

Goerz Optics

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I. Introduction

The C.P. Goerz optics is very well documented. We can find much information on the internet and published in book form.

In this short article we would like to show links to that information which we have discovered.

We have only nine C.P. Goerz binoculars in our collection, and the binocular for a directive – aiming from rangefinder, described on our web site – binoculars -> other.

Looking into documents, it appears the Goerz Company has been founded nearly in the same time as Carl Zeiss Jena.

The production profile of C.P. Goerz was very wide: lenses, cameras, photo-stereo binocular and binoculars for;

- civilian use,

- military use
- and for theatres

Some the C.P. Goerz binoculars were produced in large numbers, but some models were manufactured in small quantities.

The Company extensively advertised its products in many countries of the world, especially binoculars.

The Company founded many branches around the world:

- Paris in 1893;
- New York in 1895; the branch began the own production in 1902, and turned into *C. P. Goerz American Optical Co* in 1905. The New York division sustained function independently until 1972, when Company fused with *Schneider Optics*;



Goerz advertisement NY, ca 1903

- London in 1899;
- Saint Petersburg -Russia, in 1905; Goerz binoculars were produced in Russia – in St. Petersburg and in Riga with inscription in Russian language.

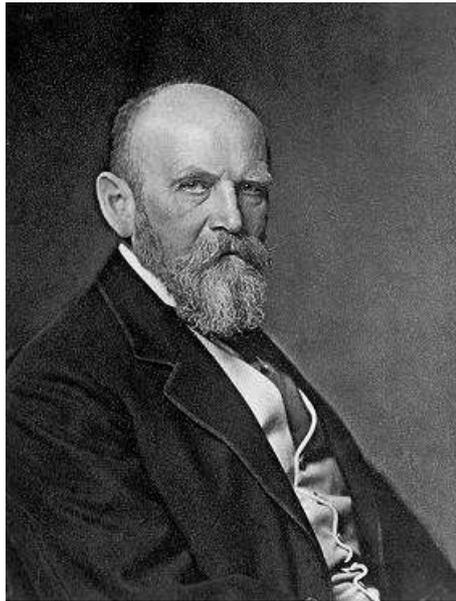


C. P. Goerz advertisement in Russian language, ca 1910.

- In 1905 was opened factory for production of the military optics in Vienna;
- Bratislava in 1908 (Pressburg/POZSONY); this branch produced binoculars as well, giving them own production number, disconnected from the C.P. Goerz Berlin numbers.
- In 1908 Goerz established a new Company in Zehlendorf-Berlin, which produced roll films and films for the movie Industry. The branch was named – Goerz Photochemisches Werk GmbH;

II. History of the Company

The Company was created by Carl Paul Goerz in 1886 in Berlin 7a, Schöneberg.



Carl Paul Goerz (21/07/1854 – 14/01/1923); Picture courtesy:

<http://www.ikon.de/de/site/IKON/Aktuelles/Presse/Mediathek/>

In that year it was a mail order corporation for mathematical instruments and in 1887 photographic equipment was supplied as well. It was located in Berlin-Friedenau, Rheinstrasse 44-46.

The photographic business was such promising that the Company begun to produce amateur equipment and cameras as *Photographer CP Goerz*.

In 1890 the Company begun to produce lenses and changed the name into *CP Goerz Optical Institute*.

Highly developed lenses were produced by Goerz. The optician Emil von Höegel developed a (doppelanastigmaten) high quality lens, which was sold under the name *Dagor*. Up to 1891 there were produced 4000 lenses, to 1911 – 300,000.

“Dagor” is the abbreviation for “**D**oppler-**A**nastigmat Goerz-> **GOERz**”.

The license of the lens design was sold to British Company Ross London in 1893, and to Austro-Hungarian Company in Vienna Karl Fritsch.

In 1900 was developed another lens by Goerz - Hypergon. It was a photographic wide angle lens. It consisted of two mirror-symmetric lenses with a large aperture – 1:22 up 1:32; excellent image quality with a field of view of 135°.

Many new designs of the lenses by Goerz bring into being a new development in the photographic and film industry.

In 1897 was built a new building for the Optical Institute C.P. Goerz. We can watch the documentary film about this historical Goerz building:

http://www.rbb-online.de/heimatjournal/archiv/heimatjournal_vom145/carla_kniestedt_ist.html

More about New York branch on the web site: <http://www.14to42.net/34street.html>

The site was found and kindly sent by Dr Simon Tomlinson.

*“C. P. Goerz American Optical Co. [...] moved to 317 E. 34th St. around 1911. Carl Paul Goerz (1854-1923), the founder, is famous in the annals of photography as the inventor of several revolutionary precision optical instruments, including the Anschutz folding press camera, the first camera with a self-contained (focal plane) shutter capable of speeds as short as 1/1000 sec. Born in Brandenburg, Germany, Goerz started in Berlin in 1886, opened a photographic workshop in 1888, a factory for grinding lenses in **Winterstein**, Thuringia in 1895, and a larger factory in Friedenau in 1898. Goerz died in 1923, and in 1926 the firm Optische Anstalt C. P. Goerz AG, Berlin, was taken over by Zeiss IKON AG.*

The original branch for Goerz lenses in New York was opened at 52 Union Square Place (later called Union Square East) around 1895 and managed originally by William Goerz and later by Otto C. Goerz. In 1901 C. P. Goerz Optical Works opened a factory at 79 E. 130th St. in Harlem which remained there until around 1911 when both offices and factory were moved to the East 34th St. location above. By this time the firm was called C. P. Goerz American Optical Co. and seems to have become independent of Goerz (Berlin). In any case Goerz America survived its German progenitor by many years. The Goerz name was trademarked by C. P. Goerz American Optical Co. at 461 Doughty Blvd., Inwood, N.Y. in 1964. Goerz American Optical was purchased by Schneider Optics of America in 1972.

Goerz was located in this building until the mid-1950s. Two photographs by Percy Loomis Sperr (1890-1964) on the New York Public Library's [...] seem to date the Goerz sign [...] the second photo is dated 1941 and gives a glimpse of a bright and shiny Goerz sign. So it would have been re-painted around 1940.”



C.P. Goerz American Optical Co; in NY – Manhattan 317-323 34th Street (East); 1941(left) and at the present time

In 1891 C. P. Goerz Berlin received the first contract for the production of military optics for Navy and Imperial Army.

III. Cameras

We do not have any Goerz cameras and lenses in our collection of the cine items.

Because C.P. Goerz played an essential part in the cine subject, we have to shortly describe that production part of Goerz.

Goerz is known primarily for Anschuetz strut-folding cameras, Dagor lenses and Tengor and Tenax cameras, later continued by Zeiss Ikon.

On the "Historic Camera" web site we can find a short history of the Goerz Optical Works Company [about photographic part].

In 1887 Carl Moser an employee of the Goerz started the photo supply business in the company.

In 1888 Goerz purchased the F. A. Hintze's mechanical workshop and began producing cameras. In approximately 1889 Goerz began making optical lens with the trade name of Lynkeioskop C/2. Lens making became the primary business.

In 1890 the company changed its name to Optische Anstalt C. P. Goerz and the company continued to develop operations in Berlin.

Also in 1890, Goerz products were first introduced to the American public during the World's Fair at Chicago and they subsequently opened a company office in New York, in 1895. This branch would begin producing cameras in 1902.

In 1892 and 93 the double Anastigmat type of lens were introduced with Goerz taking the lead. Goerz has the credit of having introduced the first symmetrical lens fully corrected for astigmatism. Goerz became well known for the high quality of lenses.

In ca 1896 Goerz obtained rights to produce the Ottomar Anschütz focal plane shutter with speeds up to 1/1000 of a second. Cameras were produced with Goerz-Anschütz name and in approximately 1905 shorted to Ango derived from the first two letters of the two names **AN**schultz and **GO**erz. Ottomar Anschütz (1846-1907) had invented the shutter in 1883.

In 1905 the American branch adopted the name C. P. Goerz American Optical Co, located at 317 East 34th street New York, which contained full manufacturing capabilities.

In 1908, Goerz Photochemisches Werk GmbH was founded in Berlin-Zehlendorf. This company produced roll film and film for the movie industry.



Picture courtesy <http://www.ikon.de/de/site/IKON/Aktuelles/Presse/Mediathek/>

In 1910 Goerz became owner of the Sendlinger Optische Glaswerke, an optical glass maker near Munich.

In 1923 Carl Paul Goerz died.

In 1926 the German branch of Goerz merged with ICA, Contessa-Nettel and Ernemann to form Zeiss Ikon. As a result of the merger, only the Zeiss company continued to produce lens. The German Branch of the Goerz was no longer marketed.

However the American branch continued and in 1927, the Burke & James company, led by George Drucker, bought the German Goerz optical company holdings, complete with all existing lenses, tooling, and rights to the name and formula.

In 1975 the American branch closed operations.

The Goerz cameras can be seen on the web site: <http://camerapedia.wikia.com/wiki/Goerz>

The Goerz lenses Kino-Hyper were shortly supplied to American Bolex 16 mm cameras, from 1939.



Goerz lenses for Bolex 16 mm



Goerz Kino-Hyper lens

In 1942 the Goerz lenses were transferred to the US defence and were not supplied for civilian market.

In this chapter should be mentioned about a Goerz innovation, the Company designed and next begun to produce Photo Stereo Binocular.

Photo-Stereo binocular

In the Goerz catalogue, published in 1903, we are reading:

“There are two things before all others which the tourist likes always to have with him – a field glass and a photographic camera [...] The travelling public will therefore welcome with satisfaction an instrument which combines Camera and field glass in one. [...] the Goerz Photo-stereo Binocular, which we are now placing on the market”

In the later part of the description we can read: "it forms at once an opera glass, field glass, single camera and stereoscopic camera."

Furthermore, is placed very detailed instruction for this instrument:



FIG. 7.

Photo-Stereo Binocular; the Goerz catalogue, NY edition; page 67;



FIG. 14.

