J. R. BRAY.

PROCESS OF AND APPARATUS FOR PRODUCING MOVING PICTURES.

APPLICATION FILED JULY 30, 1915.

1,179,068.

Patented Apr. 11, 1916.

2 SHEETS—SHEET 1.

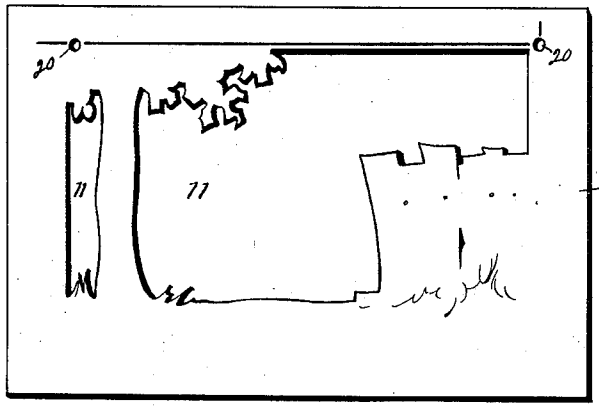


Fig. 1.

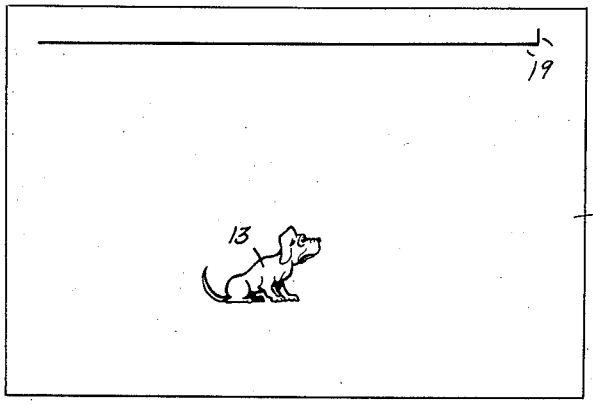


Fig. 2.

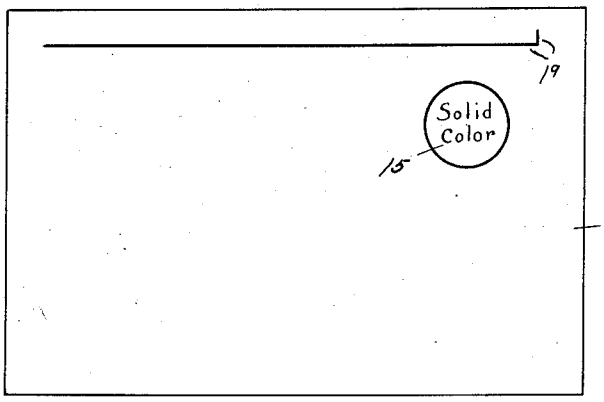


Fig. 3.

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2 SHEETS—SHEET 2.

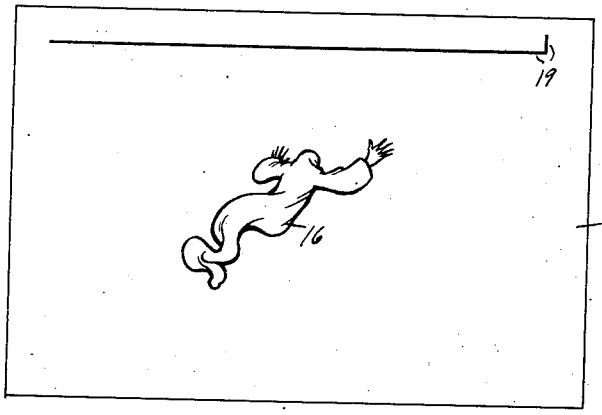


Fig. 4.

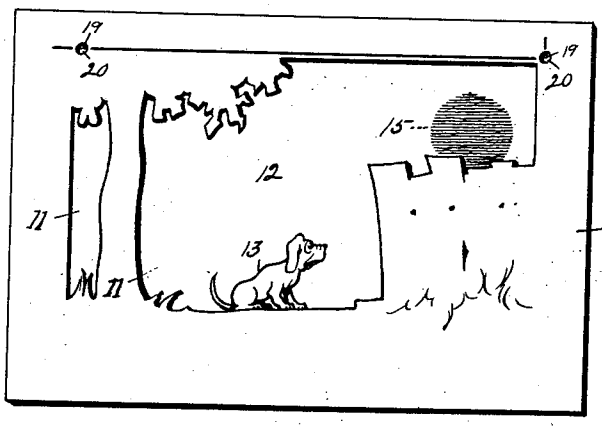


Fig. 5.

