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HINTS ON LENSES

BY

DR. HANS HARTING, F.R.P.S.

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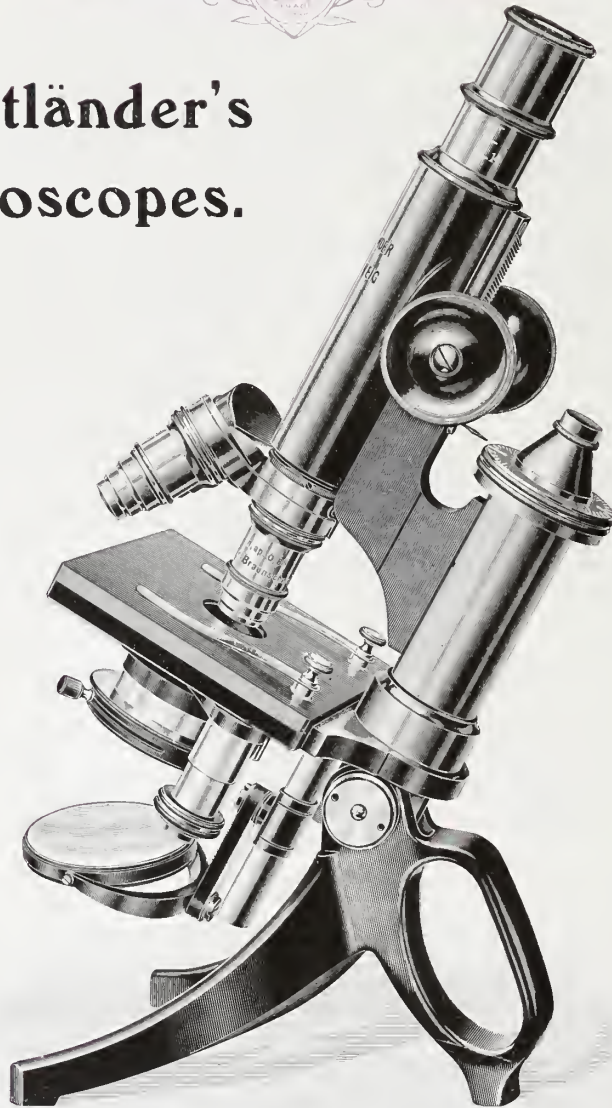
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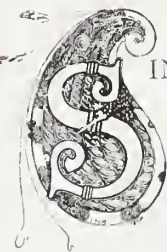


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I. Preface.



SINCE the publication of our last price list, a large number of innovations have been introduced by us. Among photographic Lenses the **Heliar**, **Dynar**, and **Oxyn** series have become immensely popular in the photographic world. We have also provided the serious worker with a useful addition to his outfit in the shape of our new Light Filters. These come as a great boon at a time when the progress in the preparation of plates sensitive to colour is so marked.

Having considerably enlarged our factory to enable us to manufacture Cameras, we are now in a position to supply complete photographic outfits which will meet all requirements. We direct your special attention to our **NEW METAL and REFLEX CAMERAS**, which, owing to the nature and traditions of our factory, are absolutely reliable.

Quality is remembered when price is forgotten. We do not enter into competition with those manufacturers who produce Cameras



at prices so low as to be prejudicial to their quality. But, on the other hand, we guarantee that each part of our apparatus is dealt with singly, and is brought to the highest degree of perfection. For this reason our prices **must** necessarily be higher in proportion to the excellence of finish. The initial outlay will, however, find full compensation in the greater reliability and durability of our apparatus.

In order that photographers may more clearly understand the conditions under which photographic lenses and apparatus—especially those of our own manufacture—work, we have prefaced the price list proper by some details respecting the practical selection of photographic lenses and cameras, written by Dr. H. Harting, F.R.P.S. Although somewhat lengthy, these details will satisfy a real want felt by many, if not all, photographic workers, because they treat questions which have been asked by many intending purchasers of Lenses and Cameras.

If, by publishing these details, together with the appended price list, we have succeeded in meeting the wish of the photographic world, then the goal of our endeavours has been reached.





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The Judicious Selection of Photographic Lenses and Cameras.

By Dr. H. HARTING, F.R.P.S., F.R.M.S.



IN order to get an adequate photographic outfit for a definite purpose, it is in the first place necessary to know how far our requirements can be judiciously realized, and whether they do not at the outset surpass certain limits which have been fixed by the laws of nature. It will be necessary to bear this in mind, especially in the **choice of a lens**.

We shall therefore try in the following pages to explain the general capabilities of lenses, as far as necessary for individual selection, and at the same time to point out the limits within which the ambitions of the photographer must be restrained.

The following tables of the **Voigtländer Lenses** given in this first part, show that there is a selection sufficient for every requirement. At this point it cannot be too strongly urged that for practical working it is necessary to be clear, **first of all**, as to which lens is the most suitable, and then to select **the camera and accessories**.

If the opposite method be chosen, it is certain that the right outfit for a fixed purpose will not be acquired. One begins to make alterations in the apparatus, and in the end is compelled to spend more time and money than would have been necessary if the right way had been followed at first.

We desire to impress the reader with the fact that the assortment of lenses contained in the **Voigtländer Series** meet every requirement

Among the
Voigtländer
series
photographers
will find the
lens they
require.

The camera to
be adapted for
the lens and
not vice-versa.

of the up-to-date photographer. In the event of requirements which need special construction we shall be pleased to give estimates for the manufacture of the necessary apparatus.

THE LENS.

In the first instance all kinds of lenses can be classified according to their

Focal Length.

By the focal length of a lens is meant the distance of its foci from its cardinal point, or, in other words, the distance between the ground

From the focal length and the distance of the apparatus from the object results the proportion between the size of the object and that of the image.



Photo by M. Dixon & Co

Motor Boat travelling at full speed.
Taken with a Voigtländer Collinear Lens, Series II.

glass and the plane of the diaphragm when the lens is focussed on a point infinitely far away. The focal length is the indication of the size in which the image of any object is produced; the greater the focal length, the larger the image appears on the ground glass, whilst the size of the diaphragm does not alter the size of the image.

The **marking** of the lenses in **centimetres** according to their focal lengths has been invariably maintained by us, for the reason that the necessary measurements for carrying out any photographic process are thus given at a glance, whilst the marking with numbers, although appar-

Voigtlander lenses are marked in centimetres according to their focal lengths.



Photo by M. Dixon & Co.

Speed Trials in Southampton Water.
Taken with Collinear Lens, Series II.

ently more simple, yet renders a reference to the price list always necessary.

A further classification of the lenses with regard to their capacity for giving, with even the shortest exposures upon the sensitive plate, an image more or less distinct even in the shades is indicated in figures which express the

Luminous Strength.

Behind every photographic lens is fixed a contrivance which enables the regulation of the quantity of light reaching the plate in a given time. This is called the **diaphragm**. If it is desired to regulate the supply of light rapidly and at will, an **iris diaphragm** is necessary. The moveable parts of this, by convenient turning of the ring of the

For regulating the intensity of light, iris or ordinary diaphragms are used.

diaphragm fixed on the cylinder of the lens, produces any opening required. If such a variety of sizes is not essential, then it is better to make use of a fixed diaphragm, which is introduced from outside into the cylinder of the lens in the form of a **slide diaphragm**. But in by far the greatest number of cases it is advisable to make use of the iris form.

The size of the diaphragm has an influence on the **brightness** of the image sketched by the lens; the narrower the diaphragm the darker the image appears on the ground glass. But one must not confuse between the *aperture of the diaphragm* and the *effective aperture* of the lens. This is equal to the diameter of the image which the part of the lens in front of the diaphragm gives of the diaphragm itself. Only



Taken with Reflex Camera and 18 c/m Heliar Lens.

in one case is the diameter of the diaphragm equal to that of the effective aperture, viz., when the diaphragm stands **before** the lens. In all other cases the diaphragm is **smaller**, because the cone of rays passing through the effective aperture on its way to the diaphragm, in consequence of the

collecting activity of the lenses, aims at a point placed nearer to the objective than before its refraction upon the first lens surface. **The proportion between the effective aperture and the focal distance** is known as the *aperture proportion*, the *relative aperture*, or the *intensity of light*. But it follows from what has been said that it is wrong to try to calculate, by means of this figure, the diameter of the respective diaphragms from the focal length, because it is impossible, by means of the figures given in the list, to fix the proportion between the effective opening and the opening of the diaphragm.

In speaking of the intensity of light from a lens, the greatest intensity possible is that which corresponds to the largest aperture of the

A distinction must be made between the aperture of the diaphragm and the effective aperture.

The intensity of light of an objective is effective aperture by focal distance.

The diaphragms of the Voigtländer lenses are scaled on the English or "Stolze" system.

diaphragm. The number is the standard for every series, and is accordingly marked upon each lens.

For the purpose of rapid working a scale is placed on the iris diaphragm, upon which are indicated the various openings. This scale is the same as that of the slide diaphragm of the **English system**, or of that proposed by **Stolze**.

The diminution of luminosity in a square proportion corresponding



Taken with an 18 c/m Heliar Lens.

Photo by E. Raupp.

to the diminution of the diameter of the diaphragm and of the effective aperture gives the following series: $\frac{1}{2}$, 1, 2, 4, 6, 8, 16, 32, 64, 128, 256, 512, iv.

If, for instance it has been found that with a lens stopped down to F 6.3 the exposure is to last one second in order to obtain an image answering the purpose, then with a further stopping down to F 18 the exposure must last eight seconds.

We would mention here that our lenses have the **same focussing for all diaphragms**.

The time of exposure increases in square proportion to the stopping down.

The Voigtländer lenses have the same focussing for all diaphragms.



Hampton Court.

Photo by C. Hofman, Esp.

Taken with Voigtlander $\frac{1}{4}$ -plate Film and Plate Camera and Voigtlander Collinear Lens, Series III.

A further classification of photographic lenses is due to the question as to whether the various **single lenses** form for themselves alone a **useful object glass**.

According to this we distinguish between double lenses, which consist of two equal halves symmetrically arranged towards a diaphragm standing in the middle, and each of which can be used by itself, and between lenses the various parts of which, cannot be used by themselves, or in which an exchange of one lens for another for the purpose of changing the focal distance is impossible if the whole system is working satisfactorily.

To the group of the symmetrical double lenses belong the **Collinears**, which are divided into four series, according to their intensity of light. The use of the **single lenses** makes it possible to put together, into one, two halves of the same series which, however, differ from each other in their focal distance, and in this way the so-called **sets** are formed. The **Euryscopes** belong also to this kind.

Unsymmetrical lenses, the single parts of which cannot be used independently, are: The **Heliar, Dynar, Oxyne and Portrait Lenses 1a and 1.** It will easily be understood that other conditions being equal, the double lens deserves the preference on account of the generality of its use.

Concerning the working capacity of the lenses, it must not be forgotten that every optical instrument can only fulfil those conditions which are not contrary to the laws of nature.

To settle once and for all the matter offering most difficulty to photographers, **it is impossible to make an optical instrument which, while giving a great intensity of light, possesses a wide image free from astigmatism curvature and that depth** which can be observed in strongly stopped down photographic object glasses. It must never be overlooked that it is unavoidably necessary in increasing the working capacity of a photographic lens in *one* direction (for instance, in that of the intensity of light), to leave out of consideration other conditions (as, for instance, that of increased depth).

The symmetrical lenses, other conditions being equal, deserve the preference. Pages 31, 32, 33.

Great depth cannot be united with great intensity of light.



Photo by F. R. Hatch, Esq.

A Norfolk Homestead.

Taken with Collinear Lens, Series III., 18 cm.

If an object at a certain distance from the camera is sharply focussed with a lens affording great intensity of light (for instance, with a Collinear Series III., which has the intensity of light F 6,8), it will be observed that other objects which are **before** and **behind** are **indistinctly** reproduced on the ground glass. But the more the diaphragm is closed, the wider becomes the region of focus and more distinct the reproduction



Taken with Dynar Lens.

of the object. By stopping down, therefore, greater **depth** is gained.

If, without changing the position of the camera, the Collinear Series III. is replaced by a Heliar, with the intensity of light F 4,5 and equal focal distance, the depth will be found to have become less. But if the Heliar is stopped down to the relative opening of F 6,8, it will be seen that the depth becomes exactly like that of the Collinear F 6,8. This experiment merely proves the truth of the physical law:

Under otherwise equal conditions (focal distance and distance

from the object) the depth is independent of the kind of lens, but it only depends upon the proportion of aperture. It is impossible to increase the depth without diminishing luminosity.

How far objects may be placed from the lens in order to still appear distinctly on the ground glass, depends (since **depth is a relative conception**) upon the requirements of the photographer in regard to the photograph. Entirely setting aside the work of technical reproducers, to whom special demands are made, it is possible to set down certain possibilities which may as a rule be obtained.

Let us suppose that the lens be focussed upon a very small luminous point, the image of which has on the ground glass an infinitely small diameter. If either we move farther back or approach the ground glass to the lens, the point widens itself into a small circle, because the cone of rays aiming at the point of the image is no longer crossed by the plane of the ground glass at the point. Such a point when situated nearer necessitates a greater distance of the ground glass, and a point further away a smaller one. It follows then that in focussing upon a point lying between the two, the image of the nearer and of the farther one is drawn out into a small disc. This is called the **diffusion circle**, and forms the measure for the indistinctness which must result from the shifting of the ground glass from the plane of sharp focus.

The question of the best focussing and the giving of equal value to

For different lenses at equal focal range and distance from the object the depth is greater, the smaller the relative aperture.



Taken with Collinear Lens, Series II.



the indistinctness of depth can only be discussed in working with lenses of shorter focal distance, as fitted in hand and smaller stand cameras. It is sufficient therefore if, with lenses having focal lengths of from 6 to 24 centimetres, we take an **average** figure for the **diffusion circle**, viz., **0.1 mm.** This figure has been arrived at through experience, and must be increased or diminished according to requirements. In by far the most cases it will be safe to admit an enlargement of the dispersion circle to 0.2 mm.

Depth may thus be defined as the removal either to or from the sharply focussed object, in which takes place an enlargement of the image of a minute point into a small disc of 0.1 mm. in diameter.

The following Table I. gives in metres the focal distance and the proportion of opening from the apparatus of the photographer, up to which, in case an object was focussed at an infinite distance, it can be from the infinite put forward without suffering a greater want of distinctness than 0.1 mm.

Table I.

Focus in c/m	APERTURE.								
	F 4.5	F 6.3	F 7.7	F 9	F 12	F 18	F 25	F 36	F 50
6	8	6	5	4	3	2	1.5	1	0.7
9	18	13	11	9	6	4	3	2	1
12	32	23	19	16	11	8	6	4	3
15	50	36	29	25	18	12	9	6	4
18	72	51	42	36	25	18	13	9	6
21	98	70	57	49	35	24	17	12	9
24	128	91	75	64	45	32	23	16	11

You focus, for instance, with a Collinear Series III., of a focal length of 12 cm., stopped down to F 9, on an object at infinity, how far does the sharpness extend from the infinite to the apparatus?

The figures belonging to the focal distance of 12 cm. are on the third horizontal line; those belonging to the intensity of light, F 9,



A Critical Test of Rapidity with depth of Focus.

Taken with Collinear Series III, No. 4, at Full Aperture.

are in the fourth vertical row. Where these two lines cross each other stands the figure 10. Consequently the want of sharpness characterized by the dispersion circle of 0,1 mm. in diameter begins at a distance of 16 metres.

For practical purposes you will not be satisfied with this result, but you will try to gain greater depth by not focussing from the start upon an infinite distance, but upon **the point up to which the distinctness extends in a forward direction**, on the distance therefore of 16 m. In so doing you get towards the back the infinitely distant objects with a dispersion circle of 0,1 mm. and to the front all those objects which have the same distance from the apparatus, consequently 8 metres, and these also with the still allowed diffusion circle of 0,1 mm.

If, therefore, you focus upon an object, the distance of which is indi-

You do not focus at an infinite distance, but upon a nearer point, the distance of which results from Table I.

cated in the above-mentioned table, corresponding to the focal distance and the opening proportion, you focus the objects at an infinite distance as well as all those points which are placed at a distance equal to one-half of the figures given in the table.

Again, if the limit for the sharpness is fixed at 0,2 mm. of dispersion circle, the zone of indistinctness in the above example only begins at a distance of 4 m.

In order to be complete we give a further Table II., from which, for focussing at a distance of 6 metres from the diaphragm of the lens, the distances of the points in a forward and backward direction can be taken, which appear just distinct enough for a dispersion circle of 0,1 mm.

Table II.

Focus.		APERTURE.																			
		F 4.5		F 6.3		F 7.7		F 9		F 12		F 18		F 25		F 36		F 50		F 70	
		Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward	Forward	Backward
c/m																					
6		3.4 23	2.9 ∞	2.6 ∞	2.4 ∞	2.0 ∞	1.5 ∞	1.2 ∞	0.9 ∞	0.7 ∞	0.5 ∞										
9		4.5 8.9	4.1 11	3.8 11	3.6 17	3.1 71	2.6 ∞	2.1 ∞	1.7 ∞	1.3 ∞	1.0 ∞										
12		5.1 7.4	4.8 8.1	4.6 8.8	4.4 9.4	4.0 12	3.5 23	3.0 ∞	2.4 ∞	2.0 ∞	1.5 ∞										
15		5.4 6.8	5.2 7.2	5.0 7.5	4.9 7.8	4.5 8.9	4.1 11	3.6 23	3.1 94	2.6 ∞	2.1 ∞										
18		5.6 6.5	5.4 6.8	5.3 7.0	5.2 7.2	4.9 7.8	4.5 8.9	4.1 11	3.6 17	3.1 63	2.6 ∞										
21		5.7 6.4	5.5 6.5	5.4 6.7	5.4 6.8	5.1 7.2	4.9 7.9	4.5 9.0	4.1 11	3.6 18	3.1 110										
24		5.7 6.3	5.6 6.4	5.6 6.5	5.5 6.6	5.3 6.9	5.1 7.3	4.8 8.0	4.4 9.4	4.0 12	3.5 21										

The depth extends from sharply focussed points farther in the direction from the lens than towards it.

For instance, in a lens with a focal length of 18 cm., and an aperture of F 9, the space that is sharply reproduced extends from 5,2 to 7,2 m., if the point focussed on the ground glass is at a distance of 6 m. from the diaphragm of the lens.

From these lists it will be seen that the **depth in backward direction is greater than that in front**, and, further, that **with equal proportions of aperture the depth is greater with small focal lengths than with large ones**.

In reality, however, if we eliminate special cases, such as architectural, photogrammetrical, tele-reproductions, and other photographs, the so much dreaded want of sharpness in depth is not of great importance in lenses of strong luminosity. On the contrary, the very want of sharpness contributes to make a **"taking picture,"** and to tone down the accuracy so objectionable in many photographs, so that the result is a harmonious ensemble. Through strong stopping down of the lens the principal group of the picture and the disturbing accessories are faith-

The want of sharpness in depth can be utilized in the production of artistic images.



Taken with a Heliar lens, F 4.5, 18 c/m focus.

fully committed to the plate. Thus, in using lenses with **strong luminosity**, a means is given whereby distinctness and indistinctness may be cleverly distributed so as to impart **depth** and **life** to a picture, in opposition to the dead flatness of photographs of trenchant sharpness made with small diaphragms. Even if it is not a question of instantaneous exposures, which require a great intensity of light, the principle will always have to be followed. It is necessary to work with as large a diaphragm as possible.



That it is possible, by means of a clever distribution of sharpness and indistinctness, to obtain quite remarkable results, is shown by the picture of the Berlin-Naples express train which was taken with a Heliar lens F 4.5, focal length 18 cm., at an angle of 45 degrees from a distance of 12 m., travelling at a speed of 50 miles per hour, and this, besides, in winter time. The sharpness is so great that the 9 by 12 cm. plate could be six times enlarged upon a plate of 55 by 66 cm.

According to what has been said, it is absolutely necessary, in judging the work done by a photographic lens, to examine the picture of a plane object standing **vertically to the axis of the object-glass**, in order to avoid the influence of the indistinctness of depth. The Voigtlander lenses are free from all these faults, which no first-class lens should possess. We especially point out the fact that the so-called

Coma,

which betrays itself by the lack of brilliancy and absolute sharpness of the image, **is absent in all our lenses**, whilst the symmetrical or nearly symmetrical anastigmats, which consist of four non-cemented lenses, and which are at the present time much in vogue, show this defect very frequently and distinctly. If, for instance, coma was not so completely absent from our Heliar, this lens could not be used for process work with the greatest diaphragm, F 4.5.

Only with regard to one kind of defect in optical instruments we must make a division of our lenses, viz., with regard to

Astigmatism and the Curvature of the Image,

and on this ground we divide them into Anastigmats and Astigmats.

If we continue to make the latter, to which belong the two unsymmetrical Portrait lenses, Series 1a and 1, and the two series of Euryscopes, it is done for very weighty reasons, which are justified by an experience of many years. The four series mentioned are exclusively used by professional photographers for the reproduction of objects at very short distance. Owing to the small depth of the two first-mentioned series, the Anastigmats offer no advantages, whilst in the two Euryscope

All Voigtlander lenses are free from Coma.

Four series of the Voigtlander lenses are astigmats: they are only used for the studio and for Cinematographic exposures as well as for projection.
Pages 33, 34.



Taken with Voigtlander Lens, F45.

A. Grainer.



Series the easier production and the corresponding lower price explain their being maintained in our list.

In outward appearance the **Astigmats** are distinguished by their much more **elongated structure**. The sharp field of the astigmats is very far behind that of the anastigmats of equal focal length and aperture, and even with a strong stopping down their work is far inferior to that of the Anastigmats. The sharpness characteristic of the astigmats is specially useful to portrait photographers, but one must not on this account attribute to them a greater delicacy in the sharpness than is given by our anastigmats, which are specially constructed with a view to avoid coma.

In the choice of a lens it should be kept in mind **that for the amateur photographer only anastigmats are suitable**, for one reason because he rightly asks for a large image at **full aperture**, and in the second place, because the unwieldy shape would render instantaneous exposures almost impossible for him.

But with the exception of the above four series, all our objectives are anastigmatically planed over a wide field. How great the extension of the sharp image is, depends for the most part upon the intensity of light which the lens possesses: **the greater the intensity of light of the system, the smaller the field**.

It must, besides, be taken into consideration that a lens with great intensity of light, if stopped down to the aperture of one of less intensity of light, is inferior to the latter in extension of the sharp image. If, however, you have to choose between two objectives of equal focal length, you should, as a rule, take the one with the greater intensity. This course finds its full justification in the fact that inferiority in the extension of the field is amply compensated by the advantage of a shorter exposure, and by the possibility of gaining in artistic effect on account of the smaller depth.

If, in the enumeration of our various lenses, the size of the plate is given, that means that in the **Anastigmats** this plate will be **absolutely sharp to the edge**.

For the amateur photographer only anastigmats are suitable.

These have also, together with a great intensity of light, as large an anastigmatically planed field as can be produced by the use of all efficient means.

We must, however, point out explicitly that the expression, "perfect sharpness to the edge," is, to a certain extent, vague, as in the various kinds of photographic work different standards of sharpness of the image are set up. The portrait photographer desires to give to his photos a certain softness, and makes use, in a clever way, of the indistinctness of depth. The landscape



Taken with a Collinear Lens, Series II.

photographer, on the other hand, wants a sharpness which allows of enlarging the negatives to several times their original size. The reproducing photographer requires absolute sharpness of lines which will stand a sharp examination by the aid of the magnifying glass. Finally, the astronomical photographer makes such pretensions as to the limitation and distinctness of the photos obtained from stars that for him only small sizes are of use.

The figures given of the sizes of plates for the Voigtländer lenses have in all cases been certified by experience as correct.

If now, in spite of the different ideas about a necessary sharpness, we make only one-sided statements, we do so on the strength of our many years' experience, which we have gained by our own observations and an extensive exchange of opinions with the purchasers of our lenses. Without hesitation we give every guarantee that in making suitable use of the Voigtländer instruments our statements will be confirmed.



Taken with Collinear Lens, Series II.

It is our principle to make, in a case of doubt, rather limited statements as to the working capacities of our goods, so as to do justice even to the most exacting requirements. For this reason, we ask our customers to make a comparison of our instruments with those of other makes, **not merely as regards prices**, but rather to make a more thorough-going examination of our instruments, comparing the focal length, the proportions of aperture, etc., etc. In a test of this kind we are quite

The testing of lenses should only be made by examining the image of a plane object.

certain that our lenses will confirm all that has been claimed for them.
As it is of importance also to know the

Angle of the image,

so as to compare the instruments one with another, there are given here-



Taken with a Heliar Reflex Camera, 18 c/m lens.

after two tables which give the relation between the angle of the image, that is to say, the angle under which appears the diameter of the plate from the back cardinal point when focussing on the infinite, the focal length and the diameter of the plate.

For practical use, table IV. is arranged in such a way that the diameter of the plate results from the focal length, in centimetres (vertical entrance), and the angle of the image in degrees (horizontal entrance). It goes without saying that there is not the slightest difficulty

The angle of the image is obtained from the diameter of the plate and the focal length.

Table III.