Photo-Stereo Binocular; the Goerz catalogue, NY edition; page 68;

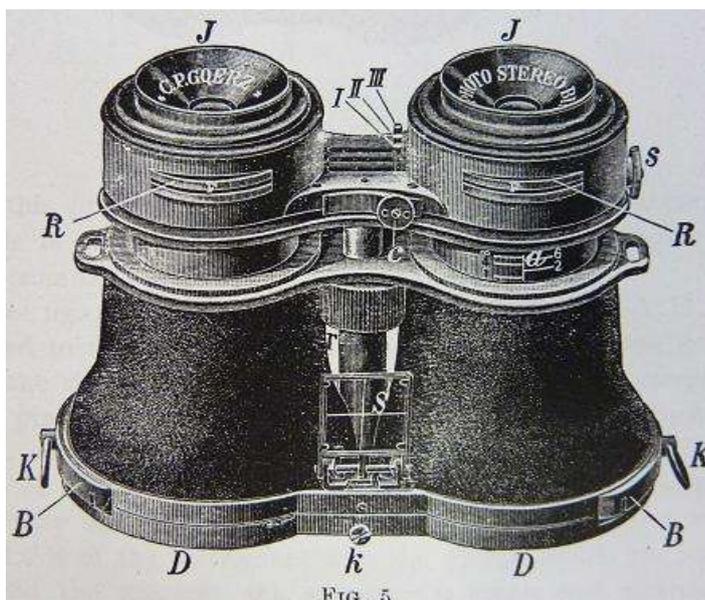


FIG. 5.

Photo-Stereo Binocular; the Goerz catalogue, NY edition; page 65;

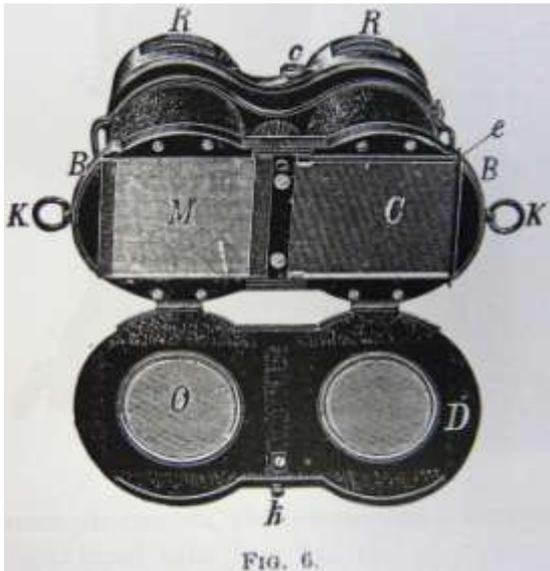


Photo-Stereo Binocular; the Goerz catalogue, NY edition; page 66 & 67;

“At the upper, or eye-piece end of the instrument, the disc, **R R**, project outward sufficiently to revolve them, whereby either the theatre eye-pieces, the field glass eye-pieces or the photographic lenses can be placed in the axis of the instrument” Using as a camera the shutter is adjustable from 1-20 to 1-60 of a second.

The price for that instrument was \$108, 75, at that time.

Except the description and the pictures in that catalogue, we have never seen that unusual and atypical instrument.

This catalogue (copy) is in our collection, kindly supplied by Peter Abrahams.

IV. Binoculars

The Italian enthusiast of Goerz optics, Marco Bensi, has researched the production numbers for decades.

Here is the latest updated version of the list, kindly sent by Marco Bensi:

“Estimated numbers of serial production of binoculars of Optische Anstalt C.P.GOERZ - Berlin
Serial numbers were estimated from the intersection of several data (dates engraved on military binoculars) and bibliographical sources Goerz and other collectors.

The start and end range are indicative and cannot be taken with utmost precision, but are sufficiently indicative to identify year of build of a product “Optische Anstalt Goerz” binoculars. Serial numbers have been rounded down, or over, a thousand (after 1898).

Of course I hope that with the help of many fans of Goerz binoculars you can achieve greater accuracy.”

The list of Goerz binoculars production numbers

Anno Year	Inizio Start	Fine dati End	da T.MIX by Thomas Mix
1891	1	300	
1892	301	900	
1893	901	1700	
1894	1701	3200	
1895	3201	4700	

1896	4701	6200	
1897	6201	7900	
1898	7901	15,000	
1899	15,001	23,000	
1900	23.001	32.000	
1901	32.001	41.000	
1902	41.001	51.000	
1903	51.001	61.000	
1904	61.001	70.000	Summer 65.000
1905	70.001	90.000	Summer 75.000
1906	90.001	107.000	5 May 100.000
1907	107.001	133.000	August 130.000
1908	133.001	148.000	
1909	148.001	151.000	
1910	151.001	154.000	
1911	154.001	184.000	March 157.153
1912	184.001	224.000	
1913	224.001	274.000	
1914	274.001	324.000	
1915	324.001	369.000	
1916	369.001	412.000	March 370.231 – November 407.040
1917	412.001	472.000	May 454.478 – October 455.655
1918	472.001	522.000	
1919	522.001	527.000	
1920	527.001	533.000	
1921	533.001	543.000	
1922	543.001	557.000	
1923	557.001	572.000	
1924	572.001	588.000	
1925	588.001	605.000	
1926	605.001	623.000	
1927	623.001	639.000	
1928	639.001	654229	

The table reformatted by Anna Vacani

Marco Bensi explains further: *“Start and end figures only ‘virtual’ reference. It must be clear to everyone [that] a value of 1700 may have been, for example -1689 or 1713, but you cannot be sure of this. Otherwise I think it is important to know for a collector, with a good approximation, the year in which the binoculars was produced but it would be difficult to have very precise range. Although we hope to one day find ... a log produced by Goerz.”*

Marco Bensi has written a book about Goerz Company, it is in Italian language.



“Restaurando un vecchio telescopio del 1911” – “Restoring an old telescope, 1911” – translating by Google

Here is a presentation of Marco Bensi book: “The book is composed of two distinct parts, the first of the restoration work and the second biography of CP Goerz and the history of its Optical Institute in Berlin and the World. The book includes about 90 images. “- translating by Google

Thomas Mix in his article- “The rise and fall of the C.P. Goerz Company” published in “Zeiss Historica”, Fall 2010, pages 8 – 16 is given his list of Goerz binocular number production:

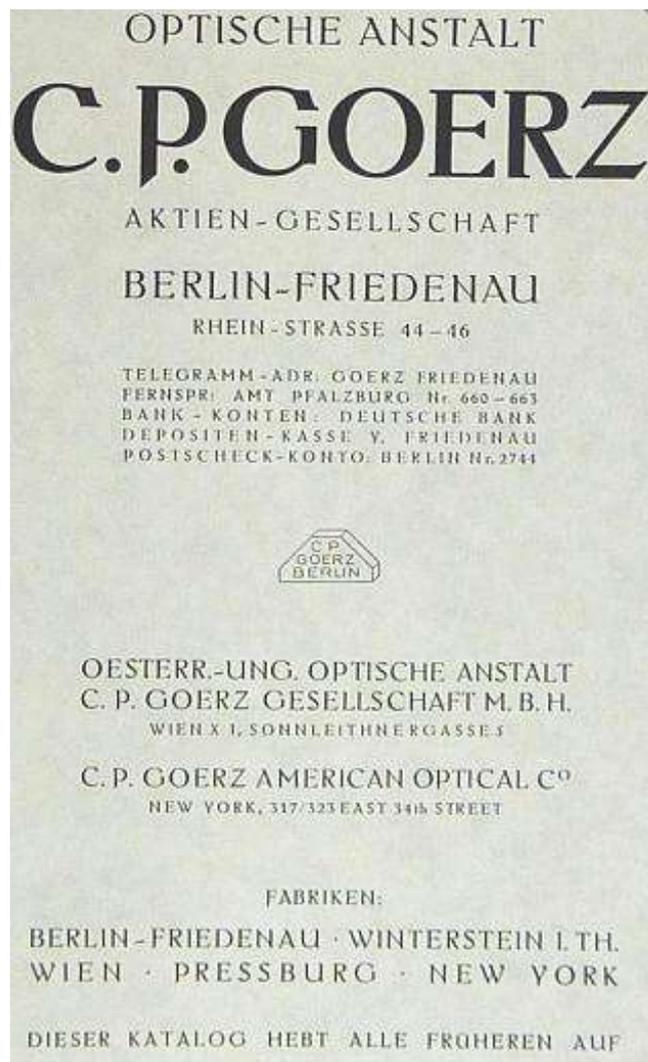
Goerz binocular production					
End of year:	Estimated total (cumulated)	End of year:	Estimated total (cumulated)	End of year:	Estimated total (cumulated)
1897	1,734	1910	220,000	1922	550,000
1898	4,926	1911	240,000	1923	560,000
1899	12,000	1912	280,000	1924	575,000
1900	20,000	1913	312,000	1925	600,000
1901	30,000	Start, WW I	330,000	1926	620,000
1902	40,000	1914	340,000	Part of Zeiss Ikon 1927 632,000 1928 650,000*	
1903	55,000	1915	375,000		
1904	70,000	1916	420,000		
1905	90,000	1917	480,000	*highest serial number recorded so far is 647,738.	
1906	114,000	1918	505,000		
1907	138,000	1919	515,000		
1908	165,000	1920	525,000		
1909	190,000	1921	535,000		

“The rise and fall of the C.P. Goerz Company”, by Thomas Mix, published in “Zeiss Historica”, Fall 2010, page 16

Military optics, produced by Goerz since 1891 on Army contract, were supplied to other countries; among them England, Holland, Italian, Japan, Norwegian, Portugal, Russia, Sweden, Spain, USA.

Prof Dr Antoni Piaskowski in his book “Dawne Lunety I lornetki w Zbiorach Polskich (Old Lunettes and Binoculars in Polish collection)” says: “At the beginning of 1897 C. P. Goerz Berlin published a catalogue with a description of 4 models of Trieder Binocle: 3x, 6x, 9x and 12x magnification. The binoculars were central focused and applied mechanism was “mit Zahn und Trieb” [with rack and pinion], and further: “in 1897 [Goerz] produced a total of 1,734 of those models, while in the next year, already 3,192 pieces”. Other models produced by Goerz were not mentioned, by Prof Dr Antoni Piaskowski.

