

L. L. MACK & R. D. HORTON.
AUTOMATICALLY OPERATED ILLUMINATED ADVERTISER.

APPLICATION FILED FEB. 23, 1910.

Patented May 16, 1911.

4 SHEETS-SHEET 1.

992,366.

FIG. 1.

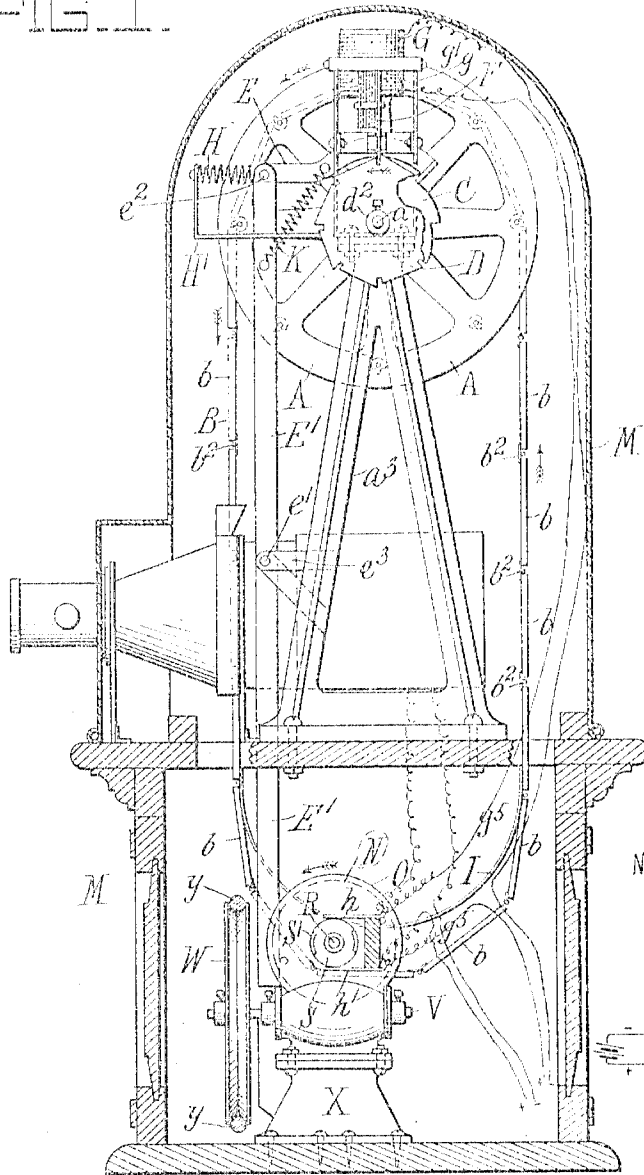
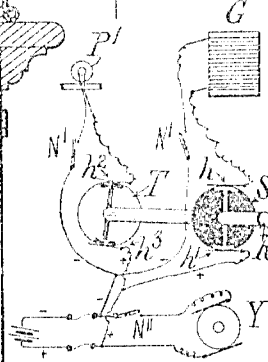


FIG. 11.



