

N° 5945



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Date of Application, 12th Mar., 1909

Complete Specification Left, 21st Apr., 1909—Accepted, 7th Oct., 1909

PROVISIONAL SPECIFICATION.

Means for Taking and Exhibiting Cinematographic Pictures.

I, OTTO PFENNINGER, 105, Hythe Road, Brighton, in the County of Sussex, Photographer, do hereby declare the nature of this invention to be as follows:—

5 The object of my invention is to produce and exhibit cinematographic pictures in such a manner that they are seen approximately in the colours of the original.

According to my invention, I place, between the object and the sensitised surface on which the pictures are taken, the colour screens which are used in taking negatives for reproduction in colours by the additive method of photography in colours.

10 The said screens being mounted so that they are rapidly and with the desired rotation brought into position to filter or colour the light for the formation of the photographic negative-colour-records, which are of primary necessity for photography in colours.

15 Each circular colour screen is revolving on its own centric or excentric axis, and each such colour screen holding one colour only has also a blank, that is transparent not coloured space of one quarter to one third of its whole surface when used with a two colour system.

20 Generally speaking, when two such colour screens of equal size (say one in green and the other in red) are revolving with equal speed, radially covering each other, it will be found that the colour filtering can be arranged in a manner that "green and blank," "green and red," "red and blank," "red and green" will successively be shown.

25 By this means I am able to dispense with the opaque shutter as used in the ordinary cinematographic apparatus, because the double-coloured spaces, "green and red" and "red and green" will act as opaque screen or shutter and during that time allow a change of film in the focussing plane. An additional screen or screens may be added so that the colours may at intervals be slightly changed in colour shades.

30 The exposures for the photographic pictures are regulated as usual by adjusting the gearing in the cinematographic apparatus.

35 Positives from negatives thus taken are exhibited through like moving screens and the several pictures corresponding to the different colour sensations being exhibited rapidly one after the other, present to the eye an appearance in form, movement and colour, resembling the original form from which the photographs were taken.

The apparatus can not only be constructed for a two colour system but as well for a three or four colour system.

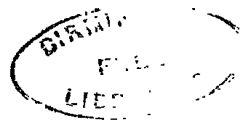
40 The positives representing the various colour sensations may be exhibited by a similar apparatus singly in rapid succession, or two or all of them may be superposed.

To take the usual photographic pictures an ordinary opaque shutter can be exchanged for the colour screens.

Dated this 12th day of March, 1909.

OTTO PFENNINGER.

[Price 8d.]



Means for Taking and Exhibiting Cinematographic Pictures.

COMPLETE SPECIFICATION.

Means for Taking and Exhibiting Cinematographic Pictures.

I, OTTO PFENNINGER, 105, Hythe Road, Brighton, County of Sussex, Photographer, 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:—

Reviewing cinematography in colours by way of a general and historical 5
chronology, I believe that Lee and Turner 6202⁹⁹ were the first, who combined
additive colour photography with cinematography and their seven claims are
based on the several colour screens, interspaced with opaque places, being fixed
on "one" revolving disc, and such disc holding the colour screens taking the 10
place of the ordinary shutter; superposition of two or three thus obtained
positive colour records singly or in rapid succession is also mentioned in the
above specification.

Davidson in 23,863⁹⁹ mounts his three-colour screens on one disc and revolves
this disc excentrically in front of the usual shutter.

Jumeaux and Davidson with Specification 3729⁰³ actually tried the two- 15
colour system. With certain precautions against the double sight of the
prisms, when the prisms are used as oculars, I was able to take for Davidson
two-colour cinopictures and the results were first publicly shown May 1904.

Other prism apparatus are 27,418⁰⁴ Davidson and 322⁰⁵ Pfenninger.

Smith, 26,671⁰⁶, also places several colour screens, interspaced by opaque 20
places on "one" revolving disc, the latter also taking the place of the ordinary
shutter; Smith however especially accentuates the use of the system for a two-
colour system.

Davidson with 453⁰⁸ strikes a new line, the colour filters are forming a 25
travelling band which moves on with the picture film.