In the Goerz catalogue – “Optische Anstalt C. P. Goerz Aktien Gesellschaft Berlin-Friedenau”, published ca 1914-1915; for Goerz factories produced in Berlin; Vienna-Pressburg and New York, we can find information on the early Goerz models, as well.



Goerz catalogue (copy) in German language, page 1; in our collection;



Erklärung der Benennung der Fernrohre

Auf den folgenden Seiten ist unmittelbar unter dem Firmenaufdruck der Name eines jeden Fernrohrs angegeben, z. B. Goerz Armee-Trieder 6×24. Diese Bezeichnung bedeutet, daß das Glas eine 6×Vergrößerung und eine Objektivöffnung von 24 mm hat. Wir bitten, sich in Schriftwechsel dieser Benennung der Gläser zu bedienen. Für telegraphische Bestellungen genügen die angegebenen Telegrammworte.

Goerz Armee-Doppelfernrohre

sind in folgenden Staaten offiziell eingeführt oder den Offizieren durch ministerielle Erlasse zur Anschaffung empfohlen:

Argentinien	Norwegen
Belgien	Osterreich-Ungarn
Bulgarien	Portugal
China	Rumänien
Dänemark	Rußland
Deutschland	Schweden
England	Schweiz
Griechenland	Serbien
Holland	Spanien
Italien	Türkei
Japan	Vereinigte Staaten
Mexiko	von Nordamerika

In Deutschland wurden die Goerz Prismen-Gläser gemäß Erlaß des Königlich-Preussischen Kriegsministeriums, Allgemeines Kriegs-Departement vom 29. 5. 03. Nr. 616. 5. 03. A. 2. und vom 24. 11. 08. Nr. 569. 11. 08. als Dienstgläser offiziell eingeführt.

Durch kriegsministeriellen Erlaß vom 13. 8. 09. A. K. D. Nr. 253. 8. 09. A. 2. ist das von Goerz konstruierte Galileische Doppelfernrohr neben den Goerz Prismen-Gläsern unter der Bezeichnung „Fernglas 08“ als Dienstglas für die Gruppenführer der Infanterie offiziell eingeführt und auch zur privaten Anschaffung empfohlen.

Goerz Marine-Trieder 6×30 und Goerz Marine-Nachtgläser sind in der Kaiserlich Deutschen Marine eingeführt.

Den Angehörigen der deutschen Armee und Marine, einschließlich Beurlaubtenstand, bewilligen wir die in der vorliegenden Preisliste für 1913/14 genannten Vorzugspreise, wenn aus der Bestellung einwandfrei die Zugehörigkeit zum Heer oder der Marine hervorgeht.

E. 6

C. P. Goerz catalogue (copy) in German language, in our collection; page 6

We are reading in the catalogue, page 6:

Goerz Armies - Double telescopes; are officially introduced in the following countries or are recommended for officers to order with departmental enactment:

<i>Argentinean</i>	<i>Norwegian</i>
<i>Belgium</i>	<i>Austro-Hungary</i>
<i>Bulgarian</i>	<i>Portuguese</i>
<i>China</i>	<i>Romania</i>
<i>Denmark</i>	<i>Russia</i>
<i>Germany</i>	<i>Sweden</i>
<i>England</i>	<i>Switzerland</i>
<i>Greece</i>	<i>Serbia</i>
<i>Holland</i>	<i>Spain</i>
<i>Italian</i>	<i>Turkey</i>
<i>Japan</i>	<i>USA and North America</i>
<i>Mexico</i>	

In Germany, the Goerz Prism Binoculars were officially introduced as department devices due to an order from the Royal Prussian War Department, General War Department on 05/29/03 # 616.5.03 A.2., and on 11/24/08 Nr. 569.11.08.

By war ministerial order on 08/13/09 A.K.D. Nr.253.8.09. A.2., the from Goerz constructed Galilean double telescope is next to the Goerz prism glass under name "Binocular 08" officially introduced as department device for infantry group leaders and recommended for private purchase. Goerz marine Trieder 6x30 and Goerz marine night vision devices are introduced to the Royal German navy.

Members of the German army and navy, including absentees due to vacation, are granted the bargain prices available in price list 1913-14, if the order shows correct proof of affiliation to the army or navy.

The text was kindly translated by Burckhardt Lorenz.

This catalogue (copy) is in our collection, kindly supplied by Peter Abrahams as well.

1. Galileans binoculars

In August 1903 model "DF 03" officially has been confirmed, as the Prussian army binoculars. Consequently, in period of 1903 – 1908 the Prussian Army was provided with 23 000 units per year.

As we read in above translation, in August 1909, Galilean model "Fernglas 08" became officially established as Prussian Armii model. It was Goerz Galilean Modell 1908:



Goerz Armee-Galilei Modell 1908

6fache Vergrößerung, feldgraue Farbe

Durch kriegsministeriellen Erlaß vom 13. 8. 09 A. K. D. Nr. 253 8. 09. A. 2 neben den Goerz Prismenklärern unter der Bezeichnung „Fernglas 08“ in der deutschen Armee als Dienstglas für die Gruppenführer der Infanterie offiziell eingeführt und den Angehörigen des Heeres zur Anschaffung empfohlen

Mechanische äußere Einrichtung wie beim Prismenklarer



1/2 natürlicher Größe

Optische Daten und Leistungen

Objektiv-Durchmesser	Austrittspupille	Relative Helligkeit, Lichtstärke	Wahres Gesichtsfeld auf 1000 m Entfernung	Höhe	Gewicht ohne Behälter
39 mm	6,3 mm	39,7	77,4 m *)	115 mm	460 g

Vorzugspreis
mit den auf Seite 16 aufgeführten Zubehörteilen M. 40.—

Telegrammwort: **Galex**

Strichplatten kann man in galileischen Gläsern nicht benutzen. Bezugsbedingungen vergl. Seite 5. Das Goerz Armee-Galilei ist auch ein gutes Jagdglas

*) Bei einem Durchmesser der menschlichen Pupille von 6 mm und einer Entfernung von 10 mm vom Okular.

SEITE 15

The Goerz Armee-Galilean Modell 1908 officially named "Binocular 08 - Fernglas 08" in the German catalogue; page 15



C.P Goerz Fernglas 08 6x30 from Simon Spiers collection - "Original Case with instructions on how to care for your binocular!" ; Copyrights picture Simon Spiers



C.P Goerz Fernglas 08 6x30 from Simon Spiers collection; Copyrights picture Simon Spiers

Simon Spiers says: "This Galilean model was in service for many years by the German army, it has a very narrow field of view and a 6X magnification, high for a small binocular without prisms. The centre disc with the makers name and model is used to lock the IPD, the scale of which is below this disc [...]. The view through these little binoculars is very narrow, the field of view is less than any Porro design I have looked through. Centre resolution is sharp and becomes soft fairly quickly at around 50% of the field. Viewing a street lamp at night is amazingly bright, but the internal reflections cause a loss of image quality in this situation."

On the top of the binocular just under the eye width adjustment is the date of manufacture. This model was originally supplied with a metal rain guard which is held to the binocular by a binocular neck strap. The color of the rain guard paint is the same as color on the main binocular body.

It is very rare to find one. We have seen that part only once, as a new example.

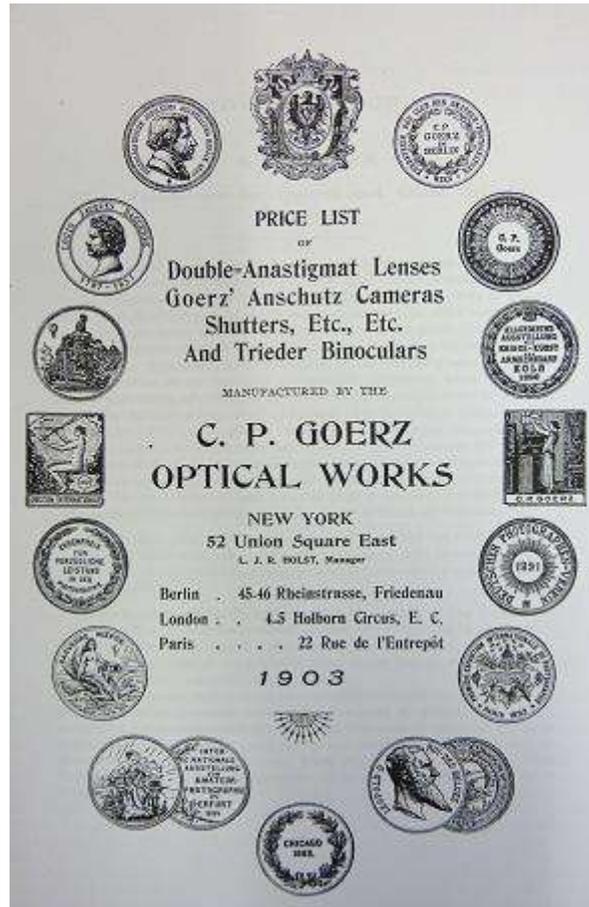
The picture of the Fernglas 08 complete, with that part is placed in the Hans Seeger 'red' book, page 22.



5 x40 Fernglas 08, Goerz Berlin, 1915; the picture from Hans Seeger book – "Feldstecher Ferngläser im Wandel der Zeit"; page 22

2. Prismatic binoculars

The Trieder Binocle models were described in the New York catalogue with a comparison of some technical differences between Galilean models and new prismatic Goerz binoculars. The catalogue: "Price list of Double-Anastigmat Lenses Goerz' Anschutz Cameras Shutters, Etc., Etc. And Trieder Binoculars Manufactured by C.P. Goerz Optical Works New York; Berlin; London; Paris" was published in 1903.



