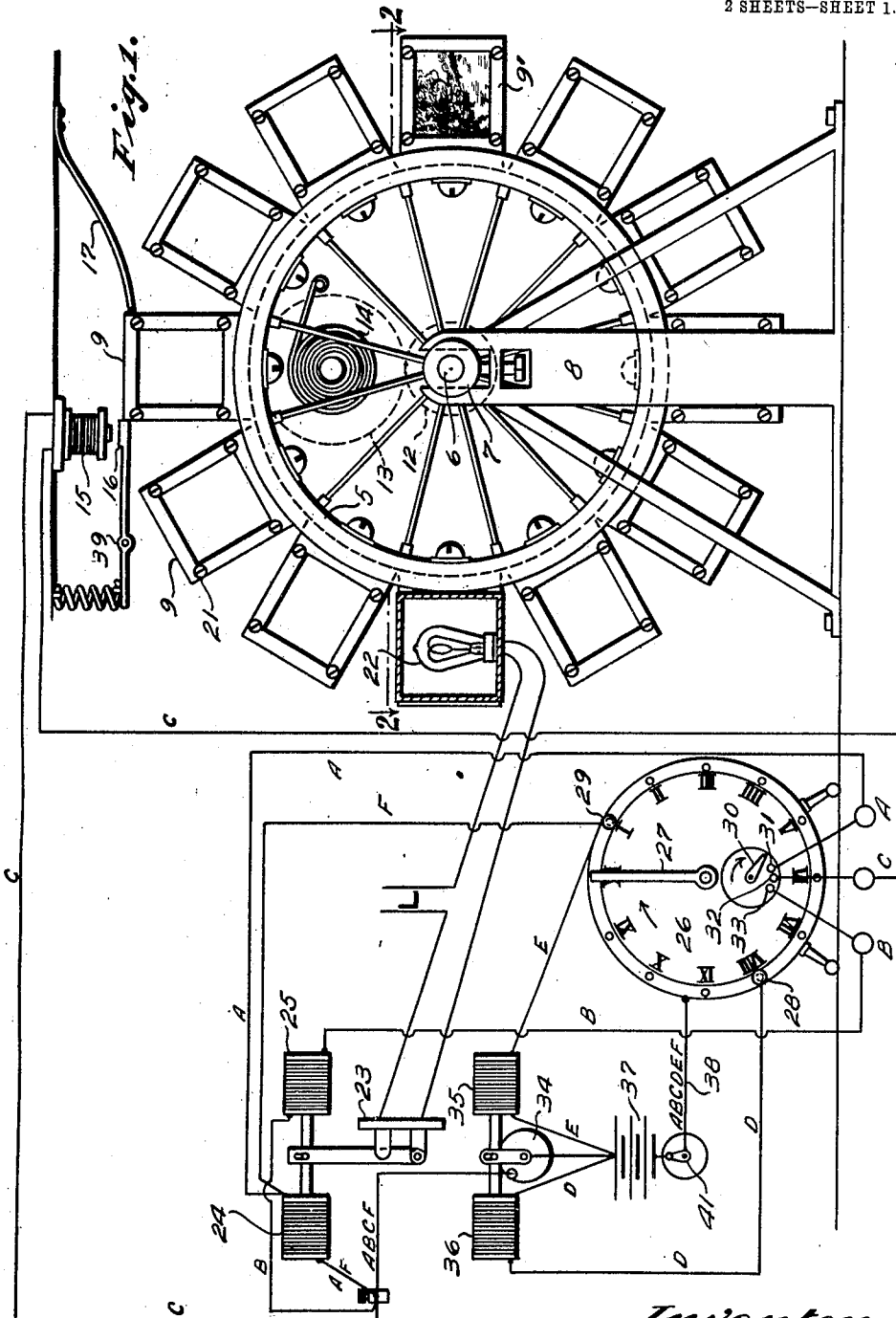


No. 817,251.

PATENTED APR. 10, 1906.

