

PATENT SPECIFICATION



Application Date: Feb. 7, 1924. No. 3177/24. **224,425**

Complete Left: Oct. 10, 1924.

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PROVISIONAL SPECIFICATION.

Improvements in Photographic Objectives.

We, HORACE WILLIAM LEE, a British subject, and KAPELLA LIMITED, a British company, both of 104, Stoughton Street, Leicester, do hereby declare the nature of this invention to be as follows:—

This invention relates to photographic objectives and particularly to that type consisting of a dispersive element placed between two collective systems, and has for its object the provision of a new form of such type of photographic objective yielding an extremely large aperture.

In our former invention described in Patent Specification No. 155,640, the dispersive element is placed approximately symmetrically between two simple collective elements. With this form it is possible to construct a lens yielding good definition over a sufficiently large field at an aperture of F/3 or thereabouts. In order to increase the aperture appreciably it is necessary to reduce the zonal spherical aberration, and this we do in the present invention by splitting the

back collective component into two simple collective lenses, so as to reduce the positive spherical aberration. With this modified form of objective it is not necessary to restrict ourselves within the limits of symmetry required in the earlier specification.

We also preferably make the dispersive element of material of which the refractive index for the D line of the solar spectrum is higher than that of the glass from which any of the collective components are made.

Dated the 6th day of February, 1924.

HORACE WILLIAM LEE.

KAPELLA LIMITED.

The common seal of Kapella Limited was hereunto affixed in the presence of:—

A. WARMISHAM,
W. S. HOLESON,
Directors.

T. E. HUDSON,
Secretary.

COMPLETE SPECIFICATION.

Improvements in Photographic Objectives.

We, HORACE WILLIAM LEE, a British subject, and KAPELLA LIMITED, a British company, both of 104, Stoughton Street, Leicester, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to photographic objectives and particularly to that type consisting of a dispersive element placed between two collective systems, and has for its object the provision of a new form of such type of photographic objective yielding an extremely large aperture.

[Price 1/-]

In our former invention described in Patent Specification No. 155,640, the dispersive element is placed approximately symmetrically between two simple collective elements. With this form it is possible to construct a lens yielding good definition over a sufficiently large field at an aperture of F/3 or thereabouts. In order to increase the aperture appreciably it is necessary to reduce the zonal spherical aberration, and this we do in the present invention by splitting the back collective component into two simple collective lenses, so as to reduce the positive spherical aberration. We place the

Price 4s 6d.

two simple collective lenses of the back component close together, *i.e.* the separation is not greater than 1% of the focal length of the complete system, and we place the dispersive element, as in our previous specification, approximately symmetrically (to within 10%) between the outer surfaces of the collective components.

We also make the dispersive element of material of which the refractive index

for the D line of the solar spectrum is higher than that of the glass from which any of the collective components are made. 15

EXAMPLE.

As an example of our method of construction we give the specification of a photographic lens of 1" focal length and aperture $f/2.5$, giving a flat field of 40° , as illustrated in the accompanying drawing. 20

	Radii.	Thicknesses and Separations.	n_d .	V.	Number in Chance Bros' Catalogue.
25	$R_1 + .4256$	$T_1 .06$	1.6084	56.1	5542
	$R_2 - 6.582$	$S_1 .15$			
30	$R_3 - .5481$	$T_2 .012$	1.6469	33.7	337
	$R_4 + .4244$	$S_2 .12$			
	$R_5 + 1.66$	$T_3 .03$	1.6084	56.1	5542
35	$R_6 - 1.66$	$S_3 .001$			
	$R_7 .00$	$T_4 .04$	1.6084	56.1	5542
40	$R_8 - .4778$				

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

1. A photographic objective consisting of four simple components of which one is dispersive of higher refractive index than any of the collective components and is placed approximately symmetrically (to within 10%) between a simple collective component in front of it, that is nearer to the object, and a pair of simple collective components which are separated by an air space not greater than 1% of the focal length of the complete system, behind it. 45 50 55

2. A photographic objective as in Claim 1, in which the refractive index of any of the collective components is not less than 1.60. 60

Dated the 9th day of October, 1924.

HORACE WILLIAM LEE. 65
KAPPELLA LIMITED.

The common seal of Kapella Limited was hereunto affixed in the presence of:—

A. WARMISHAM, 70
C. STAFFORD,
Directors.
T. E. HUDSON,
Secretary.

[This Drawing is a full-size reproduction of the Original.]