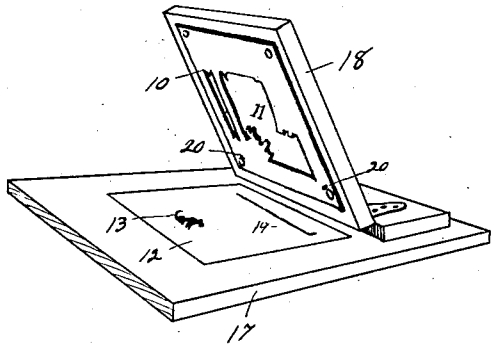


Fig. 6.

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PROCESS OF AND APPARATUS FOR PRODUCING MOVING PICTURES.

1,179,068. Specification of Letters Patent. Patented Apr. 11, 1916.

Application filed July 30, 1915. Serial No. 42,731.

To all whom it may concern:

Be it known that I, JOHN R. BRAY, a citizen of the United States, and resident of New York, borough of Manhattan, in the county and State of New York, have invented certain new and useful Improvements in Processes of and Apparatus for Producing Moving Pictures, of which the following is a specification.

This invention relates to certain improvements applicable to the manufacture of that type of moving pictures which are often designated as animated drawings or cartoons.

In my prior and co-pending application Serial No. 853,974, filed July 29th, 1914, (now Patent No. 1,159,740, issued Nov. 9, 1915,) I have disclosed and claimed certain improvements over the invention disclosed and claimed in my Patent No. 1,107,193 issued August 11, 1914, whereby shading effects may be produced and various advantages secured. In said application, I have also disclosed but not claimed an invention of mine, involving the use of separate and superposed sheets each having the representation of a movable object thereon, whereby novel and interesting effects may be secured, independently of the production of shade or tone effects. This last mentioned invention is made a part of the present application and is hereinafter claimed and to that extent the present application is a continuation of the said prior application Serial No. 853,974.

A further feature of my present invention involves the use of an opaque sheet of such size or so cut as to expose to view a portion of an underlying sheet. By drawing, printing, painting or otherwise representing the background, setting or other stationary parts of the picture on this overlying, opaque sheet and the movable objects on the exposed portion of the underlying sheet, I am able to produce interesting and novel effects otherwise difficult to secure and can produce the required number of drawings and other articles necessary to the production of the film, with great rapidity and with a very small expenditure of time and labor.

The underlying sheet bearing the movable object may be constructed as disclosed in my prior patent or as disclosed in the prior application, or in any other manner desired and ordinarily will have shown thereon only the parts of the picture which it is desired to represent as moving. These movable objects will be shown in such positions as will bring them into proper relationship to the background or setting when the sheet bearing the latter is superposed on the sheet bearing the movable object. The superposed opaque sheet may have merely an aperture cut therein through which the movable object on the underlying sheet may be seen so that the superposed sheet will constitute a border entirely surrounding the portion of the underlying sheet bearing the representation of the movable object or it may merely extend across one or more sides. The edge of the overlying sheet is preferably cut so as to follow the contour of the stationary objects or setting represented thereon, and these stationary objects, constituting the background or setting, may be drawn with pen and ink, painted in black and white, or in colors, or may be printed and in some instances I might even use a photographic representation of the actual objects, setting or background which I desire to employ. It might be painted in close imitation of a photograph of an actual scene. As the superposed sheet is preferably of thick material, the covered portions of the underlying sheet will be invisible and therefore in drawing the objects on the underlying sheet, I may, in many cases, avoid the necessity of accurately drawing and completing the objects or terminating it at the exact edge of the superposed sheet. For instance, if I desire to represent the movable object as coming out from behind a stationary object, such as a building or other part of the setting, or as coming up over the horizon, no particular care need be exercised in terminating the representation of the movable object at the periphery of the superposed opaque sheet as a part of the representation of the movable object may extend beneath the superposed sheet but will be concealed by the latter.

