

L. F. DOUGLASS.

METHOD AND APPARATUS FOR PRODUCING MULTIPLE AND VARIED IMAGE EFFECTS IN PHOTOGRAPHY.

APPLICATION FILED JULY 7, 1922.

1,438,906.

Patented Dec. 12, 1922.

2 SHEETS—SHEET 1.

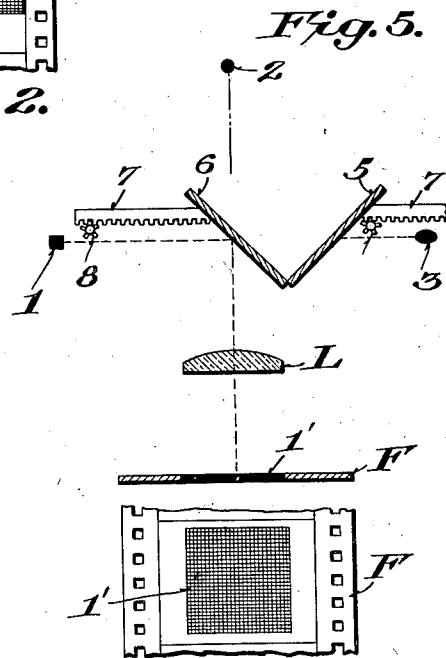
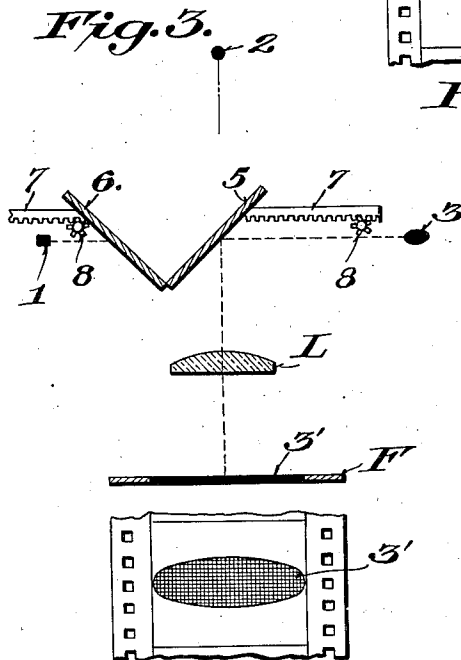
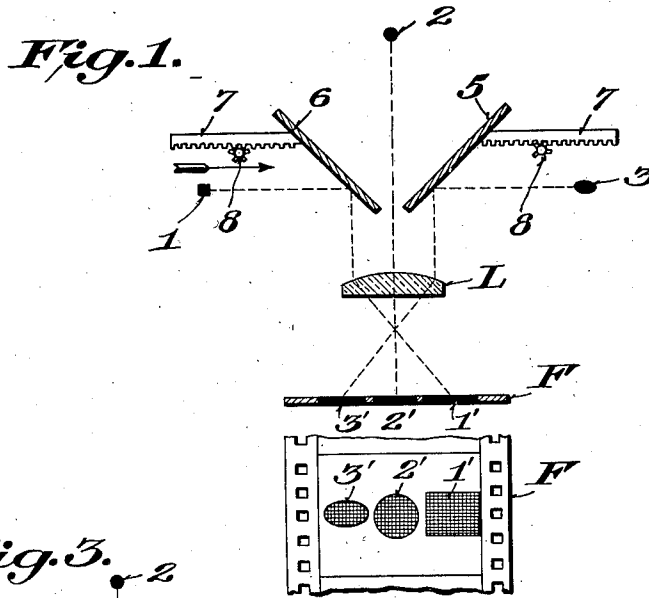


Fig. 4.

Fig. 6. Inventor
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2 SHEETS—SHEET 2.

Fig. 7.

