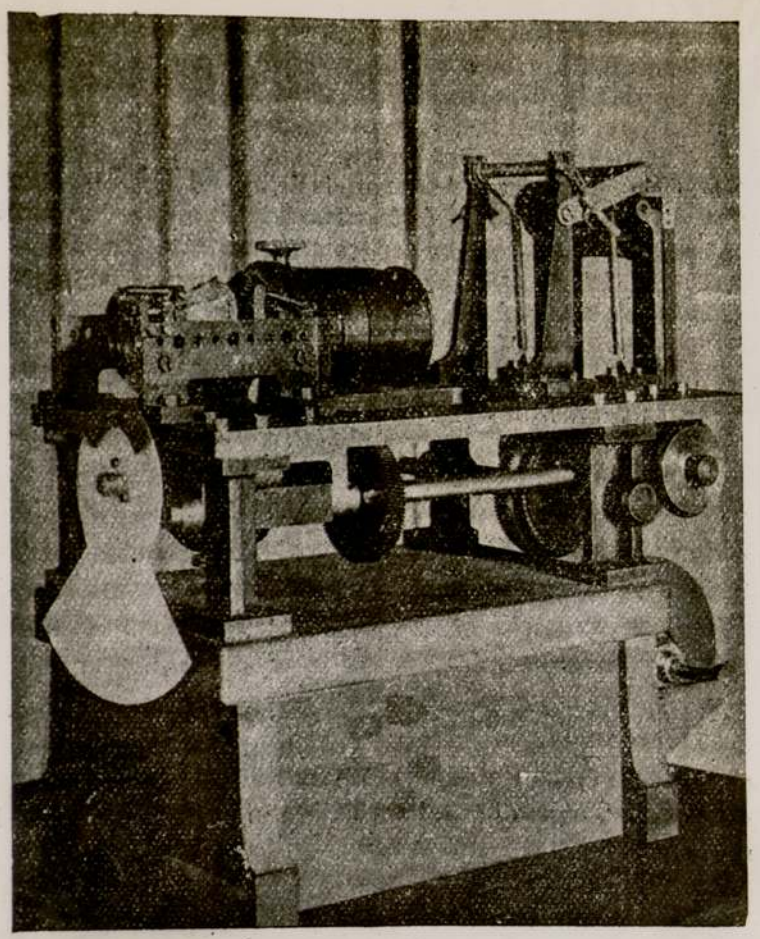
~~Browning's Original Arc Lamps~~
~~which worked off a six cell~~
~~Grove's Battery and used two sticks~~
~~of charcoal for the illuminants~~

11.2.36 ✓

Reel of Kinora Pictures

Coll. Wild Day

Lumiere

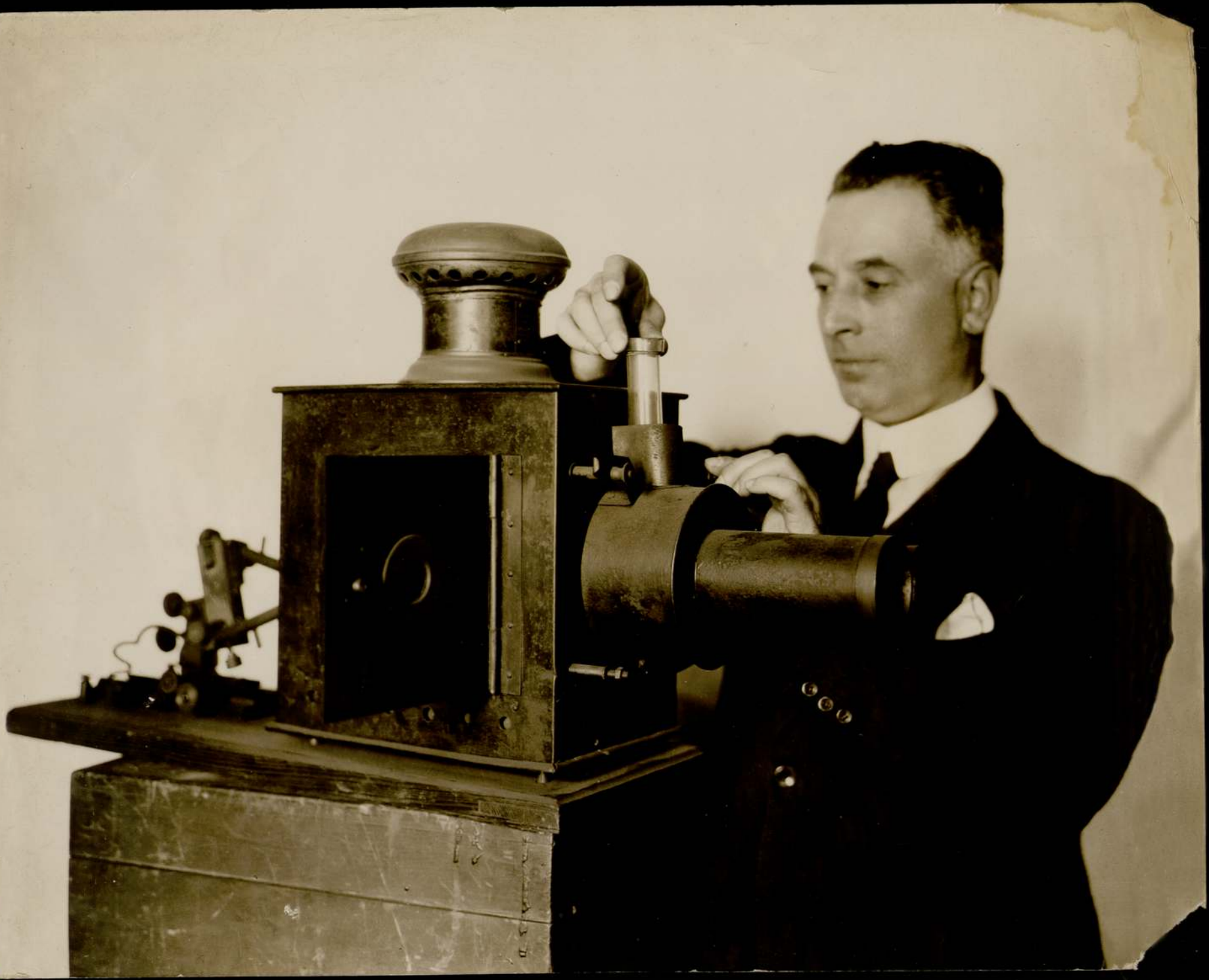


Lumieres
First
Projector

Francis Pochet

The Interlocutor

1895, which was granted to them under number 245,032, and thus the cinematographe as it was termed by the Bros. Lumiere, came into existence. The first instrument constructed was made in their own workshop by Monsieur Moisson assisted by I. Carpentier et Cie, of Paris, and it was this instrument which was used to give the first public exhibition of moving pictures, both in France and England. The film used differred from that produced by Edison, insomuch that in only had one single round perforation hole on each side of the picture, whereas that of Edison's had four, but the size of the picture mask in both films was identical. After a trial exhibition at their Lyons Factory on March 22nd 1895, a successful series of films were shown to the Congres de L'Union Nationale des Societies Photographiques de France before the memebrs of the Congres, who expressed their unbounded enthusiasm at the success of the Lumieres in the new photographic art. Having proved their invention to be thoroughly satisfactory in every way, they proceeded quietly to Manufacture a supply of films and apparatus, and on December 25th, 1895 opened an exhibition of moving pictures at the Grand Cafe on the Boulevard Capucines No.14 at Paris and on January 25th 1896 at Lyons. The great success achieved by their entertainments in France, induced them to turn their attention to England and they applied at once for a British Patent which was granted to them on April 8th 1896, number 7187, and an additional patent for a perforated front shutter on April 13th 1896, number 7801. The exhibitions given in France were carried out by Mons. Trewey, who was an extremely expert Entertainer, giving as one of his principle items, a wonderful display of shadowgraphy; and as he had appeared at all the principle Music Halls throughout England and France, it was little wonder that the choice of Auguste Lumiere fell on him to act as his representative; and he personally tutored him in the art of cinematographe. After carrying out the first show at the Grand Cafe with such great success, Trewey was entrusted with the exploitation of Lumiere's moving pictures in England. Making the journey across the Channel early in February, 1896, he gave a few private demonstrations of the new entertainment, resulting in the booking of an engagement with the Royal Polytechnic Institute in Regent Street. The first series of Seances of A HALF HOURS DURATION were opened to the British Public on February 20th 1896, this being the first public show of moving pictures given in England. The hours of showing were from 2 p.m. until 9 pm and the charge of admission was 1/- for each person. A preliminary lecture was given at each performance by



Mr Matt Raymond, the first cinematograph electrician, with the old apparatus he used, who will be present at the Polytechnic special memorial performance ~~next week~~. Feb. 20th 1896 was the date he first used the Arc Lamp for the original show of moving Pictures (note the Water Bottle Condenser)

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12. 2. 36

This Photograph shows Mr Matt Raymond who was the first Electrician and operator to use Lumiere's Apparatus & Show the Diamond Jubilee Pictures at the Empire Theatre Leicester Sq. Note the Water Bottle Condenser to the first Lumiere Lamp House

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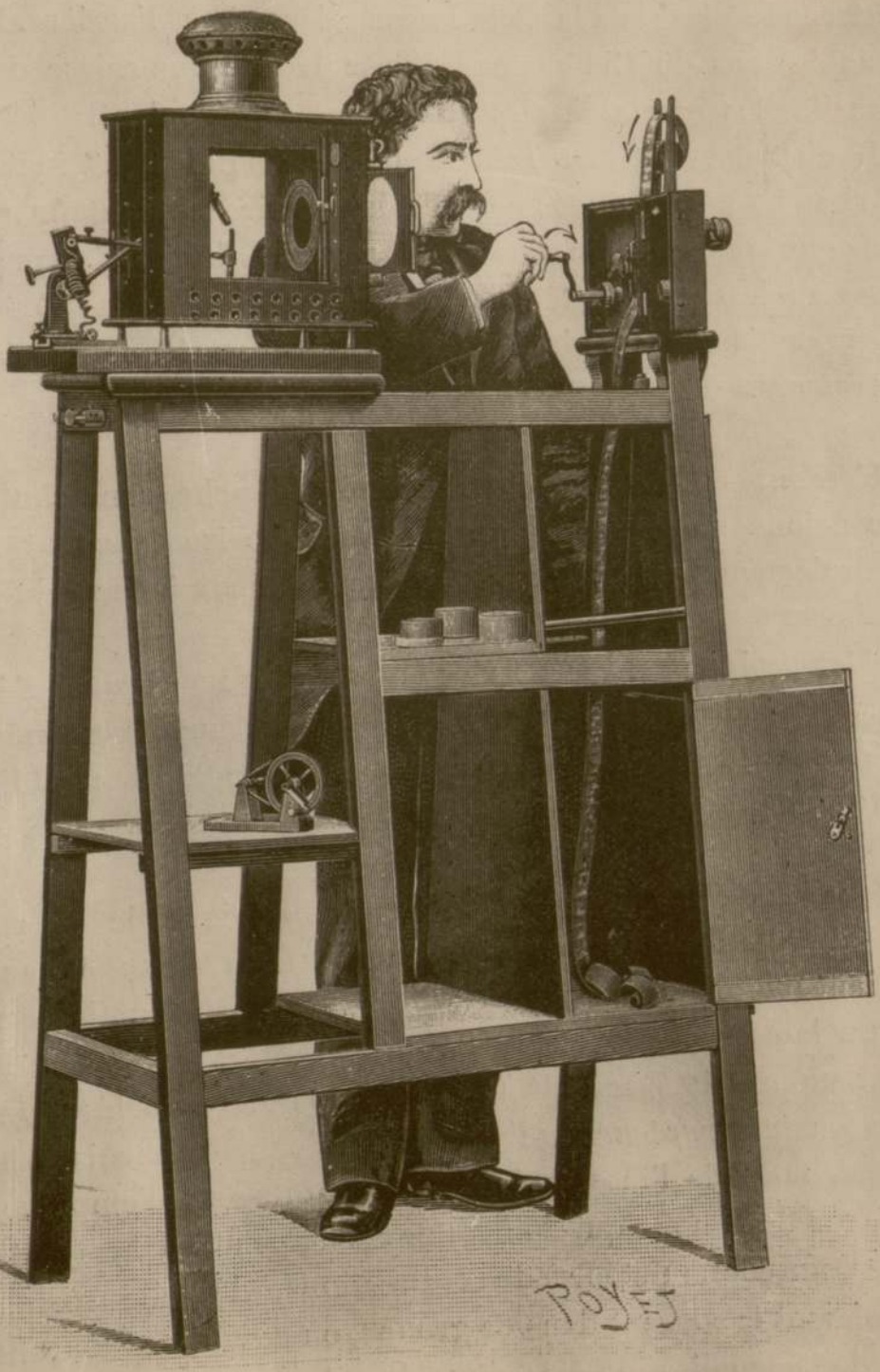
POYET

