

May 22, 1923.

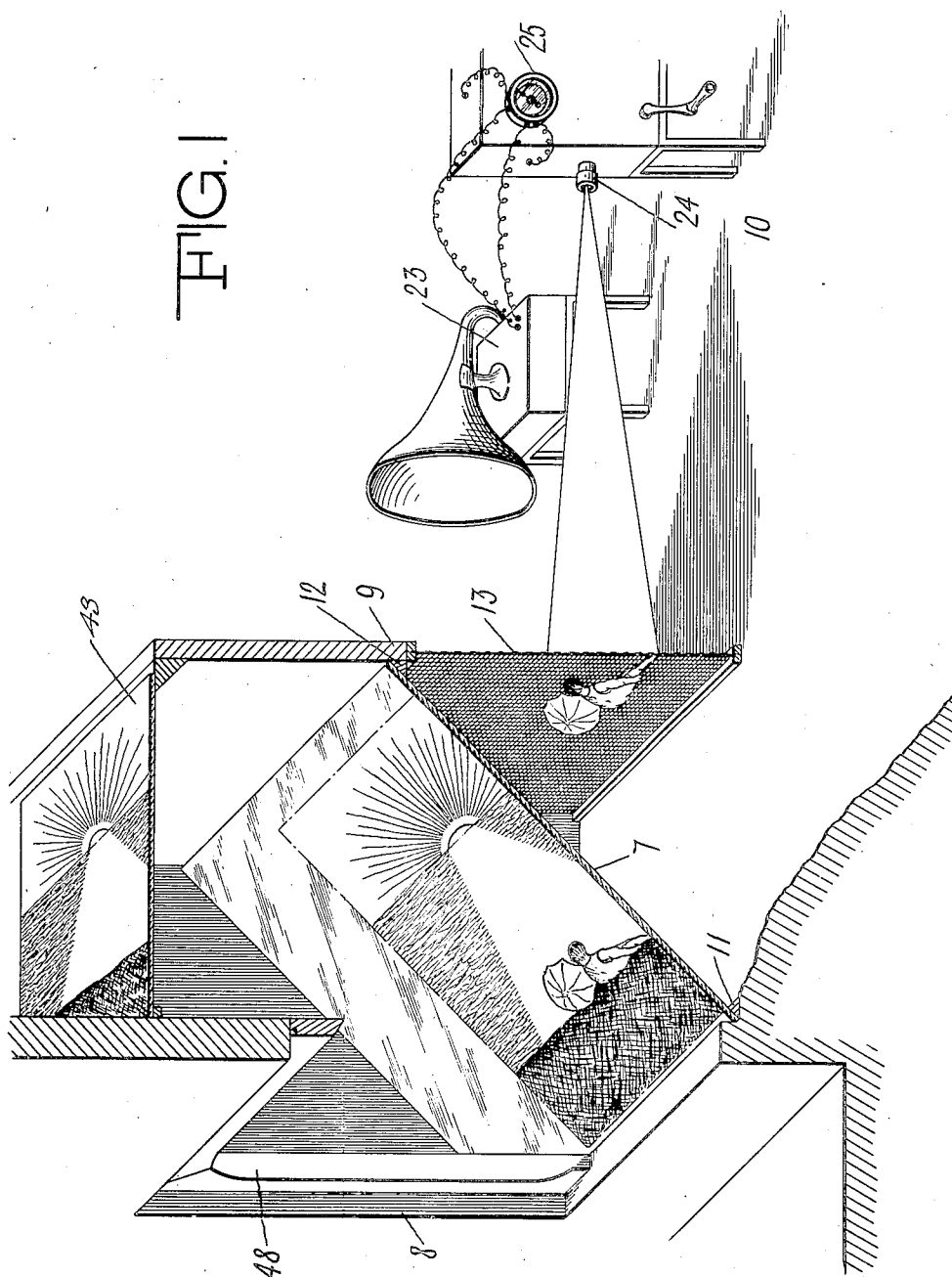
L. E. HAMMOND ET AL

1,456,233

ILLUSION APPLIANCE

Filed June 6, 1919

3 Sheets-Sheet 1



Louis E. Hammond Inventor
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May 22, 1923.