Size of Plate in c/m	6 × 9	8.5 × 10	8.3 × 10.8	9 × 12	10.2 × 12.7	9 × 14	12 × 16
Diameter in m/m	108	131	136	150	163	166	203

Size of Plate in c/m	13 × 18	13 × 21	16 × 21	18 × 24	21 × 27	24 × 30	26 × 31
Diameter in m/m	225	247	264	300	342	384	406

Size of Plate in c/m	30 × 40	35 × 45	40 × 50	45 × 55	50 × 60	55 × 65	60 × 70	70 × 80
Diameter in m/m	500	570	640	711	781	851	922	1063

Table IV.—Diameter of Plate in Millimetres, Focus in Centimetres, and Angle of Image in Degrees.

Focus.		ANGLE OF IMAGE.															
c/m		10°	20°	30°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°		
6		10	21	32	44	50	56	62	69	76	84	92	101	110	120		
9		16	32	48	66	75	84	94	104	115	126	138	151	165	180		
12		21	42	64	87	99	112	125	138	153	168	184	201	220	240		
13.5		24	48	72	98	112	126	141	156	172	189	207	227	248	270		
15		26	53	80	109	124	140	156	173	191	210	230	252	275	300		
16		28	56	86	116	132	149	167	185	204	224	245	268	293	320		
18		32	64	96	131	149	168	188	208	229	252	276	302	330	360		
20		35	71	107	146	166	187	208	231	255	280	307	336	367	400		
24		42	85	129	175	199	224	250	277	306	336	368	403	440	480		
28		49	99	150	204	232	261	292	323	357	392	430	470	513	560		
30		52	106	161	218	248	280	313	346	382	420	460	503	550	600		
36		63	127	193	262	298	336	375	415	459	504	552	604	660	720		
42		73	148	225	306	348	392	438	485	535	588	644	705	770	840		
48		84	169	257	349	397	448	500	554	611	672	736	805	880	960		
50		87	176	268	364	414	466	521	577	637	700	767	839	917	1000		
60		105	212	322	437	497	560	625	692	764	840	920	1007	1100	1200		
70		122	247	375	510	580	653	729	808	892	980	1074	1175	1284	1400		
80		140	282	429	582	662	746	834	923	1019	1120	1227	1342	1467	1600		
100		175	353	536	728	828	933	1042	1154	1274	1400	1535	1678	1834	2000		

in finding the focal length from the diameter of the plate, and from the focal length the angle of the image.

If, for instance, it is desired to know what size of plate corresponds to an angle of image of 65 degrees at a focal length of 20 cm., it is only necessary to look in table IV. for the crossing point of the vertical column under 65 degrees with the horizontal column of 20. The diameter of the plate is therefore 255 mm., and, according to table III., the size of plate corresponding with it is 14 by 21 cm.

Or: You want to find the angle of image for a plate of 16 by 21 cm., given a focal length of 18 cm. The corresponding diameter is 264 mm. As for 252 mm. diameter the angle of image is 70 degrees, and for 276 mm. 75 degrees, to the given plate corresponds an angle of image of 72,5 degrees.

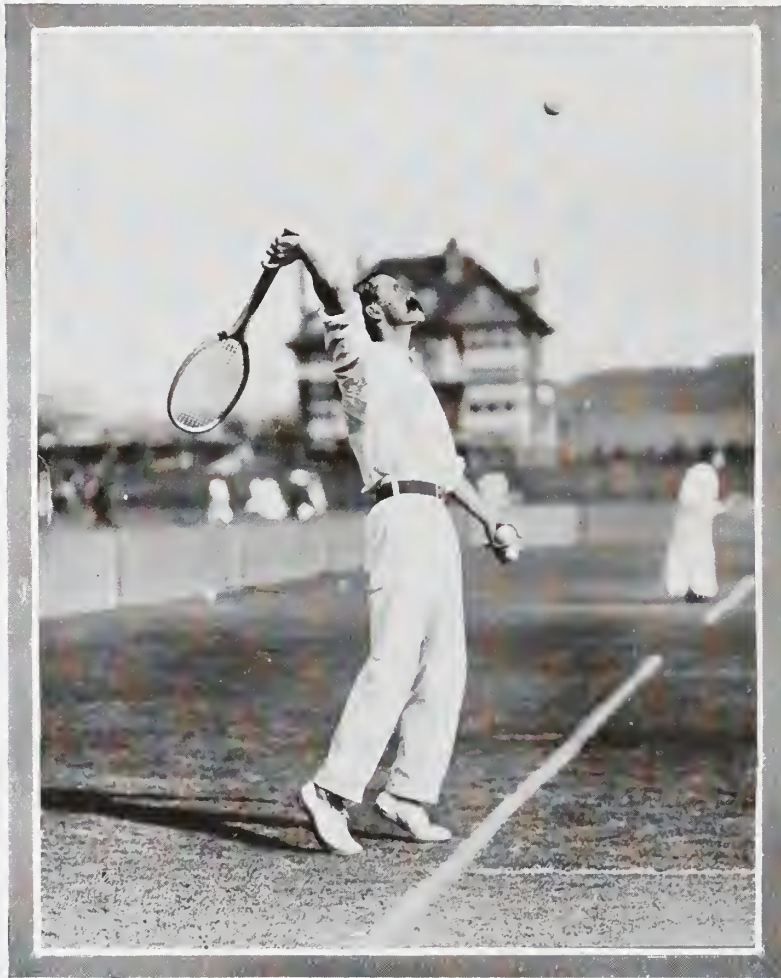
With the increase of sharpness of depth by the insertion of a smaller diaphragm, we have the **extension of sharpness** over the plate sharply focussed at full aperture. Both find their explanation in the fact that by the diminution of the angles of the cones of light (the basis of which is the effective aperture, and the greatest stricture of which is in the point of image), these cones are crossed by the focussing plane in discs, which become smaller and smaller. Thereby increases the sharpness in itself, and at the same time the extension of the sharpness.

An attempt with a lens of great measurement, into which are inserted diaphragms with a very small aperture, shows, however, that it is not possible to carry on indefinitely this increase of sharpness. For when a limit of stopping down is passed, an increase of coarseness makes itself perceptible in the sharpness, until, finally, with a very small aperture, there is **complete indistinctness of the image**. This phenomenon has its reason in the diffraction of the light, which proves the insufficient severity of the supposition that the more distinct the rectilinear and undisturbed spreading of light, the smaller is the cross section of the cluster of light.

This extreme sharpness shows itself at stopping down to F 70 up to F 120.

It is useless to employ a smaller proportion of aperture than F 70, and it is desirable not to stop down to more than F 36.

In no case, therefore, should the stopping down go below F 70. For this reason we carry the division of the diaphragms with short focal lengths only as far as F 36; with very short focal lengths only as far



Taken with a Collinear Lens, Series II.

as F 18. Likewise also this applies to cases where a strong stopping down does not take place, as, for instance, in Series 1a of the portrait lenses.

By dint of strong stopping down nearly **the whole field illuminated** by the rays of light traversing the lens will appear sharply upon the ground glass. But it will be seen at a glance that the delimitation between bright and dark upon the ground glass is not sharp, but that, on the contrary, there is from the centre towards the circumference a gradually increasing diminution of light, which cannot be removed by any contrivance. This

In all photographic lenses a diminution of light from the centre towards the edge of the field must take place.

Vignetting

is less intense and objectionable, the more compact the construction of the instrument. In this the great superiority of the more recent arrange-

ments shows itself as compared to older patterns. Our lenses are fully up-to-date in this respect also.



Taken with Heliar Reflex Camera and 18 cm. Heliar.

The unavoidable diminution of light is especially striking in **instantaneous exposures** with large aperture. The only means of removing the ugliness thus caused is the selection of a lens with a **greater**

The Voigtlander lenses are of a very compact structure, in consequence of which their lighting is a comparatively uniform one.

focal length, in which the diminution of light can be recognized at the same angle, but only at a greater distance from the centre of the plate.

Granted that the size of the plate has been decided on which it is intended to take photos, the point of the **focal length** will still have to be decided. If particular aims are not pursued, the choice is not difficult. He whose aim is to get a **picture** on the plate, will try to work under

approximately the same circumstances as the painter who sketches a landscape or a group on his canvas. If 45 degrees are taken as the greatest angle which a picture embraces under any circumstances, photographic exposures are accurately obtained on plates with diameters, according to tables III. and IV. of about $\frac{4}{5}$ of the focal distance.

Under these circumstances, to a **plate of 9 by 12 cm.** corresponds a **focal distance of 18 cm.,** a figure which at first sight appears to be too high.



Taken with a Heliar Camera.

Under other-
wise equal
circumstances
the lens with a
greater focal
length is to be
given the
preference.

If, however, photos, taken by a Heliar F 4.5 18 cm., are compared with those which were taken from the same standpoint, but with a focal length of 12 cm., there is at once a considerable difference in favour of the former.

In photographic exposures of the latter kind there is too much on the plate, the background in comparison with the foreground is so unpro-

portionately small that there would seem some reason to talk about a false perspective of the lenses with a short focal length.

The facts are similar in portraiture. It is well known how disproportionate the figure of the person to be photographed looks if the photographer, in order to obtain a certain size of the image, has to get too near the person with a lens of short focal length. The fact is, that a certain distance has to be kept if the image is to appear perspective correct. With regard to this point the angle must never be more than **40 degrees**.

Table V.

Dimensions of Plates in c/m.	Focus in c/m.		
	Angle of the Image.		
	45°	55°	60°
6 × 9	13·5	10	9
8·3 × 10·8	16	13·5	12
9 × 12	18	15	13·5
12 × 16·5	24	20	18
13 × 18	27	22	19
16 × 21	32	25	23
18 × 24	36	29	26
24 × 30	46	37	33

As the working with lenses with a long focal length, on account of the smaller depth, require greater care in the focussing, and as for instantaneous exposures there is generally very little time for this, it is as well to put up with a deviation from the accustomed perspective, and to increase the angle to about 55 degrees, and in case of need, when a focussing upon the ground glass is altogether out of the question, even to 60 degrees. The corresponding focal lengths are given for the most usual size of plates in Table V.

The choice of one of the three focal lengths, given for each size of

plate, must be decided by the photographer himself. If he makes use of a camera which enables **exact focussing even with great intensity of light** (as, for instance, the Voigtländer Reflex Camera), he will obtain by far the finest results by using the **long focal lengths**. On the other hand, the short focal lengths are for quick instantaneous exposures, in which there is no time for slow focussing, but just long enough for throwing the far background out of focus so as not to have too disturbing an effect. It goes without saying that with short focal lengths every object appears to be smaller in comparison with the greater focal lengths.



Landscape and group exposures, with a stand camera, should not be made with a larger angle than 55 degrees.

For portrait exposures **experience** has shown that the smallest focal lengths are:—

For Carte de Visite (bust)	-	-	20 cm.
Cabinet (bust)	-	-	30 cm.
Boudoir portrait	-	-	40 cm.

If we have given **preference to the greater focal lengths over the smaller ones**, we have done so in order to avoid the unpleasant influence of the diminution of light, and to obtain truer and more artistic pictures.

The lenses with short focal lengths optically admit the use of a still larger plate than that indicated in table V., the **overworking** of such a lens is not practical. If the selection of the focal lengths is made on these principles, the difficulties with which photographers have very often to deal **will not arise**.

Thus it may be observed that a **shifting** of the lens horizontally or vertically in the camera, when focal distance, for instance, is equal in length to the longer side of the plate, not only is there a loss of light at the edges, but more especially the plate is not completely covered. Were it for no other reason than this, a focal length should be chosen which in a plate would correspond to an angle of, at most, 60 degrees, at an intensity of light of F 6,8; to an angle of, at the outside, 55 degrees, with an intensity of light of F 5,4; and to an angle of 45 degrees, with an intensity of light of F 4,5.

The distortion that occurs when the camera is brought too near to the object to be photographed has nothing to do with the **distortion** which a photographic object shows through bad construction, or owing to the position of the diaphragm. All Voigtländer lenses are free from the optical effects of distortion, with the exception of the single lenses of the Collinears. Thus a single combination with diaphragm placed before it shows, like **every lens with front stop**, a so-called barrel-shaped distortion, that is to say, a square is reproduced with sides bulged in an outward direction. To remove such distortion in a lens with front stop is not possible. But if two single Collinear lenses, of equal or different focal distances, are put together as a whole, the distortion is entirely neutralized.

The optical axis of the lens must stand vertically to the object to be photographed. If the instrument is inclined a little out of position, one obtains **precipitating** lines, which are very disturbing in effect, especially in photographing the front parts of buildings. The deviation from the parallel position of the corners of geometrical bodies, as the photograph must show it on the plate, is not ugly in effect, for the reason that in that case the perspective corresponds to the vision with the naked eye. Only you must not approach too closely to such objects, as, for instance, street corners, etc.

VOIGTLÄNDER

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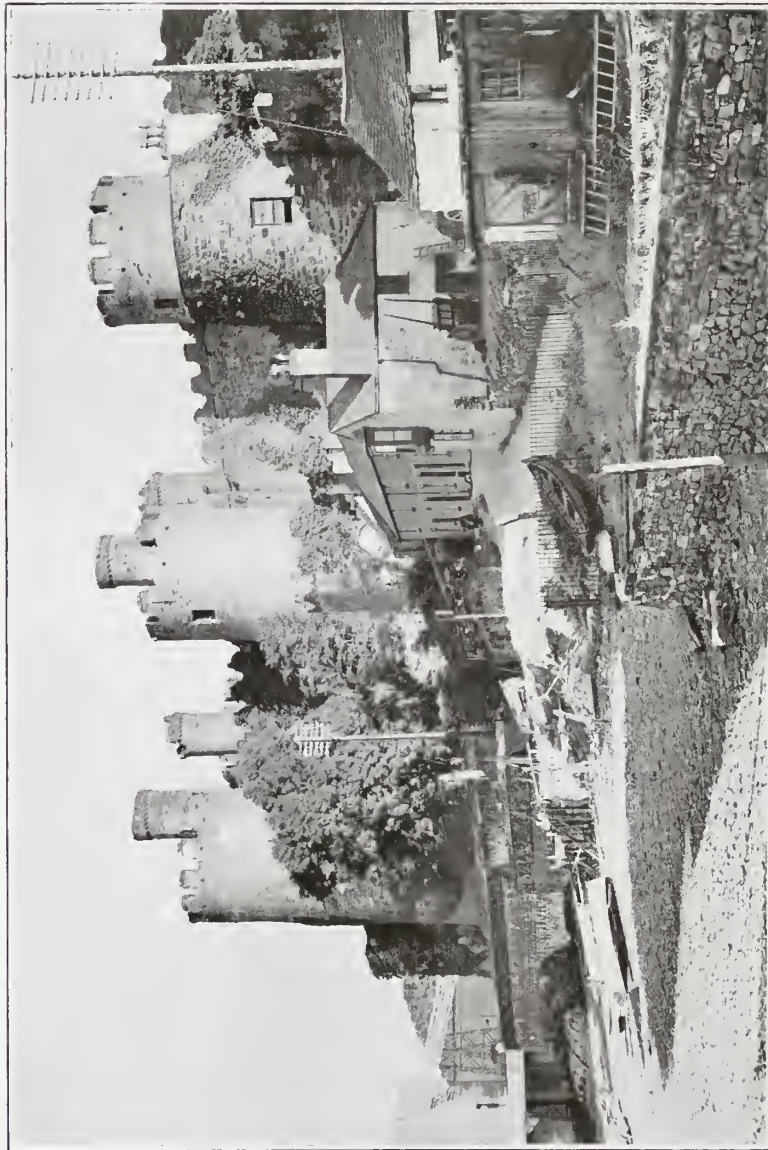


Photo by Mr. F. Fielding, Manchester.

Conway Castle.
Taken with a Voigtlander Heliar Lens.



Description of the various Voigtlander Lenses.

I. Anastigmats.

1. **The Collinear** consists of two equal halves placed **symmetrically** against a central diaphragm, each of which is composed of three lenses cemented together. It is made in four series.

(a) **The Collinear, Series II.,** is made from 6 cm. up to 20 cm. focal length, with a full aperture of **F 5,4**, and for longer focal distances, **F 6,3**. The angle with the greatest aperture is 60 degrees.

(b) **The Collinear, Series III.,** is made from 7 cm. up to 18 cm. focal length, with a full aperture of **F 6,8**, and upwards, **F 7,7**. The angle corresponding to these is 60 degrees.

The single halves, the focal lengths of which are in proportion to that of the double lens as 5 is to 3, work with the largest aperture **F 15**, with an angle of 50 degrees. They are useful for the **combination of sets**; in this manner it is possible to obtain, by the use of three halves of various focal lengths, six combinations all different from one another. Three of these combinations are double lenses, with the largest aperture **F 7,7**, and an angle of 66 degrees. We do not recommend putting together the halves of numbers which are too wide apart from each other; as a rule, three or four single halves of numbers **close to one another** are best adapted for the formation of a set.

For simplification in use, the scale on the iris diaphragm indicates its opening in millimetres; with every set is a table, giving the aperture of the diaphragm corresponding to the focal distance of each combination for the graduation. The set contains as its body that of the double lens, the half of which forms the largest number of the set.

These two Collinear Series are in every respect **Universal lenses**, and are appreciated by amateur photographers, on account of their symmetrical structure and their intensity of light.

(c) **The Collinear, Series IV.,** has an aperture of **F 12,5**, and at full

Of the four series of Voigtlander Collinear the two of greatest intensity of light are most adapted for amateur photography.

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The Collinear sets of Series III. consist of 3 or 4 Collinear halves.
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Photo by C. Hofman, Esq.

Taken with Voigtlander $\frac{1}{4}$ -plate Film and Plate Camera and Collinear Lens, Series III.



Photo by C. Hofman, Esq.

Taken with the back combination of Collinear Lens, Series III., using the double extension of Camera, from the same standpoint as above picture.

A useful illustration of the possibilities of the Collinear Lens when used complete, or the back combination only.

aperture an angle of 75 degrees. It is not used for general purposes, nor for hand cameras. Its usefulness, however, lies in making wide angle exposures, such as architectural work, etc., and for process work, by reason of its symmetrical arrangement.

(d) The construction of the **Apochromatic Collinear Series** is based on the calculations of Dr. H. Harting, F.R.P.S.* The aperture is **F 9**, from a focal length of 30 cm. upwards; in the smaller sizes it is **F 8**. The angle varies according to the purpose for which the lens is intended, between 60 and 75 degrees. This series is for reproduction photography. Through the total suppression of the secondary spectrum a complete congruity of the different coloured images has been attained, both in size and position. **Therefore the Apochromatic Collinear Lens has become indispensable for colour photography, and likewise for the process of three-colour printing.**

2. The **Heliar**, constructed also upon the calculations of Dr. H. Harting, F.R.P.S.,† is an unsymmetrical lens, the various parts of which cannot be used separately, or in conjunction with the corresponding parts of other focal lengths.

Between two pairs of lenses, consisting each of two lenses cemented together is placed a single lens, and behind this lens is the diaphragm. Owing to the excellent union of the light rays and the **total absence of coma**, the proportion of aperture up to a focal length of 60 cm. is **F 4.5**, while the field for a plate **sharply focussed** at full aperture is 48 degrees.

The Heliar is specially adapted for forcing the photo-mechanic process to the utmost. According to results from our own tests, as well as from those of Professor O. Mente, in Charlottenburg, **it is in the highest degree adapted for all exposures in half tone**, because owing to the suppression of every difference in the diaphragm, and also by reason of the great capacity for work at the full aperture of F 4.5, and the absence of coma, it is possible to use a very large diaphragm,

* Dr. H. Harting, F.R.P.S.: "On the suppression of the secondary spectrum in optical systems," and "On the theory of the Apochromatic Collinear." *Photogr. Korrespondenz*, 1901.

† Dr. H. Harting, F.R.P.S.: *The Heliar. Photogr. Korrespondenz*, 1902.

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The Heliar Lens is largely used by professional photographers, who recognise that it is possible to produce the highest class of work by its use.

The Voigt-
länder Dynar
is a lens for
universal use,
but owing to
its lack of
symmetry it
can be used
only as a whole.
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and consequently to do the work in a short time (three to five minutes with an illumination from two lamps of 25 Amperes).

3. **The Dynar Lens**, also constructed by Dr. H. Harting, F.R.P.S., is similar to the Heliar in structure with regard to the position of the diaphragm, and except that the collecting lenses of the cemented pairs are placed outside, whilst in the Heliar they stand against the central lens. It is made only in four focal lengths, viz., 12, $13\frac{1}{2}$, 15, and 18 c/m., with an aperture of **F 6**, and a field of 60 degrees. Not being however, a symmetrical lens, **only the complete objective** can be used.



Photo by Bowden Bros.

"Demoiselle Cranes."

Taken with Collinear Lens, Series II.

Copyright.

The two series, the **Heliar** and **Dynar**, have their greatest working capacity approximately at their widest aperture, whereas the fields of the **Collinears** widen considerably with increased stopping down.

It is necessary to state explicitly that the differences in the intensity of light of two lenses of equal focal length and of equal effective aperture, of which one contains **cemented** and the other **uncemented** lenses are so *trifling*, that for **practical purposes** they are *of no importance*.

Cemented and
uncemented
lenses of equal
proportions of
aperture
require the
same time of
exposure.

4. **The Oxyn Lens** (*Oxys*, Greek, sharp), constructed by Dr. H. Harting, F.R.P.S., is composed of five lenses, two pairs of which are cemented, divided by a single lens in the centre. It is claimed for the Oxyn lens that the power of both the cemented surfaces is equal to that of a collecting (positive) lens.

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II. Astigmats.

1. **The Portrait Lens, Series Ia**, with an aperture of **F 2.3**, was invented by Professor H. Zincken, and adopted by Dr. H. Harting, F.R.P.S., in up-to-date manufacture.* It consists of four lenses, of which two are cemented together. The angle of the picture proper is 22 degrees; the structure is very elongated, so that vignetting soon takes place. In spite of the small field excellent results can be obtained in **small sizes**. Accordingly this lens is specially adapted for **cinematograph** exposures, and for studio work in very weak light, but not for landscape photography or general pictures. Owing to its size it cannot be used in a hand camera.

The astigmats are only intended for professional photographers especially the Portrait lenses, Series I. and the Portrait Euryscope Series III. They cannot be used with a hand camera.

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The depth of focus is very small; but in spite of this, with clever handling on the part of the operator, very good results may be obtained.

2. **The Portrait Lens, Series I.**, is manufactured with the Voigtländer alterations resulting from the calculations of Petzval. The aperture is **F 3.2**, and the angle of the satisfactory part of the picture 28 degrees. In shape it is somewhat shorter than that of Series Ia. It is principally used for taking single portraits and for projection, and is found in all photographic studios.

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Although the construction of these two series dates back nearly half a century, their correctness for astigmats is remarkable. In consequence of the suppression of the coma, a **splendour** and **delicacy** is obtained which is looked for in vain in many **anastigmats made by other manufacturers**. It is a universally recognized fact that, whilst many makers forget to suppress the principal enemy of brilliancy of the image, viz., **the coma**, in the endeavour to give to their

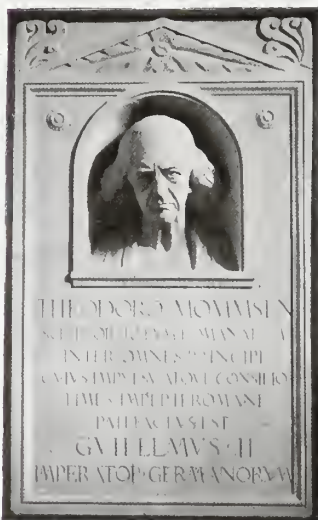
* Dr. H. Harting, F.R.P.S.: "On a portrait objective with strong luminosity." *Photogr. Korrespondenz*, 1900.

lenses a wide anastigmatically levelled field, this has always been an important feature in the **Voigtländer Lenses**.

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3. **The Portrait-Euryscope, Series III.**, belongs to the class of aplanat consisting of two achromatic halves. The full aperture is **F4,5**. The angle of the picture proper measures 32 degrees. This lens is used principally by professional photographers. Owing to its somewhat inferior intensity of light in comparison with the preceding Series I., the larger sizes are used for taking smaller groups.

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Taken with Voigtländer Alpine Camera, 9×12 c/m.

There is a convenient Voigtländer lens for every purpose.

4. **The Euryscope, Series IVa.**, is of the same class as the last mentioned series; with an aperture of **F7** the angle of the picture proper is 40 degrees. In consequence of its shorter structure vignetting shows itself only at a greater angle. This lens is used only in the studio, for taking portraits and large groups when stopping down is no consideration.

As this shows, the **Voigtländer lenses** are of such variety as to meet every requirement. So far as we are aware, Series Ia, with an aperture of **F2,3**, represents the photographic lens having the greatest intensity of light which is regularly manufactured by optical firms. A

further increase of the intensity of light would serve no purpose owing to the rapidly decreasing depth and the diminution of the field of usefulness. In this respect a limit is set to the introduction of greater focal lengths by the considerable measurement of the body.

At the opposite extremity stands the **Collinear Series IV.**, the field with comparatively great intensity of light is sufficient for all requirements. Here, of course, the construction of very long focal distances is possible. Among the anastigmats the **Heliar** has the **greatest intensity of light with F4,5**; for the reasons above expressed it is useless to construct anastigmats with a larger proportion of aperture.

Page 79.



Toilers.

F. Rattap

Voigtlander Heliar Lens, 18 c/m.



Valuable Accessories to Photographic Lenses.