The Lumiere Projection Apparatus as set up for use at the Empire Theatre Leicester Square to show Queen Victoria's Diamond Jubilee Film June 22nd 1897 Note the Film dropping loosely into the cupboard to receive it.

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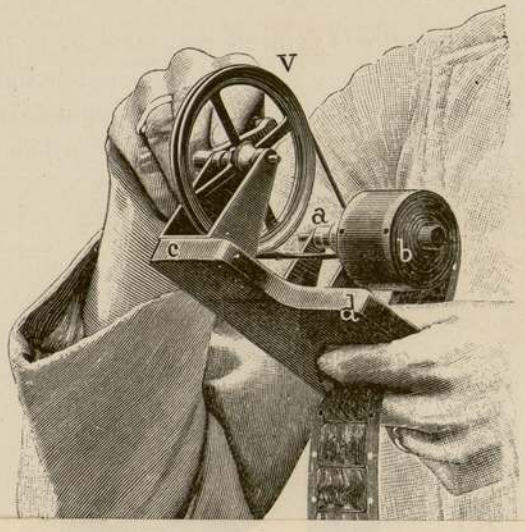
Mr. Frances Pocket, who described the wonders of the entertainment about to be shown and personally introduced Monsieur Trewey. The actual show of pictures consisted of a selection of six different films, each measuring 45 feet in length and lasting barely half a minute for each subject. The success of these first shows at the Polytechnic was not very great, as the Public were under the impression that it was only an ordinary Magic Lantern Entertainment, there were to witness, for which the Polytechnic for many years had enjoyed much fame. The Electrician in charge of the showing and lighting was Mr. Matt Raymond, who had been iniated into the art of projecting a picture by Monsieur Trewey. The doors were opened and a few people induced to enter, and after a while the first performance commenced. The entertainment proceed normally until the film of the Arrival of the Train at a Country Station was thrown upon the screen, being accompanied by the usual sounds of a trainapproaching a station. This must have been of a very realistic nature, or the audience must have been very sceptical, for without any warning, they made one mad rush for the exit, thinking it was a real locomotive behind the screen, which any moment might leave the stage and run amongst them. This taught Monsieur Trewey a lesson, to carefully explain to future audiences that it was only a Moving Photograph they were looking at, and not a real locomotive. The show at the Polytechnic was followed by an ENGAGEMENT at the Empire Theatre, Leicester Square, on March 9th,1896 which opened for afternoon shows only, and six weeks later went into the regular bill for evening performances which then ran without a break for three years, this being the first Music Hall in England to show animated pictures. From this, many shows were inaugurated all over England, and it was not long before similar entertainments were running at all the principle Music Halls, whereit proved immensely popular, and was a certain draw. Messrs. Lumiere's next turned their attention to a viewing machine and produced their famous "Kinora" which was very popular for Public Exhibitions on Fair Grounds and Exhibitions. This machine was operated by dropping a coin into a slot, which released a catch and by turning a handle, a series of moving pictures mounted upon cards were flicked over, giving a very life like picture of some domestic happening., which always had the happy knack of stopping, just as some extremely interesting episode was about to occur. The Kinora was patented by Messrs. Lumiere in England on October 19th,1896, the number granted to same being 23,183. This machine was

La Revue du Siècle

se fait au moyen de deux tenons vissés sur le volet et qui embrassent une languette placée vers le haut de la boîte réceptrice. Deux épaulements du volet soutiennent la boîte par le bas.

Bobineuse (fig. 6). Cet accessoire sert à enrouler les pellicules. Il se compose du volant V mis en mouvement à la main au moyen d'une manivelle ; ce volant, par l'intermédiaire d'un cordon en cuir, commande une sorte de treuil *ab* terminé d'un côté par un cylindre creux fendu dans toute sa longueur suivant une génératrice. Une planchette *cd* en noyer, qu'on tient dans la main gauche, supporte



One of the first Film Winders made to rewind 50ft of Film in 1896. Lumière

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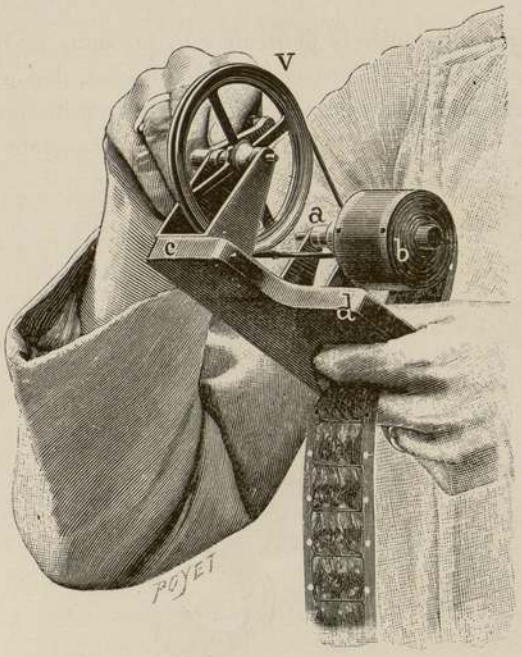


Fig. 6

le tout ; en regard du cylindre creux, cette planchette est munie d'une ouverture garnie de velours. Le bout de la pellicule, d'abord introduit dans cette ouverture, vient ensuite s'engager dans la fente du treuil. On tourne alors le volant de la main droite, d'une façon régulière, jusqu'à ce que la pellicule soit enroulée. Pendant cette opération, il faut avoir soin de guider la pellicule en dessous de la

planchette, au moyen de l'index et du majeur de la main gauche, afin d'éviter les torsions qui pourraient provoquer des déchirures irrémédiables.

Manipulations. — Les manipulations nécessaires pour l'obtention des négatifs comprennent :

A. — *Introduction de la pellicule sensible dans la boîte-châssis.*

B. — *Mise au point.*

C. — *Mise en place de la pellicule dans l'appareil et fonctionnement de celui-ci.*

A. — Pour introduire la pellicule sensible dans la boîte-châssis, il faut tout d'abord, au moyen de la bobineuse, dérouler la bande que nous expédions et l'enrouler à nouveau en prenant pour bout intérieur le bout libre de la pellicule, le *côté sensible étant placé en dedans.*

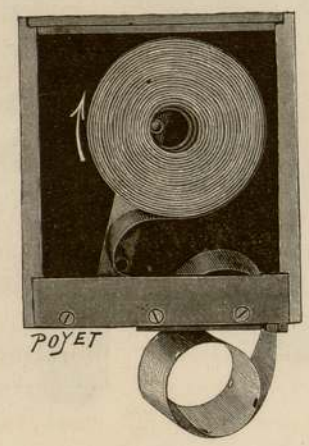
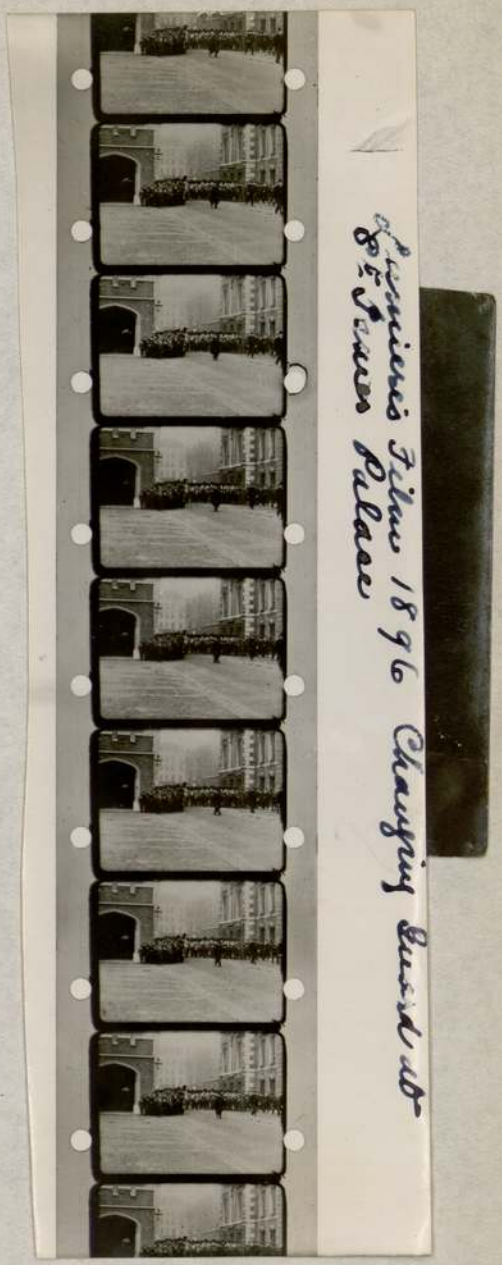


Fig. 7

Cela fait, on place le rouleau de pellicule dans l'axe central de la boîte, de telle sorte que le sens du déroulement soit celui du mouvement des aiguilles d'une montre (fig. 7). On replie l'extrémité de la bande vers la gauche, de façon qu'elle entoure le levier coudé, puis on la ramène à droite en l'engageant dans la fente garnie de velours. On a soin de laisser dépasser le bout de quelques centi-

Lumiere

Kinora Picture showing Lottie Collins in Tar-ra-ra Boom de ay



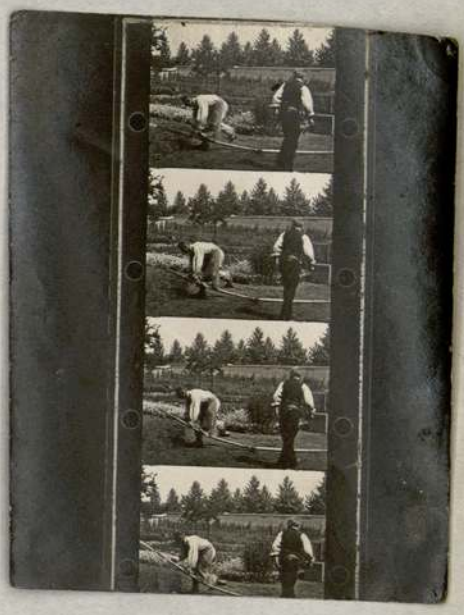
Lumieres Films 1896 Changing Guard at St James Palace

Lumieres Films
arrival of Train
at country Station
1895

F. Trevey
doing his hat
Trick for
Lumiere
1895

Lumière

Kinora Picture showing Lottie Collins in Tar-ra-ra Boom de ay



Lumiere's Film
Arrival of Train
at country Station
1895

F. Trewey
doing his hat
Trick for
Lumiere
1895

MONSIEUR TREWEY.

