



GRAFLEX Journal

SHARING INFORMATION ABOUT GRAFLEX AND THEIR CAMERAS

ISSUE 1 2023

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THE LAST NATURALISTS' GRAFLEX EVER MADE

By Thomas Evans

The Naturalists' Graflex was introduced in 1907 and was produced until 1921. The 1907 Graflex catalog described the concept behind this unusual design very well:

"The Naturalists' Graflex Camera is designed especially for naturalists' work in photographing birds, wild animals, or similar subjects where long-focus or telephoto lenses are required. The camera in general design and construction is similar to the regular Auto Graflex, but the increased length of the camera accommodates much longer side arms. These arms are made of heavy brass, giving a liberal extension, yet maintaining absolute rigidity. The focus is obtained by reflection on the upper mirror and enables the operator to conceal himself behind a stone or log and focus from the rear of the camera without exposing too much of his person, as would be the case in using the ordinary type of Graflex Camera.

The Naturalists' Graflex will accommodate lenses of from 12¾ to 26 inches equivalent focus and is fitted with the regular Graflex Focal Plane Shutter."

The camera without lens, including one double plate holder was priced at \$190.00. The camera with the Bausch & Lomb Zeiss Protar lens, Series VII a, No.19, f6.3, was twice as expensive, priced at \$378.50. This Double-Protar lens had a focal length of 13¼-inches (336.5mm) and was a combination of two 'Protarlinse' of 23⅞-inches (590.5mm) each. The Protar lenses were designed to be used in combination, at f/6.3, or each component could be used singly, usually at about f/12.5. And so, this lens could be used at either 13⅞-inch or 23⅞-inch focal length. Zeiss, and Bausch & Lomb under contract, made Protar lenses in several focal lengths, and, in theory, some different Protarlinse and combinations could be used with this camera.

The 1920 Bausch & Lomb catalog said this about their Protar VII a lenses:

"The series VII a lens has satisfactorily solved the problem of variety and convenience; for composed as it is of two series VII single Anastigmats, the doublet resulting from the combined components is simply perfection in all the qualities desired in a photographic lens."

As single Anastigmats, the Series VII lenses have a distinct field of their own. They are perfect single lenses, having a speed of F:12.5, which is ample for instantaneous exposures out of doors under favorable light conditions. So perfect are the spherical and astigmatic corrections as to make the single lens almost equal to the doublet, and not only equal, but actually superior to many doublet lenses of other makers..."

In the 1908 catalog, the Naturalists' Graflex had a new feature: the view finder could be rotated from horizontal to vertical, to allow focusing from the ordinary Graflex position.

The Folmer & Schwing Division offered to fit the customer's own lens to their cameras. Mike Hanemann, in his first-quarter 2001 [Graflex Historic Quarterly](#) article, described a Naturalists' Graflex that had been fitted with an f:5.6, 20-inch Taylor Telephoto lens, and due to the quality of the workmanship, he thought that it must have been done by the factory. The modification involved cutting away the top of the lens box to make room for the lens and to allow access to adjust the lens aperture.

Frank M. Chapman

Frank Chapman, ornithologist and Bird Curator at the American Museum of Natural History, New York City, was an early user of the Naturalists' Graflex. A Graflex catalog entry for the Naturalists' Graflex added that he used and recommended this Graflex camera. Mr. Chapman may

have been a significant inspiration for the design of this camera. In his 1903 book, Bird Studies with a Camera, he described his ideal apparatus for making photographs of birds, which would be a 4x5-inch 'reflecting' camera, with "... a mirror, set at an angle of forty-five degrees to the plate, is interposed between the latter and the lens, and reflects the image to a ground glass on top of the camera... The mirror, when released, should automatically release a focal plane shutter. Mr. Chapman also recommended that the bird photographer use a convertible Zeiss Anastigmat (Protar), Series VII a lens, in order to have at hand both a fairly fast normal lens and a lens of about twice the focal length when a single component lens was used. The Naturalists' Graflex appears to have been designed to make the best use of the B&L Convertible Protar No. 19, as it accommodates both the combined focal length of 13¼-inch and the single element focal length of 23¼-inch, which are very close to the minimum and maximum focal lengths that can be used with this camera.

In his 1933 Autobiography of a Bird Lover, Mr. Chapman reflected on his early experiments at bird photography: "There were no reflecting or Graflex cameras available for our work in Florida, and the naturalist photographer was handicapped by the lack of a camera carrying a long-focus lens with which, without pausing to insert a plate, he could make an exposure at the moment of focus." The camera that he first tried was made for him by John Rowley who worked with him at the museum, which was a 5x7-inch twin-lens-reflex camera, which he described as cumbersome but practical. I suspect that a Naturalists' Graflex, as large as they were, would seem quite trim and nimble in comparison to this camera.

Frank Chapman was the editor of the Bird Lore Magazine, published under the auspices of the National Association of Audubon Societies, and in the March - April 1908 issue, he included a recommendation for the Naturalists' Graflex, quoting substantially from the Graflex catalog. This prominent recommendation may have been sought-after by Folmer & Schwing and must have been much appreciated by the company. As a possible measure of Mr. Chapman's influence, he was an associate of then President Theodore Roosevelt, and the Naturalists' Graflex page from the 1908 catalog is among Mr. Roosevelt's papers. His son, Kermit Roosevelt, later carried a Naturalists' Graflex on safari in Africa, in article from the Graflex Journal, Issue 2, 2016."

focal length of eight inches, the component lenses having each a focal length of fourteen inches. Although these single lenses are rated with a speed of only F. 12.5, I have found no difficulty in making satisfactory pictures of birds in flight with an exposure one-thousandth of a second, the lens being wide open. ... if one can afford a No. 19 lens of the same series with a focal length of thirteen and one-eighth inch focus, the components being each of twenty-three and one-eighth inch focus, he will materially increase his chances of success..." In this book, he mentions using the 23-inch Protar single component lens for photographing birds at greater than 50 yards.

Arthur Radclyffe Dugmore

A. Radclyffe Dugmore was another prominent photographer of birds and wildlife who may have had some influence on the design of the Naturalists' Graflex. As early as 1902, the year that the very first Graflex camera was introduced, he had praise for the camera: "... The Graflex, which, though expensive, is about all that can be wished for. Being strongly made, it will withstand the rough usage incidental to natural-history photography. Its long draw of bellows allows the use of a twelve-inch lens, and for objects up to within about ten feet distant a six-inch lens with hand-camera telephoto attachment can be used. ... A bird may be caught on the wing with as much ease and certainty as if it were mounted."

He goes on to describe his preference in lenses: "The most useful lens for all-round work is one whose two systems or combinations can be used separately. By having such a lens, you have practically two in one, the single combination having about double the focal length of the couplet."

In a latter book, Mr. Dugmore says: "The reflex camera should be so arranged that the focusing hood admits of use from above and from the back. The advantage of this is that it allows the camera to be held level with the eyes so that the immediate foreground is not shown in the picture. When you are in a canoe you can operate this camera with greater freedom and safety as it will not be necessary to stand up or even to kneel in order to clear the adjacent water or the canoe bow which so often obtrudes itself in such pictures."