I. The Tele-Photo Lens.

When it is desirable to obtain **enlarged** on the plate some details of a distant object which an exposure with a lens of average focal length will not afford, and the use of lenses of long focus is often impossible, because of their weight and their adjustment, then the Tele-photo lens becomes necessary.

The great focal lengths of ordinary lenses require a long extension bellows camera. But cameras fitted with long extension bellows are not generally suited to take such small sizes as $\frac{1}{4}$ plate.

It is however possible to obtain the required focal length for producing an enlarged image by inserting the negative lens between the ground glass and the outside lens, the distance of which from the lens is subject to certain conditions. The focal length of the whole tele-photographic lens, consisting of the outside lens and the negative lens, is **variable**, but always remains greater than that of the outside lens alone. It becomes infinite if the back foci of this lens and of the negative lens (the so-called **tele-negatives**) cover each other. If the two parts which are placed in the tele-extension are screwed farther asunder, the focus grows less and becomes finite.

The Tele-photo lens replaces an infinite number of single lenses of different focal lengths. The advantages would be inestimable if the disadvantages which have to be taken into account did not considerably diminish the value of this contrivance. But as the effective aperture, independently from the displacements of the tele-negatives, remains always the same, **the proportion of aperture diminishes the more, the greater the focal distance ; and consequently diminishes in proportion as the enlargement increases.**

If, for instance, we put together a Collinear Series II., with a local length of 20 cm., with a tele-negative so placed that the image on the ground glass shows a five-fold enlargement on the image projected by the Collinear alone, the focal length of the whole Tele-photo is 100 cm.

The tele-photo lenses serve for the production of enlarged pictures with a comparatively short extension of the camera.

The intensity of light of the **F 5.4 of the Collinear Series II.** falls in the **Tele-photo lens to F 27.** The time of **exposure** is therefore **increased 25 times.**

The main advantage of the combination is, however, the comparative **short extension of bellows**, because the back cardinal point of the whole system moves far away from the lens in the direction of the object. In this way it is possible with the ordinary stand cameras ($\frac{1}{2}$ and $\frac{1}{2}$ plate) to make greatly enlarged tele-photographs.

The fundamental conditions for the success of tele-photography are : **The rigidity of the whole apparatus**, and above all **calm atmosphere**, in which there are neither undulations nor currents. These conditions are not always possible, therefore good tele-photographs are somewhat difficult to obtain.

Owing to the fact that diffraction becomes visible if very small diaphragms are used, the lens itself must only be stopped down so that **the aperture of the tele-photo system is not smaller than F 100.** If, for instance, the enlargement is fivefold, the lens must not be stopped down below F 20. On the other hand, it is necessary to stop down as much as possible in order to obtain the necessary sharpness which is lacking if the lens is fully opened, owing to the insertion of the tele-negative into the pencils of light between the outside light and the image.

The Voigtländer Tele-Negatives

are constructed upon the calculations of Dr. A. Miethe. They consist of three lenses cemented together, the diameter of which increases with the focal length. They are manufactured so that the qualities of the lens suffer no deterioration ; but you cannot get with a tele-lens the sharpness of an anastigmat of the same focal length and aperture.

The smaller the focal length of the tele-negative is in comparison with the lens, the smaller becomes both the extension of the camera and the extension of the picture with otherwise equal proportions. In the Voigtländer tele-negatives the focal distance is about the *third part* of the focal length of the positive lens.

The tele-negative is screwed into the back of the tele-extension,

When working with tele-lens it is advisable to choose calm weather with little or no wind, on account of the increased exposure.

The tele-lenses give a less distinct picture than ordinary anastigmats of equal aperture and focal length.
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The enlargement is ascertained by measuring the original and the enlarged picture by means of a scale.

which consists of a tube provided with a rack and pinion movement. This tube has at the fore end the thread for receiving the positive lens. Through a small opening in the tube a millimetre scale is visible; if the indicator is placed at zero, the focal length of the whole tele-photo lens is infinite. In any given position of the tele-negative the optical intermediate space is read of the foci of lens and tele-negative. The division of the focal length of the tele-negative by the intermediate



Taken with a Voigtlander Folding Camera and Collinear Series II.

space indicated on the scale gives the enlargement upon the ground glass as compared with the exposure through the lens alone.

The accuracy of this calculation can be tested by measuring on the ground glass, with a scale, the original and enlarged picture.

Only Anastigmats can be used in a tele-system. The introduction of an astigmat, and especially of a system suited for the lens of a telescope with large aperture, is to be particularly discouraged, on account of the limited extension of the field and strong distortion.

only Anastigmats to be used in conjunction with a Tele-negative Lens.

For easy handling the **Collinears Series Dynar** and **Heliar** are **specially recommended**, as these lenses are already sufficiently luminous to render a good lighting of the ground glass possible.

Tele-photo Objectives for Hand Cameras.

Owing to the interest taken in tele-photo work we have constructed fixed tele-extensions without rack and pinion movement. The enlargement obtained by this accessory is about $2\frac{1}{2}$ times. Should one of these Tele-negative lenses be used in connection with our Heliar or Collinear, Series II., **instantaneous pictures** can be obtained.

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II. Colour Filters.

If in all instruments of which we have so far spoken, we examined the alterations in shape affecting the pencils of light in their passage through the lens, we have now to discuss some arrangements which do not influence the work of the lens, but by which the quality of the silver salt sensitive to light is influenced in various degrees by **coloured** light. These are called **Colour Filters**, and it is their function, according to the purposes in view, to extinguish certain colours in the spectrum of an object radiating light, the image of which is produced on the plate by the lens. The actinic light is therefore passed through a sieve, so to speak, and the undesirable part of the spectrum is retained in the filter.

The Colour Filters serve to retain certain spectral colours of the object to be photographed.

The ordinary photographic plate, in which the bromide of silver is embedded in the gelatine in the shape of fine dust, is most sensitive to dark blue light, whilst it is not at all influenced by red or yellow rays: and by green ones only after a very long exposure. The result of this is the reproduction of those colours which, in luminosity, do not correspond to those we most easily perceive with the eye. By the introduction of a plate sensitive to colour, it became possible to make green and yellow rays act on the bromide of silver as well, and in the pan-chromatic plates there exists a considerable sensitiveness even to red, but always with an over-sensitiveness to dark blue. If, therefore, only certain colours can pass through a colour filter, care must be taken beforehand that the plate is sensitive for all kinds of coloured light.

Colour Filters and plates sensitive to colour.

But in all exposures—with the exception of the processes in colour photography—it is desirable also to let rays which appear to the eye to be yellow or green make particularly strong impressions on the plate. If dark blue is to be suppressed by a filter, then the principal rule must be observed: **A filter should only be used in connection with a plate sensitive to colour.**



Photo by Dr. H. Harting.

View from the summit of the Schalkkogel, 11,000 ft. altitude.
Collinear Series III. 15 c/m Contrast Filters B.

The Voigt-
länder Colour
Filters are
instruments
of precision.
Page 93.

Experience has shown that the use of filters for ordinary exposures increases yearly, because the advantages obtained with these are extraordinary. Previously one had to make shift with plates coloured in the mass, or with plates over which coloured collodion had been poured. By the introduction of **Voigtländer Filters**, which are prepared in accordance with the prescriptions of Dr. G. Aarland, considerable progress has been made.

Voigtländer Filters are toned by analyzing the various colouring substances for special purposes ; no filter is permitted to leave our hands without having been carefully **examined with the spectroscope**. They are far superior in efficiency to the ordinary yellow glass screens coloured *en masse*, sold at nominal prices, which do not really act as filters, but only as dampers over the entire spectrum, for even the most dense of these is transparent to dark blue.

(a) **Compensation Filters** weaken the spectral colours inclusive of violet except yellow green, the brightness of which they do not alter. Their effect upon a plate sensitive to colour corresponds to that upon the retina of the human eye. As the reproduction of colour values depends upon the sensitiveness of the plates to colours a *special* compensation filter must be adapted for *each* plate, and this must be fully explained when giving an order. This filter is used in portrait, instantaneous, and ordinary landscape work, as well as in the reproduction of pictures which do not contain any dark red.

(b) **Contrast Filters** serve completely to suppress blue. They are made in three different qualities : contrast *a*, contrast filter *b*, and contrast filter orange. The difference between the contrast filters *a* and *b* consists in the different suppression of the blue rays. In opposition to the compensation filters, therefore, these **Contrast Filters** need *not* be toned for one quite definite photographic plate ; which must, however, in any case be sensitive to colours ; *a* and *b* are used with advantage in mountain photographs (glaciers and snow), vast views with great distances, sea photos, snapshots from a balloon, and reproductions of paintings with dark red tones. The time of exposure is much **shorter** than if the common yellow screens were used. With a really good plate sensitive to colours the times of exposure when using contrast filter *b*, contrast filter *a*, compensation filter, and finally without any filter at all, are in proportion like 4 to 3 to 2 to 1. Consequently, with a good light and a larger aperture of the lens, even with the contrast filter *b* **instantaneous exposures** up to 1/100 second, giving distinct shades, are possible ; *b* is used when it is important

Compensation Filters must be toned for each particular description of plate sensitive to colour.

The Contrast Filters *a* and *b* are suitable for all plates sensitive to colours, the Orange Contrast Filter only for panchromatic plates.

The Voigtländer filters are suitable for instantaneous exposures.



Photo by Dr. H. Hartung.

Taken with Collinear Lens, Series III., 15 cm., and Voigtlander Contrast Filter A.



Photo by Dr. H. Hartung.

Taken with Collinear Lens, Series III., 18 cm., and Voigtlander Contrast Filter B.

strongly to emphasize green, yellow, and white, as in snow landscapes with delicate white shadings, photographing of clouds, etc.

Whilst the ordinary plate sensitive to colours is no longer influenced by orange, the range of sensitiveness extends in the pan-chromatic plates as far as dark red. For use with these the **orange** filter is intended, whereby it is possible to get full value from orange and red tones, which



Taken with Reflex Camera and 24 c/m Heliar.

upon an ordinary plate sensitive to colour, even with the contrast filter *b*, act in the same manner as black. This is the case with the photographs of yellow and reddish stones (dolomites), of the evening sky, and of flowers. In spite of the increased difficulties which the developing of plates sensitive to red give the photographer in a room lighted only by dark red light, it is impossible to too strongly recommend for such cases the use of our *orange* contrast filters.

The filters hitherto mentioned are used to reproduce, so far as possible the brightness of the colours sensitive to the human eye. The



second kind of filters, on the other hand, are used in the process of colour photography, especially in the three-colour process.

We need only point out that to obtain reproductions of the coloured liquids put in the filter, they must show a quite definite spectral action, which depends upon the selection of the printing colours.

The three-colour filters thus definitely established must be absolutely in accord with one optical condition: **The working capacity of the lenses through their insertion into the passages of the rays must not be impaired.** This can only be accomplished, however, by the filter being composed of **plane parallel** plates.

These plane parallel plates, when inserted into the passage of the rays in cases of reduction or enlargement, cause in reproductions a removal of the plane of the sharp image from the lens. Special attention must therefore be given that the three-coloured partial images does not come out different in size. If this should be the case, the partial images will not fit exactly upon each other, in printing one on top of the other.

This is the explanation of the demands that are made on filters for the production of coloured partial images. They can only be inserted either in the immediate proximity of the lens or immediately before the sensitive plates.

In the first case they belong directly to the lens; the greatest care has to be exercised in their manufacture so as to ensure perfect plane parallelism, and the plane parallel plates enclosing the coloured liquid must be made of glass which is quite free from tension. Moreover, the thickness of the glasses and of the coloured liquid must be equal for the three filters. The relatively high price of these troughs is accounted for by the difficulty of manufacturing glass free from tension and in the preparation of true plane parallel plates.

The **Voigtländer** troughs consist of two plates of glass, which are kept apart by an equal plane parallel glass ring resting on the edge at a distance of 10 mm. The whole is fixed in a metal casing which can easily be taken to pieces.

For filling the troughs the **Voigtländer solutions of coloured liquid** for three colour printing are used, and are spectroscopically fixed according to a convenient selection of the printing colours.

The Voigtländer troughs are placed immediately in front of the lens and filled with the coloured liquids.

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Page 92.

The farther the filters are from the lens the greater their dimensions must become, in order that all the effective light pencils shall be influenced. If they are placed immediately before the sensitive stratum they must be of the same size as the plate. To make similar plate filters in the same manner, and mathematically true, as are the troughs filled with liquids, is impossible. But fortunately this is not necessary, because calculations and experience shows that approximately good results can be obtained with plate filters of the best mirror glass, which are put together, and between which the body containing the colouring liquid is no longer exchangeable, but is permanently fixed.

This, therefore, means facility in the manufacture, although obtaining plates of mirror glass free from bubbles and streaks is most difficult. On the other hand, however, the preparation of the Voigtländer three-colour plate filters also presents great difficulties. If toning and alteration of the plate filters is considered impossible, it will be understood that where **great** pretensions are made to exactness in the work, the **troughs are preferred**, because they are easier to handle, and have the advantage that their contents can be varied. It is evident that a three-colour plate filter must never be inserted into the passage of the rays in the vicinity of the lens. Further, in all exposures with filters, the sharp focussing must take place only **after** the inserting of the filter.

The Voigtländer plate filters of three colours are placed immediately before the plates.

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III. The Reversing Prism.

For certain methods of reproduction the negative must be reversed. This exchange of right and left is obtained by placing a rectangular prism before the lens, on the hypotenuse of the prism. In consequence of total reflection, a mirage of the luminous rays takes place.

In this case also the difficulties of obtaining a block of glass perfectly free from streaks and tension and having mathematically plane surfaces are very great, but this has been accomplished in our reversing prisms.

For the purpose of quick adjustment of the prisms when screwed into position, the lens is fitted to a turning ring. Besides this, the setting of the prism itself is provided with a **second** turning ring.

The Voigtländer prisms serve for reversion by reflecting the image.

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V. Magnifying Glasses.

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For examining the photographic image and for exact focussing achromatic magnifying glasses are used, which consist of three lenses cemented together, thereby affording a large plane field.



Taken with a Heliar Lens, 18 c/m, and Heliar Camera.

Shutters.

When the operator does not wish to work with the lens cap, he may make the exposure by means of a shutter. The chief condition of a perfect shutter—namely, that it should work without vibration—is fulfilled in all shutters supplied by us.

Classification of the shutters may be made, as in the case of the filters, by distinguishing between **Lens shutters** and **Plate shutters**. If the exposure takes place in the plane of the diaphragm of the lens, even with

All Voigtlander shutters work without vibration.

There is a distinction between Lens shutters and Plate shutters.

the smallest aperture of the shutter, the *whole* plate is exposed. All the moving actions are reproduced instantaneously. As the greatest stringency of all efficient light pencils takes place at the diaphragm opening, these lens shutters have comparatively small measurement. In most cases they are arranged so that the body includes the casing of the lenses, while they are at the same time provided with an iris diaphragm. For reducing the time of the exposure the rapidity of the shutter can be altered by the insertion of a brake.

But even if the distance over which these little sections of the shutter have to pass is small, nevertheless, owing to the simultaneous exposure of the whole plate, only a velocity of about $1/150$ th of a second at most can be reached, and it diminishes in proportion as the shutter of the lens is larger.

All lens shutters are arranged for time and instantaneous exposures.

The shutters which are to be put immediately before or behind the lens, work similarly to those working in the plane of the diaphragm. For this purpose we recommend a Venetian blind shutter without a cord, which has a larger measurement, in order to avoid vignetting. Its velocity can also be easily varied.

The second kind of shutter—the Focal Plane—works under entirely different circumstances. Whilst by opening lens shutters the *whole* plate is exposed to light, in Focal Plane shutters a rectangular slit, the width of which can be altered from the outside, moves past the plate, so that the image is impressed **gradually** upon the plate. The great velocity of which these shutters are capable, and the varying size of slit, enables the time during which any point of the plate is exposed to be shortened to one-thousandth of a second, and even less.

In this consists the great importance of the **Focal Plane Shutters**, which for very rapid instantaneous exposures are superior to the shutters with iris diaphragm.

By exposure with a Focal Plane shutter moving objects are fixed to the plate one after the other. Such action taking place with great rapidity causes a slight *distortion* to the image. This distortion is smallest when the direction of the movement of the subject and that of the slit

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In great rapidities a slight distortion of the image is produced by using Focal Plane shutters.

are opposed to each other. However, the influence of these directions is greatly over-estimated, because it makes itself felt only when the velocity of the slit does not exceed that of the image upon the ground glass.



Taken with Collinear Lens, Series II.

If the two speeds are exactly equal, then the image of a point only falls upon the plate. If it moves simultaneously with the slit upon the

border of the plate, then the point is drawn out into a line which extends across the whole plate. If, on the contrary, the directions of movement of the image and of the shutter are opposed, the distribution is exceedingly small compared to the former.

In reality, however, the velocity of the slit is much greater than that of the image upon the ground glass, and the faster the slit, the smaller the advantage obtained by the opposite movement of slit and image.

Theoretically it is possible to reach extraordinary velocities by narrowing the slit *ad libitum*, **but the slit should never be narrower than 2 mm.** If, for instance, it is put at about 1 mm., small deviation from the rectangular shape of the slit causes unequal exposure, which shows itself by streaks which run vertically to the movement of the opening across the plate.

The slit of the shutter should not be narrower than 2 mm.

It is true that the Voigtländer Focal Plane Shutter is worked with such precision that even when the width of the slit is 1 mm. such streaks do not occur; nevertheless, in almost all cases it is preferable to use a wider slit.

As highly tempered springs for great velocities are difficult to regulate for slow speeds, it is best to work with the strongest tension of the spring, and to regulate the exposure by a change in the width.

The main principle for the construction of a Focal Plane shutter is **simplicity**, avoiding mechanical complications. It only works well when the instructions for use are **carefully** observed; the more complicated its construction, the easier it gets out of order; and the slower the running down after loosening the spring the less will be the reaction.

The simplest Focal Plane shutter is the best.

We fit our **Reflex, Folding, and Heliar** Camera with a Focal Plane shutter, which is of simple construction, and good work is thereby ensured.

According to what has been said, it is clear that each kind of shutter mentioned has its peculiarities. The Focal Plane shutter enables the photographer to obtain the fast movements, but it must be handled with care. The diaphragm shutter only works to 1/150th of a second, but in compensation is very handy, and if it is carefully finished in its mechanical parts it will withstand ordinary wear and tear. By attending

The importance of the Lens shutter lies in its handiness; that of the Focal Plane shutter in its great rapidity.

to the instructions for handling the shutters supplied with our apparatus the best results will be obtained.

In order to ensure satisfactory results with our lenses and shutters we give a few particulars of the **average time** of exposure for instantaneous and time photographs.

With instantaneous plates, if the aperture is stopped down to **F6,8**, the exposure must be at least: $1/20$ th second for objects which move very slowly, and are at a distance equal to 150 times the focal length; for instance, ships at anchor, moderate movement of waves, a crowd of people, cattle reposing. Also for portraits 20 times the focal length and upwards.

Approximate
time of
exposure.



Taken with Collinear Lens, Series II., 15 c/m

$1/50$ th second: objects distant more than 150 times the focal length, which do not move quicker on the ground glass than the image of a man of the size of 1 c.m.; ships and slow travelling trains, trains moving in a slanting direction towards the lens, street scenes, etc.

$1/100$ th second: objects distant upwards of 250 times the focal length, moving with the velocity of waves in a storm, of a galloping horse, obliquely to the lens.

$1/300$ th second: objects distant upwards of 100 times the focal length, such as ships moving at a moderate speed, bicyclists, explosions, etc.

1/500th to 1/1000th second: race-horses, railway trains, ships, flying birds at short distances.

Below we give two Tables, which give the approximate time of exposure for an aperture of F 6,8.

A.

MORNING.	AFTER-NOON.	June.	May. July.	April. August.	May. September	February. October.	January. November	December.
		sec.	sec.	sec.	sec.	sec.	sec.	sec.
12		1	1	1½	1½	1½	2½	4
11	1	1	1	1½	1½	2	3	5
10	2	1	1	1½	2	2	4	6
9	3	1	1½	1½	2	3	6	...
8	4	1½	1½	2	3	6	...	...
7	5	2	2½	3	6	...	...	...
6	6	3	3½	6	...	...	...	...
5	7	5	6	...	...	...	...	...
4	8	12	...	...	...	...	...	...

B.

LIGHT.

	Sunny.	Changeable Light.	Dark Sky.	Dull Weather.	Very Dull Weather.
	sec.	sec.	sec.	sec.	sec.
Sea, Lake, and Sky...	½	1	2-3	3	5
Distant Sea Views.....	1	2	4	6	10
Falling Snow.....	3	6	12	18	30
Boats at Sea, short distance.....	2	4	8	12	20
Landscape, with near foreground.....					
Foliage with Water	4	8	16	24	40
Building, with well lighted foreground					
Building, with dark foreground.....	8	12	24	36	80
Thick Foliage in the foreground.....					
Moving Objects, plain landscape.....	12	20	40	60	100
Portraits at a Window.....					
Portraits in a Forest.....	20	40	80	120	200

Instructions.—See Table A for the figure which corresponds with the month and time of day when the exposure is made. Take from table B a second figure, the greatness of which depends upon the exposure and the nature of the object. Multiply these two figures A and B, and you will get the time of exposure in hundredths of seconds.

Example.—A photograph is to be taken in April at four o'clock in the afternoon with a clouded sky. The subject is a landscape with near foreground.

The lens has the diaphragm of F 6,8.

Time of exposure $\frac{2 \times 16}{100} = 0,32 = \frac{1}{3}$ of a second approximately.

If the photograph is taken with any other diaphragm than F 6,8, then the figure obtained by the preceding operation is to be multiplied by the following, which corresponds quite sufficiently with the practical facts: —

With a diaphragm F 4,5, F 6,8, F 7,7, F 9, F 12, F 18, F 25, F 36, F 50
by $\frac{1}{2}$ 1 $1\frac{1}{2}$ 2 4 8 16 32 64

These figures can of course only be approximate. At all times too short an exposure is to be avoided, and the shades are to be specially taken into account.



Photographic Cameras and Auxiliary Apparatus.

In the construction and selection of cameras contained in the price list, we have been guided entirely by one consideration:—**How can the working capacity of the Voigtländer lenses be taken full advantage of while at the time preserving the greatest simplicity and solidity of construction, and successfully solving all the problems confronting the art of photography at the present time?**

That we have been successful in answering this question will, we hope, be seen from what follows.

We wish to distinguish between hand cameras and stand cameras. The former are constructed principally either for use with a Focal Plane shutter working immediately in front of the plate, or for use with a lens shutter.

I. Hand Cameras with Focal Plane Shutter.

- (a) The **Voigtländer Heliar Reflex Camera** (after designs by Baron Liliencron), size $\frac{1}{4}$ or $\frac{1}{2}$ plate, enables a focal length of 18 and 24 cm. respectively to be used. It is **the camera** with which the fullest working capacity of our lenses with great intensity of light can be obtained. By observation on a glass mirror, silvered on the surface, an exact focus and a correct view of the image up to the moving of the shutter is obtainable.

The focal length of the lens (18 cm. for $\frac{1}{4}$ plate, and 24 cm. for $\frac{1}{2}$ plate) is the correct one for artistic photographs; for Press photography the $\frac{1}{2}$ plate size is recommended. The lens, in order to increase the handiness of the camera, should be placed in a countersunk mount.

- (b) The **Voigtländer Folding Camera**, size $\frac{1}{4}$ plate, or 9×12 cm., can be fitted with lenses 12 to 15 cm. focal length. The body is made of light aluminium alloy. The fore part is united to the body by folding stays. In consequence of this and its small

The construction of the Voigtländer cameras.

The Voigtländer Reflex Camera allows full use to be made of the lenses with greatest intensity of light.

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In the Voigtländer Folding Camera 9×12 cm. only one lens can be used.

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VOIGTLANDER

& SOHN, A.G.

12 Charterhouse St.

LONDON, E.C.



Photo

Gladiola.

T. Roberts, Esq.

Taken with Collinear II, 20 c/m.

size it is easy to handle. As the most suitable lenses we recommend the Collinear Series II., the focal length of which is $13\frac{1}{2}$ cm., or the Heliar F 4.5, 15 cm. Only *one* lens, however, can be used because the stays cannot be altered. If the back lens of a symmetrical combination of lenses is to be used, the camera is lengthened by a back extension.

In these cameras the lenses are fitted in focussing mounts.

- (c) The **Voigtländer Heliar Camera**, size $\frac{1}{4}$ plate, or 9×12 cm., is also made entirely of light metal. The front is moved by a rack and pinion on base board, and can be fitted with lenses of a focal length from 12 to 20 cm., in countersunk mounts. Focussing is effected by means of the rack and pinion movement.
- (d) The **Voigtländer Stereo Panoram Camera**, size $3\frac{1}{2} \times 5\frac{1}{2}$ ins., 9×14 cm. This Camera has been designed either as a Stereoscopic or for Panoramic Work, the distance of the axis is 70 mm., exactly corresponding to the distance of the centres of the eyes, and it is fitted with Collinear Series II. lenses, 12 cm., exactly paired for stereoscopic work.

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II. Hand Cameras with Lens Shutters.