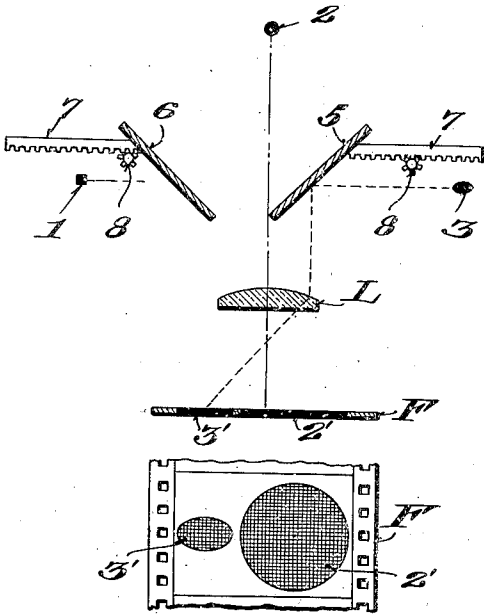


Fig. 8.

Fig. 9.

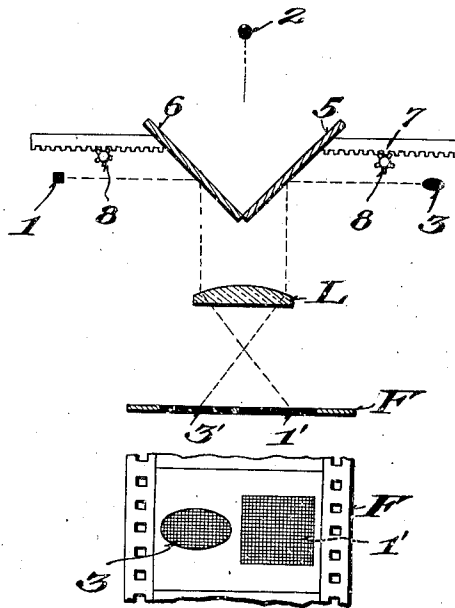
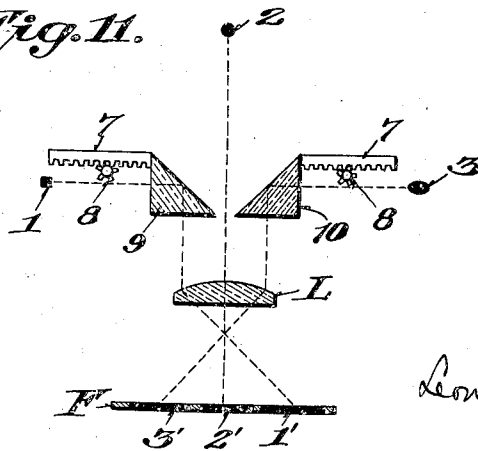


Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE.

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METHOD AND APPARATUS FOR PRODUCING MULTIPLE AND VARIED IMAGE EFFECTS IN PHOTOGRAPHY.

Original application filed January 3, 1922, Serial No. 526,587. Divided and this application filed July 7, 1922. Serial No. 573,295.

To all whom it may concern:

Be it known that I, LEON F. DOUGLASS, a citizen of the United States of America, and a resident of Menlo Park, California, have invented new and useful Improvements in Methods and Apparatus for Producing Multiple and Varied Image Effects in Photography, which invention is fully set forth in the following specification.

This invention relates to a method and apparatus whereby at will one or more images of separate objects or scenes may be simultaneously produced on a single sensitized film or plate.

An object of this invention is to provide a novel method and improved apparatus whereby one or a plurality of laterally displaced images may be produced upon a single photographic film or plate.

Another object of this invention is to provide apparatus of the type just characterized which may be readily applied to an ordinary camera without change in its mechanism or construction.

Another object of this invention is to provide a novel method and improved apparatus whereby novel effects may be secured upon a single film or plate by manipulating, by means of an adjusting mechanism, either one or more light-reflecting elements to reflect images of separate and distinct objects through a lens onto a sensitized film or plate, or allow an image of another separate and distinct object to pass uninterrupted and directly through said lens and onto said film or plate or to produce various combinations of these effects.