C. P. Goerz catalogue (copy) in English language, in our collection; page 1

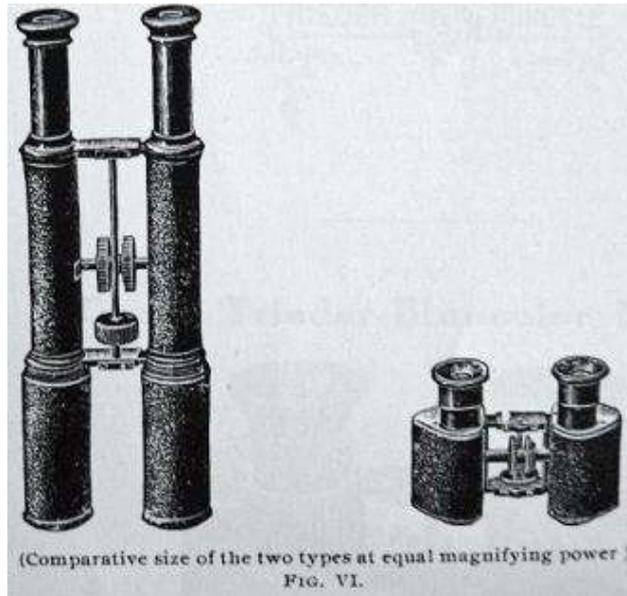
In the catalogue it is discussed the issues:

- The angle of view;
- The prism system;
- Magnification

We are reading in the catalogue:

“As a result of our investigation we may assert, therefore, that the Dutch or Galilean telescope gives us a handy and useful glass at a slight magnifying power, say not more than 4 diameters. [...] to increase the magnifying power the faults of this instrument become so apparent as to exclude it from practical use, while [...] the astronomical or terrestrial telescope do not come into play until a magnifying power of 15 diameters or more is reached. [...] the great size of the instrument utterly precludes its use in the hand. [...] we need [...] some method of construction which will permit of a magnifying power of 5 ½ diameters in convenient and handy form. A glass of this kind would prove extremely convenient for use in the army and navy, for hunters, tourists, theatres, race-courses, etc.

Our Trieder-Binocular fulfils these requirements in every possible way. [...] to combine the goods points of the Galilean telescope (its size and the binocular sights) with the more valuable optical qualities of the astronomical telescope, [...].

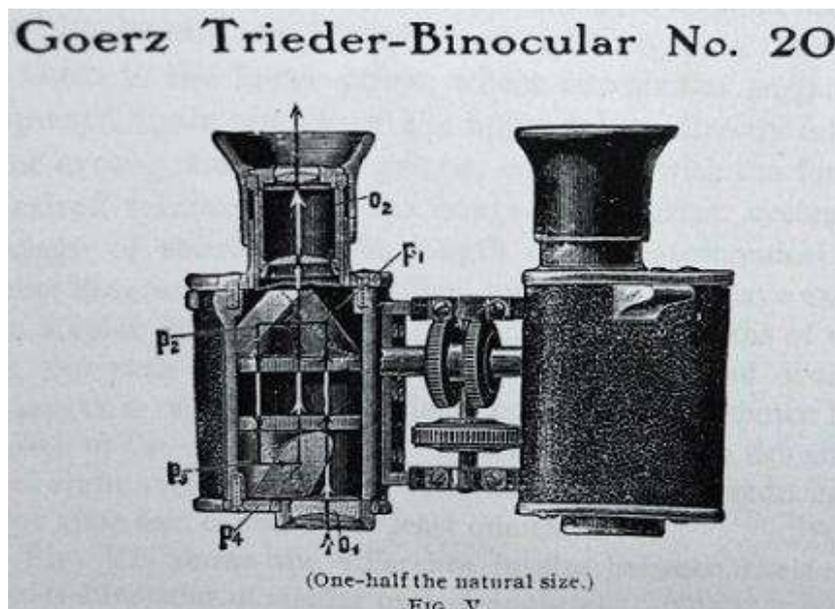


Picture from C. P. Goerz catalogue 1903 with a comparison of the same magnification of two glasses

Further we are reading:

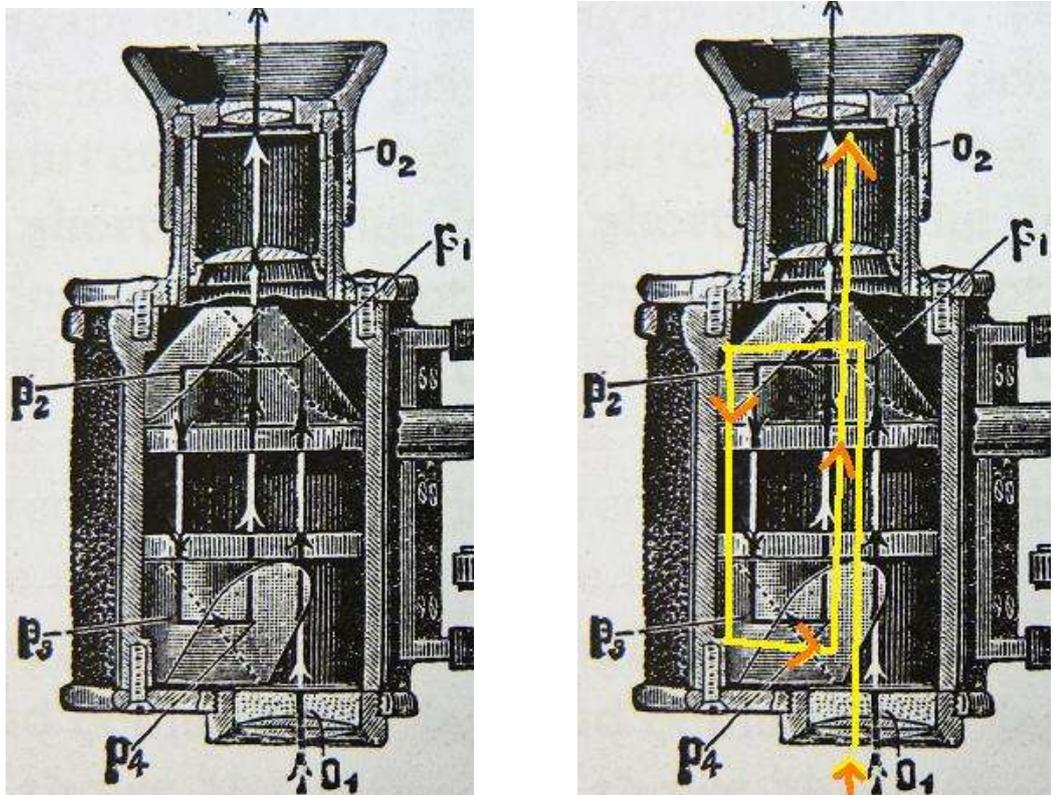
“The inversion of the image as obtained in the Galilean and terrestrial telescope [...] may be obtained by a system of prisms. [...] a combination of mirrors will give a complete inversion of the reflecting object. In optics such reflections are obtain by the far more effective prism surface. Therefore, if we combine an astronomical telescope, showing an inverted image, with a system of reflecting prisms, [...] the result will be a glass which, while retaining its good optical qualities, will give a reinverted image of the object observed.

The Geometrician and Optician Porro, who long understood the immense advantage of the prism system [...] put his idea to practical proof. [...] the principles laid down by Porro could be put to practical use in their present perfection. “



Picture from C. P. Goerz catalogue 1903 with prisms system explanation in Trieder-Binocular 6x magnification

It is explained: "O1 is the objective lens through which the rays of light entered the telescope. This object glass is constructed especially for the **Trieder- Binocular (Ger. Patent A. No. 11322, III, and Foreign Patents)**. It contains of two lenses of great optical power, cemented together"
 The arrows drawn in the graphic shows the path of light, inside the binoculars;



Picture from C. P. Goerz catalogue 1903 with the light path explanation in Trieder-Binocular 6x magnification

In the catalogue is announcement that every binocular must be marked with this inscription:



Picture from C. P. Goerz catalogue 1903

Afterwards the design of the inscription was changed a few times. Simultaneously with the binoculars were produced monocular of the same magnification and the same kind of floral art- deco inscription.
 Trieder Binocle models: 3x, 6x, 9x and 12x magnification technical data is published in the catalogue as well.

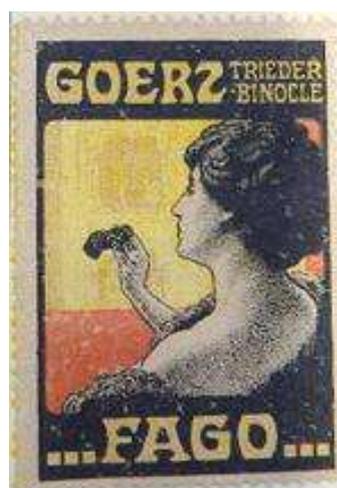
BINOCULARS	No. 10	No. 20	No. 30	No. 40
Linear Magnification.....	3x	6x	9x	12x
Superficial Magnification.....	9x	36x	81x	144x
Actual Field of View.....	13.3°	6.7°	4.4°	3.3°
*Subjective Field of View.....	40°	40°	40°	40°
Code-word.....	Trias	Tribus	Trigon	Trio
Price.....	\$38.00	\$46.00	\$54.00	\$62.00
MONOCULARS.				
Linear Magnification.....	3x	6x	9x	12x
Code-word.....	Motaras	Motribus	Motrigon	Motrio
Price.....	\$15.50	\$18.50	\$21.50	\$25.00

The actual and subjective field of view of the monoculars is equal to that of the corresponding binoculars.

Picture from C. P. Goerz catalogue 1903 – technical data of binoculars and monocular

Later models of the Trieder received deferent names:

- Pernox Trieder ;
- Pagor Trieder;
- Neo-Trieder;
- Heli-Trieder;
- Army Trieder;
- Navy Trieder;
- Battery Trieder;
- Marine Trieder
- Fago Trieder – theatre glasses



The post mark (print) of the theatre glasses – Goerz Fago Trieder Binocle, in our collection

The C.P Goerz produced many theatre glasses. Some of them were very elegant. Here are examples from Jack Kelly theatre glasses collection.

GOERZ ADVERTISEMENT 3X THEATER GLASS

Goerz Triöder-Binocle
No. 10.



($\frac{1}{2}$ natürliche Größe)
Preis 900.

Lineare Vergrößerung: 3 mal.
Flächen-Vergrößerung: 9 mal.
Wahres Gesichtsfeld: 13,3 Grad.
Subjektives Gesichtsfeld: 40 Grad.

Telegraphenveret für Telegraph. Bestelldng:
Trias.



The Goerz Trieder Binocle advertisement from Jack Kelly collection;



Fago Theatre glass with Diopter Adjustment from Jack Kelly collection; Copyrights picture Jack Kelly.



