May 1, 1923. 1,453,893

R. C. SMITH

LANTERN SLIDE PROJECTING APPARATUS

Filed April 20, 1921 2 Sheets-Sheet 1

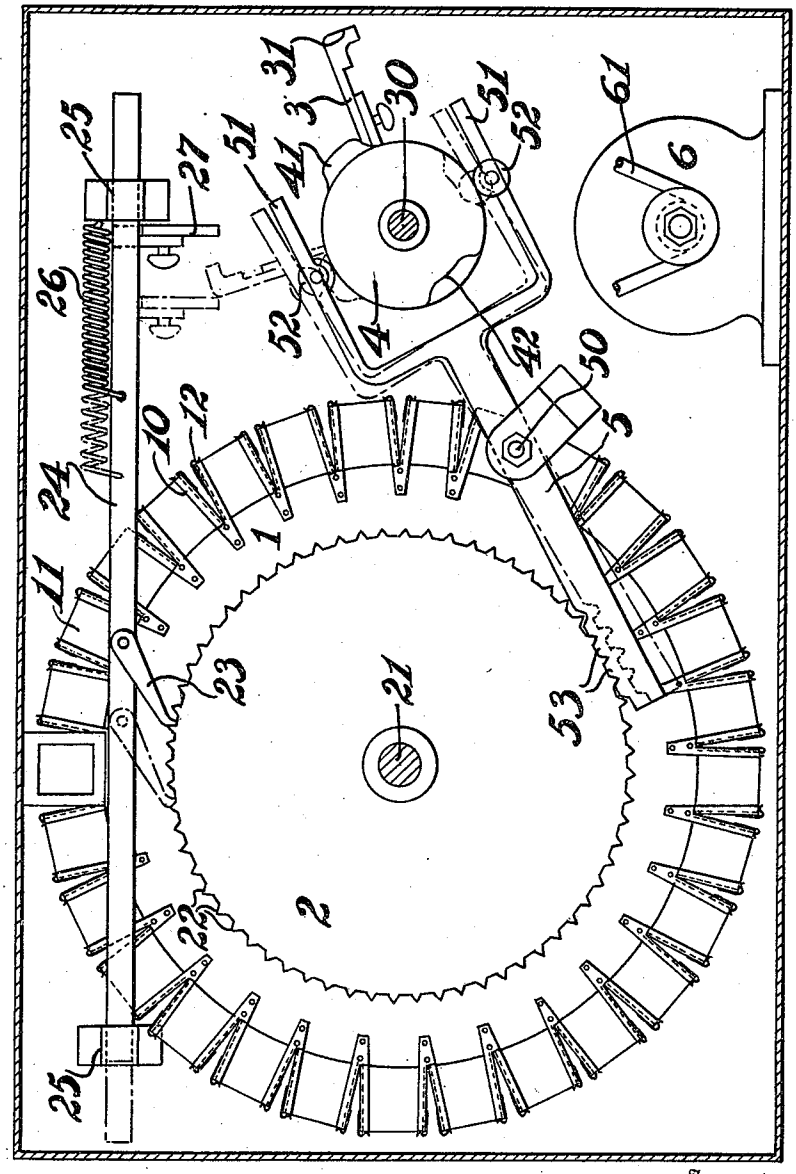


FIG. 1

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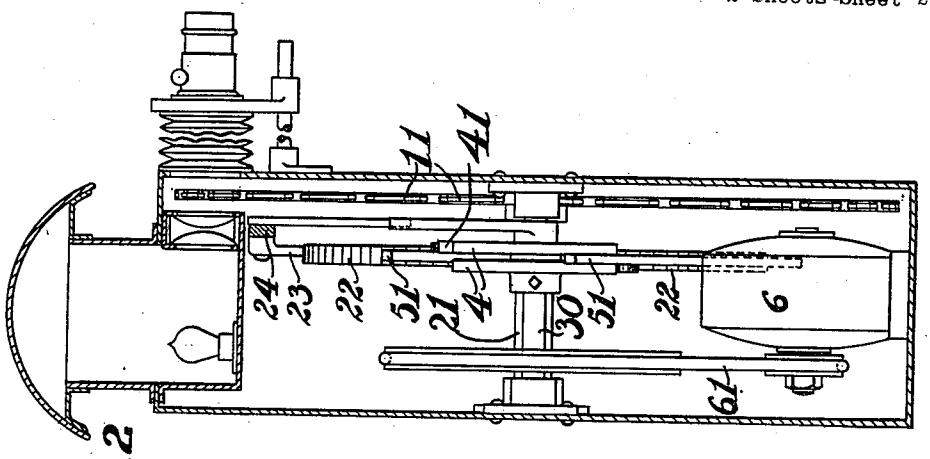


