W. J. ASHLEY.

ATTACHMENT FOR PROJECTION APPARATUS.

APPLICATION FILED APR. 28, 1909.

941,752. **Patented Nov. 30, 1909.**

2 SHEETS—SHEET 1.

Fig. 1.

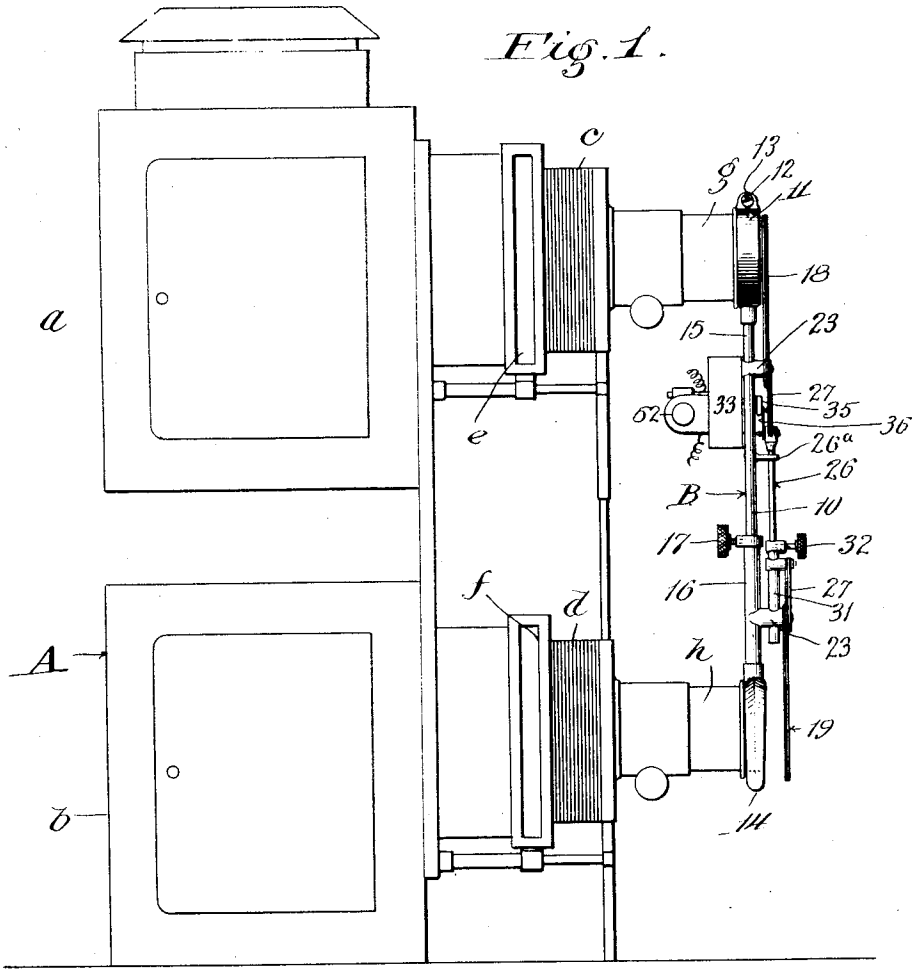
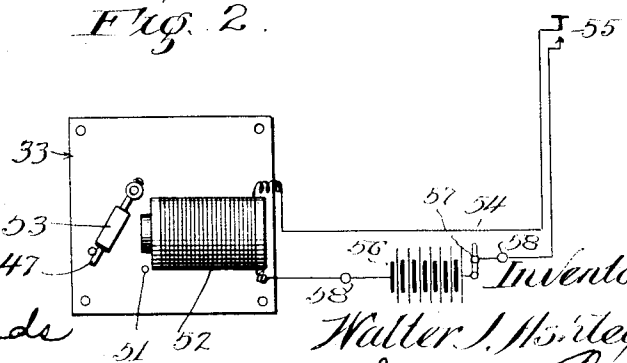