- (e) The **Voigtländer Stereophotoscope** is a camera for stereoscopic exposures, size of plate, $4\frac{1}{4} \times 1\frac{3}{4}$ ins. It is made *entirely* of light metal, and provided with an exchanging magazine for 12 plates. It differs from the known small stereo cameras of the same size in its excellent mechanical workmanship, so that two Heliars of a focal length of 6 cm., with full aperture, F 4.5, may be used. Stopping down of the lenses, behind which lies the shutter, is done by two iris diaphragms. In consequence of the complete absence of any wooden parts, this camera is recommended for use in the tropics, and owing to its portability it is admirably adapted for touring.
- (f) The **Voigtländer Film Camera** is made to take roll films $3\frac{1}{4}$ by $4\frac{1}{4}$ ins., but it can also be used with plates $3\frac{1}{4} \times 4\frac{1}{4}$ ins. In con-

The Voigtländer Stereophotoscope is constructed entirely of aluminium alloy, light weight.
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The Voigtländer Film Camera is the most suitable for film exposures.
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sequence of its small measurements it is only fitted with Collinear Series III., with a focal length of 12 cm. The lens is placed in a Koilos or Compound shutter. This Camera has been provided with a long extension rack and pinion movement, which renders it possible to work with the back combination of the lens alone,



Photo by M. Dixon & Co.

International Trophy Race at Southampton. Brooke I. at full speed.
Taken with a Collinear Lens, Series II.

which has a focal length of 20 cm. The dimensions are so small that this camera represents the smallest pattern of a film apparatus which can be put to practical use.

The above Camera is also made in **5 × 4** inches, fitted with Collinear III., 13½ cm., and **Post Card** size, fitted with **Collinear III., 15 cm.**

- (g) **The Voigtländer Alpine Camera**, $\frac{1}{4}$ plate, or 9 × 12 cm., for plates or film pack. Especially suitable for use in tropical climates. This Camera is entirely constructed of **Light Metal**, and is fitted with a Collinear Lens, Series III., 12 cm., F 6.8, in Koilos or Compound Shutter with hinged View Finder. It weighs 1 lb. 11 ozs.

The Voigtländer Alpine Camera is extremely portable.

In consequence of the very long triple extension, work can be done with the Back Combination of the Collinear Lens. Focussing is done by means of a rack and pinion movement, with scale affixed on the left. The objective can be adjusted in vertical or horizontal direction. The measurements of the apparatus are $5\frac{3}{4} \times 4\frac{3}{8} \times 1\frac{1}{2}$ inches. **The extreme portability of this apparatus enables it to be carried in the pocket.**

III. Stand Cameras.

(h) **Stand Cameras**, in three series, A, B, and C. Series B differs from A by its longer extension, whilst Series C is made only in the size of 13×18 cm., or $\frac{1}{2}$ plate, but this series is supplied with a Focal Plane shutter. These cameras are made to suit all climates, so that the difficulties of working with an ordinary camera (for instance, in a damp, hot climate) is entirely obviated. Experience has shown us that these cameras give the best results.

The Stand Camera B has the longest extension. Series C has Focal Plane shutter before the plate.

Pages 121—23.

(i) **Voigtländer Tele-partition Stand Camera.** Having recognized the increasing importance of Tele-photography, we, as the foregoing pages show, have resolved to do what we can towards the perfecting of the required apparatus.

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We believe that in our new Stand Camera, $\frac{1}{2}$ plate or 13×18 cm., we have constructed an apparatus particularly suited for the purpose, and which gains in importance chiefly through **the introduction of the Kiesling Tele-partition.**

As is well known, by the introduction of this system the ordinary tele-tube becomes superfluous, as the tele-negative lenses are inserted into the partition wall of the camera. The elimination of all reflection is the great point of superiority in this arrangement.

Both extensions, that of the objective board as well as of the matt-disc part, are carried out from the back, the first with a spindle, the second by rack and pinion.

In consequence of the 57 cm. ($22\frac{1}{2}$ inches) long extension, the enlarging power is extraordinarily great.

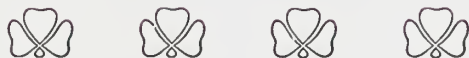
- As a suitable object lens, our Collinear II., 20 cm., F 5.4 is specially recommended (see page 29).
- (k) **Studio Cameras** in three series, D, E, and F, correspond to all requirements of portrait photography. They differ from each other by the difference in their size, outfit, and arrangement of the gearing, as can be seen from our illustrations and descriptions.



Taken with a Reflex Heliar Camera.

IV. The Dark Slides.

The Dark Slides are made in the following various patterns: -- **Solid**, with folding back or removable sides, **book form**, also changing boxes to hold plates. For film users we supply film pack and roll film holders. It is to be noted that all Focal Plane shutter cameras can be adapted for use with films, whilst the pack film holders can be fitted to all cameras with the exception of the Roll Film Cameras and the Stereophotoscope. The dark slides that **are best adapted for use** in a **Voigtländer camera** can be seen in the price list.



Combination of Apparatus for the most important Photographic Work.

After the foregoing it will not be difficult to make a satisfactory selection from among the Voigtländer lenses and apparatus, having decided which branch of the photographic art shall be more particularly cultivated.

The question of a **Hand or Stand Camera is**, in the great majority of cases, decided in favour of the former, owing to the great sensitiveness of the photographic plates and the intensity of light of the anastigmats, which united together render instantaneous exposures possible even with an unfavourable light. If experienced photographers use the Stand Camera as well as the Hand Camera, this is owing to the reliable working which can be done with the former.

If, however, the beginner is in a position to use a Stand as well as a Hand Camera, he will ultimately attain success with less expense than had he worked with the Hand Camera alone.

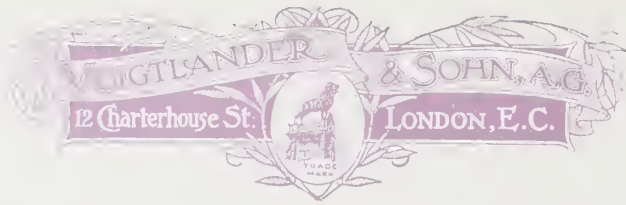
But in spite of this we can only advise in a case of doubt the choice of the Hand Camera, as they also can be used on a stand.

The question is as to the **size of the apparatus** to purchase.

The Hand Camera should not be larger than 9×12 c/m, or $\frac{1}{4}$ plate, except in the case of a camera for stereo exposures, when the Stereo Folding Camera of 9×18 cm. should be selected.

Should a lens of a greater focal length be required, with a larger angle, the Folding Camera 13×18 cm., or $\frac{1}{2}$ plate, is the suitable one.

For practical work the smallest size Stand Camera should be 13×18 cm., or $\frac{1}{2}$ plate, as the advantages show themselves only from that size upwards. Whilst there are no difficulties in the transport of that size, the next larger size of Stand Camera (18×24 c/m, or whole plate)



is very unwieldy, and for this reason is used only for special purposes. But mention must be made of the stand camera, 13×18 cm., for stereo exposures, each separate picture of which is 13×9 cm. in size.

Voigtländer cameras can be used with glass plates and films, but in the selection of the camera to be purchased it is well to consider whether



plates or films would be principally used, as in the former case lenses of greater luminosity can be used, while in the latter the gain in the bulk and weight has its advantages.

In the majority of cases cited in the following table, we give briefly

what experience has proved to us to be **the most suitable equipment** for every class of work. In addition to this we take the opportunity of pointing out the most prominent features of each outfit, so as to facilitate the selection of a camera, guided by the individual taste and special circumstances of the purchaser.

Various Styles of Photography.	Suggested Apparatus.	Characteristic Feature.
Amateur Exposures.	Film Camera, Collinear III., 12 c/m. Film Camera (Postcard), Collinear III 15 c/m. Film Camera (5 in. \times 4 in.), Collinear III., 13½ c/m. Alpine Camera, Dynar or Collinear III. Heliar Camera, Heliar 18 c/m.	Use of 2 focal lengths, extreme lightness and portability. Extreme portability. Great luminosity and long focus.
Artistic Exposures.	Heliar Reflex Camera, 18 c/m or 24 c/m. Heliar Camera, 18 c/m.	Utmost utilisation of the intensity of light.
Landscape Studies.	Reflex Heliar Camera, 18 c/m or 24 c/m. Heliar Camera, Heliar 18 c/m. " Collinear II., 15 c/m. Stand Camera C, 13 \times 18 c/m, Collinear set III., 13 \times 18 c/m, or ½ plate. Stand Camera C, 13 \times 18 c/m, or ½ plate, Heliar 24 c/m.	Utilization of intensity of light Larger angle. Use of 6 different focal lengths. Great luminosity.
Instantaneous Exposures.	Heliar Reflex Camera, 18 c/m or 24 c/m. Folding Camera, 9 \times 12 c/m, or ¼ plate, Collinear II., 13½ c/m. Heliar Camera, Collinear II., 15 c/m. Folding Camera 13 \times 18 c/m, or ½ plate, Collinear II., 20 c/m.	Utmost luminosity obtainable. Quickly manipulated. Wider angle. Large size.
Artificial Light Exposures.	Stand Camera C, 13 \times 18 c/m, or ½ plate, Collinear III., 18 c/m.	Large size.
For Stereoscope Views.	Folding Camera 9 \times 18 c/m, Collinear III., 12 c/m. Stereophotoscope.	Medium size. Extreme portability.
Travel and Exploration.	Folding Camera, 13 \times 18 c/m, or ½ plate, with extension, Collinear II., 20 c/m. Stand Camera C, 13 \times 18 c/m, or ½ plate, Collinear set III., 13 \times 18 c/m Stand Camera B, 18 \times 24 c/m or whole plate, Collinear set III., 18 \times 24 c/m.	Large size and 2 focal lengths. Use of 6 focal lengths. Use of 10 focal lengths.



Various Styles of Photography.	Suggested Apparatus.	Characteristic Feature.
For use in the Tropics.	Stereophotoscope. Heliar Camera, Collinear II or III., 15 c/m. Folding Camera 9 × 12 c/m, Collinear II., 13½ c/m. Stand Camera for the tropics.	Extreme portability. Wider perspective angle. Quick manipulation. Each of these four cameras are remarkable for their great solidity.
Scientific and Medical Exposures.	Stand Camera C, 13 × 18 c/m, or ½ plate, Heliar 24 c/m. Stand Camera C, 13 × 18 c/m, Collinear set III., 13 × 18 c/m. Reflex Camera, Heliar 18 c/m & 24 c/m.	Great luminosity. Use of 6 focal lengths. Quiet working. Free from vibration.
Projection.	Heliar.	Resistance to high temperature.
Cinematography.	Portrait lens Ia., F 2.3. Collinear series II., F 5.4. Heliar F. 4.5.	Greatest intensity of light. Large angle of view. Luminosity.
Interiors and Architecture.	Stand Camera C, 13 × 18 c/m, or ½ plate, Collinear IV., 15 c/m.	Wide angle.
Tele-Photography.	Tele partition Camera with Collinear II., 20 c/m, and Tele-negative lens. Stand Camera B 18 × 24 c/m, or whole plate, Collinear II., 25 c/m, Tele 5.	Completeness. Very large size.
Micro-Photography.	Heliar lenses. small sizes.	Luminosity.
Portraits.	Reflex Camera Heliar 18 c/m & 24 c/m. Stand and Studio Cameras with: Portrait objective I Portrait-Euryscope III. Heliar.	Silent action for rapid exposures. Greatest luminosity. Low price. Wide angle of image.
Groups.	Folding Camera 13 × 18 c/m, or ½ plate, Collinear II., 20 c/m. Stand and Studio Cameras with: Portrait-Euryscope III. Euryscope IVa. Heliar. Collinear II.	Quick manipulation. Low price. Low price. Wide angle. " "

Warnerhouse St

LONDON, E. C.



Golf—A difficult Stroke.

Taken with Voigtländer Collinear Lens II, F 5.4.



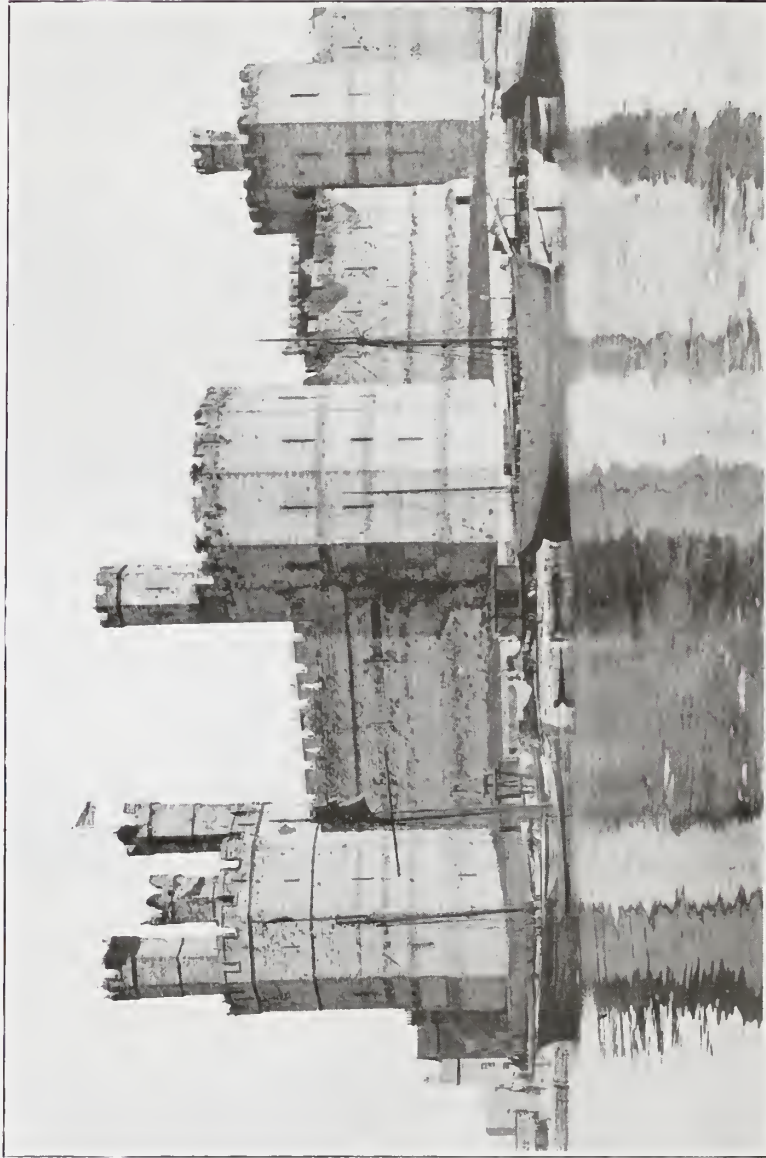


Photo by Mr. F. Fielding, Manchester

Carnarvon Castle.
Voigtlander Heliar Lens, F 4.5.

Portrait photographers will find every facility in the selection of lenses for all kinds of work in the following table. Thus, for instance, with a studio 8 yards long, the Heliar with focal length of 30 cm. will be found convenient, in taking both full length and bust size photographs.

In the first Table we give in meters the distances between the person who is to be photographed and the ground glass.

SERIES.	Focal length cm.	Distance between person and ground glass in meters for			
		Cabinet half length.	Carte de visite half length.	Cabinet full length.	Carte de visite full length.
Heliar F 4.5	24	—	3.2	5.2	6.6
„ „	30	2.2	4.0	6.5	8.3
„ „	36	2.6	4.8	7.7	9.9
„ „	42	3.0	5.6	9.0	11.6
„ „	48	3.5	6.4	10.3	13.3
„ „	60	4.4	8.0	12.9	16.7
Portrait Lens I. F 3.2	17	—	2.3	—	—
„ „	21	—	2.7	—	5.6
„ „	25	—	3.2	—	6.6
„ „	31	2.2	4.0	6.4	8.3
„ „	40	2.8	5.2	8.3	10.7
Portrait Euryscope III. F 4.5	22	—	2.8	—	5.9
„ „	28	2.1	3.7	6.0	7.7
„ „	35	2.5	4.5	7.2	9.3
„ „	40	3.0	5.4	8.7	11.1
„ „	51	3.7	6.7	10.8	13.9
„ „	66	4.8	8.8	14.1	18.2

For **Groups** we recommend

Plate **10 x 7 ins.**: Collinear II. 37 cm. Collinear III. 31 cm.

„ **12 x 10 ins.**: Collinear II. 52 cm. Collinear III. 44 cm.

„ **16 x 12 ins.**: Collinear III. 52 cm.

Practice shows that in all studios the

HELIAR 36 cm

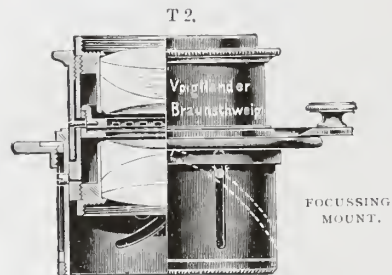
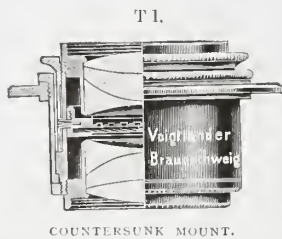
is used with greatest success as an Universal Portrait Lens.

Mounting of Lenses.

In conformity with the construction of photographic apparatus we make the mounts of our lenses in four different ways.

1. **Lenses in ordinary mounts** have the flange at the base of the tube, *i.e.*, that turned towards the ground glass focussing screen.

2. **Lenses with countersunk mounts** have the flange in the upper part of the tube (that turned towards the object to be photographed). This mounting is chosen for cameras such as the Heliar, where there is not sufficient space in front to allow for the projection of the ordinary mount, and the lens must therefore reach further into the interior of the camera. These lenses are provided with an iris diaphragm adjustable from the front.



3. **Lenses in focussing mounts** carry the flange in the upper part of the body, and possess a focussing arrangement which gives scope for the movement of the lenses outside the body, as required, for focussing purposes. Upon the outer ring there is a scale, and on this the estimated or measured distance is given in metres, in order to be able to get a sharp image with hand cameras of unchangeable extension. If the focussing is done upon a very distant (infinite) object, the lens is placed back in the mount as far as it will go. The infinity mark is indicated by a ∞ , which is engraved on the mount. These lenses also are only supplied with iris diaphragm.

For stereoscopic cameras with two identical lenses in focussing mounts, it is advantageous to apply a **double lever**, which renders a simul-



Taken with Voigtlander Euryscope III., F 4.5.

A. Grainer.



Taken with Voigtlander Collinear Lens, Series III., 15 c/m, F 6.8.



taneous focussing and adjustment of the iris diaphragm. The price of this double lever is 30 shillings; and the telegraphic word is "*Norma*."

4. Lenses in **Shutters** are supplied to special order, when required to fit customers' own cameras. For further particulars as to the various shutters and prices see pages 99 and 100.

All Voigtländer lenses are engraved with the name Voigtländer, the series number, and the number of the lens itself.

Caution.—Purchasers should satisfy themselves that the lenses are genuine, as **fraudulent imitations are not unknown**.

The Quality of our Glass.

We here give some particulars as to the quality of the glass which we use. **The durability** of all our lenses is well known.

The great improvement which has taken place in photographic lenses, since and in consequence of, the introduction of the new Jena glass was brought about through the large selection placed at the disposal of opticians to test the power of refraction, as well as the diffusion of colours in this glass. However, it has been practically impossible to produce this Jena glass entirely free from air bubbles enclosed in them; **which, curiously enough, exercise absolutely no influence on the correctness of the image.**

We believe that, on this subject, nothing more satisfactory can be afforded than a communication from the glass works of **Schott and Co., of Jena**, which gives a practical explanation in a few words.

The efforts of opticians to improve the systems of lenses of the finest character have been the means, during the last ten years, of using more and more of certain kinds of glass, especially for **photographic** purposes. These kinds of glass, on account of their optical qualities and chemical composition, differ considerably from the crown and flint glass formerly in use, and their production presents to the manufacturer, in a way, much greater technical difficulties than the melting of the optical glass formerly in fashion. Most of the various kinds of glass which have of late come



Taken with Voigtlander Collinear, Series IV., 15 c/m.

to the front for the manufacture of improved photographic lenses are uncommonly difficult to obtain with complete homogeneousness—that is to say, exemption from tiny air bubbles. The reason for this is that all the special uses to which they are now put, differing entirely from the old ones between the power of refraction and the diffusion of colours, subject the chemical composition of the glass to such strict limitations that the technics of melting have now comparatively small field. The consequence of this is, that in the same kind of glass it has become practically impossible to produce regular pieces entirely free from bubbles.

We must point out that the existence of small air bubbles, even in the most unfavourable case, causes a loss of light of scarcely one-fiftieth per cent., and consequently remains absolutely without effect upon the optical working of a system of lenses.

Now it is evidently *unfair* to ask the producer of glass for optical purposes to fulfil the increased and very varying demands of opticians with regard to all the *really* essential qualities of the glass for lenses, and require him, moreover, to throw away nine-tenths of the glass produced, simply because it shows a defect which makes absolutely no difference to the work done.

If the purchasers of photographic lenses condemn those with a few tiny air bubbles, according to the old habit, as being “defective,” the optician will have to make them understand that, unfortunately, lenses of refined quality cannot be made from any crown or flint glass whatever, but only from kinds of glass, the selection of which much more weighty reasons must decide than the presence of a few bubbles.

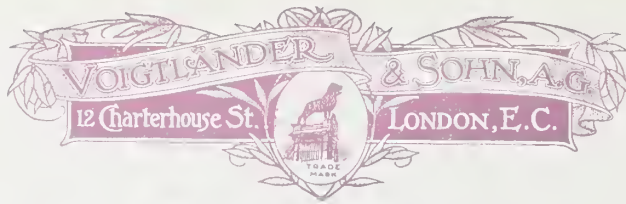
Now that practical experience has proved the non-influence of air-bubble defects, and as we proceed in the selection of our glass material with the greatest care, we beg to ask our customers not to attribute any importance to the presence of such bubbles; **we cannot admit them as a justified reason for any claim.**



A. G. G. G.



Taken with Voigtlander Heliar Lens, F 4.5.



Voigtlander
ESTABLISHED 1756 & Sohn A.G.

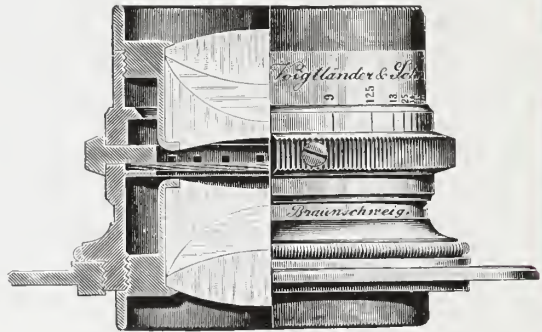
Collinear - Lens. -

Page 21.

The "**Collinear**" is the most perfect type of anastigmat symmetrical lens. It has all the corrections that is possible in a lens of this description. It will make a simultaneously sharp picture of vertical and horizontal lines crossing each other, or a perfectly sharp picture of concentric circles.

"**Collinear Lenses**" are symmetrical, the front and back combination being exactly the same focus; each combination is in itself corrected, achromatic, anastigmatic, of sharp defining power, and can be used as a single lens.

Series II., F 5.4, is used for extra rapid work with a Focal Plane shutter, also most suitable for all work performed in a weak light. This lens is generally used by **Press Photographers for photo graphing horse races, athletes, animals in nature, &c.**



T 3.

SERIES II.

Full Aperture, Up to 20 c m focus, F 5.4. 25 c m to 60 c m, F 6.3.

Equivalent Focus.	Diameter of Lens.	Size of Plate sharply covered.		Ordinary Mount.	Code Word.	Countersunk Mount.		Focussing Mount.	
						Price.	Code Word.	Price.	Code Word.
		At Full Aperture.	Stopped Down.						
c/m	ins.	m m	ins.	ins.	f s. d.	£ s. d.		£ s. d.	
6	2 3/8	11	2 x 2	3 1/4 x 3 1/4	4 10 0	Galen	..	..	..
7	2 3/4	13	3 1/4 x 2 1/2	4 x 3 1/4	4 10 0	Galeotto	..	..	..
9	3 1/8	17	4 x 2 3/4	3 3/4 x 3 1/4	5 0 0	Gandara	5 5 0	Gabes	5 15 0
12	4 1/4	23	4 1/4 x 3 1/2	6 1/4 x 4 1/4	5 15 0	Gaston	6 0 0	Gafun	6 10 0
13 1/2	5 1/8	26	5 x 4	6 3/4 x 5 1/4	6 5 0	Gatter	6 10 0	Galmei	7 0 0
15	6	29	6 1/2 x 4 3/4	8 1/4 x 6 3/4	6 15 0	Gawein	7 0 0	Gamba	7 10 0
20	7 7/8	38	7 1/2 x 5	9 1/2 x 7	9 0 0	Gemma	9 8 0	Gaza	10 0 0
25	9 1/4	40	8 1/2 x 5	9 1/2 x 8	11 0 0	Georgia	..	..	..
31	12 1/4	48	8 1/2 x 6 1/2	12 x 10	15 0 0	Ginster	..	..	..
37	14 3/8	58	9 x 7	14 x 10 1/2	20 0 0	Gorgone	..	..	..
44	17 1/8	70	11 x 8	15 1/2 x 11 3/4	27 0 0	Gudrun	..	..	..
52	20 1/2	82	12 x 10	17 1/2 x 13 3/4	34 0 0	Guntram	..	..	..
60	23 5/8	91	13 3/8 x 10 5/8	19 1/4 x 15	45 0 0	Gunter	..	..	..

All these Lenses are fitted with Iris Diaphragm. The cost of pairing two Collinears for Stereoscopic work is 8/-..