FIG. 2

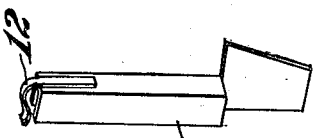


FIG. 4

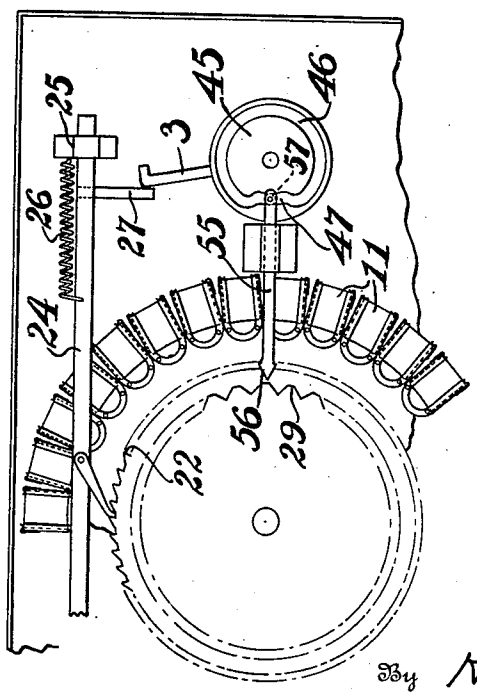


FIG. 3

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Patented May 1, 1923. 1,453,893

UNITED STATES PATENT OFFICE.

RICHARD C. SMITH, OF SEATTLE, WASHINGTON.

LANTERN-SLIDE PROJECTING APPARATUS.

Application filed April 20, 1921. Serial No. 462,874.

To all whom it may concern:

Be it known that I, RICHARD C. SMITH, a subject of the King of England, and resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Lantern-Slide Projecting Apparatus, of which the following is a specification.

My invention relates to lantern slide projecting apparatus in which a slide carrying member is automatically given an intermittent movement to advance individual slides into and out of projecting position. My device is particularly intended for use in the projection of advertising slides.

The principal object of my invention is to simplify such devices without sacrificing efficient and positive operation thereof.

Another object is to provide an intermittent feed mechanism, and in connection therewith a positive lock for the slide-carrying members which will maintain them fixed in position until they are released to permit their advance, whereupon the locking mechanism will again function to secure them in the new position.

My invention comprises those novel parts and combinations thereof which are shown in the accompanying drawings, described in the specification, and particularly defined by the claims terminating the same.

In the accompanying drawings I have shown my invention in a form which is now preferred by me, with a modified form employing the same principles.

Figure 1 is an elevation of my device, the casing being shown in section.

Figure 2 is a section showing my device in elevation at right angles to Figure 1.

Figure 3 is a side elevation similar to Figure 1, showing a modified form.

Figure 4 is a perspective view of a slide-holding channel unit.

The slides 11 are suitably mounted upon a slide carrying member which I have shown as the disk or wheel 1. It is largely immaterial in what position or in what manner the slides are mounted upon the disk 1, but the preferable mounting is as shown in Figures 1 and 3, wherein they project radially in the plane of the disk and are placed edge to edge upon its periphery. They are held in place thereupon by suitable guides 10. These are channel shaped, and are secured to the disk, and have at their outer ends spring clips or other retaining members 12. The channels 10 receive the side edges of the slides, and the clips 12 engage their outer or top edges to retain them in position upon the disk 1. Any other suitable securing means may be employed for these slides. Further, the slide carrying member need not be a disk, as shown, but may be any suitable member. It is not outside of the scope of my invention to provide a chain carried upon a suitable sprocket wheel as the slide carrying member, or an annular ring, as these and like members are well-known in the art.

