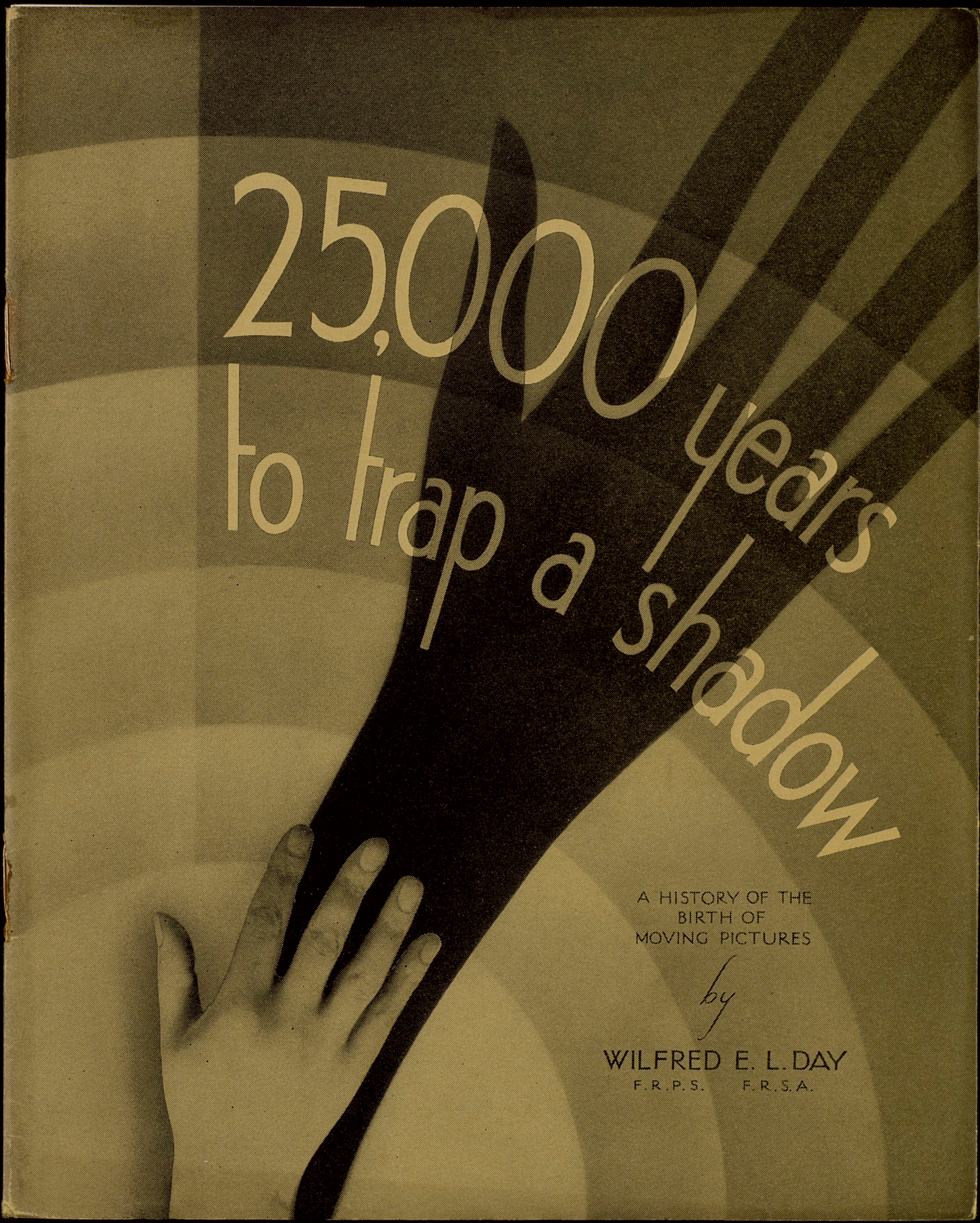


A HISTORY OF THE
BIRTH OF
MOVING PICTURES

by

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

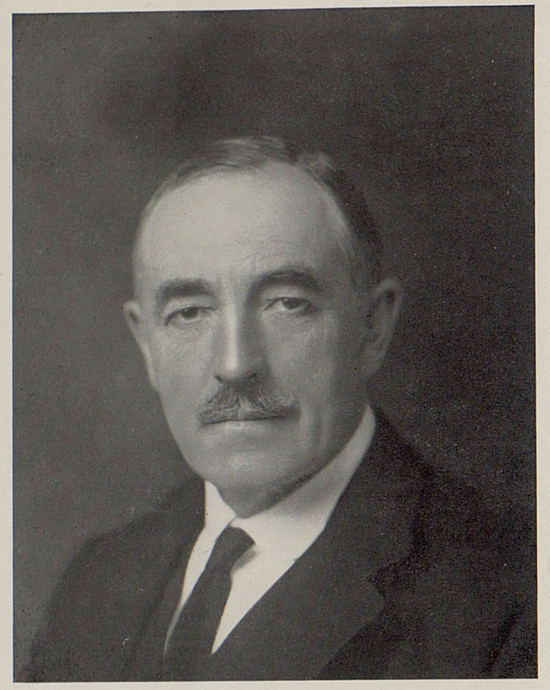
Announcing
the forthcoming
production of

"25,000 YEARS TO TRAP A SHADOW"

THE BIRTH AND
BIOGRAPHICAL HISTORY
OF MOVING PICTURES

BY

W. E. L. DAY
F.R.P.S., F.R.S.A.



"I know nobody better equipped to write the history of Kinematography than Mr. Will Day."

