

Nov. 24, 1931.

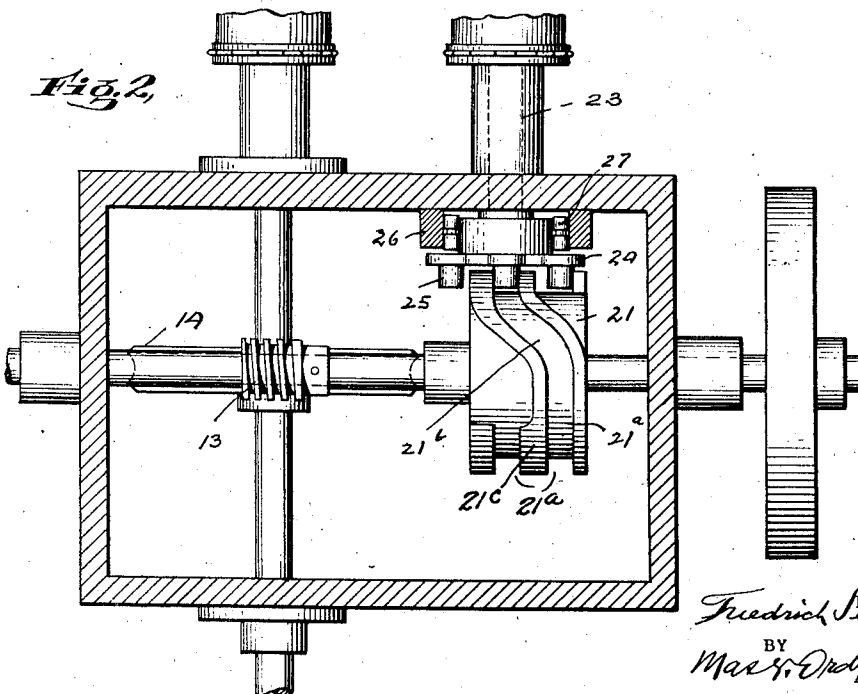
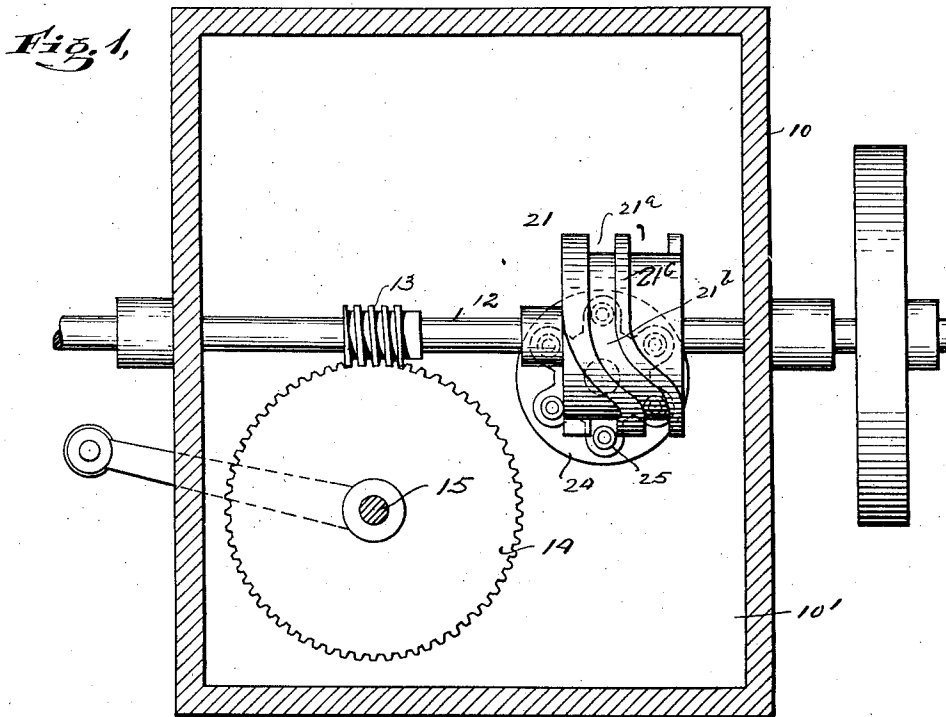
F. SEUFERT