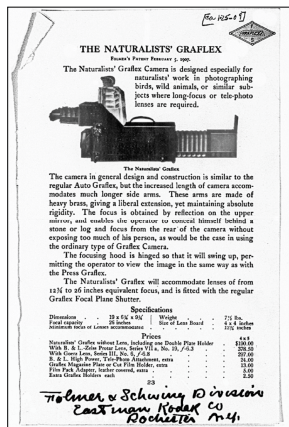
I don't know how closely Mr. William Folmer read such books and magazines by naturalist photographers, looking for ideas, but if he did, the desires of these photographers were there to find and inspire his designs.

Production

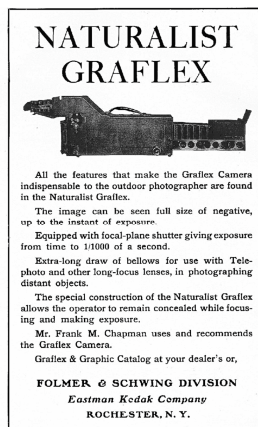
Despite its wonderful design and promotion, it appears that the total number of Naturalists' Graflex cameras made would be less than 200. There is no existing record of the cameras made from 1907 to 1914, but the existing records do show that 61 4x5-inch Naturalists' Graflex cameras, and one 5x7-inch model, were made from 1915 to 1921. If the rate of about nine cameras per year had been held in the first eight years of production, then that would bring the total to about 130 cameras, but there is really no way to know for sure.

Naturalists' Graflex production orders from the extant serial number book: [61: 4x5" and 1: 5x7"]

Lot	Amt.	Camera	Serial numbers	Location
6671	18	4x5 Naturalists' Graflex Cameras	56760 - 56977	[sheet 4, .1915]
6677	18	4x5 Naturalists' Graflex Cameras	76988 - 77005	[sheet 5]
5801	1	5x7 Naturalists' Graflex Camera	111700	[sheet 17]
6845	12	4x5 Naturalists' Graflex Cameras	111751 - 111762	[1920 - 1921]
6845	13	4x5 Naturalists' Graflex Cameras	111787 - 111799	[1920 - 1921]



ists' Graflex page from Roosevelt's papers. Ad for the
ists' Graflex in Bird Lore Magazine.



Naturalist-Naturalist

In the introduction of Mr. Chapman's 1908 book, Camps and Cruises of an Ornithologist, he described his photographic outfit: "I still use a reflecting camera of the 'Graflex' type, and also a tripod camera ... a Bausch & Lomb Convertible Series VII a No. 10, F. 6.3, with a

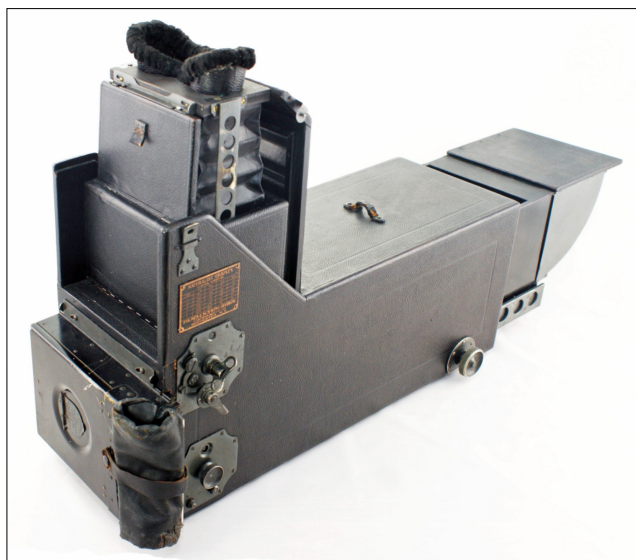
According to Al Benham's article: "Rural Life Photographer," in the Graflex Journal, Issue 1, 2017, his grandfather, John Calvin Allen, had the 5x7-inch Naturalists'

Graflex, 111700, made-to-order to photograph individual beef animals where a long-focus lens must be used to avoid distortion. J. C. Allen wrote of this camera: "The camera will accommodate a 23-inch lens and is focused through a reflector, so the animal is seen on the ground glass until the exposure is made. This is quite an advantage with restless animals, especially in fly time." Mr. Allen had a rural photographic business in Indiana, as well as running his own farm, and working for a while for Purdue University.

Assuming that the existing production orders were accurate, then the Naturalists' Graflex camera that I have, number 111799, was the last one ever made.



Naturalists' Graflex showing the view finder in horizontal position.



Naturalists' Graflex showing the view finder in vertical position.



Bausch & Lomb f:6.8, 24-inch, Telestigmat lens.

The camera arrived with some damage, but in overall very good condition. The slide that holds the lens in place on the front standard had come loose, the screws had pulled out, and this heavy lens had apparently banged around in the lens box, splitting the wooden sides of the box. This was fairly easy to repair, and once the focal plane shutter had been lubricated and exercised a bit, the camera works well. The lens is not the B&L Zeiss Protar VII a No.19 but is instead a Bausch & Lomb 24-inch, f:6.8 Telestigmat. It is a large piece of glass, weighing 4 pounds. The lensboard is a hefty 3/8th-inch thick, with no step around the edges, and is just under 4½" square.

The 1917 Graflex catalog still lists the Protar VII a No. 19 lens for the Naturalists' Graflex, but the 1919 catalog lists this 24-inch Telestigmat in its stead. Carl Zeiss Optical Works and Bausch & Lomb had entered into a collaboration in the 1890s under which B&L was licensed to produce lenses according to the Zeiss optical designs, but this corporate alliance ended during World War I. The Telestigmat is marked "Pat. Oct. 24, 1918," and so was developed during World War I, apparently to be used for aerial reconnaissance. As B&L was no longer under license to Zeiss to make the Protar lenses, a new lens was needed, and the Telestigmat would have been an appropriate and readily available substitute.

In his book *Flight, Action, Camera*, Douglas E. Campbell mentions that in September 1921, the U. S. Navy conducted tests of the 24-inch B&L Telestigmat for use in aerial mapping. Curiously, the Navy concluded that this 24-inch lens did not adequately cover the 4x5-inch format. Later, during World War II and into the 1950s, the U. S. Military did use a B&L 40-inch, f:8 Telestigmat, for aerial reconnaissance, and to photograph nuclear tests.



A second mirror reflects the ground glass image to the view finder when used in the horizontal position.