To complete a perfectly successful result with the Cinematographe, it is essential that it should be manipulated under the direction of an artiste—Trewey, the most expert in his profession of scientific variety prolusions, is happily the person to whom the Lumières have entrusted the exhibition of their wonderful invention.

No 16

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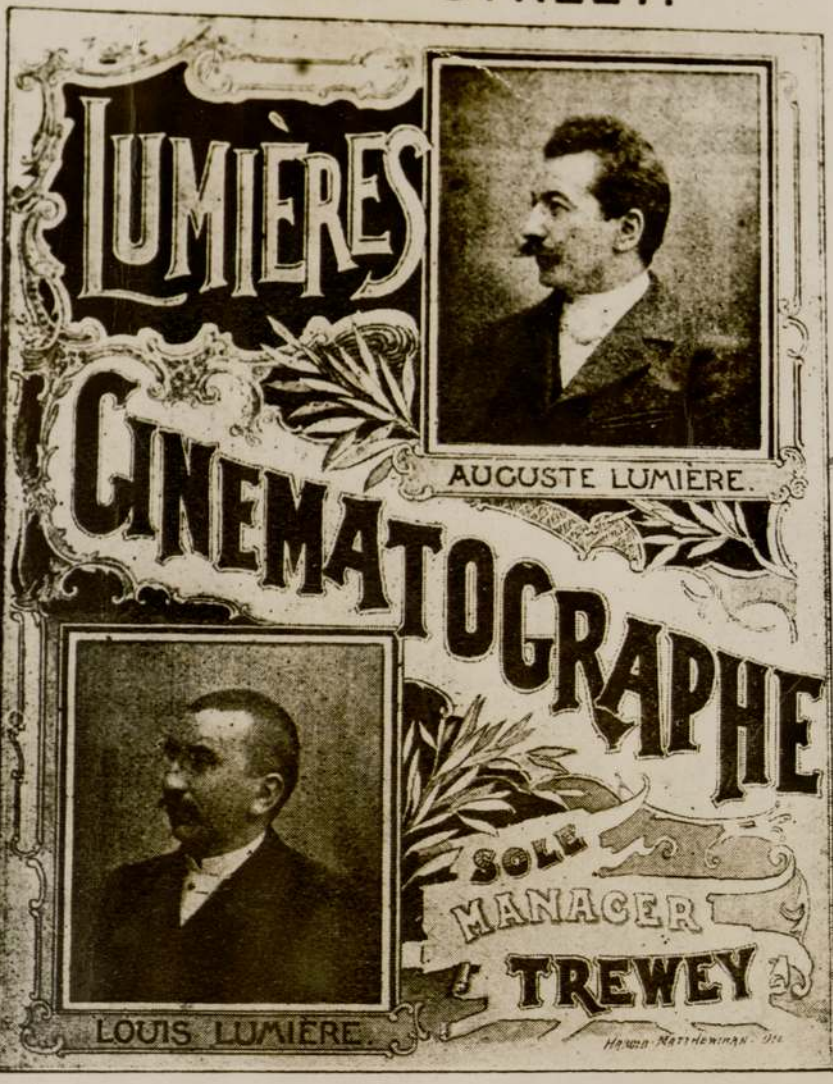
REGENT STREET.



Edited by HERBERT NORTH.

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The cover of the first programme ever issued in England for a moving picture entertainment.

Lumiere

Daylight
hung outside
The Polytechnic

NOTICE

NEW VIEWS
OF
LUMIERE
CINEMATOGRAPHE

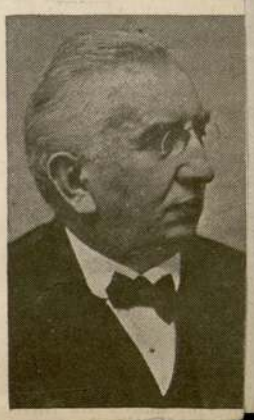
RUSSIAN PAGEANTS

CORONATION OF THE CZAR

ON VIEW FROM
2 till 6

POLYTECHNIC

TREWEY
Sole Manager



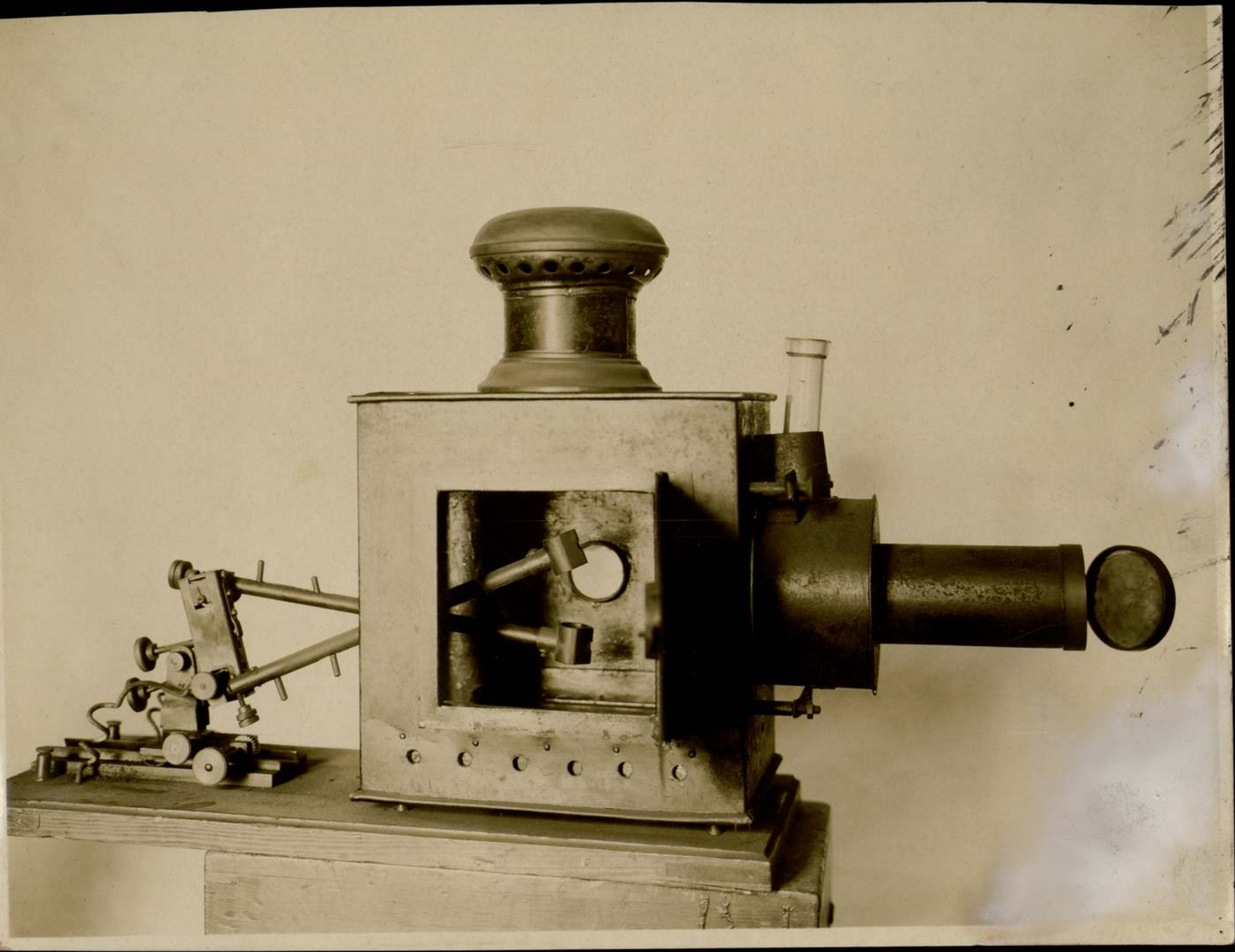
Louis
Lumiere

also produced in a small size for home use, and at one time was quite a popular form of home entertainment, but the high cost of the picture reels, limited the number of sales, and it was eventually withdrawn from the market. Messrs. Lumiere for many years enjoyed a large sale, for both their apparatus, and films, all over the world, and were serious rivals to Edison on the American Market, and many of the early film producers conscientiously converted their Lumiere Projector mechanism into film printers, so excellent was the precision of the workmanship, WHICH RESULTED IN A LARGE AMOUNT OF DUPING OR COPYING OF FILMS TAKING PLACE.

For many years they were serious rivals to Eeastman for the supply of both Negative and Positive film, STOCK, and their sales at one time must have reached a very high figure. Of late years, their products have not been exploited to such a great extent, but their commodities have always been of a very high standard, and perhaps one of the best proofs of the quality of their films lays in the fact that the first films they ever produced in 1895, are still intact, and in a perfectly showable condition at the present day. Since the death of his Brother, Auguste; M. Louis Lumiere has devoted a great deal of time to the study of producing films in colour and also with the third dimension or steroscopic effect. It is not the work of a novice with no previous experience to guide him, as in 1907 he was the one man responsible for the production of Lumiere's Autochrome Photographic Plate, which gave excellent results for ordinary still photography in colour. After much patient research and study in his own private laboratory he has perfected a colour system which will allow of perfect registration of colour taken at the same speed as the "Talkies" viz., 24 frames per second. The process consists of coating the film upon one side with a thin layer of a special secret compound, which consists of very minute particles or granules of Orange, Green and Violet colouring matter, the particles being so small that between 6000 and 8000 granules are carried upon one square millimetre of film the pictures are taken through this medium which acts as a colour filter, the final results achieved are very beautiful and give a perfectly natural colour effect.

Monsieur Lumiere very seldom visits a movie show, as he always asserts the characters portrayed are too unreal laying as they do, flat against the screen. It is a thought that has ever been in his mind to produce a third dimensional effect or as he terms it a "Stereoptical" Cinema. Many years ago the "Anaglyph" system produced apparent stereoscopic effect upon a screen using the subjects printed in red and green, which were viewed by the

LANTERN SLIDES.



