

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION

Improved Lens System

We, J. H. DALLMEYER, LIMITED, a British Company, and BERTRAM LANGTON, a British subject, both of Church End Works, Willesden, London, do hereby declare the nature of this invention to be as follows:—

The invention relates to a lens system corrected spherically, chromatically, astigmatically and comatically, of the type consisting of four lenses, two positive and two negative, separated from one another by air spaces, the two negatives being enclosed by the two positives. All the component lenses are meniscal in shape and turn their concave surfaces towards the diaphragm. The complete assembly is not symmetrical. Its principal objects are to provide a very large field and good definition when manufactured in long focal lengths.

By using a very highly refractive crown glass for the front positive lens and one of lower refractive index and dispersive power for the rear positive lens we can reduce the Petzval sum without increasing

the separations, thus ensuring illumination over a wide field.

At the same time we can employ ordinary light flint for the negative lenses. This together with the very high refractive index of the front glass tends to shallow the curves and so reduce zonal spherical aberration. Owing to the small size of the circle of confusion the lens system yields sharp images when manufactured with extremely long focal lengths.

By making the system unsymmetrical we are unable to eliminate coma over a large field.

Dated the 9th day of March, 1937.

J. H. DALLMEYER, LIMITED.

p.p. J. H. Dallmeyer, Ltd.,

J. S. BARROW,

H. A. CARTER,

Joint Managing Directors.

J. S. BARROW,

Secretary.

BERTRAM LANGTON.

COMPLETE SPECIFICATION

Improved Lens System

We, J. H. DALLMEYER, LIMITED, a British Company, and BERTRAM LANGTON, a British Subject, both of Church End Works, Willesden, London, 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:—

The invention relates to that type of lens system corrected for spherical and chromatic aberration, astigmatism and coma and consisting of two single positive meniscus lenses and two single negative meniscus lenses, the positive lenses being placed on the outside of the system and enclosing the negative lenses and each of the four lenses having its concave face turned towards the diaphragm placed between the two negative lenses. It is known that by making such a system asymmetrical better corrections for coma and distortion are obtained.

[Price 1/-]

The principal objects of our invention are to provide a very large angular field of approximately 90°, the edges of which are exceptionally well illuminated, and good definition when manufactured in long focal lengths.

These objects are obtained using a very highly refractive crown glass, for which the Nd is at least 1.62, for the front positive lens and one of lower refractive index and dispersive power for the back positive lens so as to reduce the Petzval sum without increasing the separations, thus ensuring more even illumination over a wide field.

A further feature of our invention is that by keeping the total vertex length small, i.e., not exceeding one seventh of the focal length, we are enabled to obtain greater illumination on the edge of the field.

At the same time we can employ ordinary light flint for the negative lenses.

This together with the very high refractive index of the front positive lens glass permits the use of shallow curves with consequent reduction of zonal spherical aberration and owing to the small size of the circle of confusion the lens system yields sharp images when manufactured in long focal lengths.

We will now give data for the construction of such a lens system which is shown in the accompanying drawing, the nota-

tion being that the radii of curvature counting from the front are R_1, R_2 , etc., and the sign + denoting that the surface is convex to the incident light.

The axial thicknesses of the elements are denoted by $D1, D2$, etc., and the separations of the members by $S1, S2$. The material is defined in terms of the mean refractive index Nd and the Abbe V number.

	Equivalent focal Length = 1"		Aperture f/8.		Glass	
	Radii	Thickness	Separation	Nd	V	
25	$R_1 = +.1692$	$D1 = .017$	$S1 = .008$	1.6267	56.1	
	$R_2 = +.3958$					
30	$R_3 = +.2347$	$D2 = .005$	$S2 = .068$	1.5827	41.8	
	$R_4 = +.1347$					
	$R_5 = -.1211$	$D3 = .005$	$S3 = .008$	1.5827	41.8	
	$R_6 = -.2035$					
35	$R_7 = -.3228$	$D4 = .017$		1.6129	58.6	
	$R_8 = -.1470$					

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 spherically, chromatically, astigmatically and comatically corrected lens system consisting of two single positive meniscus lenses and two single negative meniscus lenses, the positive lenses being placed on the outside of the system and enclosing the two negative lenses and each of the four lenses having its concave face turned towards the diaphragm placed between the two negative lenses, and in which the front positive lens facing the

longer conjugate is made of crown glass the refractive index of which is at least 1.62 and exceeds that of the other positive lens.

2. A lens as claimed in Claim 1 in which the total vertex length does not exceed one seventh of the focal length.

3. A lens system as claimed in Claims 1 and 2 substantially as described in the example given.

Dated the 27th day of January, 1938.

J. H. DALLMEYER, LIMITED.

H. A. CARTER,
J. S. BARROW,
B. LANGTON.

[This Drawing is a reproduction of the Original on a reduced scale.]