Fago Theatre glasses, earlier models from Jack Kelly collection; Copyrights pictures Jack Kelly.



Fago Theatre glass 2 1/2 magnification, produced in 1902, from Jack Kelly collection; Copyrights pictures Jack Kelly.

[3. Goerz prismatic models in our collection](#)

[6x20 Triöder Binocle model](#)

This model is the oldest in our collection. The production number is 45325. Looking at the list of production numbers, completed by Marko Bensi, it looks as this binocular was produced in 1902.





C. P. Goerz 6 x 20 Trieder- Binocle, No 45325 in our collection; Copyrights picture Anna Vacani

The body is covered with the original leather. This binocular, as one of the first of Goerz Trieder-Binocle models, has the body constructed of two metals: alloy aluminum and brass.

The brass parts are:

- the rack and pinion adjustment (mechanism described at next model);
- Objective rings;
- Eye lens tubes.

Measurements of the binocular:

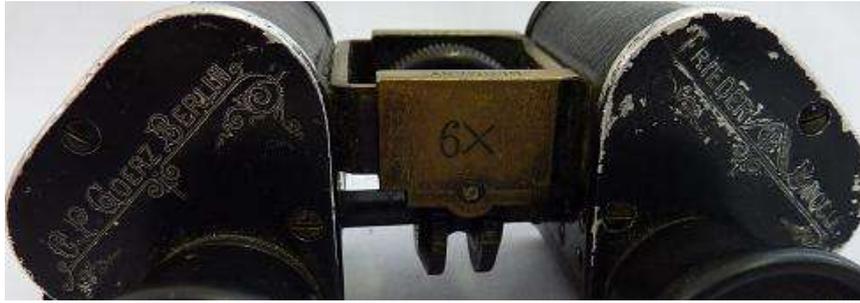
- Weight – 391 gram (13,8 oz)
- Height – 90 mm (3,54 inches)
- Width – at minimum eye width – 110 mm (4,33 inches); at maximum eye width - 120 mm (4,72 inches)

The production number is placed on the bottom bar of the adjustment mechanism.



C. P. Goerz 6 x 20 Trieder- Binocle, production number on the bottom bar- 45325 in our collection; Copyrights picture Anna Vacani

On the plates the description is in the form of ornamental leaves.



9x20 Triöder Binocle model

This model was illustrated in the catalogue: "Price list of Double-Anastigmat Lenses Goerz' Anschutz Cameras Shutters, Etc., Etc. And Triöder Binoculars Manufactured by C.P. Goerz Optical Works New York; Berlin; London; Paris" pictured above.



9x20 Triöder Binocle, No 97580 from our collection; Copyrights picture Anna Vacani

Second of our 9 x 20 binoculars' body is covered with the original leather.



9x20 Triöder Binocle, No 94158 from our collection; Copyrights picture Anna Vacani

Both binoculars were produced in 1906, according to the list of Mark Bensi.



9x20 Triöder Binocle both models from our collection; Copyrights picture Anna Vacani

This model has a little different the body construction compared to the previous model. The plates covering the prisms house and objectives plates also are made from brass.

Measurements of the binocular:

- Weight – 455 gram (1 lb)
- Height – 110 mm (4,33 inches)
- Width – at minimum eye width – 110 mm (4, 33 inches); at maximum eye width - 120 mm (4,72 inches)

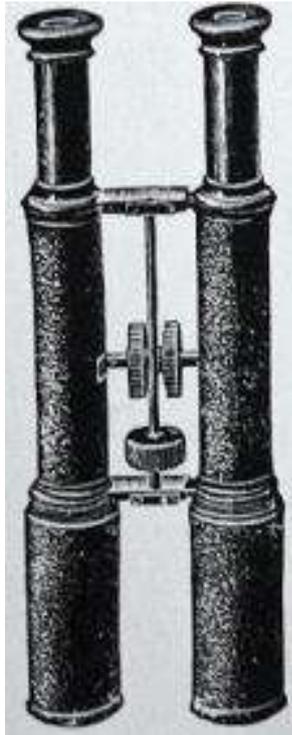
The description of the binocular changed as well. It does not have a description in the form of ornamental leaves. Only Goerz logo is in the same shape of a prism.



9x20 Triöder Binocle, No 97580 from our collection; Copyrights picture Anna Vacani

The adjustment mechanism in these two models; 6 x 20 and 9 x 20 is a very remarkable. It has the rack and pinion adjustment for the focusing and inter- pupils distance.

These kinds of adjustments were both used earlier in 1880s for double telescopes.



The picture from the catalogue: "Price list of Double-Anastigmat Lenses Goerz' Anschutz Cameras Shutters, Etc., Etc. And Trieder Binoculars Manufactured by C.P. Goerz Optical Works New York; Berlin; London; Paris"

Probably, the first time this mechanism was implemented to prismatic binoculars.



The rack and pinion adjustment mechanism and production number

The separate adjustment is on right eye piece.

In later models, this mechanism has been completely redesigned.

Frank Lagorio disassembled this model and described in details the internal construction of this binocular.



Goerz Triëder No. 30 9X20 Disassembled; Copyrights picture Frank Lagorio

Frank Lagorio described this disassembled binocular:

1. *Ocular tubes: The rectangular piece fixed to the side of each sliding ocular tube is a rack which is driven by a pinion gear to focus binocular. The left side pinion gear inside the body is visible in View 4 [picture below]. Each sliding ocular tube fits into a fixed ocular tube which screws into the rear prism plate. The interior of the fixed tube is lined with a fabric sleeve, an edge of which can be seen surrounding the base of the sliding tube protruding from the back of the prism plate.*
2. *Prism plates: The cork square on the back of each plate holds its respective prism in place. This is an early feature of binocular design which would soon be replaced by prism clamps/springs and/or glue. The French would pack the prisms in plaster of Paris. Another early feature is that the sides of each prism plate are flat fitting flush against the binocular body. Subsequent designs would have a rim surrounding each plate fitting around the binocular body better sealing it (especially when caulked) against moisture and dust.*
3. *Objective assemblies: Do not yet have eccentric rings. Collimation is done through prism adjustment often using thin paper or cork shims. Also, note that the objective assembly screws into the prism plate, not the binocular body, an early weakness in design soon to be changed.*
4. *Binocular body: The focusing/IPD assembly uses screws to connect to each half of the binocular body. These screws go completely through the body allowing for ingress of dust and moisture. The Zeiss Feldstecher hinge assembly similarly used screws to connect the halves of the body, and its strap lugs were additionally screwed into the body. On the Triëder, the strap lugs are part of the body, an advanced design for the time. Finally, the body is covered with leather which would prove unsatisfactory because of its tendency to absorb moisture, peel and shrink. The leather coverings on both the Triëder and Feldstecher in this collection show obvious shrinkage.*

Many of the improvements made to these early designs were done to meet the German army's test commission requirements for a military binocular and were subsequently applied to civilian models.

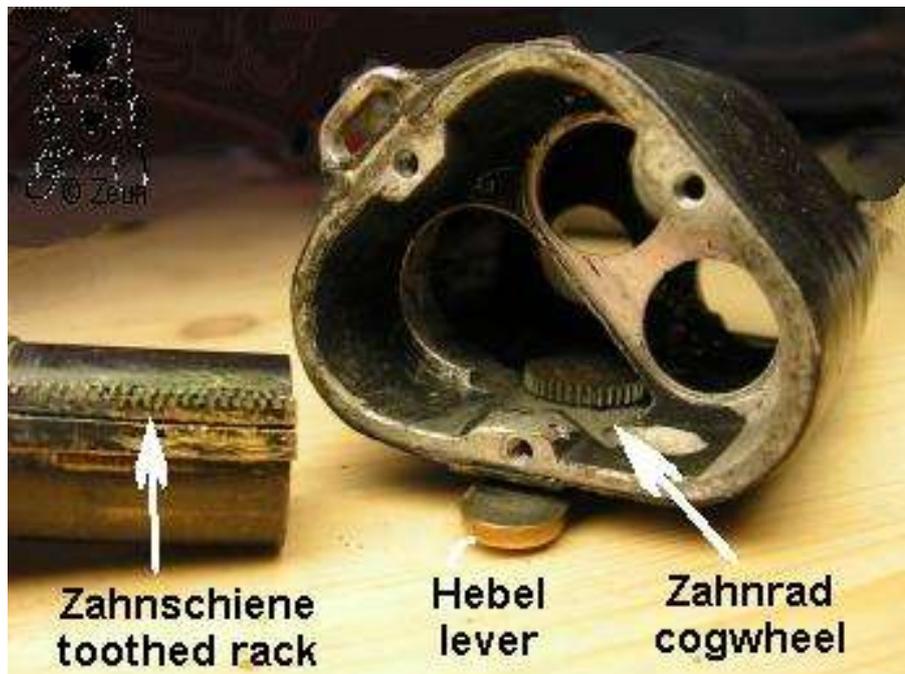


Goerz Triöder No. 30 9X20 Disassembled; Copyrights picture Frank Lagorio

The cork pieces were fitted on most slopping shoulder Carl Zeiss Jena in a period of 1900 – 1912 as well. Later on the cork was replaced with the spring clip.

But we have seen an exceptional very early Carl Zeiss slopping shoulder model of 1898-1897 with the spring clip applied.

The same adjustment system for the focusing was applied to Goerz monocular as well.



The picture from Ulrich Zeun collection; Copyrights picture Ulrich Zeun

Ulrich Zeun, the biggest enthusiast and collector of monoculars says:

"This mechanism was applied only to Goerz monoculars as far as I know. I have never seen it with some other monoculars -- even the early Hofmann monoculars, although they look the same and have a lever, work with another simpler mechanical principle inside to slide the eyepiece tube in and out. The early French Hofmann monoculars do not have the rack and pinion adjustment. The drawing in Hans Seeger's book and in other sources shows the pin I described which moves the inner tube for focusing. Although I have not seen an original Porro monocular (the forerunner of the Hofmann monocular) opened, I think it was the same simple construction instead of the more sophisticated rack and pinion Goerz used. "

The early monoculars did not have a serial number as Ulrich Zeun says:

"There is no serial number on the depicted monocular 9x20 neither on the cover plates nor on the brass lever (where it sometimes was). "

The production numbers have been given when floral (art-deco) script was no more applied.