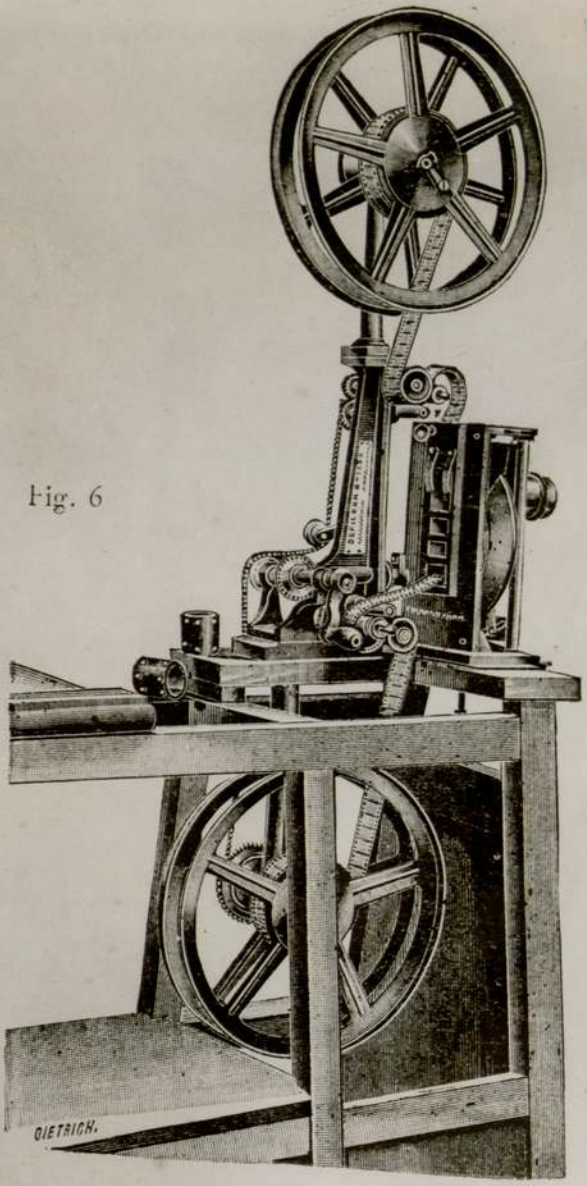
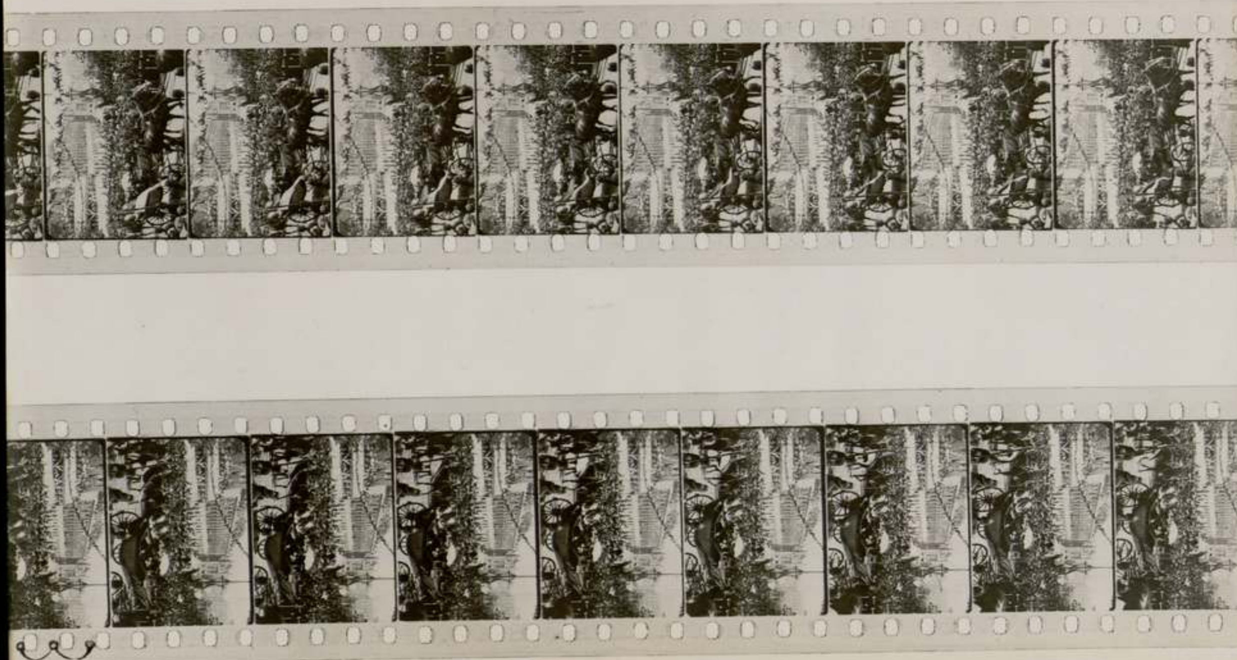


Fig. 6

Carpentier Lumiere
Projector 1896

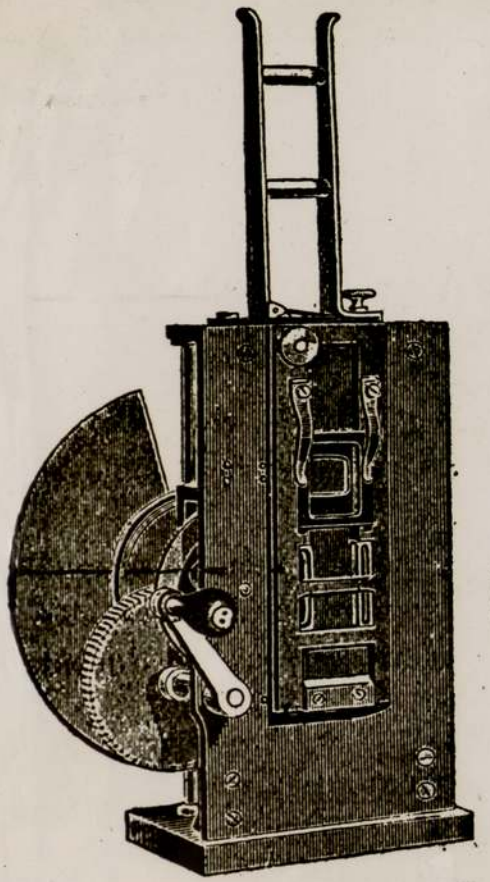
Lumiere's Films on Edison Gauge Stock Queen Victoria's Diamond Jubilee 1897

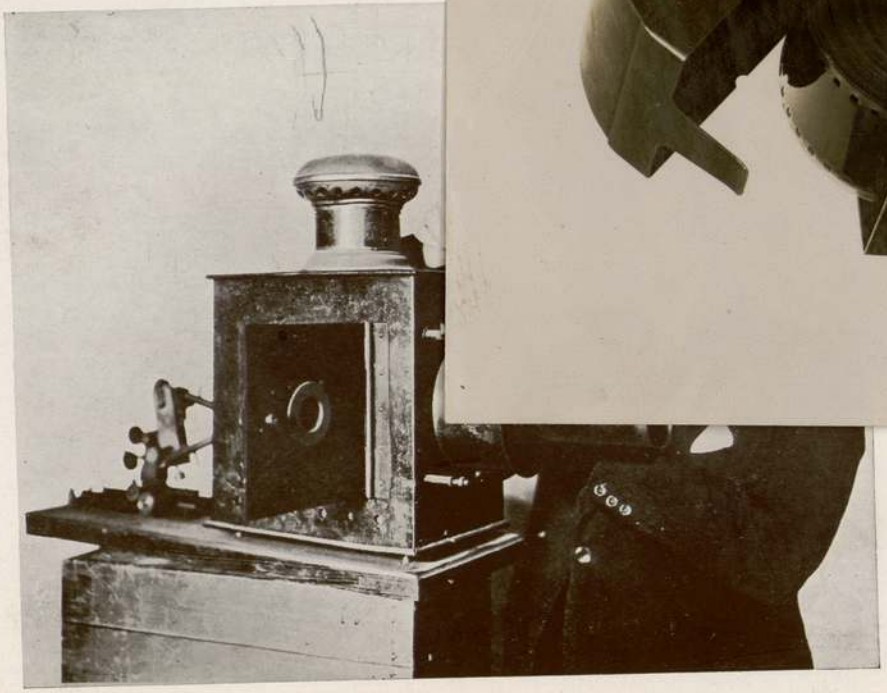


Lumiere

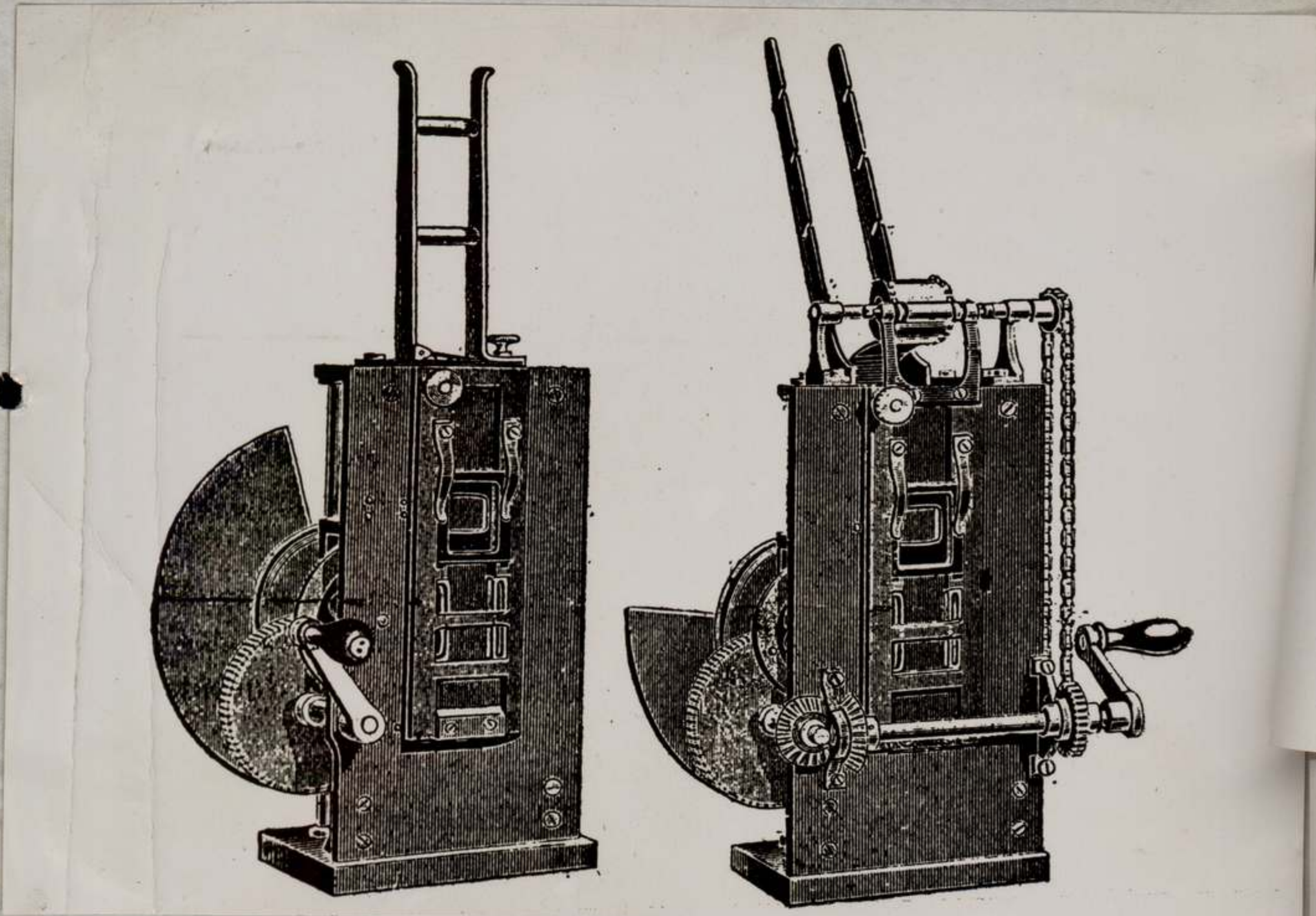
Lumiere's Film. La Bebé 1895
Auguste Lumiere with wife + child