Sir Kynaston Studd.

The Polytechnic,
309, Regent Street,
London, W.1.
October 5th, 1933

When the history of the 20th century comes to be written there will have to be a wonderful chapter devoted to the growth and development of the cinema Among the great contributions made by science to everyday life, Kinematography will undoubtedly rank as one of the greatest. The subject is of particular interest to us at The Polytechnic, as it was at this Institution that the first public performance of moving pictures in London was held In the Polytechnic Magazine for February 26th, 1896, published just after the first performance, the following account appears :

> " This Cinematographe seems to be, practically, an adaptation "of Edison's Kinetoscope. It is, briefly, living photography, if this "term may be used, thrown on a screen in the same way as are "dissolving views by the oxy-hydrogen lantern. The effect is really "most wonderful. For instance, a photograph of a railway station "is shown, two or three seconds elapse, and a train steams into the "station and stops, the carriage doors open, the people get out, and "there is the usual hurrying and scurrying for a second or two, and "then again the train moves off. The whole thing is realistic, and is, "as a matter of fact, an actual photograph."

I know nobody better equipped to write the history of Kinematography than Mr. Will Day. Mr Day was taught lantern projection by his father at the early age of nine, and ever since has devoted a lifetime to pioneer work and research. The high position he has held throughout his life on the technical side of Kinematography will enable him to trace step by step the development of this fascinating art from its early origin and from 1896 to the present day.

J. E. K. Studd

DEDICATION

IN WRITING this book I have been in contact with the work and inventive genius displayed by those, who, through the ages, have added their quota to give the world the pleasure and enlightenment this generation has received from the science of Kinematography.

Therefore, to all those pioneers and veterans who paved the way for the huge industry that has since been brought into being, I sincerely dedicate this book, with the hope that sometimes a thought will be spared for those wonderful men that helped to achieve the marvels of portraying both sight and sound, enjoyed by the millions who attend the various entertainments throughout the wide world.

Many of these great minds have done their work and passed over, but there are still some left, who have not reaped any reward for their labour. May it be, that they will never be left to know the need of want.

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

November 1933

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INTRODUCTION BY THE AUTHOR

THERE have been many attempts by writers from time to time to give an outline of the various efforts of man, through the past, to portray movement. In most of these writings they record particulars of some of the principal inventions, but in no single instance has a complete survey of the historical facts been given. This led the author to endeavour to discover the genuine sources of all the various branches of the Science of Physics, leading up to their ultimate amalgamation to the climax of Kinematography.

Kinematography is not, as stated by most writers, the result of one man's single achievement. It is the resultant efforts of many scientific discoveries, through the known history of the human habitation of this globe.

The author has devoted over thirty years to the study of the portrayal of movement upon this earth, and during that period has visited many of the principal cities of the Continent, and examined the interesting objects contained in their museums and

similar institutions, besides amassing the most valuable collection of apparatus, books and films, connected with this subject ; a portion of which is at the present time to be seen in the Science Museum at South Kensington, London.
It has necessitated much research through various libraries to obtain the works giving particulars of the science of optics, and the quotations from the Ancients of their knowledge of this study. And more especially of the phenomena of persistence of vision, which is the basic principle of the portrayal of movement. Added to this, the author has many rare works in his own collection which have furnished the means to discover the truth of the formation and evolution of the several Sciences.
One of the great factors that has placed the author in a somewhat different position to other writers, is being in personal contact with the use of the optical lantern from childhood, and being actively connected with the Kinematograph industry from its inception. As a child the author was well versed in the mysteries of the optical lantern, and the manipulation of the wonderful mechanical lantern slides, by which it showed movement upon the screen, being tutored by his father, who was a very enthusiastic devotee to this form of home entertainment.
The Fantoscope and Zoetrope, and colour changing tops, were everyday playthings of his childhood also. It was, therefore, quite reasonable to expect, with the advent of Kinematography, that this subject at once attracted his attention. Many interesting evenings were spent in the company of a friend giving Kinematograph demonstrations with a projector made by R. W. Paul in 1896, which was eventually purchased by the author early in 1898, together with six films.
In 1899 an item in his programme of entertainment shows the combination of the gramophone and pictures, thus early endeavouring to combine sight and sound as a means of amusement.
Many of the early inventors and exploiters in the realms of moving pictures have been personally and intimately known to the author, who carefully recorded their work in conjunction with Kinematography during their lifetimes.
In the year 1926 the Royal Photographic Society of Great Britain issued an invitation to all those interested in the subject to meet the author, either in person or by proxy, to put forward any claims they might have to the invention of Kinematography.
Amongst the many that replied was a letter received from the late T. A. Edison, wherein he stated that he put forward no claim to being the first inventor of Kinematography.
There was also a letter from Herr Skladanowsky in Germany, who made several claims, but, as there was no evidence to substantiate these claims, it was impossible to admit them.
It was clearly proved upon that occasion that no prior patent existed before that of W. Friese-Greene, No. 10131, June 21st, 1889.
It has been a colossal task to trace this wonderful science through the ages, and it has also been difficult to know not so much what to include in this work, as what to omit, from the mass of records secured and still impart the necessary knowledge to give the reader the essential facts.
Commencing with the first records of the portrayal of movement in the shape of the trotting boar depicted on the walls of the cave at Altimira 25,000 years B.C., and noting through the ages the various records left on ivory and bone, sometimes in the shape of drawings and in other cases of sculptures and carvings, coming later to the Chinese era at a period about 5,000 years B.C., when figures cut from buffalo hide were shown in shadow form upon a screen of parchment, using the sunlight as an illuminant, thus giving moving shadow shows 5,000 years B.C.