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

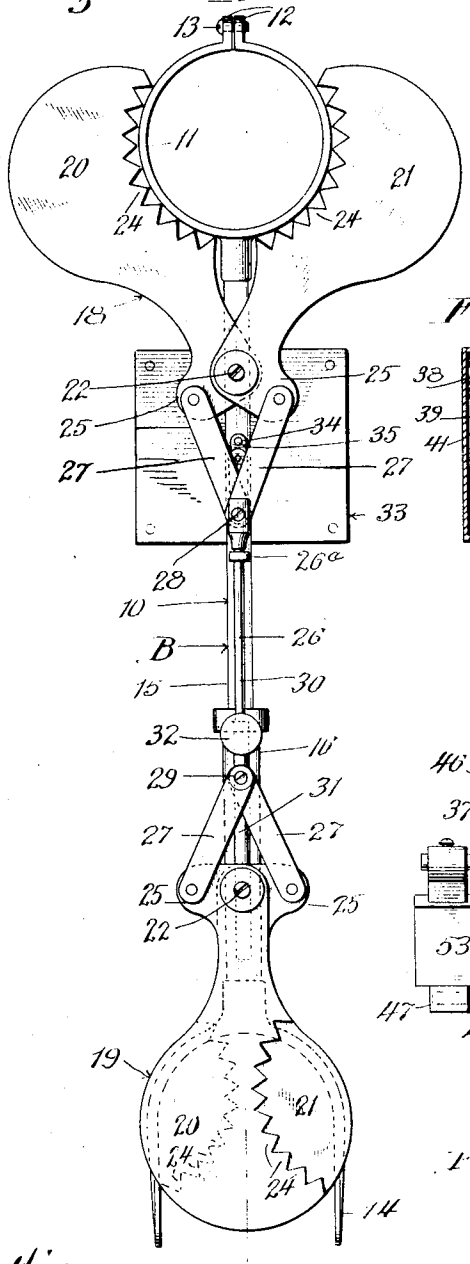


Fig. 7.

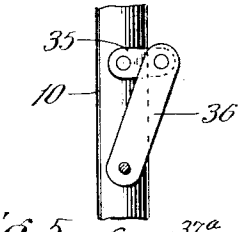


Fig. 5.

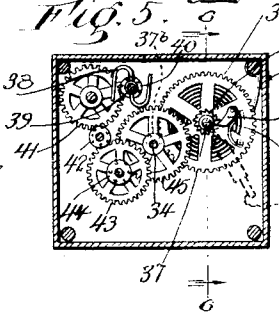


Fig. 6.

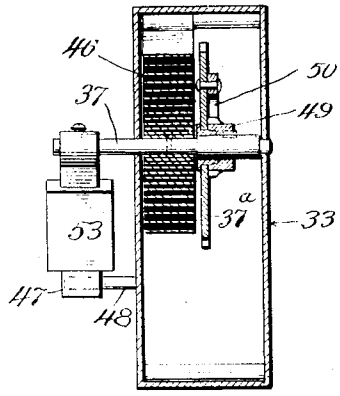


Fig. 8.

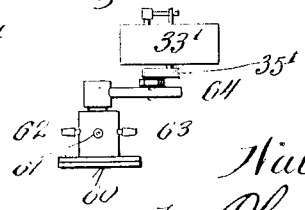
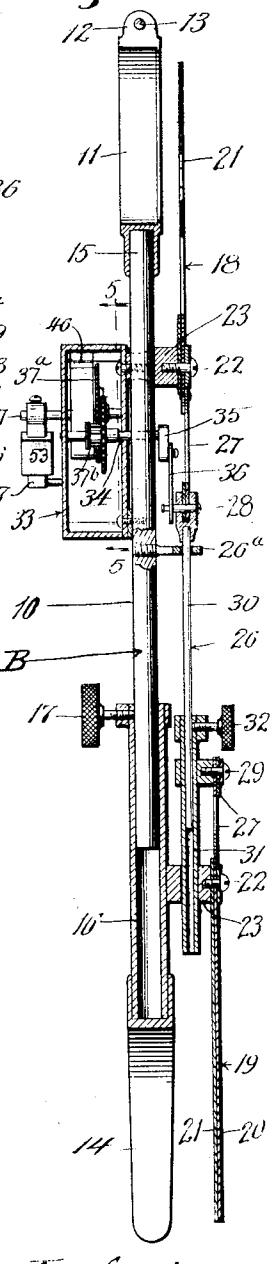


