C. A. BRAUN.

PICTURE EXHIBITING MACHINE.

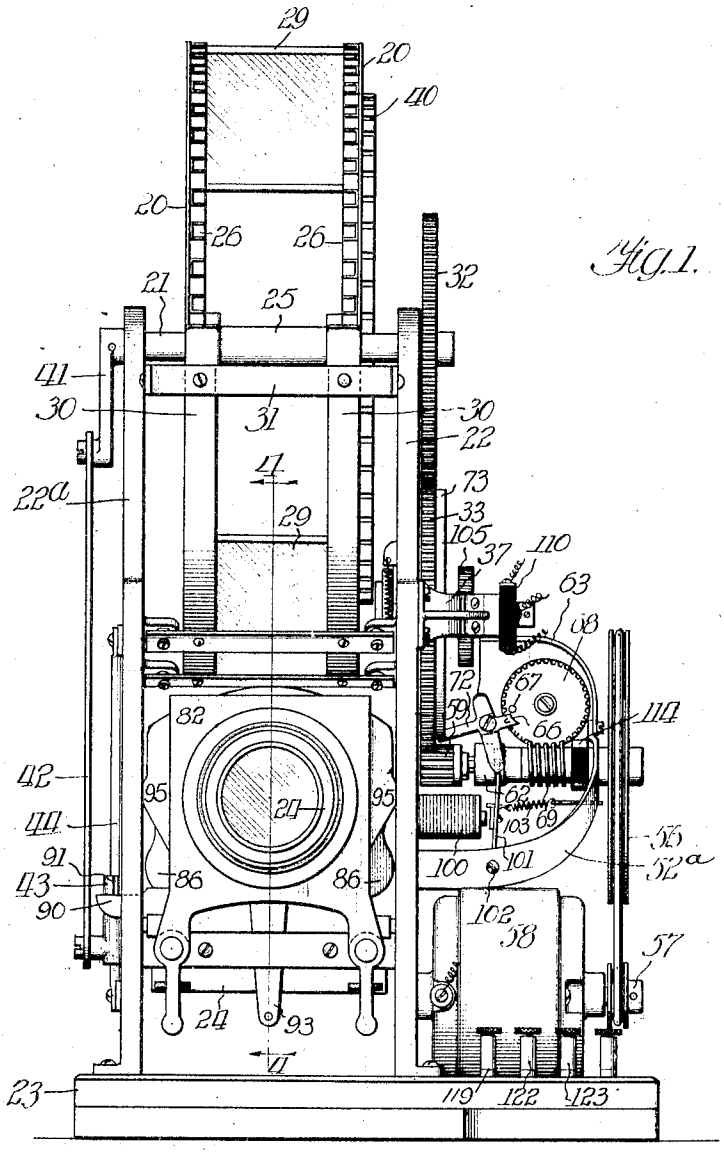
APPLICATION FILED OCT. 20, 1910.

1,082,260.

Patented Dec. 23, 1913.

8 SHEETS—SHEET 1.

FIG. 1.



Witnesses:
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Charles G. Cooke

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By William L. English
Attorney

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PICTURE EXHIBITING MACHINE.

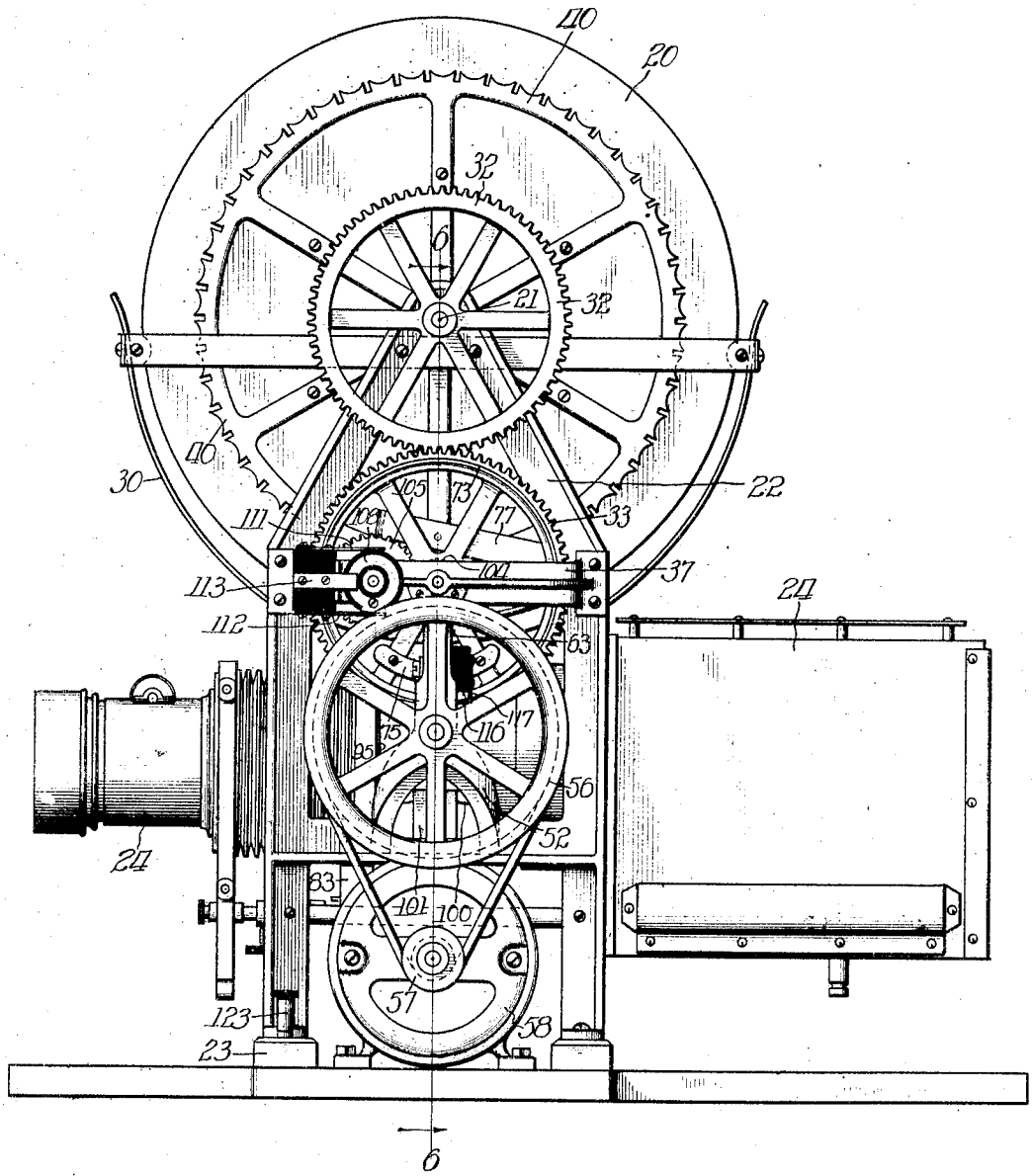
APPLICATION FILED OCT. 20, 1910.

1,082,260.

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8 SHEETS—SHEET 2.

Fig. 2.



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PICTURE EXHIBITING MACHINE.