Associated with the slide carrying member, though preferably not integral therewith, are means for advancing the same intermittently. I have shown a toothed wheel 2 which is secured upon the same shaft 21 as that which carries the disk 1. The teeth 22 of the wheel 2 are engageable by a spring pressed pawl 23 which is secured upon a reciprocable bar 24. The bar 24 is suitably supported in guides 25 and has secured thereto a spring 26 or equivalent means to return the bar to its normal position after it has been advanced by means to be later described. When the bar 24 is advanced, this occurring at intervals, the engagement of the pawl 23 with the teeth 22 of the wheel 2 advances the wheel and consequently the slide carrying disk 1. The advance of the bar 24 is regulated to be sufficient to advance the disk 1 by the spacing between the individual slides 11.

The bar 24 has secured thereto a projection or pin 27, and this pin 27 is engaged during a part of the rotation of a trip arm 3, which rotates regularly and which is secured upon a shaft 30. The arm 3 is preferably provided at its outer end with an offset portion 31 which is curved to correspond with the arc described by the outer end of the arm 3 for a purpose to be described later. Either the pin 27 or the arm 3, or both, may be made adjustable in length, if desired.

Secured upon the shaft 30 are a pair of cams 4 axially spaced upon the shaft. One of these cams has a lug 41 upraised from its peripheral cam surface, and the other cam has a corresponding depression 42 placed substantially opposite the lug 41, and of substantially equal angular extent. A lever 5, which is fixedly pivoted at 50 between its ends, terminates at one end in a yoke, the arms 51 of which extend on op-

posite sides of the cams 4. Followers, consisting of the rollers 52 mounted in the arms 51, engage the cam surfaces. The engagement of the lug 41 with one of the rollers 52 and the simultaneous engagement of the opposite roller 52 with the depression 42 oscillates the lever 5 upon its pivot. Its other end is provided with teeth 53 which are engageable with the teeth 22 of the wheel 2, to lock the wheel, and consequently the slide carrier 1, in fixed position during most of the rotation of the cams 4.

The trip arm 3 is so positioned upon the shaft 30 that, upon oscillation of the lever 5, as described, the wheel 2 and the slide carrier 1 are unlocked, and the bar 24 is advanced by engagement of the trip arm with the pin 27 to advance the slide carrier. The curved projection 31 of the trip arm retains the pin 27 advanced until the followers 52 have passed beyond the lug 41 and depression 42, whereby the slide carrier is retained in advanced position until the locking teeth 53 are again engaged with the teeth 22. This obviates the possibility of a return movement of the slide carrier due to a premature return of the bar 24. The grooves between the teeth 53 which receive the teeth 22, are inclined in both directions; therefore, if the slide is a little to either side of the proper projecting position, the tendency of the engagement of the teeth 22 with these grooves between the teeth 53 is to exactly and properly position the slide. A motor 6 is provided for driving the shaft 30 through a suitable belt 61.

The reciprocable bar 24 need not necessarily engage directly the disk 2 of the slide carrier 1. For the purpose of the claims, in referring to the slide-carrying member as engaged by an intermittently-operable device, I desire the term "slide-carrying member" to include any gear, slide, or other member in a train supporting or advancing the slides, or it may mean a chain, if this is employed. The intermittent feed mechanism described also may be replaced by any equivalent construction as, for instance, a Geneva movement. The cams 4 may be single as well as plural. If properly timed in their rotation relative to the trip arm 3, several pairs of lugs 41 and depressions 42 may be formed upon a single set of cams. The feed teeth 22 may be of any shape found desirable, although that form shown in Figure 1 is my preferred form. The locking member, that is the teeth 53, may be engageable with the slide carrying member, as defined above, by reciprocable, oscillatory, or even rotary motion, as in a Geneva movement. as I consider these the equivalent of the form described. The bar 24 may be positively advanced and retracted, as by a cam, if desired.

