

AMENDED SPECIFICATION.

Reprinted as amended under Section 8 of the Patents and Designs Acts, 1907 to 1928.

PATENT SPECIFICATION

346,454

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(Divided out of No. 346,466).

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COMPLETE SPECIFICATION (AMENDED).

Improvements in Means for the Projection of Cinematographic Effects in Colour.

I, DEMETRE DAPONTE, a Roumanian Subject, of Royal Automobile Club, Pall Mall, London, S.W. 1, formerly of The Engineer's Club, 39, Coventry Street, London, W. 1, 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 present invention deals with improvements in or relating to means for the projection of cinematographic effects in colour and is particularly applicable for projecting cinematographic films of the kind obtained from negative films upon which complementary colour images are formed preferably taken from the same point (aspect) of view and disposed side-by-side on the film with the width or horizontal lines of the object running along or parallel with the length of the film.

In the projection of such side-by-side images the ordinary optical system is replaced by one so constructed as to turn the two pictures into normal position and project them in register through appropriate colour filters on the screen, the erection of the images being performed by a combination of suitably angularly disposed mirrors or their prism equivalent.

Means have to be employed to superimpose the two side-by-side pictures in exact registration on the screen, and such superimposition of the two pictures has been effected by including in the erecting system a split mirror device, the two halves of the mirror being capable of tilting relatively to one another about axes at right angles one to the other.

Hitherto the divided mirror has been the final reflecting surface of the erecting system, i.e., the surface from which the pictures are reflected directly on to the screen.

[Price 1/-]

It should be understood that in the case of projectors as ordinarily used for kinematography the beam of light emerging from the projection lens converges down to a minimum diameter at the plane in which an image of the condenser aperture is formed by the projection lens. Immediately after passing this plane the beam of light spreads out in sectional form depending upon the size and distance of the screen image.

In the case of a split or divided lens a pair of such minimum diameters or condenser images are formed side by side, generally overlapping to a small extent depending upon the dimensions of the apparatus. In order that each part of the divided mirror receives light coming from one of the pair of pictures on the film it is clearly important that the divided mirror should be situated at some point between the divided lens and the condenser image plane, since beyond this plane the light from the two pictures overlaps.

In practice the length of path through the erector represents a much greater distance than the available distance between the lens jacket and the plane in which the condenser image is formed, so that if the divided mirror is arranged towards the screen it comes in a plane outside the condenser images and the light from each picture cannot therefore be properly separated.

The aim of the present invention is to prevent or minimise the mutual interference of the light from the two pictures and to ensure that the light from each picture be incident upon its respective half of the split mirror, and also by using a split projection lens to avoid the display outside the superimposed pair of images of undesired images which appear

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when a single lens is used and which are difficult to cut off unless an aperture can be arranged some considerable distance away from the projection lens.

5 To the foregoing ends the present invention consists in using a split projection lens and in placing the split mirror in or near to the plane in which the image of the condenser is formed by the split
10 projection lens. The complementary pictures may be thereby registered and then reflected by the remaining surfaces of the erecting system in correct orientation onto the screen.

15 In order that the present invention may be the more clearly understood, reference is made to the accompanying drawings in which:—

20 Figs. 1 to 3 show one form of optical system according to this invention.

Figs. 4 to 6 show a modified form, and

25 Fig. 7 shows a piece of film with side-by-side images which the systems herein-described are adapted to turn through 90° and project in register on the film.

30 Referring to Figs. 1 to 3 of the drawings the split mirror device to produce the correct registration of the images on the screen is constituted by two adjustable mirrors 69 and 70 placed in or near to the plane in which the image of the condenser is formed by the projection lens or lenses. In this arrangement the side-by-side images are erected and projected
35 in register on the screen by directing the light beams from the light source and the lens or lenses to the mirrors 69 and 70 which reflect the beams to another mirror 72 from which the beams pass to the mirror 71, by which they are turned
40 in a direction parallel with the lens axis, but with the images rotated in the desired direction so that on projection they appear as one image correctly orientated on the screen.