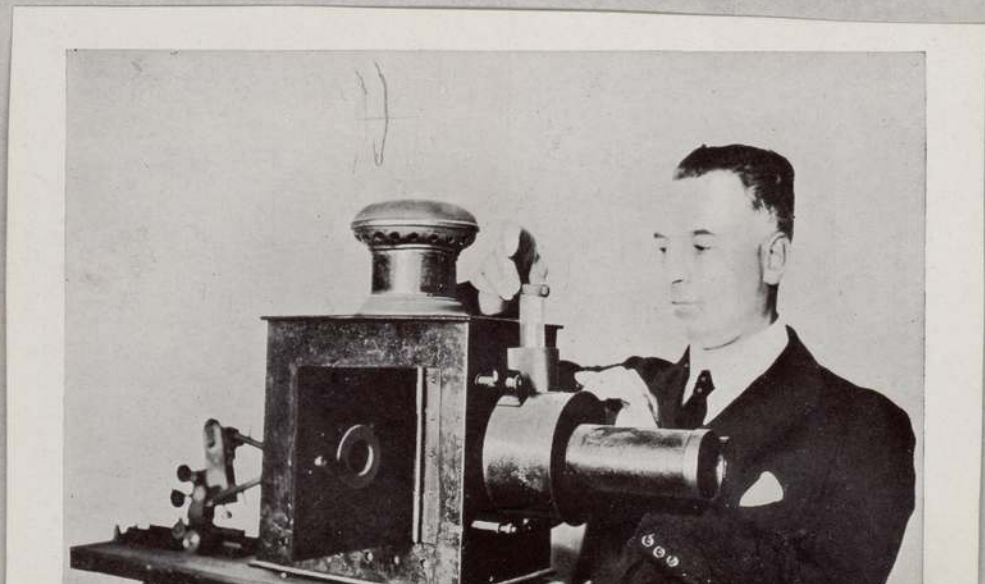
Lumiere





Lumiere





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Will be selected from the following subjects, and will be liable to frequent changes, as well as ADDITIONAL POURTRAYALS.

Lecturer - FRANCIS POCHET.

Bathing in the Mediterranean.

Arrival of a train in a country station.

Trewey (under the hat).

Fall of a wall.

Babies playing.

A quiet game of ecarte.

Russian Views.

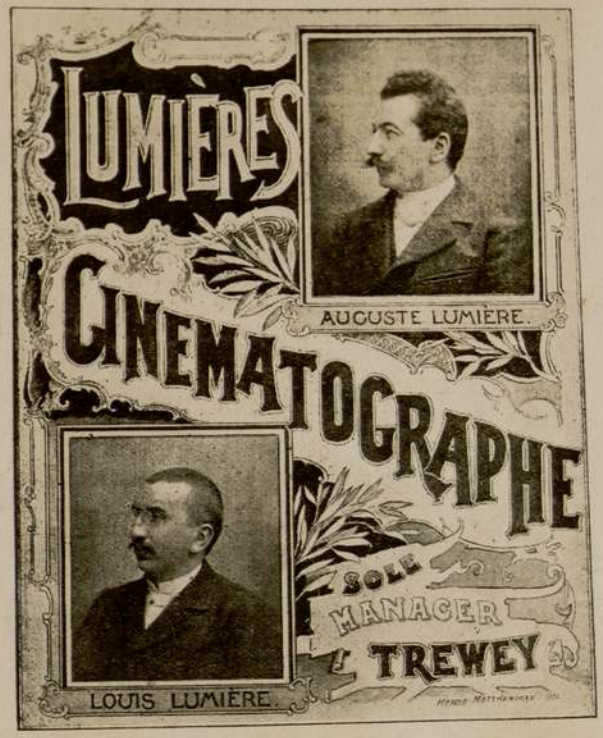
London Street Niggers.

Racecourse Scene.

Cavalry horses led to be watered.

MARLBOROUGH HALL

REGENT STREET.



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PROGRAMME.—Continued.

Surf boat leaving harbour.

Ludgate Circus.

Change of Guard—St. James' Palace.

Hyde Park at noon.

Spanish Life.

Blacksmith at work.

Breakfast on the lawn.

Travelling Photographer.

Charge of Cavalry.

Tit for Tat.

Champs Elysees (Paris).

Place des Cordeliers (Lyons).

Teasing the gardener.

Arrival of the Mail Boat at Folkestone.

The Tuileries, Paris.

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THE PHOTOGRAPHIC JOURNAL

THE OFFICIAL PUBLICATION OF THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN AND THE PHOTOGRAPHIC ALLIANCE

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GENERAL EDITOR : H. H. BLACKLOCK.

VOL. LXXV
NEW SERIES, VOL. LIX

DECEMBER, 1935

TWO SHILLINGS AND SIXPENCE

HOMAGE TO M. LOUIS LUMIÈRE

[*Continued from p.* 627]

Thanks to you, we are making use of this marvellous instrument in 60,000 *kinema theatres scattered throughout the world for the instruction and entertainment of the greater part of the human race. The fulfilment of this task has created an industry which in its extent and ramifications is without equal.*

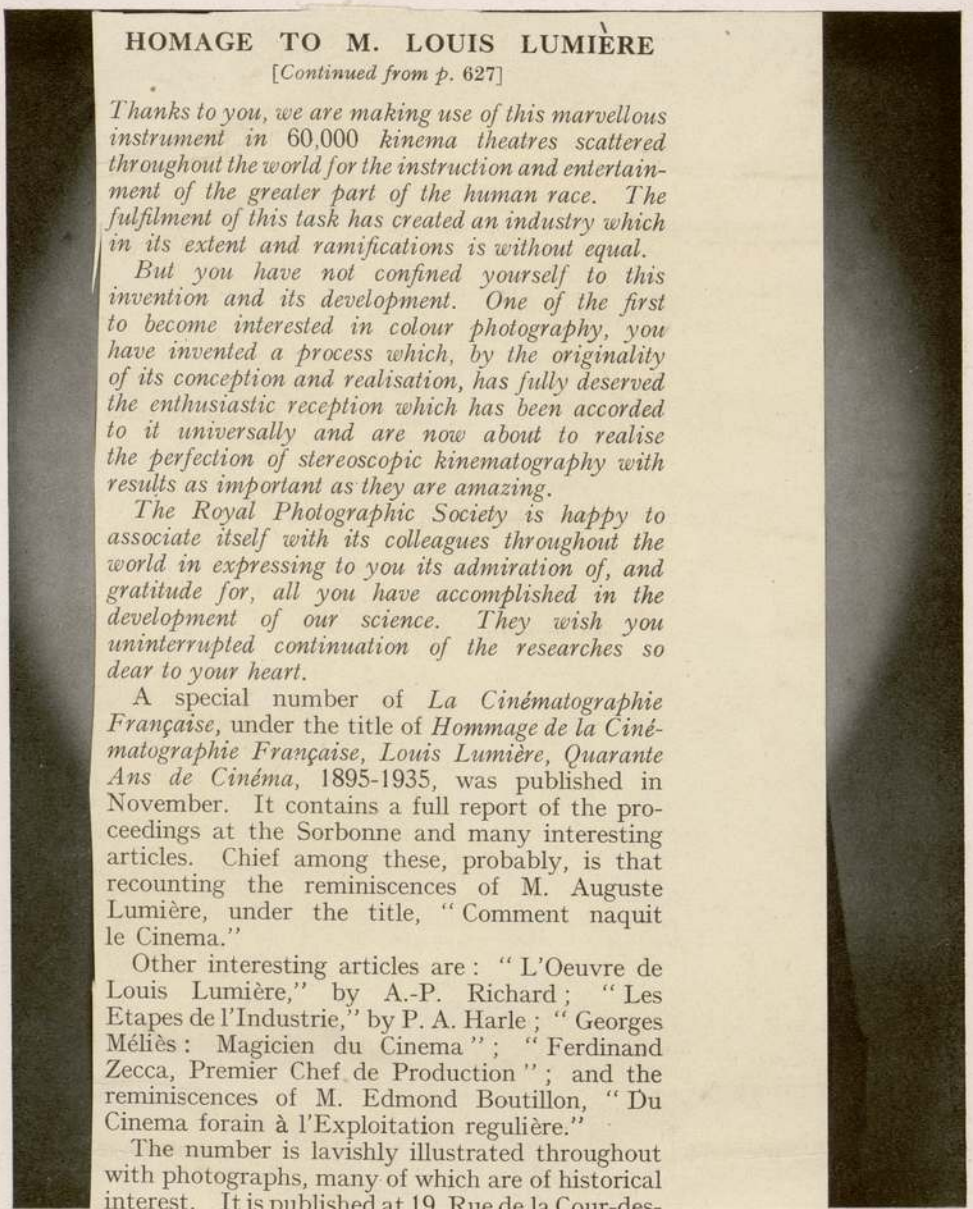
But you have not confined yourself to this invention and its development. One of the first to become interested in colour photography, you have invented a process which, by the originality of its conception and realisation, has fully deserved the enthusiastic reception which has been accorded to it universally and are now about to realise the perfection of stereoscopic kinematography with results as important as they are amazing.

The Royal Photographic Society is happy to associate itself with its colleagues throughout the world in expressing to you its admiration of, and gratitude for, all you have accomplished in the development of our science. They wish you uninterrupted continuation of the researches so dear to your heart.

A special number of *La Cinématographie Française,* under the title of *Hommage de la Cinématographie Française, Louis Lumière, Quarante Ans de Cinéma,* 1895-1935, was published in November. It contains a full report of the proceedings at the Sorbonne and many interesting articles. Chief among these, probably, is that recounting the reminiscences of M. Auguste Lumière, under the title, "Comment naquit le Cinema."

Other interesting articles are : "L'Oeuvre de Louis Lumière," by A.-P. Richard ; "Les Etapes de l'Industrie," by P. A. Harle ; "Georges Méliès : Magicien du Cinema" ; "Ferdinand Zecca, Premier Chef de Production" ; and the reminiscences of M. Edmond Boutillon, "Du Cinema forain à l'Exploitation regulière."