Using The Naturalists' Graflex

The Naturalists' Graflex does not have a revolving back, and the film is held in the landscape position. The view finder stores away compactly when not in use and can be used from the rear as well as from the top. When used in the horizontal position, a second 45-degree mirror reflects the image from the ground glass back

through the view finder. The main body of the camera is seven inches tall by seven inches wide, including the shutter controls, and eighteen inches long. The view finder at the rear of the camera brings the height to twelve inches, and when opened for viewing, it reaches sixteen inches tall, when vertical. The view finder adds eight inches to the length when horizontal, reaching twenty-six inches. So, the camera is roughly three times the length of the standard 4x5-inch Auto Graflex, or about twice the length of the RB Auto Graflex. When the 24-inch Telestigmat is focused at infinity, because it is a telephoto lens, it needs to be extended only three inches beyond the front of the camera, and at this focus, the camera is well balanced and easy to use hand-held. However, as one focuses on nearer subjects, the camera becomes quite front-heavy. The camera without the lens weighs eleven pounds, and with the 24-inch Telestigmat, it is fifteen pounds. When the bellows is fully extended, the camera will focus on a subject at nine and one-half feet, but the camera is then thirty-one inches long, not counting the view finder if horizontal. At this closest focus, the camera is unwieldy hand-held, and it is a challenge to use even on a sturdy tripod. Used on a heavy tripod, this closest focus produces an image on the film that covers an area one foot wide.

Conclusion

The Naturalists' Graflex is an extraordinary and fascinating camera. It was designed in 1907 with the special needs of the then pioneer naturalist photographer in mind. That is, the field-going photographer needed a portable, hand-held camera that would be self-contained and yet versatile enough to not only allow up-to-the-moment-of-exposure focusing, full image viewing on a ground glass, and shutter speeds of up to 1/1000th-second to catch quick movement, but which would also accommodate telephoto and long-focus lenses so that the photographer could secure detailed images of birds and other wildlife, or similarly unapproachable subjects, from a distance. The long-focus lenses also proved to be useful for producing distortion-free images such as were valuable for scientists and commercial photographers. This camera foreshadowed the development of later long-focus cameras such as the Big Bertha.

Being a large and somewhat unwieldy and expensive camera, probably kept it from being more widely appreciated, but it was well designed for the narrow purpose for which it was intended. Sales were never high, and this plus the loss of the ability of Bausch and Lomb to continue to manufacture the Protar Ser. VII a lenses, for which the camera appears to have been designed, probably led to the camera being discontinued.

Today, a hundred years after the Naturalists' Graflex was discontinued, it is hard to imagine hauling so much camera around while on safari, exploring the swamps of Florida, mountain climbing, or just walking down to the local park. The quality and unimaginable quantity of telephoto and zoom lenses now available for small cameras that produce high resolution images at the touch of a button have removed the need for packing such a large camera, but they have not removed the fascination.



U.S. Army Signal Corps during WWI with a Naturalists' Graflex among other cameras, courtesy of De Miollis Laurent.

Bausch & Lomb Optical Company, 1920 Photographic Lenses (Pages 37, 58).

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Graflex and Graphic Cameras, 1907. Folmer & Schwing Co. Rochester New York.

Graflex and Graphic Cameras, 1917. Folmer & Schwing Department, Eastman Kodak Co. Rochester New York.

Graflex and Graphic Cameras, 1919. Folmer & Schwing Department, Eastman Kodak Co. Rochester New York.

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Tuttle, Ronn 2015. "Two Naturalists' Cameras." Graflex Journal, Issue 3, 2015. (Page 1) Available here: <https://journal.graflex.org/journal-2015-03.pdf>

Wikipedia Frank Chapman, Ornithologist [https://en.wikipedia.org/wiki/Frank_Chapman_\(ornithologist\)](https://en.wikipedia.org/wiki/Frank_Chapman_(ornithologist))

Wilson's Photographic Magazine, 1913, Volume 50, page 316



Courtesy George Eastman Museum (<https://www.eastman.org>). Kodak group photo ca. 1910. Size 24.3 x 179 cm. Notably, George Eastman is pictured (with a star on his lapel), and William Folmer appears twice as a “double ender,” due to the slow rotation of the camera.

THE CIRKUT CAMERA

By Ken Metcalf

Before the article about the George Eastman Museum’s important and rare acquisition, I needed to update myself on Cirkut cameras. Here are some things I found.

For a straightforward definition of the Cirkut camera, here is how it was described in the 1905 Rochester Panoramic Camera Co. brochure.

The Cirkut is a panoramic camera constructed on lines *radically* different from any other on the market, being a *revolving* camera containing a relatively *stationary* lens and a relatively *moving* film, the latter moving past a vertical slot through which the exposure is made and the axis of the camera being at any desirable point *between* the lens and the film.

This construction readily distinguishes it from the panorama camera, having the *swinging* lens and *stationary* film arranged in semicircular form, which, in addition to being limited to an angle of, less than 180°, is in its practical form of *short* and *fixed* focus, and produces a negative showing *great* distortion.

According to Cirkut collector and panorama historian Bill McBride¹, “Panoramic cameras have been produced for at least 150 years. Most of the cameras produced an image of at least 110 degrees wide, and many take a picture of 360 degrees, a full circle. The writer has researched hundreds of United States patents of photographic items, like a folding panoramic camera, panoramic attachments, etc., that the inventor was apparently not able to sell to a manufacturer. Many inventors patented their devices with the intention of getting wealthy. They usually wound up being the only user of their own invention, and that would be the end of it.” Mr. McBride’s “most recent” and interesting patents started with:

1887 - J.R. Cannon, a Canadian, patented a simple cyclo-ramic camera fitted with a lens of fixed focus.

1890 - Jules Dames, of Paris, built the Cyclographe camera which could make a 360-degree picture (8.5cm x 80cm) on a key wind clockwork driven mechanism.

1895 - Scovill Panoramic Camera made by Scovill & Adams Co, was equipped with a swinging lens.

1899 - No. 4 Kodak Panorama Camera made by Eastman Kodak Co., used 103 film and had a 142-degree field of view with a 3½" x 12" photograph.



Cirkut cameras were sold by Rochester Panoramic Camera Company, the Century Camera Company of Rochester, N.Y., Divisions of Eastman Kodak. Here is a chart of the various models and their features.

MODEL	No. 10	No. 16	Panoramic	No. 5	No. 6 & No.8	No. 6
TYPE	Camera 6 models **	Camera (2 types)**	Attachment*	Camera	Outfits *** With attachments.	Camera
INTRODUCED BY	Rochester Panoramic Camera Co.	Rochester Panoramic Camera Co.	Century Camera Co.	Folmer & Schwing Div. of the EKC	Century Camera Co.	Folmer Graflex Corp.
YEAR INTRODUCED	1904	1904 RPCC 1908 Div. of EKC	Ca. 1907	1915 Described 1916 priced	1907	1932
CAMERA FORMAT	Various	Various	5x7" Century camera	5" wide	5x7 & 6½x8½" Century or Cycle Graphic	6" wide
FILM SIZE	6, 8, 10x144" wide	10,12, 14, 16x24" wide		5x42"	6½x72 & 8x96"	6"x15 feet
CAMERA DIMENSIONS	9x12x12"	11¼x14½x18"	NA	12x7x4"	87/8x4¼x9¼" & 105/ 8x4¼x10½"	
BELLOWS LENGTH	27"	39"	NA	12"	22½ & 26"	
PICTURE LENGTH	5 to 20 feet	18 or 20 feet		42"	6 & 8 feet	5, 10 & 15 foot rolls
STANDARD LENS	Turner-Reich Converti- ble Anastigmat Series II	Turner-Reich convertible Anastigmat Series II	NA	Triple convertible Gundlach Manhattan Rapid Rectilinear lens	convertible Rapid Rectilinear & convertible	Wollensak Anastigmat triple convertible f/7.7 lens
FOCAL LENGTHS	10½, 18 & 24-inch	15, 24, & 36-inch	NA	6¼, 11 & 14"	Rapid Rectilinear 8 & 14-inch 11 & 18-inch convertible 7½, 12, & 18-inch 10½, 18 & 24-inch	7, 10 & 15"
PATENTS	776,403; 780,351; 780,406	776,403; 780,351; 780,406	NA		NA	Folmer 1,251,494
WEIGHT with Attach- ment (or complete Outfit)	49 lbs.	90 lbs.	NA	Camera 6¼lbs. Complete 19 lbs.	25 & 44 lbs.	35 if sold as an outfit
EST. PRODUCTION	1,483	100	NA	400	NA	127
LAST SOLD	1949	1921 last Gx retail	Ca. 1909-10*	1923	1921 last Gx retail	1949 (last 2—1933)