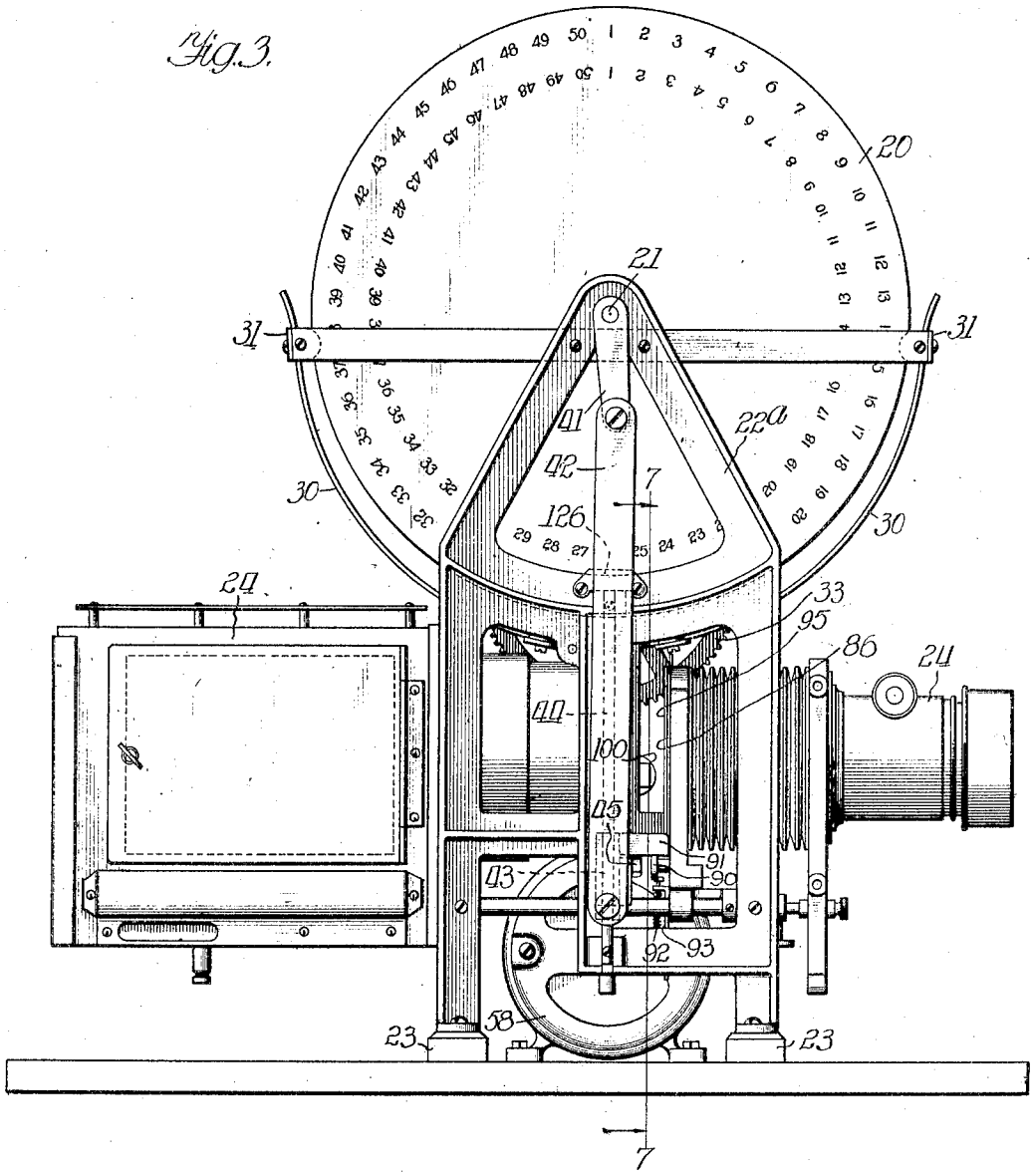
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1,082,260

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8 SHEETS—SHEET 3.

Fig. 3.



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PICTURE EXHIBITING MACHINE.

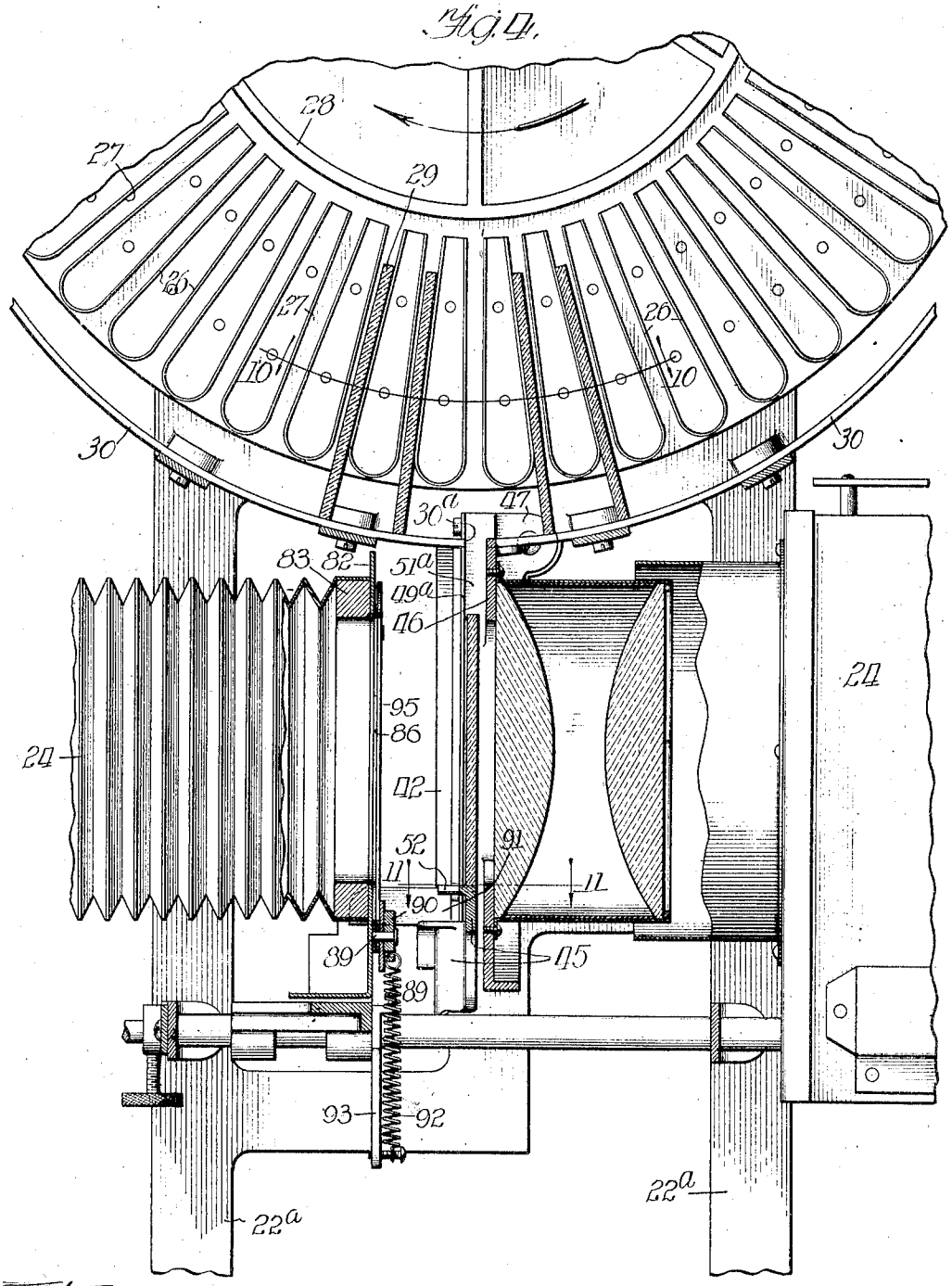
APPLICATION FILED OCT. 20, 1910.

1,082,260.

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8 SHEETS—SHEET 4.

Fig. 4.