In this my present invention I use colour discs in place of ordinary colour 30
filters or colour screens, each colour disc revolving on its centric or excentric
axis, generally side by side and partly overlapping each other, but the colour
discs can also be superposed on one axis and so revolved on one axis, and which-
ever way the colour discs are then revolved, they will when revolving filter the 30
light as required by the additive method of colour photography, and provide
so new means for taking and exhibiting cinematographic pictures, by a two-
colour system, by an intermediary system between a two- and a three-colour
system, and also by a three-colour system.

I do not think it is necessary to repeat my Provisional Specification and it 35
is sufficient to refer to it as being included in my Complete Specification, so
that I can at once describe my revolving discs and how I place and how I
use them.

Figure 1 and Figure 2, represent my colour disc, this disc is at the same 40
time a colour filter, also called colour screen or light filter. Each disc can
hold one or several colours, but in a general way a disc is formed so that it
holds only one colour filter. The disc is of any suitable material, but glass
seems a good support for the colour filter. One-third to one-fourth (*bl*) or
more or less, of this disc is generally blank, that is perfectly transparent and
in that case when the disc holds only one colour filter, then the blank can be 45
formed by cutting away. My colour disc is therefore formed by a coloured
part, *co* and another part *bl*, which latter is generally blank but can also be
coloured, and if *bl* is coloured is then of a different shade to the main or
principal colour on part *co*. This colour disc or disc may have an opening at 50
A, so that it can be attached to a revolving axis. The disc can be fitted into a
casing best suited for certain requirements. Neither is it necessary that the
disc is circular, it can be adapted and fitted into a casing.

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Two or more such colour discs each of different colour are the components of my invention for cinematography in colours by the additive method of colour photography. To a two-colour system I can add a system of intermediary colour changing movement as shown in Figure 7. My colour disc can
 5 be adapted to a colour movement in which the colour discs are revolved on one or on several axes. If three different colour discs are revolved on one axis or on several axes for the purpose of a scientifically correct three-colour system then the blank spaces and the coloured spaces of each colour disc have to be specially arranged or spaced to suit that purpose.

10 Figure 3 and Figure 4 show such forms of casings as referred to above, other forms suggest themselves; *tr* is open or cut out and C is open or solid, A is the place where the fixing to the revolving axis may take place. The fixing or placing of the disc into such a casing is to be made in such a way as to suit the purpose. A casing can be used, but is not absolutely necessary,
 15 these casings are however an auxiliary part of my invention. The principal interest does not lay with these casings, but with the fact, that my several colour discs, will themselves form the light safe places, or parts which are preventing the actinic light passing, which places are necessary to give time for the change of film or light receiving light sensitive surface in the focussing
 20 plane.

Figure 5 front view, Figure 6 side view, show how I can place two circular colour discs in front or at the back of a lens O. Disc S 1 being of green, blue green or blue colour (*g*) and disc S 2 of red, orange red or orange colour (*r*). In Figure 6, C is meant for the casing if used.

25 Figure 5 and Figure 6 are repeated in Figure 7 and Figure 8, with the addition of an excentric disc S 3. This disc S 3 is also a colour disc, actually it is a part of a circular disc and I can therefore also use a circularly shaped disc in its place; this disc is wholly or partly coloured, say in yellow, or any other colour desirable, the colouring of this disc may be homogeneous, or
 30 grating like, or broken up mosaic like just to suit my purpose, all in one colour or more than one colour. This third colour disc does not necessarily revolve with the same rapidity as the other two discs, but can be made to revolve, with or without a casing, so that the other discs are overlapped by it at intervals and in such a manner that the successive exposures will be
 35 influenced as shown in Figure 9 or in any similar way.