* “The Outfit is in itself a complete affair, made of a Camera which can be used in the ordinary manner for plates (with a supplied ground glass back), and a Panoramic Attachment which is quickly and easily attached to the Camera, thus converting it into an Outfit, The Attachment is much like an ordinary Cartridge-Roll Holder.” From the 1910 Century Camera Catalog of the Century Division of the EKC “Up to the time that Cirkut Apparatus was introduced the extensive field of Panoramic Photography was practically closed. Cirkut Apparatus has eliminated all the obstacles in the way of true Panoramic Photography...” The Apparatus was touted, but not available as a single item.

** There were two types produced, the fan speed-control type and the governor speed-control type.

*** Film for Cirkut Outfits is not spooled the same as for Cirkut cameras.

1900 - No. 1 Kodak Panoram introduced by Eastman Kodak and patented by Frank A. Brownwell in 1901. Used 105 film and gave a 112° 2¼ x 7" picture.

1902 - George Lawrence of Chicago built swing lens panoramic cameras in seven sizes varying from 10" x 24 to 26 x 96". In 1906 he made the world famous panoramas of the San Francisco earthquake.

1904 - Frederick W. Mueller of Baltimore made and patented a 360° Cyclorama camera using the revolving lens principle. Before WWI, one of his cameras was used for the first aerial photos taken using a U.S. navy plane.

1904 - Cirkut No. 10 and No. 16 cameras were now manufactured by the Rochester Panoramic Camera Co. They made up to 360° views on a fan governed clockwork. The 10" wide roll film Cirkut camera was the most widely used panoramic camera by the professional photographer.

1906 - Century Camera Co. of Rochester introduced the Cirkut Panoramic Attachment to fit on customers' own 5x7" Century cameras. It could make 360° pictures on 6½" film.

1907 - The No. 6 and No. 8 Cirkut Outfit cameras were introduced by Century Camera Co. The outfit could be used as a standard view camera or with the Cirkut back to take panoramic photographs up to 360°.

1907 - Minimum Palmos Stereo made by Carl Zeiss Jena. The camera front could be shifted to take 9x18cm panoramic pictures on glass plates using a focal plane shutter.

1911 - Conley Camera Co., introduced their Model A Conley Panoramic Camera. It made a 140° 3½ x 12" picture on standard 103 roll film. It was marketed by Sears Roebuck & Co.

1918- The clockwork-slit No. 5 Cirkut camera was presented by the Folmer & Schwing Division of EKC. and patented by William F. Folmer in 1918. The camera could make a 360° exposure on 5" roll film and was the smallest most compact Cirkut manufactured.

1926 - The swing-lens 3A Kodak Panorama was announced by the Eastman Kodak Co. It made a 120° 3¼ x 10¾" picture on standard 122 roll film.

1930 - Oscar Barnack, the famed German Leica designer, made a swing-lens prototype 35mm panoramic camera. It was a crude example and never got into production.

1931 - The clockwork-slit No. 6 Cirkut camera was entered into production by Folmer Graflex Co. This camera was capable of making a 360° picture on 6" roll film.

1944 - Fairchild Camera Corp, USA, made a U.S. Air Force Panoramic aerial "strike camera" that made a 180° 2¼ x 10" picture on 70mm film with a Carl Zeiss 3" lens and rotating prism.

1948 - The swing lens revolving slit Panon Wide Angle Camera made a 140° 2 x 4½" picture on standard 120 roll film.

1958 - The swing-lens revolving slit Widelux 35mm model FV was introduced by the Panon Camera Co, Ltd., of Japan. It made 140° 25 x 60mm negatives.

1960 - Veriwide 100 wide angle stationary camera made by Ploubel & Co., of Frankfurt, Germany, produced 100-degree 6 x 9cm pictures on 120 roll film.

1976 - Linhof Technorama 612 PC - a fixed camera from Germany takes 6 x 12cm pictures on 120 roll film.

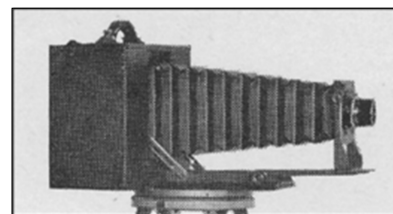
1994 - Noblex Pro 06/150 HS is a high speed 146-degree rotating lens panorama camera.

The trade name "Cirkut," (trademark issued April 24, 1906, and expired in 1946), although clever, was not well defined. Here is a company attempt from their 1908 catalog: "The introduction of Cirkut Apparatus most assuredly and admittedly marks a new epoch in that most delightful field of all photography – the panoramic. The meaning that is gathered from the work panoramic itself, conveys an idea of the kind of photography with the Cirkut- a complete and true picture just as one would see it were one to stand in a central position and view the scene in every direction."

Several patents were issued for features of the Cirkut-type cameras, such as patents 776,403 and 780,351 issued to William J. Johnson in 1904. Patent (780,406) was applied for in 1904 and granted in 1905 to Frederick W. Brehm. In 1905 the Rochester Panoramic Camera Co. started manufacturing and selling a "Cirkut" panorama camera. The January 1, 1905, catalog gives singular recognition to patent 776,403 and Mr. Johnson, although the catalog uses the word "patents." In 1906, as supervisor for Century Camera, Mr. Brehm produced a 360-degree panoramic photograph of the nation's Capitol that was nineteen feet long and patented improvements making the Cirkut easier to adjust and run.

"The man who is believed to have perfected the Cirkut camera and readied it for mass production was Frederick W. Brehm (1872-1950), a brilliant camera designer who was later to found the Department of Photographic Technology at Rochester Mechanics Institute (now RIT). A cabinetmaker by training, he eventually moved to Rochester and joined the F. A. Brownell Company, manufacturers of wooden camera bodies for Eastman Kodak. Brehm was soon building his own cameras and designing them for several Rochester camera companies and working as a professional photographer."²

For me, the most interesting Cirkut camera is the No. 6 (right). Lacking adequate communicating and analytical skills, I turned to Les Newcomer for help. Here is his insightful analysis:



"There were two No. 6 Cirkut cameras. The Century version is occasionally called the No. 6 Cirkut OUTFIT, though the instructions simply call it a camera. This outfit looks like a Century No. 8 Outfit that got left out in the rain and shrank. It uses an RB Century camera (5x7) with a Cirkut attachment.