The number is lavishly illustrated throughout with photographs, many of which are of historical interest. It is published at 19, Rue de la Cour-des-Noues, Paris (20e), and the price is eight francs.



FROM T ITISH PICTURE
UNDER ORATION, LTD.

HOMAGE TO M. LOUIS LUMIÈRE

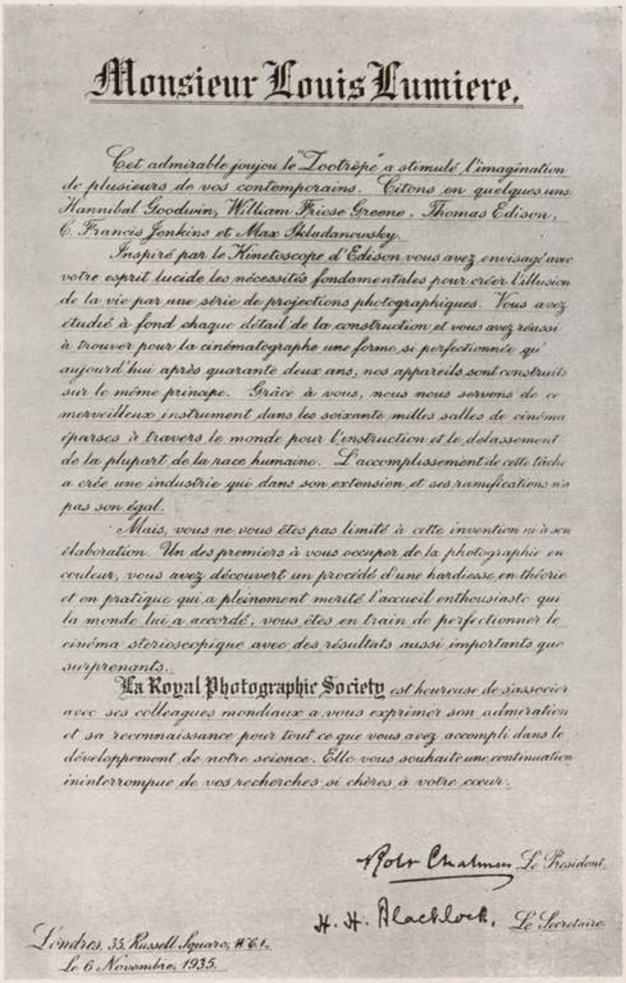
THE Sorbonne, Paris, was the scene of a sympathetic ceremony when the jubilee of M. Louis Lumière, world-famous for his contributions to kinematography and colour photography, was celebrated at a Séance Solennelle in his honour.

The ceremony was attended by a distinguished audience, drawn from all over the world, headed by The President of The French Republic.

The Royal Photographic Society was represented by Sir Robert Mond, M.A., LL.D., F.R.S.Ed., Member of Council, who, on behalf of the Society, presented to M. Louis Lumière an Address of appreciation and congratulation inscribed on vellum.

Writing from Paris, Sir Robert Mond contributes the following interesting account of the ceremony :—

"THE Jubilee of Monsieur Louis Lumière was not only an impressive, but a delightful ceremony. Under the Chairmanship of Monsieur Mario Roustan, and in the presence of The President of The Republic, the Chairmen of both the Senate and the House of Deputies, and in the presence of most of the Ministers of foreign nations (27 were represented officially) most of the Academicians, and an enthusiastic audience which filled the Great Hall of the Sorbonne to overflowing, tribute was paid by Presidents of the Scientific and Technical Societies, and of the industries that Lumière's invention created. These industries are producing annually 150,000 miles of film, shown to 80,000,000 spectators in 60,000 halls and giving employment to 550,000 people. This is the result of 40 years' work of a man who had only enjoyed two years of schooling, but endowed with a clear and mechanically gifted mind and systematically exploring and improving each detail of his inventions and whole-heartedly devoted to his work. It is a noble record, and when presenting your address I told him that all our thoughts were with him that evening. As the oldest foreign delegate, I was called upon to speak for the foreign nations. Professor Fabry, Mons. Delac and Mons. Georges Lecomte all made appropriate speeches. The first films made by Monsieur Lumière were shown. They were excellent in quality and everybody acclaimed their soundlessness. A number of his early coloured transparencies were shown, some of them most successful, but he declined to allow his stereoscopic film to be shown, as he is not yet fully satisfied with it. Monsieur Lumière's reply was delightful, dignified and modest, acknowledging his debt to other workers, especially what he owed to his brother.



Monsieur Louis Lumiere.

Cet admirable joujou le "Zootrope" a stimulé l'imagination de plusieurs de vos contemporains. Citons en quelques uns Hannibal Goodwin, William Friese Greene, Thomas Edison, C. Francis Jenkins et Max Skladanowsky.

Inspiré par le Kinetoscope d'Edison vous avez envisagé avec votre esprit lucide les nécessités fondamentales pour créer l'illusion de la vie par une série de projections photographiques. Vous avez étudié à fond chaque détail de la construction et vous avez réussi à trouver pour la cinématographe une forme si perfectionnée qu' aujourd'hui après quarante deux ans, nos appareils sont construits sur le même principe. Grâce à vous, nous nous servons de ce merveilleux instrument dans les soixante milles salles de cinéma éparses à travers le monde pour l'instruction et le délassement de la plupart de la race humaine. L'accomplissement de cette tâche a crée une industrie qui dans son extension et ses ramifications n'a pas son égal.

Mais, vous ne vous êtes pas limité à cette invention ni à son élaboration. Un des premiers à vous occuper de la photographie en couleur, vous avez découvert un procédé d'une hardiesse en théorie et en pratique qui a pleinement merité l'accueil enthousiaste que la monde lui a accordé, vous êtes en train de perfectionner le cinéma stérioscopique avec des résultats aussi importants que surprenants.

La Royal Photographic Society est heureuse de s'associer avec ses collegues mondiaux a vous exprimer son admiration et sa reconnaissance pour tout ce que vous avez accompli dans le développement de notre science. Elle vous souhaite une continuation ininterrompue de vos recherches si chères à votre coeur.

Robt Chalmers Le President

H. H. Blacklock. Le Secretaire

Londres, 35, Russell Square, W.C.1.
Le 6 Novembre, 1935.

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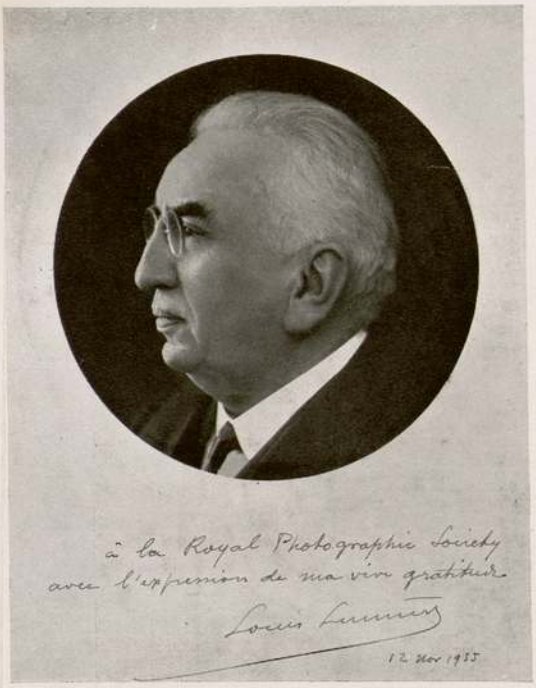
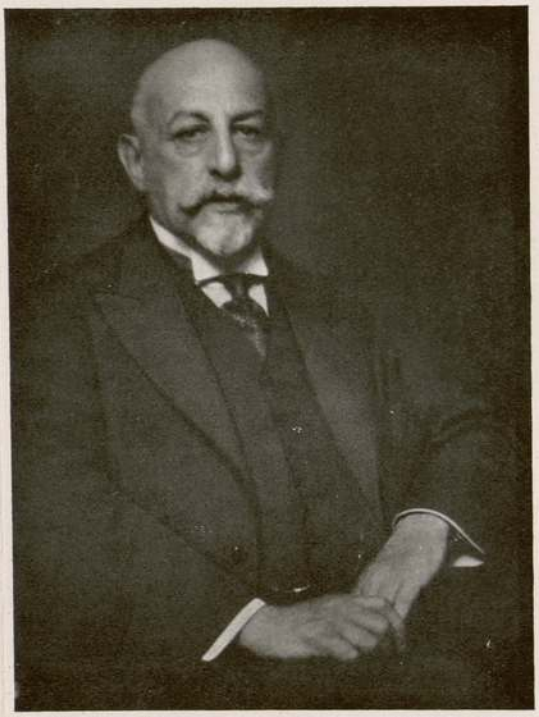
"An unforgettable evening, proving that the world is still capable of appreciating great work and great workers."



M. Louis Lumière



Sir Robert Mond, M.A., LL.D., F.R.S.Ed.

Photograph by Fayer, Vienna

The Society's Address

Monsieur Louis Lumière,

Cet admirable joujou le "Zoëtrope" a stimulé l'imagination de plusieurs de vos contemporains. Citons en quelques uns: Hannibal Goodwin, William Friese Greene, Thomas Edison, C. Francis Jenkins et Max Skladanowsky.

Inspiré par le Kinetoscope d'Edison vous avez envisagé avec votre esprit lucide les nécessités fondamentales pour créer l'illusion de la vie par une série de projections photographiques. Vous avez étudié à fond chaque dètail de la construction et vous avez rèussi à trouver pour le cinèmatographe une forme si perfectionnèe qu'au jour d'hui après quarante deux ans, nos appareils sont construits sur le même principe. Grâce à vous, nous nous servons de ce merveilleux instrument dans les soixante mille salles de cinèma éparses à travers le monde pour l'instruction et le delassement de la plupart de la race humaine. L'accomplissement de cette tâche a crée une industrie qui dans son extension et ses ramifications n'a pas son égal.

Mais, vous ne vous ètas pas limitè à cette invention, ni à son élaboration. Un des premiers à vous occuper de la photographie en couleur, vous avez dècouvert un procèdè d'une hardiesse en thèorie et en pratique qui a pleinement merité l'accueil enthusiaste qui la monde lui a accordé, vous étes en train de perfectionner le cinéma sterioscopique avec des résultats aussi importants que surprenants.

La Royal Photographic Society est heureuse de s'associer avec ses collegues mondiaux a vous expremer son admiration et sa reconnaissance pour tout ce que vous avez accompli dans le dèveloppement de notre science. Elle vous souhaite une continuation ininterrompue de vos recherches si chères à votre coeur.

(Signée) Robert Chalmers, Le President.
(Signée) H. H. Blacklock, Le Secretaire.

Londres, 35, *Russell Square, W.C.*1.
Le 6 *Novembre,* 1935.

TRANSLATION.

Monsieur Louis Lumière,

The imagination of several of your contemporaries was stimulated by that admirable toy, the Zoëtrope. Let us mention a few: Hannibal Goodwin, W. Friese Greene, Thomas Edison, C. Francis Jenkins and Max Skladanowsky.