In some cases, I may show all the background or setting on the superposed sheet and only movable objects on the underlying sheet, and in other cases I may have the major portion of the stationary objects on the superposed opaque sheet and may have a portion printed or otherwise reproduced on the underlying sheet. This latter arrangement may be employed where it is desired to represent a movable object as passing at times in front of a portion of the

background or setting. Such last mentioned portion may be separately drawn on each underlying sheet or may be printed as disclosed in my prior Patent No. 1,107,193. This same effect might be produced by binding with the opaque sheet a transparent sheet such as glass or celluloid and upon which may be produced the portion of the background or setting in front of which it is desired to have a movable object pass. In the pictures in which the movable object is represented as passing in front of this portion of the background, the necessary erasures may be made from the transparency so that none of the lines representing the background or setting will appear as superposed on the movable object.

The sheet bearing the movable object may be of any suitable material although, preferably, I employ translucent material such as tracing paper. The extent of the translucency may vary as it is only necessary that the sheet be sufficiently translucent to permit the object on a similar underlying sheet to be seen therethrough during the drawing of the object on the upper and translucent sheet, so that the proper positioning of the movable object may be secured. By using ordinary tracing paper it is not necessary to have any light underneath but if thicker paper, such for instance as thin cardboard, is employed, the sheet may be rendered sufficiently translucent by artificial illumination in the rear thereof. The sheet bearing the movable object may be of such a high degree of translucency as to be practically transparent in which case, celluloid, glass or other similar material may be employed as the sheet material upon which the movable object is drawn.

As an important feature of my present invention, I make the sheet bearing the movable object of such transparency or translucency as will permit the representation of a movable object on an underlying or bottom sheet to appear therethrough. Of the two sheets bearing representations of movable objects, the bottom one may of course be opaque, but the upper one is translucent or transparent. If it be nearly or perfectly transparent, the movable object on the lower sheet will appear substantially as distinct as the movable object on the upper sheet, but by making the upper sheet less nearly transparent, the object on the lower sheet will appear more or less faint or indistinct, and thus the effect of a ghost may be secured. A pale moon or clouds may be made to appear as moving across the sky, the paleness resulting from the fact that the upper sheet bearing the other movable objects may be only partially transparent. The object on the bottom sheet may be merely an outline or in solid color as may also the object on the semi-transparent sheet. By having different movable objects on separate superposed sheets, and by having the upper sheet substantially transparent, I may not only secure the results which could not readily be secured by showing all of the movable objects on one sheet, but I may greatly reduce the amount of labor and time involved in producing the necessary number of sheets. For instance, the movable object or objects on one sheet may remain stationary while the object or objects on the other sheet are moving. Thus, in photographing on the film, one sheet showing the objects, which remain stationary for some little time, may be employed while the other sheet, bearing the other movable object or objects, is replaced by similar sheets showing its object or objects in different positions for each successive picture. Thus, the amount of drawing is materially decreased.

In the accompanying drawings to which reference is to be had and in which similar reference characters indicate corresponding parts in the several views, I have illustrated merely one embodiment of my invention. I desire these drawings to be considered merely as illustrative and in no way limiting the scope of my invention.

In these drawings, Figure 1 is a face view of an overlay showing a background or setting and cut out along a portion of the outline of the latter; Fig. 2 is a face view of a sheet showing a movable object and adapted to be used in connection with the sheet shown in Fig. 1; Fig. 3 is a face view of a third sheet showing another movable object and adapted to be used beneath the sheet shown in Fig. 1 or beneath both of the sheets shown in Figs. 1 and 2, the movable object being shown in solid color; Fig. 4 is a face view of the sheet adapted to be used for the same purpose and in the same combinations as the sheet shown in Fig. 2, but showing the movable object in outline; Fig. 5 is a face view of the picture resulting from the superposing of the sheets shown in Figs. 1, 2 and 3; and Fig. 6 is a perspective view of an apparatus for use in properly positioning the superposed sheets.

In the specific construction illustrated in the drawings, I employ a sheet 10 of opaque material and having represented thereon a scene or setting which is to constitute the back-ground of the picture. This has the sky portion of the picture cut away along the outline or sky-line of the objects or bodies going to make up the background of the picture. As shown, there are two separate cut-out portions 11 due to the fact that one of the objects shown extends up to the upper limit of the picture. It is of course evident that there may be only a single cut-out portion or a larger number of cut-out portions. For instance, a fence might be shown with the spaces cut out between the posts