In Figure 5 the two colour discs have the blank space (*bl*) towards the left side, in that case "red" of the disc S 2 will be shown in the light cone of the lens O, now if we turn, revolve, the two discs so that blank (*bl*) is at the top as shown in Figure 7, we shall find "red" of disc S 2, and "green" of the
 40 disc S 1 superposed together over the lens O, red and green together form what the colour photographer calls a safe light; by these two colour filters the actinic light is prevented passing; these two-colour filters act therefore together precisely the same as an opaque shutter space. The third turning movement will show the colour filtering to be that opposite to the one shown in Figure 5, therefore "green" of the disc S 1 will be made to act as light
 45 filter to the light cone at O. And in the fourth revolving movement when the blanks (*bl*) are opposite to that shown in Figure 7, another safe light formed by red and green will be before the focussing plane of O. The next turning movements are simply a repetition of the above four movements of light filters and safe lights acting in succession. Instead of revolving the discs in the same
 50 direction, both to the left side or both to the right side, the discs can also be revolved towards each other, one to the left side and one to the right side, the result is exactly the same; or the two discs can be mounted together on one axis, but so that a green space is opposite a red space and so that both
 55 coloured spaces are separated by safe light.

Generally speaking if now my third colour disc S 3 which we can suppose to be coloured yellow, passes at intervals through the light cone formed by O,

Means for Taking and Exhibiting Cinematographic Pictures.

when red or blue, or when the colours used in disc S 1 and disc S 2 are separately over the focussing plane, or behind or in front of lens O, then red will be coloured to the filter colour orange red, and blue to blue green respectively; I can also arrange that only one colour, red alone, or blue alone, is influenced by the temporary superposition of the yellow disc S 3, I can also add a fourth colour disc where best suited or a special shutter for specific purpose can be added. 5

To effect the exposures through the discs holding the different colour filters, the mechanical movement can be so arranged that my colour discs are revolved continually and then the change of film in the focussing plane takes place when the safe lights are interposed into the light cone; or, the mechanical movement can be so arranged that the colour discs are wholly or partly stationary during the exposure but the film in the focussing plane and also the colour discs are moved on when an auxiliary shutter is interposed into the light cone. 10 15

By adding a supplementary colour disc to other two-colour cinematographic apparatus and applying this supplementary colour disc similar to my disc S 2 or S 3, I shall obviously be in a position to improve the respective method.

I can also fit two of my colour discs (say a red and a green disc) together and revolve them together on the same axis in such a way that they act as one shutter, holding two colour filters and two safe lights, instead of two colour filters and two opaque metal spaces; I can also fit two of my colour discs together in such a way, that they resemble one colour disc or resemble to one colour disc bound up with one transparent cover disc. 20

With my apparatus in conjunction with a cinematographic camera I am able to take the negative-colour-records for cinematography in colours. Positives printed from negatives thus obtained are projected by a projecting apparatus to which my apparatus has been fitted, the light action operating the reverse way. It is taken for granted that the cinematographic operator places behind the colour discs the right colour records, when we shall have cinematography in colours, and if not in absolute colours of nature, we shall nevertheless have a fairly true representation of the objects photographed in their original colours. 25 30

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: 35

1. The method of inserting and revolving several colour discs through the light cone of a lens in cinematographic camera or cinematographic projector, as hereinbefore described for the purpose specified.
2. Moving picture cameras or projectors in which with one lens and in combination with two or several colour discs, moving pictures in colours are produced; substantially as hereinbefore described for the purpose specified. 40
3. Cinematographic cameras or cinematographic projectors having their parts constructed, arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawings, for the purpose specified. 45
4. The method of forming colour discs and using them without casings or in conjunction with casings, substantially as hereinbefore described for the purpose specified.
5. The method of interchanging and superposing two or several colour discs to filter or colour the light in the additive method of colour photography as applied to cinematographic apparatus. 50

Dated the 21st day of April, 1909.

OTTO PFENNINGER.