In Figure 3 I have shown an alternative construction. In this form the teeth 22 are only employed for engagement by the pawl 23 to advance the slide carrying disk 1. A second disk 20 is employed, having large teeth 29 thereon, spaced angularly by the spacing between the individual slides. The lever 5 is replaced by a reciprocable member 55 having a single point 56 upon its end which is reciprocable into and out of engagement with the teeth 29. A single cam 45 having a continuous groove 46, extending the greater part of the distance about the disk, has a depressed portion 47. A follower 57 upon the end of the locking member 55 is engaged in the groove 46, 47. The disk 45 carrying the cam groove rotates with the trip arm 3 and gives to the locking member 55 the proper motion to release it from engagement with the teeth 29 only when the bar 24 is being advanced.

What I claim as my invention is:

1. In a lantern slide projecting apparatus, in combination with a slide-carrying member, intermittent feed mechanism therefor, operable to advance the slide-carrying member and to maintain it advanced momentarily after an advance, cams movable in conjunction with said feed mechanism, and a locking member engageable with said slide-carrying member while it is held in advanced position and controlled by said cams to secure the slide-carrying member in fixed position during the inaction of the feed mechanism and to release it to permit its advance.

2. In a lantern slide projecting apparatus, in combination with a slide-carrying member, intermittent feed mechanism therefor, cams movable in conjunction with said feed mechanism, means for maintaining the slide-carrying member in advanced position momentarily after an advance, and a locking member engageable with said slide-carrying member prior to its release from said latter means and controlled by said cams to secure the slide-carrying member in fixed position during the inaction of the feed mechanism and to release it to permit its advance, said locking member being operable to exactly position said slide-carrying member.

3. In a lantern slide projecting apparatus, in combination with a slide-carrying member, intermittent feed mechanism therefor including a rotary trip arm and operable to intermittently advance the slide-carrying member, said trip arm having a peripheral extension at its outer end to maintain the slide-carrying member momentarily advanced following an advance thereof, cams movable in conjunction with said trip arm, and a locking lever engageable with said slide-carrying member while it is held in advanced position and controlled by said cams to secure the slide-carrying member in fixed

position during the inaction of the feed mechanism and to release it to permit its advance.

4. In a lantern slide projecting apparatus, in combination with a slide-carrying member, intermittent feed mechanism therefor, a pair of rotary cams movable in conjunction with said feed mechanism, one of said cams having a lug upraised therefrom, and the other cam having an opposite depression of substantially equal angular extent, a locking lever pivoted between its ends, one end being engageable with said slide-carrying member to lock it in fixed position during the inaction of the feed mechanism, and to release it during its advance, and the other end of the locking lever terminating in a yoke each arm of which extends adjacent one of the cams, and a follower secured in each arm of the yoke, and simultaneously engageable each with its respective cam lug or depression.

5. In a lantern slide projecting apparatus, in combination with a slide-carrying member, intermittent feed mechanism for advancing said slide-carrying member, positive locking means for said slide-carrying member, means for releasing said locking means to permit advance of the slide-carrying member, a rotary trip arm in conjunction with the releasing and locking means for retaining said slide-carrying member in advanced position until the locking means is in operative position.

6. In a lantern slide projecting apparatus, in combination with a slide-carrying member, intermittent feed mechanism therefor including a reciprocable bar, positive locking means for said slide-carrying member, means for releasing said locking means to permit advance of the slide-carrying member, a rotary trip arm engageable with said bar to advance it while the lock is released, and a circular arc extension on said trip arm operable to maintain said bar advanced until the locking means is again in operative position.

7. An intermittent mechanical movement including, in combination with a member to be advanced, intermittent feed mechanism therefor, including means for maintaining it in advanced position momentarily following an advance, a locking member engageable with said first member prior to release thereof by the momentary holding means, and cams movable in conjunction with said feed mechanism to secure said first member in fixed position during the inaction of the feed mechanism, and to release it to permit its advance.

Signed at Seattle, King county, Washington, this 12th day of April, 1921.

RICHARD C. SMITH.