Another object of this invention is to provide a novel method and improved apparatus whereby novel effects may be secured upon a single film by manipulating, by means of adjusting mechanisms, either one or more light-directing elements in such a manner that the image of one object or scene is made to gradually dissolve into and take the place of an image of a separate object or scene.

Another object of this invention is to provide apparatus of the type just characterized

with means for variably manipulating either one or more light-reflecting elements.

In its preferred embodiment, the invention comprises in combination with a sensitized film, one or two light-reflecting elements positioned to reflect either or both images of two distinct objects through said lens onto said film, and at the same time adapted to allow an image of a third object to proceed directly and without interruption through said lens onto said film.

Generally stated, I so position one or two light-reflecting prisms or mirrors with reference to a lens, which may be the lens of an ordinary camera, that each is in the path of the light rays from separate and distinct objects to be photographed. Each light-reflecting element is positioned at an angle of approximately forty-five (45) degrees with reference to the axis of the lens and the particular object it reflects, and the light-reflecting elements may be so positioned that light rays from a third object are permitted to pass between them through said lens, and onto said film. By a single exposure, novel and multiple image effects of three or a less number of separate and distinct objects may be produced simultaneously upon a single sensitized film or plate. By the manipulation of the light-reflecting prisms or mirrors, an image of any one, or images of any two or of all of the separate objects, may be produced by single exposure on the film or plate, as is desired.

The number of images formed will vary according to the number of mirrors or prisms actually reflecting images of their respective objects through said lens onto said film, and coincident therewith upon the manipulation or positioning of said mirrors or prisms in reference to the object immediately in front of the camera lens.

So that the number of images produced may be varied, and in order to secure novel image effects, I associate with each of the light-directing members, a rack and pinion, either or both of which may be manipulated so as to cause the light rays coming from

two of the objects to be photographed to be reflected through the lens onto the film, or to cause the light rays from but one of the objects to be photographed to be reflected through the lens onto the film, or to cause the light rays from an object not in position to be reflected by either of the two light-reflecting elements to proceed directly and without interruption through the lens onto the film. The number of images produced, and their positions upon the film or plate, will therefore vary in accordance with the manipulation of the racks and pinions associated with the mirrors or prisms.

The invention is capable of being carried out in a variety of ways, and of receiving a variety of mechanical expressions, a few of which are illustrated on the accompanying drawings, but it is to be understood that the drawings are for purposes of illustration only, and are not to be construed as a definition of the limits of the invention, reference being had to the appended claims for that purpose.

In said drawings, in which, for the sake of clearness, the images on the film are shown larger than the objects photographed:—

Fig. 1 is a diagrammatic view illustrating the relative arrangement of the objects to be photographed, the light-reflecting elements, the lens and the photographic film;

Fig. 2 is a diagrammatic fragment of a photographic film produced when the mirrors are in the positions shown in Fig. 1;

Fig. 3 is a diagrammatic view illustrating the relative arrangement of the various objects and the positions of the mirrors when one particular object is to be photographed;

Fig. 4 is a diagrammatic fragment of a photographic film produced when the mirrors are in the positions shown in Fig. 3;

Fig. 5 is a diagrammatic view illustrating the relative arrangement of the various objects and the positions of the mirrors when another particular object is to be photographed;

Fig. 6 is a diagrammatic fragment of a photographic film produced when the mirrors are in the positions shown in Fig. 5;

Fig. 7 is a diagrammatic view illustrating the relative arrangement of the various objects and the positions of the mirrors when two particular objects are to be photographed;

Fig. 8 is a diagrammatic fragment of a photographic film produced when the mirrors are in the positions shown in Fig. 7;

Fig. 9 is a diagrammatic view illustrating the relative arrangement of the various objects and the positions of the mirrors when two other particular objects are to be photographed;

Fig. 10 is a diagrammatic fragment of a

photographic film produced when the mirrors are in the positions shown in Fig. 9; and

Fig. 11 is a view corresponding to Fig. 1, to illustrate the use of prisms in place of mirrors.