Witnesses:
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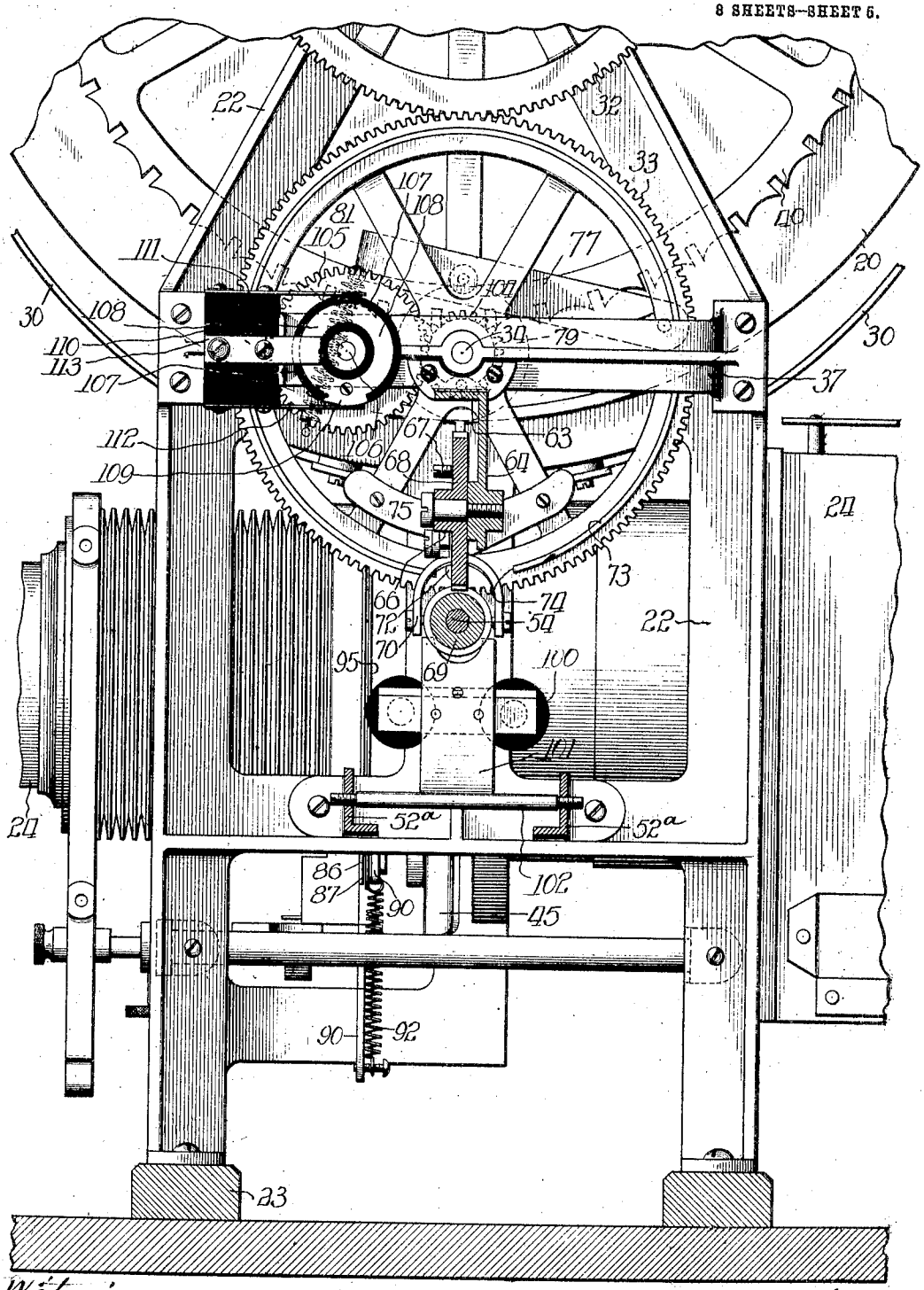
PICTURE EXHIBITING MACHINE.

APPLICATION FILED OCT. 20, 1910.

1,082,260.

Patented Dec. 23, 1913

8 SHEETS—SHEET 5.



Witnesses:
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Fig. 5.

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PICTURE EXHIBITING MACHINE.

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Patented Dec. 23, 1913.

8 SHEETS—SHEET 6.

Fig. 6.

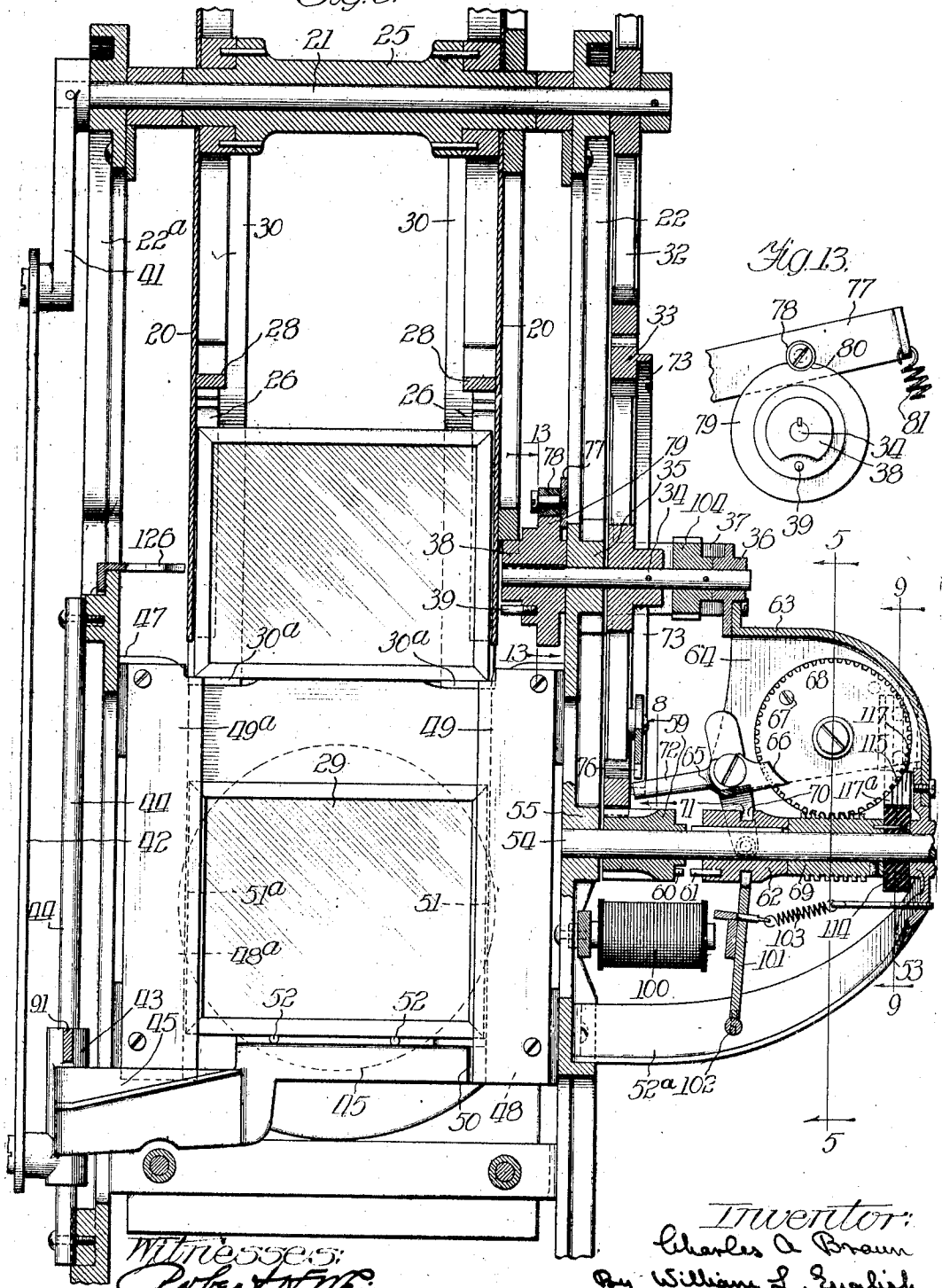


Fig. 13.

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PICTURE EXHIBITING MACHINE.

APPLICATION FILED OCT. 20, 1910.

1,082,260.