The really clever men of the ancient school of philosphers were those who, without any works of reference, or anything but their own personal observations and investigations to guide them, laid the foundations for most of the branches of the Science of Physics as we know them to-day.
How Thales of Miletus, through rubbing a piece of amber on his garment, discovered electricity, which force ultimately gave us the necessary illuminant for exhibiting moving pictures ; the formation of glass by the fusing of nitrate and sand, discovered by some Phoenician traders in cooking their evening meal, which gave others the means to produce a lens, without which cameras could not secure their photographic records or projectors exhibit them.
The discovery of a lens, through a tear in the eye being perceived to enlarge an object, was brought about by the observance of one of this early school of philosphers, the application of which we see in the use made of this knowledge by Archimedes.
Persistence of vision had been studied and remarked upon by several students of the ancient Roman and Greek schools, and the writings of Lucretius, 65 B.C., make very clear the defined principles of this great phenomenon.
The wonders of the Camera Obscura were also observed by these early scientists, and are quoted in the records of their lives, but the first fully annotated effects of this forerunner of the modern camera are to be found in the writings of Leonardo da Vinci, who, in his work, Trattato-Dilla-Pittura, gives a full explanation of the phenomena concerning this optical marvel.
The invention of the optical lantern, or Magia Catoptrica, by Athanasius Kircher, and his mechanic Walgenstenius, gave another very necessary adjunct to the portrayal of movement upon the screen.
The actual formation for laying the basic principles for creating apparent moving figures, is to be found in the writings, after much deep study and investigation, by Dr. Peter Mark Roget, M.D., who, in 1824, gave his marvellous paper before the Royal Society, to which institution he acted in the capacity of Secretary.
It is sufficient proof of the value of these writings for both Dr. Plateau of Ghent, and Dr. Stampfer of Vienna, through the writings of Quetelet in his Quarterly Review, and also by correspondence in the author's collection, to acknowledge Dr. Peter Mark Roget, M.D. as the author who gave them the means to produce their first discs of moving figures in 1829.
The securing of an image upon a glass plate was first achieved by Tom Wedgewood, the son of Josiah Wedgewood, the great potter, with the aid of the Camera Obscura, although he died before he was able to fix the "Sun Pictures" he thus secured. A paper written by him upon this subject, printed for the Royal Society in 1802, at the instigation of his great friend, Sir Humphrey Davy, the inventor of the miner's safety lamp, leaves a permanent record of his work.
This was followed later by the work of Niecephore Niepce and Daguerre, with their single print bitumen process, but the man to give us the first really commercial form of photography was Fox-Talbot, of Laycock's Abbey in Wiltshire, England, who curiously enough, in his original application for a patent of his "Talbotype" process, claimed to be able to reproduce living figures by photographic means.
The invention of celluloid in 1854 was the work of Alexander Parkes, of Birmingham, England, and this was first clarified for use in a hand camera, in place of photographic glass plates, by Mr. Hyatt or New Jersey, U.S.A. in 1869, followed by J. Carbutt, of Philadelphia, U.S.A. in 1884.
In the year 1887, the Rev. Hannibal Goodwin, an American clergyman, patented a

process for clarified film in ribbon form, whilst in England, W. Friese-Greene, with the aid of Dr. Vragarra, at Thornton Heath, had produced sheets of clarified celluloid film from the raw dope he purchased from Mr. Maine of Birmingham, in July 1889, with which he secured his first Kinematograph pictures taken at that time.

Thus, in this short survey, we have seen how the necessary adjuncts to form Kinematography were brought into being, and from what simple origins the various phases of the Sciences were derived.

It now only remained for someone to amalgamate these great discoveries, and consolidate them into one concrete formation, to give the world the Science known as Kinematography.

Although many writers, each in their own country, put forward some single individual as being the true inventor, if the facts are carefully considered, there is no doubt whatever that the credit for this great achievement must be given to the first man who was granted a patent for the complete process of being able to secure upon a band of celluloid film, a perfect sequence of photographic images, taken in rapid succession by a sinlge camera, fitted with one lens, and taken from one point of view. This being the case, the credit can only be given to W. Friese-Greene, a native of Bristol, England, whose specification was lodged at the British Patent Office on June 21st, 1889, and his complete specification of March 13th, 1890, for which he was granted letters patent No. 10131. This is the first patent specification in the world to give full particulars for both taking and exhibiting moving pictures by photographic means, as we understand the term Kinematography at the present day. This Patent has been upheld in America, and all over the world, as the prior Patent for Kinematography.

The author, in all his lectures before some of the principal learned societies in England, has always made the specific line of demarcation of alluding to all portrayals of movement up till the time of Friese-Greene's Patent of 1889 as moving pictures, and from thence onwards as Kinematography.

It has been impossible to give, in the limited space of this present work, a complete and full record of all that has been done in the portrayal of movement, and the many valuable adjuncts to this great Science, but the author has ever borne in mind the fact, that to make this work readable to the masses, it would not have to consist of a mere stringing together of names and dates, but would have to be presented more in the form he has adopted, in giving as far as possible a little knowledge of the work and lives of the great pioneers and veterans that played their several parts, in bringing into being, and commercializing, one of the greatest inventions of all time.