Referring more particularly to Fig. 1, object 1 is positioned at an angle approximately 90 degrees with reference to the axis of the lens L and is on the left side of the camera; object 2 is positioned directly in front of the camera and lens L; and object 3 is positioned on the right side of the camera and at an angle approximately 90 degrees with reference to the axis of lens L. Lens L may be the lens of any ordinary camera, no unusual kind or shape being necessary for the carrying out of this invention.

Interposed in the path of the light rays emanating from object 1, is a light-reflecting mirror 6, so positioned that it will reflect the light rays through the lens L and onto a sensitized film or plate F. On the opposite side of the camera and separated from mirror 6 by a suitable intervening space and interposed in the path of the light rays emanating from object 3 is a light-reflecting mirror 5, so positioned that it will reflect the rays therefrom through the lens L and onto the sensitized film F. Directly in front of the camera lens L is another object 2, the light rays from which proceed directly between mirrors 6 and 5, through said lens L and onto said film F.

Referring particularly to Fig. 3, mirrors 6 and 5 have attached to them by any suitable means, such as screws or rivets, racks 7 which engage with pinions 8. By manipulating and turning pinions 8, the racks 7, together with their respective mirrors are moved in a plane that is at approximately 90 degrees with reference to the axis of the lens L, in and out, as is desired. Thus, for instance, if it is desired to produce an image of object 3 only, upon film F, the pinion 8 associated with mirror 5 is turned in the proper direction until the mirrors 6 and 5 are in the positions illustrated. In this instance the light rays proceeding from object 2 do not pass through lens L because of the fact that they strike the back part of mirror 5 and are not permitted to proceed farther. Neither do the light rays proceeding from object 1 pass through lens L, for the reason that mirror 6 is not in a position to reflect the light rays from object 1 through lens L. Consequently the only rays passing through lens L are those proceeding from object 3, which said rays produce upon the film F the image 3', as shown in Figs. 3 and 4.

If it is desired to produce on film F an image of object 1 only, the pinions 8 are turned until the mirrors 6 and 5 are in the positions illustrated in Fig. 5. The light rays proceeding from object 1 strike mirror

6 and are reflected through lens L onto film F, where image 1' is produced. The light rays proceeding from the other two objects 2 and 3 do not pass through lens L, for the reason heretofore explained.

If it is desired to produce on film F images from the objects 2 and 3 only, the pinion 8 associated with mirror 6 is turned until said mirror no longer reflects an image from object 1 through lens L. Fig. 7 shows the relative positions of the mirrors when object 1 is not to be photographed. In this instance the rays of light from object 2 proceed directly through lens L onto film F, while the rays of light from object 3 are reflected by mirror 5 through said lens onto said film, where images 2' and 3' of objects 2 and 3 respectively are produced.

If it is desired to produce images from objects 1 and 3 on film F, the pinions 8 associated with mirrors 5 and 6 are turned until said mirrors are in the positions illustrated in Fig. 9. In this instance the rays of light from object 2 are blocked off by the back parts of said mirrors, and are not permitted to pass through lens L, while the light rays from objects 1 and 3 are reflected, by mirrors 6 and 5 respectively, through said lens onto said film, where images 1' and 3' are produced.

By means of the apparatus herein shown the light rays from any one of the objects, by the manipulation of the pinions associated with their respective mirrors, may be gradually dissolved or faded out, so that the images either gradually disappear from the film, or gradually disappear as an image from one of the other objects appears and gradually takes its place upon the film. Referring particularly to Fig. 1, if it is desired to gradually dissolve the images 2' and 3' of objects 2 and 3 respectively, from film F, and to have an image of object 1 take their places thereon, the pinion 8 associated with mirror 6 is slowly turned toward the right. As mirror 6 moves along the plane indicated by the arrow, the image 2' of object 2 gradually dissolves as image 1' of object 1 takes its place; and as the pinion 8 is turned still farther toward the right, mirror 6 comes in contact with mirror 5, moves it along in the same direction until the image 1' of object 1 entirely takes the place of images 2' and 3' of objects 2 and 3 upon the film. Similarly images of objects 2 and 1 may be made to dissolve from the film and an image of object 3 be made to take their places thereon. In a like manner, and by the manipulation of the pinions associated with the two mirrors, the image of object 2 may be made to dissolve from the film as images from objects 1 and 3 take its place thereon. Therefore it is clearly perceived that the images of the various objects may be made to dissolve from the film as images of

the other objects gradually take their places thereon.