Patented Dec. 23, 1913

8 SHEETS—SHEET 7.

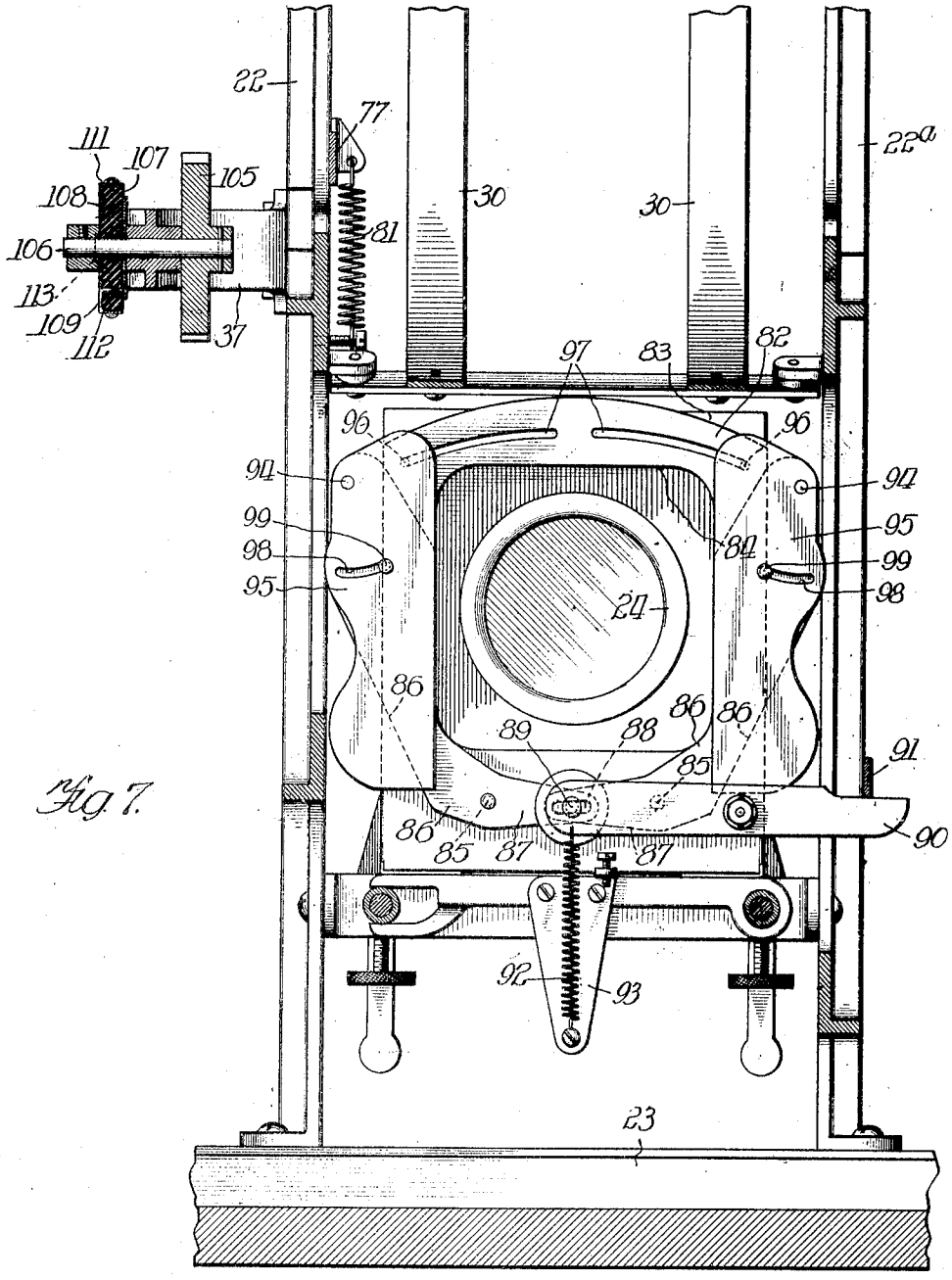


Fig. 7.

Witnesses:
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PICTURE EXHIBITING MACHINE.

APPLICATION FILED OCT. 20, 1910.

1,082,260. Patented Dec. 23, 1913.

8 SHEETS—SHEET 8.

Fig. 9.

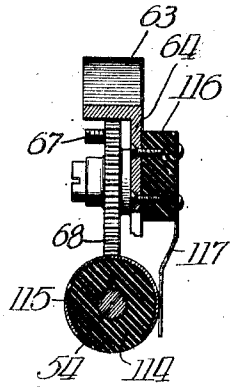


Fig. 8.

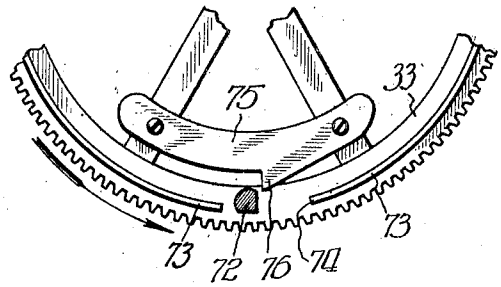


Fig. 10.

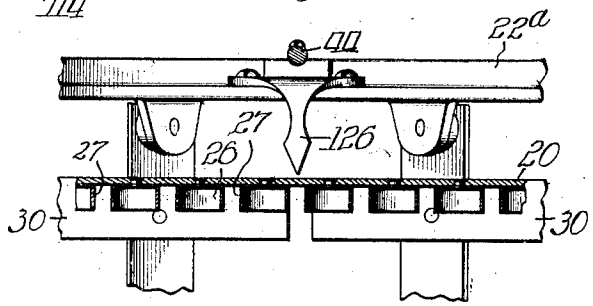


Fig. 11.

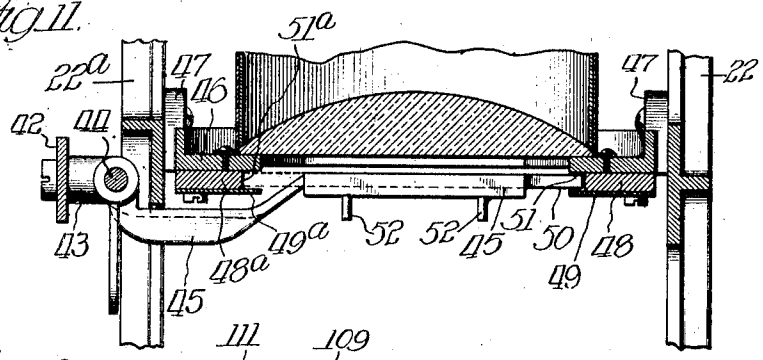
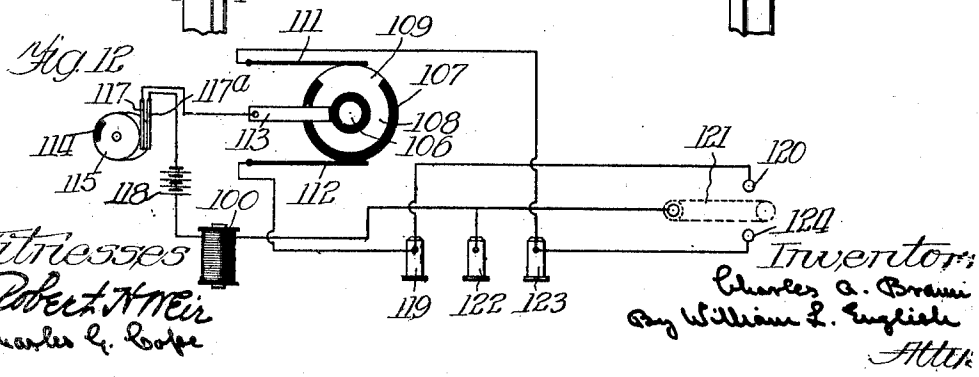


Fig. 12.



Witnesses
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Inventor:
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By William L. English
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UNITED STATES PATENT OFFICE.

CHARLES A. BRAUN, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN AUTOMATIC ADVERTISING CO.

PICTURE-EXHIBITING MACHINE.

1,082,260. Specification of Letters Patent. Patented Dec. 23, 1913.

Application filed October 20, 1910. Serial No. 588,054.

To all whom it may concern:

Be it known that I, CHARLES A. BRAUN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Picture-Exhibiting Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention pertains, in general, to slide magazines for picture exhibiting lanterns and to mechanisms for use in connection with such magazines; it particularly relates to magazines of the character in which the magazine comprises a hollow drum provided with means for supporting the slides radially therein, and having an elevator associated therewith for removing the slides, bringing them into the correct position in the lantern, and replacing them in the drum.

It is the principal object of my invention to simplify the construction of slide magazines, to increase their capacity, and to improve upon them generally; also, when the magazine is actuated automatically, to provide actuating mechanism which is simple, certain of operation, and not liable to get out of order.

A further object is to provide slide magazines of the character particularly designated above, with mechanisms whereby they are automatically actuated at predetermined intervals.

It is a still further object to provide slide magazines with mechanisms whereby they may be actuated from a distance with certainty and precision. And other objects of my invention will appear from the following specification.

I have embodied my invention in a working device, and in order that the invention may be understood, this device is shown in the accompanying drawings, and described in the following specification. I do not limit myself, however, to the particular apparatus which I have chosen to describe since numerous changes may be made without exceeding the scope of my invention as expressed in the appended claims.

In the drawings: Figure 1 is a front elevation of a picture exhibiting lantern, magazine, and actuating devices therefor, constructed in accordance with my invention; Fig. 2 is an elevation of the same as seen from the right-hand side of Fig. 1; Fig. 3 is an elevation of the same as seen from the left-hand side of Fig. 1; Fig. 4 is an enlarged vertical section taken on the line 4—4 of Fig. 1, looking in the direction of the arrows; Fig. 5 is a section taken on the line 5—5 of Fig. 6; Fig. 6 is an enlarged section taken on the line 6—6 of Fig. 2; Fig. 7 is a sectional elevation showing the construction of the shutter, the section being taken on the line 7—7 of Fig. 3; Fig. 8 is a fragmentary, partly sectional, detail view showing a portion of the driving wheel for the pitman shaft, the section being taken on the line 8—8 of Fig. 6; Fig. 9 is a detail section of the safety make-and-break device, the section being taken on the line 9—9 of Fig. 6; Fig. 10 is a fragmentary detail view of the slide supporting drum, the section being taken on the line 10—10 of Fig. 4; Fig. 11 is a horizontal section taken on the line 11—11 of Fig. 4; Fig. 12 is a diagram of connections; and Fig. 13 is a detail sectional view showing the locking device for the counter-shaft, on line 13—13 Fig. 6.