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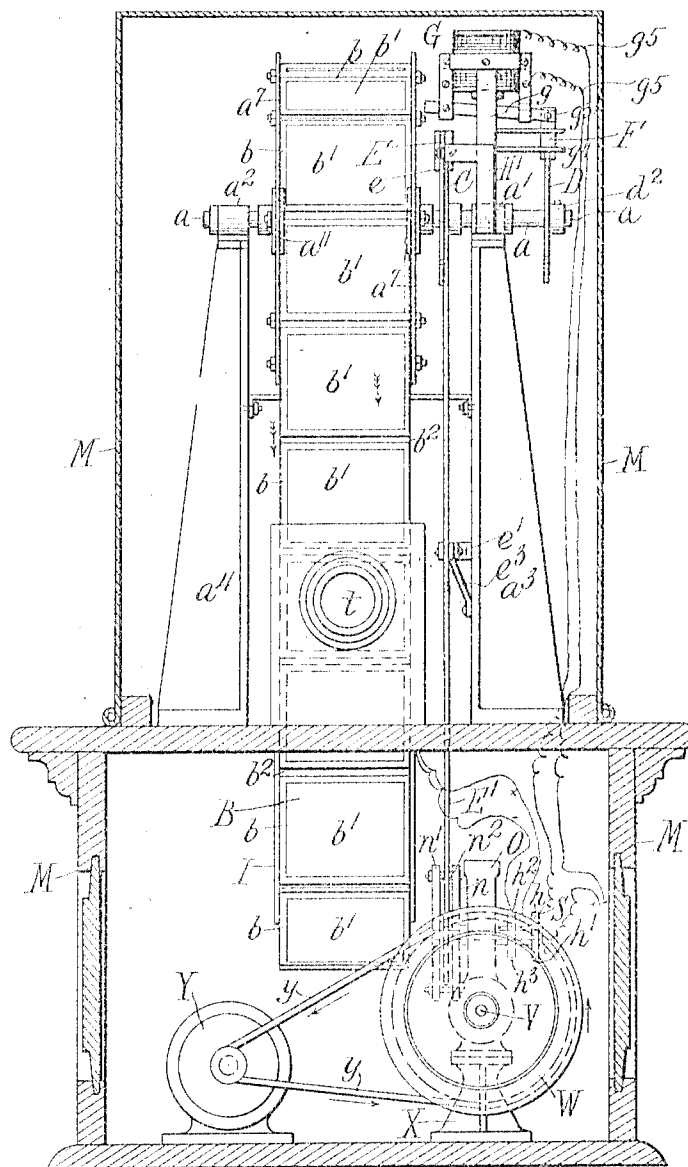
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4 SHEETS—SHEET 2.

FIG. 2.



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4 SHEETS—SHEET 3.

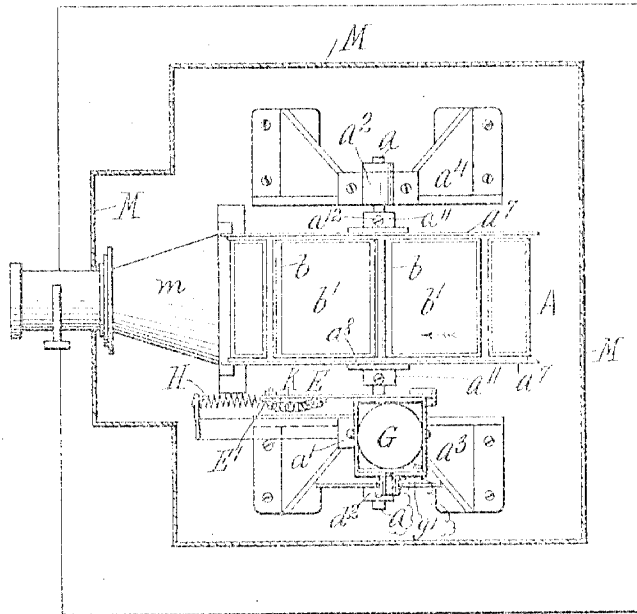


FIG. 3.

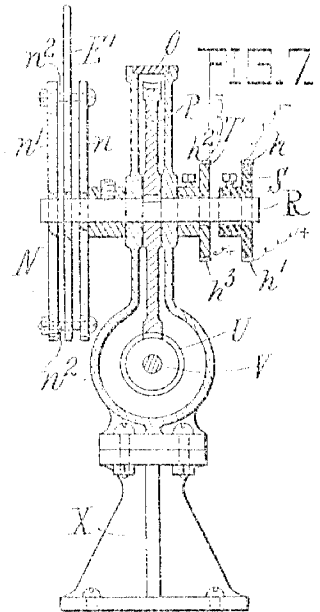


FIG. 7.

FIG. 6.

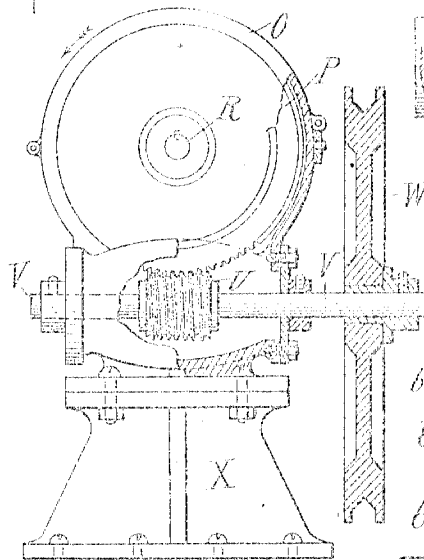


FIG. 8.