Fig. 4.



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UNITED STATES PATENT OFFICE.

WALTER J. ASHLEY, OF OAK PARK, ILLINOIS.

ATTACHMENT FOR PROJECTION APPARATUS.

941,752. Specification of Letters Patent. Patented Nov. 30, 1909.

Application filed April 28, 1909. Serial No. 492,618.

To all whom it may concern:

Be it known that I, WALTER J. ASHLEY, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented new and useful Improvements in Dissolving Attachments for Projection Apparatus, of which the following is a specification.

This invention relates to dissolving attachments for projection apparatus, and more particularly to that class of dissolving attachments for use in connection with stereopticons where it is desirable to have the picture which is projected upon the screen gradually fade away and simultaneously have a new picture gradually appear in place thereof.

The object of this invention is to provide an improved device of the character capable of performing the functions above set forth, and provided with suitable mechanical operating means, which can be set in motion at the instrument or at some point away from the stereopticon.

Another object is to provide in a device of this class a motor for operating the shutters and controlling mechanism whereby the motor can be set in motion either directly, that is by means of a movable device on the motor itself, or it may be set in motion from a distance by means of electrical, pneumatic or other actuating mechanism.

To such ends this invention consists in a dissolving attachment having mechanical means for controlling the light, and provided with setting mechanism capable of being operated at the motor or capable of being operated from a distance.

The invention further consists in the several novel features of construction and arrangement shown and described in this application, and particularly defined in the claims appended hereto.

The invention is clearly illustrated in the drawings furnished herewith, in which—

Figure 1 is a side view of a stereopticon and showing my improved dissolving attachment mechanism attached thereto, Fig. 2 is a rear view of the motor and showing one form of controlling mechanism, Fig. 3 is a front view of the dissolving attachment, Fig. 4 is a detail vertical section taken on the line 4—4 of Fig. 3, Fig. 5 is a view of the motor partly in front elevation and partly in vertical longitudinal section, the line of section being indicated at 5—5 of Fig. 4, Fig. 6 is a detail vertical cross section taken on the line 6—6 of Fig. 5, Fig. 7 is a front view of a certain supporting post, crank arm and link, and Fig. 8 is a side view of a modified form of the invention.

The stereopticon upon which the invention is shown as attached, is seen at A, and is of the ordinary form comprising upper and lower lanterns *a*, *b*, provided with the usual bellows *c*, *d*, slide frames *e*, *f*, and lens mounts *g*, *h*, in which are mounted the usual lens. The particular construction of the lantern is immaterial to my invention, and the one shown in the drawings will serve for the purposes for illustration.

The dissolving attachment is shown at B, and is secured to a stereopticon as for instance by clamping it upon one of the lens mounts. In the arrangement which I have shown, a longitudinally adjustable post or standard 10, is employed which has secured upon its upper end a split ring 11, adapted to surround the upper lens mount and provided with projecting ears 19, in which is threaded a screw 13, by means of which the ring can be clamped upon the lens mount. The lower end of the post or standard 10, is shown as having a fork 14, adapted to straddle the lower lens mount, so as to bring the parts in proper relative position with respect to the stereopticon. In the preferred form, the post or standard is made telescopic, whereby the ring 11, and fork 14, may be adjusted toward or from each other so as to adjust the device to different forms of stereopticons in which the lens mounts are nearer together or farther apart. In the form shown, a stem 15, of the post or standard 10, telescopes into a tube 16, and the two parts are rigidly secured together by securing means here shown in the form of a set screw 17, threaded in the upper end of the tubular portion 16.