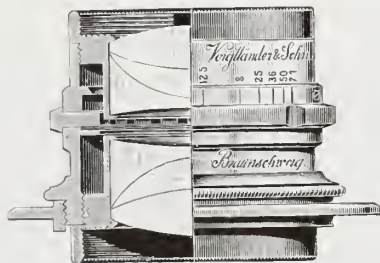
Code Word for pair of Collinears II. paired for Stereoscopic work in focussing mounts — 9 c/m, Newa; 12 c/m, Nicol; 13 1/2 c/m, Nicodem; 15 c/m, Nirwana; 20 c/m, Noah.



Voigtlander
ESTABLISHED 1756 & Sohn A.G.

**Collinear
≈ Lens.**

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T 4.

Series III.—This Lens is fully as quick as the majority of Anastigmats, does all kinds of ordinary instantaneous work, and is preferable to Series II. for view work, flash light, out-door groups, copying, and for small Hand Cameras, because of its greater compactness and slightly increased covering power.

SERIES III.

Full Aperture, Up to 18 c/m, F 6·8. 20 c/m to 58 c/m, F 7·7.

Equivalent Focus.		Diameter of Lens.	Size of Plate sharply covered.		Ordinary Mount.	Code Word.	Countersunk Mount.		Focussing Mount.	
							Price.	Code Word.	Price.	Code Word.
c/m	ins.	m/m	ins.	ins.	£ s. d.		£ s. d.		£ s. d.	
7	2 $\frac{3}{4}$	11	1 $\frac{3}{4}$ × 2 $\frac{3}{4}$	3 $\frac{1}{4}$ × 4	4 0 0	Hadramaut	.. ..	..	.. ..	..
9	3 $\frac{1}{2}$	14	2 $\frac{1}{2}$ × 3 $\frac{1}{2}$	4 $\frac{3}{4}$ × 3 $\frac{3}{4}$	4 5 0	Hagar	4 10 0	Hebe	5 0 0	Narbo
12	4 $\frac{3}{8}$	18	4 $\frac{1}{4}$ × 3 $\frac{1}{4}$	6 $\frac{1}{4}$ × 5	5 0 0	Hakon	5 5 0	Hedwig	5 15 0	Nathan
13 $\frac{1}{2}$	5 $\frac{1}{2}$	20	4 $\frac{1}{2}$ × 3 $\frac{1}{2}$	7 × 5 $\frac{1}{2}$	5 10 0	Halde	5 15 0	Hegar	6 5 0	Natter
15	6	23	6 $\frac{1}{2}$ × 4 $\frac{1}{4}$	8 × 6	6 0 0	Halma	6 5 0	Helga	6 15 0	Neckar
18	7 $\frac{1}{4}$	28	7 $\frac{1}{2}$ × 5	9 × 7	7 5 0	Hassan	7 10 0	Helm	8 0 0	Nelda
20	8	27	8 $\frac{1}{2}$ × 6 $\frac{1}{2}$	10 × 8	8 0 0	Hatto	8 5 0	Hediodor	8 15 0	Nenner
25	10	34	9 × 7	12 × 10	10 0 0	Hella	.. ..	..	.. ..	..
31	12	40	12 × 10	14 × 12	14 0 0	Hestia	.. ..	..	.. ..	..
37	14 $\frac{1}{2}$	47	14 × 10	16 × 13	18 0 0	Honduras	.. ..	..	.. ..	..
44	17 $\frac{1}{2}$	57	15 × 12	20 × 15	23 0 0	Horus	.. ..	..	.. ..	..
52	20 $\frac{1}{2}$	67	18 × 12	20 × 18	30 0 0	Hulda	.. ..	..	.. ..	..
58	23	76	20 × 14	24 × 20	42 0 0	Hutten	.. ..	..	.. ..	..

All these Lenses are fitted with Iris Diaphragm.

The cost of pairing two Collinears for Stereoscopic work is 8/-

Code Word for pair of Collinears III. paired for Stereoscopic work in focussing mounts:—

9 c/m Niger 13 $\frac{1}{2}$ c/m Nil 18 c/m Noema
12 c/m Nipon 15 c/m Nizam 20 c/m None



Copyright

Photo by Burgess & Dixon.

Hurdle Race : Woolwich v. Sandhurst at Woolwich.

Taken with a Collinear Lens, Series II.



Sets of Voigtländer Collinear Lenses.

THESE sets offer a great advantage, the operator being able to use various foci from the same point, and it is also possible to make different sized images.

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Each set is composed of the following:—

- 1.—A special setting fitted with Iris Diaphragm, so arranged that either of the combinations may be screwed into the back or front, as desired.
- 2.—Three or four single Anastigmats, each cell being engraved with the focal length.
- 3.—A Screen Ring, to intercept any reflected light, when a single Lens only is in use.
- 4.—A Case to contain Lenses and setting.
- 5.—A table of the various apertures of the different combinations that can be obtained with the set.

Sets of Voigtländer Lenses.

The following combinations are the most useful:—

A.—SET OF COLLINEARS, SERIES III.,

9 × 12 c/m or $\frac{1}{4}$ -plate.

Price £7 10 0

Code Word: Labienus.

No.	Focus of the				Focus of the Combination.		Largest Aperture	Size of Plate with	
	Front Lens.		Back Lens.					F 7.7.	F 25.
1	ins.	m/m	ins.	m/m	ins.	m/m	F.	ins.	ins.
	...	...	10½	262	10½	262	15	...	7½ × 9½
2	...	...	8⅓	209	8⅓	209	15	...	5½ × 7½
3	...	...	5⅔	143	5⅔	143	15	...	3⅔ × 5⅔
4	10½	262	8⅓	209	5⅓	133	7.7	3⅔ × 4½	4½ × 6
5	10½	262	5⅔	143	4¼	106	7.7	3½ × 4	3½ × 5½
6	8⅓	209	5⅔	143	3⅑	97	7.7	2½ × 3⅔	3⅔ × 4½

B.—SET OF COLLINEARS, SERIES III.,

13 × 18 c/m or $5\frac{1}{5} \times 7\frac{1}{5}$ ins.

Price £10 0 0

Code Word: Labrador.

No.	Focus of the				Focus of the Combination.		Largest Aperture.	Size of Plate with	
	Front Lens.		Back Lens.					F 7 7.	F 25.
	ins.	m/m	ins.	m/m	ins.	m/m	F.	ins.	ins.
1	...	...	14 $\frac{1}{3}$	358	14 $\frac{1}{3}$	358	15	...	8 $\frac{1}{4}$ × 10 $\frac{1}{4}$
2	...	...	10 $\frac{1}{2}$	262	10 $\frac{1}{2}$	262	15	..	7 $\frac{1}{8}$ × 9 $\frac{1}{2}$
3	...	...	8 $\frac{1}{3}$	209	8 $\frac{1}{3}$	209	15	...	6 $\frac{3}{8}$ × 8 $\frac{1}{4}$
4	14 $\frac{1}{3}$	358	10 $\frac{1}{2}$	262	6 $\frac{4}{5}$	172	7·7	4 $\frac{3}{4}$ × 6 $\frac{3}{8}$	6 × 8
5	14 $\frac{1}{3}$	358	8 $\frac{1}{3}$	209	6	150	7·7	4 $\frac{3}{4}$ × 6 $\frac{3}{8}$	5 $\frac{1}{3}$ × 7 $\frac{1}{8}$
6	10 $\frac{1}{2}$	262	8 $\frac{1}{3}$	209	5 $\frac{1}{3}$	133	7·7	3 $\frac{1}{2}$ × 4 $\frac{3}{4}$	4 $\frac{3}{4}$ × 6 $\frac{3}{8}$

C.—SET OF COLLINEARS, SERIES III.,

For plate 18×24 c m or $8\frac{1}{2} \times 6\frac{1}{2}$ ins. Price £19 0 0

Code Word: Latona.

No.	Focus of the				Focus of the Combination.		Largest Aperture.	Size of Plate with	
	Front Lens.		Back Lens.					F 7.7.	F 25.
	ins.	m/m	ins.	m/m	ins.	m/m	F.	ins.	ins.
1	...	...	21½	538	21½	538	15	..	9½ × 12
2	...	...	18	447	18	447	15	...	8¼ × 10¼
3	...	...	14⅓	358	14⅓	358	15	...	8¼ × 10¼
4	.	..	10½	262	10½	262	15	...	7⅛ × 9⅓
5	21½	538	18	447	11⅘	277	7.7	9½ × 7⅕	10 × 12
6	21½	538	14⅓	358	9⅘	244	7.7	8½ × 6½	8½ × 11⅞
7	18	447	14⅓	358	9	226	7.7	8½ × 5⅕	7⅛ × 9½
8	18	447	10½	262	7½	188	7.7	7⅕ × 5⅕	6½ × 8½
9	14⅓	358	10½	262	6⅘	172	7.7	6½ × 4⅘	6 × 8





Taken with Voigtlander Collinear, Series III.

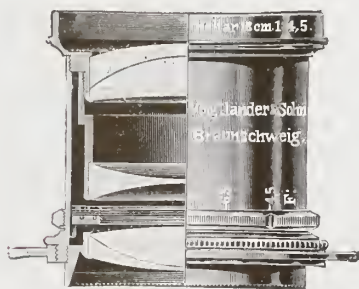
VOIGTLÄNDER & SOHN A.G.
12 Charterhouse St. LONDON, E.C.

Voigtländer
ESTABLISHED 1756 & Sohn A.G.

Heliar
Lens.

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For Portraits, Groups, Landscapes, and also for the most
rapid Instantaneous Work.



T 8.

Full Aperture,
F 4.5
in all sizes.

Equivalent Focus.		Diameter of Lens.		Size of Plate sharply covered, F 4.5.		Ordinary Mount.		Code Word.		Countersunk Mount.		Focussing Mount.	
										Price.	Code Word	Price.	Code Word.
c m	ins.	m m	ins.			£	s.	d.		£	s.	d.	
5	2	11	1 1/4	2	4 0 0	Fiasco	..	..	..	..	..	..	..
8 1/2	3 3/4	19	2	2	4 15 0	Fibre	..	..	..	..	..	..	..
12	4 3/4	27	3 1/4	2 3/4	5 10 0	Fibrin	5 15 0	Fixage	6 5 0	Fiscus			
15	6	33	4 3/4	3 1/4	6 5 0	Fibrinosus	6 10 0	Fibroso	7 0 0	Filiorum			
18	7 1/2	40	5 1/2	4	8 0 0	Figella	8 5 0	Filigran	8 15 0	Figurina			
24	9 1/2	54	7	5	13 0 0	Finota	13 10 0	Finte	14 0 0	Finale			
30	11 3/8	67	8 1/4	6 1/4	18 0 0	Firna	..	..	..	..	..	..	..
36	14 1/4	80	9 1/2	7	24 0 0	Fisano	..	..	..	..	..	..	..
42	16 1/2	93	10 1/2	8 1/2	31 0 0	Fiscal	..	..	..	..	..	..	..
48	19	107	12	10	37 10 0	Fistel	..	..	..	..	..	..	..
60	24	132	16	12	75 0 0	Finger	..	..	..	..	..	..	..

The cost of pairing two "Heliars" for Stereoscopic Work is 8/-

ESTABLISHED 1756

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Equivalent Focus.		Diameter of Lens.	Size of Plate sharply covered with full aperture.	Ordinary Mount.	Code Word.	Countersunk Mount.		Focussing Mount.			
						Price.	Code Word.	Price.	Code Word.		
c/m	ins.	m/m	ins.	£	s.	d.		£	s.	d.	
12	4 $\frac{3}{4}$	21	4 $\frac{3}{4}$ × 3 $\frac{1}{4}$	3	15	0	Dyn	4	0	0	Dynein
13 $\frac{1}{2}$	5 $\frac{1}{8}$	24	5 $\frac{1}{2}$ × 4	4	5	0	Dyro	4	10	0	Dyrocin
15	6	26	6 × 4 $\frac{1}{2}$	4	15	0	Dysis	5	0	0	Dysiscin
18	7 $\frac{1}{8}$	32	7 × 5	6	0	0	Dytes	6	5	0	Dytescin

The cost of pairing two "Dynars" for Stereoscopic Work is 8/-.



Taken with Reflex Camera and Heliar Lens.

12 Charterhouse St.

LONDON, E.C.

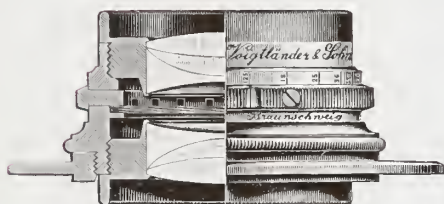
Voigtlander
ESTABLISHED 1756
& Sohn AG

**Collinear
- Lens. -**

Page 29.

SERIES IV.

Full Aperture, F 12.5.



T 10.

**Wide-Angle Anastigmat,
for Architectural, Process
Work, and Landscapes.**

Equivalent Focus.		Diameter of Lens.	Size of Plate Sharply Covered.		Price.			Code Word.
			F 12.5.	Stopped Down.				
c/m	ins.	m/m.	ins.	ins.	£	s.	d.	
10	4	8	$1\frac{1}{4} \times 3\frac{1}{2}$	$6\frac{1}{2} \times 4\frac{3}{4}$	4	0	0	Kabale
12	$4\frac{3}{4}$	10	5×4	$7\frac{1}{2} \times 5$	5	0	0	Kabul
15	6	12	$6\frac{1}{2} \times 4\frac{3}{4}$	$8\frac{1}{2} \times 6\frac{1}{2}$	5	10	0	Kallias
20	$7\frac{7}{8}$	16	$8\frac{1}{4} \times 6\frac{1}{2}$	10×8	6	0	0	Kandahar
25	$9\frac{3}{4}$	21	9×7	12×10	9	0	0	Kaste
32	$12\frac{3}{4}$	26	10×8	$10\frac{3}{4} \times 13\frac{3}{4}$	12	0	0	Kondor
44	$17\frac{1}{2}$	35	12×10	15×12	20	0	0	Konon
58	$22\frac{3}{4}$	46	15×12	24×18	30	0	0	Korfu
80	$31\frac{1}{2}$	65	16×14	28×22	45	0	0	Kuno

The "Collinear" Series IV. is only made in ordinary Mounts, up to the Focus of 58 c/m with Iris Diaphragm, the 80 c/m is supplied with a set of Waterhouse Diaphragms, 7 circular and 5 square openings; price of extra sets Waterhouse Diaphragms. 16/-.



Taken with Collinear Series II.



Portrait Lenses.

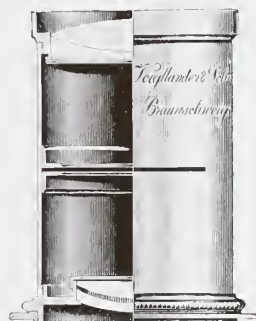
= SERIES Ia. =

Page 33.

Full Aperture F 2.3.

Extra Rapid Objectives for Portraits & Cinematograph Work.

Equivalent Focus.			Diameter of Lens.	Diameter of Useful Field.	Size of Picture.	Price.			Code Word.
c/m	ins.	m/m				£	s.	d.	
8	3 $\frac{1}{4}$	36	1 $\frac{3}{8}$	1 $\frac{3}{8}$	Cinematograph	6	0	0	Adler
10	4 $\frac{1}{8}$	46	1 $\frac{5}{8}$	1 $\frac{5}{8}$	"	6	0	0	Agathe
15	6	64	2 $\frac{1}{4}$	2 $\frac{1}{4}$	C.D.V. Bust	8	0	0	Aller
20	7 $\frac{3}{4}$	84	2 $\frac{3}{4}$	2 $\frac{3}{4}$	C.D.V. f. length	12	0	0	Andorra
30	11 $\frac{1}{2}$	128	4	4	Cabinet Bust	30	0	0	Argus



T 11.

These objectives, from 8 c/m to 20 c/m are fitted with Iris Diaphragms, the 30 c/m has Waterhouse Diaphragms; price of extra set Waterhouse Diaphragms, 25/-.

Portrait Lenses.

= SERIES I. =

Page 33.

Full Aperture F 3.16.

Modified Petzval Lens. For Portraits and Projection.

Equivalent Focus.			Diameter of Lens.	Suitable for	Price.	Code Word	Price of extra sets Waterhouse Diaphragms
c/m	ins.	m/m					
17	6 $\frac{3}{4}$	53	1 $\frac{1}{2}$	C.D.V. Bust and Children	6 0 0	Barbara	15 0
21	8 $\frac{1}{4}$	66			9 0 0	Belisar	17 0
25	9 $\frac{3}{4}$	79	1 $\frac{3}{4}$	C.D.V. bust & full length	13 0 0	Bergamo	19 0
31	12	92	2	Cabinet	18 0 0	Beowulf	1 2 0
40	15	105	2 $\frac{1}{2}$	Boudoir	24 0 0	Bramarbus	1 5 0



T 12.

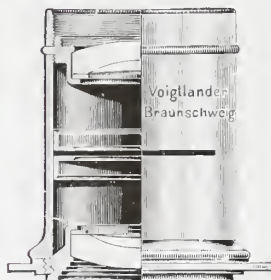
All Portrait Lenses, Series I., are supplied with Waterhouse Diaphragms; the 17, 21, and 25 c/m are fitted with rack and pinion.

Portrait Euryscope. SERIES III.

Luminous Lenses for Portraits and Small Groups.

Page 34.

Full Aperture F 4.5.



T 13.

Portrait Euryscope Series III.		Diameter of Lens.	Size.	Price.	Code Word.	Price of a Set of Waterhouse Diaphragms.
Focus,						
c/m	ins.	m/m		£ s. d.		£ s. d.
17	6 $\frac{3}{4}$	40	C.D.V.	4 10 0	Cadmus	13 0
20	7 $\frac{1}{4}$	46	,,	5 10 0	Catalonien	14 0
22	8 $\frac{1}{2}$	53	,,	7 0 0	Catania	15 0
28	11	66	Cabinet	10 0 0	Ceder	17 0
35	13 $\frac{3}{4}$	79	,,	14 0 0	Centaur	19 0
40	16	92	Cabinet	20 0 0	Certosa	1 2 0
51	20	105	and Boudoir	26 0 0	Cimon	1 7 0
66	26	135	{ Boudoir, Imperial, &c. }	47 10 0	Cybele	1 14 0

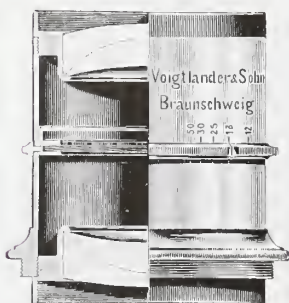
All these Lenses are supplied with a set of Waterhouse Diaphragms.

Universal Euryscope. SERIES IVa.

Lens for Groups.

Page 34.

Full Aperture F 7.0.



T 11.

Euryscope, Series IVa.		Diameter of Lens.	Size of Plate Covered.		Price.	Code Word.		
Focus.			Stopped down.					
c/m	ins.	m/m	ins.		£	s.	d.	
15	6	22	3½	× 4¾	3	10	0	Dingo
18	7⅛	27	3¾	× 6½	4	4	0	Divan
20	7¾	30	7½	× 5	4	16	0	Dolman
25	9¾	38	6½	× 8½	5	12	0	Dolus
30	11¾	46	9	× 7	6	18	0	Domina
36	14¼	55	10	× 8	8	12	0	Dorn
43	17	67	12	× 10	11	12	0	Duenna
50	19½	77	14	× 11	16	10	0	Despina
66	26	104	15	× 12	26	0	0	Dessin
87	34¼	137	20	× 16	50	0	0	Dina

This Series, up to 50 cm., are fitted with Iris Diaphragms; 66 and 87 cm. with Waterhouse Diaphragms.

Voigtländer Telephotographic Lenses.

Page 37.

We manufacture the Telephoto Negative Lenses in five sizes, suitable for Lenses up to 31 c/m Focus.

Telephoto Lens.	Focus of the Tele-negative.	Objective Focus. c/m	Extension of Camera.	Size of Plate.	Price of Telephoto Negative Lens.	Code Word.	Price of Tele-negative and Objective complete.	Code Word.
No.	m/m		ins.	ins.	£ s. d.		£ s. d.	
1	—33	Collin. II, 9	2½ up to 10	4 × 3¼	4 0 0	Mabel	9 0 0	Magog
		Collin. III, 9					8 15 0	Mahdi
2	—33	Collin. II, 12	3½ „ 18	4¾ × 3½	4 0 0	Macbeth	9 15 0	Malton
		Collin. III, 12					9 0 0	Manna
		Dynar 12					7 15 0	Mandrill
3	—51	Collin. II, 15	4¾ „ 20½	6¼ × 4¾	4 5 0	Macduff	11 0 0	Masure
		Collin. III, 15					10 5 0	Mekka
		Dynar 15					9 0 0	Merino
		Heliar 15					11 5 0	Merlin
4	—67	Collin. II, 20	6 „ 21	8½ × 5½	4 15 0	Maffia	13 15 0	Mestize
		Collin. III, 20					12 15 0	Mignon
		Collin. III, 18	6½ „ 26	7½ × 5			12 0 0	Mentol
		Dynar 18					10 15 0	Memento
		Heliar 18					12 15 0	Membran
5	—97	Collin. II, 25	8 „ 32	9½ × 7½	5 10 0	Magnolie	16 10 0	Minaret
		Collin. III, 25					15 10 0	Minze
		Heliar 24					18 10 0	Minka
		Collin. II, 31	12 „ 56	12 × 10			20 10 0	Misurina
		Collin. III, 31					19 10 0	Mizar
		Heliar 30					23 10 0	Mixtura



Taken with Voigtländer Collinear Lens, Series III. No. 4,
and Voigtländer Telephoto-Attachment No. 4.

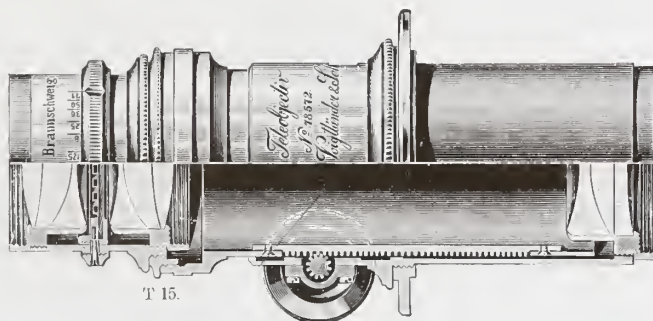
Both negatives taken from the same standpoint.

Taken with Voigtländer
Collinear Lens, Series III. No. 4.

Photo by R. F. Foster, Esq.



Every degree of magnification may be obtained, according to the distance the Lens is placed from the plate. The image is from three to four times as large as that obtained by an ordinary Lens of the same focus as the Camera extension. An image ten to twelve times larger than that of the Positive Lens alone, can be obtained sharply defined.



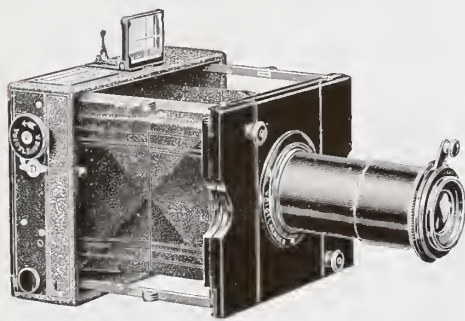
VOIGTLÄNDER TELE-NEGATIVE WITH COLLINEAR.

The **Telephotographic Lens** is recognized as forming an **essential part** of the Photographer's outfit, as it gives him—within certain limits—a considerable range of foci to make the **subject as large as he chooses**.

These Telephotographic Lenses give perfectly flat field with accurate reproduction of straight lines. They are suited for use with all high-grade positive lenses.

Tele-negative with fixed Tubes.

Page 39.

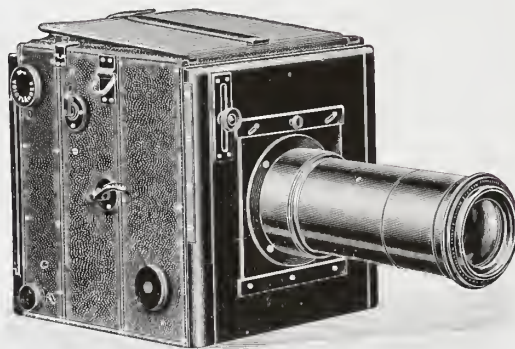


Voigtlander Folding Camera, $\frac{1}{4}$ -plate, 9 & 12 c/m with Tele-tube A, focussing made with the Lens.

Owing to the large demand for Telephoto apparatus we have introduced a Tele-negative lens for hand cameras, with fixed tube, giving a magnification of about **$2\frac{1}{2}$ times**. It is quite possible and practical with this instrument to make instantaneous pictures, always remembering to give a 6 times longer exposure. Focussing is made either with the Camera adjustment or the focussing attachment of the lens.

Telephotography with the Heliar Reflex Camera.

We have also manufactured a Tele-photo Objective, producing a $2\frac{1}{2}$ times enlargement, for use with our $\frac{1}{4}$ -plate Heliar Reflex Camera, working with an equivalent focus of 45 c/m., and can therefore be used for long-distance photography with most excellent results.



T 17.

Voigtlander Heliar Reflex Camera, with Tele-tube B, focussing effected by the rack and pinion of the Camera.