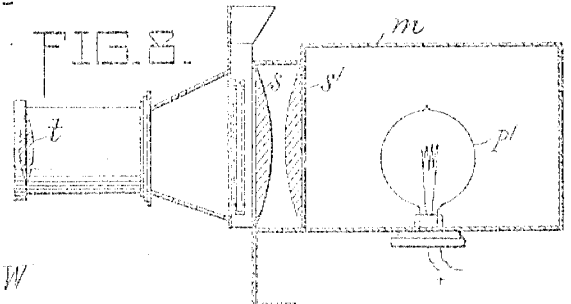


FIG. 9.

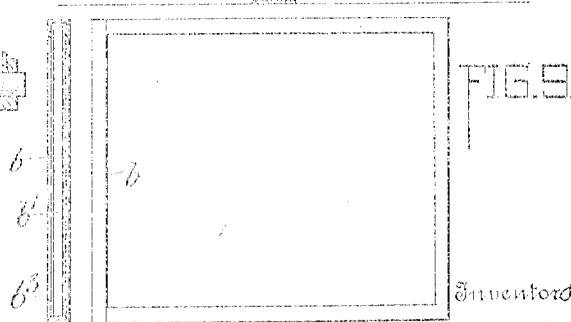


FIG. 10.

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UNITED STATES PATENT OFFICE.

LUTHER L. MACK AND RALPH D. HORTON, OF LONGBEACH, CALIFORNIA, ASSIGNORS
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AUTOMATICALLY-OPERATED ILLUMINATED ADVERTISER.

992,366.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed February 23, 1910. Serial No. 545,352.

To all whom it may concern:

Be it known that we, LUTHER L. MACK and RALPH D. HORTON, both citizens of the United States of America, and both residing at Longbeach, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Automatically-Operated Illuminated Advertisers, of which the following is a specification.

The principal object of our invention is to perfect as far as possible an accurately dependable but simple means for the automatic operation of an ordinary stereopticon which is used for the purpose of displaying intermittently upon a suitable screen, ground glass or other surface, a series of pictures or advertisements, in regular succession, without manual aid, or assistance, it being our aim to accomplish the desired result by the use of the simplest mechanical motions and structural design. In our improvements this result is obtained and the only attention needed is for the starting or stopping of the machine by means of an ordinary electric switch.

Our invention consists in the novel combination of devices as hereinafter described and claimed.

In order that our invention may be fully understood we will proceed to describe it with reference to the accompanying drawings, in which:

Figure 1 is a view of our automatically operated illuminated advertiser partly in side elevation and partly in section on the center line. Fig. 2 is a view thereof partly in front elevation and partly in section on the center line. Fig. 3 is a top plan view of the same; the upper part of the casing being omitted. Fig. 4 is an end view of the carrier wheel and attachments partly broken away. Fig. 5 is a front view thereof. Fig. 6 is a rear elevation of the operating means partly in section. Fig. 7 is a view of the operating means partly in front elevation and partly in section. Fig. 8 is a view of the projecting apparatus partly in elevation and partly in section. Fig. 9 is a side view of one of the frames, or links of the endless slide carrier. Fig. 10 is a transverse section thereof. Fig. 11 is a diagram of the elec-

tric circuits necessary for the operation of the machine.

A is a carrier wheel having metal end plates a^1 , mounted upon a carrier shaft a , and secured by hub disks a^8 , fastened together, through the end plates a^1 , by bolts a^9 , and spaced apart upon the carrier shaft a by a distance sleeve a^{10} . The carrier wheel A is held in place upon the carrier shaft a by collars a^{11} , secured by set bolts a^{12} . The end plates a^1 carry near their peripheries metal spacing rods a^6 , provided with end segments L, having their front edges adapted to support the adjacent sides of the slide holders b , and each front edge of the segment L is formed with a tooth L' , adapted to enter a space or interstice between the slide holders. The carrier shaft a is journaled in bearings a^7 , seated upon frames, or standards, a^3 , a^4 , mounted upon the lower part, or base, of the casing M.

B is an endless chain slide carrier traveling upon the carrier wheel A. This slide carrier consists of a continuous series of frames b , in the form of links spaced apart and connected together by hinges b^2 , and having pockets b^3 , in which the slides b^1 , are removably inserted endwise of the carrier wheel A.

