V. FREDERIKSEN.

PICTURE SLIDE CONTROLLER FOR STEREOPTICONS.

APPLICATION FILED SEPT. 29, 1913.

1,141,456.

Patented June 1, 1915.

3 SHEETS—SHEET 1.

Fig. 3.

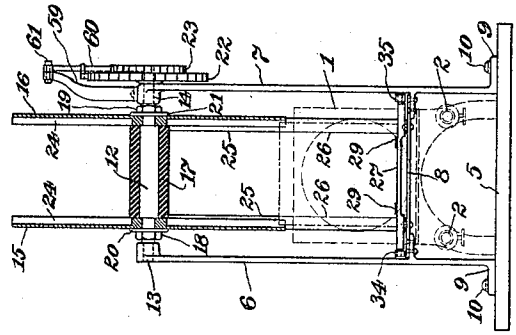


Fig. 1.

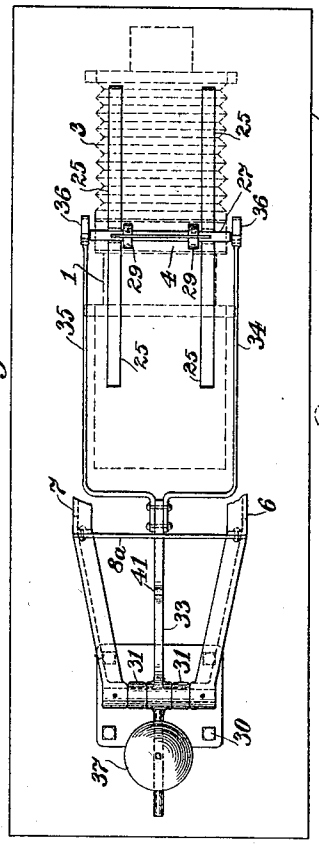
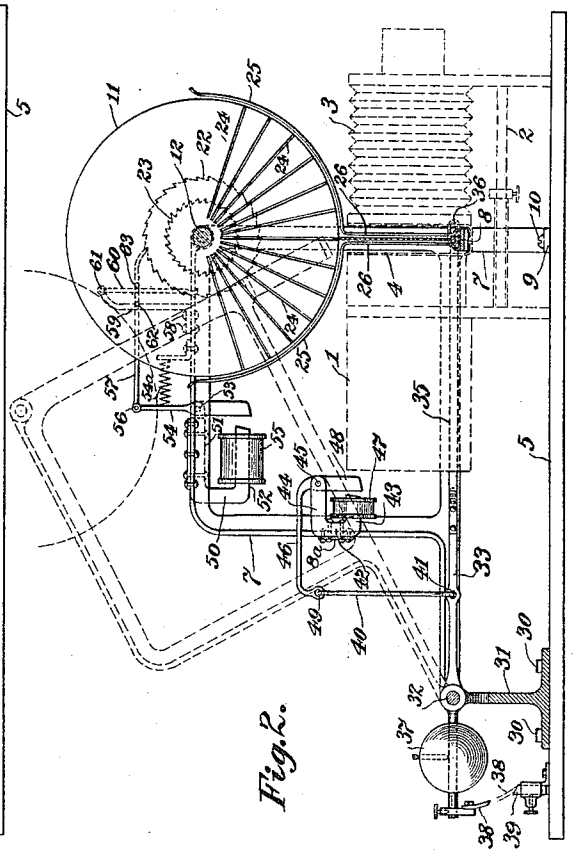


Fig. 2.



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Fig. 4.

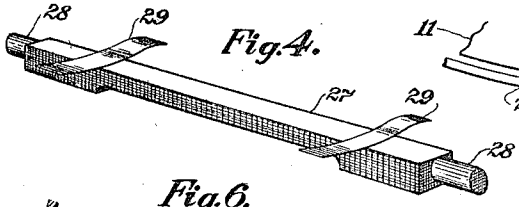


Fig. 5.