Tele-photo lens **A** for focal length $13\frac{1}{2}$ c/m. Collinear Lens - - 60/-

Code Word—**Teleklapp.**

„ „ **B** for Heliar Reflex Camera, 9×12 c/m. or $\frac{1}{4}$ -pl. 70/-

Code Word—**Telespiegel.**

For our Tele-stand Camera, for use with Kiesling's Tele-partition, we supply a set of 4 Tele-negative lenses. Focus—33—51—67 and 97 m/m in cells. Price £8 - 0 - 0.

Code Word—**Telelinsensatz.**



VOIGTLÄNDER Apochromatic Collinear Lenses.

Page 31.



T 18.

APOCHROMATIC COLLINEAR WITH TROUGH.

Full Aperture 20 c/m, F 8.
30 c/m to 100 c/m, F 9.

Anastigmatic Objectives for
Process Work, Three Colour
Work, and Scientific Purposes.

Focus.		Diameter of Lens.	Size of Plate sharply covered at F 18.		Price.		Code Word.	Price of a set of Waterhouse Stops, consisting of 7 circular and 5 square openings.		Code Word.
			Same Size.	Reduction.						
c/m	ins.	m/m	ins.	ins.	£	s.	d.	£	s.	d.
20	8	26	7 × 9½	6 × 8½	9	0	0	Humus	16	0
30	12	34	10½ × 12½	8 × 10	15	10	0	Huzule	17	0
42	16½	47	14½ × 18	10 × 12	25	0	0	Hybla	19	0
50	20	56	16 × 20	12 × 16	34	0	0	Hyperion	1	0
60	23½	67	20 × 24	16 × 20	45	0	0	Hydrant	1	2
70	28	78	22 × 26	18 × 22	60	0	0	Hyrceanien	1	6
80	31½	89	24 × 28	20 × 24	75	0	0	Hymnus	1	10
100	40	111	28 × 32	24 × 32	110	0	0	Hystese	2	0

All the Apochromatic Collinear Lenses are supplied with a set of Waterhouse Diaphragms, comprising seven round and five square openings.

We would recommend to our customers who intend using an Apochromatic Collinear in conjunction with a prism not to have same of too short a focus, as the employment of the prism diminishes the angle of view.



Voigtländer OXYN LENS.

For Finest Process Work.



T 19.

D. R.-P. 154 910.

THIS Lens is specially constructed for finest line details and half-tone work, to be made with relatively large aperture.



Equivalent Focus.		Full Aperture.	Size of Plate sharply covered	Price.		Code Word.	Price of a set of Waterhouse Stops, consisting of 7 circular and 5 square openings.	Code Word.		
c/m	ins.		ins.	£	s.	d.	£	s.	d.	
36	14 $\frac{1}{4}$	F 9	14 × 14	13	0	0	Odo	0	18	0
42	16 $\frac{1}{2}$	F 9	16 × 16	18	0	0	Odoaker	0	19	0
50	20	F 10	18 $\frac{1}{2}$ × 18 $\frac{1}{2}$	24	0	0	Odaliske	1	0	0
60	23 $\frac{1}{2}$	F 10	22 × 22	30	0	0	Otfried	1	2	0
80	31 $\frac{1}{2}$	F 11	27 $\frac{1}{2}$ × 27 $\frac{1}{2}$	45	0	0	Ossa	1	10	0
100	40	F 12	33 $\frac{1}{2}$ × 33 $\frac{1}{2}$	62	10	0	Okarina	2	0	0
130	51 $\frac{1}{2}$	F 13	40 × 40	80	0	0	Oker	2	10	0
170	67	F 15	48 × 48	155	0	0	Olbers	3	5	0

All "Oxyne" Lenses are supplied with a set of Waterhouse Diaphragms comprising six circular and five square openings.

Reversing Prisms

Page 45.

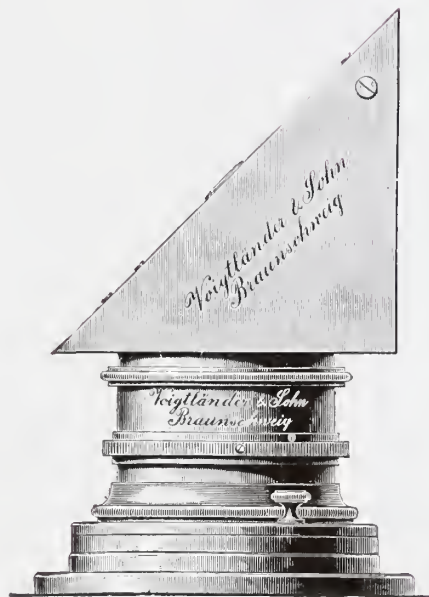
For Photo-Mechanical Process Work.

OUR Prisms are rectangular, composed of colourless crown glass, very accurately worked. The surface of the hypotenuse is silvered.

In the price of the Prisms is included two flanges, the one to fix the lens to the prism, the other to turn the lens and the prism in the direction required.

To adopt our Prisms to a lens, it is necessary that we should have same for accurate fitting.

It should be recollected that when using a Prism the angle of view is always diminished, a long focus lens is therefore the most practical.



T 20.

Length of Surface.	Apochromatic Collinear.	Collinear. Series III.	Collinear. Series IV.	Oxyn.	Price.	Code Word.
m/m	c/m	c/m	c/m	c/m	£ s. d.	
25	..	15	15, 20, 25	..	4 10 0	Omaha
35	..	18, 20	32	..	5 10 0	Omega
45	20	25	44	..	6 15 0	Omdurman
55	30	31, 37	..	..	10 0 0	Ontario
65	42	44	58	36	15 0 0	Opal
80	50	52	80	42, 50	20 0 0	Orlando
95	60	58	..	60	30 0 0	Oscar
105	70	..	..	80	45 0 0	Ornat
120	80	..	..	100, 130	60 0 0	Otto
145	100	..	..	170	80 0 0	Ottilie



Filter Troughs.

Page 44.

THESE Filter Troughs are used for working with definitely coloured light. They consist of two plain parallel plates of glass perfectly free from tension, between which lies a glass ring, also parallel, which is perforated in two places to receive the influx cock, and the funnel for filling. The whole is fitted in a metal frame. When ordering these troughs it is necessary to send the Objective Lens for accurate fitting.

Diameter of Filter.		Apochromatic Collinear.	Collinear Series III.	Collinear Series IV.	Oxyn.	Price.			Code Word.
m/m	ins.	c/m	c/m	c/m	c/m	£	s.	d.	
45	1 $\frac{3}{4}$	20	18, 20	15—32	...	5	0	0	Ovambo
65	2 $\frac{9}{16}$	30	25, 31, 37	44	...	5	0	0	Ovum
84	3 $\frac{3}{8}$	42	44	58	36	7	0	0	Oxal
95	3 $\frac{3}{4}$	50	52	...	42, 50	10	0	0	Oxhoft
106	4 $\frac{1}{4}$	60	58	80	60	14	0	0	Oxytonon
120	4 $\frac{3}{4}$	70	...	...	80	18	10	0	Oxus
130	5 $\frac{1}{4}$	80	...	...	100, 130	23	0	0	Oxygen
160	6 $\frac{1}{4}$	100	...	...	170	32	10	0	Oxyano



Page 44.

SELECTED FILTER LIQUIDS

FOR THREE-COLOUR PRINTING.

We supply at the rate of **3/- per 100 cubic centimetres 3 $\frac{1}{2}$ ozs.** They are toned down for a layer of 10 m/m in thickness between the inner walls of the Filter Trough.

Separate preparation of these liquids and the toning for other thicknesses of layer we **charge 5/- per 100 cubic centimetres 3 $\frac{1}{2}$ ozs.**

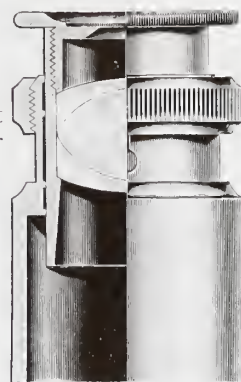
For the exact focussing upon the ground glass we supply
TWOFOLD CEMENTED FOCUSSING ACHROMATIC POCKET MAGNIFIERS.

Price 15/- Code Word: "Pagano."

THREEFOLD CEMENTED ACHROMATIC MAGNIFIERS.

These Magnifiers are very useful for the finest photographic (photo mechanical) focussing, and for examining small objects.

Magnification.	Price.			Code Word.
	£	s.	d.	
6 times	1	0	0	Paloma
12 "	1	0	0	Pergamon
18 "	1	0	0	Perseus



T 21.

Page 46.

LENS (Compensation and Contrast) FILTERS.

These Filters serve to completely suppress blue rays: they are made in three qualities, A, B, and Orange; they are far superior in efficiency to the ordinary yellow glass screens, which do not really act as filters, but only as dampers over the entire spectrum. The A and B are used for the suppression of the blue rays, the Orange to obtain full value from orange and red tones. These filters, circular in shape, are for use with plates sensitive to colours.

The price of a **Compensation Filter** is one half higher than the **Contrast Filter** of similar size.

Prices of the Contrast Filter (A, B, and Orange):—

Opening of Filter.		Price for A, B, or Orange.			Code Word for A.	Code Word for B.	Code Word for Orange.	Price for Mounting to fit our Lenses.		
c/m	ins.	£	s.	d.				£	s.	d.
3	1 ³ / ₁₆	0	12	0	Gelaceo	Gelado	Orbano	0	3	0
4	1 ¹ / ₈	0	13	0	Geladena	Gelanoma	Orbitus	0	3	0
5	2	0	15	0	Gelana	Gelerad	Orchidee	0	4	0
7	2 ³ / ₄	1	0	0	Geletal	Gelinias	Orseille	0	5	0
9	3 ¹ / ₂	1	8	0	Geliz	Gelonto	Orsini	0	6	0

Page 41.



THREE-COLOUR FILTERS.

For photography in natural colours after the synthetical method we prepare **dry light filters**, which are placed **immediately before the plate**.

A set of three (Red, Green, and Violet).

Size of Filter.		Price.			Code Word.
c/m	ins.	£	s.	d.	
9 × 12	$3\frac{1}{2} \times 4\frac{3}{4}$	2	10	0	Filander
8½ × 17	$3\frac{1}{4} \times 6\frac{3}{4}$	3	10	0	Filangus
9 × 18	$3\frac{1}{2} \times 7\frac{1}{8}$	4	0	0	Filantoria
13 × 18	$5\frac{1}{8} \times 7\frac{1}{8}$	5	0	0	Filau
18 × 24	$7\frac{1}{8} \times 9\frac{1}{2}$	10	0	0	Filatero
24 × 30	$9\frac{1}{2} \times 11\frac{3}{4}$	15	0	0	Fileli
30 × 40	$11\frac{3}{4} \times 15\frac{3}{4}$	20	0	0	Filfa
40 × 50	$15\frac{3}{4} \times 19\frac{3}{4}$	25	0	0	Filida
50 × 60	$19\frac{3}{4} \times 23\frac{5}{8}$	30	0	0	Filipos
60 × 70	$23\frac{5}{8} \times 27\frac{1}{2}$	35	0	0	Filisander

Larger sizes on application.





Photo by T. Roberts, Esq.

Group of Statuary (Albert Memorial).
Taken with Collinear Series II. 20 c/m. Back Combination.



YELLOW SCREENS for Landscape Photography.

Three degrees of Intensity—Light, Medium, Dark.

With mounts to slip on the Lens hood.

Light, Code Word, "Oase"; **Medium**, Code Word, "Obir"; **Dark**, Code Word, "Odin."

The time of exposure increases by the use of these Yellow Screens 5, 10, and 15 fold respectively.

Filters as well as Yellow Screens must be used only with plates sensitive to colours.



In the following table the prices are given for 11 sizes of

Lens Caps.

Ordinary round Yellow Glass Screens.

Diameter of Hood in m/m.	Price of Cap.		Price of Yellow Screen.		Collinear II.		Collinear III.		Collinear Set III.		Collinear IV		Apochromatic Collinear.		Heliar.		Dynar		Oxyn.		Portrait Lens Ia.		Portrait Lens I.		Portrait Euryscope III.		Euryscope IVa.		Prisms.		Filter Troughs.	
	s.	d.	s.	d.	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	c/m	m/m	m/m	m/m	m/m	
35	9	3 0	12	15	..	..	..	20	..	8 1/2	12s	..	..	..	..	..	..	..	..	..	..	..	..	..	15	..	..	..	..	..	..
50	1 0	3 7	15	25	13 × 18	32	30	..	..	12 1/2	18	..	..	..	..	..	..	..	..	..	..	..	..	..	20	35	..	..	..	..	..
60	1 3	4 3	31	37	18 × 24	44	42	..	..	16s	..	36	8	..	..	..	..	..	..	..	..	..	..	..	30	45	..	..	..	..	..
70	1 6	6 0	..	..	..	..	58	..	..	18s	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	..	55	45	..	..	..
80	1 7	7 0	37	44	..	..	..	..	..	24s	..	42	10	17	20	36	65	..	..	..	..	..	..	..	20	36	65	..	..	..	..
90	1 9	8 6	44	52	..	..	80	60	..	..	..	50	..	21	22	50	..	..	..	..	..	..	..	..	50	..	..	80	..	..	65
100	2 0	10 0	52	58	..	..	..	..	..	30	..	60	15	..	28	..	..	..	..	..	..	..	..	..	..	..	80	..	..	..	..
120	2 6	..	60	..	..	..	..	80	..	..	..	80	..	24	..	..	105	95	..	..	..	..	..	..	..	..	105	95	..	..	..
140	3 3	..	..	..	..	..	..	..	..	42	..	100	30	31	41	..	145	106	..	..	..	..	..	..	..	..	145	106	..	..	..
170	4 6	48	..	130	..	40	51	130	130
200	6 0	60	..	170	66	170	160

The Heliars and Dynars in **Focussing Mounts** have a smaller diameter hood than in Ordinary and Countersunk Mounts. Those Lenses that have the Focussing Mount are distinguished in the preceding list by a small s.

In ordering a Cap or a round Yellow Glass Screen, the Series, Focal Length, and the Number engraved on the Lens should be given, to enable us to supply the correct size.

Prices and Interior Diameters of Flanges.

The Objectives.	With the focal length															
	cm															
Collinear, II	6, 7, 9	12	13½, 15	—	—	20, 25	31	—	37	—	44	52	—	60	—	—
Collinear, III	7, 9, 12	13½, 15	18, 20	—	25	31	37	—	44	52	—	58	—	—	—	—
Collinear, Set III	—	9×12	13×18	—	—	18×24	—	—	—	—	—	—	—	—	—	—
Collinear, Set IV	10, 12, 15	20	25, 32	—	—	44	58	—	—	80	—	100	—	—	—	—
Apochromatic Collinear	8	—	20	—	—	30	—	42	50	—	60	70	80	—	—	100
Heliar	5	8½, 10	12	—	15	18	—	24	—	30	—	36	—	42	48	60
Dynar	—	12	13½, 15	—	18	—	—	—	—	—	—	—	—	—	—	—
Oxyn	—	—	—	—	—	—	36	42	—	50	60	80	—	100	—	—
Tele Negative	—	—	33	51	—	67	97	—	—	—	—	—	—	—	—	—
Portrait, Lens 1A	—	—	—	—	—	8	10	—	—	15	—	20	—	30	—	—
" " 1	—	—	—	—	—	—	—	17	21	—	—	25	—	31	40	—
" Euryscope III	—	—	—	—	—	17	20	22	—	28	—	35	—	40	51	66
Euryscope IVA	—	15	18	—	20	25	30	—	36	—	—	—	—	66	—	87

The above have the following FLANGES

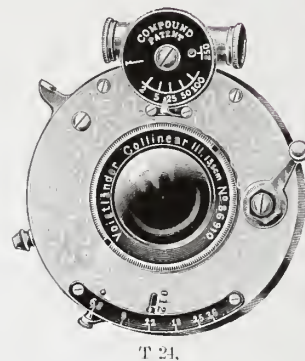
In Ordinary Mounts.																
Number of Flange.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Interior Diameter of Flange .....m/m	29.5	36.0	42.0	47.0	52.3	57.7	65.0	74.0	80.0	86.5	91.0	103.5	116.5	124.0	136.0	158
Price.....Sh.	1/7	1/7	1/9	1/9	2/-	2/3	2/6	2/9	3/-	3/3	3/7	4/-	4/3	5/-	6/-	7 3

In Countersunk Mounts.																
Number of Flange.....	2	3	4	5	6	7	8									
Interior Diameter of Flange .....m/m	36.0	42.0	47.0	52.3	57.7	65.0	74.0									
Price.....Sh.	1/7	1/9	1/9	2/-	2/3	2/6	2/9									

In Focussing Mounts.																
Number of Flange.....	21	22	23	24	25	26	28									
Interior Diameter of Flange .....m/m	34.7	42.5	47.0	52.6	56.8	61.0	77.8									
Price.....Sh.	2/5	2/10	3/-	3/3	3/6	3/9	4/-									

Compound Sector Shutters.

No.	Suitable for Lenses, focus up to	Price. £ s. d.	Code Word.
0	Collinear II, 12 c/m ,, III, 15 c/m Dynar, 13½ c/m	1 15 0	Compano
1	Collinear II, 15 c/m ,, III, 20 c/m ,, Set III, 13 × 18 c/m Dynar, 15 c/m Heliar, 12 c/m	2 0 0	Compastro
2	Collinear II, 20 c/m ,, III, 25 c/m Dynar, 18 c/m Heliar, 16 c/m	2 5 0	Compella
3	Collinear II, 25 c/m ,, III, 31 c/m ,, Set III, 18 × 24 c/m Heliar, 18 c/m	2 10 0	Comperina
4	Collinear II, 37 c/m ,, III, 44 c/m Heliar, 24 c/m	2 15 0	Competenz



T 24.



Negative by Bowden Bros.

Copyright

"Canadian Geese."
 Taken with a Collinear Lens, Series II.

VOIGTLÄNDER

12 Charterhouse St.

LONDON, E.C.

Koilos Sector Shutters.



T 25.

No.	Suitable for Lenses, focus up to	Price.	Code Word.
		£ s. d.	
1	Collinear II, 112 c/m	1 15 0	Max
	Collinear III, 15 c/m		
	Dynar, 12 c/m		
2	Collinear II, 15 c/m	2 0 0	Maxim
	III, 20 c/m		
	Set III, 13 × 18 [c/m]		
	Dynar, 15 c/m		
3	Heliar, 12 c/m	2 8 0	Maximinius
	Collinear II, 20 c/m		
	III, 25 c/m		
	Dynar, 18 c/m		
4	Heliar, 16 c/m	3 0 0	Maxentius
	Collinear II, 31 c/m		
	III, 37 c/m		
	Set III, 18 × 24 [c/m]		

This Shutter is very light and free from vibration.



When ordering a Lens and Shutter together no charge is made for fitting.

To have a Lens fitted to one of our Shutters we charge as follows:—

Shutters.	No. 0.	No. 1.	No. 2.	No. 3.	No. 4.
	s. d.	s. d.	s. d.	s. d.	s. d.
Koilos Sector Shutters	...	6 0	7 0	10 0	14 0
Compound „ „	6 0	7 0	10 0	14 0	20 0

If a Shutter is forwarded to us to have one of our Lenses fitted to it, the charge is the same as for the Lens in ordinary mount, no further charge being made for fitting. (See price of Lenses.)

Roller Blind Shutters.

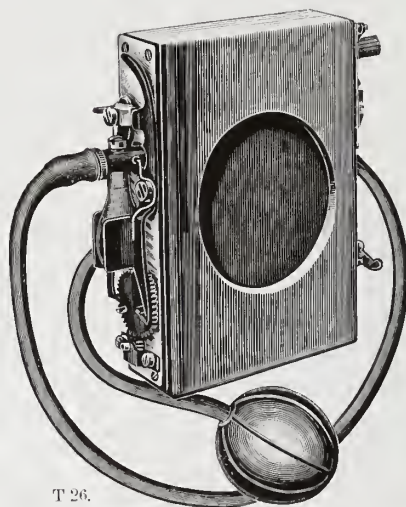
FOR ALL KINDS OF
STAND CAMERAS.

IN this pattern the curtain runs on two rollers, and gives time as well as instantaneous exposures.

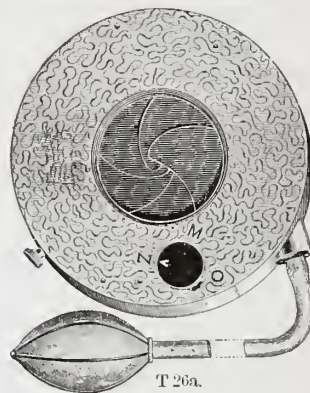
There is a spring to increase the rapidity. The plate is evenly lighted. All the pivots run in metal bearings.

The Shutter is set by turning a nut, which is better than the usual cord, and it can be fitted in front of or behind the Lens.

No	Suitable for Lenses.	Price of Shutter, including Fittings.	Code Word.
	c/m	£ s. d.	
1	Collinear II, 15	9 0	Echidna
	III, 20		
	Set III, 13 × 18		
	IV, 32		
	Heliar 12		
	Dynar 15		
2	Collinear II, 31	12 0	Eduard
	III, 37		
	Set III, 18 × 24		
	IV, 44		
	Heliar 16		
	Dynar 18		
3	Collinear II, 37	15 0	Eldorado
	III, 52		
	IV, 80		
	Heliar 24		
4	Collinear II, 52	18 0	Erebus
	III, 58		
	Heliar 30		
5	Collinear II, 60	1 1 0	Ergotin
	Heliar 36		
6	Heliar 42	1 5 0	Elias
7	Heliar 48 and 60	1 10 0	Elvira
8	Stereoscopic, Size	15 0	Eleazar



T 26.



T 26a.

BEFORE LENS SECTOR SHUTTER.

Before Lens Sector Shutter.

Made of Aluminium, very light, giving time and instantaneous exposures, a suitable addition to Cameras fitted with Focal Plane Shutters, or as a Studio Shutter.

33 m/m aperture	£1 2 0	45 m/m aperture	£1 5 0	70 m/m aperture	£1 10 0
35 " "	£1 3 0	50 " "	£1 6 0	88 " "	£1 10 0
40 " "	£1 4 0	60 " "	£1 8 0		
Stereoscopic		30 m/m aperture	£1 18 0		
		40 " "	£2 2 0		



"Orchids."

L. Roberts, Esq.

Taken with Collinear Lens Series III, 15 c/m.



SO as not to tax the patience of the reader too much we give in the following only the principal qualities and the prices of the various apparatus. The proper directions for use have been omitted from these pages, but are given with each apparatus.

We beg to point out that **all experimenting with the apparatus must be preceded by an attentive reading of the directions** for use. If these are observed point by point with the utmost precision, the apparatus will work faultlessly. This is especially the case **in the method of working the Focal Plane shutters and the focussing upon the scales of the film cameras.** We are obliged to charge for putting cameras in order after they have been damaged by not complying with the instructions.

All the apparatus are instruments of precision, and must be treated as such. We pack them carefully in cardboard boxes, but it is nevertheless preferable to make a small extra outlay, and get a solid leather case for the whole equipment, which will give greater protection against injuries.

Except in extraordinary cases, we fit one of our lenses to a camera sent to us without charge.

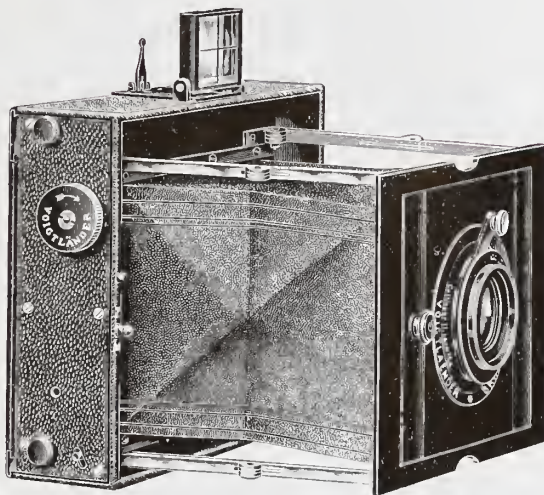


I. HAND CAMERAS.

VOIGTLÄNDER FOLDING METAL CAMERAS.



Suitable for Tropical
Climates.



T 27.

$\frac{1}{2}$ -Plate, or 9×12 c/m Continental Size only.

THIS Camera possesses the following special characteristics:—
The Focal Plane Shutter (adjustable from the outside), for time and instantaneous exposures, is wound up by **one** turn of the knob.

The body of the Camera is cast in a light but powerfully resisting metal alloy.

Owing to the simplicity of the shutters the rapidity is very great, and the running down is noiseless. Every Camera is provided with a mechanical and press knob release.

In consequence of the folding stays rigidity is attained, and the machine is quickly made ready for use.

The measurements are small.

We guarantee that the Focal Plane Shutter will work perfectly provided the instructions given with the apparatus are carefully followed.

This Camera, fitted with a Collinear Series II. or Heliar, is an apparatus fit for all kinds of **instantaneous exposures**.



For the observation of the object before and during the exposure, a folding "Newton View Finder" is used. The apparatus can be used for horizontal or vertical exposures with or without a stand.

To intending purchasers we recommend the Camera with the Collinear II., 13½ cm. **This combination is always kept in stock.** For the fitting of any other of our lenses we require about a fortnight for delivery.

Every Voigtlander Folding Camera, 9 × 12 cm., ¼ plate, bears on the winding knob the name of Voigtlander, and an arrow in the direction in which it is to be wound up.