The apparatus shown in the accompanying drawings comprises a drum mounted above the lantern and provided with a series of radial slide-receiving guides the outer ends of which are open. In order to prevent the slides which are carried by those guides which are located below the plane of the axis of the drum from slipping out of the guides, a pair of guard flanges are secured adjacent the edge of the lower part of the drum. The bottom corners of the slides engage these flanges and slide upon them as soon as, by reason of the revolution of the drum, the slides tend to fall out of the guides. The guard flanges are formed, at a point substantially vertically below the axis of the drum, with openings of sufficient width to allow a slide to pass therethrough. An elevator is arranged immediately below these openings and mechanism is provided for intermittently raising and lowering the elevator and at the same time rotating the drum through a distance equal to the space between two of the slide guides. By the raising of the elevator, a slide, which had been in position for exposure and which had previously been carried down from the slide guides immediately above the openings in the guard flanges, will be raised into the vacant guides in the drum. Just after the

slide has entered its guides, the drum starts to revolve and thereby brings the slide carried by the next pair of guides into position upon the elevator. The elevator then descends and brings the slide into position for exposure. After such a time has elapsed as is considered sufficient for exposing the slide, the above operation will recur and the slide which has been exposed will be replaced by the next in order in the drum. The elevator, just before it reaches the limit of its downward movement, effects the opening of a shutter, the latter being automatically closed as soon as the elevator begins to rise. By this means reproduction, upon the screen, of the movement of the slides is avoided. The device, as outlined below, is of considerable use in displaying pictures for advertising purposes, but, in order to adapt it for use in illustrating lectures and for like purposes, I provide means whereby, instead of being automatically actuated at predetermined intervals, it may be actuated at will by the lecturer or other person exhibiting the pictures.

Referring now to the several figures of the drawings, in which like characters of reference refer to like parts throughout, 20 is a drum rotatably mounted upon a shaft 21 having its bearings in standards 22 and 22^a secured to a base 23. These standards carry between their lower ends the lantern 24, which may be of any desired construction and the details of which it is not necessary to describe. The drum consists of a pair of oppositely disposed side plates connected at their centers by hollow bearings 25 (Fig. 6). Secured to the inner faces of these side plates are a plurality of radially disposed metallic strips 26 which are bent into the form of open-ended loops with the curved bases of the loops disposed toward the periphery of the drum. These strips 26 are so spaced as to form between them guides 27 for the slides 29 (Figs. 4 and 10), into which guides the slides may be inserted from the top of the drum, the curved portions of the strips providing a tapering opening for the guides, which enables the slides to be inserted into them with facility. Circular flanges 28 are provided adjacent the inner ends of the guides 27 to support the inner ends of those slides which are located in the upper portion of the drum. As the drum rotates, those slides which were in the upper portion of it will be brought down into a position in which they will tend to fall out of the guides 27. In order to prevent the slides from falling out of the guides, guard flanges 30 are provided. The flanges 30 are mounted upon cross-bars 31 secured to the standards 22 and 22^a and extend around the lower half of the periphery of the drum in a position adjacent the edges of the side plates of the drum. As soon, therefore, as the slide passes, in its downward movement, below a horizontal plane passing through the axis of the drum and consequently starts to fall out from the guides, its corners will strike upon the guard flanges 30 whereby it will be prevented from falling out of its guides. During the further movement of the drum, the corners of the slide engage and slide upon the guard flanges 30. The convexity of the guard flanges is made somewhat greater than that of the drum so that the centers of the guard flanges are somewhat farther from the periphery of the drum than the ends are. By this means the slides are caused to slip out of the guides to a certain extent before they reach the limit of their downward movement and enough room is provided for the operation of the elevator. Immediately below the axis of the drum, the guard flanges 30 are provided with openings 30^a of sufficient width for a slide to pass therethrough.

The shaft 21 (Figs. 2 and 6) has mounted upon one end thereof a gear-wheel 32 which meshes with a second gear wheel 33 carried by an intermittently driven counter-shaft 34. The counter-shaft is rotatably mounted at one end in a bearing 35 carried by one of the standards 22 and is mounted at the other end in a bearing 36 formed upon a bracket 37 which is secured at its ends to the standard 22. The number of teeth upon the wheels 32 and 33 is the same, so that the shaft 21 will rotate at the same speed as the counter-shaft 34. Upon the inner end of the counter-shaft 34 is mounted a disk 38 formed at one side with an arc-shaped recess containing a pin 39. The disk 38 and pin 39, together with a suitably recessed flange 40 carried by the outer face of the adjacent side plate of the drum, constitute a "Geneva movement" for driving the drum. It will be seen, therefore, that each revolution of the disk 38 will result in a movement of the drum through a circumferential distance equal to the distance between the recesses of the flange 40, which recesses are spaced apart a distance equal to that between the slide guides 27, while the drum is securely locked against movement except during such time as the pin 39 enters one of the recesses of the flange 40. The disk 38 is so placed upon the counter-shaft 34 that the pin 39 will effect the movement of the drum just after the elevator (to be hereinafter described) reaches its uppermost position.

Secured to the end of the shaft 21 opposite to that which bears the gear wheel 32, is a crank 41 which is connected by means of a pitman 42 (Figs. 3, 6 and 11) with the elevator. The elevator comprises a block 43 which is slidably mounted upon a vertical pillar 44 carried by the standard 22^a, the block being formed with a laterally project-

ing arm 45 extending between the standards 22 and 22ª and located in substantially the same vertical plane as the axis of the drum 20. Secured between the standards 22 and 22ª immediately behind the arm 45, is a vertical guide plate 46 having rearwardly extending ears 47 by means of which it is attached to the standards 22 and 22ª. The central portion of the plate 46 is cut away to allow the passage of light in order to exhibit the pictures, and the top edge of the plate extends upwardly into the openings 30ª in the guard flanges 30 of the drum, being cut off flush with the upper surfaces of these flanges. Vertical strips 48 and 48ª are secured to the edges of the plate 46 adjacent to the standards 22 and 22ª, respectively, the inner edges of these strips being located somewhat within the vertical edges of the openings in the plate 46. Upon the strips 48 and 48ª are mounted other strips 49 and 49ª, the vertical edges of which extend beyond the vertical edges of the strips 48 and 48ª. The strips 48 and 48ª, 49 and 49ª form, with the plate 46, a pair of vertical guide grooves 51 and 51ª which grooves are of sufficient width to receive and guide a slide when the latter is carried up or down by the elevator. The outer end of the arm 45 is provided with a lug 50 which enters the groove 51, whereby the arm 45 will be accurately guided in its vertical movements.

The normal condition of the parts (that is, the condition in which a picture is being exhibited) is shown in Figs. 4 and 6 of the drawings. In this condition of the parts the arm 45 is in its lowermost position and carries upon its upper edge a slide 29 which has been withdrawn from the slide guides 27 located immediately above the openings 30ª in the guard flanges 30. When, after sufficient time has elapsed for the exhibition of the picture, the counter-shaft 34, and consequently the shaft 21, begins to rotate, the pitman will begin to raise the elevator, the arm 45 carrying with it, in its upward movement, the slide 29, the latter being guided in the grooves 51 and 51ª. The guides 51 and 51ª form a continuation of the slide guides 27 located immediately above them, and consequently the slide will be moved back into the guides 27 from which it had been withdrawn in a previous operation. The crank 41 is of such length that the elevator will be lifted sufficiently to bring the top edge of the arm 45 somewhat above the surfaces of the guard flanges 30.

Just as the top edge of the arm 45 comes level with the top surfaces of the flanges 30, during the upward movement of the arm, the rotation of the drum begins to take place, the pin 39 of the disk 38 having, by this time, moved through somewhat less than 180° and having begun to engage in the adjacent recess of the flange 40 of the drum. During the slight remaining portion of the upward movement of the arm 45, the drum will rotate, thereby moving the slide, which has just been raised, off from the edge of the arm 45 and onto a pair of pins 52 with which the arm is provided. At the same time the next succeeding slide is approaching the opening in the guard flanges 30. As soon as the arm 45 has reached the limit of its upward movement, it begins to return, carrying with it, upon the pins 52, the slide which has just been raised, and depositing it gently upon the guard flanges 30.

