N° 7179 A.D. 1904

Date of Application, 25th Mar., 1904
Complete Specification Left, 24th Jan., 1905—Accepted, 2nd Mar., 1905

PROVISIONAL SPECIFICATION.

"Improvements in Optical Projection Apparatus for Producing Coloured Images".

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

This invention relates to improvements in optical projection apparatus for producing coloured images so that they will superimpose on the screen and give cinematograph or other views in the natural colours of what is displayed.

In carrying my invention into effect I place the three positive colour records at one end of a camera or lantern at the opposite end of which is a lens or lenses.

In front of or behind the lens or lenses is a series of mirrors or other reflecting surfaces namely in front of one of the end positives a single mirror; in front of the middle positive a mirror having two reflecting surfaces, in front of the other end positive another mirror having two reflecting surfaces and beyond that a single mirror.

These mirrors are inclined so as to cause the positive images to superimpose on the screen when light is passed through them and if suitable colour screens are interposed in the path of the light after or before it has passed through the positives the superimposed images will appear on the screen in their proper colours.

In place of the mirrors having two reflecting surfaces, two mirrors may be used back to back and this is to be preferred as providing for more accurate adjustment.

The apparatus may be used for superimposing two instead of three positives, and in all cases the mirrors are pivoted so as to provide for accurate adjustment. Under favourable conditions, the mirror can be used for producing the original negatives as well as project the resulting colour records on the screen; but for producing negatives transparent reflecting surfaces are required instead of some of the opaque mirrors.

Dated this 6th day of May, 1904.

HUGHES & YOUNG,
55/56, Chancery Lane, London, W.C.
Agents.

COMPLETE SPECIFICATION.

"Improvements in Optical Projection Apparatus for Producing Coloured Images".

I, WILLIAM NORMAN LASCELLES DAVIDSON, Captain, late 4th Battalion, "The King's Liverpool Regiment", 20, Middle Street, Brighton, do hereby declare

[*Price* 8*d*.]

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 improvements in projecting colour records so that they will superimpose on the screen, and give kinematograph or other views in the natural colours of what is displayed.

In carrying my invention into effect I proceed in or in about the following manner making reference to the accompanying drawing wherein:—

Fig. 1 is a diagram of a plan of one mode of carrying my invention into effect, and

Fig. 2 a similar view of part with the mirrors differently arranged.

Fig. 3 a diagrammatic plan of a modification, and

Fig 4 a similar view of part with the mirrors differently arranged.

Referring to Fig. 1, I place three positive colour records *a*, *b*, *c*, at one end of a camera or lantern at the opposite end of which is a lens *d* or more than one lens.

In front of the lens is a series of mirrors, or other reflecting surfaces, namely, a single mirror *e*: a mirror or mirrors providing two reflecting surfaces *f*: another mirror having two reflecting surfaces *g*, and beyond that a single mirror *h*.

These mirrors are inclined so as to cause the positive images to superimpose on the screen when light is passed through them, and if suitable colour screens *i*, *j*, *k*, are interposed in the path of the light after or before it has passed through the positives, the superimposed images will appear on the screen in their proper colours.

A condensor k^1 is also provided.

When the double reflecting surfaces are required, it is preferable to use two mirrors back to back as they provide for more accurate adjustment.

As a variation of the above mentioned arrangement of mirrors, they may be placed to incline as shown in Fig. 2, that is, in the opposite direction to that shown in Fig. 1.

As a modification, the mirrors may be so arranged as to only reflect the two end positives on to the screen, the light passing directly through the centre positive without reflection.

Such an arrangement is shown in Fig. 3, where *l*, *m*, *n*, *o*, are the reflectors, *p* the lens, *q*, *r*, *s*, the colour records, *t* the condensor, and *u*, *v* and *w* the colour filters.

In this arrangement, the rays passing direct through the centre of the lens should pass through a red filter.

Fig. 4 shows a modification in the arrangement of mirror shown in Fig. 3, and this arrangement gives the colour records almost the same point of view unless very near objects are photographed.

The apparatus may be used for superimposing two instead of three positives. In this case, the mirrors *l*, *m*, or *n*, *o*, may be removed; and in all cases the mirrors are pivoted so as to provide for accurate adjustment.

By placing the mirror *l* further from *m* or *n* further from *o* stereoscopic negatives can be produced, and positives projected in two colours stereoscopically with one lens.

Under favorable conditions, the mirrors can be used for producing the original negatives as well as for projecting the resulting colour records on the screen.

In any event means are provided not only for adjusting the angles of the reflectors as already mentioned, but also for varying their distances from one another and from the lens.

The mirrors should be enclosed in a box with a suitable opening or with suitable openings, to allow the image or images to pass to the lens, and the box of mirrors may be so small as to be easily attached to the lens hood.

When producing negative colour records, all extraneous light must be shielded off, and kept from entering the lens or lenses behind the mirrors.

For producing a complete tri-chromatic colour record for each eye stereoscopically, another accurately paired lens can be mounted on the camera, with another set of identical mirrors in front. For non-stereoscopic pictures the very slight difference caused by the pictures being taken from different points of view with one lens, is not noticeable unless very near objects are photographed.

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:—

1. In an apparatus for projecting colour records the arrangement in front of the projecting lens of single and double reflectors whereby the images from transparent colour records are superimposed on a screen after passing through suitable colour filters or screens, substantially as hereinbefore described with reference to Figs. 1 and 2 of the accompanying drawings.