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ILLUSION APPLIANCE

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3 Sheets-Sheet 2

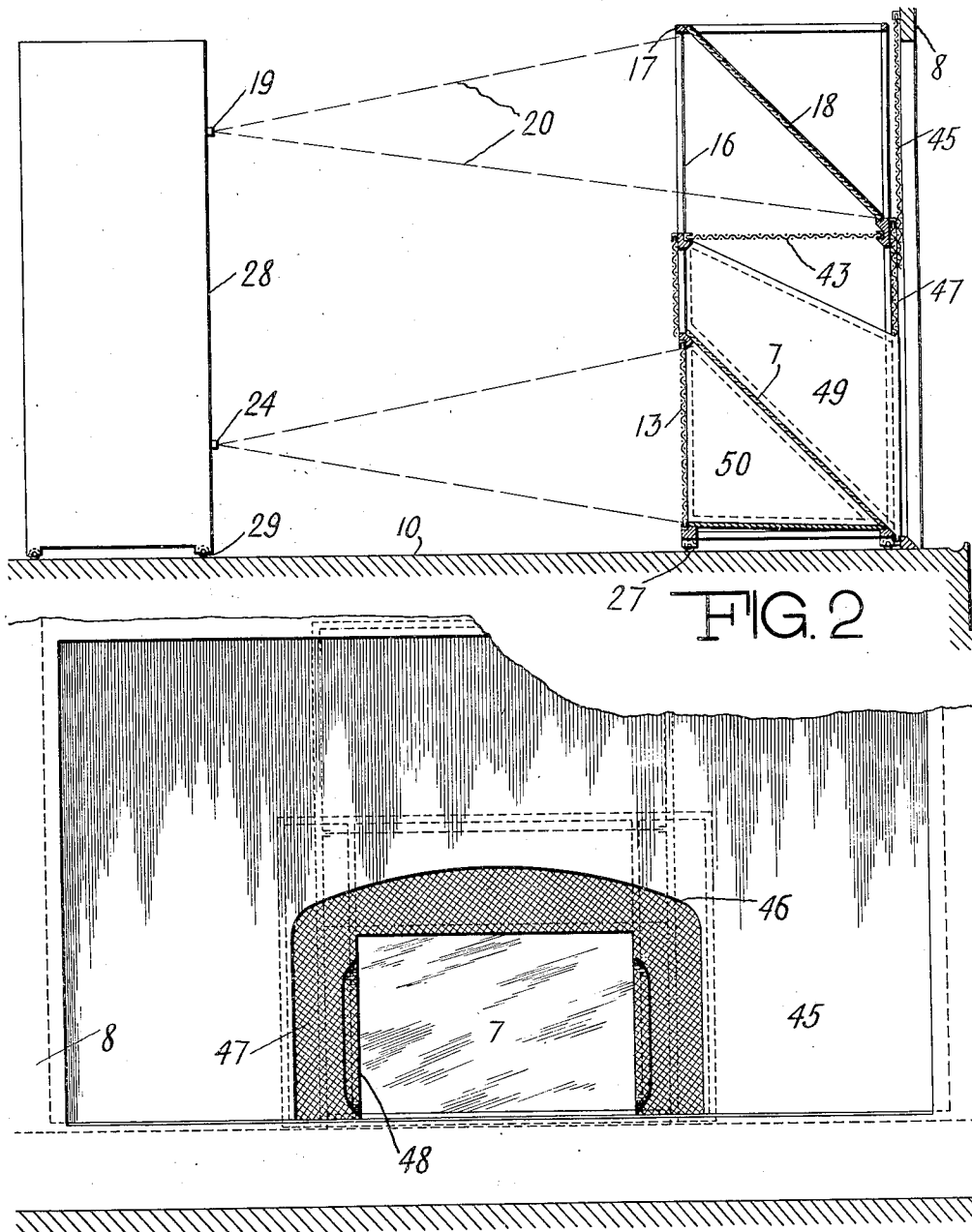


FIG. 3

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 and
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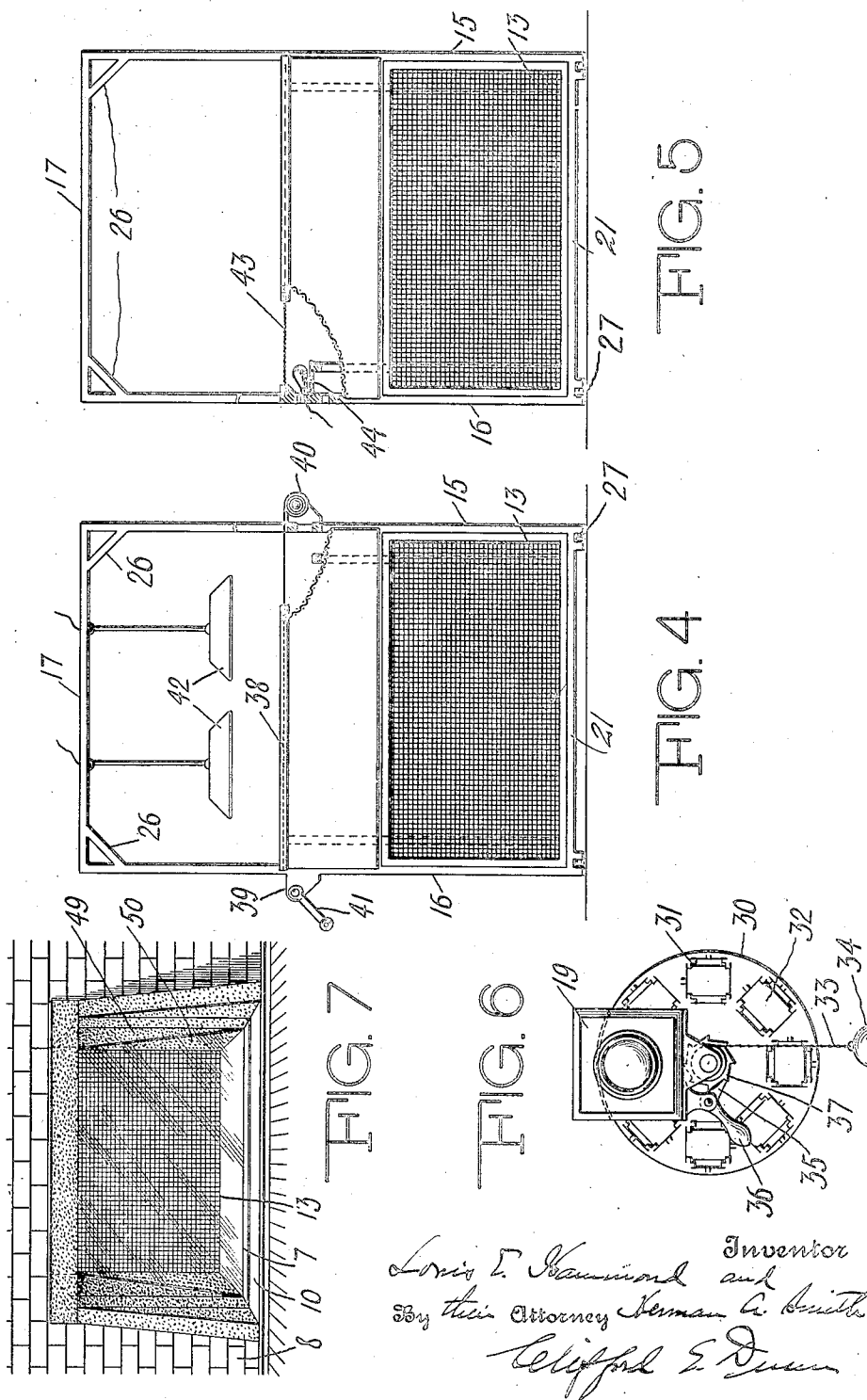
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ILLUSION APPLIANCE

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3 Sheets-Sheet 3



Louis E. Hammond and
 By their Attorney Herman A. Smith
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UNITED STATES PATENT OFFICE.