M. H. KILLEN.
AUTOMATIC STEREOPTICON APPARATUS.
APPLICATION FILED APR. 26, 1905.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

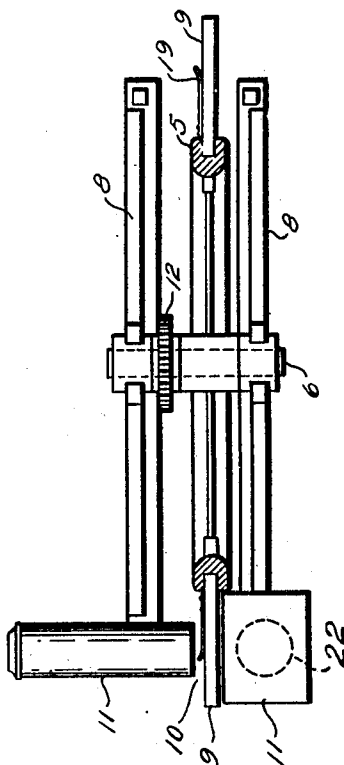


Fig. 3.

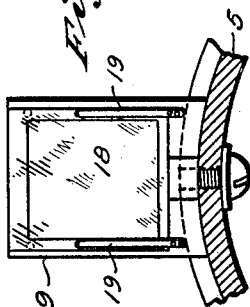


Fig. 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC STEREOPTICON APPARATUS.

No. 817,251.

Specification of Letters Patent.

Patented April 10, 1906.

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To all whom it may concern:

Be it known that I, MARCUS H. KILLEN, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Stereopticon Apparatus, of which the following is a specification.

This invention relates to magic lanterns and stereopticon apparatus, and has particular reference to mechanisms for automatically controlling the operation of a device of this class so that all of the various manipulations necessary for exhibiting a series of pictures will be successively carried out without requiring the attention of an operator.

The main object of this invention is to provide automatic controlling mechanism for successively changing the pictures exhibited by a stereopticon, to provide means for automatically starting the device and causing the same to operate automatically to present a series of pictures and finally to automatically cease to operate after the expiration of a certain predetermined period of time, to provide improved electrically-controlled mechanisms for accomplishing the foregoing objects, to provide an improved form of slide-holding device whereby each slide of a series may be independently focused and whereby other slides may be readily substituted for slides already focused without disturbing the focusing adjustment, and to provide in an electrically-controlled device of this class improved means whereby each circuit is automatically broken when its current is not longer required, thereby preventing unnecessary expenditure of power. I accomplish these objects by the device shown in the accompanying drawings, in which—

Figure 1 is an elevation, partly diagrammatic, of a stereopticon apparatus constructed according to my invention, the casing and some parts of the lantern being omitted for the sake of more clearly showing the working parts. Fig. 2 is a horizontal section of the same on the line 2 2 of Fig. 1 with some of the spokes of the slide-holding member omitted for clearness. Fig. 3 is a detail of the slide-holder, the arm of the supporting member being partly broken away. Fig. 4 is an end view of the same.

The main features of the device which is shown in the drawings are a lantern such as

is used for projecting transparent pictures upon a screen, a slide-holding member having thereon an annular series of lantern-slide holders lying in the same plane with each other and spaced at equal angular intervals, spring mechanism normally urging the rotation of said member, mechanism for intermittently stopping such rotation to successively bring different slides into positions of alinement with the lenses of the lantern, time-controlling mechanism for controlling the successive movements of the slide-holding member and for extinguishing the light of the lantern during periods in which the change of slides is taking place, and mechanism for starting the device at a certain hour of the day and stopping the operation of the same after the expiration of a certain predetermined interval of time.

In the construction shown in the drawings the plate-holding member 5 is in the form of a wheel mounted on a horizontally-disposed shaft 6, which is journaled in adjustable bearings 7 in the supporting-frame 8. The member 5 has a series of equally-spaced plate-holders 9 secured to its periphery. The plate-holders 9 lie in the same plane with each other and are arranged to pass edgewise through the slide-space 10 of a lantern 11, mounted at one side of the supporting-frame.

The member 5 is provided with spring mechanism adapted to normally urge its rotation, said mechanism being indicated by the pinion 12, the gear 13, and the coiled spring 14. The rotation of the member 5 is controlled by an escapement device which consists of an electromagnet 15, having an armature 16, mounted to move into and out of the path of the slide-frame. The armature 16 is normally urged into position for engaging the advancing edge of one of the frames 9, as is seen in Fig. 1. Recoil of the member 5 after engaging the armature 16 is prevented by means of a spring 17, secured to a convenient part of the inclosing casing, said casing having been omitted from the drawings.