The other No. 6 Cirkut camera and its older, but diminutive brother the No. 5 (left), have Bill Folmer's prints all over it. It's clear Bill wanted to make a more compact, more integrated (more complicated!) camera. So, he introduced the No. 5 in 1915, right after he filed for the patent. Which means the cameras made between 1915 and 1918 should say Patent Pending* on them. After 1918, they'll have the number.



The model ran up through 1923. It was compact, small, if not light. But it had its limitations, maxing out at a 'mere' 42 inches of film width.

If the peak for panorama photos was the first 20 years of the 20th century, the No. 6 came in at the tail end of the era. It probably appealed to the serious hobbyist, as the professionals wanted the taller print from a No. 8 or 10.

The No. 6 came to the party too late. Introduced in 1932, at the depths of the depression at a price of \$275, it was too expensive for the hobbyist, and still too small for most professionals. They weren't made during the war, as Uncle Sam wanted the No. 10, or Number 8. And after the war, was a new era. We left our depressed and restrictive life behind and wanted all those new things (like affordable 35mm cameras), and panorama cameras were simply out of fashion.

Why the long wait from 1914 to 1918? GOOD question. No provable answer. The perfect patent covers all of the possible variations (which is why the patent doesn't mention film size), while deftly not making a claim to anything that's already been patented.

Maybe it took that long to make sure they weren't claiming some bit of design on any of the myriad of other panoramic cameras that came before.

The same thing happened to Doc Edgerton's patent for the Xenon strobe. I think the delay was around 12 years!

I wonder if the Patent office has an historian.

Then, why the long wait from 1918 to 1932 to produce the camera?

Well, more like the wait from 1923 (end of the No. 5) to 1932 (intro of the No. 6). The No. 5 and the No. 6 will be patented under 1,251,494. And through most of the 1920s, George was nervous about exactly where that monopoly suit was going to go, so he stopped spending money when it came in the F&S Div./Dept. (or the Folmer-Century Dept as it was known in-house),

Without money coming in from dear old dad, cost cutting was the modus operandi at the house Bill built. That included advertising and probably anything that didn't have a fat profit margin, which probably included the No. 5 Cirkut.

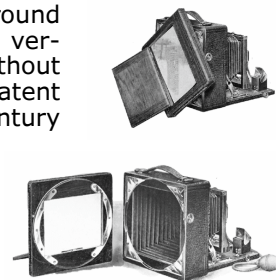
In 1928 Bill Folmer found himself right back where he was in 1900, only this time the company is a lot bigger and the problems that much more complicated...not unlike Brexit. So 4 years isn't a lot of time to wait to get the company back on its feet with consistent production of profitable cameras, so Bill can play with his "freak cameras," as Geo. Eastman called them. The trouble was, the public had moved on.

We could test my theory if we could find sales of other non Cirkut panorama cameras of the same relative size from the same time period.

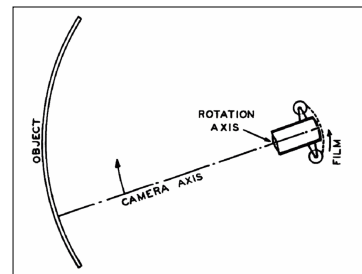
*During one of the episodes of the TV Series BATMAN!, the Caped Crusader needs help on something, so as the narrator said, "He went to that famous inventor, Pat Pending." 50+ years later, it still makes me giggle."

William Folmer is justly recognized as an inventor, mainly because of his numerous patents. He did, however, purchase products and features, especially once his company was purchased by George Eastman. In 1904 The Century Camera Company proudly introduced their "new" Revolving Back for all Century Cameras which enables the photographer to decide instantly, because the reflected im-

age can be viewed with the ground glass focusing screen in either a vertical or horizontal position, without detaching the back. This back (patent 833,885) was used with the Century Model 46 camera. It appears the Cycle Graphic, through its discontinuance in 1924, continued to use the Century-type revolving back.*



The Cirkut was a scanning-type split camera. Here is the way lens designer Dr. Rudolph Kingslake described the camera. "This is a special type of camera used for photographing broad groups or landscapes, in which the film passes behind a slit in the focal plane of the lens. Two well-known types of panoramic camera exist. In the first type, the entire camera is made to rotate slowly about a vertical axis, the picture



Participants are being positioned in a semicircle to avoid distortion.²

being taken through a narrow vertical slit on the lens axis close to the film (above). The film is automatically rolled back past the slit by gearing at such a rate that the point on the film receiving the image is moving at the same speed as the image itself. This type of camera is typified by the Cirkut cameras of 1904. Indeed, with such a camera, it is possible to repeat a scene many times along one strip of film by letting the camera rotate several times.

In the other type of panoramic camera, the lens is made to rotate during exposure about a vertical axis through its nodal point, and a shield is attached to the rear of the lens terminating in a slit close to the film."

*In 1906 two F & S Co, catalogs were issued, the first for their new Auto Graflex line, and the second for all their retail items. It is unclear from catalog illustrations if the Reversible Back Auto Graflex converted to a Revolving back in 1906, as the name changed, but the illustrations were identical. The first patent specific to a revolving back (1,060,748) was applied for in 1910 and approved in 1910.

¹On the Cirkut Cameras, the exposure slot is in the back of the film box, while on the Cirkut Camera Outfits, the exposure slot is on the front of the film box. That's why the films are wound differently for each type of Cirkut Camera.

² Lewis, Harold B., *The Elusive 16-inch Cirkut Camera*, the *Graflex*, January-February 1983, p.4.

Coe, Brian, *Cameras*, Crown Publishing, 1978.
Gustavson, Todd, *Cameras*, Sterling Publishing, 2011.
Kingslake, Dr. Rudolph, *The Photographic Mfg. Cos. of Rochester, NY*, George Eastman House, 1979.
MacKay, Robert B., *America by the Yard: Cirkut Camera*, W.W. Norton & Co., NY, 2006.
Graflex Historic Quarterly, 10, 3, 2005
Graflex Historic Quarterly, 14, 3, 2009
Pacific Rim Camera (<https://www.pacificrimcamera.com/>)



**GEORGE EASTMAN MUSEUM
CIRKUT CAMERA NO. 16**

From Todd Gustavson, Curator of Technology at the George Eastman Museum. "We just received a gift from Andrew Davidhazy of RIT – the No. 16 Cirkut camera that originally belonged to Frederick Brehm. Brehm was one of the designers of the camera, did some work for EKC as a photographer, and taught photography at Mechanics Institute (now RIT). The No. 16 is extremely rare, and this one has the Rochester Panoramic Camera Company label on it, so it would have been produced between 1904 and 1905. The Century Camera Co. acquired Rochester Panoramic Camera Co. in 1905, which in turn was acquired by EKC, who produced the Cirkut cameras until 1940. This is the first example of a camera made by the Rochester Panoramic Camera Company I have ever seen."