2. In an apparatus for producing colour records the arrangement in front of the taking lens of single and double reflectors whereby the rays from the objects are passed through suitable colour filters on to colour sensitive surfaces, substantially as hereinbefore described with reference to Figs. 1 and 2 of the accompanying drawings.

3. In an apparatus for projecting colour records, the arrangement in front of the projecting lens of single reflectors whereby the filtered images from the end ones of three transparent colour records are caused to superimpose on one another, and on the image from the red sensitive record, which passes direct through the lens and a red screen or filter, substantially as hereinbefore described with reference to Figs. 3 and 4 of the accompanying drawings.

4. In an apparatus for producing colour records, the arrangement in front of the taking lens of single reflectors whereby the rays from the objects are transmitted to the end ones of three colour sensitive surfaces, the rays for the centre colour sensitive surface being passed through a red filter, substantially as hereinbefore described with reference to Figs. 3 and 4 of the accompanying drawings.

5. A modification of what is claimed in the above Claims 1 and 2 by which modification some of the mirrors are omitted, substantially as hereinbefore described.

6. A modification of what is claimed in the above Claims 3 and 4, by which modification some of the mirrors are omitted, substantially as hereinbefore described.

Dated this 14th day of January, 1905.

HUGHES & YOUNG,
55/56, Chancery Lane, London, W.C.
Agents.

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DAVIDSON'S COMPLETE SPECIFICATION. (1 SHEET)

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

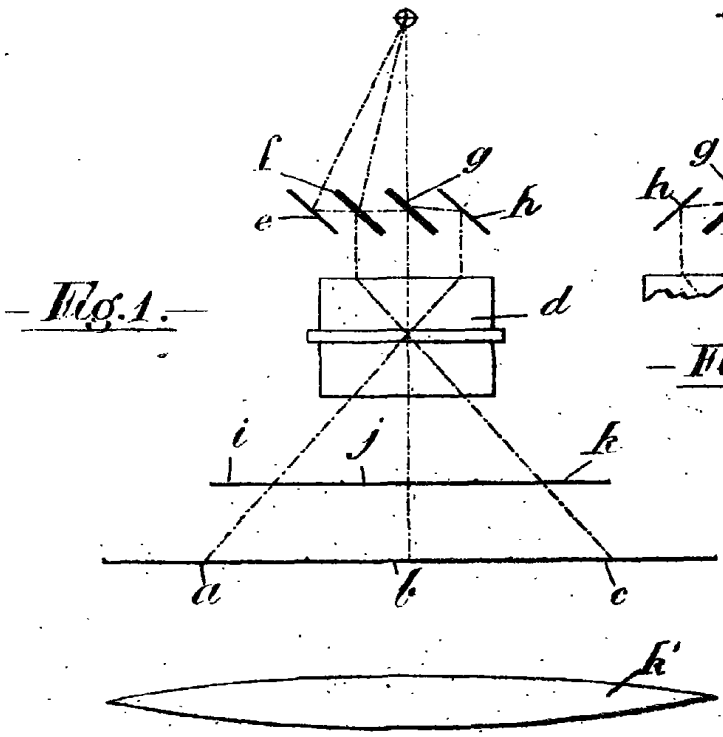

Fig. 1.

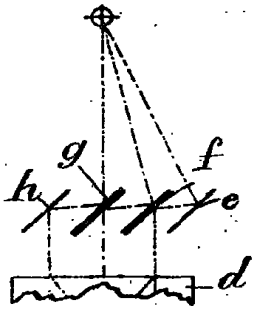

Fig. 2.

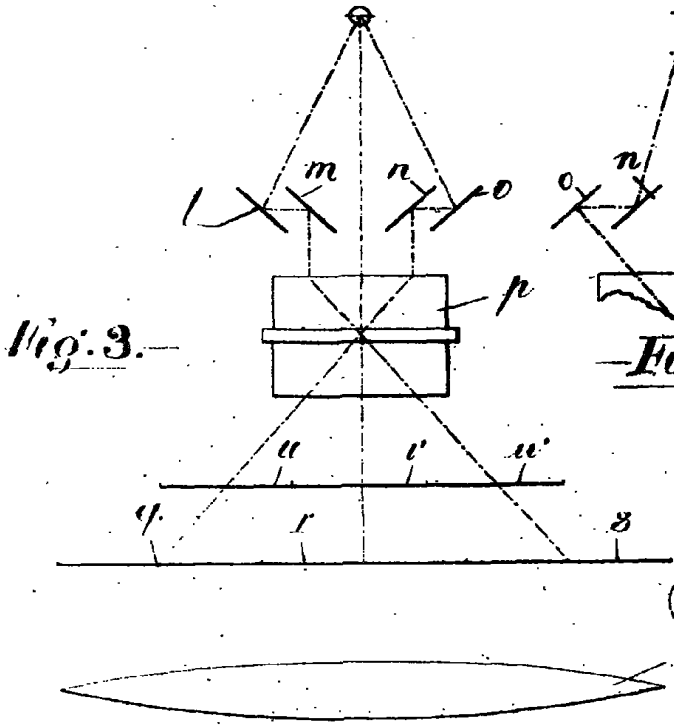

Fig. 3.

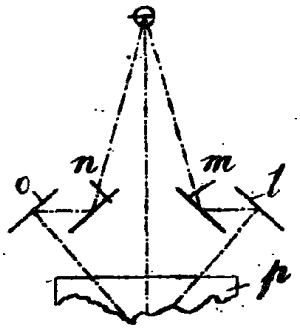

Fig. 4.

Malby & Sons, Photo-Litho.