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

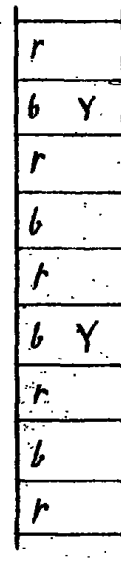
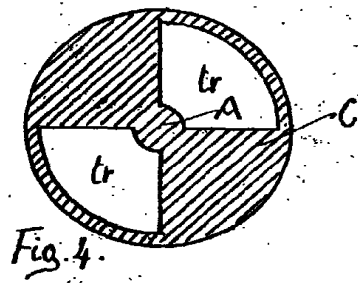
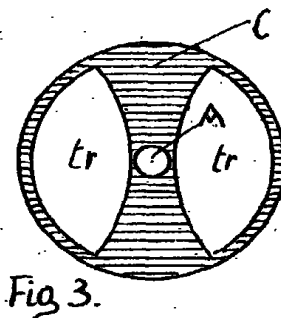
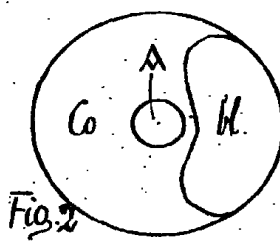
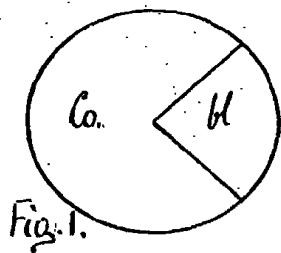
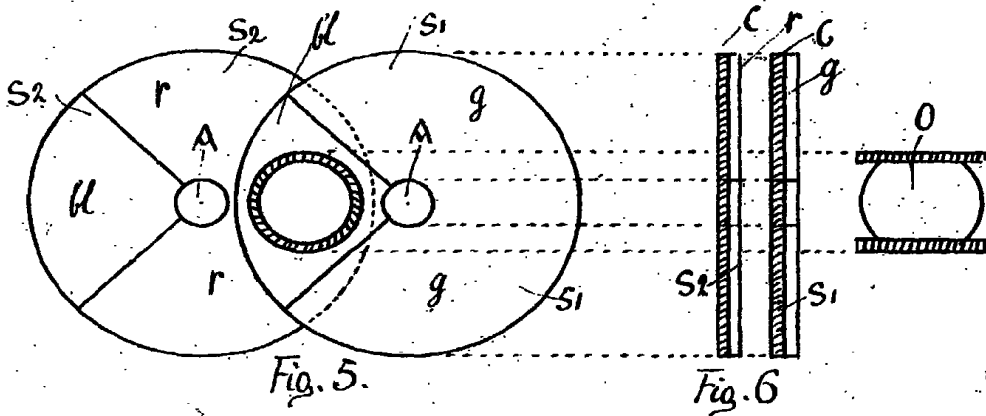
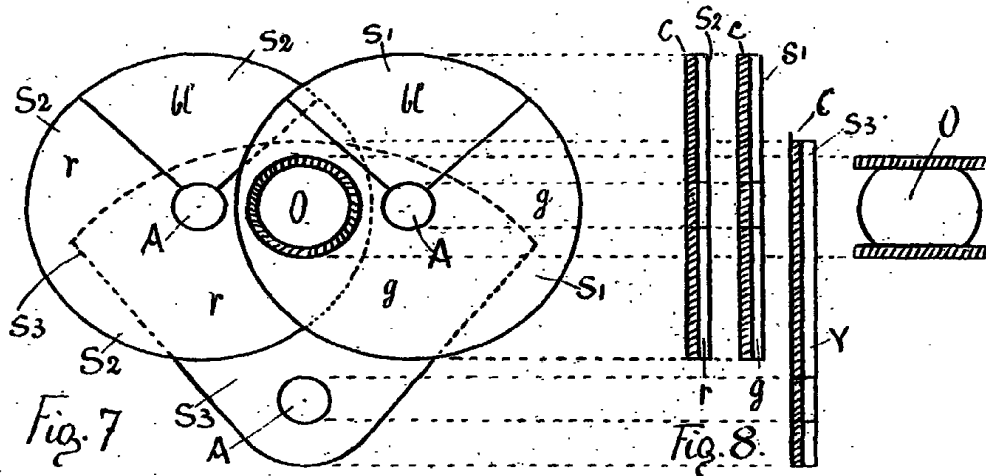


Fig. 9. BIRMINGHAM FREE LIBRARY