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PROVISIONAL SPECIFICATION.

An Improved Reflecting Lens Attachment for Photographing and Exhibiting Still or Animated Objects in Natural Colours.

WILLIAM NORMAN LASCELLES DAVIDSON Captain, (late) 4th Bn "The King's" (Liverpool Regiment) 20 Middle Street, Brighton do hereby declare the nature of this invention to be as follows:—

In this Provisional Patent Application the reflecting lens attachment and colour screens (or colour fitters)—red, blue and green (or yellow) are placed directly in front (not behind or between the combinations) of a photographic lens (or lenses), and two or three (according to the number of reflections required) identical images of the object (or objects) to be reproduced in colours are presented to the lens (or lenses) and sensitive plate or film simultaneously. The image through the red screen (which is placed at an angle to the lens (or lenses) and reflects as well as admits the object (or objects) being direct, and the images through the blue and green (or yellow) screens, reflections, respectively, of the object (or objects) already presented through the red screen and lens (or lenses); consequently, identical negatives are taken with one or more lenses from the same point of view and simultaneously. To view results in colours, positives (called colour records) are placed in the position where the sensitive plate or film usually occupies, and the eye applied to the red reflecting transparent surface (slightly different shades of colour screens being employed for this purpose when necessary), the record will appear in natural colours. Kinematograph colour records of animated objects can also be projected on a screen and exhibited in colours through an optical lantern or other device, in conjunction with the reflecting lens attachment described. Objects can also be photographed and viewed stereoscopically in colours. Results may be obtained by omitting the second reflection, and photographing the object (or objects) in two colours, as red and blue. By viewing the two-colour record through a yellow screen or light in conjunction with the reflecting lens attachment, the record will be seen in colours. Instead of exhibiting colour records in two or three colours through the reflecting lens attachment the double or triple negatives may be printed from by any colour process. By dispensing with the colour screens, identical duplicate negatives can be produced simultaneously for printing in monochrome when necessary. If the focus of the lens employed or the size of the sensitive plate or film will not permit two or three images to be taken side by side, accurately paired lenses may be mounted on a camera, horizontally or vertically, and the reflecting surfaces adjusted to the correct angles, one reflection for each lens (blue and green) (or yellow) except the red, the red screen and lens admitting the object (or objects) to be photographed direct as already explained. The reflecting surfaces can be adjusted to any angle when required.

Dated this 12th day of June 1902

W. W. LASCELLES DAVIDSON,
Capt. (late) 4th Bn The Kings (L'pool Regt)

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[Price 8d.]



Lens Attachment for Photographing, &c., Objects in Natural Colours.

COMPLETE SPECIFICATION.

An Improved Reflecting Lens Attachment for Photographing and Exhibiting Still or Animated Objects in Natural Colours.

I, WILLIAM NORMAN LASCELLES DAVIDSON, Captain, late of the 4th. Battalion, "The Kings" (Liverpool Regiment) of 20 Middle Street, Brighton, in the County of Sussex, 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 an improved reflecting lens attachment for photographing and exhibiting still or animated objects in natural colors. the object being to reduce the exposure required to make the red sensation negative and to lessen the loss of light, by reducing the number of reflecting surfaces.

I attain my object by the use of the appliances shown in Fig. 1, which is a section in diagram form of one method of putting my invention into practice, and Fig. 2 and 3 similar views showing modification of this method.

Referring to Fig. 1, I provide a box or casing *a*, having an opening *b* at one face, and an opening *c* at the opposite face in which is inserted the hood of the lens *d*.

Within the said box and placed at a suitable angle or at suitable angles approximately as shown, are the red screen or filter *e*, the transparent reflector *f* and the plain or silvered reflector *g*.

Between the reflecting screen *e* and reflector *f* can be placed the green (or yellow) screen *h*, and between the reflectors *f* and *g* is the blue reflector *i*. Some of the rays from the object *j* pass direct through the red reflecting filter *e* and by the lens *d* are projected on a colour sensation plate *k* and produce the red sensation negative.

The rays from the object *j* impinging on the screen *e* are partially reflected by *f* passing through the green (or yellow) screen *h*, and the image formed by the lens *d* is projected on the plate *l* and produces the green (or yellow) sensation negative.

Other rays reflected from *e* pass through the transparent reflector *f* and falling on the silvered or plain reflector *g* after passing through the blue, screen at *i* go through the lens and produce the blue sensation negative at *m*.

The box *a* is made in two or more parts or otherwise so that the distance between the color screens and reflectors and the lens (or lenses) can be varied or adjusted when required, or that necessary change between "taking screens" and "projection screens" may be made.

It is not essential to set the reflecting surfaces and colour screens in a box; they may be attached to the hood of the lens (or lenses) in any suitable manner so long as they are in the path of the correct bundle of rays. The reflectors and colour screens and lens (or lenses) are shielded from any extraneous light, and they can be adjusted in the manner already described.

The hood of the lens *d* instead of being permanently fixed in the box *a* may be inserted in a board free to slide laterally and vertically so that its position can be varied at pleasure. The negatives can be taken and resulting colour records viewed or projected either horizontally or vertically. Means are also provided for altering the angles of the screens and reflectors, as well as to separate or place them closer together.

The resulting negatives *k*, *l* and *m* may be used for the production of positive printing blocks, trichromatic prints, or for transparencies by any colour process.