The Camera is supplied with dark slides of either of the following patterns: book form with folding wood shutters, solid form with folding wood shutters, and solid form with extractable vulcanite shutters.

PRICES OF VOIGTLÄNDER METAL FOLDING CAMERA.

¾-Plate or 9 × 12 c/m Continental Size.

Fitted with Voigtlander Lens in Focussing Mount.	With 3 Double Dark Slides, Solid Form with folding Wood Shutters.	Code Word.	With 3 Double Dark Slides, Solid Form with extractable Vulcanite Shutters, or Book Form with folding Wood Shutters.	Code Word for Camera with 3 Double Dark Slides fitted with extractable Vulcanite Shutters.	Code Word for Camera with 3 Double Dark Slides, Book Form with folding Wood Shutters.
c/m	£ s. d.		£ s. d.		
Collinear II, 13½, F 5.4	13 0 0	Festnarcin	13 10 0	Klappnarcin	Holznarcin
„ II 13½, F 5.7 with Tele-tube A.	16 0 0	Festtelenarcin	16 10 0	Klapptelenarcin	Holztelenarcin
„ III, 12, F 6.8	11 15 0	Festnathan	12 5 0	Klappnathan	Holznathan
Dynar 12, F 6	10 10 0	Festdynarch	11 0 0	Klappdynarch	Holzdynarch
„ 15, F 6	11 10 0	Festsisarch	12 0 0	Klappsisarch	Holzsisarch
Heliar 15, F 4.5	13 0 0	Festfilarum	13 10 0	Klappfilarum	Holzfilarum

Size of Camera when closed, 6½ × 5½ × 2 ins.

Weight without Lens, 2 lbs. 4 ozs.

Price of Extra Dark Slides, Changing Boxes, and Film Pack Adapters, see pages 113 and 114.

Price of Leather Carrying Cases, see page 113.



Taken with Reflex Camera and Heliar 18 c/m.



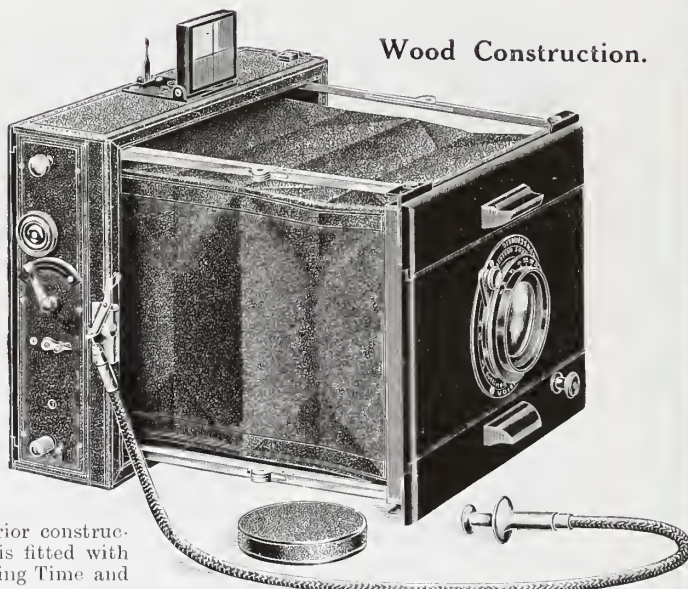
Taken with Reflex Camera and Heliar 18 c/m.

Folding Cameras

This Model Camera is manufactured in the following—

Sizes.	Continental Sizes.
ins.	c/m
$4\frac{3}{4} \times 6\frac{1}{2}$ ($\frac{1}{2}$ -plate)	13 × 18
$2\frac{3}{8} \times 5\frac{1}{8}$ (stereoscopic)	6 × 13
$3\frac{1}{4} \times 6\frac{3}{4}$ (stereoscopic)	9 × 18

This Camera is of superior construction, light and rigid. It is fitted with a Focal Plane Shutter, giving Time and Instantaneous Exposures.



T 28.

Size, Dimensions, and Weight.	Fitted with Voigtlander Lens in Focussing Mount.	Price of Camera, with 3 Double Dark Slides.	Code Word for Camera, with 3 Double Dark Slides, fitted with extractable Fibonite Shutters.	Code Word for Camera, with 3 Double Dark Slides, Book Form, with Folding Wood Shutters.
inches.	Focus in c/m.	£ s. d.		
Folding Camera, $4\frac{3}{4} \times 6\frac{1}{2}$	Collinear II, 20 F 5.4	17 0 0	Klappnegus	Holznegus
Size when closed, $8\frac{1}{4} \times 6\frac{5}{8} \times 2\frac{3}{8}$	„ III, 18 F 6.8	15 0 0	Klappnelda	Holznelda
Weight, 2 lbs. 14 ozs.	Dynar 18, F 6	13 15 0	Klapptesarch	Holztesarch
Stereo-Folding Camera, $2\frac{3}{8} \times 5\frac{1}{8}$	2 Collinear II, 9, F 5.4	16 0 0	Klappnewa	Festnewa
Size when closed, $6\frac{3}{4} \times 4 \times 2\frac{1}{4}$	2 „ III, 9, F 6.8	14 0 0	Klappniger	Festniger
Weight, 1 lb. 12 ozs.				Only with solid form Dark Slides.
Stereo-Folding Camera, $3\frac{1}{4} \times 6\frac{3}{4}$	2 Collinear II, 12, F 5.4	19 10 0	Klappnikol	Holznikol
Size when closed, $8\frac{1}{4} \times 5 \times 2\frac{1}{4}$	2 „ III, 12, F 6.8	18 0 0	Klappnipon	Holznipon
Weight, 2 lbs. 4 ozs.				

The cost of Release for either size is 5/-. Code Word, “Pneuma.”

Stereoscopic Cameras can be fitted with a double lever for simultaneous stopping down and focussing of the two lenses. Price, **£1 10s.** Code Word, “Norma.”

The weights quoted above are without Lens.

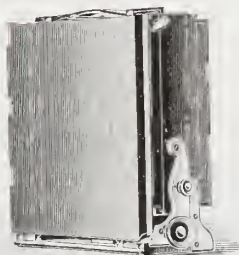
VOIGTLANDER

& SOHN, A.G.

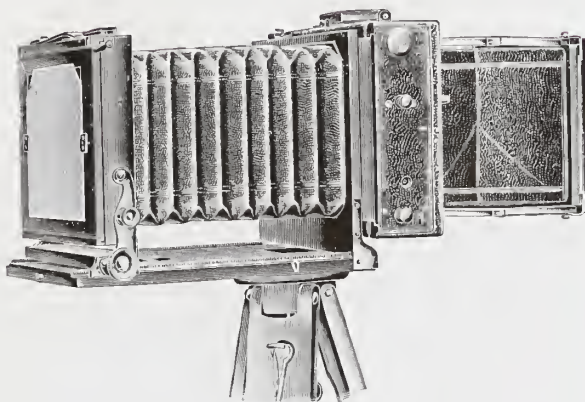
12 Charterhouse St.

LONDON, E.C.

Back Extensions for Folding Cameras.



T 29.



T 30.

Extra Extensions.—In order to allow the back combination-lens of the Voigtlander Collinear to be used alone as a Landscape Lens with about double focus we supply "Extra Extensions" with rack and pinion motion for use with our Metal or Wood Folding Cameras. They slide into the same grooves as the Dark Slides, and are fitted with swing back. These Extensions are also suitable for Telephoto work with our Folding or Heliar Cameras.

Extension. c/m	Camera. c/m		Price. £ s. d.		Code Word.
9 × 12, $\frac{1}{4}$ -plate, for	9 × 12, or $\frac{1}{4}$ -plate	..	2 10 0	..	Kleinansatz
13 × 18, $\frac{1}{2}$ " " "	9 × 12, " $\frac{1}{4}$ " "	..	3 0 0	..	Mittelansatz
13 × 18, $\frac{1}{2}$ " " "	13 × 18, " $\frac{1}{2}$ " "	..	3 0 0	..	Grossansatz

Separate lens boards, adjustable upwards and downwards, as well as laterally, so that the extension may be used as a stand camera. cost **10s.** each. Code Word, "Ansatzbrett."

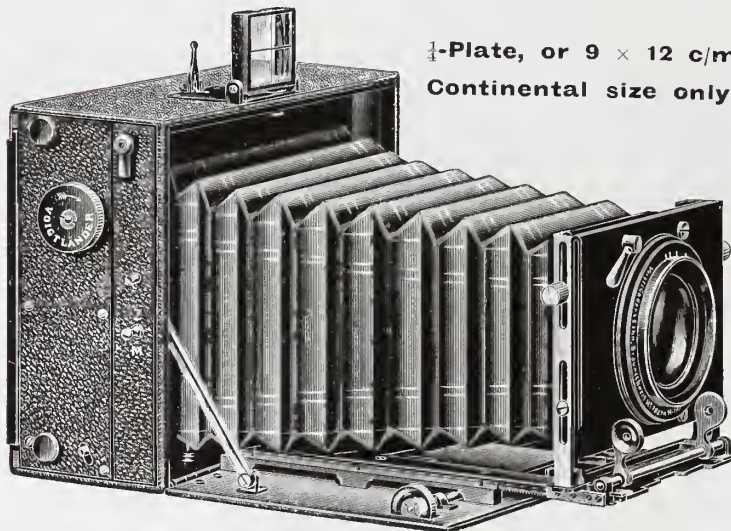
The Dark Slides for all Folding Cameras are the same with regard to size and focus as those for the Voigtlander Heliar Camera and the Voigtlander Reflex Camera. Their prices are given on page 114.

Leather Cases for Folding Cameras.

Size.		To hold Camera and three Double Dark Slides, or Camera and one Magazine.		To hold Camera and six Double Dark Slides, or Camera, three Double Dark Slides, and one Magazine.	
ins.	c/m	s. d.	Code Word.	s. d.	Code Word.
3 $\frac{1}{4}$ × 4 $\frac{1}{4}$	9 × 12	12 0	Kleinleder	16 0	Extralein
4 $\frac{3}{8}$ × 6 $\frac{1}{2}$	13 × 18	18 0	Grossleder	22 0	Extragross
2 $\frac{3}{8}$ × 5 $\frac{1}{4}$	6 × 13	12 0	Schmalleder	16 0	Extraschmal
3 $\frac{1}{4}$ × 6 $\frac{3}{4}$	9 × 18	16 0	Stereoleder	20 0	Extrastereo



Voigtländer Metal Heliar Camera.



1-Plate, or 9 × 12 c/m
Continental size only.

**Suitable
 for
 Tropical
 Climates.**

T 31.

THIS Camera is also constructed of Light Metal similar to the Voigtlander Metal Folding Camera, and for high-class workmanship and mechanical ingenuity is unsurpassable.

The Heliar Camera is fitted with a Focal Plane Shutter of similar construction as in the Folding Camera. The Lens generally supplied with this Camera is a Heliar 18 c/m 7½ ins. focus. This Lens has already made a great name for itself in the Photographic world, working at a full aperture of F 4.5. It is suitable for all the requirements of general Photography, and is the best of all modern Lenses.

The Camera is fitted with Rack and Pinion Focussing movement with extension to 11½ ins., enabling Lenses of various Focal lengths to be used.

PRICES OF VOIGTLÄNDER HELIAR CAMERAS.

Fitted with Voigtländer Lens in Countersunk Mount.	Camera with 3 Double Dark Slides, Solid Form with Folding Wood Shutters.	Code Word.	Camera with 3 Double Dark Slides, fitted with extractable Ebonite Shutters or Book Form with Folding Wood Shutters.	Code Word for Camera, with 3 Double Dark Slides fitted with extractable Ebonite Shutters.	Code Word for Camera with 3 Double Dark Slides, Book Form with Folding Wood Shutters.
	£ s. d.		£ s. d.		
Heliar 18 c/m, F 4.5	14 15 0	Festfiligran	15 5 0	Helifiligran	Holzfiligran
Collinear II, 15 c/m, F 5.4	13 10 0	Festigamba	14 0 0	Heligamba	Holzgamba

Dimensions when closed 6½ × 5 × 3 ins.

Weight without Lens, 2 lbs. 15 oz.

LEATHER CASE FOR CAMERA, 3 Dark Slides, 15/-

Code Word—Heliartasche.

" " " 6

18/-

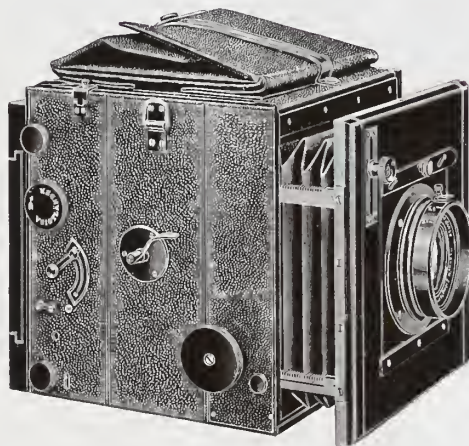
" " " Heliarleder.

Each Voigtländer Metal Heliar Camera bears the name Voigtländer.

Voigtländer Heliar Reflex Camera.

$\frac{1}{4}$ -plate and $\frac{1}{2}$ -plate.

Fitted with Heliar Lens F 4.5.



T 33.

Page 53.

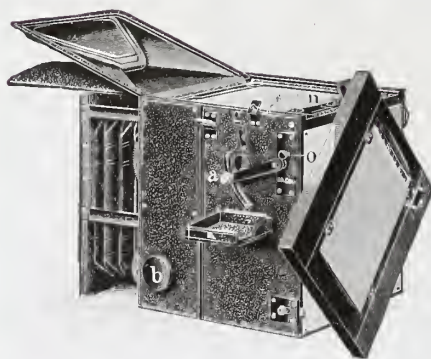
THIS is the most perfect type of Hand Camera. It is of superior construction, and is fitted with a Rack and Pinion Movement working on all four corners of the front, ensuring rigidity when extended.

The Mirror is of optically worked glass, silvered on the surface, and coated with a colourless preparation for preservation.

The image reflected is therefore identical with that obtained upon the plate. This arrangement permits the photographer to **observe the image up to the moment of exposure.**

The Camera is fitted with a Focal Plane Shutter, giving time and instantaneous exposures up to $1/10000$ th of a second, and is guaranteed to work without vibration. The Camera is also fitted with a reversible back as shown in illustration on next page.

A Special **Tele-photo Attachment**, with a fixed magnification of about $2\frac{1}{2}$ times, can be supplied with this Camera for $\frac{1}{4}$ -plate.



T 33a.
REVERSING BACK.



T 34.

Price of Voigtländer Heliar Reflex Camera,
 $\frac{1}{4}$ -Plate, or 9×12 c/m, and $\frac{1}{2}$ -Plate, $12 \times 16\frac{1}{2}$ c/m.

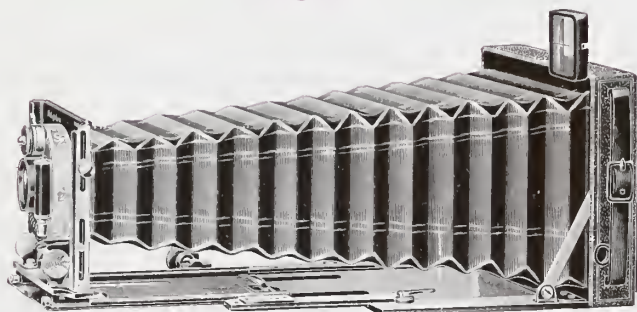
Size of Plate.	With Voigtländer Lens in Counter-sunk Mount.	Camera with 3 Double Dark Slides, Book Form with folding Wood Shutters.	Code Word.	Camera with 3 Double Dark Slides, Book Form with folding Wood Shutters.	Code Word for Camera with 3 Double Dark Slides, Book Form with folding Wood Shutters.	Code Word for Camera with Magazine for 12 Plates.
		£ s. d.		£ s. d.		
$\frac{1}{4}$ -Plate or 9×12 c/m	Heliar 18 c/m, F 4.5	19 10 0	Fest-spiegel	20 0 0	Holzspiegel	Wechsel-spiegel
	Heliar 18 c/m, with Tele-tube B	23 0 0	Festele-spiegel	23 10 0	Holztele-spiegel	Wechtele-spiegel
$\frac{1}{2}$ -Plate or $12 \times 16\frac{1}{2}$ c/m	Heliar 24 c/m, F 4.5	—		30 0 0	Grossspiegel	—

Dimensions of $\frac{1}{4}$ -Plate Camera, closed $7 \times 7 \times 6\frac{1}{2}$ ins. Weight with lens, 5 lbs.

„ $\frac{1}{2}$ -Plate „ „ $10 \times 10 \times 8\frac{1}{2}$ ins. Weight with lens, 9 lbs.

Solid Leather Sling Case for Camera and Dark Slides, Size 9×12 c/m, **£1 5s.**
 Size $12 \times 16\frac{1}{2}$ c/m, **£1 15s.**

VOIGTLÄNDER & SOHN, A.G.
12 Charterhouse St. LONDON, E.C.



T 38a.

The Voigtlander Alpine Camera.

$\frac{1}{4}$ -Plate, or 9×12 c/m.

FOR PLATES OR FILM PACK.

Especially suitable for use in Tropical Climates.

This Camera is entirely constructed of LIGHT METAL, and is fitted with a Collinear Lens, Series III, F 6.8, or Dynar Lens, F 6, in Koilos or Compound Shutter with hinged View Finder. It weighs 1 lb. 11 ozs.

In consequence of the very long triple extension, work can be done with the Back Combination of the Collinear Lens. Focussing is done by means of a rack and pinion movement, with scale affixed on the left. The objective can be adjusted in vertical or horizontal direction.

The measurements of the apparatus are $5\frac{3}{4} \times 4\frac{3}{8} \times 1\frac{3}{4}$ inches.

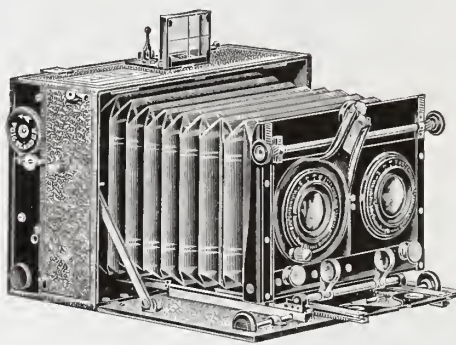
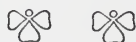
PRICES.

	£	s.	d.	Code Word. Koilos Shutter.	Code Word. Compound Shutter.
With Collinear Lens, Series III., 12 cm., in Koilos or Compound Shutter, 6 single Dark Slides, and Focussing Screen	10	0	0	Alpinhakon	Comalpinhakon
Ditto with Collinear III. 13 $\frac{1}{2}$ cm.	10	10	0	Alpinhalde	Comalpinhalde
Ditto with Dynar 12 cm.	8	15	0	Alpindyn	Comalpindyn
Ditto with Dynar 13 $\frac{1}{2}$ cm.	9	5	0	Alpindyro	Comalpindyro
Film Pack Holder $\frac{1}{4}$ Plate, for same	7	6		Alpinpack	
Single Dark Slides	1	6		Alpineas	
Solid Leather Case for the Alpine Camera, with 6 Slides	10	6		Alpintasche	

The extreme portability of this apparatus enables it to be carried in the pocket.

Voigtländer Stereo-panoramic Camera.

✻ ✻
(Specially designed
for Tropical Climates).



T 32.

Page 55.

In many respects the design of the Stereo-Panoram Camera corresponds to the Heliar Camera (see page 108). It is made throughout of a light aluminium alloy, and is fitted with two Collinear lenses of exactly the same focus, viz., 12 cm. The axis of these two lenses lies at a **distance of 70 mm.**

It is absolutely essential for perfect Stereoscopic Photography that the apparatus is of proper construction, and equality in distance from the object lens and from the eye is maintained.

In the Voigtländer Cameras this is fulfilled, and accordingly false photographic reproduction of actualities made by an apparatus with greater objective distance (viewed stereoscopically) is avoided.

In consequence of the long extension of the camera, stereoscopic pictures can be taken not only with the double objectives, but also with the Back Combinations—of 21 cm. focal length.

In both cases focussing is done by using the scale on the left of the travelling base.

The value of this Camera is—it is important to note—immeasurably increased, because **POSTCARD OR PANORAMIC PHOTOGRAPHS**, $3\frac{1}{2} \times 5\frac{1}{2}$ inches, 9×14 cm. in size, may be taken **WITH THE COMPLETE LENS OR WITH THE BACK COMBINATION ONLY.**

The Voigtlander Stereo-Panoram Camera is fitted with a Focal Plane Shutter, with the name Voigtlander on the winder, and an arrow pointing in the direction in which it should be wound.

We wish specially to draw attention to the fact that $3\frac{1}{2} \times 5\frac{1}{2}$ inches or 9×14 cm. plates can be procured without difficulty from all the business houses where photographic requisites are sold.

The Price of the Voigtlander Stereo-panoramic Metal Camera:

Fitted with 2 Voigtlander Objectives in Countersunk Mounts.	With 3 Double Dark Slides, Solid Form with extractable Vulcanite Shutters, or Book Form with folding Wood Shutters	Code Word for Camera with 3 Double Dark Slides fitted with extractable Vulcanite Shutters.	Code Word for Camera with 3 Double Dark Slides, Book Form with folding Wood Shutters.
Collinear II. 12 cm., F 5.4.	£ s. d. 21 0 0	Stereonikol	Stereoaufnikol

Dimensions of Camera closed, $7\frac{1}{2} \times 5 \times 3$ ins. Weight with Lenses, $3\frac{3}{4}$ lbs.

Extra Dark Slides, $3\frac{1}{2} \times 5\frac{1}{2}$ inches, 9×14 cm., **15/-**. Code word for the wooden slide, *Mittelholz*; for the ebonite slide, *Mittelgummi*.

Leather Case for Camera and 3 Double Dark Slides, **16/-**. Code word, *Stereotasche*. Ditto for Camera and 6 Double Dark Slides, **£1**. Code word, *Stereoleder*.



Taken with Collinear II. 15 c/m.



Dark Slides.

All the Dark Slides for the Folding Cameras, Heliar Camera, and Reflex Camera are interchangeable.

Size. c/m	Solid Form Double Dark Slide with Folding Shutters.	Solid Form Double Dark Slide with Ebonite Shutters.	Book Form Double Dark Slide, with Folding Shutters.	Roll Film Holder.	Film Pack Holder.	Magazine for 12 Plates.	Magazine for 24 cut flat Films.	Double Dark Slide with Roller Blind Shutters.	Metal Dark Slide.
$\frac{1}{2}$ plate or 9 × 12 Code Word	9/- Klein- fest	12/- Klein- gummi	12/- Klein- holz	26/- Klein- roll	12/- Klein- paek	45/- Klein- wechsel	9/- Kleinhülse	16/- Jalousie	20/- Klein- metall
13 × 18 Code Word	..	15/- Gross- gummi	15/- Gross- holz	36/- Gross- roll	..	75/- Gross- wechsel	12/- Grosshülse	..	..
$\frac{1}{2}$ plate or 12 × 16 $\frac{1}{2}$ Code Word	..	15/- Spiegel- gummi	15/- Spiegel- holz	..	..	75/- Mittel- wechsel	..	..	..
6 × 13 Code Word	9/- Schmal- fest	..	..	..	..	..	..	..	..
9 × 18 Code Word	..	15/- Stereo- gummi	15/- Stereo- holz	36/- Stereo- roll	..	60/- Stereo- wechsel	9/- Stereo- hülse	..	..



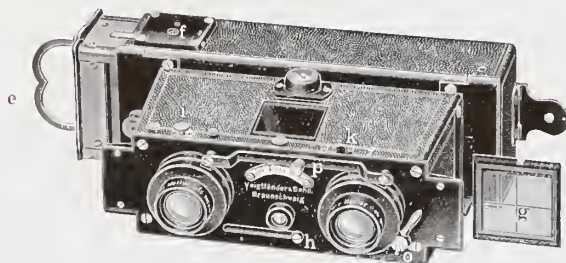
Taken with a Folding Camera and Collinear Lens, Series II, 15 c/m.

The Stereophotoscope.

Fitted with VOIGTLÄNDER "HELIAR" LENSES.

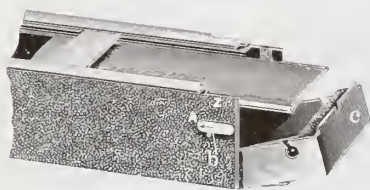
F 4.5 Full Aperture.

The Best Camera for Perfect Stereoscopic Pictures.

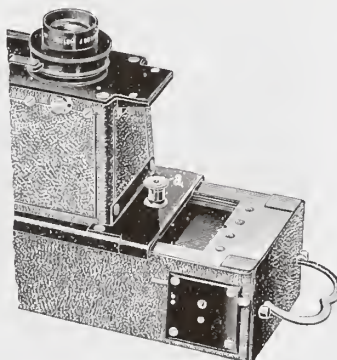


T 35.

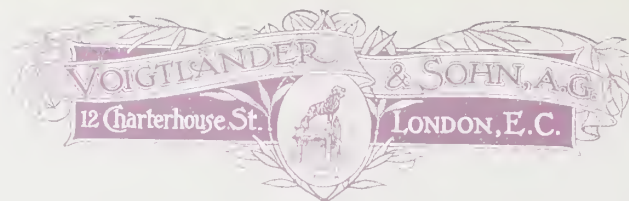
THE "**Stereophotoscope**" will produce the most perfect Stereoscopic picture upon plates $4\frac{1}{4} \times 1\frac{3}{4}$ ins. The body is constructed from one piece of metal, and it is, therefore, most suitable for warm or damp climates. The Magazine Changing Box carries 12 plates, and has an automatic counter showing number of plates used. Stereophotos when viewed through the special size Stereoscope are magnified, and appear as large as the ordinary size Stereoscopic Views. The whole apparatus is of the **very highest class workmanship.**



T 36.