Just as the edge of the arm 45, in the downward movement of the latter, comes level with the top surfaces of the guard flanges, the next succeeding slide will be brought into position upon it, the next succeeding pair of slide guides 27 being now in position above the guide grooves 51 and 51ª. Just at this time the pin 39 will leave the recess of the flange 40 which it has just engaged and the drum will therefore be locked against movement until the next operation. The arm 45 will continue in its downward movement until it regains the position shown in Figs. 4 and 6 where it will remain until the shafts 34 and 21 are again caused to revolve. It will thus be seen that the slides contained in the drum are consecutively removed from the guides in which they are held, brought into position for exhibition of the pictures, and replaced in the guides.

For advertising and some other purposes it is desirable that a picture be exhibited for a more or less lengthened period of time and then, as quickly as possible, replaced by another. I provide a mechanism which automatically effects this, the construction of such mechanism being as follows: Secured to the standard 22 is a bracket 52ª (Figs. 5 and 6) carrying a bearing 53 which supports the outer end of a driving shaft 54, the inner end of the shaft being supported in a bearing 55 with which the standard 22 is provided. Beyond the bearing 53, the shaft 54 has secured to it a belt pulley 56 which is connected, by a suitable belt, with the driving pulley 57 of an electric motor 58. The motor 58 is kept continuously running during the use of the apparatus, so that the shaft 54 revolves continuously. Loosely mounted upon the driving shaft 54 is a pinion 59 which meshes with the gear wheel 33 carried by the counter-shaft 34 and is provided with a clutch pin 60 adapted to be intermittently engaged by a clutch pin 61 carried by a corresponding clutch block 62 which rotates with, but is slidably mounted on, the driving shaft 54. In Fig. 6 the clutch block 62 is shown in the position in which the pin 61 is out of operative engagement with the pin 60. When the clutch block 62 is in this position, the pinion 59,

tooth wheel 33 and the related parts remain stationary. At predetermined intervals, however, the block 62 is moved toward the left, whereupon the pin 61 engages the pin 60 and makes a driving connection between the revolving shaft 54 and the pinion 59, whereupon the tooth wheel 33 and related parts are caused to rotate, which rotation continues until the tooth wheel 33 has made one complete revolution. As soon as the wheel 33 has made one revolution, the clutch block 62 will be automatically thrown toward the right, and the driving connection between the driving shaft 54 and the pinion 59 broken. The pinion 59, tooth wheel 33 and the related parts will then remain stationary until the clutch is again operated.

The mechanism for intermittently actuating the clutch block 62 is as follows: A bridge 63 is secured between the brackets 37 and 52[a] and is provided with a substantially vertical web 64 upon which is pivotally mounted a cam lever 65, the outer end 66 of which is located in the path of a pin 67 carried upon the face of a worm wheel 68, the latter being rotatably mounted on the web 64 and meshing with a worm 69 secured to the shaft 54. The outer end 66 of the cam lever is formed with a cam surface, the effect of which is that, upon the pin 67 striking it, the lever 65 will be rocked in a clockwise direction upon its pivot. Projecting downwardly from the cam lever is a fork 70 carrying rollers which engage in a circumferential groove 71 with which the clutch block 62 is formed. The consequence, therefore, of the tilting of the cam lever will be that the clutch block 62 is thrown toward the left, a driving connection thereby being made between the shaft 54 and the pinion 59. The relation between the teeth of the worm wheel 68 and the thread of the worm 69 is determined according to the length of time during which it is desired to expose each successive slide. In the device illustrated the operation of replacing a slide by another is effected during about 1/16 of the time occupied by the worm wheel 68 in completing a revolution, and the picture will therefore be exhibited for a time which is approximately that taken by the worm wheel 68 in making 15/16 of a revolution.

In order that the cam lever 65 may be definitely held in the position in which the clutch block 62 makes operative engagement with the pinion 59, it is provided with an arm 72, which extends inwardly toward the tooth wheel 33. The tooth wheel 33 is provided with an outwardly extending peripheral flange 73 having an opening 74 (Fig. 8) through which the end of the arm 72 can pass upward when the lever 65 is tilted by the pin 67. As soon as the lever 65 is thus tilted and the clutch 62 has therefore made connection with the pinion 59, the tooth wheel 33 begins to rotate and the flange 73 passes beneath and engages under the end of the arm 72. The flange 73 thereafter prevents downward movement of the arm 72, which would result from a tilting of the lever 65 in a contra-clockwise direction to throw out the clutch, and the clutch is therefore held in locked condition until the tooth wheel 33 has made a complete revolution.

Secured to the tooth wheel 33 adjacent the opening 74 of the flange 73 and somewhat above the same, is a cam plate 75 having a cam projection 76 thereon. When the tooth wheel 33 has nearly completed its revolution the cam projection 76 will strike the top of the end of the arm 72 and will force the latter downward, thereby rocking the lever 65 in a contra-clockwise direction and causing the clutch to unlock. In order that, when the clutch has thus been unlocked, the tooth wheel 33 may remain stationary in the proper position ready for the next operation of the clutch, I provide an arm 77 which is pivoted to the standard 22 and carries a roller 78 which runs upon the outer periphery of an annular enlargement 79 of the disk 38, which, as will be remembered, is mounted upon the counter-shaft 34. The annular enlargement 79 is provided with an arc-shaped recess 80 into which the roller 78 is adapted to fall when the tooth wheel 33 reaches the position in which the cam projection 76 has almost concluded the operation of forcing the arm 72 of the cam lever 65 downward. A tension spring 81 is connected between the standard 22 and the outer end of the arm 77 in order that the roller 78 may be drawn into the recess 80 with some degree of force. The result of this arrangement is that, when the tooth wheel 33 has almost completed its revolution and the cam projection 76 has nearly completed the downward movement of the arm 72 of the cam lever 65 to disengage the clutch, the roller 78 will be just entering over the adjacent edge of the recess 80 and the spring 81 will then force the roller 78 downward into the recess 80, thereby definitely completing the last fraction of the revolution of the tooth wheel 33, and definitely disengaging the clutch.

In order to prevent the projection of light upon the screen during the changing of the slides, I provide a shutter which is automatically opened by the elevator when the latter reaches the limit of its movement and which closes as soon as the elevator starts its upward movement. The effect of this arrangement is that a picture is exhibited upon the screen for a time determined by the relation between the teeth of the worm wheel 68 and the thread of the worm 69, after which it is cut off for the short space of time necessary for the changing of the slide, the screen remaining dark during this period. When the slide has been replaced by the next suc-

ceeding one, the latter is exhibited for a predetermined time as before.

In order to effect the above result, I provide a vertical plate 82 which is disposed immediately against the rear frame 83 of the bellows of the lantern. This plate has formed therein a rectangular aperture 84 of a size corresponding to that of the slides used. Pivoted at the points 85, to the plate 82, are two oppositely disposed leaves 86 provided with inwardly extending arms 87 which overlap and are formed with corresponding slots 88 for receiving a pin 89 carried by the inner end of a lever 90. The lever 90 is pivoted to the plate 82, and its end, remote from that which carries the pin 89, extends outward to one side of the device in position to be engaged by a foot 91 which is secured to the sliding block 43 of the elevator. The position of the lever 90 with respect to the foot 91 of the elevator is such that the lever will be engaged by the foot 91 just before the elevator reaches its lowest position, so that during the last portion of the downward movement of the elevator the outer end of the lever will be depressed, thereby moving the inner end of the lever upward and rocking the leaves 86 outward about their pivots 85 into the position shown in Fig. 7 of the drawings. A tension spring 92 is connected between a downwardly extending arm 93 and the inner end of the lever 90. This spring effects a downward movement of the inner end of the lever 90 as soon as the latter is enabled to move by reason of the foot 91 rising during the first part of the upward movement of the elevator to change a slide.

Pivoted at 94 to the leaves 86 are a second pair of leaves 95, the inner edges of which are vertical. The leaves 95 are provided with forwardly extending pins 96 which enter grooved slots 97 formed in the plate 82; they are also provided with arc-shaped slots 98 which receive pins 99 which project rearwardly from the leaves 86. The slots 98 are curved in an arc of the circle whose center is at the pivots 94, and they operate, together with the slots 97, to maintain the inner edges of the leaves 95 vertical during the movement of these leaves toward and away from each other when the leaves 86 are rocked by the movement of the lever 90. The parts are of such size that the leaves 95 will slightly overlap when they are brought together by the action of the spring 92.

