T. A. EDISON.

MOVING PICTURE APPARATUS.

APPLICATION FILED JUNE 6, 1910.

1,178,062.

Patented Apr. 4, 1916.

2 SHEETS—SHEET 2.

Fig. 2

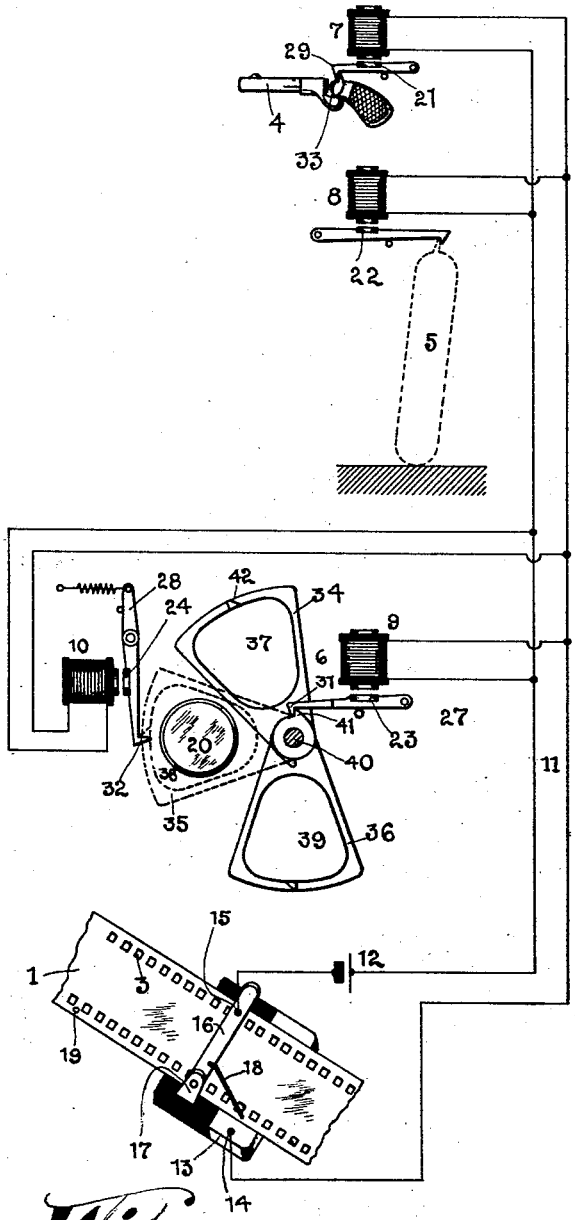



Fig. 3

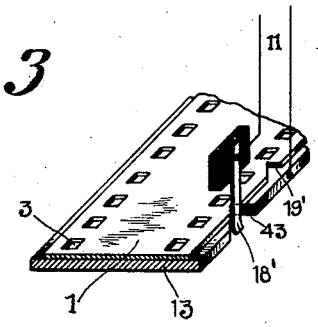
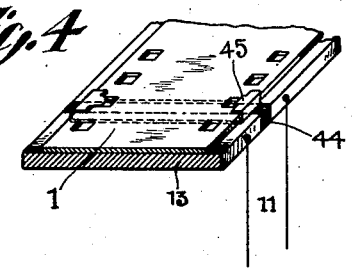



Fig. 4

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Inventor:

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his Atty.

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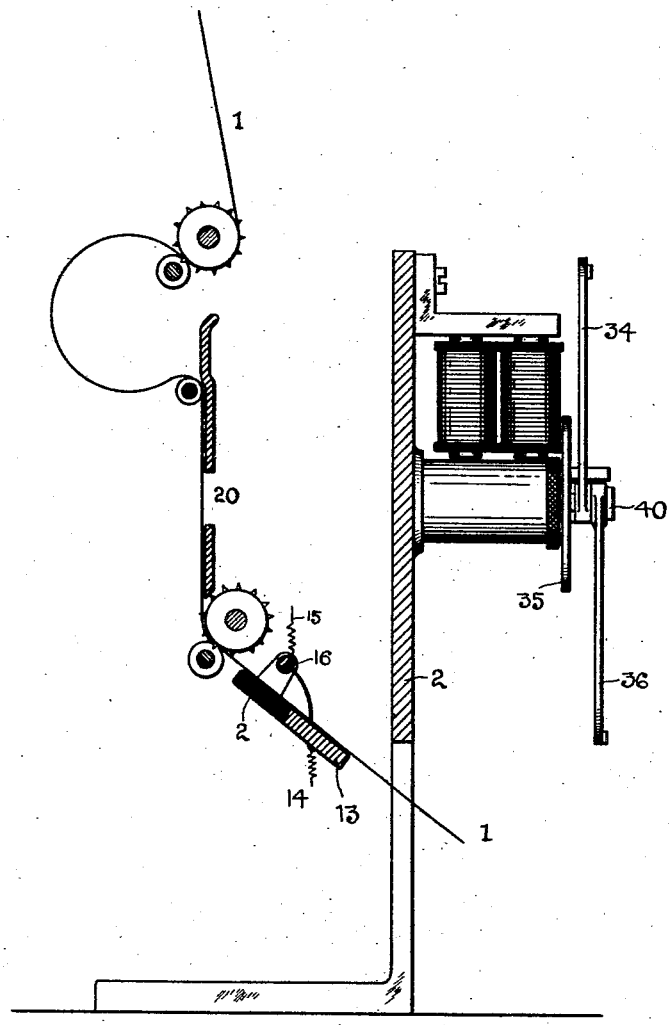
Fig. 1