LOUIS E. HAMMOND, OF HACKENSACK, NEW JERSEY, AND HERMAN A. SMITH, OF YONKERS, NEW YORK; SAID HAMMOND ASSIGNOR TO EDGAR J. MARSTON, OF GREENWICH, CONNECTICUT.

ILLUSION APPLIANCE.

Application filed June 6, 1919. Serial No. 302,152.

To all whom it may concern:

Be it known that we, LOUIS E. HAMMOND and HERMAN A. SMITH, both citizens of the United States, and residing, respectively, at Hackensack, in the county of Bergen and State of New Jersey, and Yonkers, county of Westchester, and State of New York, have invented certain new and useful Improvements in Illusion Appliances, of which the following, taken in connection with the accompanying drawings, forms a complete and exact description thereof.

The present invention relates generally to improvements in theatrical appliances and is more especially directed to that form of theatrical appliance wherein illusionary devices are utilized to produce or create various effects for amusement, advertising or educational purposes.

While our invention is particularly adaptable to the production of illusionary effects by or with the employment of physical bodies, it is especially designed to provide or create a medium for improving the art of projecting moving and still pictures and the production of what are commonly known as talking pictures.

As is well known in the projection of moving pictures, a screen is employed upon which the complete action is thrown or shown by means of a suitable machine, such as is familiar to those versed in the art to which this invention appertains, the action being photographed upon a continuous strip of film which is fed through the machine. This means that each photograph is complete in itself and includes not only the figures in action, but the settings or scenic effects and properties employed in the production of the picture. Consequently, in the showing of the picture the desired realistic effect is lost to a considerable degree by the constant fluttering or flickering movement of the entire scene or setting. Furthermore, with the present methods of projection the pictures are what is commonly known as "flat," it being impossible to obtain the proper degree of perspective to overcome this in the slightest degree.

To overcome these difficulties of projection and to give a plastic or life-like appearance of solidity to the action of moving pictures which appears to take place within a still background, various means have here-

tofore been suggested, but none has presented a satisfactory solution of the problem. It has been proposed to project the action of moving pictures indirectly upon an opaque screen through an inclined plate of glass, the plate of glass serving to reflect to spectators the background actually situated in front of and above the screen, which appears to be behind the action. This arrangement fails to overcome completely the above-noted difficulties in a number of respects. By projecting the action indirectly upon the opaque screen through a plate of glass, much of the light is reflected by the glass so as never to reach the screen, thereby diminishing the brightness of the action shown on the screen. The reflected light falls upon the enclosure above the plate glass so that spectators in certain portions of the auditorium will see a "ghost" caused by a reflected view of the enclosure as illuminated by the reflected light. Moreover, an inclined plate of glass will collect on its upper surface dust and dirt which will cast shadows on the screen, thereby giving a speckled appearance to the action shown thereon.

In order to eliminate certain of these objections, it has been proposed to incline the upper portion of the plate of glass forwardly, toward the spectators, so that the background, which is to be reflected, will actually be situated below the opaque screen, being visible by reflection through a hole cut in the stage. With this arrangement, it is extremely difficult, if not impossible, to conceal the actual background from the direct vision of spectators situated in balconies, or whose line of sight is depressed to any great extent from the horizontal.

From the foregoing, it is obvious that it would be impossible to produce the illusionary effects toward which the structures of the prior art are directed in such a manner as to permit their successful presentation in theaters and other auditoriums in which theatrical and similar entertainments are now presented on a commercial scale; nor could the illusions of the prior art be successfully presented in store windows for advertising purposes under conditions where the angles from which the illusion is viewed are most diverse.

The primary object of our invention is to provide means for producing an illusion of

moving-picture action standing out from a stationary or moving background, which shall be visible to spectators situated in all parts of a theater or auditorium irrespective of the angle from which the illusion is viewed, and means for concealing from the direct vision of such spectators the means employed in producing the illusion.

A further object of the present invention is to provide a means whereby moving pictures may be projected in such a manner as to overcome the above-mentioned defects in the methods of projection now employed, by a simple and economical arrangement of the various co-operating means which may be of a fixed or portable character so as to lend themselves readily to the many requirements of the amusement, advertising and educational fields.