Two pairs of shutters 18, 19, are provided, each pair being designed to intercept the rays of light from one of the lanterns when in one position, but to permit the same to be projected upon the screen when moved into an open position. As shown, each pair of shutters comprises two leaves 20, 21, pivoted together at 22, and pivotally mounted upon a post 23, at such pivotal point. The main bodies of the leaves are somewhat of the form of a crescent having serrations 24, along the edges which approximate each other. The shutters are provided with arms

25, by means of which they are oscillated upon their pivots, and said arms are connected to an operating rod 26, by means of links 27. The links are arranged in pairs, one pair for each shutter and each pair of links is pivoted together and to the reciprocating operating rod 26, at the points 28, 29. The shutters are so arranged that when one is in closed position, or in other words, in a position wholly intercepting the rays of light from the lens, the other is in open position, permitting the light to pass and be projected upon the screen. The links being connected to the rod 26, it is evident that reciprocation thereof will actuate the shutters and that movement from the position shown in Fig. 3 in an upward direction, will swing the upper leaves into closed position and the lower leaves into open position. The rod 26, is guided to move longitudinally of the post in perforated studs 26^a, 23, projecting out from the post.

In order to accommodate the device to stereopticons in which the distance between the lens varies, the reciprocating rod 26, is made longitudinally adjustable and in the form shown in the drawings this is accomplished by making the rod in two parts, one part 30, telescoping into a tubular part 31, and being secured therein by a securing means here shown as a set screw 32, threaded in the tubular member 31, and bearing upon the part 30.

The reciprocating rod 26, may be moved by hand, if desired, but I prefer to actuate the same by means of a motor, and have illustrated a simple form of mechanical motor for accomplishing this purpose. The motor is seen at 33, and is secured to the upright post or standard 10. The motor has a spindle or shaft 34, which carries upon its end a crank arm 35, which is connected to the reciprocating rod 26, by a link 36, and as shown said link may be connected to the pivot pin 28, which connects the links 27, with the rod 26.

Any suitable form of motor may be employed to revolve the crank arm 25, and in the form illustrated, a train of gears 37^a, 37^b, is employed between the power shaft 37, and the crank shaft 34. It is desirable that the shutters move slowly in operation and for this reason a governor has been provided which is shown as comprising a fan 38, secured upon a spindle 39, which is driven by a train of gears 40, 41, 42, 43, 44 and 45, the gear 45 being fast upon the crank shaft 34. It is evident that the fan will retard the speed of the motor and that by increasing or decreasing the ratio of gears, practically any desired speed may be given to the crank shaft 34. The power shaft may be driven directly by means of a coiled or clock spring 46, one end of which may be secured to the shaft and the other end to some stationary part of the motor. The power shaft is shown as extending outside of the case of the motor, and said power shaft bears a setting arm 47, which, when given a partial rotation, is arranged to partially wind up the spring. When the arm is released after such partial rotation, the spring partially unwinds and turns the setting arm back to its normal or original position. A stop 48, is provided to limit its backward movement. The power shaft carries a ratchet wheel 49, which is rigid therewith, and said ratchet wheel is engaged by a pawl 50, which is pivotally connected with the power wheel 37^a. The teeth of the ratchet wheel 49, are properly spaced apart so that when the setting arm 47, is swung through a predetermined distance, the ratchet wheel will advance one tooth, thereby bringing the following tooth into engagement with the pawl 50. It is evident that whenever the setting arm is turned sufficiently from its normal position to bring the pawl into engagement with the following tooth, and the setting arm is released, the spring will turn the power shaft 37, back and thereby carry with it the power wheel 37^a, thus partially rotating the crank shaft 34, through the instrumentality of the gears 37^a, 37^b, and the arrangement of the parts is such that the setting arm 47, is arranged to move through a sufficient arc to permit the power wheel 37^a, to turn the crank shaft and crank arm through an arc of 180 degrees. This has the effect of moving the operating rod 26, through its proper stroke to open and close the two shutters.