Inspired by Edison's Kinetoscope, you, with your lucid intelligence, have discovered the fundamental principles for the creation of the illusion of movement by a series of photographic projections. You have studied each detail of construction and have succeeded in discovering for the kinematograph a form so perfect that after 42 *years our machines to-day are constructed on the same principle.*

[*Continued on p.* 675]

BADGER OLIVER G. PIKE, F.Z.S., M.B.O.U., F.R.P.S.

WILD LIFE IN BRITAIN'S WILDS

By Oliver G. Pike, F.Z.S., M.B.O.U., F.R.P.S.

THE second of the lantern lectures delivered during the 80th Annual International Exhibition of The Royal Photographic Society at 35, Russell Square, London, W.C., was delivered on September 20th, by Mr. Oliver Pike, whose subject was "Wild Life in Britain's Wilds." Mr. A. S. Newman, Fellow and Vice-President of the Society, presided, and, in introducing the lecturer, said that bird photography called for two important attributes; good photography and extreme patience. There was no doubt that Mr. Pike was the embodiment of both those attributes.

Mr. Oliver Pike, whose lecture was illustrated by some admirable lantern slides made from his own photographs taken direct from Nature and also coloured by him, likened the countryside at all seasons of the year to a vast theatre, the doors of which were ever open for those who cared to enter and view the wonderful scenes always on the stage. At times one experienced disappointment, though not with Nature. For instance, one day a friend and he sat with their fishing rods from 9 a.m. until 6 p.m. without capturing a single fish, an incident that was rendered more galling by the fact that at intervals throughout the day a beautiful kingfisher settled on a nearby branch and every time the bird dived it came up with a fish in its beak. An interesting point about the kingfisher was that, like all other fish-eating birds, it always swallowed its capture head first. The only time the bird held its prey with tail pointing towards its throat was when carrying the fish to feed its youngsters, because held in that way rather than crossways there was no resistance as the bird travelled through the air, and it was able to hand it to the young one head first. The female kingfisher was, said the lecturer, a clever little engineer in that when she built her nest she chose, generally, a gravel bank on the side of a lake or river. About five or six feet above the water she pecked out a small round hole, and this she continued to enlarge with her beak until her

Artisan in Light

Louis Lumière, Whose Method of Projecting Pictures Made the Cinema Possible, Is Now Perfecting the Three-Dimensional Movies

By Mallory Browne

Photo, A. Harlingue

MONSIEUR LOUIS LUMIERE IN HIS LABORATORY

"I VERY RARELY GO TO the movies, you know—almost never, in fact!"

Spoken by the man who played a large part in giving moving pictures to the world, these significant words, tinged with the barest touch of sadness, told the story of an inventor's disappointment at the way in which his invention has been utilized. There was no bitterness, no condemnation—just the slightest trace of regret that the world had not fully realized the possibilities of his own original ideal.

Louis Lumière might be called France's answer to the question: "What's in a name?" For "lumière," of course, means "light," and Louis Lumière is primarily an artisan of light, a pioneer in the field of photography.

Appropriately enough, he is to be found at Paris, the *ville lumière*—"city of light," not actually in the city, however: on its outskirts, in a villa-filled suburb. Viewed from the front, M. Lumière's villa resembles all the others. It has the same high iron fence topped with chestnut trees. But behind this screen of bourgeoise similarity there is a radical difference: instead of the traditional French flower and vegetable garden in the rear, M. Lumière's villa is backed by a large and businesslike red brick laboratory.

Here, in an office lined from top to bottom with books, he received me. Deep-set in a head of really heroic proportions, two twinkling eyes beamed at me like twin projectors. Irresistibly, I was reminded of America's "wizard of light," Thomas A. Edison. There was something intangibly similar about them—though possibly that something was but the effect of each of working constantly with the same medium—light.

"Edison invented the kinetoscope in 1894," M. Lumière explained in response to my request for a clarification of the part he himself played in the discovery and development of motion pictures; "but his machine was hardly more than a 'peep-show.' It made no use of projections. The originality of my cinematograph, in 1895—that is to say, the very next year—was to project moving pictures, for the first time, onto a screen where they could be seen simultaneously by an entire audience."

* * *

Thus, as M. Lumière recognizes, the motion picture is not the product of any single person; it is a combination of the efforts of many pioneers of photography whose labors continued throughout most of the nineteenth century. But it cannot be denied that, by perfecting the process of projection, M. Lumière contributed immeasurably toward the eventual crystallization of the cinema in its present form.

The essence of his invention, M. Lumière explained, was simply a device which permitted the film to pass before the beam of light, not continuously, as had been the case with the earlier kinetoscope, but in a series of imperceptible jerks—almost imperceptible, at least, for one recalls the jerkiness of the moving pictures many years ago! Progress has since increased the speed—the number per second—of these "stops and starts" to the point where the jerkiness has disappeared; the process, however, remains fundamentally the same as the system discovered by Louis Lumière back in 1895—40 years ago.

* * *

Light, however, is not simply the "black-and-white" thing it seems on the screen today. Light, the apparently white light of the sun, is in reality composed of all the colors we see in nature. A simple prism proves this by breaking the sun's rays up into the seven principal colors of the spectrum: violet, indigo, blue, green, yellow, orange and red.

So M. Lumière could not be expected to remain for long a simple draftsman in black and white—an etcher in projected light and shade. Almost immediately he turned his attention to painting in colors on the screen. By 1907 he had evolved the Lumière "autochrome" photographic plates, designed to permit natural color photography.

"Today," M. Lumière announced with just a bit of pardonable pride in his deep, mellow voice, "we are about to present to the world the perfected application of these color plates to motion pictures.

"Of course, there are countless so-called 'natural' color films being shown now. But you know as well as I do how far they are from being 'natural.' Here, look at this." Reaching into a drawer of his desk, M. Lumière took out a case containing a photographic negative and held it up to the window so that the light flooded through it onto a mirror.

I looked. It was a picture of a young woman clad in an unmistakably prewar dress, holding a pale blue parasol and standing in a field of green grass dotted with wild flowers, against a beautiful background of fruit trees in full bloom.

"I took that myself in 1908," M. Lumière at my elbow chuckled triumphantly as I gazed in obvious admiration. "Tell me, is or isn't it much more natural than some of the color films you see on the screen today?"

It was, and I said so. One could hardly imagine a more nearly accurate reproduction of natural colors.

"Well, then," continued M. Lumière, still chuckling with pleasure, "that is what we now have in store for the cinema. It was relatively easy to do this with ordinary photography; the difficulty was to speed up the process so that it could be used for motion pictures. For color photography has in the past required a much longer exposure than black-and-white photography—an exposure six or eight times as long.

"Now, however, we have perfected a process by which we can take pictures in the same virtually natural colors you see there, at the rate of 24 per second. The details, of course, are a commercial secret: but the essence of it is that the film is covered on one side with a thin layer of chemical, consisting of minute granules of orange, green and violet coloring matter, so small that there are 6000 or 8000 particles to the square millimeter. The picture is taken through this screen of colors, which acts as a sort of color filter."

Thus, M. Lumière—for the "we" he modestly referred to is the Société Lumière, of which he is the technical counselor—has now become a painter—not in oils but in chemicals. "Of course," he explains, "chemicals must always play their part—a very important part. That is why there can never be, in my opinion, any absolutely natural color photography, because color, after all, is a very personal thing for each one of us; while the cinema in colors must always be, not nature seen directly, but a 'translation' of nature through chemical processes."

Etcher in projected light-and-shade, painter in projected chemical color—what is left? Sculpture: and this is Louis Lumière's latest achievement — three-dimensional modeling in projected light, the cinema in relief.

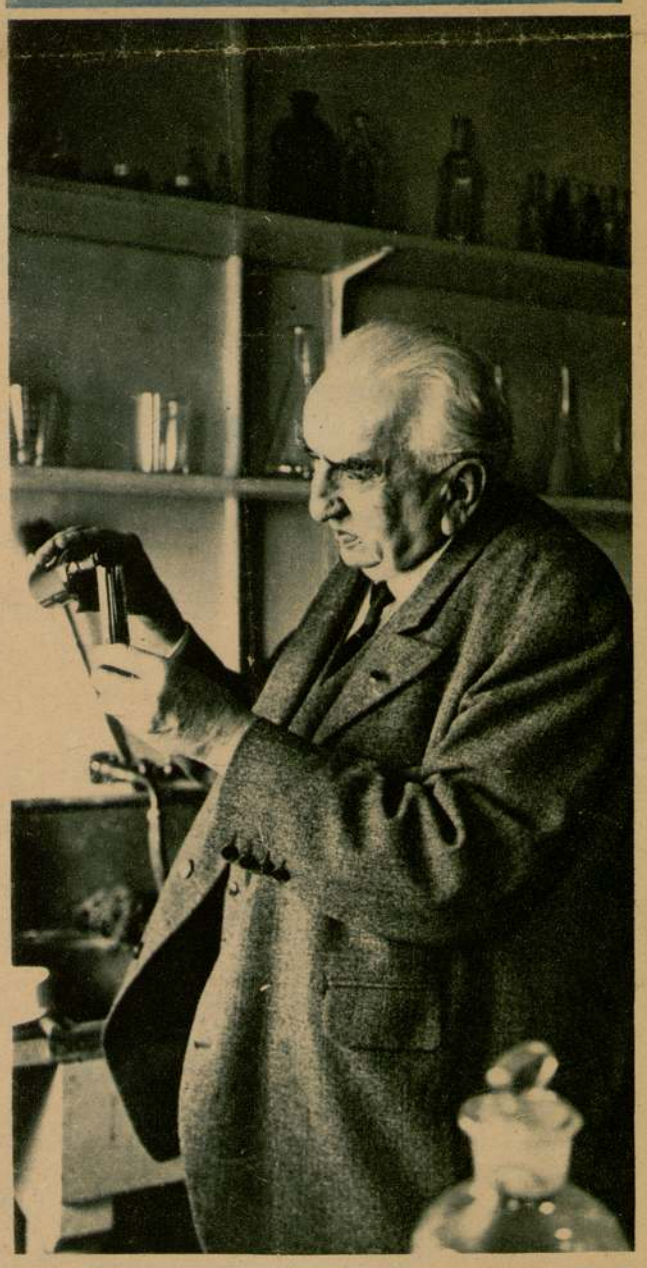
"With my stereoptical cinematograph, the screen finally disappears," M. Lumière says. "The actors are no longer seen flat against a silver sheet, but right in the room with the spectators."

"Stereoptical cinema"—these two words reveal the essence of M. Lumière's three-dimensional movies. For his invention is a development of the old stereoscope with its two colored windows—one red, one green—through which one regarded the juxtaposed green and red images which produced the impression of relief. But instead of the crudely unsatisfactory and uncomfortable red and green eyeglasses which had been used in previous experiments, M. Lumière has perfected an optically correct pair of spectacles with one lens a greenish yellow and the other bluish in tone. When the spectator regards the screen through these, a really startling effect of depth is obtained.

Of course, the spectacles are not all there is to it: M. Lumière had to devise and construct a special camera to photograph simultaneously on a special film two images instead of one; and likewise a special projector to throw them on the screen in just the right way. All this has been done, however, and the process has now been perfected to a point where its commercial exploitation is possible.