Reprint of parts of articles from the Graflex Historic Quarterly third quarter 2009; "No. 5, No. 6 and No. 16 Cirkut Cameras" by Bill McBride. If additional items are added, they will be noted or footnoted.

The No. 16 Cirkut camera was the largest Cirkut roll film camera commercially produced. There were two types of No. 16 Cirkuts manufactured; one that used air-resistance fans to control the camera rotational speed, and the other which utilized an internal variable-speed governor to control the camera rotational speed.

The first No. 16 Cirkut, a fan-type, was manufactured by the Rochester Panoramic Camera Co. in 1905. The camera came in three carrying cases, one for the body, one for the back and one for the tripod and gears, where the whole outfit weighed 90 pounds. The tripod top was 20" in diameter, and it provided a flat surface for the rollers on the camera bottom to rotate. A triple convertible Turner-Reich Anastigmat lens made by Gundlach-Manhattan Optical Co. was supplied with 15", 24" and 36" focal lengths. A set of nine camera gears (three for each focal length) was furnished, along with five air resistance fans which provided shutter speeds of 1/3, 1/6, 1/10, 1/25 and 1/30 of a second. This No. 16 Cirkut was the only one made that had an adjustable exposure slit of 1/8", 1/4" and 1/2". The camera was constructed of mahogany and covered with Morocco leather. The exposed wood was varnished natural, the metal parts nick-

el plated, and bright red leather bellows (39 inches in length) were provided for this camera. The lens could be raised or lowered to arrange the amount of sky or foreground required in the picture. The lensboard could be tilted when making negatives of groups of people where the subjects occupied several rows, to get these rows in the proper perspective in the picture. The film back was provided with a perforating button to mark the roll film when taking more than one picture. The film made available for the No. 16 Cirkut was 8", 10", 12" and 16" in width up to 20' long. When using the 36-inch focal length lens, a 360-degree picture would produce a negative 18 feet long.

From 1905 to 1907, the No. 16 Cirkut was manufactured by the Century Camera Company of Rochester, N.Y., who purchased the Rochester Panoramic Camera Company in 1905. The Century Camera Co. No. 16 Cirkut was identical to the Rochester No. 16 Cirkut, except that the exposure slit was fixed at 1/4" in width, and three fans of 1/3, 1/6 and 1/10 of a second shutter speed were provided instead of five fans on the previous version. Figure 1 shows the front view, and Figure 2 illustrates the open film box of a Century Camera No. 16 Cirkut. In 1907 the Century No. 16 Cirkut was priced at \$425.00, or the same could be purchased without lens and shutter for \$350.00. A roll of film 16 inches by 20 feet was listed at \$12.80.

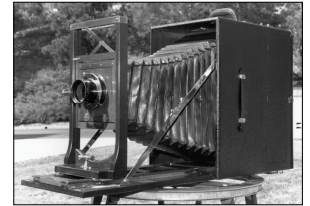


Figure 1. The Century Camera Co. No. 16.

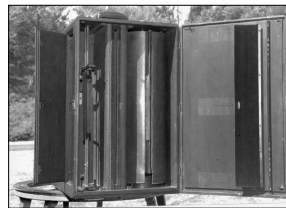


Figure 2. No. 16 camera with open film box.

In 1907 Eastman Kodak Co. created the Century Camera Division which manufactured the next version of the No. 16 Cirkut (Figure 3). The No. 16 Cirkut made by the Century Camera Division was the same as the one previously produced by the Century Camera Co., except that the scissors-type mechanism, for raising and lowering the lens, was redesigned to use a rack and pinion-type mechanism. Also, the spring for the motor was made larger and more powerful. To focus the camera, the film box is removed, and the internal ground glass is extended as shown in Figure 4. The fan-type No. 16 Cirkuts had a wide range of serial numbers, so it appears the company manufactured cameras when they received orders for some.



Figure 3. Camera with the film box removed to focus on the next picture.

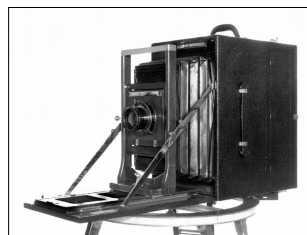


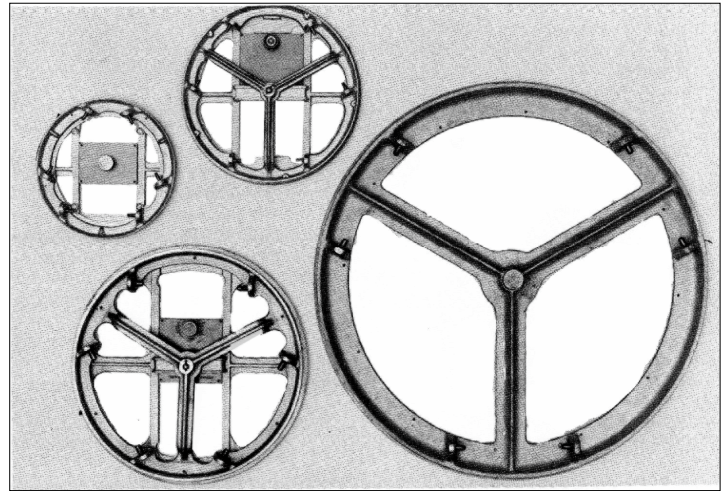
Figure 4. Century Camera Div. camera front view. Scissors mechanism shown in Figure 1 has been deleted.

The Century Camera Division redesigned the No. 16 Cirkut about 1915, to replace the air fan speed control system with an internal variable governor speed control system which had speeds of 1/2 through 1/12 of a second available. The speed control dial and start and stop lever were like the one shown in The camera was made of mahogany covered with Morocco leather, the exposed wood parts were painted with an ebonized fin-

ish, and exposed metal parts were oxidized to give a nice gun metal-type finish. This 1915 governor-type model serial number range appears to be 68370 through 68390. The Century Camera Division catalog listed the No. 16 Cirkut, complete, at \$425.00 or without a lens and shutter at \$350.00. The 1916 Graflex catalog listed the No. 16 Cirkut at \$629.85, where a 16" x 20' roll of film was available for \$15.20.

In 1917 the Folmer & Schwing Division of the Eastman Kodak Co. manufactured the same governor drive No. 16 Cirkut as the Century Camera Division of Eastman Kodak Co. The only difference was the nameplate. The Folmer & Schwing Division produced the last batch of No. 16 Cirkuts and of 36 governor-type cameras in 1917, which had serial numbers ranging from 80737 to 80772. The 1917 Standard Photo Supply Co. catalog, Eastman Kodak Co., New Orleans, had the No. 16 Cirkut, complete, priced at \$445.00 or without lens and shutter at \$370.00. In 1920 the roll film of 16" x 20' cost \$15.20, which included the war excise tax. The Folmer & Schwing No. 16 Cirkuts were available until 1924.