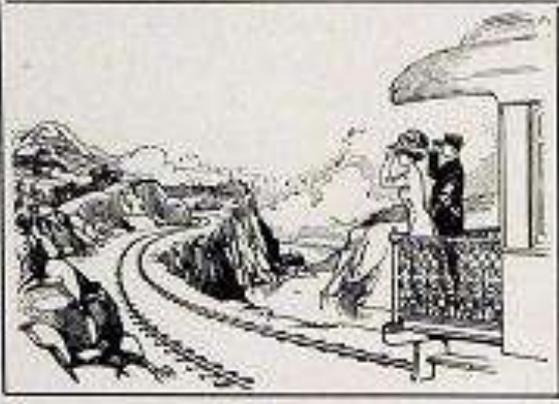


C.P. Goerz monocular 9x20, production number 49969-1903; the picture from Ulrich Zeun collection; Copyrights picture Ulrich Zeun

[6 x 15 & 10 x 15 Pagor Trieder Binocle models](#)

Model Pagor Trieder was one of the many subsequent models of Goerz. The first of this model was on the market ca. 1905. It was produced for civilian market. In the newspapers and magazines were placed many advertisements of this binocular for tourists and sport using.

TAKE A PAIR OF
Goerz Binoculars



ON YOUR MIDWINTER VACATION
They Annihilate Distance!

GIVE your friend a pair of Goerz Binoculars for Christmas. No gift could be more surely welcomed. We make them in four styles: The NEO, a universal outdoor glass, compact and efficient; the PAGOR, a small glass for campers, mountain climbers, etc.; the HELINOX, a medium sized glass excelling all others in brilliancy; and the FAGO, a theatre glass of luxe of wonderful covering power and illumination.

Ask your dealer for our catalog.

G. P. GOERZ OPTICAL CO.
319B East 34th St. New York

New York advertisement from 1912 advertised Goerz binoculars: Pagor, Neo, Helinox and Fago binoculars

Goerz Binocular "Pagor"



The smallest and newest PRISM GLASS made.
Possesses large field of view, extraordinary sharpness and clearness, even illumination to the very edge of the field of view. The excellent optical properties of this glass can only be compared to the results obtained with the CELEBRATED GOERZ LENSES.

Made in: 6x 8x 10x
Weight: 9 oz. 9½ oz. 10 oz.

Descriptive catalogue and price list free on request.

C. P. GOERZ AMERICAN OPTICAL COMPANY

CHICAGO, ILL. 1514 Heyworth Building	NEW YORK 52 Union Square East	SAN FRANCISCO, CAL. 703 Claus Spreckels Building
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The advertisement from US Goerz division ca 1905, when the name of division was changed to C.P. Goerz American Optical Company;

We have three *Pagor* binoculars in our collection: two 6 x 15 Pagor models and one 10 x 15:

- [6 x 15](#); production number 167815, according to the list of Marko Bensi it was produced in 1911.



6x15 Pagor Triöder Binocle, No 167815 from our collection; Copyrights picture Anna Vacani

Measurements of the binocular:

- Weight – 271 gram (9,6 oz)
- Height - 80 mm (3,14 inches)
- Width – at minimum eye width – 90 mm (3,54 inches) ; at maximum eye width - 97 mm (3,81 inches)
- **6 x 15**; production number 184793, produced in 1912.

Measurements of the binocular:

- Weight – 294gram (10,4 oz)
- Height - 70 mm (2,75 inches)
- Width – at minimum eye width – 90 mm (3,54 inches) ; at maximum eye width - 97 mm (3,81 inches)



6x15 Pagor Triöder Binocle, No 184793 from our collection; Copyrights picture Anna Vacani

These two binoculars of the same magnification and construction have a different design of description. The binocular produced in 1911 hold the description as model 9 x 20 Triöder Binocle, while the description of the model produced one year later is different. The words are written into triangles of prism shape.



The binocular weight is a little higher, but the height is 10 mm lower the production of the 1911.

- [10 x 15](#); production number 160286, produced in 1911



10x15 Pagor Triëder Binocle, No 160286 from our collection; Copyrights picture Anna Vacani

The description is the same as the first 6 x 15, produced in 1911.

The biggest change in the models described above - 6 x 15 and 10 x 15 is the adjustment mechanism which has been completely redesigned in comparison to the first Triëder Binocle.

The central focus mechanism moving the eye lenses up and down by wheel mounted on the bending bar.

An additional change in the Pagor models is the place of production number position. It is embossed on the side of the bending bar.



6x15 Pagor Triëder Binocle, No 167815 from our collection; Copyrights picture Anna Vacani

The body of all Pagor Triëder Binocle are built as the model 9 x 20; the plates covering the prisms housings, objectives plates, objectives rings and eye lens tubes are made from brass.

Measurements of the 10 x 15 binocular:

- Weight – 326 gram (11,5 oz)
- Height – 90 mm (3,54 inches)
- Width – at minimum eye width – 90 mm (3,54 inches) ; at maximum eye width - 97 mm (3,81 inches)



All Pagor Triöder Binocle in our collection; Copyrights picture Anna Vacani

6 x 21 Neo- Trieder models

Next civilian Goerz model in our collection is 6 x 21 Neo-Trieder.

This model was patented. On the right plate is engraved symbol D.R.P. – Patent of the German Reich (Deutsches Reichs-Patent).



6x21Neo- Triöder, No 584634 from our collection; Copyrights picture Anna Vacani

According to the production number list our binocular was produced in 1924.
The construction of this model is different to the Pagor models.

The objectives have a bigger diameter – 21. The distance between prism tubes is wider than all Pagor models. In this way, the construction of the bending bar is wider and more substantial: the central focusing wheel is larger.

The body is covered with early version vulcanite plastic imitation leather.

The production number is no more on the on the side of the bending bar, because the new model of bending bar does not have a rectangular shape. The production number with CPG logo is engraved on the bottom arm of the bending bar.



6x21Neo- Triöder, production on the bottom bending bar; Copyrights picture Anna Vacani

Our binocular has engraved a name of the binocular owner in 1925.



The objective plate with the name – Connie and date 7.10.25

Measurements of the binocular:

- Weight - 359 gram (12, 66 oz)
- Height - 90 mm (3,54 inch)
- Width - at minimum eye width – 120 mm (4,72 inch) ; at maximum eye width - 143 mm (5,62 inches)
- The field of view on 1000 m – 122,5 m

[6 x 24 Armee Trieder models](#)

This model was patented as well. On the right plate is engraved symbol D.R.P. – Patent of the German Reich (Deutsches Reichs-Patent).

Additionally, it is specified the model of the binocular – MOD 1908.



6x24 Armee Trieder, MOD 1908, D.R.P.; No 181349 from our collection; Copyrights picture Anna Vacani

Our binocular was produced in 1912.

In the German catalogue described above is a complete description of that glass as: "service glass officially introduced in the German infantry" – translated by Google.

Goerz
BERLIN

Goerz Armee-Triëder 6x24¹⁾

Als Dienstglas bei der deutschen Infanterie offiziell eingeführt

^{1) natürlicher Größe}

Optische Daten und Leistungen

Austritts- pupille	Relative Helligkeit, Lichtstärke	Wahres Gesichtsfeld		Spezifische Drehk.	Höhe	Gewicht ohne Behälter
		Winkel	auf 1000 m Entfernung			
4 mm	16	7°	122,5 m	1,85	97 mm	480 g

Vorzugspreis
mit den auf Seite 16 aufgeführten Zubehörteilen M. 85.

Telegraphenwert: Quarz
Über Strichplatten vergl. Seite 18 Bezugsbedingungen vergl. Seite 5

^{1) D. k. 6 bde. Vergrößerung, 28 mm Objektivöffnung, vergl. die Erläuterung auf Seite 6}

SEITE 10

6x24 Armee Trieder, MOD 1908, D.R.P.; in German catalogue; page 10

In the catalogue is described another Armeé Trieder model – 6 x 21. The name of the binocular and the fact that model 6 x 24 was formally qualified for use in the Army, may imply that the 6x21 was in the service Army as well.

However in the catalogue, we can see a clear description:

“Excellent tourist glass” with an explanation: *The previous (6x24) is similar but abandoned in favour of the convenience and elegance in the form of some brightness [of 6x21].*

Goerz Armeé-Trieder 6x21^{*)} 

Dem vorigen ähnlich, jedoch ill. zugunsten der Handlichkeit und Eleganz in der Form auf etwas Helligkeit verzichtet

Ausgezeichnetes Touristenglas



Vierseitiger Gestell

Optische Daten und Leitungen

Ansichts- weite	Relative Helligkeit, Leuchtkraft	Wahres Gesichtsfeld Winkel	Wahres Gesichtsfeld auf 1000 m Entfernung	Spezielles Prisma	Diabe	Gewicht ohne Behälter
5,5 mm	12,2	7°	122,5 m	1,7	90 mm	350 g

Vorzugspreis
mit den auf Seite 16 aufgeführten Zubehörteilen **M. 85.**

Telegrammwort: **Umarter**

Über Strichplatten vergl. Seite 18 Bezugsbedingungen vergl. Seite 5

*) Vergl. Seite 6 SEITE 11

6x21 Armeé Trieder; in German catalogue; page 11

This model 6x24 Armeé Trieder has all features of a modern binocular. The focus adjustment is individual to each eyepiece. In this way, the binocular can be used by people with visual impairments (with different visual perception in each eye).

This new feature caused light changes in the design of the eyepiece shell. It has fitted a special metal ring with notches for smooth manoeuvres by changing the eyepiece focus.

The body is built from the same materials as earlier models: aluminium alloy and brass plates, objectives rings and eye lenses tubes. The binoculars body is not any more covered with leather. It looks as is covered with early version vulcanite plastic imitation leather.

