AMENDED SPECIFICATION.

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PATENT SPECIFICATION

367,414

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Application Date (in United Kingdom): Nov. 12, 1930. No. 34,072/30.

Complete Accepted: Feb. 12, 1932.

COMPLETE SPECIFICATION (AMENDED).

A Method of Projecting Lenticular Films.

We, I. G. FARBENINDUSTRIE AKTIENGESELLSCHAFT, a Joint Stock Company organised according to the laws of Germany, of Frankfurt a/Main, Germany, 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 projection of lenticular films is associated with certain difficulties as regards permanently illuminating the projection screen with a completely white light, that is to say without any predominant colours. Coloured fringes are, for instance, frequently produced at the sides of the projection screen, which fringes are parallel to the direction of the strips of the multi-colour filter.

When an electric arc is used as source of light an image of the mirror or of the condenser is projected on to the multicolour filter if the latter is placed in front of the objective, whereas the image of the crater projected by the mirror or the condenser lies near the film. When the arc oscillates the mirror or the condenser is irregularly illuminated even in case a regular illumination has been obtained before. Since the image of the condenser or the mirror lies on the filter or in its vicinity, the brightness which is irregularly distributed over the filter manifests itself in the appearance of undesirable colours in the projection field.

It is already known to project an image of the source of light in the plane of the multi-colour filter and it has also been proposed to employ incandescent lamps having a plurality of parallel filaments as a light source.

In the process of projecting lenticular films, according to this invention, as many images of the source or sources of light as there are colour strips in the filter are projected by the mirror or condenser, and each of these images is focussed on a different colour strip.

It has proved to be advantageous to project on each strip of the multi-colour filter a separate picture of the source of light. This may be achieved, for instance, by inserting prisms between the mirror or condenser and the film. But it is also possible to subdivide the mirror or condenser into as many parts as the multi-colour filter contains strips, each part having its own focus, which in each case lies in one strip of the filter.

The method described may likewise be applied to projection by means of incandescent lamps, especially in the case of projection apparatus for narrow films. According to this invention lamps are preferably used which have a number of parallel wire spirals corresponding to the number of the filter strips, and one of these spirals is projected on to each strip of the multi-colour filter.

In the accompanying drawings:

Fig. 1 illustrates the known method of projecting lenticular films.

Fig. 2 is a diagrammatic representation of the arrangement according to the invention shown in Fig. 4.

Figs. 3, 4 and 5 illustrate arrangements according to the invention.

As shown in Fig. 1, it is customary to form an image of the source of light in the gate D but not in the plane of the diaphragm Bl of the objective (cf. "Kinotechnik", 1929, page 652, left column, line 9). It is obvious that the multi-colour filter cannot be in the plane of the gate; it is arranged in front of or behind the objective. An image of the mirror S is formed by the lenses L_1 and L_2 arranged in front of the gate, which mirror is disposed behind the crater A of the luminous arc serving as source of light. The image of the mirror is usually directly behind the projection objective (in S^1). As the crater A of the luminous arc moves, the mirror S is varyingly illuminated so that the brightness of the image S^1 is constantly changing. Now when the three-colour filter is in S^1, the ratio of the brightness passing through the three partial surfaces of the filter changes, i.e. the coloured picture exhibits a false and changing colour predominance. Similar conditions result—although not in the same measure—when the filter is withdrawn from the plane of the image S^1 of the mirror S, and is arranged in the plane of the diaphragm of the objective or still further towards the source of light. In this case also, a change in the intensity of the illumination of the hollow mirror produces a change in the colour predominance. This changing illumination also occurs with condenser lamps, which are nowadays seldom used.

According to this invention the image of the source of light projected by the mirror or the condenser lamp is arranged in such a position that, even if the illumination is changed, the ratio of the quantities of light passing through the partial surfaces of the filter is not changed. This position is the plane of the polychromatic filter. When there is an image of the source of light on each partial surface of the polychromatic filter, a displacement of the colour predominance can no longer occur, even in the event of changes in the illumination of the mirror S. In Fig. 2 the three crater images are designated by the references *Ar*, *Ag*, *Ab*.

Arrangements according to the invention are clearly illustrated by Figs. 3, 4 and 5.

Fig. 3 shows an arrangement in which the light is divided by a system of prisms. The light of the arc lamp A falls through the condenser B on to the system of prisms C. The latter consists of an upper third part—a prism C^1—through which a part of the light is projected through the gate D to the red part K of the colour filter at E. In the bottom part of the system of prisms, is a prism C^{11} and through which a part of the light is thrown on to the blue filter strip N at E. The middle part of the system of prisms is open. From this part the light falls through the gate D on to the middle green part L of the colour filter at E. Thus on each strip of the multi-coloured filter there is projected at E an image of the luminous arc.