The setting arm 47, may be manually shifted to set the motor in operation by merely swinging it from its normal position to a stop 51, and then releasing it, but it is highly desirable that the device may be controlled from some distance away from the machine. This I have accomplished by providing actuating mechanism which has a connection that extends from the motor to any convenient point, as for instance to the hand of the lecturer. By providing some mechanism of this kind, it is evident that the lecturer can control the operation of the shutter and therefore can operate the same at his will and not depend upon an assistant to do the same. For convenience I have illustrated this operating mechanism in the form of an electric device comprising a magnet or solenoid 52, which when energized is arranged to attract an armature 53, that is carried by the setting arm 47. It is evident that by passing a current through the electric apparatus 52, the armature will be drawn to the electric apparatus, thereby swinging the setting arm through the desired distance to bring the pawl into engagement with the next tooth of the ratchet wheel 49. I have illustrated

graphically an electric circuit 54, which is controlled by a push button or a switch 55, preferably held in the hand of the operator. A suitable battery 56, is included in the circuit and operates the magnet or other electric device 52. If desired the battery may be cut out of circuit by a switch 57, and the circuit coupled up with any other source of electric supply, and I have illustrated binding posts 58, to which the terminals from such electric supply may be connected. I desire to be understood that I do not intend to limit myself to this particular arrangement of controlling mechanism, and it is perfectly obvious that many forms of controlling devices may be substituted in its place.

In operation the lecturer or other person operating the shutter starts the motor either by means of the controlling device or by manually swinging the setting arm 47, and releases it. The motor being thus set in motion revolves the crank arm 35, half way around, at which time the setting arm will have come into contact with the stop 48, and the motor will cease to run. The semirevolution of the crank arm moves the operating rod 26, through its upward or downward stroke and closes one pair of the shutter leaves and opens the other pair, and thereby slowly cuts off the light from one lens and exposes the light from the other lens.

The modified form illustrated in Fig. 8 shows the device as adapted for use in connection with stereopticons where some form of gas is employed for projecting the pictures upon the screen. In stereopticons of this kind a dissolving key 60, is employed which contains the usual inlet port 61, which is connected with the source of gas supply and outlet ports 62, 63, which are connected with the two lanterns, one running to the burner in the upper lantern and the other to the burner in the lower lantern. Keys of this class are well known in the trade, and require no particular description. In one form the ports are controlled by means of a plug having by-passes and operated by a handle 64. In using this key, the operator merely shifts the handle so as to direct the flow of gas from the source to either one of the lanterns, and simultaneously cut off the light from the other lantern. I propose to connect the crank arm 35^1, of the motor 33^1, with the handle of the key and operate the same, thereby providing mechanical means for controlling the light of the stereopticon and producing the same effect as when the light is controlled by means of shutters.

I am aware that various alterations and modifications of this device are possible without departing from the spirit of my invention, and I do not therefore desire to limit myself to the exact details of construction shown and described.

I claim as new and desire to secure by Letters Patent:

1. In a device of the class described, the combination with two connected shutters, of a motor having a limited amount of movement for actuating said shutters and means for setting said motor in motion.

2. In a device of the class described, the combination with two oscillatable shutters and connecting means arranged to actuate said shutters simultaneously to open one and close the other, a motor for operating said actuating means and mechanism for setting said motor in motion.

3. In a device of the class described, the combination with two oscillatable shutters, a reciprocable rod and connections between said rod and shutters, of a motor for actuating said shutters and means for setting said motor in motion.

4. In a device of the class described, the combination with two shutters, of a motor for actuating said shutters and a controlling mechanism for setting said motor in motion.