The plate-holders 9 are each in the form of a hollow channel-shaped frame fitting the slide 18 and open on the end which is radially outward to permit the plates to be readily slid into or withdrawn from the frame. The plate is retained within the frame by spring-clips 19 and bears on the face oppo-

site said clips upon a loose frame 20. The frame 20 is adjustable against the pressure of the clips 19 by means of four adjusting-screws 21 at its respective corners. The frame 20 serves to prevent direct contact between the set-screws 21 and the glass of the lantern-slide, and thus prevents unequal strain upon the glass and consequent tendency to break. The function of the screws 21 is to permit of certain adjustment of the slide to bring it into exact focus with the lenses of the lantern.

The light of the lantern is an incandescent electric light 22 and receives its energy from an electric circuit, (indicated at L.) This circuit is controlled by a knife-switch 23, which is respectively opened and closed by solenoids 24 and 25.

The operation of the various mechanisms which have been described is controlled by means of a time mechanism, which is indicated by the clock-dial 26 in Fig. 1. This clock is provided with an hour-hand 27, which is adapted to have electrical contact with two contact-buttons 28 and 29, which are otherwise insulated from the clock, but are adjustable around the dial, so as to be engaged by the hand 27 when such hand arrives at a desired position on the dial. The buttons 28 and 29 are adjusted to different positions by inserting their shanks in the small apertures surrounding the dial. The clock is also provided with a seconds-hand 30, which makes a complete revolution every minute and which at certain intervals of each revolution successively comes into electrical contact with buttons 31, 32, and 33.

The various electrical circuits are indicated in the drawings by letters of the alphabet, the conductors of each circuit being indicated by the same letter throughout. Where conductors are marked with a plurality of letters, such conductors form a part of each of the circuits indicated by either of such letters.

The circuit L supplies current for the light 22 of the lantern and is otherwise independent of the controlling-circuits. The circuit L is controlled by the knife-switch 23. The circuits A, B, C, and F are controlled by means of a switch 34, which is opened by the solenoid 35 and closed by the solenoid 36. All of the circuits A, B, C, D, E, and F receive current from a battery 37. The conductor 38 connects directly with the clock-casing, which is in electrical circuit with the remaining parts of the time mechanism of the clock and forms a part of each of the controlling-circuits. The contact-buttons 28, 29, 31, 32, and 33 are all insulated from the clockwork mechanism and have electrical communication therewith only when the respective hand is in contact therewith.

The circuit D, which controls the solenoid 36, is in circuit with the contact-button 28

and controls the closing of the switch 34 for starting the various operations of the apparatus, as will be hereinafter described. Similarly, the circuit E operates the solenoid 35 for opening the switch 34 when the hand 27 is in contact with the button 29. The circuit F controls the solenoid 24 and opens the knife-switch 23 for cutting out the light 22 when the hand 27 is in contact with the button 29. The circuit A is closed when the seconds-hand 30 is in contact with the button 31 and operates the solenoid 24 for extinguishing the light. The circuit C controls the magnet 15 and operates the armature 16 of the escapement-pawl 39. The circuit B when closed by the seconds-hand 30 turns on the light 22.

The operation of the device shown is as follows: A lantern-slide is inserted into each of the frames when said frame is in the position 9' at the right of Fig. 1. The slide is inserted in an upright position and will therefore be inverted when it comes into alinement with the lenses of the lantern, as is usual in devices of this class. The operator then shifts the button 28 to a position on the periphery of the dial of the clock to correspond to the time at which it is desired to have the display of pictures commence. The contact-point 29 is also adjusted to the time at which the exhibition is to cease. The clock is then wound and set and allowed to run, the switches 34 and 23 being opened. When the hour-hand 27 arrives at the contact-button 28, shown at eight o'clock in the drawing, then the circuit D is complete and the solenoid 36 closes the switch 34, thus connecting the battery with the circuits A, B, C, and F. When the seconds-hand 30 now arrives at the contact-point 33, the circuit B is closed and the solenoid 25 closes the switch 23 and turns on the light 22 in the lantern. During each rotation of the seconds-hand 30 the circuits A, C, and B will be successively closed through contact of the hand 30 with the buttons 31, 32, and 33. When the circuit A is closed, then the solenoid 24 opens the switch 23 and cuts out the light. The hand 30 next arrives at the contact-point 32, completing the circuit C and causing the magnet 15 to lift the pawl 39 for an instant to permit the spring to bring the next succeeding slide into alinement with the lenses and light of the lantern. As soon as the hand 30 reaches the contact-point 33 the circuit B is again complete and the light 22 turned on. These operations of successively extinguishing the light, shifting the slides, and relighting the light are repeated during each minute, the picture being exhibited during that portion of the minute in which the hand 30 passes from contact-point 33 to the contact-point 31. The duration of the contact between the hand 30 and the contact-points need only be instantaneous, and said contact-points may there-