Furthermore, M. Lumière revealed that he has now taken a further step toward popularizing this sculptural cinema: he has dispensed with the spectacles. Not quite entirely, for they have in fact simply taken another form: that of a small rectangular screen, about six inches in width and four in height, fixed to the back of the seat in front of each spectator. Behind this screen the spectator may even move about with a certain measure of latitude, and the somewhat comic sight of an entire audience wearing colored spectacles is obviated. Within a few months, M. Lumière declared, the device will be installed in a number of motion-picture theaters in France, and the three-dimensional cinema will have become an actual fact.

Meanwhile, Louis Lumière is already at work in his "back-yard" laboratory on the next and logical step in the line of progress: he is seeking a way to combine sculpture and painting—to produce natural color motion pictures in perfect relief. He is, he admitted, already on the way toward such a realization. When it is perfected and placed in the hands of film producers everywhere, then it may be hoped that they will produce motion pictures that will take some of the disappointment out of the eyes of their inventor, and encourage him, and others, to go to the movies more frequently.



Photo, A. Harlingue

M. LUMIERE AT HIS EXPERIMENTS

The "Great Unpaid"

England's 10,000 Justices of the Peace, Chosen From Among the Most Respected Members of Every Community, Serve Without Salaries

By J. W. Robertson Scott

Editor, The Countryman

MORE THAN ONE AMERICAN FRIEND has asked me about our English seven-centuries-old unpaid magistracy system.

In London we have a number of police courts with paid magistrates. The same system also exists in provincial cities; but in the smaller towns and in the country districts our magistrates are all unpaid. There are in England somewhere about 18,000 of them—the "great unpaid," they have been called. These men have been appointed—the phrase is "added to the commission of the peace"—by the Lord Chancellor, who can appoint on his own motion but seldom does so. He almost invariably proceeds on the recommendation of the Lords Lieutenant of the counties.

The Lord Lieutenant—his appointment is a nonparty one—is himself aided by a small, more or less secret, advisory committee, in which usually at least one woman is included. This committee is chosen on a basis of equal representation of political and social views. Recommendations reach the advisory committee either direct to individual members or through the clerk of the peace. He is the legal officer of the Lord Lieutenant and of the chairman of quarter sessions and often at the same time clerk of the county council. Anyone is free to suggest a name, and recommendations are made no doubt on behalf of particular parties and interests.

* * *

The theory is, and a Royal Commission has expressly advised, that the benches of magistrates should represent different political views and all experiences of life. There has been during the last few years a considerable infusion of working-class magistrates and there are few benches now without one woman magistrate, whilst many benches have two or more.

The magistrates are appointed to their local bench, which may have jurisdiction over perhaps thirty parishes.

There may be a dozen or so of magistrates in a district or even two dozen. All, however, do not commonly sit. Some may be residing out of their county, some may be abroad, some may not be sufficiently interested. Until recently magistrates were appointed largely in respect of their territorial position. They consisted almost entirely of large landowners. An effort is now made to choose men primarily because they will be good magistrates. The qualifications are independence of mind, sound judgment and disinterestedness. In the County of Gloucestershire, on which I look out as I write, there are 52 women magistrates.

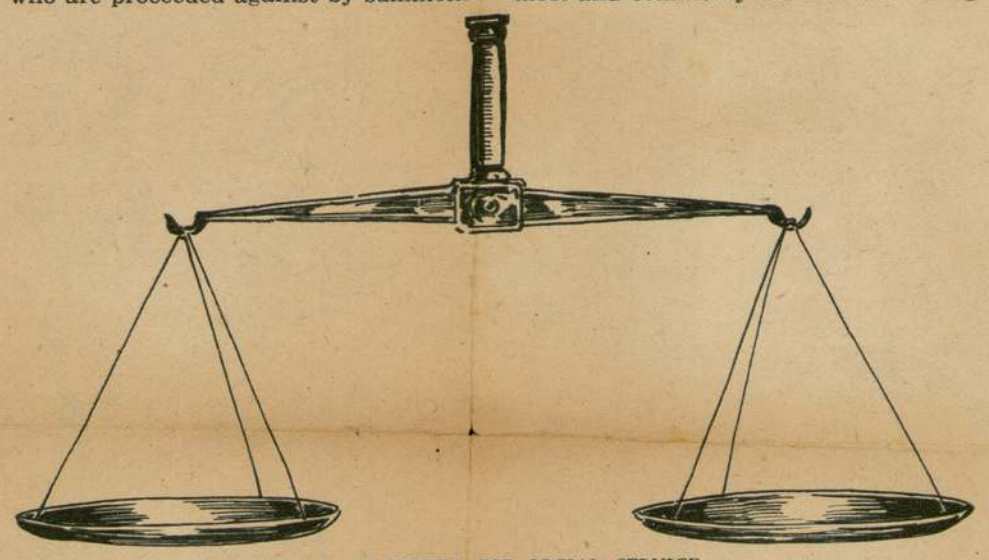
The local petty sessions may take place either weekly or fortnightly. Sometimes four or five or even six or seven magistrates turn up, but occasionally two or three only. Two is a quorum. There is a chairman, chosen annually, and one or more vice-chairmen. The usual practice is to appoint chairmen and vice-chairmen by seniority, according to the date of their appointment as magistrates.

* * *

The magistrates sit at a table which is sometimes horseshoe. They do not wear, of course, any gowns.

In front and within easy reach sits the clerk, who must be a solicitor or a man of some legal training. He is usually the most respected man in local practice. Only about 50 benches in the kingdom have whole-time clerks.

The defendants and prisoners are proceeded against and charged by the police, who outline the evidence. Then the witnesses tell their story. Finally the defendant or the prisoner, as the case may be, has the option of telling his story where he stands or of going into the box and testifying on oath, when he can be afterward cross-examined. Only persons who have been in custody are put in the dock. Persons who are proceeded against by summons are defendants, and stand in front of the dock.



AN OPPORTUNITY FOR SOCIAL SERVICE

Magistrates on the Local Benches in England, Together With Policemen and Police Superintendents, Clearly Take the Greatest Pains to Sift Out the Facts, Arrive at the Truth, and Decide Upon the Right Thing to Do, Always Giving the Benefit of the Doubt to the Accused. One Advantage of the Country Justices Is That They Know Something of the Environment and Circumstances of Persons Who Come Before the Bench.

The bench has power to inflict short terms of imprisonment in the county jail, but tries to avoid doing so whenever possible, imposing instead fines and costs. For minor offenses it is customary to bind over an accused in his own recognizances. He takes notice of the fact that, in the legal phrase, he owes "our Sovereign Lord the King the sum of Five Pounds, the same to be levied in default on his goods and chattels if he should fail to be of good behaviour" within a specified period, and to come up for trial if he should not have observed his undertaking.

Attached to each court is a man and woman probation officer, who also help at other courts. A young person may be bound over to report regularly to one of these officers and to carry out their instructions. Sometimes defendants, plaintiffs and prisoners have solicitors; rarely a barrister. He does not wear his wig. When it is a serious offense the accused is given the option of having the matter disposed of by the bench or being committed to quarter sessions or the assizes. Since I have been a magistrate I have never known a case in which a man has not preferred to be dealt with by the bench.

* * *

The great advantage of the country justices is that they know something of the environment and attitude of mind and general circumstances of the persons who come before the bench. Also the country J. P.'s cost nothing. Some years back country justices were often lampooned, but it is nowadays agreed that, on the whole, they ordinarily perform their duties with great care and common sense. There is no doubt that the benches are respected in the rural districts and that confidence is felt in their endeavor to be fair. It is rare that there is a scandal.

Each petty sessional court—erroneously called a police court—has attached to it a cell in which a prisoner may be detained for a day or two, but it is not often used.

Every kind of offender comes first before petty sessions—from one who has exceeded the speed limit to a murderer. In the case of serious offenses all that the magistrates have to do is to decide that a *prima facie* case is made out and commit the accused for trial at quarter sessions or the assizes.

Quarter sessions, which is also a venerable institution, meets, as its name implies, four times a year. Here the whole of the magistrates of the county are supposed to be the court. As a matter of fact, there is not room in court for more than 30 or so at the most and commonly the number taking part is a score or a dozen or so. Attendance is entirely at the discretion of the magistrates, who are presided over by an honorary chairman who has usually had some legal training. Occasionally, as in my own county of Oxfordshire, we have the good fortune to have residing in the county a judge of the High Court in London, and we seize upon him to be our chairman. At the assizes, when he goes on circuit, he is Lord Justice Roche, with wig and gown, and is addressed as "my lord" or, briefly, "m'lud"; when presiding at quarter sessions he is simply a local justice of the peace, is "the learned chairman," and is addressed as "sir" and not "your lordship"; in private life he is Sir Adair Roche, and is addressed as "Sir Adair."

* * *

Clerk and counsel (barristers—solicitors may not appear) wear wigs and gowns. The cases which have been too serious for petty sessions to try are divided, the less serious going to quarter sessions and the more serious to the assizes. There are quarter sessions in all county towns and assizes in most.

The first thing to be done after the accused pleads not guilty is for the jury to be sworn. As a matter of fact, quite a large proportion of prisoners plead guilty, and the impaneling of a jury is unnecessary. When a jury has found its verdict, the accused is called upon by the clerk of arraigns, as the clerk is named, and given the opportunity of saying if there is any reason why sentence should not be passed. The sentence is then considered by the chairman in consultation with his fellow J. P. colleagues. Usually the suggestion made by the chairman as to the penalty is accepted, because he has more experience than the other J. P.'s. Some chairmen are, of course, better than others. In my own county and in the next county there are two admirable chairmen, humane and wise, who take great pains to deal with offenders in a way which shall be of the utmost benefit to them and to the community.

Young people are frequently bound over to come up for judgment when called upon and placed for a period of, say, two years under the supervision of a probation officer. Young people who had evil companions or seem likely to take to criminal courses are committed to one of the Borstal institutions—there are now seven—for a specified period. The Borstals—there is one for girls—are arranged for different degrees of criminality. With regard to sentences, the tendency is to make them as short as possible compatible with giving the offender an opportunity of reconsidering himself and the best opportunity of turning over a new leaf. I have never myself been concerned in giving more than three years' penal servitude, and sentences are often for such periods as three, six or nine months. "Hard labor" is no different from ordinary imprisonment, except that the prisoner, unless excused by the doctor, sleeps for a fortnight without a mattress.

* * *

No doubt, many men come to petty sessions who are too old to sit on a bench, and there are many who do not read anything on penal reform, criminal psychology or the administration of justice. This point is frequently made; at the same time there is a steady improvement. No man is now appointed beyond a certain age, and in many counties the custom is to transfer a certain number of elderly magistrates to a "nonaffective list."

I do not know that some of the best qualities of the English people are not exhibited at petty and quarter sessions. You will often see policemen and police superintendents most obviously trying to be perfectly fair to the accused, and will certainly see magistrates taking great pains to sift the facts and to arrive at the truth and decide upon the right thing to do, always giving the benefit of the doubt to the accused.

It is assuredly a point in our favor that we are able to carry on our petty sessions and our quarter sessions with

(Continued on page 13)

Drawings by Dwight C. Sturges