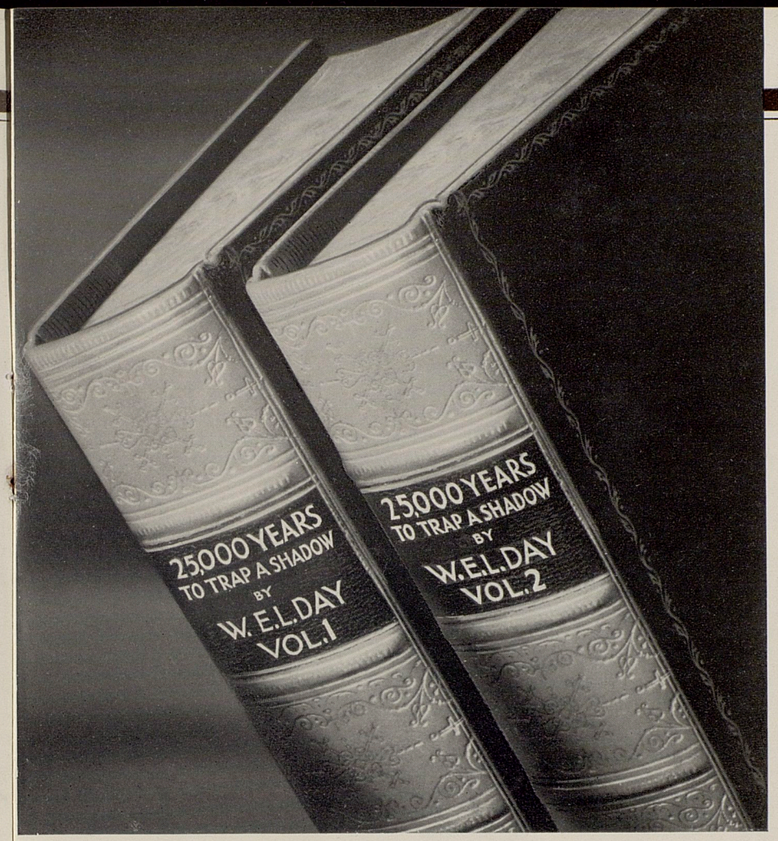
It is no idle boast to say that Kinematography has played a greater part in educating and enlightening the whole of the people of the world, no matter what their creed or country of origin may be, than any science that has preceded it. It was proved during the great European War, how men could be trained as soldiers by this means in three months, who had hitherto taken three years to acquire the same amount of learning.

The great future of this science does not, therefore, alone lie in the field of entertainment, but in the vast field of education. It cannot be a great while before the present prejudices are wiped away, and this wonderful means of learning adopted in every school and college throughout the habitable globe, with a system of interchange of subjects by the most eminent and learned professors from the world's universities and seats of learning, to the enlightenment and uplift of all.

London, 1933.

W. Day

FRPS. FRSA



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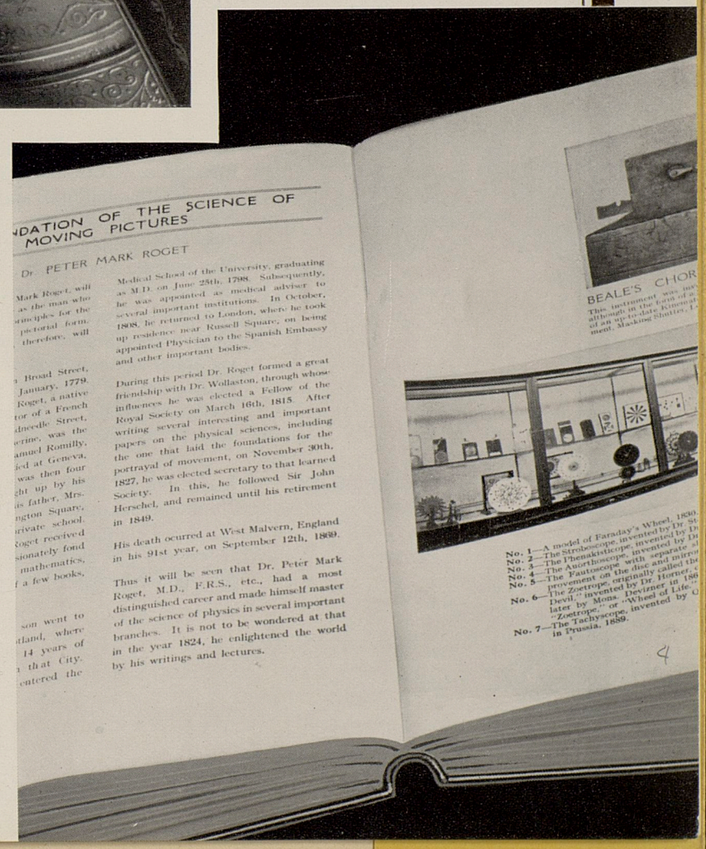