T 37.



The Lenses are fitted with Iris Diaphragms, both of which can be regulated by one movement.

	Prices.			Code Word.
	£	s.	d.	
Price of Voigtländer "Stereophotoscope," with two "Heliar" lenses, F 4.5, correctly paired, two view finders, changing box, and leather sling case complete	20	0	0	Photoskop
Ditto with two Collinear Lenses III., F 6.8	17	10	0	Cophotoskop
Extra changing box for 12 plates	3	10	0	Photomagazin
Stereoscope with Achromatic lenses for viewing the transparent "Stereophotoscope" views...	1	1	0	Photostereo
Reversing Frame for making the Stereoscopic Positive without cutting the Negative ...	8	0		Stereorahmen

Size of Stereophotoscope complete, $5\frac{1}{8} \times 4 \times 2\frac{3}{4}$ ins. Weight, 1 lb. 15 ozs.

All our "Stereophotoscopes" are engraved with the name Voigtländer.





Photos by W. Statham, Esq

Views taken with the Voigtlander "Stereophoscope" and
Voigtlander Heliar Lenses.

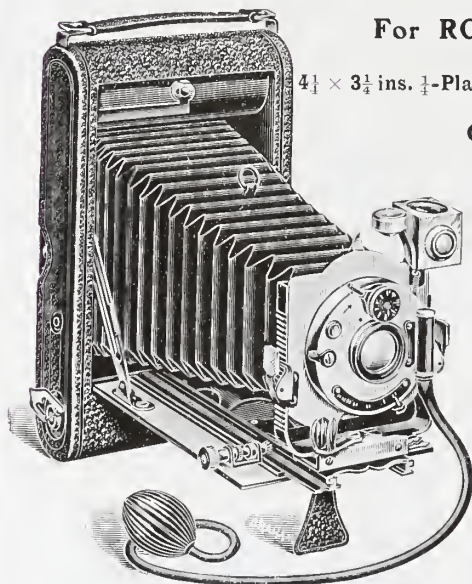
Negatives taken with the Stereophoscope can be enlarged without
any great loss of Sharpness.



VOIGTLÄNDER

Improved Film and Plate Cameras

For ROLL-FILMS and PLATES.



T 37a

$4\frac{1}{2} \times 3\frac{1}{4}$ ins. $\frac{1}{4}$ -Plate, Postcard Size $5\frac{1}{2} \times 3\frac{1}{2}$ ins. and 5×4 ins.

(Daylight Loading.)

THIS Camera is extremely portable, and has been constructed to meet the demand for a **High-class folding Camera** suitable for all the requirements of up-to-date Photography. The body is constructed of mahogany and aluminium, covered black leather, with nickel fittings, superior leather bellows, double extension rack and pinion movement, enabling the **back combination of the Lens to be used when desired**; rising and cross front for vertical and horizontal pictures; view finder and spirit level. Focussing scales for both films and plates are fixed to the base-

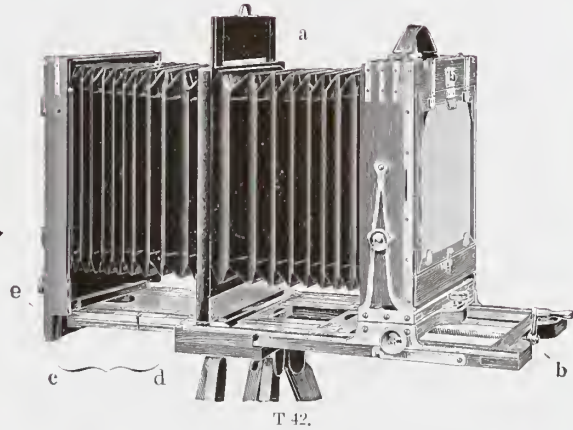
board The Lens is a Collinear, which is a perfect anastigmat and unequalled for brilliancy of definition, each combination is an anastigmat in itself and can be used separately.

		Prices.	Code Word.
		£ s. d.	
$\frac{1}{4}$ -Plate Camera, fitted with Collinear Lens, Series III., 12 c/m, F 6.8, and Koilos Shutter ..	..	9 10 0	Longkoilos.
Dimensions, closed. $8 \times 4\frac{1}{2} \times 2$ ins. : weight, 2 lbs.			
Postcard Size Camera, fitted with Collinear Lens, Series III., 15 c/m, F 6.8, in "Koilos" Shutter ..	..	11 8 0	Postani.
Dimensions, closed. $9\frac{1}{2} \times 5 \times 2$ ins. : weight, 2 lbs. 14 ozs.			
5×4 ins. ditto, Collinear III., $13\frac{1}{2}$ c/m ..	..	11 0 0	Fiforkoilos.
Dimensions, closed. $9 \times 5\frac{1}{2} \times 2$ ins. : weight, 2 $\frac{3}{4}$ lbs.			
<i>These prices include 3 single metal dark slides and focussing screen, fitted with hood cover, in case.</i>			
Black or Brown Solid Leather Sling Case with lock and key, for carrying Camera ..	..	7 6	Longtasche.
Extra Set of 3 Single Metal Dark Slides, $\frac{1}{4}$ -Plate ..	..	4 6	Longkas.
Ditto ditto Postcard ..	..	6 0	Postkas.
Ditto ditto 5×4 ins. ..	..	6 0	Fiforkas.

Voigtländer Tele-partition Stand Camera

◇ ◇
 $\frac{1}{2}$ -Plate, or 13×18 cm.

◇ ◇



With Kiesling's Tele-partition.

◇ ◇ ◇

Having recognized the increasing importance of Tele-photography, we, as the foregoing pages show, have resolved to do what we can towards the perfecting of the required apparatus.

We believe that in our new Stand Camera, $\frac{1}{2}$ -plate or 13×18 cm., we have constructed an apparatus particularly suited for the purpose, and which gains in importance chiefly through the **introduction of the Kiesling Tele-partition.**

As is well known, by the introduction of this system the ordinary tele-tube becomes superfluous, as the tele-negative lenses are inserted in the partition wall of the camera. The elimination of all reflection is the great point of superiority in this arrangement.

Both extensions, that of the objective board as well as of the matt-disc part, are carried out from the back, the first with a spindle, the second by rack and pinion.

In consequence of the 57 cm. ($22\frac{1}{2}$ inches) long extension, the enlarging power is extraordinarily great.

As a suitable object lens, our **Collinear II., 20 cm., F 5.4** is specially recommended (see page 72 for prices and full particulars).

Further, we would recommend our **TELE-LENS SETS**, consisting of the 4 Tele-negatives—33, 51, 67, 97 mm.—which should be screwed into the Kiesling Tele-partition (see page 57).



This Camera is made of teak wood, metal bound, with horizontal and vertical double swing back, and can be strongly recommended for use abroad.

The size of Camera $10\frac{1}{2} \times 8\frac{1}{4} \times 3\frac{3}{4}$ inches, and the weight 6 lbs.
The weight of one slide is 8 oz.

PRICES.

	£	s.	d.	Code Word.
Voigtlander's Tele-partition Stand Camera, $\frac{1}{2}$ -Plate or 13×18 cm., with Kiesling's Tele-partition, and 3 Double Dark Slides	11	0	0	<i>Telekamera</i>
Collinear Lens, Series II., 20 cm. F 5.4... ..	9	0	0	<i>Gemma</i>
Set of Tele-lenses, consisting of the 4 Tele-negatives, mounted	8	0	0	<i>Telenegativsatz</i>
Extra Double Dark Slides, $\frac{1}{2}$ -Plate or 13×18 cm.... .. each	1	0	0	<i>Telekassette</i>
Strong Wooden Tripod Stand	1	10	0	<i>Telestativ</i>
Solid Leather Sling Case, for Camera and 3 Slides	1	10	0	<i>Teletasche</i>
The Whole Set, with 3 Dark Slides, forms a most complete and interesting apparatus, suitable for any description of work. Price, complete	31	0	0	<i>Telecomp</i>



Copyright.

Photo by Rowden Bros.

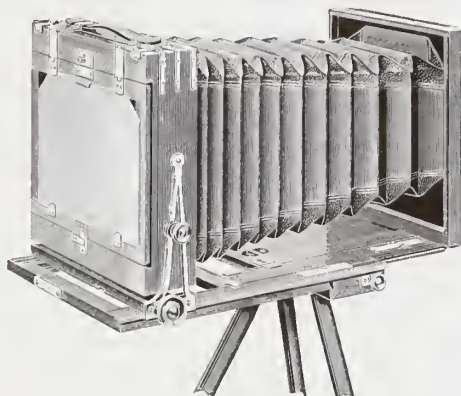
Grand National Steeplechase.

Over the Water Jump.

Voigtländer Stand Cameras.

FOR ALL PURPOSES.

Tourist Field Camera.



T 39.

Model "A."

Advantages.

Lightness and Portability.
Extensive Rising Front, horizontal and vertical.
Double rack focussing, swing back.

THIS Camera is square. The extension is done by double rack and pinion focussing, one screw actuating the front and the other the back of the Camera, which enables the Camera to be always balanced on its stand. Lightness and Portability have not been secured by weakening any part of the Camera, but by eliminating brass and wood from places where they served no useful purpose, and in consequence great rigidity is guaranteed. The Camera is made of the finest seasoned Mahogany, with polished and lacquered brass bindings.

The size, 13 × 18 c/m ($4\frac{3}{4} \times 6\frac{1}{4}$ ins.) has, when closed :—

Dimensions about $2\frac{3}{4} \times 8\frac{1}{2} \times 10$ ins.

Weight about 4 lbs.

Size.		Length of Extension.	Price, with 3 Double Dark Slides.			Code Word.	Price of 1 Double Dark Slide.		Code Word.
English.	Continental.								
ins.	c/m.	ins.	£	s.	d.		s.	d.	
$4\frac{3}{4} \times 6\frac{1}{2}$	13 × 18	$16\frac{1}{2}$	4	15	0	Abraham	13	0	Abakus
$6\frac{1}{2} \times 8\frac{1}{2}$	18 × 24	24	6	1	0	Abel	16	0	Abner
10 × 12	24 × 30	32	8	10	0	Abbate	19	0	Absalon

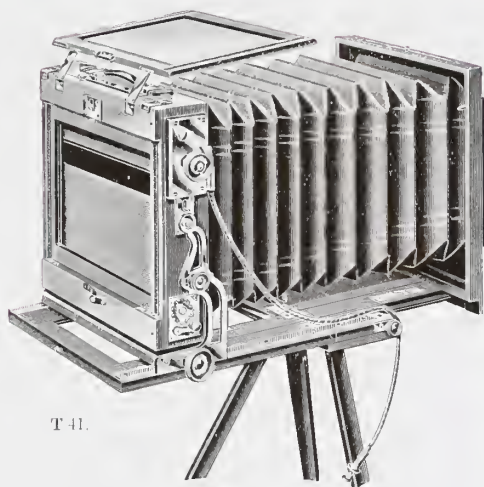
The two first sizes are fitted with Stereoscopic division.

VOIGTLANDER Stand Camera.

* *

With Adjustable Roller
Blind Shutter in front
of the Plate.

* *



T 41.

Model "C."

Page 57.

THIS Camera is square, with reversing back. It is hardly any larger than an ordinary Stand Camera, though the Shutter is built in. The double extension reaches to $17\frac{1}{2}$ ins. There is a rising and falling front. The bellows are of best quality leather. Either best seasoned Mahogany or Walnut is used, and fine lacquered or polished bindings. Weight is $4\frac{1}{2}$ lbs.; external measurements, $9 \times 9\frac{1}{4} \times 4$ ins. The Shutter can be adjusted to give time as well as instantaneous exposures.

Stereoscopic division is included.

Size.		Length of Extension.	Price, including 3 Double Dark Slides.	Extra Slides, each.	Leather Case, with Lock.
English.	Continental.				
ins. $6\frac{1}{2} \times 4\frac{1}{4}$	c/m 13×18	ins. $17\frac{1}{2}$	£ s. d. 8 8 0	13/-	20/-
Code Word			Castro	Cataract	Censur

CASES FOR CAMERAS.

Made of best Waterproof Canvas or Neat's Leather, to hold Camera
with 3 Dark Slides.

Size.		Price for Case.			
English.	Continental.	Canvas.	Code Word.	Neat's Leather.	Code Word.
ins. $4\frac{1}{4} \times 3\frac{1}{4}$	c/m 9×12	7/-	Dame	12/-	Diarium
$6\frac{1}{2} \times 4\frac{1}{4}$	13×18	10/-	Darre	20/-	Dido
12×10	18×24	14/-	Dattel	30/-	Dingo
16×12	30×40	18/-	Daziel	40/-	Distel

Portable Tripods for Hand Cameras.



Oxidised Brass
Telescopie Tubular
Tripod, 10/6
Code Word, Tnbu.

Aluminium ditto,
very light, 15/-
Code Word, Altubu.



Superior quality
Oxidised Aluminium
Telescopie Tripod,
Triangular Pattern,
£1 5 6
Code Word, Trian.

Ditto, larger size,
£1 12 6
Code Word,
Trianspee.

Black or Brown Leather Cases for above, 4/-
Code Word, Castan

Tripod Camera Stands.

	Each.
£	s. d.
Best quality polished ash, four-fold, mahogany top, suitable for $\frac{1}{4}$ and $\frac{1}{2}$ -Plate Cameras	18 6
Code Word, Astan.	
Special Tripod Stand for large Cameras, Best polished ash, with circular top and sliding legs	1 15 0
Code Word, Spectan.	
Do. do. three-fold sliding leg, with Adjustable Table-top Head	2 10 0
Code Word, Tritan.	
Three-fold Rule Joint Ash Tripod, very rigid and firm, specially suitable for large Cameras. With 10 in. Cheap Quality Top	1 7 6
Code Word, Rultan.	
Do. do. with 12 in. Cheap Quality Top	1 8 6
Code Word, Xrultan.	
Do. do. with 10 in. Best Quality Top	1 11 6
Code Word, Bestan.	
Do. do. with 12 in. Best Quality Top	1 15 6
Code Word, Lartan.	

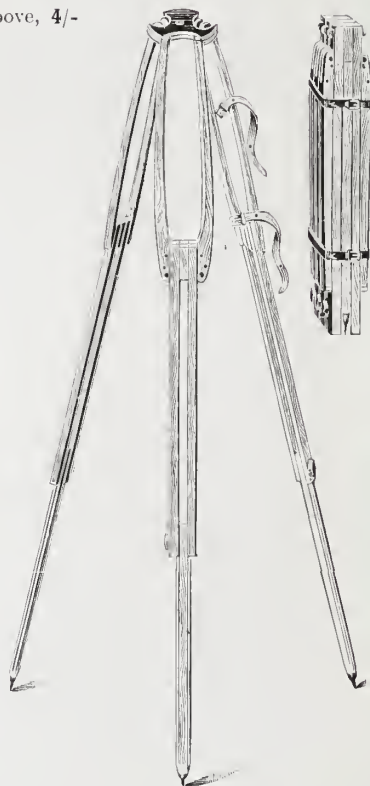




Photo by T. Roberts, Esq.

Interior of St. Magnus Cathedral, Kirkwall, Orkney. 800 years old.
Taken with Collinear Lens, Series IV.

Studio Cameras and Stands

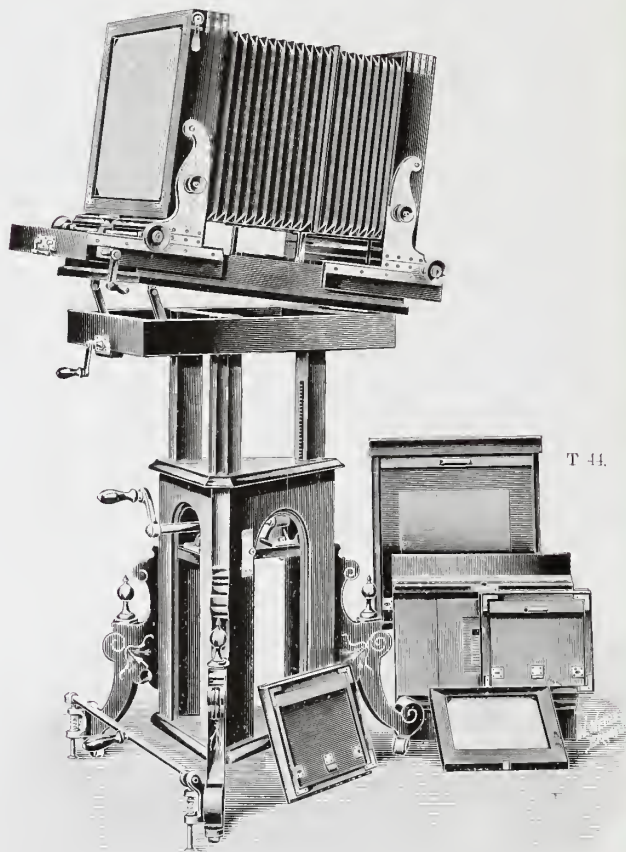
(TO ORDER ONLY.)

Universal Saloon Camera Model "D."

Swing Front in both
Directions.



THE reversing front can be moved from the back without changing the standpoint when focussing on the screen, and without assistance of a second person. The rising front is worked by rack and pinion motion. Roller dark slides are provided instead of the ordinary pattern. The Stand is fitted with roller castors, and clamps for levelling are provided, so that it can be fixed instantly on the spot desired. Camera and Stand are of high-class quality and workmanship only.

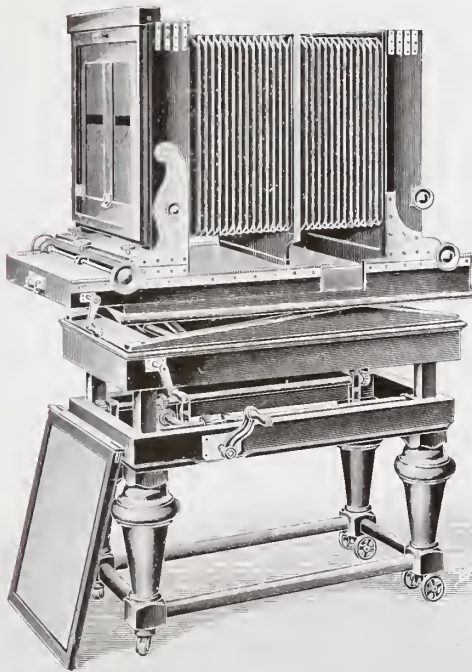


T 44.

Size,		Length of Extension,	Camera, Stand, 1 Roller Blind, Dark Slide, and 2 Small Slides, with Manipulator.	Code Word.	Roller Dark Slide extra	Code Word.
English.	Continental.					
ins.	c/m	ins.				
8½ × 6½	18 × 24	44	£21 15 0	Ebba	£1 2 0	Ecuador
12 × 10	24 × 30	50	24 0 0	Ecce	1 5 0	Edda
16 × 12	30 × 40	60	26 15 0	Economia	1 12 0	Edgar

STUDIO CAMERA MODEL "E."

THIS CAMERA IS DESIGNED FOR THE LARGER SIZES ONLY.



T 45.

pinion motion, swing plate, and rollers under the feet, of the best workmanship, is supplied with this Camera.

THE Camera works in metal grooves, and is fitted with rack and pinion movement and double swing front. The double extension in the front, as well as in the back, is arranged so that the Camera is always balanced on its stand, and every precaution is taken to render the management of this apparatus as easy as possible, even when working with the shortest focus.

Either best seasoned mahogany or walnut is used, and fine polished brass or nickelled bindings. The great advantage of this model is that the front part can be managed even at the longest extension by the operator himself when focussing, by means of a screw which moves the front part back or forward.

A black polished stand in form of a table, fitted with fourfold

Size		Length of Extension	Price, Camera, Stand, and 1 Roller Slide, with Carriers.			Code Word.	Price, Camera and Stand, 1 Roller Slide, 1 extra Extension, 2 Slides ordinary form, with Carriers.			Code Word.	Roller Slide extra.			Code Word.
ins.	c'm		ins.	l	s. d.		£	s. d.	£		s. d.			
20 × 16	40 × 50	64	34	0	0	Edona	38	15	0	Eibe	2	0	0	Elfe
24 × 20	50 × 60	76	39	5	0	Edur	44	5	0	Eichel	2	13	0	Elpis
28 × 24	60 × 70	88	45	0	0	Efeu	50	10	0	Eiger	3	10	0	Eleonore
32 × 28	70 × 80	96	52	10	0	Eforno	59	0	0	Eisen	4	0	0	Elpiso
40 × 32	80 × 100	120	60	0	0	Egon	67	10	0	Ecke	5	0	0	Elster

STUDIO CAMERA MODEL "F."

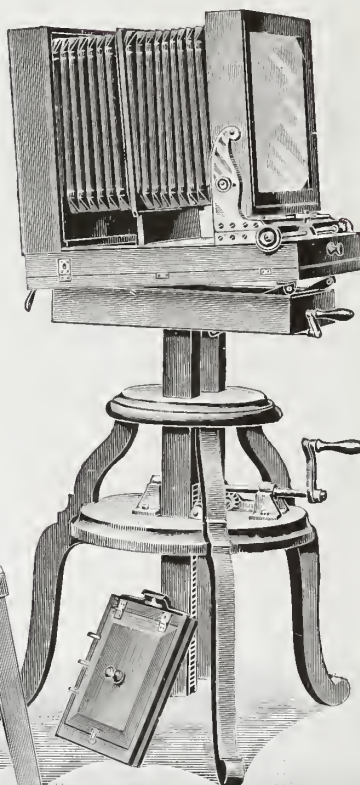
Of Simpler Construction.



THIS Model, though less elegant than the other ones, is of practical construction, and will answer the general technical requirements claimed. It is fitted with Double Rack and Pinion motion and double Swing Back.

Either dull Walnut or Mahogany is used with lacquered and fine polished binding.

The Stand is fitted with Double Pinion, and black polished.



T 46.

Size.		Length of Extension.	Price, Camera with Stand, two Ordinary Slides, or one Roller Slide.			Code Word.	Price, Camera and Stand, Extra Extension, one Roller Slide, two Ordinary Slides.			Code Word.	Ordinary Slide.	Code Word.	Roller Slide.	Code Word.
ins.	c/m.		ins.	£	s. d.		£	s. d.						
8½ × 6¼	18 × 24	44	12	10	0	Elzevir	..	..	13	6	Ernst	20/-	Erwin
12 × 10	24 × 30	50	14	5	0	Emma	16	5	0	Enzoi	..	25/-	Ernestine	
13½ × 11½	28 × 34	58	15	0	0	Erna	17	10	0	Eosin	..	29/-	Erebus	
16 × 12	30 × 40	60	16	15	0	Ente	19	10	0	Eos	..	32/-	Error	

Nickelled Bindings can be supplied at an increased price of 5%.



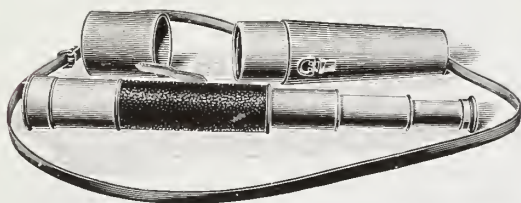
VOIGTLÄNDER'S RACE BINOCULAR.

This is acceptable to all Racing Men, inasmuch as it has a magnifying power of six times, with large field, good and brilliant definition. Weight, 15½ ozs.

Price, in Sling Case - £3 11 0

Code Word, Feld.

"Voigtlanders, who are the oldest-established optical house in the world, have just brought out a new series of binoculars—the 'Tourist,' 'Race,' and 'Stalker,' of 4, 6, and 8 times magnification respectively. For the use of sporting men the 'Race' binocular is of exceptionally good value, it is made of aluminium, and the weight is only 16 ozs."—*Sporting Times*.



x 6.

VOIGTLÄNDER'S DEER-STALKING TELESCOPES

For Tourists, Sportsmen, Military
Purposes, etc., etc.

Magnification in Diameters.	Mounted in Brass— Bronzed.		Mounted in Aluminium— Bronzed.	
	No.	Price.	No.	Price.
14	9	£3 13 0		
18	10	4 10 0		
23	11	5 8 0	15	£8 4 0
24	12	6 13 0	16	10 13 0
25	13	9 15 0	17	14 15 0
26	14	10 16 0	18	16 16 0

SPECIALLY ILLUSTRATED LIST FREE ON APPLICATION.

VOIGTLÄNDER'S PRISM BINOCULARS.

See fully illustrated price list gratis on application.

Magnifications.	£ s. d.			Monocular		
	£	s.	d.	£	s.	d.
x 2½	5	10	0	2	10	0
x 4	6	0	0	2	15	0
x 6	6	10	0	3	0	0
x 8	6	15	0	3	5	0
x 10	7	5	0	3	10	0
x 12	9	0	0	4	5	0

New model with
extra luminosity) x 8 .. 9 0 0

Specially recommended for Marine purposes, Artillery
practice, and use in dull light.

Supplied in Cases complete.



Taken with a Collinear Lens, Series III.