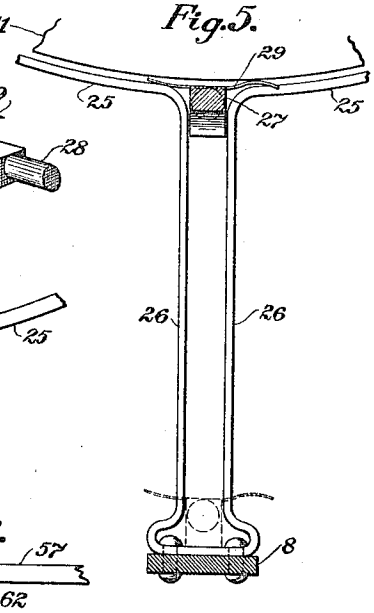


Fig. 6.

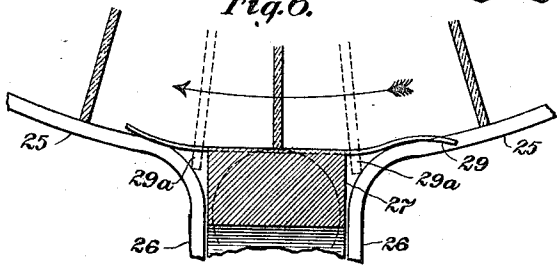


Fig. 8.

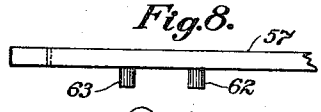
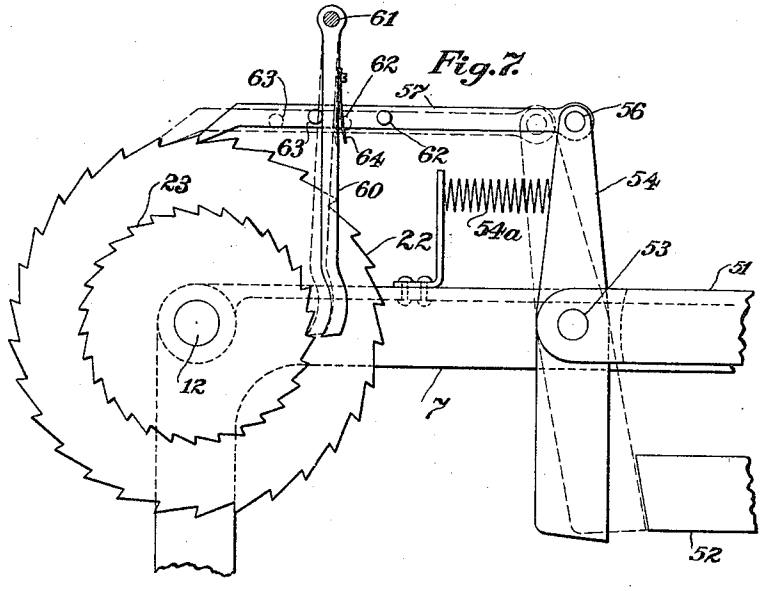


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 9.