It can be readily perceived that I have provided a method and apparatus whereby novel and multiple image effects of distinct and separate objects may be produced upon a single photographic film by a single exposure, and although I have illustrated and explained but a few of the novel effects which may be produced, it can be readily seen that there are many other novel effects which may be produced by means of the apparatus herein shown.

In carrying out the present invention, it is not necessary that mirrors be employed as light-reflecting elements. In the form shown in Fig. 11 two light-reflecting prisms 9 and 10 may be substituted for the mirrors 6 and 5 of Fig. 1. The term "light-reflecting element" as used herein is therefore to be construed as generic to light-reflecting prisms as well as mirrors or other suitable light-directing elements.

Although I have illustrated and described this invention as referring to the photographing of "objects," it is to be expressly understood that the term "object" is to be construed as referring to one object, a group of objects or a scene from which a pencil of light is to be directed onto a sensitive film, or its equivalent, separately and independently of the directioning of the pencil of light from another so-called "object" composed of one or more elements. Thus, each of the light-directing elements directs the image of an "object" different from that reflected by the other.

While the embodiments of the invention illustrated on the drawings have been described with particularity, it is to be expressly understood that I am not limited to any particular detail of construction, as changes may be made in the means for manipulating the light-reflecting element or elements, without departing from the spirit of this invention. Nor am I limited to any particular kind or form of photography or cinematography. Nor am I limited to the use of any particular character of sensitized element from which the negative is to be formed, and the term "film" as employed in the claims is to be construed as generic to plates or other suitable sensitized elements. Reference is therefore to be had to the claims hereto appended for a definition of the limits of the invention.

This application is a division of my application Serial No. 526,587, filed Jan. 3, 1922, entitled Method and apparatus for producing multiple and varied image effects in photography, wherein is claimed broadly the hereinbefore described method for simultaneously producing on a photographic film the images of two or more objects and the hereinbefore described arrangement of parts

including a plurality of light-directing or light-reflecting elements for directing the image or images of one or more objects onto a photographic film; this application being directed to the method and combination of parts whereby the image or images may be dissolved or varied in number or position by movement or adjustment of one or more of said light-directing or light-reflecting elements.

What is claimed is:—

1. The method of selectively producing on a sensitized film an image of one of three objects which consists in so positioning two light-reflecting elements adapted to reflect images of two of said objects on said film as to exclude the images of two of said objects and permit the light rays from the selected object to pass through a lens onto said film.

2. The method of producing variable image effects of a plurality of objects on a sensitized film which consists in reflecting images of two of said objects through a lens onto said film by interposing a light-reflecting member in the path of light rays from one of said objects, interposing a second light-reflecting member in the path of light rays from another of said objects, allowing the light rays from a third object to proceed directly through said lens onto said film, bodily moving said light-reflecting members to different positions, and making successive exposures.

3. The method of producing variable image effects on a single photographic film which consists in reflecting one or both of the images of two objects through a lens onto said film by adjustably positioning a lineally-movable light-reflecting element in each of the paths of light rays from said objects.

4. Means for producing a plurality of laterally displaced images of a plurality of objects upon a sensitized film comprising, in combination with a lens, a light-reflecting element positioned to reflect the image of one object through said lens onto said film, a second light-reflecting element positioned to reflect the image of a second object through said lens onto said film, and means for bodily moving one or both of said light-reflecting elements.

5. Means for producing a plurality of laterally displaced images of three objects upon a sensitized film, comprising, in combination with a lens, a light-reflecting element positioned to reflect the image of one of said objects through said lens onto said film, a second light-reflecting element positioned to reflect the image of another of said objects through said lens onto said film, and means for moving said elements lineally to vary the number of images passing through said lens onto said film.