5. In a device of the class described, the combination with two shutters, of a motor for operating said shutters, and mechanism for controlling said motor having means located at some distance away from the motor for setting said controlling means in operation.

6. In a device of the class described, the combination with two shutters, of a motor for actuating said shutters, and an electric apparatus and circuit containing a switch or push button located at some distance away from the motor for setting said motor in motion.

7. In a device of the class described, the combination with shutters, of shutter actuating mechanism for moving said shutters in unison, a motor for operating said actuating mechanism, and controlling mechanism for setting the motor in operation.

8. In a device of the class described, the combination with shutters, a reciprocating rod and connections between said rod and shutters, of a motor arranged to reciprocate said rod and setting mechanism whereby said motor is given a limited amount of movement to operate the reciprocating rod.

9. In a device of the class described, the combination with two shutters, of a motor for actuating said shutters, mechanism for setting said motor in motion, an electric apparatus for moving the setting apparatus in one direction, an electric circuit for said electric apparatus, and a circuit closing device in said circuit.

10. In a device of the class described, the combination with two shutters, of a motor for operating said shutters, setting mechanism for setting said motor in operation, an armature carried by said setting mechanism, an electromagnet coöperating with said ar-

mature, an electric circuit and a push button in said electric circuit.

11. In a device of the class described, the combination with two shutters, and a reciprocating rod connected with said shutters for moving them into open and closed position, of a motor having a crank arm connected with said reciprocating rod and means for setting said motor in motion to give the crank arm a semirevolution.

12. In a device of the class described, the combination with a supporting post and two pair of shutter leaves, each pair being pivoted together and upon the post, of an operating rod having connections with the shutter leaves for actuating them, a motor for moving said rod through one stroke each time that the motor is set in motion, and controlling means for setting said motor in motion.

13. In a device of the class described, the combination with two suitably supported shutters, of a reciprocable rod having connections therewith, a motor for moving said rod through one stroke each time that the motor is set in motion, and controlling means for setting said motor in motion.

14. In a device of the class described, the combinaiton with a supporting post, and two pair of shutter leaves hinged together, and upon the post, of an operating rod, links connecting said rod with the shutter leaves, a motor for moving said rod through one stroke each time that the motor is set in motion, and controlling means for setting said motor in motion.

15. In a device of the class described, the combination with a support, and two shutters carried thereby, of shutter actuating mechanism including a motor which is arranged to simultaneously actuate both shutters, and controlling mechanism for the motor.

16. In a device of the class described, the combination with a longitudinally adjustable support, of two shutters mounted thereon, a longitudinally adjustable operating rod having connections with said shutters, and a motor for reciprocating said rod.

17. In a device of the class described, the combination with a support, and two shutters, each comprising a pair of crescent shaped leaves, having serrations upon the edges which approximate each other, of a reciprocable rod, connections between said rod and the shutter leaves, a motor for moving said rod through one stroke each time that the motor is set in motion, and controlling means for setting said motor in motion.

18. In a device of the class described, the combination with a pair of projecting lanterns, of light controlling mechanism for each lantern, a motor for operating said light controlling mechanism and manually operated controlling mechanism for the motor.

19. In a device of the class described, the combination with two projecting lanterns, of light controlling mechanism for shutting off the light of one lantern and simultaneously exposing the light of the other and vice versa, a motor for operating said light controlling mechanism and manually operated controlling mechanism for setting the motor in motion.

20. In a device of the class described, the combination with two projecting lanterns, of light controlling mechanism for each lantern arranged to shut off the light from one lantern and simultaneously expose the light of the other, and vice versa, a motor for operating said light controlling mechanism, manually operated starting mechanism for setting said motor in motion and a stop for limiting the movement of the motor.

In witness whereof I have hereunto subscribed my name at Chicago, Cook county, Illinois, this 26th day of April, A. D. 1909.

WALTER J. ASHLEY.

Witnesses:
CHARLES O. SHERVEY,
FANNIE F. RICHARDS.