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# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, WEST ORANGE, NEW JERSEY, ASSIGNOR TO NEW JERSEY PATENT COMPANY, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## MOVING-PICTURE APPARATUS.

1,178,062. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed June 6, 1910. Serial No. 565,158.

*To all whom it may concern:*

Be it known that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, New Jersey, have invented certain new and useful Improvements in Moving-Picture Apparatus, of which the following is a description.

My invention relates to moving picture apparatus, and the object thereof is to provide means whereby various devices may be actuated during the operation of a moving picture projecting machine, the actuation of these devices being controlled by the passage of the film itself through the machine, and their operation timed to automatically occur at any desired point or points in the production of the moving pictures. For example, the portrayal of scenes by the moving picture machine may be rendered more life-like by the production of various sounds at appropriate times during the production of the picture. If, for instance, a character portrayed in the pictures fires a revolver, the report of the revolver should be heard by the audience immediately after the pressing of the trigger by the character portrayed in the picture. To complete the illusion, it also often happens that the sound of a falling body and various other sounds should be heard at properly timed intervals during the production of the picture. It has been extremely difficult for an operator to produce such effects at exactly the right times to coincide with the production of the accompanying scenes.

By my invention, the film itself is inspected and provided with apertures or other controlling means at the proper points, which controlling means upon the film cooperates with contact-making devices or trip devices at the proper points in the progression of the film through the machine to actuate the devices required to produce the desired effect.

Among other uses to which my invention may be put may be noted the control of devices for coloring the light projected through the moving film so that the picture may be shown in any desired color or colors, and the color-controlling shutter or other device actuated into operative position and again out of operative position at any desired points in the projection of the picture.

It will be obvious that many other effects than those mentioned may be produced by my invention and controlled by the passage of the film through the machine.

In order that a clear understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming part of this application, in which—

Figure 1 represents a diagrammatic vertical sectional view through a projecting machine equipped with one form of my invention. Fig. 2 is a diagrammatic view showing means for firing a pistol, releasing a falling body, and operating a color screen or shutter, a portion of the moving film and contact device being shown in perspective. Fig. 3 is a partial perspective view of the moving film and a modified form of contact-making device contacting the edge of said film; and Fig. 4 is a similar view showing another modification in which a conducting strip is secured upon the film itself at any desired point to close the circuit for actuating the various devices.

Referring to the drawings, the film 1 is fed in the usual manner through the moving picture projecting machine illustrated diagrammatically at 2 in Fig. 1. The film 1 may be fed in any suitable manner, as by means of the usual ratchets coöperating with feeding perforation 3 of the film. I have chosen for purposes of illustration as devices to be operated, the pistol 4, weight 5 and a device 6 for coloring the light projected through the film. These or other devices as desired may be operated or controlled by means of electro-magnets 7, 8, 9 and 10. I have represented these magnets as being all connected in parallel across the circuit 11, although it is obvious that they might be connected in series. Circuit 11 includes a source of energy as the battery 12. The preferred form of my circuit controlling device is shown in Fig. 2. As here shown, the film 1 passes across a portion 13 of the frame of the projecting machine, which is connected to one end 14 of the wire composed circuit 11. The other end 15 of the circuit is connected to brush holder 16 which is mounted upon insulation 17. Brush holder 16 carries a brush 18 which bears upon the film, preferably upon the upper side surface thereof on the outer side of feeding perforations 3, above plate 13 of the projecting machine. Brush 18 bears firmly upon the film as the latter

passes beneath the same, being formed of spring metal or otherwise given a slight spring pressure upon the film and may consist of several small wires. Film 1 is provided with one or more small holes 19 which are in line with the end of brush 18 as the film is fed through the machine. When one of these holes passes under the end of brush 18 the latter instantaneously makes contact through the same with plate 13 completing circuit 11 and instantaneously operating all the magnets connected in the series as 7, 8, 9 and 10. The holes 19 may be very small and brush 18 which is preferably composed of a number of fine wires, so formed as to pass through the same. The circuit is closed only momentarily upon the passage of the hole 19 under brush 18, the film 1 in its forward movement lifting brush 18 out of hole 19 and again breaking the circuit.