The operation of the shutter is as follows: In the position shown in Fig. 7, the elevator is in its lowermost position and the slide is being exposed. As soon as the determined period for the exposure of the slide has expired, the elevator will begin to move upward and the foot 91 will cease to press upon the outer end of the lever 90. The lever 90 will then be rocked by the action of the spring 92, its inner end being drawn down and the arms 87 of the leaves 86 being also depressed, with the result that the leaves 86 are rocked toward one another. The leaves 86, in their movement, carry with them the leaves 95 which latter therefore move toward one another, their inner edges being maintained vertical by reason of the engagement of their pins 96 in the slots 97 and of the engagement of the pins 99 of the leaves 86 in the slots 98 of the leaves 95. The shutter is thereby closed during the changing of the slide and will only be opened again when the elevator again descends and the foot 91 presses upon the outer end of the lever 90 to reverse the above described operation.

The device as described above is particularly useful for advertising purposes, in that the slides carried by the drum will be successively exposed so long as the motor 58 continues to run. No attention is required, and there is no danger of accidental stoppage occurring. In the use of a lantern for exposing the slides for the purpose of illustrating a lecture or the like, however, it is desirable to be able to change the slide at will during the progress of the lecture and a much greater time is often consumed between the exposures of one pair of slides than would be consumed between the exposures of another pair. To enable the device to be used conveniently for lecturing purposes, I provide means for actuating the clutch block 62 at will; instead of automatically at predetermined intervals of time.

To the above end I provide an electro magnet 100 which is located beneath the shaft 54, and the armature of which is mounted upon an arm 101 secured to a rock shaft 102 mounted in the bracket 52. The arm 101 engages at its upper end in the circumferential recess 71 of the clutch block 62 so that, upon the armature being attracted, the clutch block will be moved toward the left to cause the shaft 54 to drive the pinion 59, and therefore the drum and elevator operating mechanism. A light spring 103 is connected between the bracket 52 and the arm 101 to aid the latter in its return movement when the clutch is disconnected. Mounted upon the counter-shaft 34 is a pinion 104 which meshes with a second pinion 105 carried by a shaft 106 mounted in bearings in the bracket 37, the relation between the teeth of the pinion 105 and those of the pinion 104 being that of two to one, so that the shaft 106 will rotate at half the speed of the shaft 34. The shaft 106 extends outward beyond the bracket 37 and has mounted upon its outer end an insulating disk 107, made of fiber or similar material. To the outer surface of the disk 107 is secured a metallic disk 108 of less diame-

ter than the disk 107 and having a projecting lug 109 which extends outwardly to the periphery of the disk 107. An insulating block 110 is secured to the bracket 37 adjacent the disk 107 and carries upon its upper and lower surfaces a pair of spring contact brushes 111 and 112, respectively, which bear upon the periphery of the insulating disk 107. A spring contact 113 is mounted upon the insulating block 110 and is arranged to engage the surface of the metallic disk 108.

Upon the shaft 54 is mounted an insulating disk 114, in the periphery of which is let a metallic strip 115 which extends almost around the disk. An insulating block 116 is carried by the web 64 of the bridge 63 and supports a pair of spring contact fingers 117 and 117ª which bear upon the periphery of the disk 114, and therefore, during the major portion of the revolution of the disk 114, upon the metallic strip 115. Contact is thus continuously made between the spring fingers 117 and 117ª, except during that time in which the portion of the disk 114 which is disposed between the ends of the strip 115 engages the fingers 117 and 117ª, during which time these fingers are disconnected. The disk 114 is so disposed that the fingers 117 and 117ª will bear upon the portion of the disk which is between the ends of the strip 115 when the pin 61 of the clutch member 62 is opposite the pin 60 of the pinion 59. By this means operation of the clutch is prevented when the pin 61 is opposite to the pin 60. An attempt to actuate the clutch under these conditions would be dangerous in that a partial operation might result, which partial operation would probably have the effect of damaging the mechanism, as for instance, by the end of the arm 72 of the cam lever 65 being struck by the projecting end of the flange 73 of the tooth wheel 33.

The connections will be readily understood from Fig. 12 of the drawings. The terminal of the magnet 100 is connected to the terminal of a battery 118, the other terminal of the battery being connected to the spring contact 117. The spring contact 117ª is connected to the spring contact 113 which, supposing the disk 107 to be in the position shown in Fig. 5, is connected, through the metallic plate 108, to the brush 112. The brush 112 is connected to the binding terminal 119 to which is connected one contact 120 of a two-way switch 121. The switch 121 is connected to another binding terminal 122 from which a wire leads to the other terminal of the magnet 100, whereby the circuit is completed. The second brush, 111, is connected to a third binding terminal 123, from which a wire leads to the second contact, 124, of the two-way switch 121.

The operation of the device is as follows: Supposing the disk 107 to be in the position shown in Fig. 5 and the switch 121 to be in connection with the contact 120; current will pass from the battery to the contact finger 117; thence to the contact finger 117ª and spring contact 113; thence, through the disk 109, to the contact finger 112; thence, via the binding terminals 119, to the contact 120 and switch 121; thence, via the binding terminal 122, to the magnet 100; and thence back to the battery. The current passing through the magnet 100 will attract its armature, whereby the clutch block 62 will be moved to the left to cause the shaft 54 to drive the pinion 59, tooth wheel 33, and the related parts. The rotation of the counter-shaft 34 will, through the pinions 104 and 105, effect a like rotation, but at half the speed, of the disk 107 with the effect that the lug 109 of the disk 108 will pass away from the contact finger 112, the connection being thereby broken. The clutch will, however, be prevented from moving back by the engagement of the end of the arm 72 upon the upper surface of the flange 73 of the tooth wheel 33. By the time that the clutch is again thrown out the tooth wheel 33 will have passed through a complete revolution and the pinion 105 and disk 107 therefore, through one-half a revolution, the lug 109 of the disk 108 being then in position beneath the contact finger 111 (Fig. 12). The slide which has, by the above operation, been brought into position for exposure, will remain exposed until the switch 121 is moved over to make connection with the contact 124. When this is done, current flows from the battery 118 to the contact finger 117; thence to the contact finger 117ª and spring contact 113; thence, through the disk 108, to the contact finger 111; thence, via the binding terminal 123, to the switch contact 124 and switch 121; thence, via the binding terminal 122, to the magnet 100; and thence back to the battery, whereupon the above described operation will again occur.

In describing the above operations it has been presupposed that the spring fingers 117 and 117ª are connected by the metallic strip 115 upon the disk 114. If the switch should have been operated at a time when the pin 61 of the clutch block 62 was opposite the pin 60 of the pinion 59, current could not pass, owing to the fact that the spring fingers 117 and 117ª would, at that time, be bearing upon the surface of the insulating disk 114 between the ends of the strip 115. As soon, however, as the disk 114 has rotated far enough for the strip 115 to make contact between the fingers 117 and 117ª, current can pass and the above described operations will take place. When the clutch block 62 is to be operated by the switch 121, the worm wheel 68 should be removed.

In order to facilitate the manipulation of the slides and to enable the attendant to de-

termine the positions, in the drum, of the particular slides, I stamp, or otherwise mark, two series of numbers (Fig. 3) upon one side wall of the drum, the number being duplicated in each series but being in reversed positions, so that the numbers at the top and at the bottom of the drum may be read easily. The numbers are placed upon the drum opposite the slide guides 27 and designate the slides contained in those guides. A pointer 126 is placed upon the standard 22^a opposite to the openings 30^a of the guard flanges 30. This pointer indicates the number of the slide which is being exposed.

In the use of the machine, a lantern slide is placed in each of the slide guides 27 of the drum, there being fifty of these guides in the magazine of the aperture described above. This may easily be effected if the cam lever 65 is first removed. When the lever 65 has been removed the wheel 33 can be continuously revolved, and the slides can be inserted one by one from the top of the drum. When the slides have been placed in the drum the motor 58 is started by means of a suitable switch and the shaft 54 is thereby caused to revolve, driving the worm wheel 68. During this time a slide, say the slide opposite the number 26 on the drum, is being exposed. After a time, the pin 67 will strike the cam lever and thereby cause the clutch block 62 to drive the pinion 59, which latter, in turn, drives the tooth wheel 33. Immediately the tooth wheel 33 begins to revolve, the elevator will start to rise and the shutter will close. The elevator continues to rise until it has replaced the slide in the guides opposite to the number 26, whereupon it receives the slide from the guides opposite the number 27, and brings it down into position for exposure, the shutter being opened during the latter part of this movement. Just at this time the clutch will be thrown out by reason of the cam projection 76 of the gear wheel 33 striking the arm 72 of the cam lever 65, the pin 67 having by this time, passed away from the end of the cam lever. The parts will now be held stationary, and the slide will be exposed, until the pin 67 again strikes, and operates, the cam lever 65. If it is desired to expose the slides at will, instead of automatically at predetermined periods, the worm wheel 68 is removed and the clutch block 62 operated by the switch 121, as described above.