45 In Figs. 1 to 3, the spot indicated paths 1*b* and 2*b* Fig. 3 and 1*a* and 2*a* Fig. 2 are away from the observer, while those marked 1, 2 and 1*c*, 2*c* Fig. 1 are towards the observer.

50 Colour filters R and G are placed behind the half mirrors 69 and 70.

The mirrors are preferably coated with

a reflecting medium such as silver or platinum on the front surfaces and mounted
55 in a box from which the air may be exhausted or replaced by a suitable gas to prevent tarnishing of the mirror surfaces.

In the modification shown in Figs. 4 to 6 the split mirror device 75, 76 is used in
60 combination with prisms 73, 74.

In this arrangement the light is first received by the two adjustable half mirrors 75 and 76 by means of which the two pictures are registered, and then
65 passes through the prisms 74 and 73 (usually the two prisms will be made in one piece) on the screen.

In the arrangement shown in Figs. 4 to 6 the colour filters R and G are placed
70 between the light source and the half mirrors.

It is to be observed that in the prism system the reflecting surfaces are silvered when the critical angle is exceeded.
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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:—
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1. For the purpose of producing cinematographic effects in colour, an optically folded projecting system for combining side-by-side images on the film into a single image on the screen having an adjustable split mirror placed in or near to the plane in which the image of the condenser is formed by the projection lens used in combination with a split projection lens.
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2. An optical projection system substantially as herein described and illustrated in Figs. 1 to 3 of the accompanying drawings used in combination with a split projection lens.
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3. An optical projection system substantially as herein described and illustrated in Figs. 4 to 6 of the accompanying drawings used in combination with a split projection lens.
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Dated this 1st day of October, 1930.

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Patent Agents for the Applicant.
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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 2.

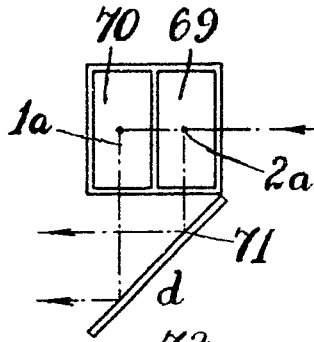


Fig. 1.

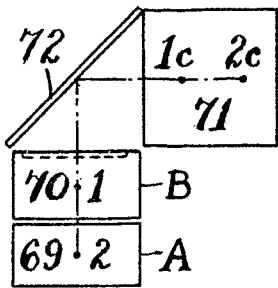


Fig. 3.

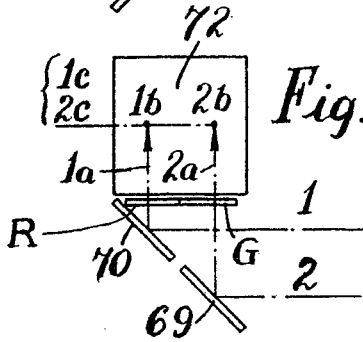


Fig. 7.

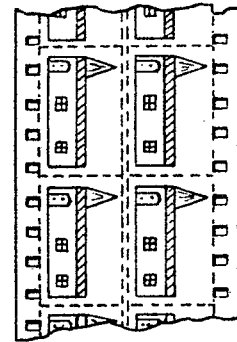


Fig. 5.

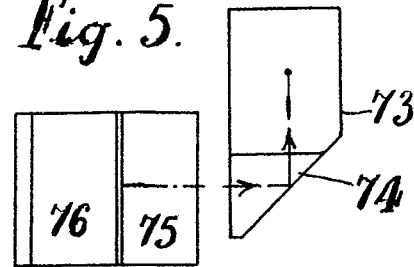


Fig. 4.

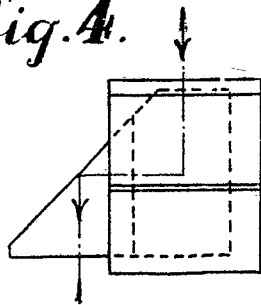


Fig. 6.