Devices such as the pistol 4 and weights 5 and their actuating magnets may well be located behind the screen upon which the moving picture is to be projected. Holes 19 may be punched in the film at such points in the length of the film as to cause the energization of the magnets at the exact moments when a particular picture is crossing the aperture 20 of the projecting machine, which picture it is desirable should be accompanied by the actuation of one of the devices controlled by the magnets. I have represented the various magnets as being provided with armatures 21, 22, 23 and 24 carried by pivoted levers 25, 26, 27 and 28, the free ends of which levers are provided with detents 29, 30, 31 and 32. When circuit 11 is closed by brush 18 contacting plate 13 through a hole 19, all of the magnets will be actuated and will attract their armatures, rocking levers 25, 26, 27 and 28 about their pivots. Accordingly, when the attendant knows that the moment for firing a pistol, for instance, has nearly arrived, the pistol 4 is secured in position with its hammer 33 held in cocked position by detent 29 of the lever 25. Upon the passage of the next hole 19 in the film beneath brush 18, lever 25 is drawn upward by the attraction of armature 21 by magnet 7, releasing hammer 33 and firing pistol 4 to cause the report of the same which should accompany the portrayal of the smoke in the picture. The armatures of all the other magnets are actuated at the same time without result. If the attendant knows that some other effect should soon be produced in the exhibition of the picture, as, for example, the dropping of a weight, the weight 5 may be secured in position in which it is prevented from falling by, for example, the detent 30 of lever 26 of magnet 8, so that upon the next actuation of the series of magnets, the weight 5 is allowed to fall. The device 6 for coloring the light projected through the film may take the form of one or more shutters as 34, 35 and 36 which may carry differently colored glass, 37, 38 and 39. These shutters may be loosely hung upon a stud 40 so positioned that the colored glass carried thereby will pass in line with the light aperture 20 of the projecting machine upon oscillation of the shutter. The coloring device 6 may be located in any convenient position in line with the light aperture of the machine as, for example, in the position illustrated in Fig. 1.

In the device illustrated, magnet 9 is intended to control the movement of the shutter into operative position to color the light at any desired point in the projection of the picture and magnet 10 is intended to remove the shutter from operative position at another desired point in the movement of the film. I have illustrated means by which the shutter is held in inoperative position by detent 31 of magnet 9 and allowed to fall by gravity into the proper position to color the light upon the actuation of magnet 9, the shutter then being held in operative position by detent 32 of magnet 10, which detent is withdrawn to release the same upon the next actuation of magnet 10, the shutter falling again into inoperative position by gravity. It is, however, obvious that the shutters might, if desired, be positively actuated into and out of operative position by magnets 9 and 10. In the embodiment of my invention illustrated, each shutter as 34 is provided with a projection 41 upon the hub thereof and a projection 42 upon the outer end of the shutter. When, during the projection of a picture, the attendant knows that the time for coloring the light has nearly arrived, he mounts a shutter as 34 upon stud 40 and secures the same in inoperative position with detent 31 of lever 27 contacting lug 41 upon the hub of shutter 34 to hold the shutter in the position illustrated, the shutter being under a constant tendency to fall by gravity to the left. Upon the passage of the next hole 19 in film 1 beneath brush 18, magnet 9 is actuated and detent 31 withdrawn from contact with lug 41 to allow shutter 34 to fall to the left across light aperture 20. Magnet 10 is actuated at the same time attracting its armature 24 and again releasing the same so that detent 32 again occupies its outer position in which it lies in the path of lug 42 upon shutter 34. Shutter 34 is arrested in operative position and held there by the engagement of detent 32 with lug 42, the projecting light passing through light aperture 20 also passing through the colored glass 37 of the shutter. The next controlling perforation 19 in the film should be for the release of shutter 34 from operative position, and accordingly magnet 10 being actuated detent 32 is with-

drawn from contact with lug 42 upon the shutter, allowing the shutter to fall into inoperative position in which shutter 36 is illustrated in the drawings. If it is desired to have the color of the light instantaneously changed from one color to another, it is obvious that this may be accomplished by mounting two shutters upon stud 40, one of them as 35 being shown in operative position, and another as 34 being in position to fall into operative position upon the actuation of magnet 9. Accordingly, upon the next actuation of the magnets the two shutters are simultaneously released and fall by gravity, shutter 35 falling into inoperative position, shutter 34 being caught as it reaches the operative position by detent 32 of lever 28, which detent is returned into the path of lug 42 upon shutter 34 before the latter has reached the detent.