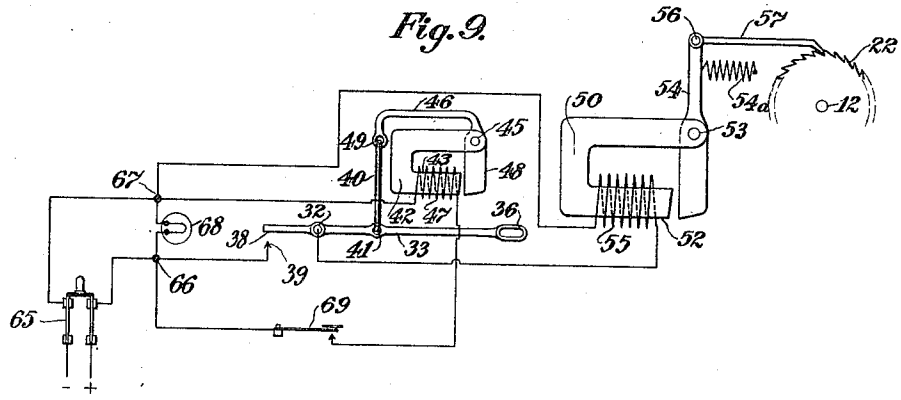
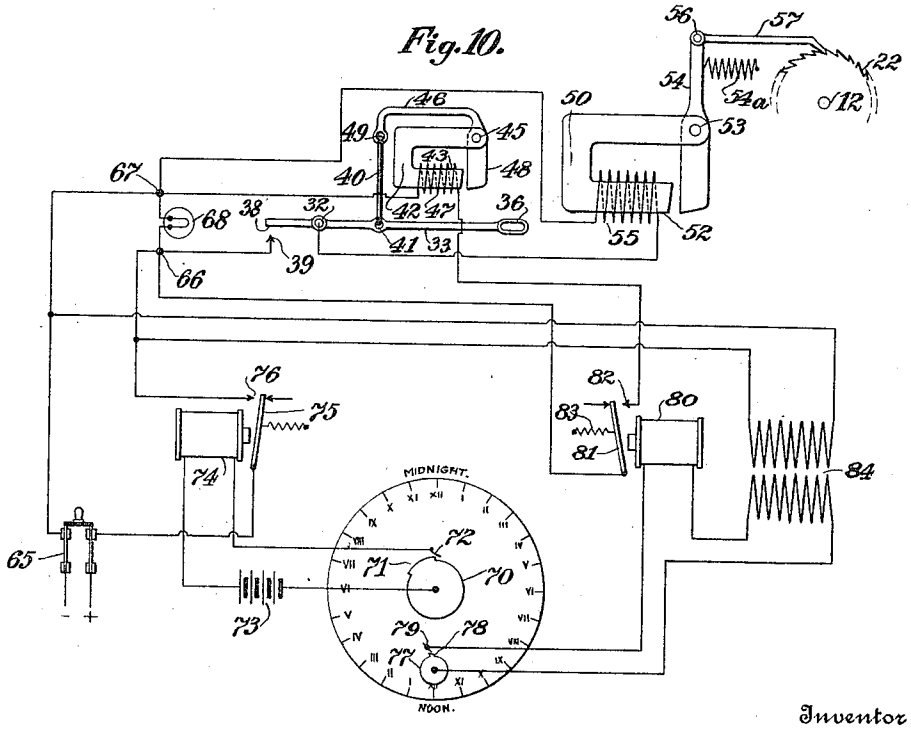


Fig. 10.



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UNITED STATES PATENT OFFICE.

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PICTURE-SLIDE CONTROLLER FOR STEREOPTICONS.

1,141,456. Specification of Letters Patent. Patented June 1, 1915.

Application filed September 29, 1913. Serial No. 792,384.

To all whom it may concern:

Be it known that I, VICTOR FREDERIKSEN, a subject of Christian X, King of Denmark, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Picture-Slide Controllers for Stereopticons, of which the following is a specification.

The object of my invention is to provide convenient means for changing the slides of stereopticons, and relates particularly to improvements in the device for which patent was granted to Arthur K. Wait, #828790, August 14, 1906. In this device it was necessary to operate the mechanism by hand or external power. In the machine of my invention I am enabled to operate the successive movements by electromagnets.

In the drawings, Figure 1 is a plan view of my invention in which the slide drum and the electromagnets and their connections are removed. Fig. 2 is a longitudinal section of the same with the slide drum and the electromagnets in place. Fig. 3 is a transverse section taken on a vertical plane through the center of the slide drum. Fig. 4 is a detail view, in perspective, of the cross head as used in this machine. Fig. 5 is a part longitudinal section taken through the center of the cross head, and Fig 6 is an enlarged part section showing the cross head raised and ready for a partial revolution of the slide drum. Fig. 7 is an enlarged side elevation of the ratchet escapement on the drum shaft and Fig. 8 a partial plan view of the main ratchet pawl showing the escapement pins. Fig. 9 is a wiring diagram for the device when controlled by hand and Fig. 10 is a wiring diagram when controlled by a time clock.