1,833,339

CINEMA OR LIKE APPARATUS

Filed April 27, 1928

2 Sheets-Sheet 1



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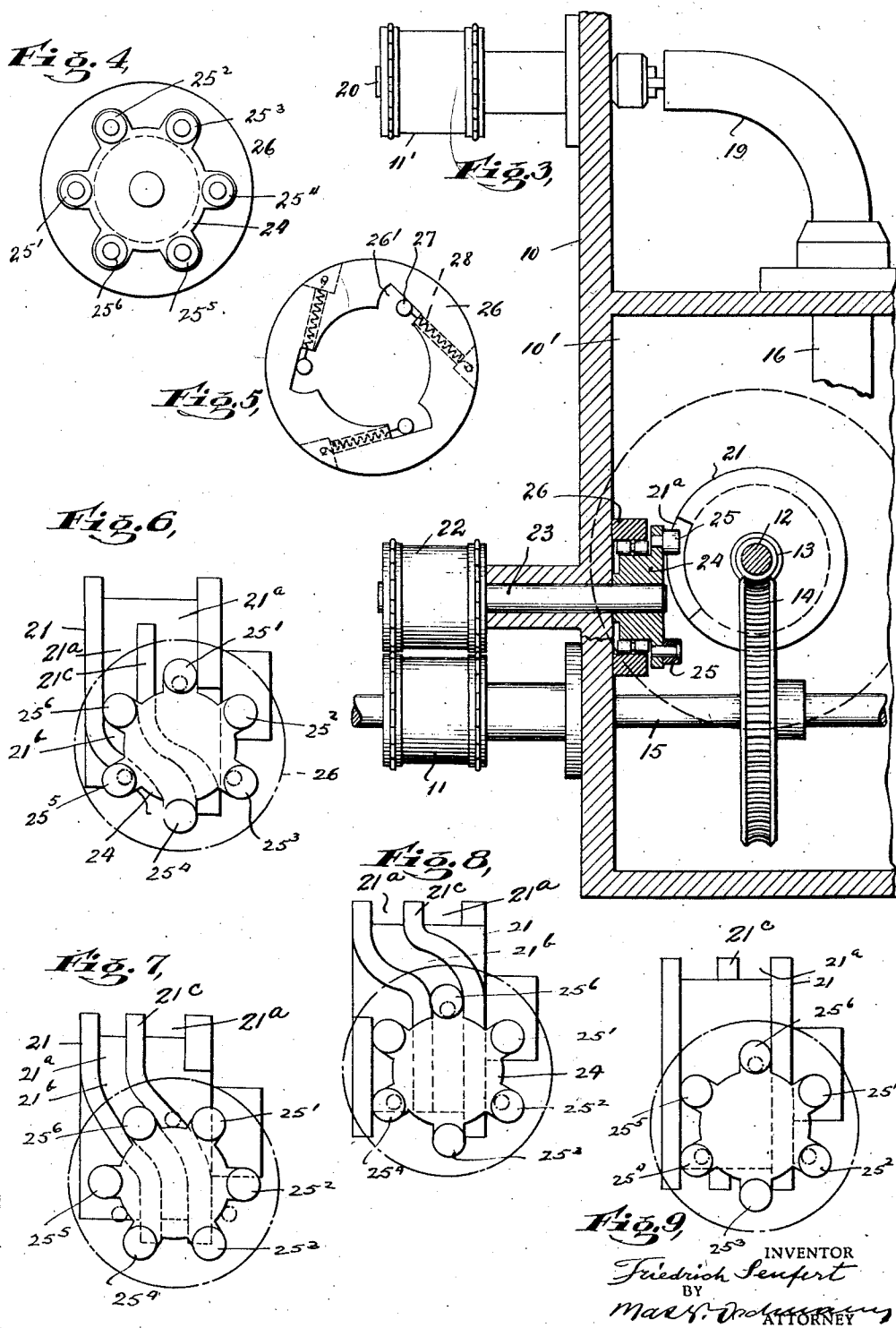
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UNITED STATES PATENT OFFICE

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CINEMA OR LIKE APPARATUS

Application filed April 27, 1928. Serial No. 273,221.