I have illustrated a modification of my circuit controlling device in Fig. 3, in which the film 1 instead of being provided with punched holes 19 is notched at its edge as shown at 19'. The brush 18' is mounted to press against the edge of film 1, the film preventing contact between the brush and plate 13. When, however, notch 19' in film 1 comes opposite brush 18', the latter makes contact with plate 13 in recess 43 thereof, thereby completing circuit 11 and actuating the various electro-magnets.

I have illustrated another modification in Fig. 4 in which the two ends of the conductor forming circuit 11 are connected to plate 13 on opposite sides of insulation 44, whereby the circuit is normally held open. In place of using a brush and making contact thereby through the film, in this embodiment of my invention I secure a thin strip or coating of conductive material 45 upon the under side of the film at any desired point or points. This strip 45 is wider than insulation 44 and accordingly as strip 45 passes across insulation 44 in the passage of the film through the machine, it bridges across insulation 44 completing circuit 11 and actuating the electro-magnets.

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

1. In moving picture projecting apparatus, in combination, a projecting machine, a moving-picture film, means for feeding the same through said machine, a device for coloring the light projected through said film, and means for automatically controlling the operation of said device including a portion of said film, substantially as described.

2. In moving picture projecting apparatus, in combination, a projecting machine, a moving-picture film, means for feeding the same through said machine, a device for coloring the light projected through said film, mechanism for controlling the movement of said device into operative position, and means controlled by said film for actuating said mechanism at a desired point in the progression of said film, substantially as described.

3. In moving picture projecting apparatus, in combination, a projecting machine, a moving-picture film, means for feeding the same through said machine, a device for coloring the light projected through said film, operable into and out of operative position, and means controlled by said film for releasing said device from operative position at a desired point in the progression of said film, substantially as described.

4. The combination with a projecting machine, a source of light and a moving picture film, of a device for coloring the light projected through the film, and means for automatically rendering the said device effective, dependent upon the portion of the film which is being projected, substantially as described.

5. The combination with a projecting machine, a source of light and a moving picture film, of devices for coloring the light projected through the film, and means for rendering any of the said devices effective, dependent upon the portion of the film which is being projected, substantially as described.

6. The combination with a projecting machine, a source of light and a moving picture film, of a plurality of movable mounted light coloring devices capable of being moved into the path of the projecting light, and electrically controlled means for operating the said devices, dependent upon the position of the film in its passage through the machine, substantially as described.

7. In moving picture projecting apparatus, in combination, a projecting machine, a moving picture film, means for feeding the same through said machine, a device for coloring the light projected through said film, mechanism for controlling the movement of said device into operative position, mechanism for arresting the device in operative position and for controlling the movement of the same into inoperative position, and means controlled by said film for actuating both said mechanisms at desired points in the progression of said film, substantially as described.

8. In moving picture projecting apparatus, a moving picture film having a picture area covering nearly its entire width and an opening therein outside but adjacent to the picture area thereof, an electric circuit containing a source of current and an actuating device, a projecting machine through which the film travels having an insulating portion and a conducting portion, said conducting portion being connected to one end of the

electric circuit and being in contact with the film in the projecting machine, and a brush mounted on said insulating portion and connected to the other end of the electric circuit, said brush normally bearing on the film, being normally held from contact with said conducting portion by the film and being adapted to contact with the said conducting portion through the opening of the film in a predetermined position of the latter, to close the circuit, substantially as described.

9. In apparatus of the character described, a moving picture film having a picture area covering nearly its entire width and a cut-away portion outside but adjacent to the picture area thereof, a moving picture machine through which the film travels, an actuating mechanism, and controlling means for said actuating mechanism comprising a member mounted on the moving picture machine and a device with which said member is adapted to coöperate, said member being biased to a position engaging said device for rendering said actuating device operative, being normally held in inoperative position by the film in its passage through the moving picture machine, and being adapted to assume operative position through the cut-away portion of the film in a predetermined position of the latter, substantially as described.

10. In apparatus of the character described, a moving picture film having a picture area covering nearly its entire width and a cut-away portion outside but adjacent to the picture area thereof, an electric circuit containing a source of current and an actuating device, a moving picture machine through which the film travels having an insulating portion and a conducting portion, said conducting portion being connected to one end of the electric circuit and being in contact with the film in the projecting machine, and a brush connected with the other end of the electric circuit, said brush being biased to a position to contact said conducting portion to close the circuit, being normally held from such position by the film in its passage through the moving picture machine, and adapted to assume such position through the cut-away portion of the film in a predetermined position of the latter, substantially as described.

This specification signed and witnessed this 31st day of May, 1910.

THOS. A. EDISON.

Witnesses:

DYER SMITH,

JOHN M. CANFIELD.