I is a suitable guide within the base of the casing for directing the slide carrier B through the base of the machine.

C is an inner ratchet wheel having teeth corresponding in number to the number of spacing rods a^6 , on the carrier wheel A, and located upon the carrier shaft a adjacent to the carrier wheel A and provided with a hub c , secured by a set bolt c' , to the carrier shaft a .

D is an outer ratchet wheel having teeth and seats or slots d , corresponding in number to the number of the spacing rods a^6 , on the carrier wheel A and to the number of teeth on the inner ratchet wheel C and is also located upon the carrier shaft a , and provided with a hub d^2 , secured by a set bolt d' , to the carrier shaft a .

E is a pawl or ratchet located over the inner ratchet wheel C and having a bifurcated tooth e , adapted to embrace the edge of the inner ratchet wheel C and to engage the teeth thereof. The pawl E is operated

by a vertically arranged lever E' , to which it is connected by a pivot c^2 , the lever E' having a fulcrum e' mounted in a bracket c^3 , secured to the lower part of the adjacent frame a^3 .

II is a coiled spring secured at its inner end to the pivot c^2 at the juncture of the pawl E and lever E' and at its outer end to an arm II' secured to and extending from the upper end of the adjacent frame a^2 . This tension spring II is provided for pulling the pawl E and the ratchet wheel C forward. K is another coil spring extending from the pawl E to the lever E' and secured at its inner end to the pawl E and at its outer end to the lever E' for holding the pawl yieldingly in engagement with the teeth of the ratchet wheel C .

The frame a^3 has an upward extension g , for supporting a rectangular horizontal frame g' , carrying an electromagnet coil G for use on either a direct or alternating current. This horizontal frame g' , has secured to its ends depending arms g^2 . To the inner arm g^2 , is fulcrumed an armature g^3 used in connection with the coil G , and having its free end guided between the outer arms g^2 , and provided with a plunger F , which engages with the teeth of and enters the seats or slots d and forms a lock for the outer ratchet wheel D ; being guided thereover between arms g^4 , extending from the extension g , beneath the armature g^3 .

Within the lower part of the casing M is a stand X on which is mounted a housing O , in the lower part of which is journaled a lower worm shaft V , carrying a worm U , meshing with a worm wheel P , fixed to a worm wheel shaft R , journaled in the upper part of the housing O . Fixed to the inner end of the worm wheel shaft R , on one side of the lower end of the lever E' , are a pair of disks n, n' , connected together by bolts n^2 , so as to form a cam wheel N , the bolts n^2 of which are adapted to engage and swing the lever E' for operating the pawl E , so as to advance the ratchet wheel C intermittently.

S is an outer commutator of non-conducting material fixed on the worm wheel shaft R and provided with two or more metal contacts S' , for the control of the coil G and h and h' are metal brushes for making contact with the metal contacts S' , on the commutator S and connected each with one of the circuits g^5 of the coil G .

P' is a suitable lamp for the purpose of projecting upon the screen the matter upon the slides b' , the particular lamp in this instance being a special incandescent lamp.

T is an inner commutator fixed on the worm wheel shaft R , and used for the control of the lamp P' .

h^2 and h^3 are metal brushes for making contact with the inner commutator T and

connected each with one side of the lamp circuit. A part of the circumference of the commutator T is of non-conducting material for the purpose of breaking the circuit of the lamp P' .

W is a sheave on the worm shaft driven by a belt y , connected with a suitable electric motor Y also located within the base.

s and s' are a pair of condensers, and t a suitable lens and with the lamp P' all inclosed in a housing m which the frames of the slide carrier pass through between the condensers s, s' and the lens t .

The current entering from the supply line, after passing the customary fuses, is split, one circuit embracing an individual switch N' and the motor Y . The other circuit is split, one of the branches embracing the brushes h and h' , the commutator S , the magnet G and an individual switch N' , the circuit being closed at regular intervals by the revolution of the commutator S bringing a conducting portion adjacent the brushes h and h' . The other branch of this circuit embraces brushes h^2 and h^3 , commutator T , lamp P' and an individual switch N' , the circuit being interrupted at regular intervals by the revolution of the commutator T bringing a non-conducting portion adjacent brushes h^2 and h^3 . These circuits are of insulated wire preferably.