When positives from the negatives *k*, *l* and *m* are substituted for the negatives, the combined colour effect can be viewed through the opening *b*, light being of course allowed to pass in the case of transparencies through the said positives.

In case of an opaque positive the light would be caused to fall upon the surface from above or below, or from either side.

Lens Attachment for Photographing, &c., Objects in Natural Colours.

If it be desired to exhibit the transparencies on a screen, the positives *k*, *l* and *m* are illuminated by light passed through a condensing lens, but when the combined effect is to be viewed through *b* or by optical projection, the screens are of different colours to those used in taking the original negatives, the nature of the required difference being well understood by experts in heliochromy.

If so desired I may use two or three lenses of identical focal length (or I may employ lenses of slightly different focal lengths if necessary) mounted side by side horizontally or vertically instead of one lens. One of these lenses would then receive its image direct through the red screen, and the others by reflection as already described in connection with the use of only one lens.

Again by duplicating the lens or lenses and properly partitioning the box *a*, stereoscopic views may be taken, viewed, or projected.

As a modification shown at Fig 2, the reflector *f* instead of being a plain transparent one may be blue, in which case the blue filter *i* would not be required as the image received on the reflector *g* being already blue would be so projected on the plate at *m*.

If it be desired only to produce red and blue sensation negatives, the reflector at *f* whether blue or colourless may be replaced by a silvered reflector and the image projected through a blue screen substituted for the green (or yellow) one at *h*, or the silvered mirror can be made by silvering the back of colourless glass (or other substance) the front or other side of which is coated with suitably coloured gelatine or collodion, and thus dispensing with a separate colour screen *h*.

When only blue and red sensation negatives are produced the resulting combined blue and red positives are usually viewed through a yellow screen.

The opening *b* need not necessarily be at the side but may be elsewhere placed but always so that the lens views the object directly through the red screen. The colour screens instead of being contained with the reflecting screens in front of the lens (or lenses) may be placed in any suitable position in the direct path of the rays (either reflected or otherwise) entering the lens (or lenses) they may be in contact with the sensitive plate or between the back combination of the lens (or lenses) and sensitive plate, or in the diaphragms of the lens (or lenses).

The use of the apparatus above described not only reduces the number of reflecting surfaces but also permits of greater rapidity in the taking of the red sensation negatives owing to there being less loss of light by reflection than in ordinary methods.

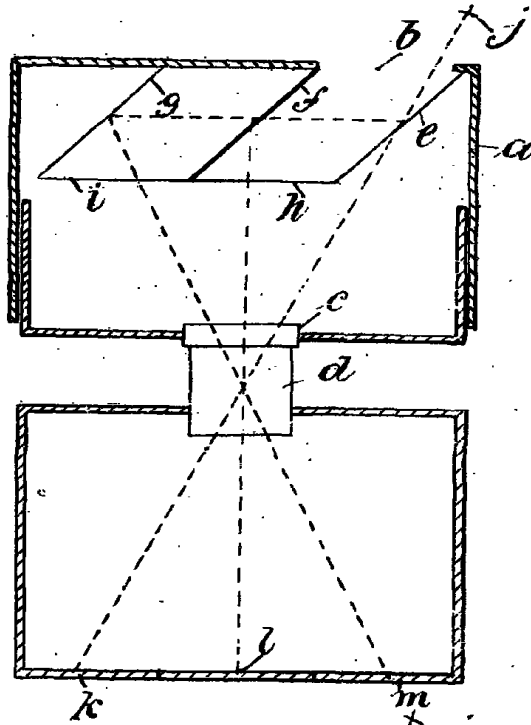
As colour filters I sometimes use glass coloured in the mass (pot metal) on the one hand or flashed or stained on the other hand. Sometimes I use plain glass coated with a film of stained or coloured gelatine or collodion; in short I use any of the various colour filters and reflectors as ordinarily or occasionally used.

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

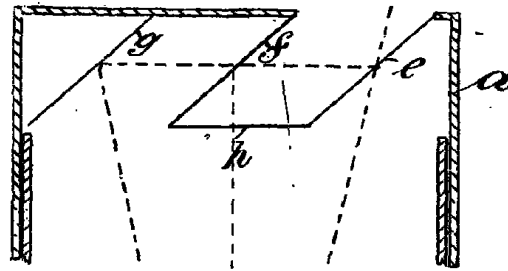
The method substantially as hereinbefore described of taking photographic colour records with the aid of reflectors and colour filters placed in front of the lens (or lenses) in such a manner that the object is always viewed by the lens directly through the red filter, the other colour sensation records being obtained by reflection through appropriate colour filters and by the aid of reflecting surfaces, the primary reflection being from the surface of the red filter.

Dated this 6th day of April 1903.

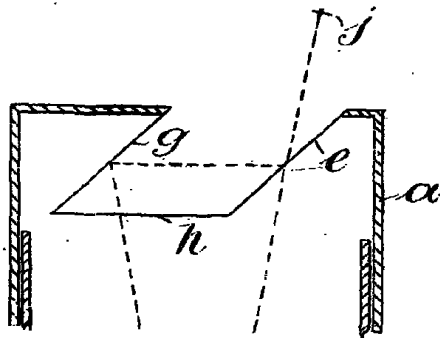
HUGHES & YOUNG,
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-Fig. 1-



-Fig. 2-



-Fig. 3-

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