In Fig. 4, A is a luminous arc, and R is a three-part concave mirror, the individual parts O, O^1, O^{11} of which are adapted to pivot about a vertical axis P, which throws a part of the light from A on to the filter strips K, L, N of the filter E, where an image of the source of light is projected on each strip separately.

In Fig. 5 the source of light is formed by three parallel wire coils A^1, A^{11}, A^{111}, by which after passage through the condenser B, the gate D and the projection objective, an image is projected in the individual colour strips in the plane of the colour filter E. The number of coils or filaments in the incandescent lamp corresponds to the number of colour strips of the filter.

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. A process of projecting lenticular films, wherein as many images of the source or sources of light as there are colour strips in the filter, are projected by the mirror or condenser, and each of these images is focussed on a different colour strip.

2. A process of projecting lenticular films according to Claim 1, wherein the source of light is an incandescent lamp, having several parallel wire spirals and one of these spirals is projected on to each strip of the multi-colour filter.

3. A process of projecting lenticular films according to Claim 1, comprising a concave mirror divided into separate parts, each pivoted on a common vertical axis, and independently adjustable to project separate images of the arc on to each strip of the multi-colour filter.

4. A process of projecting lenticular films according to Claim 1, comprising a system of prisms.

Dated this 12th day of November, 1930.

ABEL & IMRAY,
Agents for the Applicants.
30, Southampton Buildings, London, W.C. 2.

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

Fig. 1

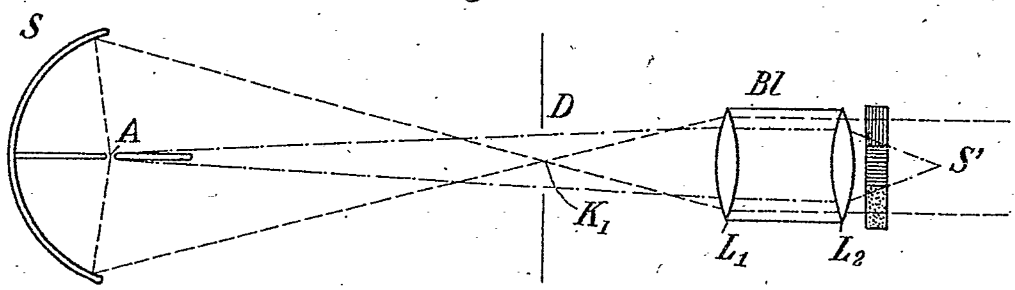
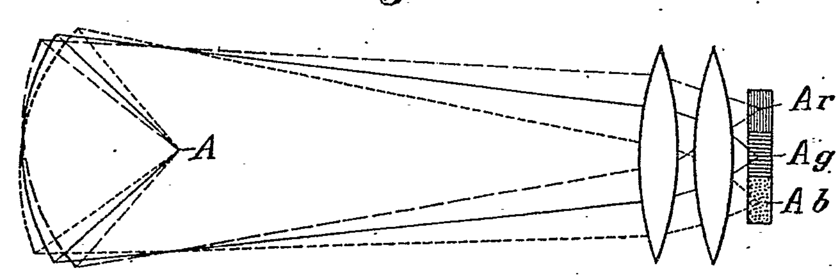


Fig. 2



2 SHEETS

SHEET 1

SHEET 2

S'