A further object of our invention is to eliminate the fluttering or flickering movement of the scenic effects for a given action and to impart to the figures employed in the action a plastic or solid appearance, a perspective being obtained in the attainment of this result, which renders it possible to produce an action or picture which will simulate a performance upon the stage of an ordinary theatre or the like.

Our invention further contemplates a means of synchronizing the functioning of a projecting device or machine and a sound reproducing medium in such a manner as to enable one to obtain absolute and positive co-operation between the various elements of our invention so as to permit of the production of a complete story, play, or the like, with the same degree of effectiveness which would be obtained in the rendition of the story, play, or the like, by human beings.

Another object of our invention is to provide a theatrical appliance having the afore-said characteristics and advantages wherein it is possible to produce scenic changes with great rapidity during the exposure of the action, whereby the same may be rendered more effective without interfering therewith or in any way detracting from the realistic effects obtained thereby.

When viewed from various angles the so-called "flat" pictures now used appear distorted to the human eye, thereby impairing or destroying the effectiveness of the action, and an additional object of our invention is to obviate this defect so that a proper perspective is obtainable from whatever angle the action may be viewed.

Various other objects and advantages of our invention will become manifest as we proceed with the description thereof and we would have it understood that we reserve unto ourselves the full range of equivalents, both in uses and structure to which we may be entitled under our invention in its broadest aspect.

In the present disclosure we have elected to illustrate and describe a specific embodiment of our invention with certain modifications thereof, in order to render a clear and comprehensive understanding of the function and operation of our invention, but it is obvious that our invention is susceptible of incorporation in various forms of structure or apparatus without departing from the spirit and scope thereof.

In attaining these objects of the invention, there is provided a translucent screen, means for projecting moving-pictures directly on said screen, that is, without any obstructions between the projector and the screen, a background situated in front of and above said screen, a plate of glass inclined rearwardly to the spectators, that is, with its upper portion nearer said screen than its lower portion, and means for concealing said background from the direct vision of spectators wherever located in the auditorium.

We shall now proceed to describe our invention with reference to the accompanying drawings, and then point out with more particularity the essential features and elements of novelty therein in the appended claims.

In the drawings—

Fig. 1 is a view partly in perspective and partly diagrammatic, illustrating the preferred form of our invention.

Fig. 2 is a sectional elevation of a portion of the structure shown in Fig. 1.

Fig. 3 is a front elevation of the proscenium of the miniature stage employed by us showing a preferred arrangement of the co-operating parts.

Figs. 4 and 5 are rear elevations of modified methods of producing the still or set scene.

Fig. 6 is an enlarged detail showing a method of effecting instantaneous scene changes; and

Fig. 7 is a modified form of a miniature stage effect to be used in conjunction with our invention.

Referring now to the drawings in detail in which like characters are employed to designate similar parts throughout the several views—

7 represents a rectangular piece of plate glass or other transparent substance which is preferably mounted or disposed at an angle of 45 degrees between the front and rear members 8 and 9, respectively, of our appliance. Where our appliance forms a permanent exhibition medium the front member thereof may be the proscenium arch of the stage 10 of a theatre or other auditorium, as shown in Fig. 1, the lower edge of the glass resting within the groove or rabbetted portion 11, while the upper edge is supported by the bed piece or bracket 12 po-

sitioned adjacent to the lower edge of the upper part of the back member. This latter member comprises the upper portion 9, which may be of wood or any other suitable material, and the lower portion 13 which consists of a screen of translucent material. This screen may be of any desired fabric, such as duck, cheesecloth, muslin or the like, which has been subjected to a coating of a paraffin or other solution to render it suitable to the purposes for which it is designed, the components of the back member formed by the portions 9 and 13 being preferably supported between the uprights or standards 15 and 16. (See Figs. 4 and 5.)