and parts of a building might be shown and the sheet cut out at the windows and doors. In connection with this opaque background-bearing sheet 10, I employ a separate or underlying sheet 12 which has the representation of a movable object 13 thereon. The sheet may, in some cases, be opaque, although preferably it is translucent. By the term "translucent" I wish to include not only cardboard which is translucent when a light is placed at the back thereof, or I may employ tracing paper, or the sheet may be so completely translucent as to be substantially transparent. I employ the term "translucent" in its broad sense to mean capable of permitting the passage of light therethrough under the conditions of use and to varying degrees in accordance with the character of the picture to be produced. I also may employ a third sheet 14, either in combination with the sheets 10 and 12 or only in connection with the sheet 12. The translucency of this sheet is comparatively unimportant so far as the production of the picture is concerned, although it is preferably translucent to facilitate the proper placing of the representation of a movable object 15 thereon. This object may be in solid color as shown in Fig. 3, or may be merely in outline as shown at 16 in Fig. 4.

The sheet 12, when superposed on sheet 14, will permit the object on the latter, either the object 15 or the object 16, to appear through the sheet 12 with greater or less distinctness. As has been previously pointed out, the objects on the sheets 12 and 14 should be properly placed in respect to the background or setting in connection with which they are to be employed, but particularly if a part of the object is to be behind a part of the background or setting, the object on the sheet 12 or the sheet 14 need not be completed and need not be terminated at a definite line so long as the object extends to, or a slight distance beneath, the edge of sheet 10 when the latter is superposed. It will be noted that on sheet 14, I have shown the movable object 15 in the form of a moon and so positioned that only a part of the moon is visible when sheet 10 is placed thereon. It is much easier to draw the complete moon on sheet 14 than it is to show the edge of the moon of an irregular outline to follow the outline of the background. A portion of the moon will be covered by the background and due to the fact that the overlying sheet 10 is opaque, the covered portion will be invisible.

Various means may be employed for insuring the proper registering of the various superposed sheets in arranging them for photographing. In Fig. 6 I have shown a perspective view of an arrangement constituting a part of my invention and which I find operates very satisfactorily. In this apparatus, I employ a support 17 and hinge a frame 18 thereto. On the support is placed certain guide marks or guide lines and due to the translucency of the sheets 12 and 14, the latter may be placed on the support with guide lines such as lines 19 on said sheets in perfect registry with those on the support. The overlying sheet 10 is fixed to the under side of the frame in any suitable manner, as for instance by thumb tacks and is properly positioned so that when the sheet 12 or the sheets 12 and 14 are placed on the support and the frame is swung down on top of them, the overlying sheet 10 will be in proper position and all of the sheets will be held in position during the photographing.

To insure the proper position of the overlying sheet 10 on the frame 18, the said overlying or background sheet 10 is provided with one or more apertures 20 so positioned as to permit the guide marks or lines, or portions of the latter, on the support or on the underlying sheet, to be visible therethrough. Thus, with the background sheet properly positioned and secured to the frame, it is only necessary to lift the frame, insert a sheet 12, or sheets 12 and 14 on the support, bring their guide marks or lines to proper position and swing down the frame bearing the overlay. Thus, after the overlay or background sheet 10 is once positioned, no further care need be exercised in positioning it for the successive pictures.

In the device shown, I employ only one frame and in case it is desired to change the scene or setting, the sheet bearing the latter may be removed from the frame and replaced by another, but I do not desire to be limited in this regard particularly where I may desire to show on the screen two or more different backgrounds alternately and in succession if the action takes place alternately at different scenes. By having more than one frame hinged to the support so that it can be swung down into the same position, more than one background could be used, each during several portions of the action, without necessitating the removal of the several background sheets from their respective frames.

It will be noted that the support 17 lies in a substantially horizontal plane. Thus in placing thereon the sheets bearing the movable objects, it is not necessary to fasten them in position while photographing, except by the clamping action of the frame. By looking through the guide apertures 20 in the overlay sheet 10 after the frame has been swung down, the photographer can instantly determine whether or not the sheet 12 is in proper position and if it is not, he can readily slide it to the proper position by only slightly raising the frame.

I have referred to the overlay sheet 10 bearing the background or setting as an

opaque sheet. It is of course evident that representation of the background or setting might be on a highly translucent or substantially transparent sheet, such as glass or celluloid, and the representation of the background or setting be of ink, paint or the like, which will render portions substantially opaque. In such an arrangement, it will not be necessary to cut out portions of the overlay sheet as the movable object on the underlying sheet may be readily seen through the transparent portion which does not bear any portion of the background or setting. If glass or celluloid be used as the overlay sheet with the background or setting, it is not necessary that all portions of said background or setting be made opaque. The background or setting might be formed by cutting out a picture or pictures and pasting them on the glass or celluloid overlay sheet. Such picture or pictures might of course be photographs, drawings, prints, paintings or other pictorial illustrations.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The process of producing moving pictures which includes the producing on a sheet of opaque material a background containing the parts of a scene which remain stationary during a series of pictures embodying the scene, producing on separate sheets a movable object in the successive positions or poses, and photographing said pictures in succession on a cinematograph film, each picture of the series being formed by superposing said first mentioned sheet on one of said second mentioned sheets so as to leave exposed to view the movable object on the latter.