The following is a description of the operation of the machine. The motor Y attached to an ordinary electric lamp socket, (not shown), operates the worm gear combination, as shown in Figs. 6 and 7, by means of a belt y connected to the drive wheel W mounted upon the shaft V on which is the worm U which operates the worm wheel P on the worm wheel shaft R , and also the commutators T and S and the cam wheel N on the same worm wheel shaft R . By means of the contacts on the outer commutator S and the brushes h and h' , the circuit of the electromagnet or coil G is closed at each full, half or quarter revolution of the worm wheel shaft R , according to the number of contacts on the outer commutator S . When this circuit is closed the coil G is energized and the core of the coil becomes magnetized and attracts the armature g^3 to which is attached the plunger F thus lifting the plunger from its seat in the outer ratchet wheel D and unlocking this wheel and allowing the pawl E , which is pulling against a tooth in the inner ratchet wheel C to pull the inner ratchet wheel C one point forward by means of the tension of the coil spring H to which it is attached. The metal points on the circumference of the outer commutator S having by this time passed out of contact with the brushes h and h' , the armature g^3 is released and allows the plunger F to drop into a position on the circumference of the outer ratchet wheel D ,

where when the forward motion of the ratchet wheel D is completed, the plunger drops into another seat as before, thus again locking the outer ratchet wheel. By this
 5 action the carrier wheel A has moved one point forward and has carried a frame *b* with a new slide *b'* in the endless chain slide carrier B into position in front of the
 10 condensers in the projecting apparatus and preparatory for the matter upon the slide to be projected upon the screen. At the instant that the carrier shaft has stopped its forward motion the vertical lever *E'* is engaged by one of the bolts *n*², on the cam
 15 wheel N, which, traveling around with the worm wheel shaft R imparts a positive backward motion to the pawl E and returns it to a position on the circumference of the inner ratchet wheel C ready to again pull
 20 the inner ratchet wheel forward. This backward motion serves to place the coil spring H again in tension and prepared for another operation.

The number of spacing rods *a*⁶ on the
 25 carrier wheel A and the number of teeth on the ratchet wheel C and the number of seats or slots *d* in the ratchet wheel D being the same, the operation of the various parts is harmonious.

The sprocket teeth on the rods *a*⁶ in the
 30 carrier wheel A engage the interstices between the frames or links *b* in the endless chain slide carrier B and thus prevent a forward or backward motion of the chain
 35 upon the carrier wheel and cause the slides in the carrier to be placed in exact position for proper projection in the projecting apparatus. The metal end plates and disks forming the ends to the carrier wheel A
 40 serve to prevent any motion sidewise on the wheel. By our means of accurately placing in succession the various slides *b'* in the slide carrier in a true and neutral position in the projecting apparatus a constant focus
 45 is maintained.

The frames or links in the endless chain slide carrier B are hinged together by any
 50 suitable hinge *b*², and are open at one end to allow the placing and removing of the slides at will. It is possible to change the slides in the carrier while the machine is in motion.

By means of the commutator T having on its circumference a short space on non-
 55 conducting material or by other means the lamp P' is darkened just before the operation of the machine as above described and remains dark until the operation is complete and a new slide is in place
 60 in the projecting apparatus, when the part of the revolution having been completed, the contact is again established and the lamp circuit closed, allowing the lamp to light. The use of this principle renders it possible
 65 to flash each new advertisement or picture

upon the screen and does not display the operation of the machine, or the disappearance of one slide and the appearance of another.

By means of an individual switch N' the
 70 circuit of the coil G the motor Y and the lamp P' it is possible for the purpose of adjustment to stop the operation of either the coil G or the lamp P' without stopping the motor Y.

Having thus described our invention the following is what we claim as new therein and desire to secure by Letters Patent.

1. The carrier wheel comprising a carrier shaft, end plates, mounted on the carrier
 80 shaft, hub disks secured to the end plates and to the carrier shaft, and spacing rods, each having end segments each formed with a tooth, and secured near to the peripheries of the end plates.

2. The carrier wheel comprising a carrier shaft, end plates mounted on the carrier shaft, hub disks secured to the end plates and to the carrier shaft, a distance sleeve
 90 mounted on the carrier shaft, between the hub disks, and spacing rods each having end segments each formed with a tooth, and secured near to the peripheries of the end plates.