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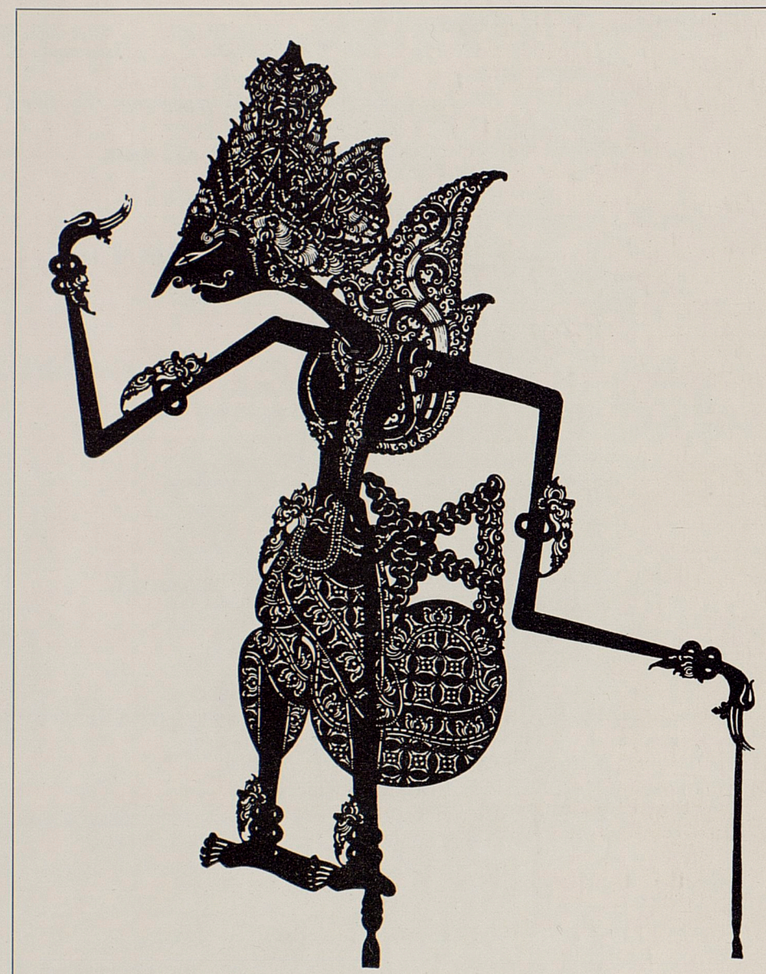
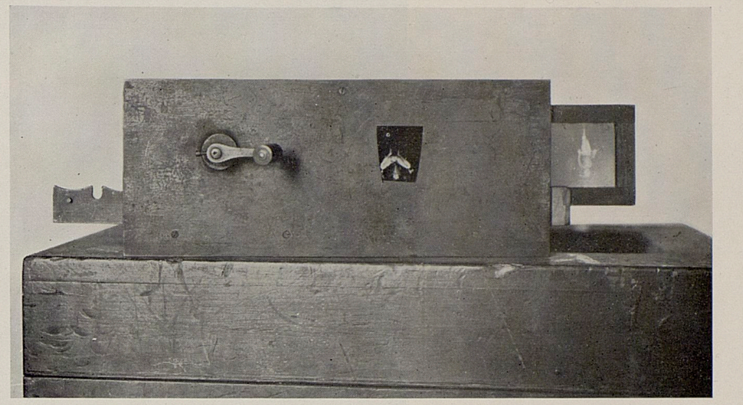
SOME OF THE UNIQUE AND INTERESTING ILLUSTRATIONS



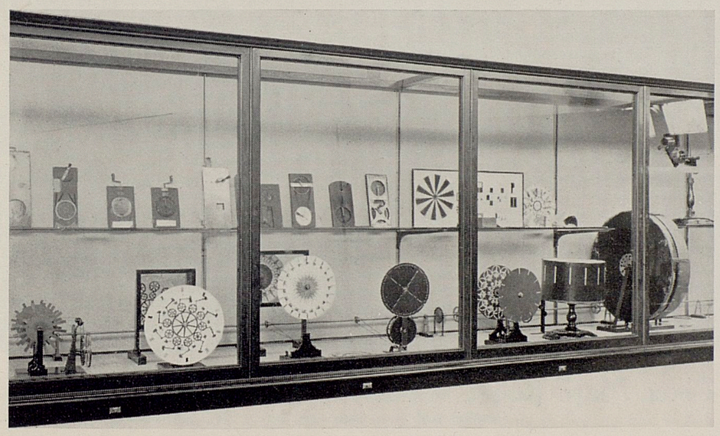
The Wayang Figures of Upper Java

These Figures are exactly similar to those used for the Ombres Chinois or Chinese Shadow Shows of 5,000 B.C. They are cut from Buffalo Hide and mounted upon Canes, being shown in shadow form upon a sheet of parchment; thus moving shadows were shown upon a screen, 5,000 B.C.



BEALE'S CHOREUTOSCOPE

This instrument was invented by Mr. Beale of Greenwich, in 1866, and although in the form of a lantern slide, it embodied all the principle elements of an up-to-date Kinematograph Projector, having a Cam and Locking Movement, Masking Shutter, Long figure Slide and was worked by a rotating handle.



A GROUP OF EARLY MOVING PICTURE MACHINES FROM THE AUTHOR'S COLLECTION IN THE SCIENCE MUSEUM, SOUTH KENSINGTON.