Positioned in a horizontal plane and supported by suitable brackets or strips of wood or other material extending transversely of the front and back members 8 and 9, respectively, is a rectangular screen 43 of translucent material on which a still scene or picture is adapted to be displayed by reflection from the angularly disposed mirror or other reflecting medium 18 positioned within the device, so as to receive the projection from the stereopticon 19, as indicated by the dash lines 20 (see Fig. 2). 23 represents a sound re-producing or so-called talking machine of the conventional type which may be electrically driven by any suitable means and which is connected to a moving picture machine 24 so as to operate in synchronism therewith. The latter machine may be any of the well-known types which is manually operated, and the synchronism in the functioning of the sound reproducing and picture machines may be accomplished by means of suitable electrical mechanism for indicating the speed of the revolutions of the turn table or motor of the sound reproducing machine and the reel or spool of the picture machine, by means of a dial 25 on the latter exposed to the view of the operator.

As will be observed from Fig. 1, the moving picture machine 24 is positioned to the rear of the screen 13 so as to project the action thereon. By positioning the moving picture machine 24 to the rear of the screen 13, the action may be projected directly on the screen so that only a single image of the action is visible to any spectator wherever located in the auditorium, whereas, if the action is projected from in front of the screen 13 through the plate glass 7, there will be visible to spectators in certain portions of the auditorium a "ghost." When the action is indirectly projected, as through the plate glass, a certain amount of light is reflected by the glass, so that two images are produced, one in the correct position on the screen 13, and the other on the overhead screen 43, or the backside of the drop curtain 45, or both. Spectators in certain portions of the auditorium will therefore see

a reflection of this second image which appears as a "ghost" and so greatly impairs the illusion as to destroy it completely. In the taking or production of pictures or the action for use in our appliance, which forms the subject-matter of an application for Letters Patent, filed by H. Armour Smith, June 11, 1919, Serial Number 303,520, means are employed for photographing nothing but the movement or action which it is desired to reproduce—that is to say, if it is desired to reproduce a play or the like, the characters only are photographed, the setting or scene being eliminated or omitted. Therefore, upon the projection of the action upon the screen 13, the figures or moving bodies only will be visible, the remainder of the screen being blank.

As previously stated, the scene in which the proposed action is to be presented, such as an interior, exterior or the like, is projected from the stereopticon 19 by the reflecting mirror 18 to the horizontally disposed screen 43 from where it is reflected upon the angularly disposed plate glass 7, the angle of incidence of the reflection being such that the scene in the glass 7 appears to be a substantially perfect perspective. Owing to the intensity of the rays projected from the machine 24 and its position relatively to the screen 13, which latter may, of course, be varied to obtain different results, the figures in the action which will be obviously opaque may be observed through the transparent plate glass 7 and will be predominant relatively to the scene produced thereupon by reflection in the manner heretofore described, and the action as it changes or proceeds to the various positions or poses will appear to be taking place or transpiring within or in front of the apparent perspective of the setting or scene produced by reflection from the stereopticon 19.

Where it is preferred to use our invention in its portable form, it may be of the structure shown in Figs. 2, 4 and 5, made up of the side frame members or standards 15 and 16 and the top and base members 17 and 21 which support the various parts of the appliance or apparatus in the relative positions previously explained, these several frame members being reinforced and held together by the corner pieces or brackets 26. To facilitate movement of the appliance about the stage or platform of a theatre or auditorium, if desired, it may be mounted upon rollers or castors, such as shown at 27 in Figs. 2, 4 and 5.

In Fig. 2, it will be noted that for convenience of operation and transportation, both the moving picture machine 24 and stereopticon 19 are mounted or positioned within a single housing or coop 28, this coop being also preferably mounted on roll-

