

PATENT SPECIFICATION

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DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Photographic Reflex Cameras.

We, FRANKE & HEIDECKE, G.m.b.H., a German Body Corporate, trading as Rollei-Werke Franke & Heidecke, of 196 Salz-dahlumerstrasse, Braunschweig, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a photographic reflex camera with a pentaprism and with an exposure meter, the light measurement being carried out through the lens system, i.e. through the camera lens in the case of single lens reflex cameras and through the view-finder lens in the case of two-lens reflex cameras.

With cameras of this kind the image on the focussing plate is observed via a pentaprism. This results in a vertical image which is seen the right way about, in addition to which the direction of viewing is parallel to the axis of the camera lens.

With this system the invention ensures a particularly simple, effective and space-saving integrating light measuring process over the entire view-finder image if between that light emergence surface of the pentaprism which is situated on the eyepiece side and the eyepiece itself a semi-reflective semi-transparent surface is provided by which the light from the whole area viewed is reflected onto a photo-electric cell. The mirror itself is preferably constructed as an image-forming system, e.g. as a concave mirror, alternatively an image forming diotric system by which the complete view-finder image is depicted on the photo-electric cell is intercalated between the mirror and the photo-electric cell.

The operation of measuring by a photo-electric cell or a photo-electric converter behind the translucent mirror is unreliable,

because the distance of the mirror surface and thus that of the cell surface from the lens and from the image plane respectively, is subject to variations. Convincingly simple and obvious though the provision of the photo-electric cell behind the mirror surface may appear, therefore, it is useless for an integrating exposure measuring operation.

The measuring operation carried out when the photo-electric cell is somehow accommodated in the view-finder chamber or behind some other reflective surface of the pentaprism is no more reliable than the foregoing method, unless by means of additional optical elements care is taken to ensure that the light entry pupil of the lens is completely depicted on the photo-electric cell, so that the stopping-down of the lens is included in the measuring result.

These difficulties are avoided by a "point measuring operation" on the focussing plate, in which system the photo-electric cell is mounted in the immediate vicinity of the image plane or focussing plate and is movable on an overhanging part above the image plane or is hinge mounted so that it can be moved down onto the said plane, for in the measuring operation it only covers over a small part of the image on the focussing plate and therefore provides a means of measuring individual points of importance to the image. It does not, however, belong to the category of integrating exposure meters, which is a precondition for building them onto cameras with fully automatic or semi-automatic control of the exposure.

It has also been suggested that the photo-electric cell in a pentaprism view-finder camera should be accommodated in the vicinity of the eyepiece and fitted with an image-forming optical system which,

[Price 4s. 6d.]

through the pentaprism, depicts the image with the maximum aperture on the photo-sensitive surface of the photo-electric cell or of the photo-electric converter.

5 According to the present invention there is provided a photographic reflex camera having a pentaprism, an exposure meter which measures the light entering through the camera lens in the case of single lens
10 reflex cameras or through the view-finder lens in the case of two-lens reflex cameras, and a view finder eyepiece into which light from the lens is reflected by the pentaprism, wherein between the light emergence surface
15 of the pentaprism on the side adjacent the eyepiece, on the one hand, and the eyepiece on the other hand, a ray-dividing surface is provided, by which part of the light from the whole area viewed is reflected onto
20 a photo-electric cell of the exposure meter, in a direction transverse to the axis of the eyepiece. Preferably the mirror itself is constructed as an image-forming system, e.g. as a concave mirror, or an image-forming
25 dioptric system, by which the complete image appearing in the view-finder is also depicted on the photo-electric cell, is intercalated between the mirror and the photo-electric cell.

30 The drawing shows a number of examples of the object of the invention, only the essential components being illustrated.

Figs. 1 and 2 are a side elevation and a horizontal projection of a constructional
35 version with a dioptrically image-forming system;

Fig. 3 is a version in which the reflective surface is itself constructed as an image-forming system;

40 Figs. 4 and 5 show a further version in which the image is reflected at an acute angle, in order to obtain a particularly compact construction;

Fig. 6 shows a fourth version, in which the photo-electric converter is accommodated in the housing of the prism.

Adjacent the focussing plate 1 there is a field lens 2 to which is cemented the pentaprism 4 by its light inlet surface 3. The plane surface of the field lens is prolonged in the direction of the eyepiece 5, so that a ray-dividing prism 6 can also be cemented onto this prolonged part. Through the semi-transparent reflector surface 7 part of
55 the path of the rays is reflected perpendicularly in respect of the axis of the eyepiece and depicted by the lens 8 on the photo-electric cell 9 by interaction with the field lens. This system enables the photo-electric components of the exposure meter to be accommodated without the consumption of any appreciable additional space.

60 Fig. 3 shows a photo-electric cell 19 and a ray-dividing surface 17 of the prism 16 constructed as a spherical surface which performs the function of the image-forming system, so that this system 8 can be dispensed with.

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In Figs. 4 and 5 a prism 26 is provided between the pentaprism 24 and the eyepiece 25 and has a semi-transparent reflector surface 27 which is situated at an obtuse angle with respect to the axis of the eyepiece, so that the reflection of the course of the exposure meter rays is effected at an obtuse
75 angle. The separating surface 28 between the outlet surface of the pentaprism 24 and the ray-dividing prism 26 is totally reflective for the ray reflected, so that the photo-electric cell 29 can be mounted direct on the ray-dividing prism 26.

Fig. 6 shows a similar version, in which the cemented surface 38 allows the reflected measuring ray to pass through. To the surface 39 of the prism is cemented a prism 40 of the same refractive power, the photo-electric cell 41 resting directly against it.

WHAT WE CLAIM IS:—

1. A photographic reflex camera having a pentaprism, an exposure meter which measures the light entering through the camera lens in the case of single lens reflex cameras or through the view-finder lens in the case of two-lens reflex cameras and a view-finder eyepiece into which light from the lens is reflected by the pentaprism, wherein between the light emergence surface of the pentaprism on the side adjacent the eyepiece, on the one hand, and the eyepiece on the other hand, a ray-dividing surface is provided, by which part of the light from the whole area viewed is reflected onto a photo-electric cell of the exposure meter in a direction transverse to the axis of the eyepiece.

2. A photographic reflex camera, in accordance with claim 1, wherein an image-forming system is mounted in front of the photo-electric cell and forms an image of the lens aperture on the photo-electric cell.

3. A photographic reflex camera, in accordance with claim 1 or 2, wherein a mirror is constructed as an image-forming system, whereby the image appearing in the view-finder is also formed on the photo-electric cell.

4. A photographic reflex camera substantially as described with reference to and as illustrated in the accompanying drawings.

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95 the lens is reflected by the pentaprism, wherein between the light emergence surface of the pentaprism on the side adjacent the eyepiece, on the one hand, and the eyepiece on the other hand, a ray-dividing
100 surface is provided, by which part of the light from the whole area viewed is reflected onto a photo-electric cell of the exposure meter in a direction transverse to the axis of the eyepiece.
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2. A photographic reflex camera, in accordance with claim 1, wherein an image-forming system is mounted in front of the photo-electric cell and forms an image of the lens aperture on the photo-electric cell.
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3. A photographic reflex camera, in accordance with claim 1 or 2, wherein a mirror is constructed as an image-forming system, whereby the image appearing in the view-finder is also formed on the photo-electric
115 cell.

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