No. 1—A model of Faraday's Wheel, 1830.
No. 2—The Stroboscope, invented by Dr. Stampfer, of Vienna, 1830.
No. 3—The Phenakisticope, invented by Dr. Plateau, of Ghent, 1830.
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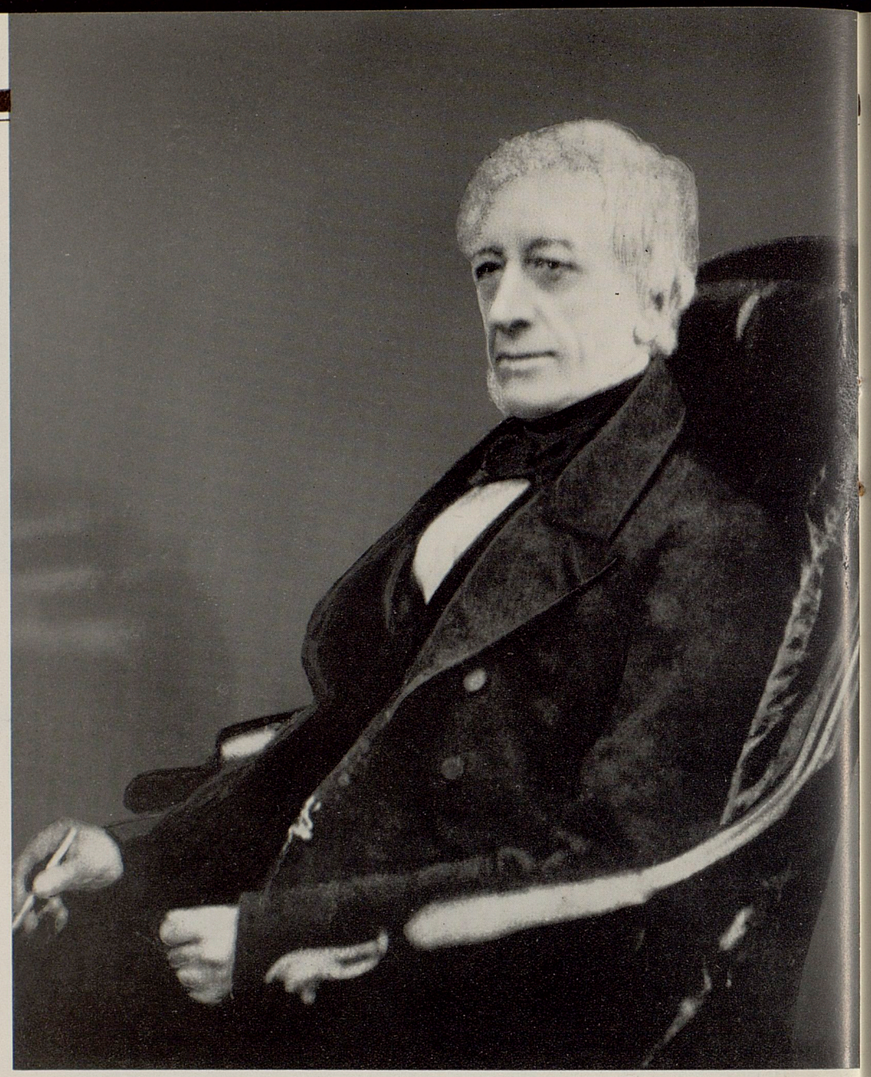


Dr. Peter Mark Roget, M.D., F.R.S.

THE FOUNDATION OF THE SCIENCE OF MOVING PICTURES

Dr. PETER MARK ROGET, M.D., F.R.S.

THE name of Dr. Peter Mark Roget, will stand out for all time as the man who laid down the basic principles for the portrayal of movement in pictorial form. A short review of his life, therefore, will prove interesting.

He was born in a house in Broad Street, Soho, London, on the 18th January, 1779. He was the only son of John Roget, a native of Geneva, who was the pastor of a French Protestant Church in Threadneedle Street, London. His mother, Catherine, was the only surviving sister of Sir Samuel Romilly, the great artist. His father died at Geneva, in 1783. Peter Mark Roget was then four years of age, and was brought up by his mother. After the death of his father, Mrs. Roget went to live at Kensington Square, at an establishment kept as a private school. It was here that young Roget received his early tuition. He was passionately fond of the study of science and mathematics, subjects which, with the aid of a few books, he pursued diligently.

In 1793, Mrs. Roget and her son went to reside at Edinburgh in Scotland, where young Roget, who was then 14 years of age, entered the University in that City. In 1795, two years later, he entered the Medical School of the University, graduating as M.D. on June 25th, 1798. Subsequently, he was appointed as medical adviser to several important institutions. In October, 1808, he returned to London, where he took up residence near Russell Square, on being appointed Physician to the Spanish Embassy and other important bodies.

During this period Dr. Roget formed a great friendship with Dr. Wollaston, through whose influences he was elected a Fellow of the Royal Society on March 16th, 1815, after writing several interesting and important papers on the physical sciences, including the one that laid the foundations for the portrayal of movement. On November 30th, 1827, he was elected secretary to that learned Society. In this position, he followed Sir John Herschel, and remained until his retirement in 1849.

His death ocurred at West Malvern, England in his 91st year, on September 12th, 1869.

Thus it will be seen that Dr. Peter Mark Roget, M.D., F.R.S., etc., had a most distinguished career and made himself master of the science of physics in several important branches. It is not to be wondered at, that in the year 1824, he enlightened the world by his writings and lectures.

Extract from the Philosophical Transactions of the Royal Society which published the paper given by Dr. Peter Mark Roget, M.D., F.R.S., on December 9th, 1824.