ers or castors 29. We have found that in practice the best results are obtained through the medium of reflection of a still scene from the stereopticon 19 on the screen 43, and where it is desired to effect quick or instantaneous scene changes in this embodiment of our invention, we employ a rotatable disc 30 which is provided with recesses 31 to support a plurality of stereopticon plates 32. This disc is rotated by the unwinding of a chain or cable 33 from which a weight 34 is suspended, the functioning of the weight being manually controlled by the actuation of the pawl 35 through the medium of the handle 36, the pawl being thereby thrown or raised out of engagement with the tooth of the escapement wheel 37 so as to permit the latter to rotate one notch. The disc 30 is mounted on any suitable support relatively to the stereopticon 19, as shown in Fig. 6; so that the proper focus to meet the requirements of the conditions under which our invention is being used or employed may be employed. In Fig. 4, in lieu of the stereopticon 19 and the screen 43 the scene to be reflected by the glass 7 is painted or printed upon a strip 38 of treated cheesecloth, duck or the like, which is mounted upon the rollers 39 and 40, the former being capable of manual rotation by the crank 41 so as to unwind the strip from the roller 40 to effect a change in scene. By this means a number of scenes may be painted upon the strip of material which is disposed transversely of the apparatus in a horizontal plane and substantially the same effect is obtained as that produced by the use of the stereopticon and the screen 43, through the employment of the trough lights 42 which are positioned within the apparatus, as shown in Fig. 4. The lights, when turned on, will illuminate the scene upon the strip 38 producing a reflection thereof upon the plate glass 7. In Fig. 5, the screen 43, which is similar to that shown at 38, is fixed, reflection being produced by the incandescent lights 44 preferably positioned adjacent to the underside of the screen and within the apparatus, as shown in said figure.

Where it is desired to employ our invention in its portable form upon a stage or platform of a theatre or auditorium having the usual proscenium arch, a curtain or drop 45 may be used having a cut-out portion along the line 46 adapted to register with the frontispiece 47 of our apparatus or appliance, the side edges of which it will be observed have curved cut-out portions 48 so as to permit of an unobstructed vision of the action, being displayed within the apparatus, from any portion of the theatre or auditorium.

By means of the particular arrangement of parts employed in our invention, wherein

the vertical screen 13 faces the spectators, the plate glass 7 is mounted before said screen and inclined at an angle of approximately 45 degrees therewith, the upper portion of the plate 7 being nearer the screen 13 than the lower portion, and the screen 43 upon which the background is depicted is positioned in front of and above the screen 13, the illusion is made visible to spectators both in the lower portions, such as the orchestra chairs of the theater or auditorium, and in the balconies; while, at the same time, the screen 43 is concealed by the curtain or drop 45 from the direct vision of spectators. It is of the greatest importance to keep the screen 43 out of the direct line of sight of any spectators, since a view of this screen in its real position would destroy the illusion. Our structure, permitting as it does a view of the illusion from unusual angles, is particularly adapted for use in miniature form in store windows for advertising purposes, under which circumstances the concealment of the means employed in producing the illusion is of paramount importance.

From the foregoing description of our invention, it will be obvious that we have evolved a method and means of presenting or exhibiting moving pictures in such a manner as to impart to them a degree of realism and effectiveness which it has heretofore been impossible to attain. The intensity of the light rays projected from the moving picture machine in co-operation with the several elements of our invention give to the figures in the action a substantial and solid appearance—that is to say, unlike the pictures projected today, which are technically described as “flat,” the figures in the action produced through the employment of our invention appear to possess bulk, the illusionary effects being so perfected that an action or performance with our device approaches that of human beings as closely as that is possible by a mechanical medium. The illusion is carried out to a greater degree by the method of synchronizing the operation of the moving picture machine and the talking machine, so that the figures in the action or performance not only appear to possess life but to have the power of speech. In some instances, where our appliance has been employed, and the focal planes of the co-operating apparatus have been so adjusted to produce increase of life-like size, there has been considerable confusion in the minds of the auditors or spectators of the exhibition as to whether the performance was by human beings or mechanical devices. This may be largely attributed to the perspective obtained in the still scene or setting through the medium of reflection and the method of producing the action, so that it seemingly

takes place within or in front of the scene setting.

In order to shut out foreign light rays and effect the concentration of the illuminating means employed within our device for carrying out the various objects thereof, we have found it preferable to enclose the ends with the flaps 49 and 50. These may be made of canvas or any material suitable to the purpose and may be fastened to the supporting standards of the apparatus in any manner which will facilitate their detachment therefrom for the purposes of making adjustments or repairs.