Because the No. 16 Cirkut was listed in catalogs from 1905 through 1924, many were made, but it was bulky to handle, and it was an expensive camera to purchase for the average photographer. Just how many No. 16 Cirkuts were manufactured is not known, but from information that exists, the total production of the No. 16 Cirkuts, which includes the fan and governor speed control types, is approximately one hundred cameras. There were about 43 fan-type and 57 governor-type No. 16 Cirkuts constructed. Nearly a third of them have survived today.



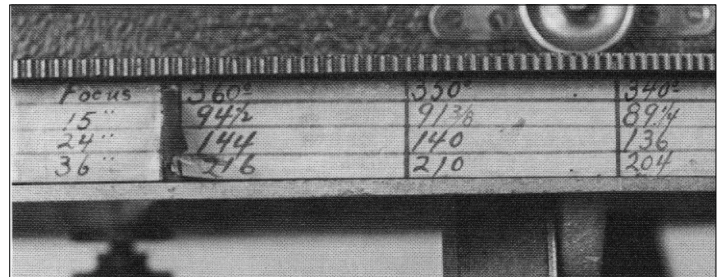
Size comparison of tripod gear heads.

SNAP SHOTS—ADVERTISEMENTS

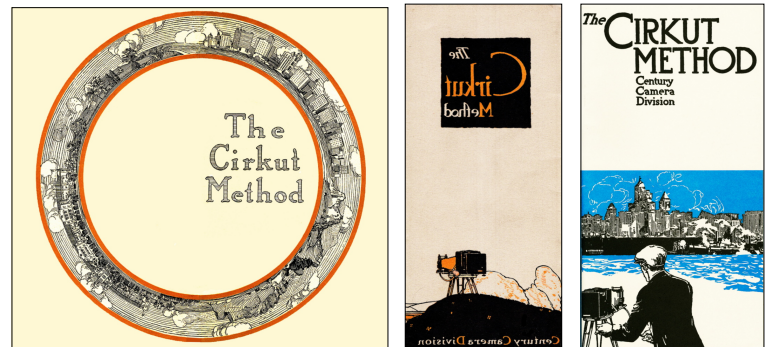
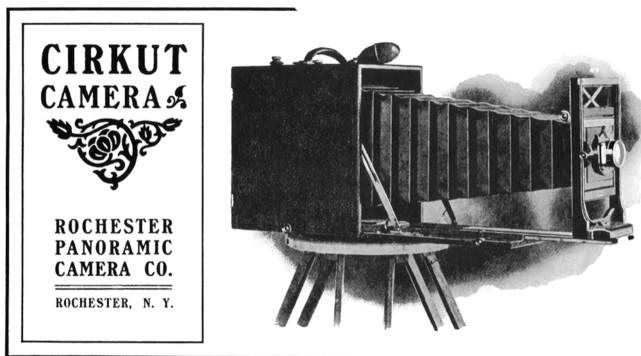
Partner Wanted: A young lady that is up-to-date in all branches of photography; to such I have a fine opportunity to offer; send samples of work and photo of self. Write for full particulars. Address Box 46, Adams, No. Dak.

For Sale: Cirkut Camera, No. 10, fitted with Turner-Reich convertible anastigmat Lens, Series No. 11 and No. 4 Century Shutter. Also four-foot printing frame, and cases. Practically new. Used ten times. Address C. G. care "Snap Shots."

1910 ads from Snap Shots Magazine.



Measurement markings on the tripod head were handwritten at the factory. This indicates the small production of 16" Cirkut cameras.



The Cirkut Method covers, left to right from earliest to Century Camera Division.

Special thanks to Pacific Rim Camera (<https://www.pacificrimcamera.com/rl/>) for invaluable information from their reference library.

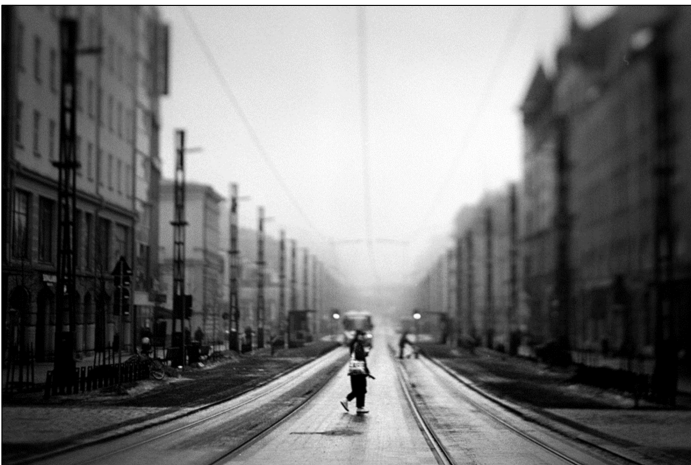
SHOOT ON FILM

By Ari Jaaksi

Graflex Journal subscriber and contributor, Jeff Yost, found an interesting post on Facebook's Graflex Camera Group from Ari Jaaksi. Ari has a regular channel on YouTube, entitled "Shoot on Film". (www.youtube.com/ShootOnFilm) He is using minimal repairs to fix his Graflex RB Series B. He is also a good photographer and pianist from Finland. He makes an interesting observation between the Speed Graphic and SLR Graflex, concerning each of their respective shutter light leaks. This is what Ari says:

I'm a Graflex Fan

I own four Graflex cameras. The fact that they were never officially imported to Finland makes them special up here. I have a Crown Graphic, an Anniversary Speed Graphic, and two RB Series B cameras. I first bought the smaller RB, a very lovely 2¼x3¼, and fell in love with it. I especially like free lensing with it, and I feature it constantly on my YouTube channel. When I saw its bigger sister, a 4x5 Series B offered in a Swedish auction, I needed to buy it, even though it was listed as "non-functional".



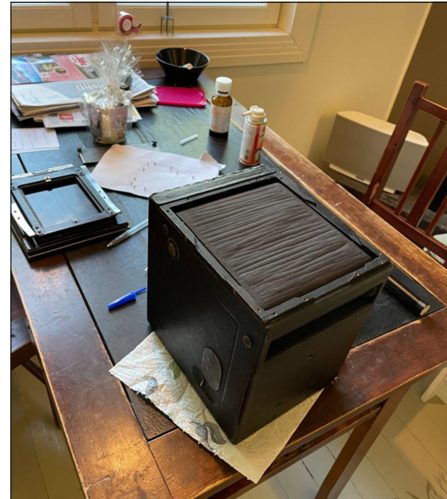
Free-lensing street photography with my Series B.

Some immediate fixes to my 4x5 Series B

When the camera finally arrived, it had a very nice lens with no fungus or scratches. Also, the leather was reasonably solid. The mirror was long gone, and the curtain shutter was so swollen and wrinkled that I could not engage its two smallest slits.

I first replaced the mirror with one from Marty1107 at eBay. Fixing was straightforward. For the dry and wrinkled curtain, I used a moist towel to slightly soften the curtain, simultaneously pushing carefully down the most significant bumps. I smoothed the curtain edges with a little isopropanol, carefully avoiding slit areas as it could loosen the glue. This unorthodox method made the curtain smooth enough to fit around the spools and allowed me to reach the highest tension. I do not recommend this method to anybody, as I'm not a camera mechanic. I'm just a photographer who tries to get the

camera back to life, with a minimum effort, without breaking anything that is not already broken.