2. The process of producing moving pictures which includes the producing on a sheet of substantially opaque material a background containing parts of a scene which remain stationary during a series of pictures embodying the scene, a portion of said sheet being cut away along a line corresponding to the edge or contour of said background, producing on separate sheets a movable object in successive positions on the separate sheets, superposing said first mentioned sheet on each of said second mentioned sheets in succession with the movable object on the under sheet properly positioned in respect to said edge of the first mentioned sheet and exposed to view, and photographing the said pictures in succession on a cinematograph film.

3. The process of producing moving pictures which includes the producing upon a substantially opaque sheet a scene or setting, the said sheet having a portion cut away along a line substantially following a portion of the contour or edge of said scene or setting, producing upon separate sheets a movable object in successive positions and superposing said opaque sheet upon said second mentioned sheet so that the movable object is exposed to view at the cut-away portion and is in proper registry in respect to the scene or setting.

4. The process of producing moving pictures which includes the producing upon a substantially opaque sheet a scene or setting, the said sheet having a portion cut away along a line substantially following a portion of the contour or edge of said scene or setting, producing upon separate sheets of translucent material a movable object in successive positions and superposing said opaque sheet upon said second mentioned sheet so that the movable object is exposed to view at the cut-away portion and is in proper registry in respect to the scene or setting.

5. The process of producing moving pictures which includes the producing upon a substantially opaque sheet a part of the scene which remains stationary during the series of pictures embodying the scene, producing upon a series of sheets of translucent material a movable object in successive positions, producing upon a second series of sheets another movable object in successive positions, photographing said pictures in succession on a cinematograph film, each picture of the series being formed by superposing said first mentioned sheet upon one of said second mentioned sheets and superposing the latter upon one of said third mentioned sheets, the movable object on the third mentioned sheet being visible through said second mentioned sheet and the movable objects on both sheets being exposed to view beyond one edge of said first mentioned sheet.

6. The process of producing moving pictures which includes the producing upon a series of sheets of translucent material a movable object in successive positions, producing upon a second series of sheets another movable object in successive positions, photographing the pictures in succession upon a cinematograph film, each picture being formed by superposing one of said first mentioned sheets upon one of said second mentioned sheets.

7. The process of producing moving pictures which includes the producing upon a series of sheets of translucent material a movable object in successive positions, producing upon a second series of sheets another movable object in successive positions, and photographing the pictures in succession upon a cinematograph film, each picture being formed by superposing one of said first mentioned sheets upon one of said second mentioned sheets, the translucency of the superposed sheet being such that the object on the underlying sheet appears less

distinct than the object on the superposed sheet.

8. The process of producing moving pictures which includes producing on a translucent medium one movable object, producing upon another medium another movable object, superposing the first mentioned medium upon the second mentioned medium, the translucency of the first mentioned medium being such as to permit the object on the underlying medium to be less distinctly visible than the object on the superposed medium, and photographing the picture produced by the objects on the superposed sheets, on cinematograph film.

9. An article of manufacture for use in the production of moving pictures, comprising a sheet having a scene or setting thereon and constituting the stationary background of the picture to be produced, the sheet being opaque and cut away along a line following the contour or outline of said scene or setting.

10. A device for use in the production of moving pictures, including, in combination, a substantially opaque sheet having a scene or setting thereon, the said sheet having one edge cut to follow a portion of the outline of said scene or setting, and an underlying sheet having the representation of a movable object thereon and in proper registry with said edge of said first mentioned sheet.

11. In combination, a support, a sheet removably supported thereon and in predetermined relationship thereto and having the representation of a movable object thereon, a frame adapted to be secured to said support, and a sheet secured to said frame and having the representation of a scene or setting thereon and adapted to partially cover said first mentioned sheet when said frame is in position on said support.

Signed at New York in the county of New York, and State of New York this 29th day of July A. D. 1915.

JOHN RANDOLPH BRAY.