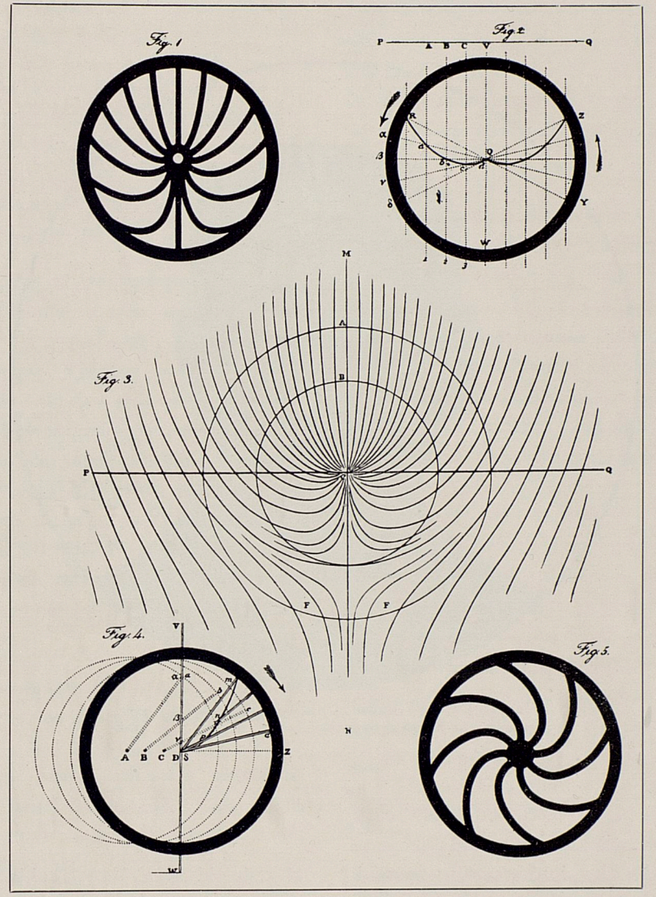
It was this paper which laid the foundations for the principle of Moving Pictures and was acknowledged by Dr. Plateau, of Ghent, and Dr. Stampfer, of Vienna, as the source from which they derived the information enabling them to produce the first Moving Picture Machines, the Phenakisticope and Stroboscope, 1830.

V. *Explanation of an optical deception in the appearance of the spokes of a wheel seen through vertical apertures.* By P. M. Roget, *M. D. F. R. S.*

Read December 9, 1824.

A curious optical deception takes place when a carriage wheel, rolling along the ground, is viewed through the intervals of a series of vertical bars, such as those of a palisade, or of a Venetian window-blind. Under these circumstances the spokes of the wheel, instead of appearing straight, as they would naturally do if no bars intervened, seem to have a considerable degree of curvature. The distinctness of this appearance is influenced by several circumstances presently to be noticed; but when every thing concurs to favour it, the illusion is irresistible, and, from the difficulty of detecting its real cause, is exceedingly striking.

The degree of curvature in each spoke varies according to the situation it occupies for the moment with respect to the perpendicular. The two spokes which arrive at the vertical position, above and below the axle, are seen of their natural shape, that is, without any curvature. Those on each side of the upper one appear slightly curved; those more remote, still more so; and the curvature of the spokes increases as we follow them downwards on each side till we arrive at the lowest spoke, which, like the first, again appears straight.



Dr. Peter Mark Roget's Diagram
of Wheel Phenomena

W. FRIESE-GREENE: AND HIS WONDERFUL INVENTION OF KINEMATOGRAPHY

1855 - 1921

WILLIAM FRIESE-GREENE, a native of Bristol, England as he was when he invented Kinematography in June 1889.

His Patent No. 10131, issued by the British Patent Office, June 21st, 1889, is the master patent for Kinematography and has been acknowledged by the American and other courts as the prior patent of the world.

ROMANCE—this word becomes possessed of peculiar significance when applied to the happenings of this man's life. It was undoubtedly represented to the full in the life of W. Friese-Greene. He was the real and true inventor of commercial kinematography. He was the first man to patent and publish his method for the use of celluloid as a photographic support for motion picture photography.

His struggles with almost insurmountable obstacles; his desire for knowledge and its application, were intense in the extreme. His striving to overcome the great and difficult problems with which his path was beset, was simply colossal. And in the end, his endeavours to find a solution to the mysteries of showing actual photographs moving upon a screen with lifelike motions were crowned with success.

The task this clever and highly scientific Englishman had set himself to accomplish was to take a series of photographs in rapid sequence upon a band of celluloid film, rendered transparent, using only one camera fitted with a single lens.

This application of photography had been claimed as possible in the original patent specification of Fox-Talbot, of Laycock's Abbey, Wiltshire, England as far back as the year 1840. It had also been suggested by others. But it had never been successfully carried into effect—nothing practical had been accomplished—with the exception of the short lengths of film produced by Dr. Marey and W. K. L. Dickson for Mr. Edison, until it was brought into being in a commercial sense by William Friese-Greene.

After some of the greatest troubles and trials that ever beset an inventor, all of which to record would fill several volumes, success was achieved. But as his life history is only one of many in this work, space will permit only of the principal episodes in his wonderful career being recorded.

W. Friese-Greene, was known amongst his intimate friends as *The British Edison*, a designation he had earned by the time he took out his first patents. These have since been successfully upheld the world over as the master patents of Kinematography.

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 Fantoscope, Zoetrope, and similar instruments — he was introduced to that clever scientific photographer and mechanic, J. A. R. Rudge, who lived at 1, New Bond Street Place, Bath. That was in 1881.

From him he learned much of the art of applying photography, and portraying movement by the optical lantern. And as we have already read in the chapters devoted to the life of this great man, Rudge did successfully exhibit a series of lantern slides upon glass plates, depicting a sequence of lifelike movements photographically recorded and shown upon a screen.