The curtain in its sad original state.

Ignoring the Pinholes

From some Graflex discussion forums, I read of people having issues with their curtain shutters. They had small pinholes that rendered little spots on their film. I didn't see any in my pictures, so I assumed my curtain was fine. But then, for some reason, I took my camera to a dark room and shed some light through its curtain. And to my amazement, it was like the Milky Way – full of little white dots like many other old Graflex curtains. But I saw no effect on my film, and I didn't understand why not?

Until one day, shooting with my Graflex, I had an epiphany. Proper pinhole cameras need a reasonably long exposure time, several seconds, even minutes. And those holes in the curtain are like little pinhole cameras. Now, most people complaining about the pinholes had a Speed Graphic, while mine was an RB Series B. With a Speed Graphic, I'd expose the curtain and those little pinholes to light immediately when I remove the dark slide. Especially when working handheld, I draw the dark slide out and only then work on composition, focusing, and directing the model. And the pinholes and the film through those holes are then exposed to light the entire working time – sometimes several minutes – burning little dots on the film.

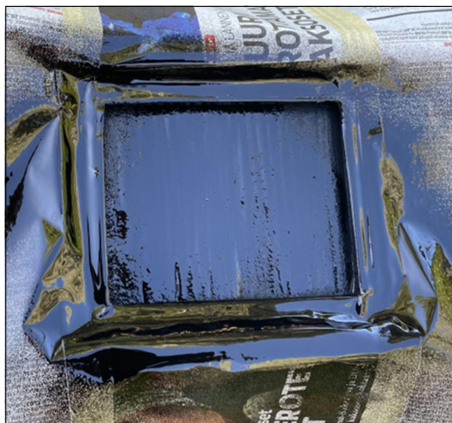
But this is not the case with an RB Series B, as it is an SLR camera! The mirror blocks the light and directs it to the viewfinder the entire time of composition, focusing and planning. So even if I remove the dark slide, I will only expose pinholes to light once I press the shutter. And, I always move the mirror back to the viewing position immediately after I take the picture. So, with a Series B, the pinholes are exposed to light only a fraction of a second, whereas, with the Speed Graphic, that may continue for minutes, giving light enough time to make its mark.

I then concluded that with a Series B SLR camera, it doesn't matter if you have tiny holes in your curtain shutter. There is not enough time for them to have any impact, especially if you have a habit of moving the mirror immediately after you take the picture.

Rubberizing

But then, a few months later, I decided to fix the pin-holes. I know it was unnecessary and goes against my rule of "don't fix it if you can live with it". But when I visited this local hardware store to buy two-stroke engine oil for my outboard Mercury engine, I saw a bottle of liquid rubber. I read the description: "it makes a water-tight seal, extremely thin and sprayable". I bought the bottle.

I removed the lens from my Graflex, released the film cartridge, and covered my Graflex with old newspaper, revealing only the curtain. I moved the curtain to the first position and sprayed liquid rubber on it. I let it dry for the day, moved the curtain to the next slot, and sprayed again. By the end of the week, I had the entire curtain rubberized without even taking it out of the camera. And now there are no longer holes!



It takes several days, but no need to remove the curtain.

So far, so good!

It is possible, of course, that the rubber will eventually peel off. But so far, so good! It's been half a year, and I'm still getting marvelous pictures with the Graflex that I fixed myself. Also, after the rubber, the curtain got even smoother and moves now better than before. So the unintended consequence of unnecessarily rubberizing the curtain shutter made the camera better! And I enjoy it tremendously!



My daughter photographed with a 4x5 Graflex RB Series B on Ilford HP5+, pushed to ASA 1600.



Graflex Journal subscriber and contributor, George Dunbar, introduced me to the Hathi Trust Digital Library (<https://www.hathitrust.org>). Here is their mission statement: "HathiTrust is a not-for-profit collaborative of academic and research libraries preserving 17+ million digitized items. HathiTrust offers reading access to the fullest extent allowable by U.S. copyright law, computational access to the entire corpus for scholarly research, and other emerging services based on the combined collection. HathiTrust members steward the collection — the largest set of digitized books managed by academic and research libraries — under the aims of scholarly, not corporate, interests."

Contrary to the widely held belief that Graflex research is insufferable, this site is offered as a partial cure!

As an example, here is a scan of several pages of the 1906 "Kodak Properties" presentation for their board of directors. It is also the year the recently acquired (1905) Folmer & Schwing Mfg. issued their first catalog as an Eastman-owned company.



Factory Century Camera Co., Rochester, N. Y. Also Occupied in Part by the Folmer & Schwing Mfg. Co. (Graflex Cameras.)

*"If it isn't an Eastman,
it isn't a Kodak."*

Graflex Journal

The Graflex Journal is dedicated to enriching the study of the Graflex company, its history, and products. It is published by and for hobbyists/users and is a not-for-profit publication. As such, we believe we qualify as a 501(c)(3) educational publication.

Masthead image. 1910 African Game Trails, by Theodore Roosevelt. According to the text: "Accompanied by Grogan, and by the gun-bearer carrying his rifle, while he [Theodor's son Kermit] himself carried his 'naturalist's graphlex' camera, he got up to within fifty or sixty yards of the dull-witted beasts, and spent an hour cautiously maneuvering and taking pictures."



Howard Sandler (howard@howardsandler.com) image shot on Instax film on Graphic View II, using the techniques he discussed in the article in the previous issue of the Journal.

Treating the Instax more like a film starting point for Photoshop. Reduced blue saturation, dimmer white and grey points, wall texture added., Shot with a Schneider Symmar 180mm f5.6, Lomografok with Instax wide

Editors: Thomas Evans, Ken Metcalf and Jeff Yost.

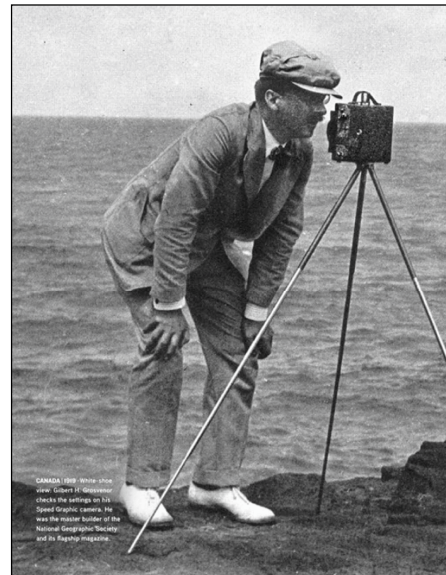
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1919 National Geographic 125 Years
Gilbert H. Grosvenor. What is wrong with this picture?

Lacking a response from the question posed in the last issue, the Graflex Journal is now offering two prizes for the correct answer.

1. A free one-year subscription to the Journal.
2. A promise to not ask you to write an article for the Journal.