REISSUED

This invention relates to cinema or like projecting apparatus. The accidental displacement of the film occurring during the projection of motion pictures is generally due to the wear caused in the film feeding mechanism.

This mechanism as is well known is particularly subjected to great wear at the beginning and end of the feeding operation.

The object of this invention is to provide a film feeding mechanism in which wear will be reduced to a minimum and whereby the film will be fed one picture at a time and be securely held against accidental displacement in forward and rearward directions and while the picture is in front of the gate.

With this and other objects in view my invention consists in the novel construction, combination and arrangement of parts as will be hereinafter more fully described and defined in the appended claims.

In the accompanying drawings which constitute part of this specification and in which similar reference characters denote corresponding parts, Fig. 1 is a sectional front view of a part of a picture projecting apparatus, equipped with my novel means; Fig. 2 a sectional top plan view thereof; Fig. 3 a sectional side view thereof; Fig. 4 is a front view of a detail of the feeding mechanism; Fig. 5 is a front view of another detail thereof and Figs. 6-9, inc. are more or less diagrammatic views of a modified form of the feeding means and illustrating different positions thereof during their operation.

Referring to the drawings more in detail, 10 denotes the framing, 10' the gear casing, 11, 11', denote the ordinary sprocket drums for guiding the film (not shown). 12 denotes the driving shaft which may be driven from a motor (not shown) and which is formed with a worm 13 which meshes with a worm gear 14 fixed on the spindle 15 of the lower sprocket drum 11. 16 denotes a vertical spindle which by means of bevelled gears (not shown) receives rotary motion from the spindle 15 and which by means of a flexible shaft 19 is coupled to the spindle 20 of the upper sprocket drum 11. Fixed on the driving shaft 12 is a cam in form of a

cylindrical body 21 formed circumferentially with a groove comprising two parallel straight portions 21^a and a helically curved portion 21^b of relatively small pitch connecting said two straight portions and so shaped that a single revolution of said cam will cause the feed of the film loop the length of a single picture. In the modification of Figs. 1 and 2 the separating wall 21^c between portions 21^a of the groove is continuous. In the modification of Figs. 6-9, the separating wall 21^c between said straight portions, does not extend entirely around said cam as it serves no function except at the curved portion 21^b to form the latter. 22 denotes the feeding sprocket drum for the film. This drum is fixed on the spindle 23 which is borne in the frame 10 and which projects into the casing 10'. On its inner end the spindle bears a cylindrical body or disk 24 from the outer face of which project toward the helical groove a circular series of studs such as 25', 25², 25³, 25⁴, 25⁵ and 25⁶ each of which carries an antifriction roller 25 and is adapted during the rotation of the cam 21 to successively engage the groove 21^a.

The disk or body 24 is fixed to spindle 23. To prevent rotation in the rearward direction, an annular member or ring 26 fixed to the wall of said case 10 and concentric with disk 24 is provided. The said ring has a series of tapered cavities 26' open on their inner sides and arranged tangentially relative to the inner circumference of said disk 24. Borne in these cavities are rollers 27 actuated by springs 28 fastened to said member 26 which tend to pull said rollers into the narrowest ends of said cavities. Thus any attempt to rotate the disk 24 in the wrong direction causes it to lock. The pins or studs 25' to 25⁶ are so distributed on the disk 24 that at all times two studs will simultaneously engage the groove 21^a of the cam 21. This simultaneous engagement of two studs in the groove 21^a of the cam cylinder 21 serves to prevent accidental rotation of the sprocket drum 22 in forward and rearward direction.