While we have described our invention with reference to the specific embodiment herein shown, it is manifest that many changes may be made in the details of construction without departing from the spirit and scope of the invention. For instance, in lieu of moving pictures a performance by human beings may be conducted behind the plate glass 7 with light rays concentrated upon the characters in such a manner as to produce substantially the same effect to the eye of the audience as that obtained by the use of the moving picture apparatus heretofore described. For lighting purposes any form of lighting effects, such as commonly employed in theatres and the like may be used, all of which we would have it clearly understood come within the broad idea of our invention as hereinafter set forth in the claims.

Having thus described our invention what we claim as new and desire to secure by Letters Patent of the United States, is:

1. In an illusion appliance, in combination with a supporting frame work, a transparent glass mounted on an inclined plane therein, a translucent screen positioned in a horizontal plane above and reflected by said glass, said screen having a scene depicted thereon, a translucent screen positioned behind said glass in a perpendicular plane, means for projecting a moving picture thereon, said moving picture being visible through said glass, the action thereof having the appearance of taking place within the scene reflected by said glass, and means forming part of said appliance for permitting an unobstructed vision of the illusion from unusual angles.

2. In an illusion device, the combination of a transparent medium positioned in an inclined plane, a translucent screen disposed in a perpendicular plane behind said transparent medium, a scenic background positioned above said translucent medium and reflected thereby, and means for concentrating light rays to render a given object visible on said translucent screen, whereby it will be seen through said transparent medium and have the appearance of being within the scene reflected thereby.

3. A portable illusion device comprising a supporting structure, a transparent glass positioned therein in an inclined plane, a translucent screen supported within said structure in a perpendicular plane behind said glass, a screen horizontally disposed above said glass and reflected thereby, said latter screen bearing a picture, said reflected picture having the appearance of a perfect perspective, means for directly projecting a moving picture upon said perpendicular translucent screen, the details of the action of said moving picture being substantially opaque and visible through said glass, said action appearing to take place within the scene reflected on said glass.

4. In an illusion appliance, the combination with a translucent screen facing the spectators, of means for projecting moving pictures directly on said screen, a scenic background disposed in front of and above said screen, means for concealing said background from the direct vision of the spectators, and means for showing said background to be apparently behind said moving pictures.

5. In an illusion appliance, the combination with a translucent screen, means located to the rear of said screen for projecting images thereon, a second screen in front of and above said first-mentioned screen, means for exhibiting to spectators in front of said first-mentioned screen a virtual image of said second-mentioned screen superposed upon said first screen, and means for concealing said second-mentioned screen from the direct vision of said spectators.

6. In an illusion appliance, the combination with a translucent vertically disposed screen, means for directly projecting a moving picture thereon, a horizontal screen in front of and above said vertical screen, and means positioned in front of said vertical screen for exhibiting in the same cone of vision with said vertical screen a virtual image of said horizontal screen.

7. In an illusion appliance, the combination with a translucent screen facing a point of observation, means to the rear of said screen for projecting real images thereon, an object hidden from direct vision from said point of observation and a plate of glass mounted in front of said screen to exhibit superposed upon said real image a virtual image of said hidden object, horizontal sections of said plate of glass being substantially parallel to said screen and the upper portion of said glass being nearer to said screen than the lower portion thereof.

8. In an illusion appliance, the combination with a translucent screen facing and disposed in a plane substantially normal to the line of sight of a spectator, means located to the rear of said screen for projecting real images thereon, a second screen

situated in front of and above said translucent screen, and a plate of glass mounted in front of said first-mentioned screen to exhibit to said spectator a virtual image of
5 said second screen superposed upon the image projected upon said first-mentioned screen, said plate of glass being inclined so that a horizontal section thereof will be substantially normal to the line of sight of said
10 spectator, the lower portion of said glass being nearer the spectator than the upper portion thereof.

9. In an illusion appliance, the combination with a vertically disposed translucent screen, of means to the rear of said screen 15 for projecting a real image thereon, a second screen situated in front of and above said first-mentioned screen, and a plate of glass mounted below said second-mentioned screen to reflect to a spectator a virtual im- 20 age of said second-mentioned screen superposed upon said real image.

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