Referring now to the drawings in which like parts are given the same reference numbers wherever they occur, 1 represents a stereopticon with adjusting rods 2 for the bellows 3. At 4 is an opening in the stereopticon for the admission of the picture slides. At 5 is a base upon which is placed the stereopticon and various parts of the mechanism of my invention. At 6 and 7 are provided side frames which are tied together by means of tie bars 8, and 8^a, transversely of the machine. The side frames are provided with feet 9 at their forward ends for attachment to the base 5 by means of the screws 10. Mounted above the stereopticon between the frames 6 and 7 is a drum 11 which is secured to a shaft 12, the said shaft 12 being journaled in the side frames 6 and 7 at 13 and 14 respectively. The drum 11 is adapted to carry the picture slides and to this end it is made up of two heads 15 and 16 which are clamped against an enlarged portion of the shaft 12, by means of the nuts 18 and 19. A rubber sleeve 17 is placed around the central portion of the shaft 12 in order to prevent the slides from being wedged into the bottom of the slide grooves. In order to secure uniform pressure against the heads 15 and 16, washers 20 and 21 are interposed between the said nuts 18 and 19 and the heads 15 and 16. One end of the shaft 12 extends through the journal 14 in the side frame 7 and to the projecting end is secured a pair of reversely disposed ratchet wheels 22 and 23 which are a part of the operating mechanism which will be hereinafter described.

In order to provide means for receiving the picture slides in the drum 11 one side of each of the heads 15 and 16 is provided with a plurality of radial grooves 24 which are disposed at equal intervals about the full circumference of the heads. The heads, in being assembled on the shaft 12 are placed with the radial grooves turned inwardly, the grooves in one head being located immediately in line, transversely, with the grooves in the other head, the two sets of grooves thus forming a series of guides for the said picture slides, the edges of which are retained in the said grooves. In Fig. 2 these grooves 24 are shown as being formed only in the lower portions of the heads, but in reality they are similarly disposed for the full circumference.

About the lower half of the outer periphery of the drum 11 are placed two guards 25 which are formed to follow a circle concentric with the drum, the purpose of these guards being to retain the picture slides in the guides or grooves 24 when the drum turns to bring them in the lower half of a revolution when they would otherwise drop out of the grooves by gravity. Immediately under the drum 11, however, the guards 25 are bent downwardly as shown at 26 and form a guide for the alternately upward and downward movement of a cross head 27. As the various picture slides in the grooves are in turn brought into position over the cross head 27 in the guide 26, they are first lowered into the path of the light of the stereopticon

and then returned into the grooves 24 of the drum. The drum then makes another partial revolution, bringing another slide into position over the cross head when the operation is repeated. In lowering a picture slide on the cross head, however, the travel of the cross head is so adjusted that when the picture slide is in the lowest position of its travel the upper portion of the slide will still extend slightly into the grooves of the drum as shown in Fig. 3. This will insure that when the cross head is raised the picture slide will return to its normal position in the grooves.

The cross head 27 is shown in detail in Fig. 4. This cross head is substantially a bar, extending transversely of the machine, the ends being formed in the shape of short cylinders 28. To the upper surface of the cross head are attached transversely of the cross head small deflecting strips 29 the purpose of which is to prevent the picture slides from hanging up between the guide 26 and the side of the cross head 27 when the cross head is in the upper portion of the guide, and the drum is revolved. This is shown in an enlarged view in Fig. 6, in which figure the dotted lines at 29ª show the position the picture slide might assume were it not for these strips.

In Fig. 5 is shown the cross head 27 in position in the top of the guide 26, the dotted lines at the bottom indicating its position when at the bottom of the guide. This figure also shows in detail the method of supporting the guards 25, which is done by riveting them to the tie bar 8.

The mechanism used for raising and lowering the cross head 27 will now be described. Secured to the base 5 by the bolts 30 is a bracket 31 whose upper portion is bifurcated, and is adapted to receive a shaft 32. The shaft 32, which is journaled in the bracket 31 extends out slightly beyond the bracket at each side. Journaled on the shaft 32 between the forked ends of the bracket 31 is a horizontally disposed lever 33. This lever is forked at its front end, the branches 34 and 35 being disposed at either side of the stereopticon. The extreme forward ends of the branches 34 and 35 of the lever 33 are provided with oblong slots 36 which are adapted to receive the cylindrical ends of the cross head 27, the length of the slots 36 being such as to allow for the increased distance between the center of the shaft 32 and the cross head 27 when the latter is moved upward in the guide 26. On the rear end of the lever 33 is a movable counterweight 37 while at the rear extremity of the lever 33 is an electric contact piece 38 adapted to make a contact with an electric terminal 39 on the base 5 when the front end of the lever 33 is raised and the rear end of the same depressed. It will of course be understood that this contact might be located on any other suitable part of the mechanism, as for example on the cross head 27 without departing from the spirit of my invention.