3. The combination of the carrier wheel
 95 comprising a carrier shaft, end plates mounted on the carrier shaft, hub disks secured to the end plates and to the carrier shaft and spacing rods each having end segments each formed with a tooth and secured
 100 near to the peripheries of the end plates, and an endless chain slide carrier consisting of a continuous series of frames hinged together and spaced apart so as to receive the segment teeth between them and to travel on the
 105 toothed front edges of the segments.

4. The combination, with a carrier shaft; of the ratchet wheel, the pawl, the vertical lever to which the pawl is pivoted, a spring
 110 adapted to pull on the pawl, a spring adapted to hold the pawl to the ratchet wheel and connecting the pawl with the vertical lever; and a cam adapted to engage and swing the vertical lever intermittently.

5. The combination with a carrier shaft; of the ratchet wheel, the pawl, the vertical lever to which the pawl is pivoted, a spring
 115 adapted to pull on the pawl, a spring adapted to hold the pawl to the ratchet wheel and connecting the pawl with the vertical lever, and means adapted to engage and swing the vertical lever intermittently, consisting of a motor driven worm gear and shaft, and a cam wheel having a pair of disks connected by bolts adapted to engage the vertical lever.

6. The combination with the carrier shaft, of the inner ratchet wheel fixed thereto, the pawl, the vertical lever to which the pawl is pivoted, a spring adapted to pull on the pawl; a spring adapted to hold the pawl to
 120
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the inner ratchet-wheel, means adapted to swing the vertical lever intermittently, consisting of a motor driven worm gear and shaft and a cam wheel having a pair of disks connected by bolts and adapted to engage the vertical lever and means for controlling the rotation of the carrier shaft consisting of an outer ratchet wheel thereon having locking slots, a coil, an armature carrying a plunger seating in the slots of the outer ratchet wheel, a commutator fixed to the worm wheel shaft, having contacts and brushes and circuits connecting the contacts with the coil.

7. The combination with the carrier shaft, of the inner ratchet wheel fixed thereto, the pawl, the vertical lever to which the pawl is pivoted, a spring adapted to pull on the pawl, a spring adapted to hold the pawl to the inner ratchet wheel, means adapted to swing the vertical lever intermittently, consisting of a motor driven worm gear and shaft and a cam wheel having a pair of disks connected by bolts and adapted to engage the vertical lever and means for controlling the rotation of the carrier shaft consisting of an outer ratchet wheel thereon having locking slots, an extension frame, a horizontal arm carrying a plunger seating in the slots of the outer ratchet wheel and a horizontal arm attached to the vertical lever.

8. The combination of a motor driven worm gear and shaft, a lamp, a commutator, fixed to the worm wheel shaft, and having a body of non-conducting material and a metal rim around the circumference, and not wholly covering the width of the body, the rim having a flattened depression at a point on the circumference, and brushes in contact therewith, and circuits connecting the lamp with the commutator.

9. An automatically operated illuminating advertiser, comprising the combination of a projecting apparatus, having a lamp, a car-

rier wheel, an endless chain slide carrier, traveling through the projecting apparatus, means for rotating the carrier wheel intermittently, consisting of a motor driven worm gear and shaft and a cam wheel having a pair of disks connected by bolts, and adapted to engage the vertical lever, and means for controlling the rotation of the carrier wheel, consisting of an extension frame and a horizontal arm carrying a plunger seating in the slots of the outer ratchet wheel and a horizontal arm attached to the vertical lever.

10. An automatically operated illuminating advertiser, comprising the combination of a projecting apparatus, having a lamp, a carrier wheel, an endless chain slide carrier, traveling through the projecting apparatus, means for rotating the carrier wheel intermittently, consisting of a motor driven worm gear and shaft, and a cam wheel having a pair of disks connected by bolts, and adapted to engage the vertical lever, and means for controlling the rotation of the carrier wheel, consisting of an extension frame, a horizontal arm carrying a plunger seating in the slots of the outer ratchet wheel, and a horizontal arm attached to the vertical lever, and a means for shutting off the lamp during the movement of the carrier wheel, consisting of a commutator fixed to the worm wheel shaft and having a body of non-conducting material and a metal rim around the circumference partially covering the width of the body, a flattened depression in the metal rim and brushes in contact therewith.

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