fore be small and near together. Thus it will be seen that the wheel 5 rotates intermittently and the pictures are successively exhibited, the series being repeated whenever the wheel 5 has made a complete revolution. The device continues to operate until the hand 27 reaches the contact-point 29. The circuits E and F are then simultaneously completed, and the solenoids 35 and 24 simultaneously open the switches 34 and 23, respectively, cutting off all of the operating-circuits except the circuits E and F, which are cut off as soon as the hand passes off of the button 29. Unless the setting of the contact-button 28 is changed before the hour-hand 27 again arrives at eight o'clock the device would again commence operating at that hour.

The switch 41 controls all of the battery-circuits, and if said switch is opened the device will not operate until the switch is again closed.

It will be seen that numerous details of the construction shown may be altered without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a lantern of the class described having a space for lantern-slides in alinement with its lenses, a supporting-frame, a member movably mounted in said frame and having thereon a series of slide-frames lying substantially in the same plane and each adapted to hold a lantern-slide, means for intermittently moving said member to bring said slide-frames successively into said space, and means for adjusting each of said slides laterally of its plane and independently of the other slides.

2. The combination of a lantern of the class described having a space for lantern-slides in alinement with its lenses, a supporting-frame, a member movably mounted in said frame and having thereon a series of slide-frames lying substantially in the same plane and each adapted to hold a lantern-slide, means for intermittently moving said member to bring said slide-frames successively into said space, means for adjusting each of said slides laterally of its plane and independently of the other slides, said slide-frames being arranged to permit slides to be removed and replaced therein without affecting the setting of said adjusting means.

3. In a device of the class described, the combination of a rectangular frame having its side and end bars grooved for loosely holding a glass plate, spring-clips adapted to bear on one face of said plate near its edges for clamping the plate in position, and a set-screw near each corner of the plate on the side opposite said clips and adapted for adjusting the plate laterally of the plane of said frame, all arranged to permit said plate to be readily removed and replaced in the frame

without affecting the setting of said set-screws.

4. The combination of a lantern of the class described having lenses, a space for lantern-slides, and an electric light in optical alinement with each other; a slide-supporting member having thereon a series of lantern-slides, means urging the shifting of said member to move said slides in succession through said space, an electromagnet escapement device for intermittently stopping the movement of said member to successively bring each slide to rest in said space; a light-circuit, a switch controlling said light-circuit, electromagnetic means for opening and closing said switch; and clockwork mechanism for timing the operation of said means and escapement device whereby said member will be shifted at predetermined intervals and whereby said light will be exposed while said member is at rest and cut off while said member is in motion.

5. The combination of a lantern of the class described having lenses, a space for lantern-slides, and an electric light in optical alinement with each other; a slide-supporting member having thereon a series of lantern-slides, means urging the shifting of said member to move said slides in succession through said space, an electromagnet escapement device for intermittently stopping the movement of said member to successively bring each slide to rest in said space; a light-circuit, a switch controlling said light-circuit, electromagnetic means for opening and closing said switch; individual circuits controlling the opening of said switch, the operation of said escapement device, the closing of said switch; and clockwork mechanism for successively closing and breaking said circuits to shift said member at predetermined intervals of time and respectively cut off and expose said light before and after the shifting of said member.

6. The combination of a lantern of the class described having lenses, a space for lantern-slides, and an electric light in optical alinement with each other; a slide-supporting member having thereon a series of lantern-slides, means urging the shifting of said member to move said slides in succession through said space, an electromagnet escapement-device for intermittently stopping the movement of said member to successively bring each slide to rest in said space; a light-circuit, a switch controlling said light-circuit, electromagnetic means for opening and closing said switch; individual circuits controlling the opening of said switch, the operation of said escapement device, the closing of said switch; a second switch for breaking said individual circuits, electromagnetic means having separate circuits for opening and closing said second switch; and clockwork mechanism having contact devices connected with

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said circuits and arranged to close said second switch, then to successively cut off the light, operate the escapement device, and turn on the light, and to repeat such successive operations at intervals during a certain predetermined period of time, and then to open both of said switches.

Signed at Chicago this 21st day of April, 1905.

MARCUS H. KILLEN.

Witnesses:

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