The lower end of a link 40 is attached to the lever 33 at 41, between the fulcrum point on the shaft 32 and the front end of the lever.

Attached to the frame cross tie 8ª is an electro-magnet 42. The lower core 43 of this electromagnet carries the winding 47, while the upper core 44 forms a fulcrum 45 for a bell crank lever 46, the vertical arm 48 of the bell crank lever forming the movable armature of the electromagnet.

When an electric current is passed through the coil 47 of the magnet the depending end 48 of the bell crank lever 46 will be drawn in against the end of the lower core 43, and the lever, fulcruming about 45 will raise the link 40 which is attached to the lever 46 at 49. The link 40 will in turn raise the front end of the lever 33, which movement will raise the cross head 27 together with the picture slide resting upon it.

The mechanism for revolving the drum 11 will now be described. Attached to the side frame 7 and disposed slightly outside of the same is an electromagnet 50. The lower core 52 of this electromagnet carries the winding 55, while the upper core 51 forms a fulcrum at 53 for a vertically disposed lever 54. The lower end of this lever forms the movable armature of the electromagnet. To the upper extremity of the lever 54 is pivoted, at 56, a ratchet pawl 57 which is adapted to engage the teeth of the ratchet wheel 22 which has been previously referred to. At 58 a bracket 59 is attached to the side frame 7, to the upper end of which is pivoted a ratchet pawl 60 at 61. This ratchet pawl is adapted to engage the teeth of the previously mentioned ratchet wheel 23. Laterally of the machine, the ratchet pawl 60 is located just outside of the ratchet pawl 57. At 62 and 63 are pins or projections on the ratchet pawl 57 so disposed that they will strike the ratchet pawl 60 so as to bring it into and out of engagement respectively with the teeth of the ratchet wheel 23. Fig. 7 shows this ratchet mechanism in detail, in which figure the full lines indicate the positions of the parts at the beginning of a forward stroke and the dotted lines their positions at the end of a forward stroke. The action of these ratchets will be readily understood by reference to the drawings, the purpose of the ratchet wheel 22 and the pawl 57 being to revolve the drum 11 for a portion of a revolution and the purpose of the ratchet wheel 23 and the pawl 60 being to limit the extent of this movement and to stop the drum in a position so as to bring a picture slide immediately over the cross head 27.

In order that the movement of the drum 11 may be stopped by the pawl 60 against a tooth of the ratchet wheel 23 and not by the pin 62 pressing against the pawl 60, a spring 64 is attached to the pawl 60. This spring 64 is so disposed that the pawl 57 may continue for a short distance forward after the pin 62 has pushed the pawl 60 against the ratchet wheel 23, thereby insuring that the movement will be finally stopped, as before stated, by the ratchet wheel 23 and pawl 60.

In order that the stereopticon may be readily removed to be cleaned or for other purposes, the rear ends of the side frames 6 and 7 are secured to the projecting ends of the shaft 32. When the screws 10 are loosed the front end of the device may be swung upward out of the slot in the stereopticon, as shown in dotted by lines in Fig. 2, when the same may be readily removed from the base 5.