Measurements of the binocular:

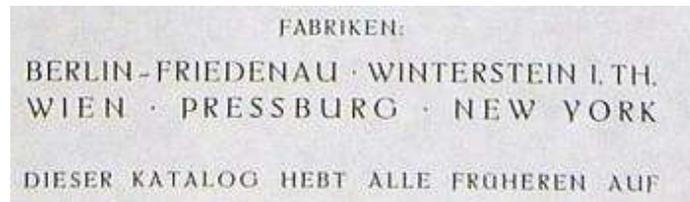
- Weight - 483 gram (1lb 1oz)
- Height - 100 mm (3,93 inch)
- Width - at minimum eye width – 130 mm (5,11 inch) ; at maximum eye width - 156 mm (6,14 inches)
- The field of view on 1000 m – 122,5 m

As on Neo-Trieder model the production number is placed on the bottom bending bar.

The bottom screw in our binocular is not original. It should be as it is showed above in the catalogue picture.

6 x 30 WIEN u. POZSONY model

Last model of Goerz in our collection is 6 x 30 Wien u Pozsony (Wien und Pozsony). This name probably means that the production was in the branch - Vienna and Pozsony (Pressburg). Pozsony was a historic administrative county of the Kingdom of Hungary. The name Pozsony changed many times; In the German language – Pressburg in 10th Century, later on and today it is Bratislava. The catalogue, in German language, specified where the binoculars described in the catalogue were produced.



Goerz catalogue (copy) in German language, in our collection; the bottom of the title page

“Dieser Katalog hebt alle früheren auf = this catalog supersedes all previous issues” – translated by Google.

This model was produced for the Austro-Hungarian Army.



6 x 30 Wien u. Pozsony, No29709 from our collection; Copyrights picture Anna Vacani

The meaning of the marks on the binocular is explained in Dr Hans Seeger book (blue). We can read in the book (translated by Google):

“Many of Vienna's military models are marked Ü.K., a double eagle (emblem of the Austrian emperor from the 14th century to 1918) [...].



Common small coat of arms (1915–1918)

http://en.wikipedia.org/wiki/Austria-Hungary#The_Great_War

Further in the book we are reading:

[...] Thomas Mix added: ‘Ü. K. means - used by artillery. The information tagged binoculars should therefore have been purchases for the KuK artillery’ [The Austro-Hungarian Army Imperial and Royal Army - *kaiserlich und königliche Armee* or *k.u.k.*] - which is located on the upper left cover. The identification is therefore an official, dated acceptance mark, roughly corresponding to the K-, J-, FLS or WaA- control stamps of German military optics – Zeiss Jena. [...]The inspection data indicate

exactly at when the binoculars were handed over to the troops, but the data do not always strictly parallel to the serial numbers.”

Further we are reading:

"Most are the Ü.K. data between 3 months and one year short of what we assume to be the date of manufacture. E.g.: Vienna Zeiss 12 x 40, Serial 312,426 has Ü.K. 7.11. 13th The Ser 312,426 a Jena production date would suggest Sept. 1912th "(Thomas Mix, personal communication).

At this point, we shall deal briefly with the model numbers of the optics, which were then used in the Dual Monarchy. The appropriate information is helpful in one respect it does indicate the year of production. So, for example, the Galilean models - M. 61, M 80, M 88, M 94, M 8 with regard to the year of production (1861, 1880, 1888,) is well defined.”



6 x 30 Wien u. Pozsony, No29709, marked Ü.K. and dated – 9.3.17; Copyrights picture Anna Vacani

In the view of the above translation, our binocular should be produced at 29.7.09 and accepted for the Austro-Hungarian Army more than 8 years later.

Dr Simon Tomlinson disagrees with that conclusion, and he writes:

“I don't think that the serial number of your binocular, 29709, represents the date of manufacture. It's just a coincidence that the last two digits are 09. Model M.9 was made for a number of years after the year of introduction, like the Fernglas 08. As far as I know, Goerz binoculars were numbered consecutively and so the higher the number, the later the date of manufacture. I don't know whether Goerz Pozsony used a separate series to Goerz Berlin. The number 29709 would be too low for a Goerz Berlin binocular made even in 1909. In my view, the true date of manufacture of your binocular is likely to be nearer to the date of the acceptance mark.”

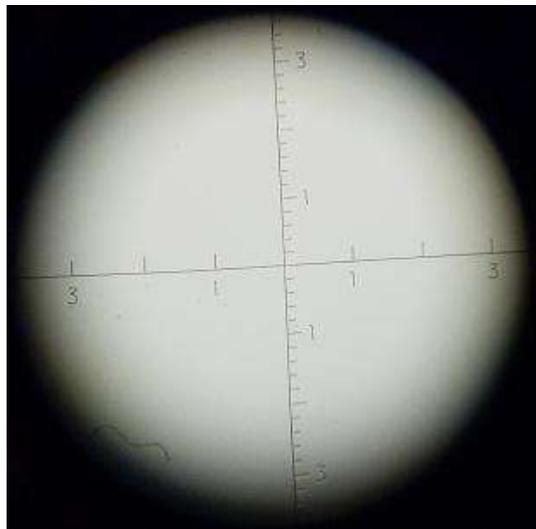




6 x 30 Wien u. Pozsony, No29709 from our collection; Copyrights picture Anna Vacani

After being adjusted for the individual viewer interocular distance, the binoculars' owner can locate that point by tightening the bottom screw on the bending bar.

The binocular, being designed for use in army, has a scale in the right eyepieces. On the right plate is engraved that the scale is inserted into binocular.



6 x 30 Wien u. Pozsony, No29709 from our collection; Copyrights picture Anna Vacani

The body is built from alloy and brass parts – top and bottom plates, objectives rings, eye lenses tubes, bending bar and width adjustment screw.

Measurements of the binocular:

- Weight - 688 gram (24,26oz)
- Height - 120 mm (4,72 inches)
- Width - at minimum eye width – 140 mm (5,51 inches) ; at maximum eye width - 172 mm (6 ¾ inches)
- The field of view on 1000 m – 150 m

In the German catalogue, in the summary table, we can read all technical data of the binoculars listed there.

Zusammenstellung

der optischen Daten und Leistungen sowie der Gewichte und Preise der in dieser Sonderpreislifte enthaltenen **Goerz Armee- und Marine-Triöder** als Anhalt bei der Auswahl eines Glases

Vergrößerung mm	Objektivöffnung mm	Austrittspupille	Relative Helligkeit, Lichtstärke	Wahres Gesichtsfeld auf 1000 m Entfg.		Spezifische Plättik	Höhe mm	Gewicht		Preis M.
				Winkel	m			ohne Behälter g	vollst. mit Behälter g	
6×	21	3,5	12,2	7°	122,50	1,7	90	350	625	85.—
6×	24	4	16	7°	122,50	1,85	97	480	850	85.—
6×	30	5	25	8° 24'	150	1,95	115	682	1165	110.—
8×	26	3,25	10,6	6° 25'	112	1,87	112	590	990	95.—
8×	38	4,75	22,5	6° 15'	110	1,95	158	815	1400	135.—
6×	39	6,3	39,7		77,4 ¹⁾	1	115	460	760	40.—
galil.					64,4 ²⁾					

Summary table in German catalogue ca 1914-1915; page 23

Other models owned by binocular collectors

C.P. Goerz for nearly 40 years produced many binocular models. Some models are completely different from the models produced at that period.

C.P. Goerz Berlin 10 x 52, 5 & 7 x 52, 5

The models from 1918 have objective diameter engraved on the prism plate, not often seen, in that time.

These two models 7 x 52, 5 and 10 x 52, 5 are a little diverse from each other not only by magnification.



C.P. Goerz Berlin 10x52, 5 from a private Norwegian collection; Copyrights pictures the owner of the binocular

The owner of the binocular says: "It is 10 x 52, 5; it is a Dienstglas number 43. V18 means it is from May 1918. Dr H.Seeger has it in his book, but as a 7x. Apparently some were made before the war ended, with 10 x. It was believed that they came with 10 x after the war ended. It was made for searchlight or balloon troops, I think."



C.P. Goerz Berlin 7x52, 5 from Dr Simon Tomlinson collection; Copyrights pictures Dr Simon Tomlinson

Looking closely to each model; the model 10 x 52, 5 does not have a bending bar. The right plates have different information. The model 10 x has additionally probably production number and the production date V18 – May 1918, whilst the model 7x, has engraved production number- 505035, on the bottom arms of the bending bar.



C.P. Goerz Berlin 7x52, 5 from Dr Simon Tomlinson collection, Production number; Copyrights pictures Dr Simon Tomlinson

[Model "M8" Armee - 6 x 24](#)

This model was manufactured in Wien u. Pozsony branch.



C.P. Goerz Wien u. Pozsony, M8 Armeemilieu 6 x 24, No 22218; from private a Norwegian collection; Copyrights pictures the owner of the binocular

This model – 6 x 24 contains a different description than model M9 – 6 x 30. The description of model M8 Armeemilieu 6 x24 is written into prism shape logo, on both plates. The right plate does not show the Austro-Hungarian emblem as it is engraved on model M9:



The production number of “M8” is much earlier- No 22218, than model M9 – No 29709. Other features of the model M8 are the same as M9 – 6x 30.

C.P. Goerz 8 x 56

This model is exceptional in some way.



C.P. Goerz Berlin 8 x 56; prod number 542144 – 1921; from Jack Kelly collection; Copyrights pictures Jack Kelly

Thomas Mix has written the history of the creation of this binocular:

“In August 1917 the War Department ordered Goerz, Zeiss and Leitz to develop handheld binoculars with a 70° field of view, 8X magnification, and an exit pupil of 7 mm, Leitz built two prototypes, a

7x50, and an 8x56 with the enormous field of view of 157 m at 1000 m (9", light intensity L = 56). Goerz/presented the very heavy 8x56, labeled "Marine-Nachtglas," in February 1918. Its field of view was 150 m at 1000 m and it weighed 3,500 grams, compared to the 2,565 grams of the Leitz 8x56. Zeiss presented its own development, an 8x60 with a field of view of 153 m at 1000 m (8 3/4") in 1918.