6. Means for producing a plurality of laterally displaced images of a plurality of objects upon a sensitized film, comprising a lens, a light-reflecting element positioned to reflect the image of one of said objects through said lens onto said film, a second light-reflecting element positioned to reflect the image of another of said objects through said lens onto said film, and a control for each of said light-reflecting elements.

7. In combination with a lens, a plurality of light-directing elements adapted to direct images from a plurality of objects through said lens onto a film, and means for moving said elements lineally whereby the number of said images may be varied.

8. In a device of the class described, the combination of a lens, a plurality of light-directing elements adapted to direct images from a plurality of objects through said lens onto a film, and means for bodily moving any one of said elements into and out of operative relation with said lens.

9. The method of producing, on a single, sensitized film, variable image effects, which consists in dissolving one or more images from a plurality of images on said film as an image of another object takes the place thereof.

10. The method of producing, on a single, sensitized film, variable image effects, which consists in dissolving an image from said film as images of a plurality of objects take its place thereon.

11. In combination with a lens, a plurality of light-directing elements adapted to direct images from a plurality of objects through said lens onto a film, and means for moving any one of said light-directing elements, to dissolve one or more images from said film.

12. In combination with a lens, a plurality of light-directing elements adapted to reflect images from a plurality of objects through said lens onto a sensitized film, and means for moving said elements transversely of the axis of said lens.

13. In a device of the class described, the combination of a lens, a light-directing element positioned adjacent said lens and at a predetermined oblique angle to the axis thereof, and means for moving said element transversely of said axis whereby said element may be positioned to direct the image of an object through said lens onto a sensitized film.

14. In a device of the class described, the combination of a lens, a plurality of light-directing elements positioned adjacent said lens and at predetermined oblique angles to the axis thereof, and means for moving said elements transversely of said axis whereby said elements may be positioned to direct images of objects through said lens onto a sensitized film.

15. In combination with a lens, a pair of light-directing elements, and means mounting said elements whereby either, neither or both may be adjusted to direct light rays from a plurality of objects through said lens.

16. In combination with a lens, a pair of light-directing elements, and means mounting said elements whereby either or both of the elements may be moved lineally to different positions to direct light rays from a plurality of objects through said lens.

17. The method of producing on a single sensitized film variable image effects which consists in lineally moving a light-directing element to direct an image of an object onto said film and dissolving an image of another object from said film.

18. The method of selectively producing on a sensitized film the images of two objects which consists in lineally adjusting a light-reflecting element to reflect an image of one of said objects through a lens onto said film and exclude the image of the other of said objects from said film or to permit the light rays from the other of said objects to proceed directly through said lens onto said film.

19. The method of producing variable image effects of a plurality of objects on a sensitized film which consists in reflecting an image of one of said objects through a lens onto said film by interposing a light-reflecting member in the path of light rays from one of said objects, allowing the light rays

from another of said objects to proceed directly through said lens onto said film, lineally moving said member to different positions, and making successive exposures.

20. Means for producing a plurality of images of a plurality of objects on a sensitized film comprising, in combination with a lens, a light-reflecting element adapted to reflect the image of one of said objects through said lens onto said film or to permit the image of another of said objects to proceed directly through said lens onto said film, and means for lineally moving said element to dissolve one image into the other.

21. In a device of the class described, the combination of a lens, a light-reflecting element adapted to direct an image of an object through said lens onto a film, and means for lineally moving said element into and out of operative relation with said lens.

22. Means for producing a plurality of laterally-displaced images of a plurality of objects on a sensitized film comprising, in combination with a lens, a light-reflecting element positioned to reflect the image of one of said objects through said lens onto said film and to permit the image of another of said objects to proceed directly through said lens onto said film, and means for lineally moving said element to vary said images.

In testimony whereof I have signed this specification.

LEON F. DOUGLASS.