

N^o 3034



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COMPLETE SPECIFICATION.

Improvements in Kinematograph Apparatus for the Production of Coloured Pictures.

We, CHARLES URBAN, Engineer, and THE NATURAL COLOR KINEMATOGRAPH COMPANY LIMITED, Manufacturers, both of 80 and 82, Wardour Street, London, W., 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
5 following statement:—

This invention relates to an improved process for obtaining kinematograph pictures that approximate nature in color or which more strictly speaking impart natural color sensation to the observer.

It is known that if a bioscope panchromatic film negative be taken through a
10 moving two color light filter, so as to produce alternating monochromatic pictures and if from such negative a positive is obtained and projected through similarly colored screens, the rapid alternation of such successive colored pictures causes the onlooker to be ignorant of their separate color identity, and to receive the impression of such colored pictures as though they were actually super-imposed.
15 This effect is known as persistence of vision, and the best two colors for the filters and projecting screens are red and green, or any two such other colors or combination of colors as are complementary to each other in the spectrum.

Now heretofore such pictures have been taken through an ordinary bioscope camera with a moving two color filter geared to synchronise with the film
20 movement and give alternate color filtered negatives.

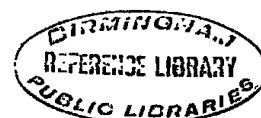
This involves a rapid movement of the film, moreover, if the object photographed be rapidly moving, the color intensity or value of such subject is recorded on the successive negatives in different positions, or out of register, so much so that the respective images do not sufficiently overlap to produce color
25 harmony, so giving rise to what is known as color "fringing".

The object of the present invention is to produce such photographic apparatus for kinematography that a two color image is obtained through a single lens by the employment of the known principle of reflecting mirrors, such mirrors being not only transparent for direct transmission of the image, but capable of reflecting the image from the lens to a non-transparent mirror, modified to the extent
30 of being combined with certain known methods of correcting the lengths of the duplicate beams so that the two images are identical in size.

It is carried out as follows:—

A bioscope camera of the type suitable for taking ordinary black and white
35 pictures may be adapted to these requirements. In operation it is necessary to double the throw of the film feeding arrangements, but allow an interval of time between the exposures. The camera may have an ordinary lens of a focus appropriate to the work required, but disposed behind the said lens are special distributing reflectors which duplicate the single image as it passes from the
40 lens, the reflected images passing through color filters disposed at a suitable position between the film and lens or film and reflector, thereby producing a simultaneous double record on the sensitized film. This film constitutes the negative, which is developed and treated in the ordinary way, the positive

[Price 8d.]



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obtained therefrom being projected by a projector, arranged to exhibit the two respective color value positives, alternately and in rapid succession, this process necessitating the employment of persistence of vision.

In such process, the film being composed of pictures alternately color filtered, is exhibited by causing it to pass through the apparatus at twice the speed 5 usually employed for black and white films, and by using a similar moving two color screen, whose movements are compelled to synchronise with the film, the positives of the previous negatives are exhibited in such rapid succession that the image appears colored.

Alternatively, the inverse of the means of procuring the negative film may 10 be used for the purposes of projecting the positive, the reflectors each receiving one of the two distinct color filtered impressions through a color screen, which pass as a combined impression or image through the projecting lens. In this case there is no persistence of vision nor super-imposition, but an actual coloring 15 of the image presented. This it will be seen, avoids all visual errors such as fringing, and gives a clear and sharp definition of the projection.

In arranging the duplicating reflectors, it is in most cases preferable to obtain the negatives one above the other, as in the manner previously described, but the invention is not necessarily limited in this respect.

Referring to the accompanying drawings, a represents the camera lens. In 20 the direct axial plane of said lens is interposed a reflector b . The reflector is transparent, and in receiving the whole of the light pencil from the lens, transmits the image, as within the lines c , at the same time reflecting same to a non-transparent mirror b^1 which in turn reflects an image within the lines c^1 . The mirror b^1 may be silver-backed or otherwise treated to assist its reflection, 25 the transmitted and reflected images c and c^1 are respectively exposed upon the film d through complementary coloured screens e , e^1 .

Owing however to the reflected image having a shorter focal length than the transmitted image, two independent films would be necessary since they would lie in dissimilar planes. 30

To correct this, for the purpose of receiving the two images upon a single film, any known correcting device, such by example as a parallel sided glass interceptor shown in the drawings at α , may be employed, whereby the error in the focal plane is adjusted.

To project with such an apparatus, the process is reversed, the light beam 35 passing through the film, color filters, and interceptor, and is received by the mirrors, and therefrom transmitted to the projecting lens. The duplicate image of the films is thereby superimposed if both images be simultaneously subjected to the light, but if they be successively brought under its influence the image would travel to the lens alternately by the mirror b and mirror b^1 , the pictures 40 being produced in rapid individual succession and the natural color effect obtained by persistence of vision.

We are aware that for three color photographic work, means have been devised for producing images in complementary colors consisting of allowing light from three monochrome images to be reflected back through corresponding light filters 45 on to a common point where a combination of three complementary color images will result by superimposition.

We are also aware that in combination with a lens placed at the common view point, the said means have been utilized for taking the monochrome units required for the three color photographic process, and we make no claim to any 50 such means, but,

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. In photographic apparatus for kinematography for the purpose of producing 55 a two color image through a single lens, the employment of two reflecting

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mirrors, one of which is transparent and arranged to receive the whole light pencil, and to pass an image thereof to a non-transparent reflector for the purpose of obtaining a duplicate image of one object, substantially as described and illustrated.

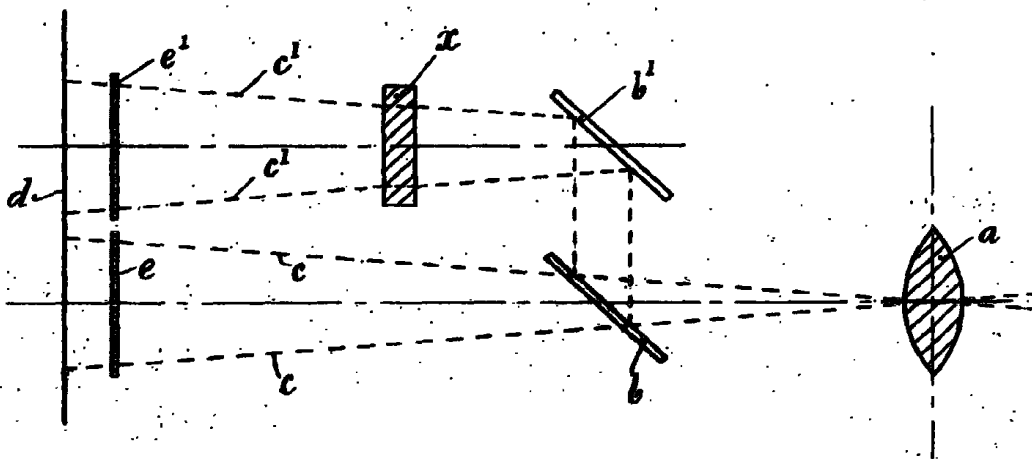
5 2. In combination with the apparatus as claimed in Claim 1, the employment of a focal length correcting device, referred to as an interceptor herein, disposed in the path of the reflected beam, substantially as described and illustrated.

Dated this 6th day of February, 1912.

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



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