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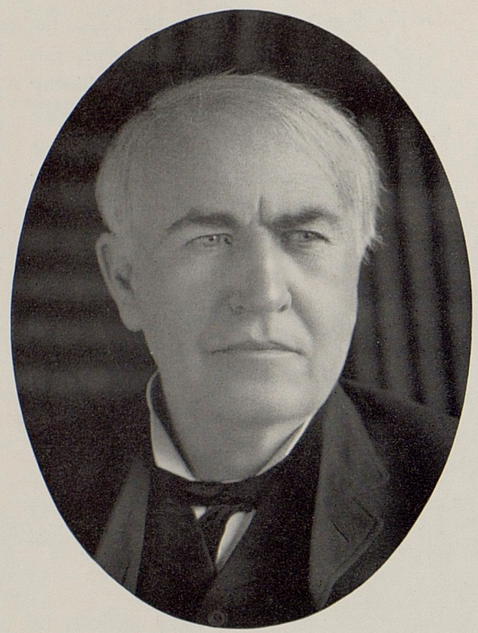


THOMAS ALVA EDISON

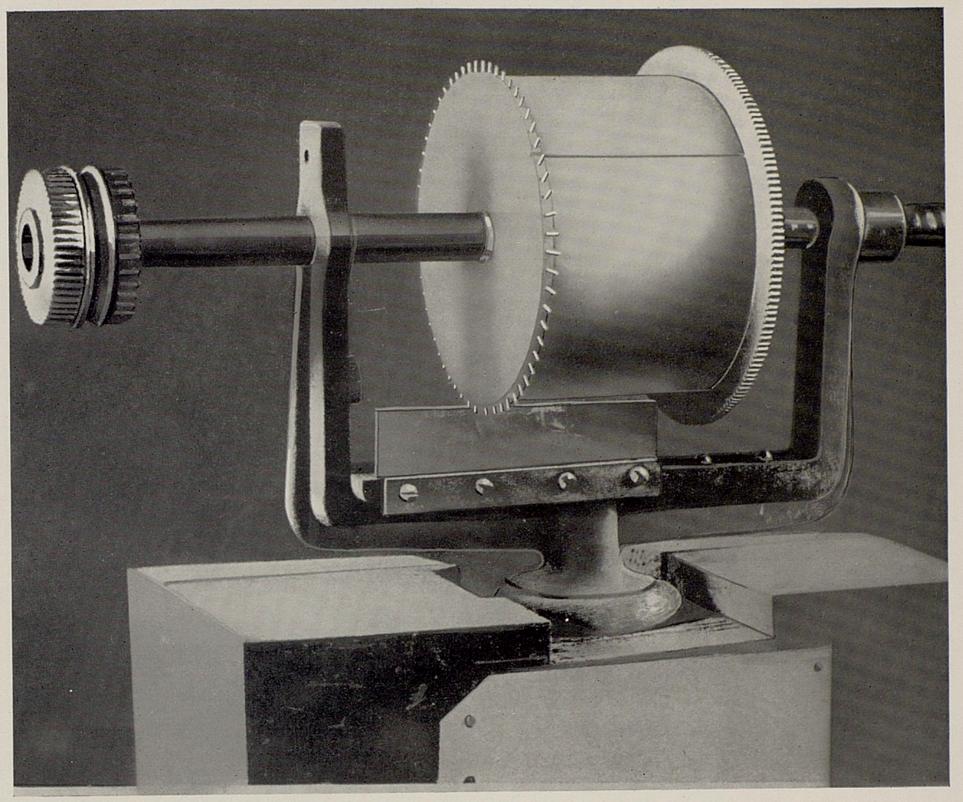
FILM: "SHOEING A HORSE"

FILM OF A SNEEZE

By Mr. OTT

upon receipt of this film Edison turned to Dickson with the remark "that having now got the correct medium, there was only one thing to do, concentrate and work until success was achieved." Dickson and his assistant at once got busy and started making pictures in a black tunnel shed put up as a lean-to building against the main experimental laboratory where Edison and Dickson had carried out their clever invention of ore milling machinery, using for negative work the thinner and earlier product, the first experiments with which produced a certain frilling, as shown in the first experimental film of "Shoeing a Horse," taken in May, 1889. This date, it will be noted, was prior to Greene's patent, although it must be noted that Greene had also produced a film before he applied for his patent.

It was about this period, in the midsummer of 1889, that W. Friese-Greene acquired his original British patent for kinematography, No. 10131, the date of application being June 21st, 1889, and the acceptance May 10th, 1890. At the latter part of July, Mr. T. A. Edison conceived the idea of making a journey to Europe to overlook personally his various interests, which had by then assumed large proportions, and as there was a great International Exhibition being held in Paris, where a large exhibit of his own works was being displayed in the Hall of Industrial Arts, what was more natural than he should resolve upon paying a visit to that wonderful display of craftsmanship and learning? It was on August 3rd, 1889, that Edison embarked on board the steamer at New York, being accompanied to the landing stage by Mr. Dickson, and as the boat left the dock Edison stood upon the deck and pantomimed to Dickson, as if he were gazing into a peep show Kinetoscope, and interpreted by Dickson to imply that he was to get a hustle on and finish the invention. During his stay in Paris, Edison made the personal acquaintance of Professor Marey, who extended to him a cordial invitation to witness a display of his recording of movement, which he lost no time in accepting, and witnessed upon that occasion a wonderful display of movement given by Marey's clever technical assistant, Georges Demeney, as depicted on the Stereo-Zootrope and also his Chrono-Photography. Edison was agreeably suprised to witness the evolutions of various gymnasts, the flight of birds, the various movements of animals, insects, etc., which Marey took great delight in showing him, these results being recorded upon a band of stout celluloid film about 15 feet in length, and it must have been a revelation to Edison to find that Marey had already discovered and used a somewhat similar substance to that he had left in the hands of his capable assistant Dickson, but not



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.