Fig. 3

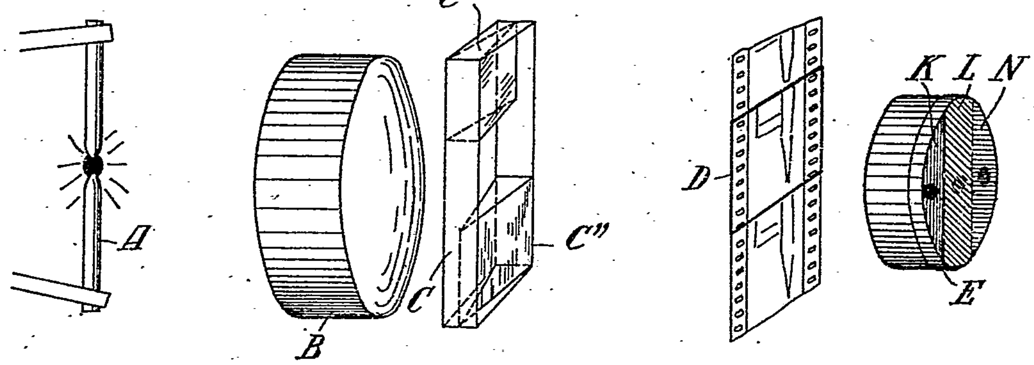


Fig. 4

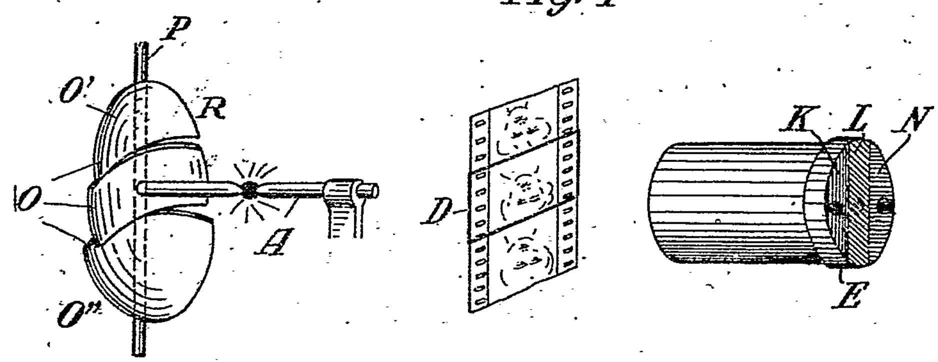


Fig. 5

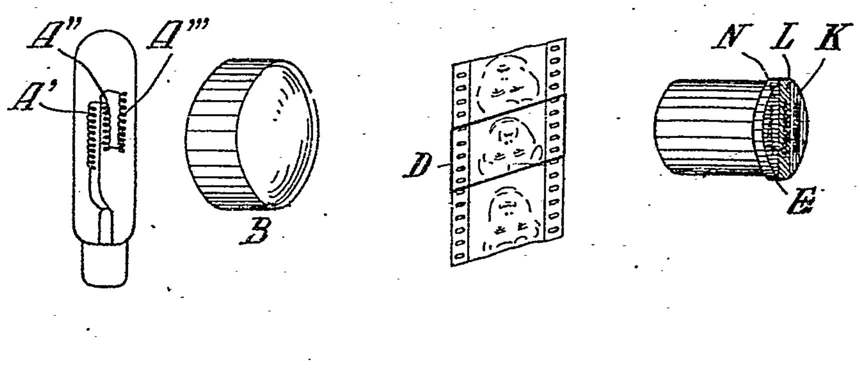


Fig. 1

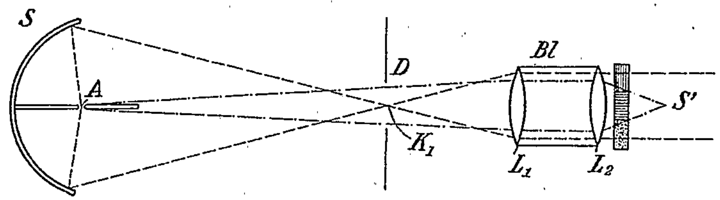


Fig. 2

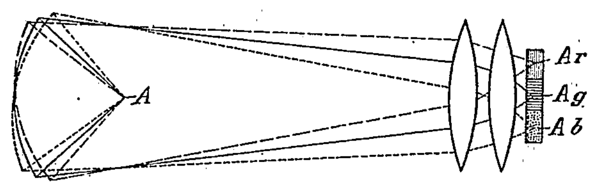


Fig. 3

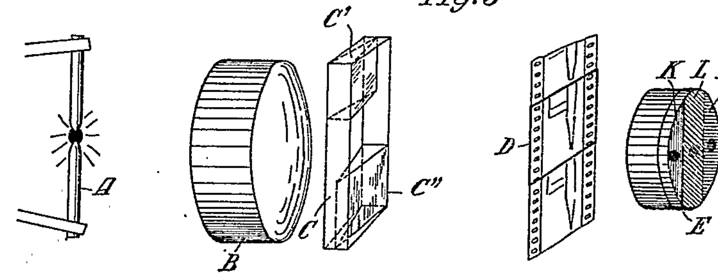


Fig. 4

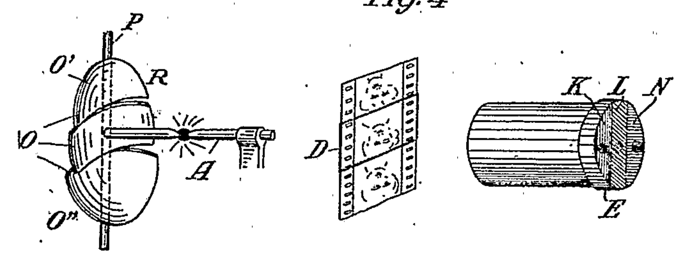
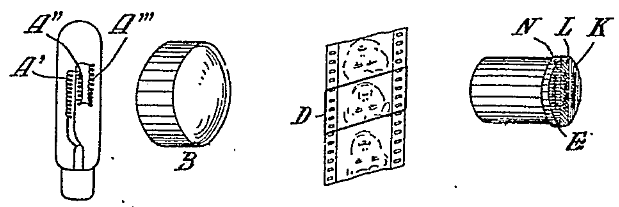


Fig. 5



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