Carl Zeiss 8 x 60 binocular, early model – deck mount, Porro II; with big letter “T”; No 1053930 in our collection; Copyright pictures Anna Vacani

Zeiss got the order. [...] a few of the Goerz/ 8x56 models were built and sold on the civilian market. “

It is first type of Porro II - 8x 60 models. Short description of that binocular is on [page 1 – German binoculars of our web site.](#)



C.P. Goerz Berlin 8 x 56, production number 542131 from Dr Simon Tomlinson collection; Copyrights pictures Dr Simon Tomlinson

Dr Simon Tomlinson says:

"This is a Porro I model with large prisms and wide-angle eyepieces. The serial number is 542131, which indicates that it was manufactured in 1921, according to Marco Bensi's list. There are no loops on the body to attach a neck strap. It came in the original wooden box which is lined internally with leather pads to protect the binocular.

This model is illustrated and described on p.327 of Hans Seeger's "grey book". It was also shown in von Hofe's "Fernoptik", published in 1921. (A lot of the optical instruments used to illustrate this book were produced by Goerz.) The model illustrated in Fernoptik has a reticule illuminator on the eyepiece and strap loops. I haven't seen these features on any of the few surviving examples that I have seen offered for sale."



The page from the book- "Fernoptik", von Hofe published in 1921; the page from "Fernoptik" kindly sent by Dr Simon Tomlinson.

We can see in the illustration, that the binocular has fitted strap loops. In the pictures of the binoculars sent by Jack Kelly and Dr Simon Tomlinson and in other pictures of that binocular the loops are not present.



C.P. Goerz Berlin 8 x 56; prod number 542144 – 1921; from Jack Kelly collection; Copyrights pictures Jack Kelly

The binocular was supplied in a wooden box which was cushioned. The box gives impression as it was homemade.

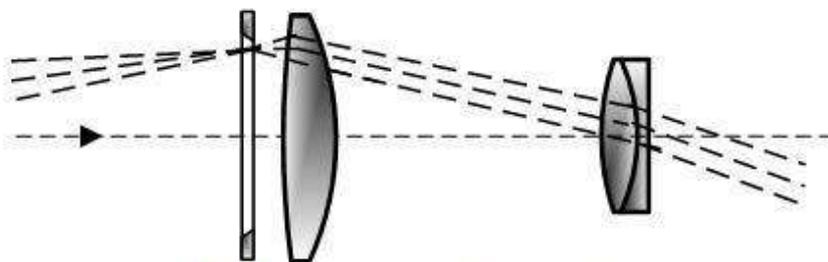




C.P. Goerz Berlin 8 x 56 in the box from Dr Simon Tomlinson collection; Copyrights pictures Dr Simon Tomlinson

The binocular body is built from an alloy with black leather covering. It is a heavy handheld binocular – 3082 grams (6.79 pounds). It is 141 mm (5.55 inches) height and 246 mm (9.96 inches) width. The field of view is wide – 150 meters at 1000 meters. Some collectors say that the wide field of view of 8 x 56 Goerz is achieved by applying Kellner ocular.

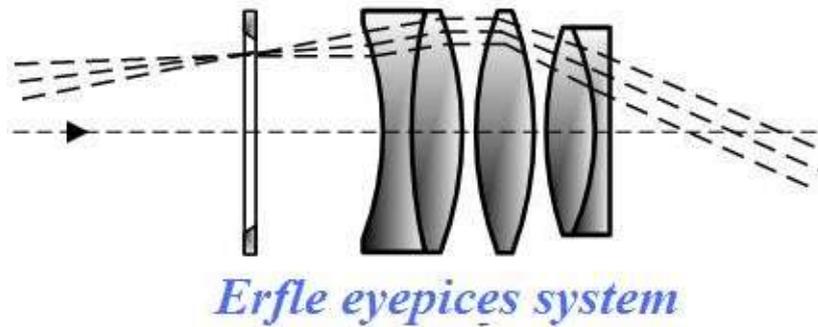
Kellner Ocular System: Three part system of lenses between the prism and eye consisting of one achromatic lens and one simple lens. This system is excellent for a standard field of view.



Kellner eyepice system

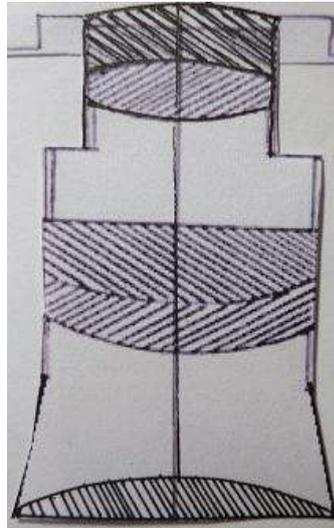
The Kellner ocular system in diagram

Erfle Ocular System: Five part system of lenses between your eye and binocular prism consisting of two achromatic lenses and a simple lens. This system affords a wide field of view.



The Erfle ocular system in diagram

None of these two optical systems were not fitted into 8 x 56 Goerz binocular. The 8 x 56 Goerz was taken apart and it turned out that the optical system of the ocular was different from Kellner and Erfle optical system. It was five parts structure of lenses, but completely deferent from Erfle system. It looks like in this diagram:



The 8x56 Goerz ocular system in diagram

Terry Vacani says: "Seeing the optic system in 8 x 56 Goerz, I was astonished that it looks exactly as the Japanese optic arrangement in the binoculars - Nikon 20 x 120 and the 15 x 80 binoculars has similar optic construction. Through my long experience with Japanese binoculars, I am sure it was copied from 8 x 56 Goerz".

In the book: "Fall of the German Empire 1914-1918", Volume II, page 234 we are reading that in January 29, 1918, in Berlin Vorwärts No 29, p.1 (was the central organ of the Social Democratic Party of Germany published daily in Berlin from 1891 to 1933) was writing: "According to the estimates of the Strike Directorate there were about 250,000 strikers yesterday [...] work is completely stopped at the Goerz"

It was heard that at that time, some technical managers (?) of the Goerz factory were employed by Japanese optic company for a short contract.

Peter Abrahams writes: "WWI brought on difficulties in obtaining the German optical glass [in Japan] [...] in 1915, due to the difficulties in importing German optical glass, the Japanese Naval Institute of

Technology in Tokyo began to develop optical glass manufacture [...]with the design and production of lenses beginning in 1918. The Institute was destroyed in the 1923 earthquake, and the technical staff joined Nippon Kogaku. The Nikon Corp. web site lists 1918 as the year that optical glass research and production began at Nippon Kogaku. In 1921, the Osaka Industrial Material Testing Laboratory (part of the Ministry of Agriculture and Commerce) began research into the production of optical glass, which at the time was imported from England, France, and Germany. [...]In 1921, eight German scientists & engineers were hired for five years: Max Lang, Hermann Dillmann, Ernst Bernick, Otto Stange, Adolf Sadtler, Karl Weise, Albert Ruppert, and Heinrich Acht (the principal engineer). One of the first tasks for the group was redesigning NK binoculars,” - Outline of Japanese binocular production, by Peter Abrahams, telescope@europa.com

It seems as it was two models of 8 x 56 Goerz Marine-Nachtglas. One produced as a military model with the strap loops and illuminated reticule for observation of air targets and out of a military balloon as well, illustrated in the “Fernoptik” book. Then a civilian model for only handheld – without a strap loops and a reticule.

Unfortunately, the military model was not seen on the market.

According to Thomas Mix the 8 x 56 Goerz Marine-Nachtglas binocular; *“was not produced as a military model - all serial numbers of 8X56 are dated later. I have a picture from 1921 showing the Goerz 8X56 in the binocular assortment of the Goerz factory.”*

V. Summary

Summarizing whole production period of Goerz Company, we can observe some general issues.

1. The first and in our opinion the most important, that C.P. Goerz paid the biggest attention to the development of the optic system in the binoculars field and in the photographic field.

It was not only a Goerz Company innovation, at that time, but a main issue in optics because;

- Good lenses in binocular presents the most clear view;
- A good lens in the camera gives the sharpest picture.

2. Through a short history of C.P. Goerz Company production, we can observe that the factory manufactured many models. Sometimes there were tiny changes in a following model, but it was noticeable improvement like:

- Constant development of the adjustments features of the binoculars from unusual regulation like- the rack and pinion adjustment next screw washer and individual eye adjustments.
- Shapes and weigh. And elegancy as they said – particularly in the theatre glasses
- Innovations – camera- binocular-theatre glasses.
- Good managements – advertisements and production in a few places around the world

We are presenting Goerz models from our collection and a few from other collections. However, the company produced many models, in four countries; Germany, Austro-Hungarian, Russia and US. Some models were produced in short quantity.

If our visitors have in their collection other and uncommon models, please send to us a picture – with a short description, and we will be very happy to present them.

The readers’ annotations

Bibliography

The following sources were used during the writing of this article:

- Prof Dr Antoni Piaskowski – Dawne Lunety I lornetki w Zbiorach Polskich (Old Lunettes and Binoculars in Polish collection).
- Dr Hans T. Seeger - Zeiss-Feldstecher Handferngläser von 1894-1919. Modelle - Merkmale - Mythos. (blue book)
- Hans T. Seeger – Feldstecher Ferngläser im Wandel der Zeit (red book)
- Dr Stephen Rohan – A Guide to Handheld Military Binoculars 1894-1945
- Catalogue – “Optische Anstalt C. P. Goerz Aktien Gesellschaft Berlin-Friedenau”, published ca 1914-1915; for Goerz factories produced in Berlin; Vienna-Pressburg and New York
- Catalogue: “Price list of Double-Anastigmat Lenses Goerz’ Anschutz Cameras Shutters, Etc., Etc. And Trieder Binoculars Manufactured by C.P. Goerz Optical Works New York; Berlin; London; Paris”, published in 1903
- Thomas Mix – “The rise and fall of the C.P. Goerz Company”- Zeiss Historica, Fall 2010, pages 8 - 16
- http://de.wikipedia.org/wiki/Optische_Anstalt_Goerz#cite_note-0
- http://en.wikipedia.org/wiki/Austria-Hungary#The_Great_War
- <http://home.europa.com/~telescope/goerz.txt>
- http://en.wikipedia.org/wiki/Pozsony_County
- <http://www.historiccamera.com/cgi-bin/librarium/pm.cgi?action=display&login=goerzco>
- <http://camerapedia.wikia.com/wiki/Goerz>
- http://www.rbb-online.de/heimatjournal/archiv/heimatjournal_vom145/carla_kniestedt_ist.html
- <http://www.monocular.info/>