Thus according to Fig. 6 at the beginning of the feed of the film past the gate stud 25⁶ is just entering the helical part 21^b of the groove, while stud 25' is about to leave the

same and enter the straight part of the groove. In this position the cylinder or disk 24 is firmly coupled to the cam cylinder 21 and is unable to turn independently in either direction. When the cam 21 completes say $\frac{1}{6}$ of a revolution the stud 25' has disengaged the groove 21^a and at the same time stud 25^s has entered the same, while stud 25^s is still in the helical part 21^b of the groove (Fig. 7). The completion of the feed of the film the length of a picture is shown in Fig. 8. Here both studs 25^s and 25^s are in engagement with the groove 21^a. It is thus apparent that during the entire feed of the film the cylinder 24 is positively coupled to said cam and is locked against accidental rotation in either direction.

When the studs 25^s and 25^s engage the straight portions 21^a of the groove, as in Fig. 9, no rotation is imparted to cylinder 24 and the film remains stationary before the gate and is locked against accidental displacement.

If the cylinder 24 is coupled to the spindle 23 thereof through the ring 26 the latter will transmit rotation to said spindle 23 through the medium of the friction rollers 27 in well known manner.

The present invention also has the advantage that sprocket drums of larger size than usual may be used, whereby the wear of the film can be greatly reduced.

Since the construction may be modified in various ways without departing from the spirit of this invention I do not wish to restrict myself to the details described and shown.

What I claim is:

1. In a cinema or like apparatus, the combination with the driving shaft and the film feeding sprocket drum of means on said shaft, revolving with the latter and having a cam groove, said groove having two parallel straight portions joined by a helical portion, rotary feeding elements coupled to said drum and adapted to successively engage said groove, so that at all times at least two of said elements will be simultaneously and respectively in engagement with opposite inner walls of said groove thereby preventing said drum from accidental rotation in either direction.

2. In a cinema or like apparatus, the combination with the driving shaft and the film feeding sprocket drum of means on said shaft revolving with the latter and having a cam groove, said groove having two parallel straight portions, joined by a helical portion, a plurality of rotary feeding elements, means coupling said elements to said sprocket drum, said elements being adapted to successively engage said groove, so that at all times at least two of said elements will simultaneously engage said groove preventing said drum from accidental rotation in either direction.

3. In a cinema or like apparatus, the combination with the driving shaft and the film feeding sprocket drum of a body formed with a groove and revolving with said shaft, said groove having two parallel straight parts joined by a helically curved part and being so shaped and admeasured that a single revolution of said body will effect the feeding of the film the length of a single picture, a rotary feed producing body coupled to said drum and formed with a plurality of projecting elements arranged concentrically about the axis of said body and adapted to successively engage said groove, so that at all times at least two of said elements will simultaneously and respectively engage the opposite inner walls of said groove thereby preventing said drum from accidental rotation in either direction.

4. In a cinema or like apparatus, a device as per claim 3, in which the projecting elements carry freely revolving rollers to engage the groove walls of said cam body and whereby friction during the operation is reduced.

5. In a cinema or like apparatus, the combination with the driving shaft and the film feeding sprocket drum of means on said shaft revolving with the latter and having a cam groove provided with a helically curved part, rotary feeding elements coupled to said drum and adapted to successively engage said groove so that at all times at least two of said elements will be simultaneously in engagement with said groove preventing said drum from accidental rotation.

6. In a cinema or like apparatus the combination with the driving shaft and the film feeding sprocket drum, of means on said shaft revolving with the latter and having a cam groove, said groove having two parallel straight portions separated by a wall and joined by a helical portion, said wall being broken away in part, rotary feeding elements coupled to said drum and adapted to successively engage said groove, at least two of said elements being simultaneously in engagement with said groove at all times and thereby preventing said drum from accidental rotation in either direction.

7. In a device as per claim 3, in which the wall separating said two straight parts of said groove is broken away in part.

In testimony whereof I affix my signature.
FRIEDRICH SEUFERT.