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

1. In a picture exhibiting machine, a slide-supporting drum having a plurality of slide-receiving guides therein, a slide carrier, a crank connected with said slide carrier so as to impart a linear movement thereto toward and away from said drum, said carrier and said crank being connected so that said crank reaches one of its dead centers when said crank is adjacent said drum, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, and means for moving said drum to bring another of said guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum.

2. In a picture exhibiting machine, a slide-supporting drum having a plurality of slide-receiving guides therein, a slide carrier adapted to be moved toward and away from said drum, a guide for said slide carrier, a shaft passing axially through said drum, a crank connection between said shaft and said slide carrier, whereby the rotation of said shaft will cause a movement of said slide carrier toward and away from said drum, said crank connection being such that the crank reaches one of its dead centers when said slide carrier is adjacent said drum, means for normally holding said drum in such position that one of its guides is in operative relation with said slide carrier, and means for moving said drum to bring another of its guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum.

3. In a picture exhibiting machine, a driving member, a slide supporting drum having a plurality of slide receiving guides therein, a slide carrier adapted to be moved toward and away from said drum, mechanism, operatively connected with said driving member for gradually moving said slide carrier from an exposing position toward said drum, and subsequently by the continued action of said driving member and the same mechanism away from said drum back to exposing position, such mechanism being so arranged as to allow said slide carrier to dwell during the part of its movement when it is adjacent said drum, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, and means, connected with said driving member, for moving said drum to bring another of said guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum.

4. In a picture exhibiting machine, a driving member, a slide supporting drum having a plurality of slide receiving guides therein, a slide carrier adapted to be moved toward and away from said drum, mechanism, operatively connected with said driving member for gradually moving said slide carrier from an exposing position toward

said drum, and subsequently by the continued action of said driving member and the same mechanism away from said drum back to exposing position, such mechanism being so arranged as to allow said slide carrier to dwell during the part of its movement, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, means, connected with said driving member, for moving said drum to bring another of said guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum, and a device for intermittently operating said driving member.

5. In a picture exhibiting machine, a driving member, a drum supported to rotate on a horizontal axis, a slide carrier adapted to be moved toward and away from said drum, a shaft passing axially through said drum, a crank connection between said shaft and said slide carrier, whereby rotation of said shaft effects a movement of said slide carrier toward and away from said drum, said crank connection being such that the crank reaches one of its dead centers when said slide carrier is adjacent said drum, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, and means connected with said driving device for moving said drum for bringing another of said guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum.

6. In a picture exhibiting machine, a driving member, a drum supported to rotate on a horizontal axis, a slide carrier adapted to be moved toward and away from said drum, a shaft passing axially through said drum, a crank connection between said shaft and said slide carrier, whereby rotation of said shaft effects a movement of said slide carrier toward and away from said drum, said crank connection being such that the crank reaches one of its dead centers when said slide carrier is adjacent said drum, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, means connected with said driving device for moving said drum for bringing another of said guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum, and a device for intermittently operating said driving member.

7. In a picture exhibiting machine, a vertically disposed slide supporting drum supported to rotate upon a horizontal axis, and having a plurality of slide receiving guides therein, a slide carrier disposed beneath said drum substantially vertically below the axis thereof, mechanism for moving said slide carrier toward said drum and subsequently by the continued action of the same mechanism, gradually away from said drum to an exposing position, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, and means for moving said drum to bring another of said guides into operative relation with said slide carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum.

8. In a picture exhibiting machine, in combination, a rotatably mounted drum, having a series of regularly disposed radial slide-receiving guides therein, a slide carrier movable toward and away from said drum, to move the slides from and replace them in, the guides of said drum, a shaft, means, actuated by said shaft, for effecting a movement of said carrier toward and away from said drum for each revolution of said shaft, a driving member, a connection between said driving member and said shaft, whereby each revolution of said driving member effects one revolution of said shaft, a connection between said driving member and said drum, whereby each revolution of said driving member moves said drum through a distance equal to the distance between a pair of said slide-receiving guides, and means for intermittently rotating said driving member.

9. In a picture exhibiting machine, in combination, a rotatably mounted drum, having a series of regularly disposed radial slide-receiving guides therein, a slide carrier movable toward and away from said drum, to move the slides from and replace them in, the guides of said drum, a shaft, means, actuated by said shaft, for effecting a movement of said carrier toward and away from said drum for each revolution of said shaft, a driving member, a connection between said driving member and said shaft, whereby each revolution of said driving member effects one revolution of said shaft, a connection between said driving member and said drum, whereby each revolution of said driving member moves said drum through a distance equal to the distance between a pair of said slide-receiving guides, means for intermittently rotating said driving member, and means for locking said driving member when the same is not being rotated.

10. In a picture exhibiting machine, in combination, a rotatably mounted drum, having a series of regularly disposed radial slide-receiving guides therein, a slide car-

rier movable toward and away from said drum, to move the slides from and replace them in, the guides of said drum, a shaft, means, actuated by said shaft, for effecting a movement of said carrier toward and away from said drum for each revolution of said shaft, a driving member, a connection between said driving member and said shaft, whereby each revolution of said driving member effects one revolution of said shaft, a connection between said driving member and said drum, whereby each revolution of said driving member moves said drum through a distance equal to the distance between a pair of said slide-receiving guides, means for intermittently rotating said driving member, a shutter, operating mechanism for said shutter, having a projecting portion, and means carried by said slide carrier for engaging said projecting portion, and opening said shutter, when said slide carrier is near the position in which it is farthest removed from said drum.

11. In a picture exhibiting machine, in combination, a rotatably mounted drum, having a series of regularly disposed radial slide-receiving guides therein, a slide carrier movable toward and away from said drum, to move the slides from and replace them in, the guides of said drum, a shaft, means, actuated by said shaft, for effecting a movement of said carrier toward and away from said drum for each revolution of said shaft, a driving member, a connection between said driving member and said shaft, whereby each revolution of said driving member effects one revolution of said shaft, a connection between said driving member and said drum, whereby each revolution of said driving member moves said drum through a distance equal to the distance between a pair of said slide-receiving guides, means for intermittently rotating said driving member, a main drive shaft, a clutch connection between said main drive shaft and said driving member, means, operatively connected with said main drive shaft, for intermittently throwing in said clutch, and means for throwing out said clutch after said driving member has turned through one revolution.

12. In a picture exhibiting machine, in combination, a rotatably mounted drum, having a series of regularly disposed radial slide-receiving guides therein, a slide carrier movable toward and away from said drum, to move the slides from and replace them in, the guides of said drum, a shaft, means, actuated by said shaft, for effecting a movement of said carrier toward and away from said drum for each revolution of said shaft, a driving member, a connection between said driving member and said shaft, whereby each revolution of said driving member effects one revolution of said shaft, a connection between said driving member and said drum, whereby each revolution of said driving member moves said drum through a distance equal to the distance between a pair of said slide-receiving guides, means for intermittently rotating said driving member, a main drive shaft, a clutch between said main drive shaft and said driving member, a movable device connected with said clutch and forming a stop adapted to lock said driving member against rotation when said clutch is thrown out, means for intermittently throwing said clutch in and removing said stop from its operative position, and means for throwing said clutch out and returning said stop to its operative position after said driving member has moved through one revolution.

13. In a picture exhibiting machine, a driving member, a slide supporting drum having a plurality of slide receiving guides therein, a plurality of guard flanges adjacent the periphery of said drum, a slide carrier adapted to be moved toward and away from said drum, mechanism operatively connected with said driving member for gradually moving said slide carrier from an exposing position toward said drum and subsequently away therefrom back to exposing position, said mechanism being so arranged as to allow said slide carrier to dwell during the part of its movement when it is adjacent said drum, and to bring said slide carrier substantially level with the upper surface of said guard flanges at the moment it receives a slide, means for normally holding said drum in such position that one of said guides is in operative relation with said slide carrier, and means, connected with said driving member, for moving said drum to bring another of said guides into operative position with said carrier, such movement occurring during that part of the movement of said slide carrier in which said slide carrier is adjacent said drum.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

CHARLES A. BRAUN.

Witnesses:
CHARLES G. COPE,
JEAN BENNET.

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