In order that the device may be operated at a distance, as by a lecturer before an audience, I provide a system of electrical control as shown in Fig. 9. In this arrangement the switch 65 connects the wiring of this machine with an external electrical source, and from this switch the wires are carried to the junction points 66 and 67. Across the points 66 and 67 is wired the electric light 68 for the stereopticon. The entire diagram will be readily understood by a description of the operation as follows. The mechanism is at rest in a position where the cross head 27 is at the bottom of its travel with a picture slide in the path of the light of the stereopticon, and the operator desires to show a different picture. He closes an electrical circuit by means of the key 69 and holds this key down for a short interval until the parts perform their movements as follows: The current flowing through the key 69 excites the electromagnet 42, the end 48 of the lever 46 is drawn in against 43 and the lever 46, fulcruming about 45 raises the link 40 and it in turn the front end of the lever 33. The upward movement of this end of the lever 33 will, through the crosshead 27 return the just used picture slide into its pair of grooves in the drum 11. When the front end of the lever 33 has moved upward a correct distance to return the picture slide, the rear end of the lever 33 has moved downward enough to make contact between the contact piece 38 and the terminal 39, thus automatically closing the circuit to the electromagnet 50. The electromagnet 50 being now excited, the lower end of the lever 54 will be drawn in against the core 52 and the drum 11 will be revolved a portion of a revolution through the action of the ratchet pawl 57 on the ratchet wheel 22, the motion of the drum being arrested by the pawl 60 in such a position that the next picture slide will be immediately over the cross head 27. The operator now releases the key 69, breaking the circuit to the electromagnet 42. The combined weights of the parts on the front end of the lever 33 slightly overbalancing the weights on the rear end of the same, the cross head 27 will descend in the guide 26 and thus bring the new picture slide into the path of the light of the stereopticon. At the same time the ratchet pawl 57 will be drawn back into position for a new forward movement by the action of the spring 54ª on the lever 54. The entire mechanism is now in position for another change of picture slides.

While the lever 33 is shown and described as being drawn up at the forward end by the electromagnet 42 and dropping by gravity, yet in some instances it might be desirable to reverse this action having the forward end raised by gravity and drawn down by the action of the electromagnet.

In Fig. 10 is shown a diagram of the wiring in cases where it is desired to operate the machine automatically from a clock, as for example, in displaying advertisements and changing them at regular intervals. In this arrangement the switch 65 may remain continuously in the closed position as shown in the diagram. Affixed to the hour hand stem of the clock is a disk 70 which is provided with an extended portion 71 adapted to be contacted by a suitable brush 72. This brush 72 may be in contact with the disk for any length of time desired, the disk shown being arranged for operation from 8 o'clock to 12 o'clock at night. During this period the current from the batteries 73 will excite the relay 74, and the armature 75 will be drawn against the contact 76, thereby cutting in the current from the outside source to operate the mechanism as previously described, when the electromagnets 42 and 50 are periodically excited. For the purpose of periodically exciting these electromagnets the ordinary second hand of the clock is replaced by a disk 77 which is provided with a projection 78 adapted to be contacted by a brush 79. When these are in contact current from the line will pass through the relay 80 when the armature 81 will be drawn over against the contact 82 which will complete the circuit to the electromagnet 42. The operation of the mechanism from this on is identical with that already described in connection with the diagram shown in Fig. 9.

In order that the several movements required to effect a change of picture slides may be completed, the peripheral length of the projection 78 on the disk 77 will be such that the relay 80 will be excited for a sufficient length of time to complete the necessary mechanical movements of replacing a slide and revolving the drum 11 when

the contact will be broken between the projection 78 and the brush 79. Current no longer flowing through the relay 80, the armature 81 will be pulled back by the spring 83 and the circuit to the electromagnet 42 will be broken which, as already described, will allow the front end of the lever 33 to descend bringing a new picture slide into the path of the light of the stereopticon. At the same time the contact between the contact piece 38 and the terminal 39 will be broken and current no longer flowing through the electromagnet 50, the lever 54 will be drawn into position for the next partial revolution of the drum 11, by the action of the spring 54a.

It will of course be understood that more than one change of pictures may be effected in one minute by providing a corresponding number of the projections 78 on the disk 77.

In order that the current for the relay 80 may be at a low potential a transformer 84 is used, the current for the primary winding of the transformer being taken from the line wires as already described. This renders the periodical making and breaking of the current at 78 and 79 less difficult than if attempted at standard lighting circuit voltages.

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

1. In a picture slide controller for stereopticons, the combination of a drum having grooves adapted to receive picture slides, a cross-head adapted to convey the picture slides from said grooves into and out of the path of the light of the stereopticon, an electromagnet adapted to move said cross-head, and a second electromagnet adapted to revolve said drum for a portion of a revolution, the movement of the said cross-head by the first electromagnet being further adapted to complete the electric circuit to the said second electromagnet.

2. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides, a cross head adapted to convey the picture slides from said grooves first into the path of the light of the stereopticon and then back into the said grooves, an electromagnet adapted to move the said cross head, an electric circuit adapted to be alternately opened and closed by the movement of said cross head when it conveys a picture slide into and out of the path of the light of the stereopticon respectively and a second electromagnet embraced in the said electric circuit and adapted to revolve the said drum for a portion of a revolution when the said electric circuit is closed by the aforesaid movement of the crosshead.

3. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides, a cross head adapted to convey the picture slides from said grooves first into the path of the light of the stereopticon and then back into the said grooves, a lever adapted to actuate said cross head, an electromagnet adapted to actuate the said lever, a second electromagnet adapted to revolve the aforesaid drum for a portion of a revolution, and means for alternately opening and closing the electric circuit to the said second electromagnet from the movements of the aforesaid lever.

4. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides, a horizontally disposed lever pivoted below said drum, said lever being bifurcated at its forward end, a cross head carried in the arms of said lever and adapted to alternately rise and fall in guides with the forward ends of said lever, the said cross head being further adapted to receive a picture slide from grooves in the said drum when in the uppermost position of its travel, an electromagnet adapted to actuate said lever, a second electromagnet adapted to revolve the said drum for a portion of a revolution each time the said second electromagnet is excited, and means for closing the electric circuit to the said second electromagnet when the said cross head is in the uppermost position of its travel.

5. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides said drum being mounted on a horizontal shaft, a cross head adapted to convey the picture slides from said grooves first into the path of the light of the stereopticon and then back into th esaid grooves, a horizontally disposed lever adapted to actuate said cross head, an electromagnet adapted to actuate the said lever, a pair of reversely disposed ratchet wheels mounted on the shaft of the said drum, ratchet pawls adapted to engage the teeth of the said ratchet wheels, a second electromagnet adapted to move the first of the said ratchet pawls to revolve the said drum for a portion of a revolution, and projections on the first of the said ratchet pawls adapted to force the second of the said ratchet pawls into or out of engagement with the teeth of the second of the aforesaid ratchet wheels to limit the movement of the said drum.

6. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides, a cross-head adapted to convey the picture slides from said grooves first into the path of the light of the stereopticon and then back into the said grooves, a lever adapted to actuate said cross-head, an electromagnet adapted to actuate the said lever, a second

electromagnet adapted to revolve the aforesaid drum for a portion of a revolution, a clock having contacts thereon whereby the electric circuit to the first of the aforesaid electromagnets may be alternately opened and closed, and electric contacts whereby the circuit to the second of the aforesaid electromagnets may be alternately opened and closed, said contacts being alternately engaged and disengaged by the movements of the said lever.

7. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides, a cross-head adapted to convey the picture slides from said grooves first into the path of the light of the stereopticon and then back into the said grooves, a lever adapted to actuate said cross-head, an electro-magnet adapted to actuate the said lever, a second electromagnet adapted to revolve the aforesaid drum for a portion of a revolution, a clock having contacts thereon whereby the electric circuit to the first of the aforesaid electromagnets may be alternately opened and closed, electric contacts whereby the circuit to the second of the aforesaid electromagnets may be alternately opened and closed, said contacts being alternately engaged and disengaged by the movements of the said lever, and a clock having contacts thereon whereby the electric circuit from an external source may be opened and closed to cut in and out the entire operation of the machine.

8. In a picture slide controller for stereopticons the combination of a drum having grooves adapted to receive picture slides, a cross head adapted to convey the picture slides from said grooves into and out of the path of the light of the stereopticon, and transverse deflecting strips attached to the upper surface of said cross head, substantially as described.

9. In a picture slide controller for stereopticons, the combination of a drum having grooves adapted to receive picture slides, a cross head adapted to convey the picture slides from said grooves into and out of the path of the light of the stereopticon, concentric guards about the lower half of the periphery of the said drum, said guards being carried downward immediately under the center of the drum and adapted to form a guide for the said cross head, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

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J. G. Scotts.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."